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# PATENT OFFICE

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Vol. 1011 Number 1

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

October 6, 1981

U.S.
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Office

# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 6, 1981 Volume 1011 Number 1


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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,674,562,** Re. S.N. 270,216, Filed June 3, 1981, Cl. 429/192, PRIMARY CELLS AND IODINE CONTAINING CATHODES THEREFOR, Alan A. Schneider, et al., Owner of Record: *Catalyst Research Corp., Baltimore, Md.,* Attorney or Agent: Stanton T. Lawrence, Jr., et al., Ex. Gp.: 114

**4,057,703,** Re. S.N. 271,561, Filed June 8, 1981, Cl. 219/69C, METHOD OF MACHINING BY EROSIVE ELECTRICAL DISCHARGES, Jean Pfau, Owner of Record: *Ateliers des Charmilles, S.A., Geneve, Switzerland,* Attorney or Agent: Claude A. Patalidis, et al., Ex. Gp.: 213

**4,112,234,** Re. S.N. 274,291, Filed June 16, 1981, Cl. 548/342, IMIDAZOLYLMETHYLTHIOETHYL ALKYNYL GUANIDINES, Ronnie Ray Crenshaw, et al., Owner of Record: *Bristol-Myers Co., New York, N.Y.,* Attorney or Agent: Joseph M. Fitzpatrick, et al., Ex. Gp.: 121

**4,170,127,** Re. S.N. 241,138, Filed Mar. 6, 1981, Cl. 073/28, CALIBRATED OIL BURNER FILTER PAPER, Anthony W. Butera, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 244

**4,197,654,** Re. S.N. 243,856, Filed Mar. 16, 1981, Cl. 33/304, SURVEY APPARATUS AND METHOD EMPLOYING ALL LATITUDE, ALL ATTITUDE GYROCOMPASSING, Donald H. van Steenwyk, et al., Owner of Record: *Applied Technologies Associates, San Marino, Calif.,* Attorney or Agent: William W. Haefliger, Ex. Gp.: 243

**4,221,267,** Re. S.N. 272,626, Filed June 11, 1981, Cl. 172/804, ANGLE AND TILT IMPLEMENT ASSEMBLY, Jerrold R. Asal, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 334

**4,238,586,** Re. S.N. 271,563, Filed June 8, 1981, Cl. 526/137, GROUP VA AND VII OXYGEN MINERAL ACIDS AS CATALYST MODIFIERS, Nikolaous K. Balint, Owner of Record: *Standard Oil Co., Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 144

**4,252,242,** Re. S.N. 271,562, Filed June 8, 1981, Cl. 211/96, CLOTHING RACK, Charles L. Tudor, Owner of Record: *Inventor,* Attorney or Agent: Norman S. Blodgett, Ex. Gp.: 355

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**3,518,946,** Reexam. No. 90/000,059, Requested: Aug. 21, 1981, Cl. 104/174, PUSHER CONVEYOR FOR WHEELED CARRIERS, Shelden M. Kavieff, Owner of Record: *Jervis B. Webb Co.,* Attorney or Agent: Joseph W. Farley, Ex. Gp.: 316, Requester: George E. Oram, Jr., Washington, D.C.

**3,523,408,** Reexam. No. 90/000,061, Requested: Sept. 1, 1981, Cl. 55/159, GAS SEPARATOR, David Rosenberg, Owner of Record: *Pall Corp.,* Attorney or Agent: Leydig, Voit, Osann, Mayer & Holt, Ltd., Ex. Gp.: 170, Requester: Pall Corp., Glen Cove, N.Y.

**3,621,243,** Reexam. No. 90/000,064, Requested: Sept. 8, 1981, Cl. 250/395, APPARATUS AND PROCESS FOR DETERMINING PARTICLE SIZE BY X-RAY ABSORPTION ANALYSIS, James Peter Olivier, et al., Owner of Record: *Freeport Minerals Co.,* Attorney or Agent: W. Philip Churchill, Ex. Gp.: 252, Requester: Micromeritics Instrument Corp., Norcross, Ga.

**3,770,033,** Reexam. No. 90/000,067, Requested: Sept. 9, 1981, Cl. 145/61C, MOLDED HANDLE FOR IMPACT TOOLS, Charles R. Gavillet, et al., Owner of Record: *Decker Manufacturing Co.,* Attorney or Agent: Austin P. Dodge, et al., Ex. Gp.: 323 Requester: Decker Manufacturing Co., c/o Robert A. Ostmann, Arlington, Va.

**3,888,582,** Reexam. No. 90/000,062, Requested: Sept. 2, 1981, Cl. 493/328, SEMI-AUTOMATIC DOCUMENT HANDLER, Augustus W. Griswold, Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: Ralabate, et al., Ex. Gp.: 324, Requester: Xerox Corp., Rochester, N.Y.

**4,157,161,** Reexam. No. 90/000,066, Requested: Sept. 9, 1981, Cl. 239/11, WINDSHIELD WASHER, Peter Bauer, Owner of Record: *Bowles Fluidics Corp.,* Attorney or Agent: Rose & Edell, Ex. Gp.: 313, Requester: Peter Bauer, Germantown, Md.

### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Post Office as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Belgrade Shoe Co., Auburn, Me., Reg. Nos. 534,058 and 812,213, Canc. No. 12,934.

Appendagez, Inc., Norwood, Mass., Reg. No. 1,116,098, Canc. No. 12,964.

Cotton Club Frocks, Inc., New York, N.Y., Reg. No. 777,452, Canc. No. 12,978.

Stylon Corp., Milford, Mass., Reg. No. 727,653, Canc. No. 12,988.

Bedford Shirtmakers Corp., by change of name from Bedford Shirt Corp., New York, N.Y., Reg. No. 761,115, Canc. No. 13,006.

EVELYN R. LOPEZ,
*Clerk, Trademark Trial and Appeal Board.*
For MARGARET M. LAURENCE,
*Assistant Commissioner for Trademarks.*

# PATENT NOTICES

**Certificates of Correction for the Week of Oct. 6, 1981**

| | | | |
|---|---|---|---|
| D. 259,045 | 4,245,057 | 4,265,035 | 4,275,105 |
| 3,931,195 | 4,245,761 | 4,265,072 | 4,275,197 |
| 3,999,386 | 4,246,682 | 4,265,095 | 4,275,654 |
| 4,030,091 | 4,248,780 | 4,265,885 | 4,275,739 |
| 4,099,638 | 4,251,498 | 4,265,993 | 4,275,880 |
| 4,107,390 | 4,252,238 | 4,267,086 | 4,275,905 |
| 4,128,043 | 4,253,043 | 4,267,095 | 4,275,935 |
| 4,130,481 | 4,253,789 | 4,267,223 | 4,276,362 |
| 4,133,877 | 4,254,241 | 4,267,322 | 4,276,427 |
| 4,134,903 | 4,254,883 | 4,267,364 | 4,276,745 |
| 4,156,144 | 4,255,349 | 4,267,671 | 4,276,914 |
| 4,159,104 | 4,255,721 | 4,267,843 | 4,277,311 |
| 4,169,990 | 4,255,907 | 4,267,882 | 4,277,318 |
| 4,184,551 | 4,256,316 | 4,268,591 | 4,277,645 |
| 4,185,511 | 4,256,471 | 4,268,870 | 4,278,005 |
| 4,189,758 | 4,257,106 | 4,269,100 | 4,278,190 |
| 4,193,885 | 4,257,188 | 4,269,236 | 4,278,215 |
| 4,194,948 | 4,257,539 | 4,269,517 | 4,278,366 |
| 4,202,625 | 4,257,968 | 4,269,675 | 4,278,439 |
| 4,219,191 | 4,258,019 | 4,269,945 | 4,278,858 |
| 4,220,792 | 4,258,041 | 4,270,028 | 4,279,500 |
| 4,221,677 | 4,259,103 | 4,270,450 | 4,279,594 |
| 4,227,648 | 4,259,250 | 4,270,975 | 4,279,873 |
| 4,228,191 | 4,259,528 | 4,271,094 | 4,280,185 |
| 4,228,232 | 4,260,469 | 4,271,191 | 4,280,201 |
| 4,230,773 | 4,260,955 | 4,271,405 | 4,280,231 |
| 4,232,113 | 4,261,056 | 4,271,536 | 4,280,442 |
| 4,232,369 | 4,261,511 | 4,271,693 | 4,280,588 |
| 4,233,430 | 4,261,983 | 4,273,055 | 4,280,811 |
| 4,234,763 | 4,262,147 | 4,273,188 | 4,280,943 |
| 4,237,082 | 4,263,091 | 4,273,563 | 4,280,969 |
| 4,238,345 | 4,263,269 | 4,273,627 | 4,281,247 |
| 4,239,128 | 4,263,392 | 4,273,774 | 4,281,307 |
| 4,239,177 | 4,263,748 | 4,274,155 | 4,281,346 |
| 4,239,299 | 4,264,070 | 4,274,272 | 4,281,638 |
| 4,244,626 | 4,264,135 | 4,274,403 | |
| 4,244,738 | 4,264,744 | 4,275,006 | |

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**2,409,774,** Mack and Klebsattel, A DRIER METAL SALT AND A PROCESS OF MAKING IT; **3,467,683,** Harson and Fogg, METAL ORGANO-PHOSPHORUS COMPOUNDS; **Re. 30,553,** Harson and Fogg, METAL ORGANOPHOSPHORUS COMPOUNDS, **filed** June 8, 1981, D.C., N.D. Ohio (Cleveland), Doc. C81-1179, *Manchem Ltd.* v. *Mooney Chemicals, Inc.*

**3,047,196,** A & E Warbern, Inc. GARMENT HANGER, **filed** Nov. 10, 1979, D.C., S.D. Fla. (Miami), Doc. 79-6487-CIV-SMA, *Huron Machine Products, Inc.* v. *A & E Warbern, Inc. f/k/a Warbern Packaging Industries, Inc., et al.* Final Order of Dismissal with prejudice entered June 30, 1981.

**3,155,539,** Ransburg Corp. ELECTROSTATIC SPRAY COATING METHODS AND APPARATUS, **filed** July 2, 1981, D.C. Conn. (Bridgeport), Doc. B-81-299, *Ransburg Corp.* v. *Interrad Corp.*

**3,221,588,** Illinois Tool Works, Inc., DRILL SCREW AND AN ASSEMBLY INCLUDING THE SAME, **filed** June 26, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 3592, *Illnois Tool Works, Inc.* v. *Construction Fasteners, Inc.*

**3,279,141,** Firman L. Carswell Manufacturing Co., Inc., SUB-STRUCTURE FOR BOAT DOCKS, **filed** June 5, 1981, D.C., N.D. Ga. (Atlanta), Doc. C81-1086 A, *Firman L. Carswell Manufacturing Co., Inc.* v. *Cherokee Metal Co., Inc., et al.*

**3,319,289,** Miles Laboratories, Inc., APPARATUS FOR MOUNTING A SPECIMEN, **filed** June 12, 1981, D.C., W.D. Pa. (Pittsburgh), Doc. 81-965, *Miles Laboratories, Inc.* v. *Fisher Scientific.*

**3,319,515,** E. I. du Pont De Nemours & Co., INTERFEROMETRIC OPTICAL PHASE DISCRIMINATION APPARATUS, **filed** June 22, 1981, D.C., N.D. Calif. (San Francisco), Doc C 81-2553 SAW, *Bio-Rad Laboratories, Inc.* v. *Nicolet Instrument Corp.*

**3,326,009,** Archie R. Gagne, PLOW FOR LAYING CABLE, FLEXIBLE CONDUIT OR THE LIKE: **3,326,010, same,** SLIT TRENCHING AND CABLE LAYING MACHINE, **filed** June 1, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 3040, *Archie R. Gagne* v. *North Star Concrete Co., Inc.*

**3,326,010. (See 3,326,009.)**

**3,465,889,** F. B. Leopold Co., Inc., LIQUID CLARIFIER WEIR CONSTRUCTION, **filed** Nov. 21, 1977, D. C., N.D. Ohio (Youngstown), Doc. C-77-2339-Y, *Sybron Corp.* v. *Molded Fiber Glass Companies, Inc.* U.S. Patent No. 3,465,889 is valid and infringed. Defendant is permanently enjoined from manufacturing the weir pan and otherwise infringing said patent. Filed May 27, 1981.

**3,467,683. (See 2,409,774.)**

**3,528,124,** Slade Gorton & Co., Inc., METHOD OF SHUCKING SHELLFISH; **3,662,432, same,** APPARATUS FOR EVISCERATING SCALLOPS; **3,665,554, same,** METHOD OF EVISCERATING SHELLFISH, **filed** Nov. 12, 1974, D.C., M.D. Fla. (Orlando), Doc. 74-343-ORL-CIV-R, *Slade Gorton & Co., Inc.* v. *Florida East Seafoods, Inc., et al.* Consent Judgment stating that Plaintiff's patents are valid and enforceable filed Feb. 16, 1977. **Same, filed** Dec. 27, 1972, D.C., M.D. Fla. (Orlando), Doc. 72-313-ORL-CIV-R, *Slade Gorton & Co., Inc.* v. *Willis Brothers of Florida, Inc., et al.* Motion for Voluntary Dismissal of Action Against Defendant granted without prejudice on Feb. 23, 1977.

**3,555,593,** Donald J. Scheier, METHOD OF EVISCERATING POULTRY; **3,653,093, same,** POULTRY EVISCERATING MACHINE, **filed** June 20, 1980, D.C., N.D. Ga. (Gainesville), Doc. 80-048G, *Simon-Johnson, Inc.* v. *Centennial Machine Co., Inc.* Defendant is permanently enjoined and restrained from infringing said patents. Filed June 30, 1981.

**3,574,911,** Milling Specialties, Inc., CUTTER AND INSERTS THEREFOR, **filed** June 10, 1981, D.C., W.D. Pa. (Erie), Doc. 81-130 ERIE, *Milling Specialties, Inc.* v. *Greenleaf Corp.*

**3,584,562,** Kenneth R. Wisner, PHOTOGRAPHIC FILM HOLDER, **filed** Nov. 13, 1980, D.C.N.J. (Newark), Doc. 80-3658, *Kenneth R. Wisner* v. *Victor Hasselblad.* Order of dismissal of action filed June 25, 1981.

**3,617,613,** Spaulding Fibre Co., PUNCHABLE PRINTED CIRCUIT BOARD BASE, **filed** Dec. 7, 1978, D.C.N.H. (Concord), Doc. C 78-434, *Spaulding Fibre Co.* v. *Oak Materials Group, Inc.* U.S. Patent No. 3,617,613 is valid and infringed. Defendant is permanently restrained from infringing plaintiff's patent. Filed June 3, 1981.





**3,624,205,** Burroughs Wellcome Co., TREATMENT OF HYPERURICEMIA IN HUMANS, **filed** Dec. 21, 1979, D.C.N.J. (Newark), Doc. 79-3643, *Burroughs Wellcome Co.* v. *Pharmadyne Laboratories, Inc.* Consent Judgment for permanent injunction in favor of plaintiff filed Mar. 30, 1981.

**3,653,093. (See 3,555,593.)**

**3,662,314,** Piher S.A., ADJUSTABLE ANNULAR POTENTIOMETER WITH TERMINAL ATTACHMENT MEANS; **3,670,285,** CTS Corp., VARIABLE RESISTANCE CONTROL WITH END COLLECTOR, **filed** May 12, 1980, D.C., N.D. Ind. (South Bend), Doc. S80-126, *Piher Sociedad Anonima* v. *CTS Corp.* Order filed Mar. 9, 1981.

**3,662,432. (See 3,528,124.)**

**3,665,554. (See 3,528,124.)**

**3,669,105,** Lenox Hill Brace Shop, Inc., BRACE FOR ARTICULATED LIMBS; Reg. No. **957,912** (LENOX HILL), Lenox Hill Brace Shop, Inc., **filed** Aug. 8, 1980, D.C., N.D. Ga. (Atlanta), Doc. C80-1363A, *Lenox Hill Brace Shop, Inc.* v. *C. H. Martin Co., et al.* U.S. Patent No. 3,669,105 is valid and infringed. Defendants are permanently enjoined from further infringing plaintiff's patent and trademark. Filed Dec. 22, 1980.

**3,670,285, (See 3,662,314.)**

**3,744,655,** Anchor Hocking Corp., SAFETY CLOSURE FOR CONTAINERS, **filed** Feb. 13, 1976, D.C.N.J. (Newark), Doc. 76-278, *Anchor Hocking Corp.* v. *Mack-Wayne Plastics Co.* Order of Dismissal of action, without costs, filed Nov. 16, 1976.

**3,787,020,** Aluma Systems, Inc., CONCRETE FORMING STRUCTURE; **3,899,152, same,** CONCRETE FORM INCLUDING EXTRUDED ALUMINUM SUPPORT STRUCTURE; **4,144,690, same,** CONCRETE FORMING STRUCTURES, **filed** Apr. 25, 1980, D.C.N.J. (Newark), Doc. 80-1199, *Patent Scaffolding Co., et al.* v. *Aluma Systems, Inc.* Consent Decree for Permanent Injunction filed Dec. 29, 1980.

**3,787,020,** Aluma Systems, Inc., CONCRETE FORMING STRUCTURE, **filed** Mar. 12, 1981, D.C., S.D. Tex. (Houston), Doc. H-81-575, *Aluma Systems, Inc.* v. *Anthes, Inc., et al.* **Same, filed** May 5, 1981, D.C., E.D. Pa. (Philadelphia), Doc. 81-1877, *Anthes, Inc., et al.* v. *Aluma Systems, Inc.*

**3,803,660,** Randomex, Inc., APPARATUS FOR CLEANING DISCS, **filed** June 22, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 3071, *Randomex, Inc.* v. *Scopus Corp.*

**3,811,414,** Thunderbird Industries, Inc., HEAT EXCHANGER APPARATUS FOR PRODUCING STEAM OR THE LIKE, **filed** Oct. 8, 1980, D.C., M.D.N.C. (Greensboro), Doc. C-80-535-WS, *Thunderbird Industries, Inc.* v. *Spartan Manufacturing Corp., et al.* Stipulation and Notice of Dismissal with Prejudice filed July 1, 1981.

**3,811,544,** Luk Lamellen-Und Kupplungsbau GmbH, CLUTCH WITH SPRING LOADED OPERATOR FULCRUM, **filed** Sept. 21, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-73691, *Luk Lamellen-Und Kupplungsbau GmbH* v. *Valeo, Inc.*

**3,820,950,** Sammy G. Hiatt, PROCESS AND APPARATUS FOR LIQUID TREATING OF TEXTILE FABRIC, **filed** July 8, 1981, D.C., M.D.N.C. (Greensboro), Doc. C-81-311-G, *Sammy G. Hiatt* v. *United Merchants and Manufacturers, Inc.*

**3,829,335,** Scientific Micro Systems, Inc., METHOD FOR PROCESSING SEMICONDUCTOR WAFERS, **filed** Nov. 7, 1980, D.C., N.D. Calif. (San Francisco), Doc. C 80 4150 RFP, *Scientific Micro Systems, Inc.* v. *Intersil, Inc.* Case dismissed with prejudice (with 90 day condition) on June 24, 1981.

**3,843,052,** Graco, Inc., PNEUMATICALLY ASSISTED HYDRAULIC SPRAY COATING APPARATUS, **filed** June 29, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 3636, *Graco, Inc.* v. *Kremlin, Inc., et al.*

**3,871,367,** Marion E. Miller, PELVIC BRACE, **filed** July 14, 1981, D.C.N.J. (Newark), Doc. 81-2230, *Marion E. Miller* v. *Pope Brace, et al.*

**3,879,188,** Fritz, Evans and Cooke, GROWTH REGULATION PROCESS, **filed** June 17, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-1730, *GAF Corp.* v. *Amchem Products, Inc., et al.* Order filed June 24, 1981.

**3,893,127,** Michael Kaplan, ELECTRON BEAM RECORDING MEDIA, **filed** Mar. 6, 1981, D.C.N.J. (Trenton), Doc. 81-681, *RCA Corp.* v. *Edmund Benjamin Davidson.* Summary judgment in favor of plaintiff declared that defendant is not sole inventor or co-inventor of patent no. 3,893,127. Filed Mar. 27, 1981.

**3,899,152. (See 3,787,020.)**

**3,910,434,** Ebeling and Ebeling, MECHANICALLY ACTUATED SIDE LOADING ARRANGEMENT FOR A VEHICLE BODY; **3,944,092, same,** CONTAINER EMPTYING DEVICE, **filed** July 27, 1977, D.C., W.D. Tex. (San Antonio), Doc. SA-77-CA-226, *Franklin D. Ebeling, et al.* v. *Pak-Mor Manufacturing Co.* Judgment filed June 22, 1981.

**3,944,092. (See 3,910,434.)**

**3,973,282,** Marvin I. May, WATER BED LINER HOLDER, **filed** July 2, 1981, D.C., N.D. Tex. (Dallas), Doc. CA3-81-1083-D, *Marvin I. May* v. *Vinylex Corp.*

**3,973,282,** Marvin I. May, WATER BED LINER HOLDER; Reg. No. **1,147,691** (TUCK-A-LINER), Marvin I. May, **filed** May 1, 1981, D.C., N.D. Tex. (Dallas), Doc. CA3-81-0717 D, *Tite Nites, Inc. & Marvin I. May* v. *Bedderest Corp.* Final Judgment in favor of plaintiff and against defendant filed July 15, 1981.

**4,019,103,** Davis, Jones and Eddy, ELECTROMAGNETIC MOTOR AND GENERATOR, **filed** Aug. 27, 1979, D.C., E.D. Tex. (Texarkana), Doc. TX-79-60-CA, *Ralph E. Lindsey* v. *United States Government, et al.*

**4,048,496,** Richard D. Albert, SELECTABLE WAVELENGTH X-RAY SOURCE, SPECTROMETER AND ASSAY METHOD; **4,260,885, same, filed** July 17, 1981, D.C., N.D. Calif. (San Francisco), Doc. C 81-3011 SAW, *Richard D. Albert* v. *Kevex Corp.*

**4,081,091,** Transportation Design & Technology, Inc., WHEELCHAIR LIFT, **filed** Mar. 30, 1979, D.C., C.D. Calif. (Los Angeles), Doc. 79-1217 (RJK) (PX), *Transportation Design & Technology, Inc.* v. *General Motors Corp., et al.*

**4,108,303,** E. W. Buschman Co., POWER TRANSMISSION ASSEMBLY FOR AN ACCUMULATOR CONVEYOR, **filed** June 3, 1981, D.C., S.D. Ohio (Dayton), Doc. C-3-81-296, *The E. W. Buschman Co.* v. *Rexnord, Inc.* Case transferred to Eastern District of Kentucky at Lexington on July 30, 1981. **Same, filed** Aug. 3, 1981, D.C., E.D. Ky. (Lexington), Doc. 81-149, *The E. W. Buschman Co.* v. *Rexnord, Inc.*

**4,112,927,** David I. Carlson, ULTRASONIC DETECTOR WITH AUDIBLE INDICATION SIGNAL, **filed** June 26, 1981, D.C. Minn. (Minneapolis), Doc. 4-81-351, *International Livestock Improvement Services Corp.* v. *Centech Corp.*

**4,116,664,** Leon R. Jones, FERTILIZER COMPOSITION AND METHOD OF MAKING SAME, **filed** Jan. 17, 1980, D.C., E.D. Calif. (Fresno), Doc. CV-80-18-EDP, *Leon R. Jones* v. *Verdegaal Brothers, Inc.* Patent held invalid and not infringed on June 29, 1981.

**4,144,690. (See 3,787,020.)**

**4,148,410,** Omar L. Brown, TAB FOR EASY-OPEN ECOLOGY END, **filed** Mar. 11, 1981, D.C., S.D. Ohio (Dayton), Doc. C-3-81-183, *Ermal C. Fraze* v. *The Continental Group, Inc., et al.*

**4,158,987,** Excellon Industries, PRESSURE FOOT FOR MACHINE TOOL, **filed** May 20, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 80 2455, *Excellon Industries* v. *Cooper Industries, doing business as Advanced Controls.*

**4,162,092,** L. R. Nelson Corp., HOSE COUPLING, **filed** July 7, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 3349, *Rain Bird Sprinkler Mfg. Corp.* v. *L. R. Nelson Corp.*

**4,182,755,** Cargill, Inc., FEED INTAKE CONTROL OF ANIMALS, **filed** June 23, 1981, D.C., N.D. Ind. (Fort Wayne), Doc. F81-168, *Cargill, Inc.* v. *Central Soya Co., Inc.*

**4,192,163,** Alan Martin, TOOL FOR SETTING BLIND FASTENERS, **filed** July 20, 1981, D.C. Mass. (Boston), Doc. 81-1833-G, *Alan Martin* v. *Marson Corp.*

**4,260,885. (See 4,048,496.)**

**Re. 29,050,** Louise Z. Hakim, TOY WITH SOUND PRODUCING MEANS, **filed** June 22, 1981, D.C.N.J. (Newark), Doc. 81-1916 *Louise Z. Hakim* v. *Sanitoy, Inc.*

**Re. 30,553. (See 2,409,774.)**

**D. 248,329,** Action Industries, Inc., SMOKING STAND, **filed** Mar. 14, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79-343, *Action Industries, Inc.* v. *Hope Picture Frame Co.* Case closed on May 26, 1981.

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**CONDITION OF PATENT APPLICATIONS AS OF August 22, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 4-29-80 |
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| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 2-02-80 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 5-06-80 |
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| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 1-07-80 |
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| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 1-23-80 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 6-08-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-20-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 12-07-79 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 1-09-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 2-06-80 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 9-13-79 |
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| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-19-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during August 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,142,841 to 3,146,458, inclusive

Plant Patents ..... Numbers 2,431 to 2,443, inclusive



# DEFENSIVE PUBLICATIONS

## PUBLISHED OCTOBER 6, 1981

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

### T101,101

### PROCESS FOR PREPARING A SMALL PARTICLE SIZE DISPERSION OF A COMPLEX OF 4,4'-METHYLENEDIANILINE WITH A SALT

**Irving C. Kogon, 1420 Drake Rd., Wilmington, Del. 19803**

**Continuation of Ser. No. 97,233, Nov. 26, 1979. This application Dec. 29, 1980, Ser. No. 220,853**

**Int. Cl.[3] C07C *87/50***

**U.S. Cl. 564—334**

**No Drawing. 13 Pages Specification**

Preparing a dispersion of methylenedianiline/inorganic salt complex curing agent of small particle size which comprises: (a) agitating while reacting 3 moles of 4,4'-methylenedianiline with not less than 1 mole of a salt selected from the group consisting of sodium choloride, sodium bromide, sodium iodide, lithium chloride, lithium bromide and lithium iodide in the presence of water and a benzenoid hydrocarbon solvent for the methylenedianiline; (b) separating the resulting complex having an average particle size diameter of less than about 10 μm from the bulk of the hydrocarbon solvent; (c) drying said complex; and (d) dispersing said complex in a substantially nonvolatile liquid carrier that is inert to the complex; with the proviso that steps (c) and (d) can be carried out in any order or substantially simultaneously.

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### T101,102

### PIGMENTED COATING OF POLYESTER/COTTON SPUN YARNS

**John J. P. Turner, 2613 Marhill Dr., Wilmington, Del. 19810**

**Filed Dec. 29, 1980, Ser. No. 220,808**

**Int. Cl.[3] B05D *1/00, 3/00, 3/02***

**U.S. Cl. 8—495**

**No Drawing. 8 Pages Specification**

Polyester/cotton 50/50 spun yarns suitable for use as the warp yarns of denim fabric are obtained by first dyeing the yarns with indigo dye, coating the yarns with a dispersion of a polyol binder and a pigment that imparts coloration similar to indigo-dyed cotton fibers and then drying the yarns, and where appropriate, curing the coated yarn and supplying heat as by singeing to thermosol some of the pigment into the polyester fiber on the surface of the yarn. The polyol binder may be starch but preferably is polyvinyl alcohol in combination with a water soluble polyamide containing secondary amino groups in the polymer chain which have been reacted with epichlorohydrin. The pigment preferably is a combination of Color Index Disperse Blue 56 dye and carbon black.

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### T101,103

### ABSORBED HYDRAZIDE NUCLEATING AGENTS AND PHOTOGRAPHIC ELEMENTS CONTAINING SUCH AGENTS

**Jasbir Sidhu, 29 Harley Rd., Harrow, Middlesex; Michael J. Simons, and Miroslav V. Mijovic, both of Kodak Works, Wealdstone, Harrow, Middlesex, all of England**

**Division of Ser. No. 60,549, Jul. 25, 1979, Pat. No. 4,278,748. This application Feb. 26, 1981, Ser. No. 238,185**

**Int. Cl.[3] C07D *249/00***

**U.S. Cl. 430—598**

**No Drawing. 68 Pages Specification**

Novel triazole-substituted phenylhydrazide nucleating agents are disclosed as well as silver halide photographic emulsions and elements containing silver halide grains capable of forming an internal latent image having the nucleating agents adsorbed to the surface of the silver halide grains.

# REISSUES

OCTOBER 6, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 30,757**

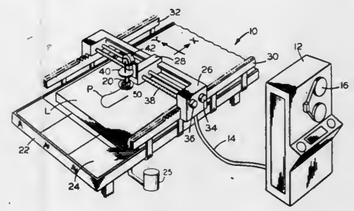
## CLOSED LOOP APPARATUS FOR CUTTING SHEET MATERIAL

**Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.**

**Original No. 4,133,235, dated Jan. 9, 1979, Ser. No. 790,149, Apr. 22, 1977. Application for reissue Feb. 19, 1980, Ser. No. 122,495**

**Int. Cl.**[3] **B26D** *5/00;* **B26F** *1/38;* **D06H** *7/00*

**U.S. Cl. 83—74** **27 Claims**



1. An automatically controlled cutting machine for accurately cutting limp sheet material comprising:

a cutting blade *having a leading cutting edge, a trailing edge and two sides extending between the leading and trailing edges, the two sides at the leading edge meeting at an angle to form a sharp knife edge for cutting the limp sheet material;*

a cutting table defining a support surface on which sheet material is positioned in a spread condition for cutting by the cutting blade;

motor means for moving the cutting blade and the sheet material relative to one another in cutting engagement;

control means connected with the motor means and providing control signals to the motor means for guiding the cutting blade through the material along a predetermined cutting path;

sensing means operatively associated with the cutting blade and sheet material for detecting lateral forces applied to the *sides of the* blade by the material as the *sharp leading knife edge of the* blade advances through the material in cutting engagement, the sensing means also producing a signal corresponding to the detected lateral forces; and

feedback means interconnecting the sensing means and the control means for generating additional control signals to regulate the cutting of the material by the blade along the predetermined cutting path in response to the detected forces.

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**Re. 30,758**

## PEDAL-ACTUATED BICYCLE GEAR SHIFT MEANS

**Richard A. Lang, 610 18th St., South, Arlington, Va. 22202**

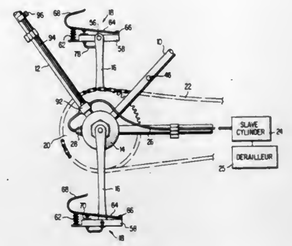
**Original No. 4,061,046, dated Dec. 6, 1977, Ser. No. 720,396, Sep. 3, 1976. Application for reissue Dec. 14, 1978, Ser. No. 966,474**

**Int. Cl.**[3] **F16H** *7/22;* **B62M** *9/00*

**U.S. Cl. 474—80** **14 Claims**

1. In a bicycle provided with front and rear sprockets defining multiple gears and a drive chain extending therebetween, *a pair of foot pedals,* a shifting mechanism, means to effect shifting of the chain with respect to the gears, the improvement comprising:

means cooperatively associated with the foot pedals of the bicycle for controlling the [gear-shifting] *chain-shifting* means, said [pedal] *pedal-associated* means including moveable elements on [the] *a* pedal whereby movement of [the pedal] *said moveable elements* to any one of a plurality of preselected positions *by the application of varying foot pressure* will effect the requisite shifting of the chain with respect to the gears.

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**Re. 30,759**

## METHOD AND APPARATUS FOR PRODUCING AND TRANSPORTING SINGLE AND MULTILAYER CHIPBOARDS

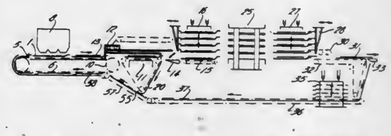
**Wolfgang Burkner, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany**

**Original No. 3,542,629, dated Nov. 24, 1970, Ser. No. 719,924, Apr. 9, 1968. Application for reissue Jan. 24, 1980, Ser. No. 115,117**

**Claims priority, application Fed. Rep. of Germany, Apr. 11, 1967, 40517**

**Int. Cl.**[3] **B29J** *5/00;* **B30B** *7/02, 15/30, 15/34*

**U.S. Cl. 264—118** **6 Claims**



*15. Method of producing and transporting chipboards of material consisting primarily of wood particles, chips, fibers or the like and a binding agent, which comprises conveying a plurality of elongated cauls each of which has a main body portion of screen-like metal cloth construction and a ledge at the leading edge thereof extending beyond the main body portion, end to end sequentially past a material dispensing station with the ledge of one caul overlapping the trailing edge of the immediately preceeding caul in the conveying direction, continuously spreading material dispensed from the device over the cauls so as to form a continuous mat of the material thereon, transversely severing the mat to form lengths thereof on the respective cauls corresponding substantially to the ultimate length of the chipboard to be formed, feeding the severed mat portions together with the respective cauls into a multitier heating press, subjecting the mat portions and cauls to pressure and heat in the heating press to form the mat portions into chipboards, withdrawing the chipboards and respective cauls together from the heating press, separating the chipboards from the cauls and continuously reconveying the cauls in closed circuit past the material dispensing device.*

*16. Apparatus for producing and transporting chipboards of material consisting primarily of wood particles, chips, fibers or the like and a binding agent, comprising a material-dispensing device, a plurality of elongated cauls, each of which has a main body*

*portion of screen-like metal cloth construction and a ledge at the leading edge thereof extending laterally beyond said main body portion, main conveyor means for conveying said cauls end-to-end sequentially past said material-dispensing device so that material is continuously spread from said device over said cauls to form a continuous mat of the material thereon, severing means located adjacent said main conveyor means downstream from said material-dispensing device for transversely severing the mat into lengths thereof on the respective cauls corresponding substantially to the ultimate length of the chipboard to be formed, a multitier heating press located downstream from said severing means for receiving said mat portions and respective cauls therein and subjecting them to heat and pressure to form the mat portions into chipboards, a multitier supply cage for feeding said mat portions and respective cauls to said heating press, means for withdrawing the chipboards and respective cauls together from said heating press, means for separating the chipboards from the respective cauls, and conveyor means for reconveying said cauls in a closed cycle past said material-dispensing device.*

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**Re. 30,760**

## PROCESS FOR THE PRODUCTION OF SYNTHETIC RESINS CONTAINING ISOCYANURATE GROUPS

**Rolf Kubens, Odenthal, and Heinrich Heine, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Original No. 4,162,357, dated Jul. 24, 1979, Ser. No. 901,534, May 1, 1978. Application for reissue Jun. 19, 1980, Ser. No. 160,882**

**Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722400**

**Int. Cl.³ C08G** *18/76*

**U.S. Cl. 528—67** **9 Claims**

1. In a process for the production of [heat-resistant] *bubble-free* synthetic resins containing isocyanurate groups by the polymerization of organic polyisocyanates in the presence of catalysts which accelerate the trimerization of isocyanate groups, the improvement wherein said polyisocyanate component is a mixture of isomers and/or homologs of polyisocyanates of the diphenylmethane series containing [more than 20%] *from 30 to 70%* , by weight, of 2,4'-diisocyanatodiphenylmethane.

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**Re. 30,761**

## THREE-PHASE DC MOTOR HAVING NON-SUPERIMPOSED ARMATURE COILS

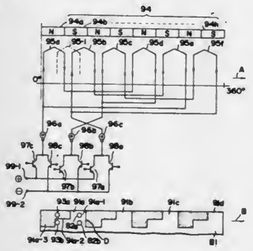
**Itsuki Ban, 829, Higashioizumi-machi, Nerima-ku, Tokyo, and Mansbu Shiraki, 171, Shimotsuruma, Yamato-shi, Kanagawa-ken, both of Japan**

**Original No. 4,107,587, dated Aug. 15, 1978, Ser. No. 614,318, Sep. 17, 1975. Application for reissue Jul. 24, 1980, Ser. No. 171,799**

**Claims priority, application Japan, Sep. 24, 1974, 49-108865; Sep. 24, 1974, 49-108866; Mar. 6, 1975, 50-26508; May 12, 1975, 50-54725; Jul. 31, 1975, 50-92553**

**Int. Cl.³ H02K** *13/14*

**U.S. Cl. 318—439** **15 Claims**



1. In a coreless DC motor comprising a fixed field magnet (**27, 121**) having four magnetic poles of N and S magnetized in equal angular widths; a magnetic material (**2, 3, 12, 16, 70, 75-1**) for closing magnetic paths of said field magnet; a rotating shaft (**1, 15, 73**) supported by bearings provided to a central portion of said magnetic material; an armature (**5, 10, 57**) of one of disc- and cylindrical-shapes secured to said rotating shaft so as to be rotatable in said magnetic paths to face against said field magnet poles; three-phase armature coils of lap winding arranged on said armature; and electric circuit means interconnecting said three-phase armature coils in a manner selected from the class consisting of delta-connection and Y-connection for supplying current to said coils, the improvement wherein: said three-phase armature coils comprise three windings (**21, 22, 23, 122a–c**) each arranged at equal angular interval so as to be non-superimposed with respect to one another on the armature by shifting the coil (**23a, 122-1**) of one-phase by 180°; each of said coils having an angular width equal to that of said field magnet pole.

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**Re. 30,762**

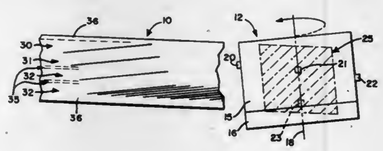
## METHOD AND APPARATUS FOR VIDEO SIGNAL RECORDING

**Alexander R. Maxey, Redwood City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.**

**Original No. 4,139,873, dated Feb. 13, 1979, Ser. No. 874,118, Feb. 1, 1978. Application for reissue May 2, 1980, Ser. No. 145,937**

**Int. Cl.³ G11B** *21/04, 15/66*

**U.S. Cl. 360—85** **6 Claims**



1. In a video tape recorder, a rotary scanner comprising means defining an axis of rotation for a plurality of transducers,

a plurality of transducer heads no less than three,

means mounting said heads spaced along and around said axis of rotation whereby each head scans along a different circular orbit and at a different time across a segment of a cylindrical surface defined by the plural orbits,

means moving a recording medium across a segment of such cylindrical surface in timed relation to scanning rotation of said heads and at an angle to said axis of rotation such that each head traces a series of helical scans on the medium within nonoverlapping paths along the direction of motion of the medium, *each helical scan being at least equal to the circumferential spacing of said heads and being less than 180°,*

and means for rotating said heads at a speed sufficient to separate each scan of a head along the corresponding path.

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**Re. 30,763**

## SELECTIVE DECELERATION BRAKE CONTROL SYSTEM

**Edgar A. Hirzel, Granada Hills, and Robert D. Cook, Valencia, both of Calif., assignors to Crane Co., Hydro-Aire Division, Burbank, Calif.**

**Original No. 4,022,513, dated May 10, 1977, Ser. No. 243,251, Apr. 12, 1972. Application for reissue Feb. 7, 1980, Ser. No. 119,381**

**Int. Cl.³ G06G** *7/70;* **B60T** *8/02*

**U.S. Cl. 364—426** **48 Claims**

13. A brake control system, for an aircraft having [plural groups] *at least one group* of braked load-bearing wheels, *said wheels in said group symmetrically mounted on opposite sides of the aircraft, said brake control system* for applying and controlling a brake application means for said wheels independently of operator brake application, said system comprising:

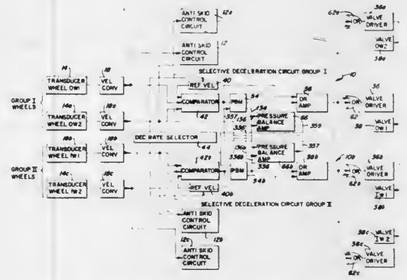
anti-skid control means for providing an anti-skid brake control signal;

signal generating means associated with each of said wheels for producing a first signal that is [related] *proportional* to the rotational speed of its associated wheel;

reference generating means for generating a reference signal;

rate selector means for manually [selecting said] *modifying said reference generating means for producing a* reference signal indicative of [a] *the* desired [rate of] vehicle deceleration;

averaging means in each of said wheel groups responsive to the first signal associated with each of said wheels in said group [to form an] *for continuously determining the* average *speed of said wheels and for forming an analog* signal [therefrom] *which is a function of said average speed of said wheels;*



comparison means for each of said wheel groups for comparing said [average] *analog* signals for the associated wheel group with said reference signal for generating an error signal indicative of the difference between said [average] *analog* signal for the associated wheel group and said reference signal;

control means associated with each group of wheels for providing a signal to said brake application means to apply brake pressure to said wheels independently of operator brake application and responsive to said error signal to provide a deceleration control signal for controlling said brake pressure in order to maintain said desired rate of deceleration; and

means for preventing said brake application means from applying said brake pressure in response to said deceleration brake control signal for said group of wheels and for applying brake pressure in response to said anti-skid brake control signal when said anti-skid brake control signal commands a lower brake pressure than does said deceleration brake control signal.

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**Re. 30,764**

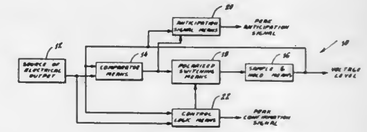
## ELECTRICAL OUTPUT PEAK DETECTING APPARATUS

**Andrew R. Muir, Wilton, and Joseph A. Vergato, Monroe, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Original No. 4,086,651, dated Apr. 25, 1978, Ser. No. 700,915, Jun. 29, 1976. Application for reissue Dec. 20, 1979, Ser. No. 105,844**

**Int. Cl.³ G06F** *15/20;* **H03K** *5/20;* **G01J** *3/28*

**U.S. Cl. 364—487** **9 Claims**



1. Circuitry for generating an anticipation signal and a confirmation signal relative to peak amplitudes of a varying electrical output, comprising:

sample and hold means for storing a voltage level;

means for differentially comparing the electrical output with said voltage level;

switching means for polarizing and connecting the output of said comparator means to the input of said sample and hold means;

means for deriving the anticipation signal when a differential exists between said voltage level and the [electrical output] *output of said comparator*; and

logic means for controlling said polarized switching means in accordance with slope polarity thresholds of the electrical output relative to said voltage level and deriving the confirmation signal at said thresholds.

# PLANT PATENTS

## GRANTED OCTOBER 6, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 4,772
### MUSCADINE GRAPE

**Byard O. Fry, 612 Terrace St., Griffin, Ga. 30223**

**Filed Jul. 1, 1976, Ser. No. 701,792**
**The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.**
**Int. Cl.³ A01H** *5/03*
**U.S. Cl. Plt.—47** **1 Claim**

**1.** The new and distinct hybrid plant variety of muscadine grape as described and illustrated which is primarily distinguished as to novelty by the unique combination of very vigorous vine, large fruit of a light bright greyed orange color wherein said fruit occurs in large clusters of from about 10 to 25 berries having an individual berry diameter of about 0.9 inches, an individual berry fruit sugar content of from about 18.50 to about 22.00 percent and producing a yield of about four (4) tons per acre.

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### 4,773
### AFRICAN VIOLET PLANT

**Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany**

**Filed Jul. 25, 1980, Ser. No. 172,219**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—69** **1 Claim**

**1.** A new and distinct cultivar of African violet known by the cultivar name Massachusetts, as described and illustrated, and particularly characterized by its profuse flowering, with up to 15 stems carrying up to 12 or more individual flowers; lilac flower color, with a deeper purple color near the center; long lasting, non-dropping flowers, and by its compact, vigorous growth habit.

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### 4,774
### AFRICAN VIOLET PLANT

**Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany**

**Filed Jul. 25, 1980, Ser. No. 172,397**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—69** **1 Claim**

**1.** A new and distinct cultivar of African violet known by the cultivar name Utah, as described and illustrated, and particularly characterized by its deep blue flower color, vigorous, compact and uniform growth habit, strong upright stems and carrying up to 15 non-dropping flowers, and by its heavy golden yellow pollen sacs which provide a pleasant contrast with the deep blue flowers.

# PATENTS

## GRANTED OCT. 6, 1981

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 051–094 R | 4,292,699 |
| 411–542 | 4,292,876 |
| 251–283 | 4,293,163 |
| 376–159 | 4,293,379 |
| 376–209 | 4,293,380 |
| 376–230 | 4,293,381 |
| 376–308 | 4,293,382 |
| 376–290 | 4,293,383 |
| 376–391 | 4,293,384 |
| 376–283 | 4,293,385 |
| 376–461 | 4,293,386 |
| 336–094 | 4,293,433 |
| 364–200 | 4,293,941 |

# PATENTS

GRANTED OCTOBER 6, 1981

## GENERAL AND MECHANICAL

**4,292,687**

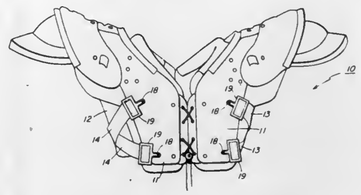
### PROTECTIVE SHOULDER PAD CONSTRUCTION

**Stanley Daverport, Jr., Knoxville, Tenn., assignor to The Kendall Company, Bostom, Mass.**

**Filed Jan. 28, 1980, Ser. No. 116,071**

**Int. Cl.³ A41D** *13/00*

**U.S. Cl. 2—2** **6 Claims**



1. In a protective shoulder pad having various protective padding attached to two at least semi-rigid front and back panel portions thereof releasably secured to each other, the improvement comprising each of said front panels having at least two attachment means disposed thereon, including a first attachment means on each said front panels disposed on a lower third portion of said panel and a second attachment means on each of said front panels disposed on a middle third portion thereof; a first V-shaped connector strap for connecting one front panel and one back panel from a single common point on said back panel, and a second V-shaped connector strap connecting said other front and back panel from a single common point on said other back panel; said first and second connector straps, each having two free ends and a common crossover point disposed approximately midway between same, said free ends having attachment means disposed near the free end thereof for releasably engaging said connector straps on said attachment means in said front panels, said common crossover point being attached to said back panels at said single common point.

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**4,292,688**

### LATCH MECHANISMS

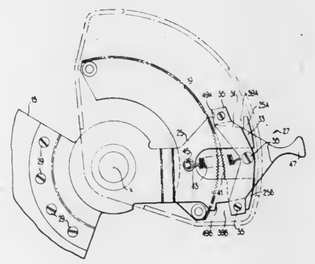
**Stafford M. Ellis, East Preston, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England**

**Filed Jul. 3, 1979, Ser. No. 54,423**

**Claims priority, application United Kingdom, Jul. 11, 1978, 29428/78**

**Int. Cl.³ A42B** *3/00*

**U.S. Cl. 2—6** **7 Claims**



1. A latch mechanism for controlling the relative movement of two hinged members about an axis comprising:

(A) a first latch part fixed to one of the two hinged members;

(B) a second latch part comprising

(i) a first member fixed to the other of said two hinged members, and

(ii) a manually operable second member

(a) having two spaced portions adapted to contact spaced reaction surfaces on said first member; and

(C) a spring arrangement which biasses said spaced portions and reaction surfaces toward contact with one another;

(D) the second member having a surface which engages a surface of the first latch part under the action of the spring arrangement, and

(E) the arrangement being such that

(i) pressure applied to the manually operable second member of the second latch part is reacted at one or other of the reaction surfaces accordingly as the applied pressure acts in a sense clockwise or counter-clockwise about the hinge axis to cause said second member to pivot against the bias of the spring arrangement about one or the other of its spaced portions with the result that the engaged surfaces are disengaged and

(ii) under continuing pressure at its second member the said second latch part moves angularly with respect to the said first latch part.

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**4,292,689**

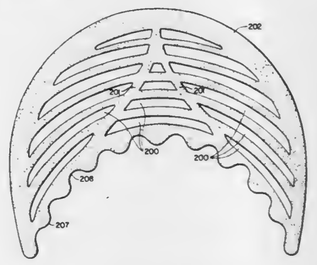
### VISORED HAT CONSTRUCTION

**Charles E. Townsend, Jr., 11 Ranch Rd., Orinda, Calif. 94563**

**Continuation-in-part of Ser. No. 943,888, Sep. 19, 1978, abandoned, and a continuation of Ser. No. 743,749, Nov. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,266, Jun. 9, 1975, abandoned. This application Dec. 19, 1979, Ser. No. 105,462**

**Int. Cl.³ A42B** *1/18*

**U.S. Cl. 2—12** **9 Claims**



9. In a hat construction of the described type, a visor formed of non-water-absorbing material outwardly projecting from the main hat body as a substantially flat surface perpendicularly from the surface of the wearer's forehead above eye level and within the horizontal plane of said wearer's forehead, said visor being formed of a section of relatively low density non-water-absorbing material having a thickness in the range between approximately $\frac{1}{4}$" and $\frac{3}{8}$", the said section being formed with a plurality of relatively large openings extending through the thickness of the section throughout a majority of the entire area of the visor section, the size and angular inclination of said cell openings and the thickness of said visor section being related to one another to substantially prohibit transmittal of direct rays of sunlight through the cellular visor to the eyes of a user and to thereby shade the user's eyes from overhead rays of light transmitted through said visor, the said flat section comprising said visor providing substantially unobstructed lateral vision to said user and said open cell configuration

thereof providing relatively minimal wind resistance to said visor section; the cell openings of said visor section being substantially arcuate elongate in plan with the arcate length of the cells extending generally parallel to and in the same arcuate path as the arcuate periphery of the visor section.

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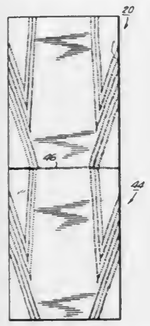
**4,292,690**

## METHOD OF MAKING A COMPOSITE FUR GARMENT

**Michael R. Forrest, and Alfred Kohn, both of New York, N.Y., assignors to Michael Forrest, Inc., New York, N.Y.**

**Filed Feb. 21, 1978, Ser. No. 879,059**
**Int. Cl.³ A41D 5/00; C14B 1/00**
**U.S. Cl. 2—65** **6 Claims**




1. A method of making a composite fur pelt which comprises the steps of:
(a) providing a fur pelt having a central area, a lateral portion on each side of said central area, a top portion and a bottom portion;
(b) slitting said fur pelt with a plurality of rectilinear cuttings as follows:
(1) a first and second group of rectilinear cuttings consisting of a series of parallel slits in and on either side of the central area of said pelt extending from the top portion to adjacent the bottom portion of said pelt, said slits being oriented substantially parallel to said lateral portions;
(2) a third and fourth group of rectilinear cuttings consisting of a series of angular parallel slits in each of said lateral portions, each of said third and fourth group of rectilinear cuttings extending upwards and outwards from the lower terminus of one of said first or second group of rectilinear cuttings;
(3) a fifth and sixth group of rectilinear cuttings consisting of a series of cuttings in said lateral portions adjacent and parallel to said third and fourth group of rectilinear cuttings but lying outside thereof said fifth and sixth group of rectilinear cuttings extending into said bottom portion of said pelt;
(c) stretching said fur pelt along said plurality of rectilinear cuttings so that said fur pelt is adjusted into a substantially rectangular shaped pelt having a length greater than its width;
(d) sewing said rectangular shaped pelt along said plurality of rectilinear cuttings so that a rectangularly shaped pelt with structural integrity is formed with a length greater than its width;
(e) slicing said rectangularly shaped pelt lengthwise into a plurality of substantially equal sized strips of fur of uniform and equal width;
(f) providing a plurality of equal sized strips of base material;
(g) alternately sewing together side-by-side fur strips and said base material strips, so that a composite fur pelt is formed, said base material being of a thickness and width so that the fur in said fur strips overlaps said base material strips and renders said base material strips invisible;
(h) cutting said composite fur pelt to the shape of at least a portion of a garment, the cut composite fur pelt being dimensioned to give a substantially continuous fur surface with vertical ribbing to said garment when worn by a human.

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**4,292,691**

## COMPOSITE FUR PELT AND GARMENT

**Michael R. Forrest, and Alfred Kohn, both of New York, N.Y., assignors to Michael Forrest, Inc., N.Y.**

**Division of Ser. No. 879,059, Feb. 21, 1978. This application Mar. 8, 1979, Ser. No. 18,709**
**Int. Cl.³ A41D 5/00; C14B 1/00**
**U.S. Cl. 2—65** **5 Claims**

1. A composite fur garment which comprises one or more composite fur pelts made in accordance with the method of:
(a) providing a fur pelt having a central area, a lateral portion on each side of said central area, a top portion and a bottom portion;
(b) slitting said fur pelt with a plurality of rectilinear cuttings as follows:
(1) a first and second group of rectilinear cuttings consisting of a series of parallel slits in and on either side of the central area of said pelt extending from the top portion to adjacent the bottom portion of said pelt, said slits being oriented substantially parallel to said lateral portions;
(2) a third and fourth group of rectilinear cuttings consisting of a series of angular parallel slits in each of said lateral portions, each of said third and fourth group of rectilinear cuttings extending upwards and outwards from the lower terminus of one of said first or second group of rectilinear cuttings;
(3) a fifth and sixth group of rectilinear cuttings consisting of a series of cuttings in said lateral portions adjacent and parallel to said third and fourth group of rectilinear cuttings but lying outside thereof said fifth and sixth group of rectilinear cuttings extending into said bottom portion of said pelt;
(c) stretching said fur pelt along said plurality of rectilinear cuttings so that said fur pelt is adjusted into a substantially rectangular shaped pelt having a length greater than its width;
(d) sewing said rectangular shaped pelt along said plurality of rectilinear cuttings so that a rectangularly shaped pelt with structural integrity is formed with a length greater than its width;
(e) slicing said rectangularly shaped pelt lengthwise into a plurality of substantially equal sized strips of fur of uniform and equal width;
(f) providing a plurality of equal sized strips of base material;
(g) alternately sewing together side-by-side fur strips and said base material strips, so that a composite fur pelt is formed, said base material being of a thickness and width so that the fur in said fur strips overlaps said base material strips and renders said base material strips invisible;
(h) cutting said composite fur pelt to the shape of at least a portion of a garment, the cut composite fur pelt being dimensioned to give a substantially continuous fur surface with vertical ribbing to said garment when worn by a human.



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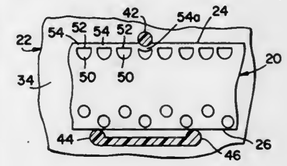
**4,292,692**

## SELF-SETTING ADJUSTABLE HEADBAND

**Anthony L. Moretti, San Rafael, and Lester W. Ferris, Tiburon, both of Calif., assignors to E. D. Bullard Company, Sausalito, Calif.**

**Continuation-in-part of Ser. No. 33,549, Apr. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 953,481, Oct. 23, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 131,252**
**Int. Cl.³ A42B 3/00**
**U.S. Cl. 2—418** **17 Claims**




1. A self-setting adjustable headband for use in a helmet suspension system or the like, said headband comprising
(a) an elongated flexible assembly adapted to be formed into an adjustable generally ring-like configuration with end portions thereof in overlapping relationship;
(b) one end portion of said elongated flexible assembly having generally parallel edges with one of said edges of said one end portion provided with a plurality of detent means;
(c) the other end portion of said elongated flexible assembly being provided with a buckle member projecting from one side thereof and adapted to receive said one end portion, said buckle member having end members spaced from each other to compressively engage the edges of said one end portion at points spaced further from each other along one edge than along the other edge thereof when received therebetween and a side member spaced from a surface of said other end portion so that the opposite surfaces of said one end portion are loosely engaged by said side member and said surface of said other end portion respectively when said one end portion is received therebetween; and
(d) said end members of said buckle being adapted to cooperate with said detent means of said one end portion of said elongated flexible assembly to provide self-setting detent action in the relative movement of said one end portion with respect to said other end portion of said elongated flexible assembly.

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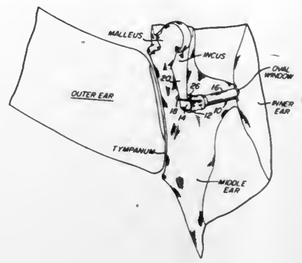
**4,292,693**

## LOCKING BAIL STAPEDIAL PROSTHESIS

**John J. Shea, Shelby County, and Calvin Griggs, Memphis, both of Tex., assignors to Richards Manufacturing Company, Inc., Memphis, Tenn.**

**Filed Oct. 5, 1979, Ser. No. 82,195**
**Int. Cl.³ A61F 1/24, 1/18**
**U.S. Cl. 3—1.9** **8 Claims**

1. In a prosthesis for replacing the stapes of the middle ear, said prosthesis being of the piston type and having a bucket end portion for receiving a portion of the lenticular process of the incus and a bail mounted to pivot about the open end of said bucket portion, the improvement comprising:
means mounted on said bucket portion for permitting overcenter pivotal movement of said bail in one direction and




thereafter preventing overcenter pivotal movement of said bail in the opposite direction.

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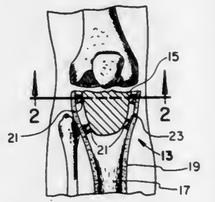
**4,292,694**

## PROSTHESIS ANCHORING MEANS

**James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.**

**Filed Jun. 25, 1980, Ser. No. 162,714**
**Int. Cl.³ A61F 1/24**
**U.S. Cl. 3—1.91** **8 Claims**




1. A securing means for anchoring the stem portion of a joint prosthesis inserted within the medullary canal of the bone adjacent a damaged or diseased skeletal joint, comprising a plurality of resilient elastomeric rings disposed about the circumference of said stem portion at spaced intervals along the length thereof, and a plurality of sections of rigid material attaching at spaced intervals about each of said elastomeric rings and extending radially outwardly therefrom, the combined diameter of said stem portion, said elastomeric rings and said sections of rigid material being greater than the diameter of said medullary canal, said elastomeric rings being compressed upon insertion of said stem portion into said medullary canal and thereby urging said sections of rigid material into contact with said bone for resisting dislocation of said prosthesis within said medullary canal.

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**4,292,695**

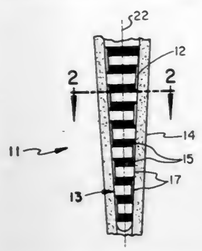
## PROSTHESIS STEM

**James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.**

**Filed Jun. 25, 1980, Ser. No. 162,715**
**Int. Cl.³ A61F 1/24**
**U.S. Cl. 3—1.91** **9 Claims**

1. In a joint prosthesis for replacing a skeletal joint in the human body, the improvement comprising a prosthesis stem having a longitudinal axis and being shaped for insertion into the medullary canal of the bone adjacent said skeletal joint, said stem including a plurality of individual sections formed of a layer of resilient elastomeric material attaching to a layer of rigid material, said individual sections being attached one on top of the other in an offset configuration to form said stem, the outer edges of at least two adjacent ones of said individual

sections defining the diameter of said stem, said diameter of said stem being greater than the diameter of said medullary canal whereby upon insertion of said stem into said medullary



canal said layers of elastomeric material deflect in shear and urge said layers of rigid material into contact with said bone for resisting dislocation of said stem within the medullary canal.

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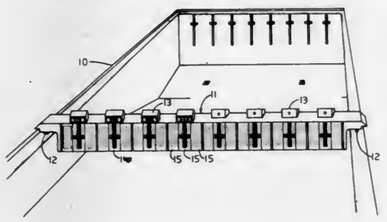
**4,292,696**

**SWIMMER ARRIVAL SIGNAL PANELS INCORPORATED IN A SWIMMING POOL BULKHEAD**

**Gordon Berger, Quebec, Canada, assignor to Annesberg Associates N.V., Curacao, Netherlands Antilles**

**Filed Aug. 30, 1979, Ser. No. 71,370**
**Int. Cl.³ F04H** *3/16, 3/18*
**U.S. Cl. 4—505** **11 Claims**



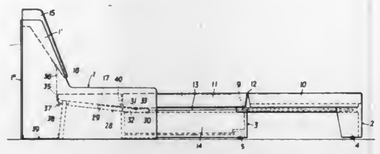
1. A movable swimming pool bulkhead comprising:
a rigid structure having top members and bottom members extending lengthwise along the bulkhead;
a walkway supported on the top members;
roller support means at each end of the bulkhead;
removable locating and anchoring means at each end of the bulkhead;
a vertical side face on at least one side of the bulkhead which acts to partition the swimming pool, the vertical side face extending between the top members and the bottom members and being divided into substantially equal portions to establish individual swimming lanes, the vertical side face including at least one integrally formed swimmer arrival panel extending between the top members and bottom members within each of the portions of the vertical side face representing individual swimming lanes;
means for mounting the integrally formed swimmer arrival panel to the rigid structure so as to be movable relative to the top members; and
a switch means located between the rigid structure and the swimmer arrival panel for producing a signal when the swimmer arrival panel is pushed toward the top members as the panel is contacted by a swimmer.

**4,292,697**

**FURNITURE FOR SITTING AND RECLINING**

**Alfred Alembik, Anastasius-Grüngasse 37/9, Vienna, 18, Austria**

**Filed Oct. 31, 1979, Ser. No. 89,786**
**Claims priority, application Austria, Nov. 2, 1978, 7845/78**
**Int. Cl.³ A47C** *17/13*
**U.S. Cl. 5—18 R** **11 Claims**



1. In furniture for sitting and reclining with which on a carriage which is movable from the frame, in the seat position two cushions are laid down one above the other and in the reclining position they are placed one behind the other, with a back cushion rigidly connected with the frame and a wedge cushion being provided, which wedge cushion is displaceably and swingably guided on the frame from a maintaining position in the seating position behind the back cushion into a use position in the reclining position in connection with the two cushions which are laid one behind the other on the carriage, the improvement comprising
suspension means for connecting an upper edge of the wedge cushion swingably with the back cushion,
a lower edge of the back cushion is swingably connected with an inner part of the carriage, said inner part being formed as a bedding box,
in the reclining position of the furniture said back cushion and said wedge cushion define a gap therebetween,
a covering connected to said wedge cushion and said back cushion covers said gap,
said covering is made of upholstery fabric,
a wedge cushion frame in which said wedge cushion is mounted,
said suspension means comprises pairs of connecting rods,
one of said connecting rods of each said pair is swingably fastened to said frame, and the other of said connecting rods is swingably fastened to said wedge cushion frame,
said one connecting rod is formed with a longitudinal slot,
a joint is disposed between said connecting rods and has a pivot bolt laterally projecting between said connecting rods engaging in said longitudinal slot.

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**4,292,698**

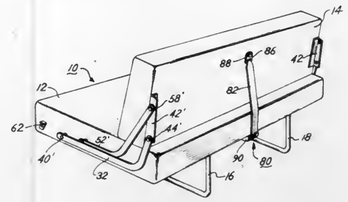
**CONVERTIBLE SOFA-BED WITH BACK RESTRAINING MECHANISM**

**Donald J. Acker, Elkhart, Ind., assignor to J. F. Enterprises, Inc., Wakarusa, Ind.**

**Filed Aug. 22, 1979, Ser. No. 68,632**
**Int. Cl.³ A47C** *17/00, 1/00*
**U.S. Cl. 5—45** **4 Claims**

1. A convertible sofa-bed unit for a vehicle comprising an elongated, horizontal seat section, a supporting frame for said seat section, a back section positioned vertically upwardly from the rear of said seat section in a sofa position and being moveable from said position to a horizontal position along the forward edge of said seat section with the front of the back facing upwardly in a bed position and being on a plane with the top surface of the seat section and with the bottom of the back facing forwardly, and a back section restraining device having a strap connected at one end to the rear of said back section near the top thereof when the back section is in its sofa position and lying over the upper surfaces of the seat and back sections when the back section is in its bed position, a reel mounted on said seat section near the rear thereof and connected to the other end of said strap, and means for preventing the rotation of said reel upon sudden forward lurching of said back section





and thereby preventing movement of said back section from its vertical position on the rear of said seat section.

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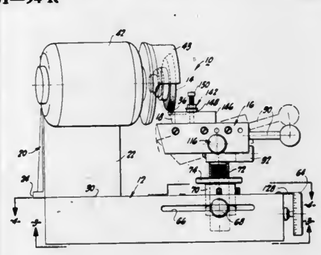
**4,292,699**

**GRINDING MACHINE FOR DELIMITED GROOVE MACHINING ON CUTTING TOOLS**

**Tibor Szabo, 2506 West Ave., 130th, San Leandro, Calif. 94577**

**Filed Dec. 17, 1979, Ser. No. 104,262**
**Int. Cl.³ B24B** *3/34*
**U.S. Cl. 51—94 R** **13 Claims**



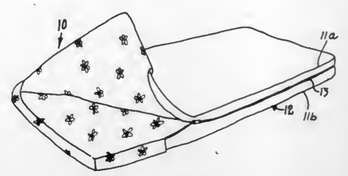
1. A grinding device particularly designed for preparing cutting edges of cutting tools comprising:
a rotary grinding wheel connected to rotary drive means for rotating said wheel about a rotation axis; said drive means having mounting means for positioning said grinding wheel with respect to a work piece; a work piece table having means for mounting a work piece thereon, said work piece table having articulation means with first and second articulation stops for freely articulating said table on a pivotal table axis generally perpendicular to said rotation axis of said grinding wheel between said stops, and table transport means for reciprocally transporting said table in a linear direction parallel to said table axis; table support means for pivotally supporting said table and said articulation and transport means with respect to said grinding wheel; and, base support means for supporting said table support means, said base support means having table support transport means for selectively transporting said table support means and said table in a linear direction generally parallel to said rotation axis of said grinding wheel and perpendicular to said direction of said table axis, wherein said articulation means and transport means comprise a tilt and slide mechanism having a combination tilt and slide rod enabling pivot articulation and linear transport of said table with respect to said table support means.

**4,292,700**

**SLEEPING BAG LINER**

**Raymond A. Markel, 1606 Monte Dr., Mandan, N. Dak. 58554**

**Filed Feb. 11, 1980, Ser. No. 120,507**
**Int. Cl.³ A47G** *9/08*
**U.S. Cl. 5—413** **5 Claims**



1. A liner for fitting within a sleeping bag having head and foot portions and for preventing the inside of said bag from becoming soiled, said liner comprising:
top and bottom panels having head and foot portions, said panels being joined along foot portion edges and at least partially along both sets of side edges;
means, attached to the head portions of said top and bottom panels, for engaging the head portion of said sleeping bag said engaging and retaining means including a hood panel covering the head portion of said top panel and underlying the head portion of said bottom panel, said hood panel having a first fold where a segment of a head portion edge of said hood panel joins a head portion edge of said top panel and a second fold where a different portion of the head portion edge of said hood panel having one side edge joined to the side edge of said top panel which is not completely joined to said bottom panel and a second side of said edge of said hood panel joined to the side edge of said bottom panel which is not completely joined to said top panel, said hood panel having a third fold approximately midway between said first and second side edges; and retaining said panels from moving undesirably toward the foot portion of said bag;
means for attaching the foot portions of said panels to the foot portion of said bag to prevent the foot portions of said panels from becoming entangled with the feet of a person sleeping in said bag.

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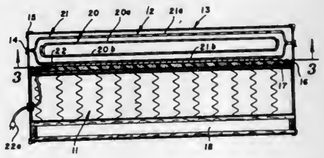
**4,292,701**

**WATER BED CONSTRUCTION WITH ENCLOSURE**

**John Woychick, Wayzata, Minn., assignor to Land-O-Nod, Minneapolis, Minn.**

**Filed Jan. 16, 1980, Ser. No. 112,535**
**Int. Cl.³ A47C** *27/08*
**U.S. Cl. 5—422** **3 Claims**



1. A water bed construction including:
a. support frame;
b. a flexible inner spring support member arranged on said frame;
c. a water retaining member arranged upon the upper surface of said inner spring support member;
d. said water retaining member including a first water retaining portion surrounded and enveloped by an air and water

impervious member having pocket means, with a removable heater, formed on its lower exterior surface; and
e. an enclosure member surrounding at least said inner spring support member and said water retaining member.

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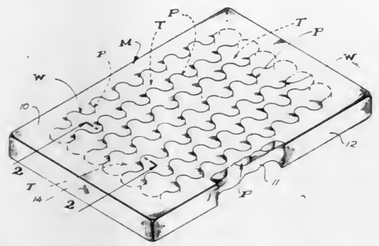
**4,292,702**
**SURGE DAMPENED WATER BED MATTRESS**
**Raymond M. Phillips, 5500 W. 83rd St., Los Angeles, Calif. 90045**
**Filed Jul. 20, 1979, Ser. No. 59,250**
**Int. Cl.³ A47C *27/08***
**U.S. Cl. 5—451** **7 Claims**



1. A flotation mattress structure including an elongate bladder like envelope of flexible fluid medium impervious sheet material having normally flot horizontal top and bottom walls, vertical side and end walls about and extending between the perimeters of the top and bottom walls, a plurality of elongate vertical imperforate partitions of flexible sheet material in lateral spaced relationship within and extending longitudinally of the mattress with opposite ends spaced from the end walls and defining a plurality of laterally adjacent longitudinally extending tunnels and laterally extending transfer chambers at the ends of said communicating with the tunnels, a volume of fluid medium within and slackly filling the tunnels and chambers and flow restricting means to slow the flow rate of the medium longitudinally through and into and out of the ends of the tunnels when portions of the mattress are depressed by externally applied forces on the top wall thereof and when said externally applied forces are reduced and removed from the mattress whereby surging and residual wave motion of the medium in the mattress is slowed and buffered, said partitions being serpentine throughout their longitudinal extent across their mean vertical planes whereby the opposing surfaces of adjacent partitions define alternate crests and troughs throughout their longitudinal extent, the crests of adjacent partitions being laterally aligned to define longitudinally spaced venturi in the tunnels and the troughs of adjacent partitions being laterally aligned to define enlarged circulating chambers between the venturi in the tunnels whereby the flow of the medium longitudinally in the tunnels is restricted and slowed entering the venturi and is circulated in and its longidutinal movement is slowed in the circulating chambers between the venturi, said venturi and circulating chambers establishing said flow restricting means.

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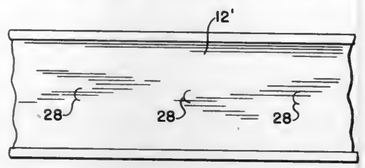
**4,292,703**
**VENTILATED CUSHIONS**
**Clarence J. Goguen, 29 Redstone Hill Rd., Sterling, Mass. 01564**
**Filed Feb. 21, 1979, Ser. No. 13,465**
**Int. Cl.³ A47C *27/00*; B68G *7/00***
**U.S. Cl. 5—468** **4 Claims**

1. A tufted cushion comprising an enclosure including top and bottom flexible impervious panels, a connecting box edge of the same material.
compressible solid cushion filling material in the enclosure, and a series of buttons on one panel attached to fasteners on the other panel, forming deep tufting at spaced intervals throughout the cushion,
mutually spaced slits about the box edge, said slits being very small compared to the width of the box edge and being



almost invisible because of their small size and because no material of the box edge is removed,
whereby explosion of the cushion in the buttoning process is obviated.

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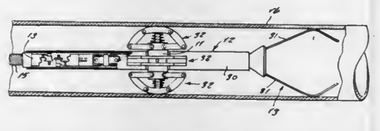
**4,292,704**
**SEWER CLEANING BLADE STABILIZER**
**Marvin A. Joanis, Sr., 2211 Batson Ave., Rowland Heights, Calif. 91748**
**Filed May 2, 1980, Ser. No. 145,963**
**Int. Cl.³ B08B *9/02***
**U.S. Cl. 15—104.3 SN** **3 Claims**



1. A sewer cleaning blade stabilizer, comprising, in combination, a universal shaft assembly between a blade and chuck assembly, carrying rotating blades for scraping an inner side of a sewer pipeline, and a cable for pushing said blades through said pipeline; said universal shaft assembly comprising a row of links connected together by universal joints, and a stabilizer along said universal shaft assembly carrying spring loaded arms for frictionally engaging said pipeline inner side.

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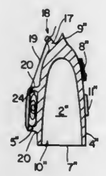
**4,292,705**
**TONGUE TOOTHBRUSH**
**James F. Stouffer, Rte. 11, Box 443, Chambersburg, Pa. 17201**
**Filed May 21, 1979, Ser. No. 41,098**
**Int. Cl.³ A46B *5/04***
**U.S. Cl. 15—110** **16 Claims**



1. A tongue toothbrush, comprising:
a hollow cup-shaped body of a size and shape to envelope the outer portion of a human tongue;
said body being constructed of thin, pliable, continuous, elastic sheet material with opposed upper and lower portions, opposed side portions, a peripheral edge and a forward tip, with respect to the normal tongue position of a standing human;



a plurality of bristles secured to at least one of the upper and lower portions adjacent the tip;
an abrasive dentrifice material embedded within said bristles;
said opposed side portions and said tip being completely free of said bristles;
said tip portion being constructed of harder and thicker material than the remainder of said body so as to provide a portion that may be used for the massage of the user's gums;
an easily water-soluble flavoring being secured to said body;
a soft abrasive material being secured to one of said upper and lower portions on the opposite side of said bristles from said tip; and
the elasticity of said sheet material being sufficiently elastic to permit expansion and contraction of said body for secure engagement with different sized tongues.

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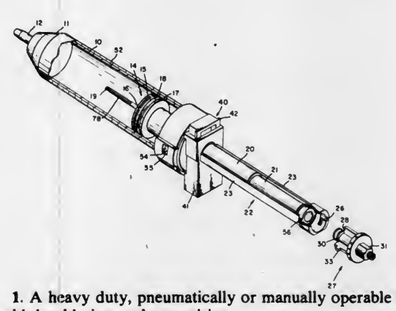
**4,292,706**
**HEAVY DUTY DESOLDERING TOOL**
**William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265**
**Filed Aug. 20, 1979, Ser. No. 68,118**
**Int. Cl.³ A47L *5/04***
**U.S. Cl. 15—341** **10 Claims**



1. A heavy duty, pneumatically or manually operable hand held desoldering tool comprising:
(a) a hollow cylindrical barrel having tip and rear ends;
(b) a hollow plunger loading cylinder;
(c) a plunger assembly removably mounted on said plunger loading cylinder;
(d) a plunger loading piston concentric with said loading cylinder and including a hollow cylinder slidable within said loading cylinder;
(e) a plunger loading guide disposed concentric with and partially surrounding said plunger loading cylinder;
(f) spring means disposed within said plunger loading cylinder and urging said loading piston outwardly away from said loading cylinder;
(g) trigger means connected to said barrel and externally actuable for locking said plunger loading cylinder in its cocked position and for releasing it; and
(h) heavy duty spring means in said barrel and retained between said plunger and the rear end of said barrel for rapidly returning said plunger rearwards upon release of said trigger means.

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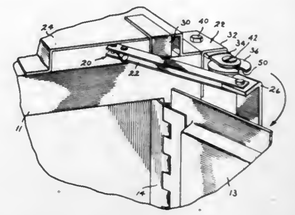
**4,292,707**
**FRICTIONAL RETAINER FOR HOLDING A DOOR OPEN**
**Clarence E. Williams, 2122 W. 450 N., LaPorte, Ind. 46350**
**Filed Dec. 31, 1979, Ser. No. 108,586**
**Int. Cl.³ E05F *15/20***
**U.S. Cl. 16—48.5** **6 Claims**

1. In combination, a door and a retainer member for holding said door in its open position, said door connected to a frame by a hinge and being rotatable about said hinge between its said open position and a closed position, said retainer member comprising a bracket connected to one of said door and said frame, a rotatable disc part carried by said bracket, and catch means secured to the other of said door and said frame for engaging said disc part when said door is shifted to its said open position, the rotation of said disc part relative to said bracket being frictionally restrained, said disc part including an annular edge portion, said annular edge portion having a notch



means therein, said notch means for accepting said catch means upon shifting said door into its said open position with said disc being frictionally restrained against rotation to thereby retain said door in such open position, said catch means being released by the rotation of said disc part during urged movement of said door from its said open to said closed position.

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**4,292,708**
**HINGES WITH POSITION-LOCKING FILAMENTS**
**Miroslav Stefanovic, Willowbrook, Ill., assignor to Stocker Hinge Mfg. Co., Brookfield, Ill.**
**Filed Oct. 9, 1979, Ser. No. 82,638**
**Int. Cl.³ E05D *11/08, 5/10***
**U.S. Cl. 16—140** **2 Claims**

1. In a hinge comprising two hinge leaves, respectively, having knuckles, the inner walls of which form, when aligned, a substantially cylindrical passage in which a full-cylindrical hinge pin is seated, the knuckles of at least one of said leaves being rotatable about said hinge pin, the improvement comprising
a piece of filamentary material laid along the hinge pin within said passage and being of a length, and having a thickness, sufficient to provide a frictional fit between the pin and the inner walls of at least one each of the relatively rotatable knuckles of said two hinge leaves, which frictional fit is capable to releasably hold said hinge in an open position.

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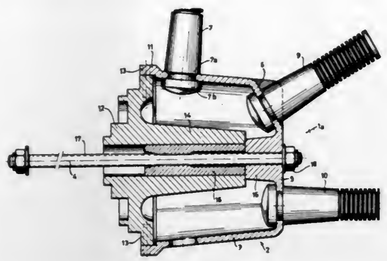
**4,292,709**
**PICKING ELEMENT FOR A POULTRY PICKING APPARATUS**
**Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Netherlands**
**Filed Apr. 30, 1980, Ser. No. 145,017**
**Claims priority, application Netherlands, May 11, 1979, 7903737**
**Int. Cl.³ A22C *21/02***
**U.S. Cl. 17—11.1 R** **4 Claims**

1. A picking element for a poultry picking apparatus, comprising a beaker-shaped support which is to be driven rotatably about the center line thereof and whose cylindrical casing surface and end face are provided with picking fingers and wherein the casing surface is a truncated conical surface of

which the end face is disposed substantially transversely to the axis of rotation, while between the casing surface and the end face are located a number of transition surface areas which lie



at a more acute angle to the center line of the casing surface than the end face and which each carry at least one picking finger, the end face carrying a number of picking fingers substantially parallel to the center line.

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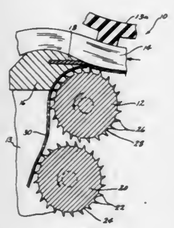
**4,292,710**
**MEMBRANE SKINNER**
**Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa**
**Filed Nov. 19, 1979, Ser. No. 95,621**
**Int. Cl.[3] A22B *5/16***
**U.S. Cl. 17—21** **4 Claims**



1. A membrane skinning machine comprising,
a frame,
a gripper roll mounted on said frame,
a shoe element mounted on said frame adjacent said gripper roll, said shoe element having a concave surface complementary to the surface of said gripper roll,
a cutting blade mounted in said shoe and extending along said gripper roll, and
a plurality of helically disposed serrations on the surface of said gripper roll.

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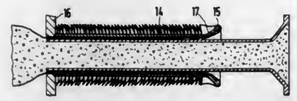
**4,292,711**
**PROCESS FOR THE SIMULTANEOUS FILLING AND TURNING OF A TUBULAR CASING WITH AN OUTSIDE COATING**
**Reinhold Becker, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**
**Filed Mar. 28, 1979, Ser. No. 24,763**
**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813847**
**Int. Cl.[3] A22C *11/02, 13/00***
**U.S. Cl. 17—49** **7 Claims**

1. A method for filling a flexible shirred tubular casing with a filling mass, comprising the steps of:
(a) providing a flexible shirred tubular casing having an inside surface and an outside surface;
(b) deshirring an end section of the casing by stretching the shirred casing in the longitudinal direction;
(c) closing the deshirred end section of the casing to form a closed end;
(d) placing the shirred tubular casing onto the exterior of a substantially straight, dimensionally stable tubular body in such a way that the closed end of the casing covers the end of the tubular body, the deshirred end section of the casing extends along and surrounds the tubular body with the outside surface of the casing being turned toward the



tubular body and the shirred casing is positioned on the portion of the tubular body surrounded by the deshirred end section of the casing;
(e) forcing a filling mass under pressure through the interior of the tubular body into the deshirred end section of the casing in a direction toward the closed end of the casing, to fill the deshirred end section of the casing and force the filled casing off of the tubular body, whereby the shirred section of the casing is simultaneously deshirred and inverted to place its outside surface on the inside; and
(f) during said step (e), preventing contact between the deshirred section of the casing and the inside surface of the shirred section of the casing.

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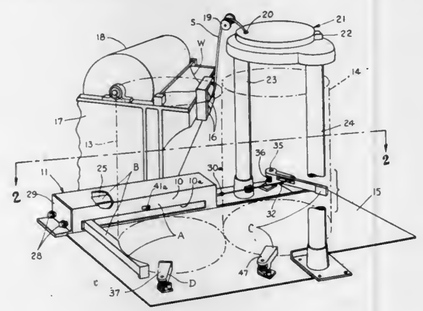
**4,292,712**
**CARD COILER CAN CHANGER**
**Alvin T. Bonner, Sr., Mauldin, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.**
**Filed Apr. 23, 1979, Ser. No. 32,550**
**Int. Cl.[3] B65H *54/80***
**U.S. Cl. 19—159 A** **4 Claims**



1. Automatic card coiler can changer apparatus for removing a full coiler can and positively positioning an empty can beneath a coiler head comprising:
guide means for moving an empty coiler can along a predetermined substantially linear path to a position beneath a coiler head;
power operated means engaging an empty coiler can on a power stroke thereof and moving same along said predetermined path;
said empty coiler can dislodging a full can from position beneath said coiler can on said power stroke;



gripping means fixing said empty coiler can against rotation in said position beneath said coiler head; and
wedging means receiving an empty can in a reserve position wedged against said guide means for engagement by said power operated means when the can beneath the coiler head has received a predetermined amount of sliver.

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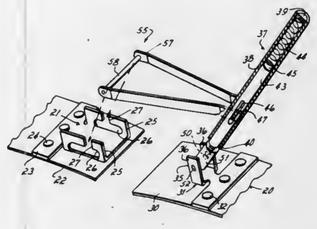
**4,292,713**
**TOOL FOR APPLYING INSULATION TO PIPES**
**Clyde R. King, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio**
**Filed Sep. 13, 1979, Ser. No. 75,257**
**Int. Cl.[3] B65D *63/06;* F16L *33/00***
**U.S. Cl. 24—24** **3 Claims**



1. A tool for applying insulation to a pipe comprising,
a strap,
a keeper fixed to one end of said strap, said keeper including a receptacle to receive a latch,
a handle pivoted at one end to the other end of said strap, said handle comprising,
a tube closed at one end remote from the pivotal mounting of the handle on the strap,
a compression spring in said tube adjacent the closed end thereof,
and a rod slidable in said tube, said rod having an end pivoted to said strap,
a latch pivoted at one end to said tube intermediate the ends of said tube, said latch having at its other end an element adapted to be received in said keeper,
whereby said band may be applied to insulation or the jacket therefor, the latch inserted in said keeper, and the handle swung to lie generally tangential to said strap thereby clamping said band onto said insulation or jacket, said compression spring permitting said latch to accommodate various sizes of insulation.

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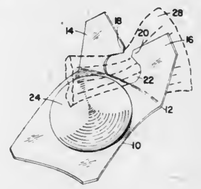
**4,292,714**
**EASY OPENING AND SECURE CLOSING CLOSURE**
**Robert J. Walker, 2942 Linden Ave., Berkeley, Calif. 94705**
**Filed Jan. 14, 1980, Ser. No. 111,901**
**Int. Cl.[3] B65D *77/10, 33/16***
**U.S. Cl. 24—30.5 R** **20 Claims**



1. A fastener, which comprises flexible material having a dome-shaped portion which is reversibly deformable from a first fixed configuration extending in one direction above its surrounding material to a second configuration extending in an opposite direction, and a pair of projections formed in said material, each projection being separated by a transverse bend from the dome-shaped portion, the bend being substantially tangent to an edge of the dome-shaped portion, the projections being spaced apart a sufficient amount to allow insertion and removal of a fastened article when the portion is in one of its configurations and sufficiently close when the portion is in its other configuration to prevent removal of a fastened article from the fastener.

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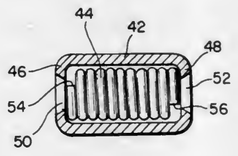
**4,292,715**
**JEWELRY CLUTCH**
**Lawrence T. Huddon, 22 Overhill Rd., Warwick, R.I.**
**Continuation-in-part of Ser. No. 916,552, Jun. 19, 1978, abandoned. This application Jul. 16, 1979, Ser. No. 57,757**
**Int. Cl.[3] A44B *9/10***
**U.S. Cl. 24—155 C** **8 Claims**



1. A jewelry clutch comprising a small hollow tubular housing having integral front and rear walls, a coil spring mounted in said housing having an outer diameter slightly smaller than the inner diameter of said housing, said front and rear walls having central openings communicating with the inside of said coil spring, and a pin adapted to fit into said openings and into said coil spring, the outer diameter of said pin being smaller than the inside diameter of said coil spring, said coil spring having means at each end for frictionally engaging said pin when said pin is pushed into said housing.

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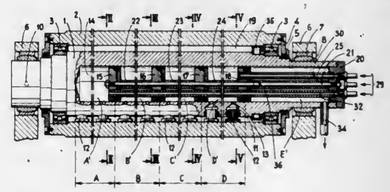
**4,292,716**
**CONTROLLED DEFLECTION ROLL**
**Ignazio Marchioro, I-Schio, Italy, assignor to Escher Wyss Limited, Zürich, Switzerland**
**Filed Oct. 19, 1979, Ser. No. 86,538**
**Claims priority, application Switzerland, Oct. 25, 1978, 11030/78**
**Int. Cl.[3] B21B *13/02***
**U.S. Cl. 29—116 AD** **5 Claims**



1. A controlled deflection roll comprising:
a stationary support;
a roll shell;
means mounting said roll shell for rotatable movement about said stationary support;
said roll shell and said stationary support defining therebetween an intermediate space;
a plurality of pressure elements, activatable by a pressurized fluid medium, for supporting the roll shell upon the stationary support;
said stationary support having a central bore;
infeed tubes arranged in said central bore;

said pressure elements forming a number of pressure zones to which there is infed the pressurized fluid medium at different pressures by said infeed tubes arranged in the central bore of said stationary support;

supply line means connected with said infeed tubes at an end of said stationary support;

partition walls arranged in the bore of the stationary support;

said partition walls separating from one another sections of the bore, each of which is correlated to individual ones of said pressure zones and into which open the infeed tubes;

said infeed tubes extending in adjacent non-concentric relationship with respect to one another; and

a first section of the bore, located between an end of the stationary support and a first one of said partition walls, containing an intermediate space between the outer walls of the infeed tubes and the inner wall of the bore for the withdrawal of the medium out of the intermediate space between the roll shell and the stationary support of the controlled deflection roll.

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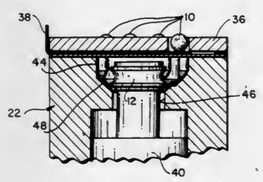
**4,292,717**

## METHOD FOR MANUFACTURE OF BEARINGS

**Gerald H. Mullen, Burlington, Conn., assignor to Virginia Industries, Inc., Rocky Hill, Conn.**

**Filed Dec. 26, 1978, Ser. No. 973,544**
**Int. Cl.³ B21D** *53/10*
**U.S. Cl. 29—148.4 A** **6 Claims**




1. Apparatus for use in the fabrication of a bearing comprising:

means defining a bore having an axis, said bore having an upper portion with a minimum diameter selected to be larger than the maximum outer diameter of a bearing inner raceway defining member, said bore having a second portion which converges inwardly toward said axis from a first end of said upper portion to a diameter smaller than said maximum outer diameter of the bearing inner raceway defining member; and

a plurality of spaced recesses formed in the wall of said bore of said bore defining member, said recesses having axes which are parallel to the axis of the bore, said recesses each having an upper section which extends downwardly from the second end of said bore defining means upper portion and a second section which extends generally downwardly and inwardly from said upper section, said second sections of said recesses terminating in flat bottoms, said recesses each having a size and shape sufficient to guide balls delivered thereto past the raceway defining upper land of an inner raceway defining member supported in said bore second portion and thereafter inwardly into contact with the raceway surface.

**4,292,718**

## METHOD OF PRODUCING METAL BEARINGS

**Yoshio Iijima, Nagoya, Japan, assignor to Daido Metal Company Ltd., Japan**

**Filed Jul. 19, 1979, Ser. No. 58,992**
**Claims priority, application Japan, Jul. 27, 1978, 53-91712**
**Int. Cl.³ B21D** *7/04, 53/10*
**U.S. Cl. 29—149.5 DP** **3 Claims**

1. A method of making composite metal bearings of semicircular or cylindrical shape from a composite strip of bearing plate consisting of a bearing alloy layer and a backing metal layer, which comprises the steps of:

(a) feeding a composite strip of bearing plate lengthwise, step by step, past a number of stations arranged to perform necessary operations;

(b) embossing on opposite sides of the strip in one stroke a pair of transverse grooves substantially V-shaped in cross section in such a manner that the groove on the surface of the backing metal layer is embossed to a depth less than the thickness of the backing metal layer, the groove on the surface of the bearing alloy layer is embossed to a depth equal to or less than the thickness of the bearing alloy layer, and the pair of grooves are formed in generally parallel alignment with each other;

(c) additionally subjecting the groove formed by embossing by the preceding step on the surface of the bearing alloy layer to a cutting step so as to enlarge the size of the groove in both its depth and width so that the groove extends beyond the interface between the bearing alloy layer and the backing metal layer and further into the backing metal layer; and

(d) bending and forming, between a set of punch and dies, a blank of the composite bearing plate provided with said grooves of desired shape and size directly into a partly severed blank having final cross sectional configuration, and then completely severing said blank from the rest of the strip of said composite bearing plate in such a manner that said bending, forming and subsequent severing of said blank are performed by a one stroke operation.

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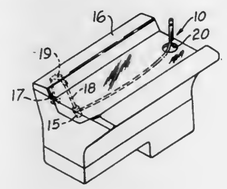
**4,292,719**

## ENGINE VALVE LIFTER SERVICE TOOL

**Francis D. Britton, Jr., 200 Railroad Ave., Henry, Ill. 61537**

**Filed Dec. 26, 1979, Ser. No. 106,559**
**Int. Cl.³ B26P** *15/00*
**U.S. Cl. 29—156.4 R** **9 Claims**




9. A method of removing a defective hydraulic valve lifter (**15**) from an engine (**16**) and installing a new lifter (**15**) in said engine (**16**) comprising the steps of:

providing a valve lifter service tool (**10**) having a valve lifter engaging portion (**12**) and an actuating portion (**11**);



inserting said service tool (**10**) into the distributor opening (**20**) of said engine (**16**);

encircling said defective lifter (**15**) with said engaging portion (**12**);

actuating said actuating portion (**11**) to engage said defective lifter (**15**) with said engaging portion (**12**);

removing said service tool (**10**) and said defective lifter (**15**) from said engine (**16**) through said opening (**20**);

removing said defective lifter (**15**) from said engaging portion (**12**);

installing a new lifter (**15**) in said engaging portion (**12**);

inserting said service tool (**10**) and said new lifter (**15**) into said opening (**20**); p1 installing said new lifter (**15**) into position within said engine (**16**) using said tool (**10**);

releasing said new lifter (**15**) from said tool (**10**); and

removing said tool (**10**) from said opening (**20**).

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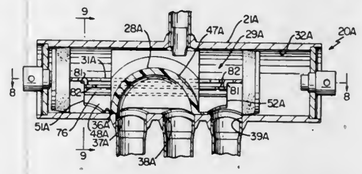
**4,292,720**

## METHOD OF MAKING REVERSING VALVE CONSTRUCTION AND PARTS THEREFOR

**Werner R. Bauer, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 958,030, Nov. 6, 1978, Pat. No. 4,240,469, which is a continuation-in-part of Ser. No. 825,958, Aug. 19, 1977, Pat. No. 4,188,975. This application Dec. 6, 1979, Ser. No. 100,729**
**The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.**
**Int. Cl.³ B23P** *15/00*
**U.S. Cl. 29—157.1 R** **16 Claims**




1. In a method of making a reversing valve construction having a housing means provided with a chamber carrying a movable valve member therein that controls port means of a valve seat means of said housing means through the relative position of passage means of said valve member relative to said port means, the improvement comprising the steps of forming a one-piece flexible sealing skirt to be carried by said valve member and extend outwardly therefrom in a cantilevered manner adjacent said valve seat means, providing said flexible sealing skirt with exposed surfaces so as to be exposed to fluid pressure in said chamber that will act directly thereon and cause said flexible skirt to flex and engage said valve seat means in a manner to tend to sealingly conform to the contour of said valve seat means and thereby seal said passage means to said valve seat means while permitting sliding movement therebetween, and disposing biasing means in said housing means to act on said flexible skirt to urge the same toward said valve seat means.

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**4,292,721**

## CRIMPING DEVICE FOR USE IN ASSEMBLING AN OVERTRAVEL SPRING ASSEMBLY FOR SLACK ADJUSTER

**Roger J. Weseloh, South Holland; Wajih Kanjo, Midlothian, and Syed Karim, Sauk Village, all of Ill., assignors to American Standard Inc., Chicago, Ill.**

**Filed Apr. 21, 1980, Ser. No. 142,569**
**Int. Cl.³ B23P** *11/00*
**U.S. Cl. 29—243.52** **8 Claims**

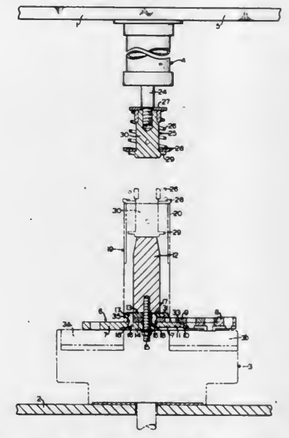
1. Crimping apparatus for crimping opposite annular ends of a housing member for an overtravel spring assembly for use in a slack adjuster, said crimping apparatus comprising:

(a) a support frame;

(b) power chuck means mounted vertically on a lower portion of said support frame and having a plurality of equiangularly spaced, radially movable jaws on which respective crimping blades are removably secured for movement therewith, said blades being operable upon inward radial movement thereof for crimping said housing member at one end;

(c) a base member concentrically secured to said chuck means;

(d) a post member concentrically secured to said base member and on which said housing member is removably installed in a crimping position in which a lower end thereof rests against said base member;



(e) power cylinder means including a piston rod and mounted vertically on an upper portion of said support frame opposite said chuck means and in axial alignment therewith; and

(f) a spring pressure assembly secured to said piston rod and movable therewith;

(g) said spring pressure assembly being operable, upon actuation of the power cylinder means, out of a retracted position to an extended position in which the upper annular rim of said housing member is engaged by the spring pressure assembly for securing the housing in said crimping position,

(h) said power chuck means being operable responsively to actuating pressure for effecting radial inward movement of said jaws and blades.

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**4,292,722**

## RENEWABLE NUT FOR A LEAD SCREW DRIVE AND METHOD OF MAKING SAME

**Daniel A. Worsham, San Jose, Calif., assignor to Pacific Western Systems, Inc., Mountain View, Calif.**

**Filed Aug. 13, 1979, Ser. No. 66,095**
**Int. Cl.³ B22D** *19/10;* **B23P** *7/00*
**U.S. Cl. 29—402.21** **9 Claims**

1. In a method for renewing a lead screw drive mechanism to remove backlash therefrom, the steps of:

threadably mating a lead screw with a nut, the threaded portion of said nut being made of a core material to be melted in place;

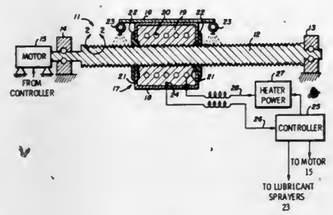
heating the threaded core portion of said nut while in threadable engagement with the threaded portion of said lead screw to cause said threaded portion of said nut to melt and to flow and to conform to the thread profile lead screw; and

allowing the melted core portion of said nut to cool and to solidify while threadably mated with said lead screw such that the threaded portion of said nut is renewed to conform to the thread profile of said lead screw, thereby renewing the thread of the nut and reducing backlash of the lead screw drive mechanism.

6. In a renewable lead screw drive mechanism:

lead screw means having an elongated externally threaded body;

nut means having an internally threaded core portion for threadably mating with the external thread of said lead




screw, said core portion of said nut being made of a material having a relatively low melting temperature;

heating means for heating said core portion of said nut means while said nut means is in threadable engagement with the thread of said lead screw to cause said core portion of said nut means to melt and to flow and to conform to the thread profile of said mated lead screw such that as said melted core portion of said nut means cools it will solidify for conforming the threaded portion of said nut to the thread profile of said lead screw means, thereby renewing the thread of said nut and reducing backlash of the lead screw mechanism.

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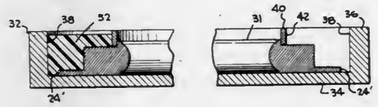
**4,292,723**

## SHEAVE AND METHOD OF PROVIDING SAME

**David A. Rauscher, Columbia, S.C., assignor to Cable Conveyor Systems, Inc., Columbia, S.C.**

**Filed Nov. 1, 1979, Ser. No. 90,485**
**Int. Cl.³ B23P** *6/00, 6/04;* **B29D** *15/00*
**U.S. Cl. 29—402.01** **8 Claims**



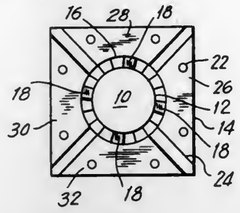

1. A method of reconditioning a sheave having an annular rim body including first and second peripheral flanges between which a peripheral trough is defined, said method comprising the steps of removing a first annular portion of said rim body including said first peripheral flange and extending radially inwardly beyond the original location of the bottom of the peripheral trough, removing a second annular portion of said annular rim body including said peripheral trough and a portion of said second peripheral flange, said second annular portion extending radially inwardly beyond the original location of the bottom of said peripheral trough but extending radially inward a distance less than the inward extent of said first annular portion, removing a third annular portion of said annular rim body comprising a radially outermost portion of said second flange positioning said sheave in a mold, casting liquid uncured plastic in the mold to fill the space previously occupied by the removed portions of said annular rim body and to also extending radially therebeyond, permitting said liquid plastic to cure and harden and machining said plastic to define first and second peripheral flanges separated by a peripheral trough.

**4,292,724**

## ARRANGEMENT FOR CONSTRUCTING SURFACES AND BODIES

**Paul DiMatteo, Huntington, N.Y., assignor to Solid Photography, Inc., Melville, N.Y.**

**Filed Nov. 5, 1979, Ser. No. 91,142**
**Int. Cl.³ B23P** *17/00;* **B32B** *31/00*
**U.S. Cl. 29—418** **8 Claims**




1. A method for constructing a predetermined surface comprising the steps of: defining cross-sections of said surface; generating a substantially planar element for each cross-section from base material having a substantially rectangular cross-section by removing material within a gap following the outline of the cross-section, said gap being discontinuous and being interrupted by tabs connecting the planar element to the base material, said tabs comprising material not removed in said gap during said material removing step; arranging locations of said tabs so that said tabs are in staggered relationship to each other when the planar elements are stacked against each other; attaching the planar elements to one another and stacking the planar elements in predetermined sequence to form such surface, the sequence of the stacked elements corresponding to the sequence of the cross-sections of said surface.

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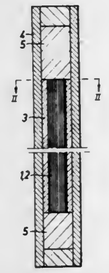
**4,292,725**

## METHOD OF PRODUCING AN OBJECT OF FIBER REINFORCED METAL MATERIAL

**Leif Larsson, Trollhättan, and Richard Warren, Landvetter, both of Sweden, assignors to Volvo Flygmotor AB, Trollhattan, Sweden**

**Filed Apr. 12, 1979, Ser. No. 29,516**
**Claims priority, application Sweden, Apr. 17, 1978, 7804337**
**Int. Cl.³ B23P** *17/04*
**U.S. Cl. 29—419 R** **9 Claims**




1. A method of manufacturing a fiber reinforced metal object having a substantially uniform density metallic matrix material throughout, comprising the following steps:

positioning each of a plurality of separate, previously drawn fibers of a tungsten-based metallic material in a separate tube of metallic matrix material;

positioning each of said fiber-filled tubes of metallic matrix material within a single casing having a configuration substantially similar to the configuration of said metal object;

isostatically pressing said casing and said fiber-filled tubes positioned therein at a temperature above ambient room temperature and below the lowest temperature necessary for melting both said fibers and said matrix material, thereby causing plastic deformation of said fiber-filled tubes into an object having the desired configuration of said metal object with substantially uniform density metallic matrix material throughout.

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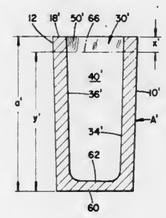
**4,292,726**

## INGOT MOLD RECONDITIONING PROCESS

**Patsie C. Campana, 2614 Sherwood Dr., Lorain, Ohio 44053**

**Filed Jan. 28, 1980, Ser. No. 116,170**
**Int. Cl.³ B23P** *6/00*
**U.S. Cl. 29—527.6** **7 Claims**




1. A process for reconditioning an ingot mold after some predetermined period of use for purposes of extending the useful life thereof wherein said mold is of a type having an external peripheral wall and opposed mold top and bottom ends with an internal mold cavity having at least one open end extending at least substantially between said mold top and bottom ends, said cavity having a predetermined first volume defined by a first length extending between opposed ends of said cavity and a predetermined first cross-sectional area disposed normal to said first length between cavity side walls, said process comprising the steps of:

(a) casting a plurality of first ingots in said mold having approximately said first volume;

(b) cutting each of said first ingots into a plurality of first bars generally equal to each other;

(c) machining said mold generally transversely of said first length following casting of a plurality of said first ingots therein for removing an area of mold deterioration adjacent said cavity open end while controlling said machining so that said cavity first length is reduced to some predetermined second length for providing said cavity with a second volume comprising some reduced multiple of said first volume;

(d) casting a plurality of second ingots having approximately said second volume; and,

(e) cutting each of said second ingots into a plurality of second bars which are lesser in number and which generally have the same dimensional and volume characteristics as said first bars.

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**4,292,727**

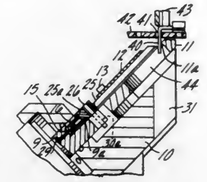
## AUTOMATIC INSERTION EQUIPMENT

**Richard B. Maxner, Danvers, Mass., assignor to USM Corporation, Farmington, Conn.**

**Filed Feb. 25, 1980, Ser. No. 124,084**
**Int. Cl.³ H05K** *3/30;* **B21F** *11/00*
**U.S. Cl. 29—566.3** **8 Claims**

1. A cut-clinch mechanism including a fixed knife and a movable knife and means to drive said movable knife into cutting relationship with said fixed knife, the improvement which comprises:

means linking said movable knife to said drive means, said linking means allowing a limited movement of said movable knife relative to said drive means and sensing means




to determine if said movable knife has achieved said limited movement.

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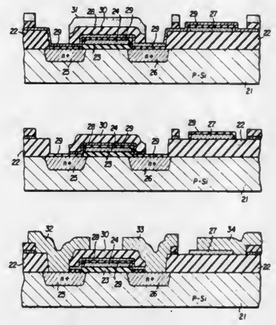
**4,292,728**

## METHOD FOR MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUITS UTILIZING SPECIAL CONTACT FORMATION

**Norio Endo, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 13, 1979, Ser. No. 48,090**
**Claims priority, application Japan, Jun. 13, 1978, 53-71088**
**Int. Cl.³ H01L** *21/283, 21/31*
**U.S. Cl. 29—571** **6 Claims**




1. A method for manufacturing semiconductor integrated circuits, comprising the steps of:

forming a field oxide layer on a semiconductor substrate;

partially removing the field oxide layer to expose a predetermined part of said semiconductor substrate;

forming in said exposed part of the semiconductor substrate insulated gate field effect transistors having insulated gates and source and drain edge regions adjacent to said field oxide layer;

forming a first insulating layer which has a different etching rate from said field oxide layer on the overall surface of said field oxide layer and said transistors;

forming on the first insulating layer a second insulating layer which has a different etching rate from said first insulating layer;

removing portions of said second insulating layer which are situated above the edge part of said field oxide layer and parts of said source and drain regions distant from the gate by using an etching material which substantially only etches said second insulating layer, and

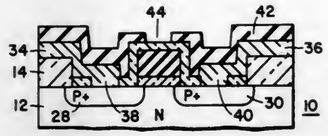
etching the first insulating layer by using the second insulating layer as a mask, thus forming contact holes to the field effect transistors.

**4,292,729**

## ELECTRON-BEAM PROGRAMMABLE SEMICONDUCTOR DEVICE STRUCTURE

**Michael W. Powell, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 834,081, Sep. 19, 1977, Pat. No. 4,190,849. This application Aug. 23, 1979, Ser. No. 68,991**
**Int. Cl.³ H01L *21/04***
**U.S. Cl. 29—571** **2 Claims**




1. A method for manufacturing a semiconductor device comprising the steps of: providing a semiconductor substrate; providing a conductive region isolated from said substrate and capable of storing charge from an electron beam; forming an insulator layer overlying said conductive region and adapted to allow penetration of electrons from said electron beam; forming a registration element in said substrate, said registration element allowing registration between said conductive region and said electron beam; and charging said conductive region with an electron beam to alter operation of said semiconductor device.

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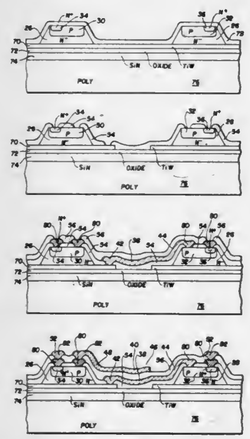
**4,292,730**

## METHOD OF FABRICATING MESA BIPOLAR MEMORY CELL UTILIZING EPITAXIAL DEPOSITION, SUBSTRATE REMOVAL AND SPECIAL METALLIZATION

**Kenneth A. Ports, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Filed Mar. 12, 1980, Ser. No. 129,913**
**Int. Cl.³ H01L *21/283, 21/302***
**U.S. Cl. 29—577 C** **5 Claims**



1. In a method of fabricating an integrated circuit having mesa devices including forming an epitaxial layer on a substrate, forming a top support on said epitaxial layer and removing said substrate, the improvement comprising:
- applying a backside metallic layer to the bottom of said epitaxial layer;
- forming a bottom support on said backside metallic layer;
- removing said top support;
- etching said epitaxial layer to form a plurality of discrete mesa;
- etching said backside metallic layer to form a discrete backside contact for each mesa;
- forming a first top insulative layer;
- applying first interconnect layer and delineating to form interconnects on said first insulating layer between said mesa and contacts to said mesa;
- forming a second top insulative layer; and
- applying a second interconnect layer and delineating to form interconnects on said second insulating layer between said mesa and contacts to surface regions of said mesa.

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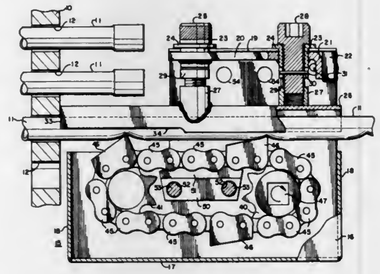
**4,292,731**

## TUBE REMOVAL MACHINE

**Burt Filer, New Hope, Pa., assignor to Sandra Lee Filer, New Hope, Pa.**

**Filed Mar. 31, 1980, Ser. No. 135,220**
**Int. Cl.³ B23P *15/26***
**U.S. Cl. 29—726** **18 Claims**



1. A tube removal machine for positioning in front of a tube sheet comprising
- a housing,
- a longitudinally elongated member carried in said housing and extending from said tube sheet for engagement under pressure along one side face portion of a tube to be removed, and
- means in said housing for advancing the tube to be removed, said means including a driving member carried on an endless chain having a rigid portion for gripping engagement with the opposite side face portion of said tube from that with which said elongated member is in engagement.

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**4,292,732**

## APPLICATOR FOR METAL STRAIN RELIEF CLAMP

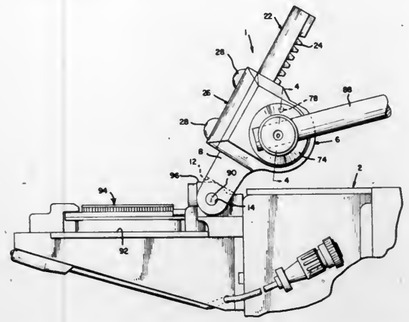
**John J. Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jun. 7, 1979, Ser. No. 46,414**
**Int. Cl.³ B23P *19/00*; H01R *43/04***
**U.S. Cl. 29—749** **5 Claims**

1. In a tool for closing a cable clamp portion of an electrical connector onto a multiple wire electrical cable, the tool having a work station supporting said connector and said clamp portion, a housing mounting: a ram carrying a toolhead for engaging and closing said clamp portion, a drive mechanism for reciprocating said toolhead toward and away from said clamp portion, a rotatable shaft mounting said pinion and mounting a lever which is manually pivotable for reciprocating said shaft in a first direction and a return mechanism for rotating said shaft in a second direction upon manual release of said lever, the improvement comprising:
- a cable engaging first means projecting from said toolhead for engaging and thrusting a cable internally of said clamp portion prior to closure thereof by said toolhead,



- said housing being pivotally mounted to said work station,
- second means for limiting pivotal movement of said housing in said first direction and for positioning said toolhead for reciprocation together with said rack toward said clamp portion, and



- said housing being pivotable in a second direction by a shift in gravity resulting from manual release of said lever and pivoting of said lever by said return mechanism.

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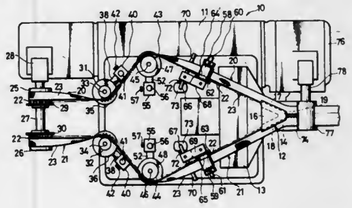
**4,292,733**

## APPARATUS FOR COUPLING A PAIR OF ELONGATE SLIDE FASTENER STRINGERS

**Yoshitaka Iimura, Kurobe, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan**

**Filed Feb. 14, 1980, Ser. No. 121,319**
**Claims priority, application Japan, Feb. 20, 1979, 54-20856[U]**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—766** **9 Claims**



1. An apparatus for coupling a pair of elongate slide fastener stringers while being fed longitudinally along a pair of respective paths, comprising:
- (a) a frame;
- (b) a pair of first spaced rolls rotatable on a first shaft on said frame;
- (c) a pair of second spaced rolls rotatable respectively on a pair of second shafts on said frame, which extend transversely to said first shaft;
- (c) a pair of third rolls rotatable respectively on a pair of third shafts on said frame, which extend substantially parallel to said second shafts and are spaced from each other by a greater distance than that between said pair of second shafts;
- (e) a pair of fourth spaced rolls rotatable respectively on a pair of fourth shafts on said frame, which extend transversely to said third shafts;
- (f) a coupling member on said frame, having a pair of converging guide channels for meshing the stringers as they pass therethrough;
- (g) means for withdrawing the slide fastener stringers as they are coupled together by said coupling member; and
- (h) said first, second, third, fourth rolls, said coupling member and said withdrawing means being arranged in the order named for guiding the stringers along their respective paths into said coupling member, said third rolls enabling the stringers to pass along a pair of converging paths leading respectively to said converging guide channels in said coupling member, and said fourth rolls allowing the stringers by widthwise engagement therewith to advance in a plane in which said converging guide channels lie.

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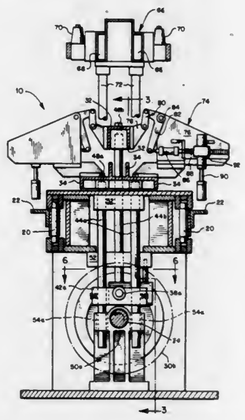
**4,292,734**

## COMMONLY ACTUATED IN-LINE ASSEMBLY MACHINE

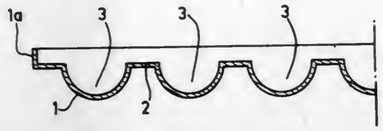
**Douglas L. Swanson, McKean, Pa., and Norman H. Yeo, Georgetown, Mass., assignors to Swanson-Erie Corporation, Erie, Pa.**

**Filed May 25, 1979, Ser. No. 42,306**
**Int. Cl.³ B23P *19/00*; B23Q *7/03***
**U.S. Cl. 29—791** **11 Claims**



1. An in-line assembly machine having a plurality of work stations, at least three of which are arranged in the same straight line, comprising:
- a camshaft oriented along an axis;
- two sets of cams fixed to said camshaft;
- an upper elongated tool plate oriented parallel to said camshaft axis;
- a lower elongated tool plate oriented parallel to said camshaft axis, said upper and lower tool plates each being mounted to move reciprocally with respect to one another to commonly actuate tooling associated with the machine at a plurality of work stations;
- a first set of lifting rods mounted to reciprocate said upper elongated tool plate;
- a second set of lifting rods mounted to reciprocate said lower elongated tool plate;
- a first set of cam followers mounted to said first set of lifting rods and mounted to follow one set of said cams;
- a second set of cam followers mounted to said second set of lifting rods and mounted to follow the other set of said cams, each of said sets of followers cooperating with a respective set of said cams to translate the rotational motion of said cams into reciprocation of said lifting rods, so that rotation of said camshaft causes said upper and lower elongated tool plates to reciprocate, thereby providing the common actuation desirable to perform operations on parts to be assembled.

4,292,735
**METHOD OF MANUFACTURING A COPLANAR PHOTOCOUPLER**
Jacques C. Thillays, Herouville St. Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 15, 1979, Ser. No. 49,015
Claims priority, application France, Jun. 16, 1978, 78 18081
Int. Cl.³ G02B *27/00, 5/14;* H01L *31/12*
U.S. Cl. 29—854 7 Claims




1. A method of making a plurality of photocouplers each having a light emitter, a photosensitive receiver and an optical element comprised of a photoconductive plastic covered with a metal mirror for coupling light from said light emitter to said photosensitive receiver, said method comprising the steps of providing a sheet of deformable metal having a pattern of deep drawn recesses formed therein, said recesses each having a shape corresponding to that desired for the mirror, filling said recesses with said plastic in liquid form, curing said plastic so that it solidifies in and adheres to the metal surface of said recesses to thereby form a plurality of said elements wherein the metal surfaces of said recesses define said mirrors, thereafter separating said elements from each other, and attaching one of said light emitters and one of said photosensitive receivers to each of said elements to thereby form a plurality of said photocouplers.

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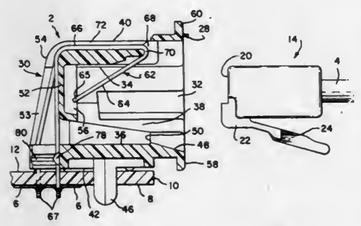
4,292,736
**METHOD FOR MAKING JACK TYPE RECEPTACLES**
Donald W. K. Hughes, Mechanicsburg, and Ronald W. Myers, Landisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 940,536, Sep. 8, 1978, Pat. No. 4,221,458. This application Dec. 5, 1979, Ser. No. 100,669
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—884 11 Claims




1. A method of manufacturing an electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely facing external sidewalls which are substantially parallel to said internal sidewalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a contact spring extending from one of said internal sidewalls at a location adjacent to said plug-receiving end diagonally into said opening and towards the opposite internal sidewall, and each conductor having a lead portion extending from said plug-receiving end towards said rearward end, said method comprising the steps of:
- producing said housing as a one-piece molded part having a plurality of side-by-side channels extending from said plug-receiving end towards said rearward end in the one of said external sidewalls which is adjacent to said one internal sidewall,
- manufacturing said conductors as a continuous flat sheet metal strip comprising a carrier strip means having at spaced intervals groups of said conductors extending in side-by-side coplanar relationship from one side edge of said carrier strip means with each group containing the number of conductors required for one of said receptacles,
- positioning said housing adjacent to one of said groups of conductors with intermediate portions of said conductors in alignment with said channels, and
- moving said one group of conductors normally of their axes towards said housing and inserting said intermediate portions into said channels, and bending first end portions of said conductors into said plug-receiving opening whereby said first end portions function as said contact springs and said intermediate portions of said conductors function as said lead portions.

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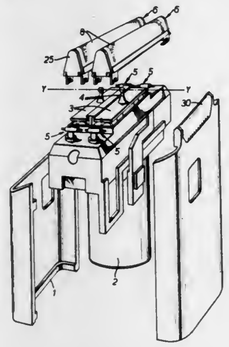
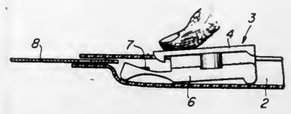
4,292,737
**DRY SHAVER WITH DIFFERENTIALLY BIASED INNER CUTTER AND BASE MEMBERS**
Charles C. Packham, Berkshire, England, assignor to The Gillette Company, Boston, Mass.
Filed Dec. 3, 1979, Ser. No. 99,247
Claims priority, application United Kingdom, Dec. 11, 1978, 48009/78
Int. Cl.³ B26B *19/06*
U.S. Cl. 30—43.92 8 Claims




1. A dry shaver having a drive means for providing reciprocating motion and including a casing on which is carried a cutter assembly comprising a reciprocating inner cutter driven by said drive means, said inner cutter co-operating with a flexible, arched foil against which said inner cutter is pressed by spring means, wherein said foil and said inner cutter are mounted on a common base member, said foil being attached along its longitudinal edges to said base member, said spring means acting between said base member and said inner cutter, wherein said base member is mounted on said casing for movement toward and away from said casing in directions tranverse to the direction of reciprocation of said inner cutter, and said base member is urged away from said casing by resilient means whose spring force is less than that of the said spring means said resilient means being independent of said spring means and said drive means.

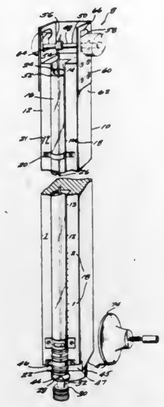


4,292,738
**KNIFE**
Hiroshi Osada, Seki, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan
Filed Jan. 16, 1980, Ser. No. 112,515
Claims priority, application Japan, Jan. 20, 1979, 54-4540[U]; May 21, 1979, 54-66905[U]
Int. Cl.³ B26B *5/00*
U.S. Cl. 30—162 6 Claims




1. A knife having an elongated holder having a front end, a rear end, a top wall, a bottom wall, and two side walls and being provided with an interior, longitudinally extending channel the frontwardmost end region of which is located rearwardly of said front end of said holder, said channel being open to the exterior through a longitudinal slot provided in said top wall of said holder and having its frontwardmost end located a predetermined distance rearwardly of said frontwardmost end region of said channel, said holder further being provided at said front end thereof with an opening which communicates with said frontwardmost end region of said channel, a blade carrier including a slider slidably received by said channel and having a front end portion and a body portion disposed within said channel and a finger portion which is unitary with said body portion through said slot and is located exteriorly of said holder in overlying relation to said top wall, and a blade extending into said channel through said opening and having a base portion detachably secured to said blade holder through an engagement of a projection formed on said front end portion of said slider and an aperture formed in said base portion of said blade; characterized in that:
- said slider has a rear end portion in sliding contact with the interior surface of said bottom wall of said holder, and said body portion, said rear end portion and said front end portion of said slider constitute a unitary, substantially rigid structure that is entirely confined within said holder,
- resilient means located entirely within the confines of said holder is operatively interposed between said slider and at least one of the interior wall surfaces of said holder for resiliently biasing said front end portion of said slider having said projection located thereat away from said interior surface of said bottom wall of said holder and so as to bring said projection into engagement with said aperture in said base portion of said blade,
- said finger portion in its forwardmost end region has a transverse extension overlying and in sliding contact with at least a portion of said top wall of said holder alongside said slot for normally inhibiting depression of said finger portion and therewith of said front end portion of said slider to prevent disengagement of said projection from said aperture, and
- said slot adjacent said frontwardmost end thereof is provided with a transverse enlargement shaped and dimentioned to permit entry of said transverse extension of said finger portion thereinto when the latter is moved to dispose said transverse extension in overlying relation to said enlargement of said slot for enabling depression of said finger portion and therewith of said front end portion of said slider to disengage said projection from said aperture against the resilient biasing force of said resilient means.

4,292,739
**LIQUID MEASURE DIP STICK**
Hugh L. Dobbins, 110 Aspenwood Dr., Riverdale, Ga. 30296
Filed Aug. 3, 1979, Ser. No. 63,576
Int. Cl.³ G01B *5/18*
U.S. Cl. 33—126.4 R 7 Claims



1. A liquid height measuring device vertically insertable in a petroleum product storage tank for measuring depth comprising:
- an elongated calibrated wood stick having an elongated vertical surface with a groove formed therein, said stick extending at least twelve feet;
- a transparent narrow hollow tube mounted on said groove and extending between a bottom portal and a top end;
- a valve element having an upper surface in confronting relationship with said portal;
- lifting means for moving said valve element between an open and closed position including a wire connecting at one end to said element, a bracket mounted on said stick adjacent said top end and having two spaced apart L-shaped slots, and a handle having an axle attached to the other end of said wire and movable between an upper position in said slots holding said valve element in a closed position and a lower position holding said valve element in an open position;
- spring means for biasing said valve element toward said open position.

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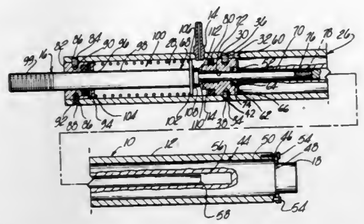
4,292,740
**SELF-ACTUATED DISPLACEMENT TRANSDUCER**
Arthur D. Vis, Warren, and Billie Feinberg, Oak Park, both of Mich., assignors to Candid Logic, Inc., Hazel Park, Mich.
Filed Jun. 7, 1979, Ser. No. 46,586
Int. Cl.³ G01B *3/22*
U.S. Cl. 33—172 E 17 Claims

1. A self-actuated displacement transducer probe assembly comprising:
- a housing comprising a length of tubing having an internal bore of uniform internal diameter extending the full length of the tubing;
- a displacement transducer mounted within said internal bore at one end of said tubular housing, said displacement transducer including a movable element means for generating an electrical signal corresponding to the position of said movable element;
- an actuator arrangement mounted within said internal bore at the other end of said tubular housing, said actuator arrangement including a probe extension shaft slidably mounted in said tubular housing having one end extending out of said other end of said tubular housing;

means securing said probe extension shaft to said movable element;

said actuator arrangement further including means generating a force acting on said probe extension shaft urging said probe extension shaft in a direction out of said tubular housing;

return spring means urging said probe extension shaft to a return position within said tubular housing;



whereby actuation of said actuator arrangement causes said probe to be extended from said tubular housing in order to cause movement of said movable element therewith thereby generating electrical signals corresponding to the position of said probe extension shaft.

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**4,292,741**

## UNIVERSAL LEVEL VIAL HOLDER

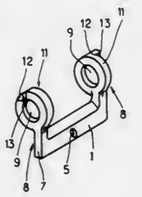
**Louis Scandella, Marnay, France, assignor to Stanley Mabo, S.A., Besancon, France**

**Filed Feb. 21, 1980, Ser. No. 123,193**

**Claims priority, application France, Feb. 26, 1979, 79 05430; Jan. 14, 1980, 80 00944**

**Int. Cl.³ G01C *9/28***

**U.S. Cl. 33—379** **9 Claims**



1. A holder for mounting a level vial within a slot in a web of an extruded or molded spirit level said holder comprising an elongated base plate having a generally planar back wall engageable with one face of the level web and a pair of support legs extending upwards from said base plate, each of said support legs having an end provided with a transversal perimeter for receiving said vial for positioning in said slot, said perimeters being spaced by a distance less than the longitudinal dimension of said slot and having a common axis offset from the plane of said back wall, said perimeter being provided with support means spaced laterally from said back wall approximately a distance equal to the thickness of said web and adapted to contact the opposite side of said web from that contacted by said back wall for supporting said holder on said level and said base plate being provided with means for locking the holder to the level web.

**4,292,742**

## PLANT FOR DRYING FUEL

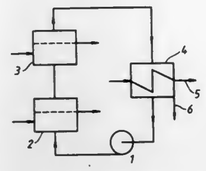
**Hakan Ekberg, Norrköping, Sweden, assignor to STAL-LAVAL Turbin AB, Sweden**

**Filed Jun. 5, 1979, Ser. No. 45,708**

**Claims priority, application Sweden, Jun. 21, 1978, 7807117**

**Int. Cl.³ F26B *3/08***

**U.S. Cl. 34—35** **10 Claims**



1. A method for drying solid materials such as fuel and fuel additives used in thermal power plants, comprising the steps of:

circulating a gas having a low oxygen content around a substantially closed loop;

passing said gas in said loop through hot ashes from said power plant, to heat said gas;

passing said gas in said loop through said materials to be dried; and

removing moisture from said gas in said loop prior to passing said gas through said hot ashes.

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**4,292,743**

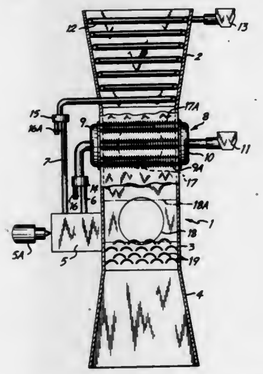
## CEREAL DRYER

**Virgiliu T. Razus, 12, Avenue Gaspard-Valette, 1206 Geneva, Switzerland**

**Filed Nov. 27, 1979, Ser. No. 98,334**

**Int. Cl.³ F26B *17/16***

**U.S. Cl. 34—65** **4 Claims**



1. Cereal grain dryer, comprising: a casing defining an enclosure having an inlet and an outlet opening for movement of cereal grains through said casing and an admission and a discharge orifice, for the flow of hot air in said casing; means for moving said hot air flow from said admission to said discharge orifices; a heat exchanger mounted to span said admission orifice and means producing a flow of hot combustion gases and feeding them to said heat exchanger, said heat exchanger having exchange wall means exposed on the outer face thereof to said air to produce said hot air flow and, on the inner face, to said flow of hot combustion gases, wherein said casing stands upright with said inlet opening being provided at the top and said outlet opening being provided at the bottom whereby said cereal grains circulate through said casing by gravity; wherein said casing has an upper section and a middle section below said upper section; wherein a heating coil lines the inner face of said upper section and means connect said coil to said means producing a flow of hot combustion gases to provide hot combustion gases to said heating coil, and wherein said admission and discharge orifices for said hot air flow are provided in facing walls of said middle section whereby said hot air flow circulates horizontally across said middle section of said casing.

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**4,292,744**

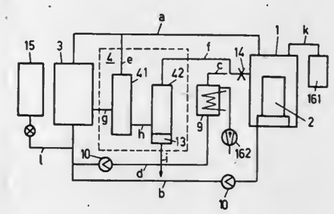
## SEPARATION APPARATUS FOR A CONDENSATION-DRYING PLANT

**Hans U. Nabholz, Ennetbaden, Switzerland, assignor to Micafil AG, Zurich, Switzerland**

**Filed Nov. 21, 1978, Ser. No. 962,699**

**Int. Cl.³ F26B *21/08***

**U.S. Cl. 34—73** **5 Claims**



1. A separation apparatus for a drying plant wherein the material to be dried is heated by the heat of condensation of a readily volatile fluid, said separation apparatus comprising:

an autoclave that is capable of being evacuated;

a plurality of evaporators operably connected and consisting of a main evaporator and first and second stage evaporators;

means to convey vapor from said main evaporator to said autoclave;

means to convey vapor from said first stage evaporator to said autoclave;

means to convey liquid condensate from said autoclave to said main evaporator;

heating means to supply heat to said plurality of evaporators;

means to convey liquid between said evaporators; and

means to remove liquid from said second stage evaporator.

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**4,292,745**

## AIR FOIL NOZZLE DRYER

**Hans-Peter Caratsch, Itenhardstrasse 16, 5620 Bremgarten, Switzerland**

**Filed Aug. 24, 1979, Ser. No. 69,392**

**Claims priority, application Switzerland, Aug. 29, 1978, 9103/78**

**Int. Cl.³ F26B *13/20***

**U.S. Cl. 34—156** **6 Claims**

1. An air foil dryer for drying webs of material moving through said dryer, comprising:

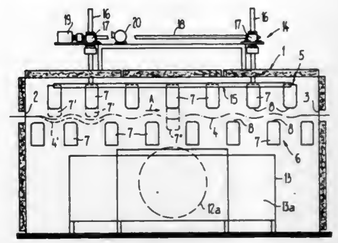
a drying chamber;

means arranged within said drying chamber for floatingly guiding said web of material during its movement;

said guiding means comprising two pluralities of nozzle means spaced apart opposite one another relative to said web of material;

each plurality of nozzle means comprising a plurality of nozzles which are provided with outlet orifices for a drying medium, said web of material being guided by the drying medium emanating from said nozzles without contacting said nozzles;

means for adjusting the space between the nozzles of the said two pluralities of nozzle means; and



means for adjusting the cross-sectional area of said outlet orifices.

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**4,292,746**

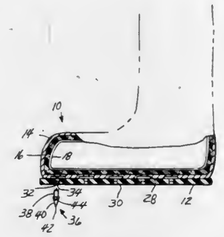
## LIGHT WEIGHT INSULATED ATHLETIC SHOE

**Glen J. Delaney, 111 Oneida, Apt. 109, Pontiac, Mich. 48053**

**Filed Apr. 25, 1979, Ser. No. 33,129**

**Int. Cl.³ A43B *1/14, 5/00*; A43C *15/00***

**U.S. Cl. 36—83** **4 Claims**



1. A light weight insulated athletic shoe comprising:

a sole of flexible rubber having a skid resistant tread;

an outer layer of semi-permeable material having a soft texture and insulating properties which allows the passage of air and excludes the passage of moisture allowing the shoe to breath, bonded at a lower portion thereof to said sole;

an intermediate layer of stretchable sponge rubber bonded to the outer layer to provide an insulating layer;

a cloth inner lining bonded to said intermediate layer providing a friction reducing and comfort improving surface to contact the leg and stocking of the wearer;

a front portion of the shoe slit from the top to a point midway along the length of the foot for ease in putting on and removal of the shoe;

a tongue of semi-permeable material extending across the opening created by said slit when the shoe is opened to receive the foot, said tongue bonded along its edges to the edges of said slit;

said inner lining extending across said tongue;

a plurality of eyelets disposed along edges of said slit to receive a lace to close said slit;

a plurality of hooks disposed along said slit between said eyelets to alternately retain said lace to secure the shoe to the wearer's foot;

a plurality of recesses formed in the outer layer at the interface of the sole and outer layer;

a plurality of apertures concentric with said recesses formed through said sole;

a plurality of metallic inserts, each of said inserts disposed

between the sole and the outer layer including an enlarged inner head complementary to said recess and a projection;

said projection being complementary to said aperture and including a threaded aperture formed in said projection, with said aperture through the sole being recessed beneath a lower surface of said sole so that no portion of said projection will contact the surface on which the wearer may walk; and

a plurality of removable studs engageable with the inserts, said studs comprising a threaded upper end to enter the aperture and threadingly engage the threaded aperture, a tapered projecting lower end projecting below the sole and terminating with a rounded point, and a pair of opposed wrench flats along the projecting portion for insertion and removal of said studs.

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**4,292,747**

## COMPRESSED AIR DREDGE

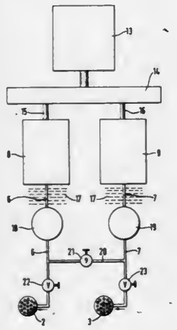
**Walter Hoppe, Düren, Fed. Rep. of Germany, assignor to Zimmermann & Jansen GmbH, Düren, Fed. Rep. of Germany**

**Filed May 2, 1979, Ser. No. 35,165**

**Claims priority, application Fed. Rep. of Germany, May 8, 1978, 2820024**

**Int. Cl.³ F04F *1/08, 1/10;* E02F *3/88***

**U.S. Cl. 37—58** **4 Claims**



1. In a compressed air dredge for removing gravel, sand, mud or the like from the sea floor of the type including a compressor which is installed on a dredging ship having a vertically-disposed feed pipe and which, via a compressed air line, blows compressed air into the bottom end of the feed pipe so as to provide the required suction force, the improvement comprising:

at least two vertically-disposed feed pipes, each of which is coupled to a separate compressor and each of which is provided with a separate compressed air line, said compressed air lines being coupled together via a coupling line having shut-off means for establishing and closing off communication between said two compressed air lines and said compressed air lines also each being provided with separate shut-off means disposed, in the flow direction of said compressed air line, downstream of said coupling line, for establishing and closing off communication between the compressed air line and its associated feed pipe.

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**4,292,748**

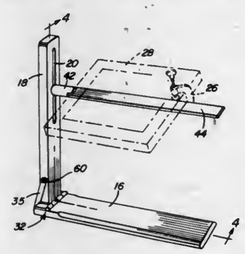
## CLAMP STAND FOR NEEDLEWORK FRAMES

**Betty J. Miller, 1509 Ballard, East Brewton, Ala. 36426**

**Filed Sep. 19, 1978, Ser. No. 943,741**

**Int. Cl.³ D05C *1/04;* A47B *97/04***

**U.S. Cl. 38—102** **1 Claim**



1. A portable needlecraft stand for supporting a needlecraft working frame, said stand comprising:

base means normally positionable on a seat so as to permit a needlecraft craftsman to sit thereon thus supporting said needlecraft stand;

support means pivotally hingedly attached to said base means and being substantially orthogonally positioned relative thereto when said stand is being used by said needlecraft craftsman and being selectively collapsible into a folded position against said base means when it is desired to store or transport said stand;

locking means operable to secure said support means in substantially orthogonal alignment with said base means, said locking means including a latch means pivotally attached to said support means and being engagable in a recess formed on said base means, said recess being formed partially by a slot cut into a portion of said base means and further being formed by one surface of a hinge fixedly secured to said base means, said hinge being further attached to said support means so as to permit a pivotal movement of said support means relative to said base means, said latch means being directly engageable with one surface of said hinge, said latch means further being selectively movable out of engagement with said recess when it is desired to collapse said support means against said base means thereby to store or transport said stand;

working frame holding means to which said working frame is fixedly securable, said holding means including a clamp bar lying in substantially parallel alignment with said base means and being substantially orthogonally positioned relative to said support means, said holding means being adjustably movable along a portion of said support means so as to vary a distance between said holding means and said base means thereby to accommodate the needs of a needlecraft craftsman sitting on said base means, said holding means further being rotatable along a horizontal axis thereof so as to vary an angle in space of said working frame fixedly secured thereto;

gripping means operably associated with said holding means and being selectively releasable to permit adjustable heightwise movement and rotation of said holding means, said adjustable heightwise movement of said holding means relative to said support means being afforded through the use of a longitudinal slot positioned within said support means, said gripping means being selectively releasable to permit said movement of said holding means within said slot, such selective release of said gripping means to afford a movement of said holding means within said longitudinal slot also permitting said holding means to be selectively rotated along said longitudinal axis thereof, said gripping means including a support shaft and a wingnut, said support shaft having machine screw threads on one end thereof to permit said wingnut to be threadably secured thereto and further having wood screw threads on another end thereof so as to permit said support shaft to be threadedly secured to said holding means, said holding means being positioned on one side of said support means proximate to said longitudinal slot and said wingnut being positioned on another side of said support means proximate to said longitudinal slot, said support shaft extending through said longitudinal slot whereby a tightening of said wingnut on said support shaft effects a gripping action of said holding means against said support means, said holding means being formed of a dowel portion and a flat bar portion, said dowel portion having said wood screw threads of said support shaft longitudinally positioned therein and further including a slot formed in one end thereof, said flat bar portion being fixedly secured within said dowel slot; and

clamping means for fixedly securing said working frame to said holding means, said clamping means being selectively removable from and attachable to said holding means to facilitate the attachment and removal of said working frame relative to said holding means, said clamping means comprising a C-clamp which is manually attachable to and removable from said holding means.



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**4,292,749**

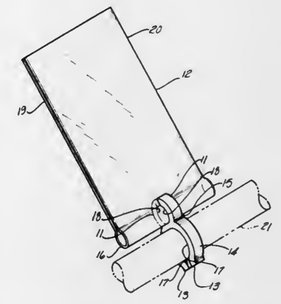
## DISPLAY DEVICE FOR COUPON CLIP

**Claude E. Thomas, Bldg. 36631, Apt. 104, Chatham Hills Apts., Grand River Ave., Farmington, Mich. 48024**

**Filed May 19, 1980, Ser. No. 151,388**

**Int. Cl.³ G09F *3/00***

**U.S. Cl. 40—308** **13 Claims**



1. A display device consisting of a coupon clip and an integrally formed holder adapted for attachment to said coupon clip and an elongated support member having a longitudinal axis extending horizontally and being of substantially circular cross section about said axis, said clip comprising

a clear thermoplastic material having a thickness in the range of about 1/16 inch comprising: a first leg and a second leg, said first leg being shorter than said second leg, a resilient hinge connecting said first and said second leg at one end and resiliently urging the opposite ends of said legs into engagement, said legs generally converging toward each other from said hinge toward the distal end of each leg for removably storing coupons therebetween, one of said legs having an edge generally extending across its width at its distal end, said edge facing the other of said legs and being relatively sharp and having a length in the range of at least 1½ to 3 inches;

said holder comprising clamping member and a securing means of resilient material said clamping member having two integrally joined leg portions jointly defining an axially open channel for receiving said support member, said channel constituting a resilient wall of about more than 180 degrees but substantially less than 360 degrees of the circumference thereof, the respective terminal parts of said leg portions defining therebetween a radial entrance to said channel, said terminal parts being resiliently movable relative to each other in a substantially circumferential direction between a relaxed position in which said entrance is narrower than said cross sectional width of said support member and an extended position in which said entrance is at least as wide as said cross sectional width; and wherein

said securing means is attached to said clamping member and has two integrally joined leg portions jointly defining an axially open channel constituting a resilient wall of about more than 180 degrees but substantially less than 270 degrees of the circumference thereof, the respective terminal parts of said leg portions defining therebetween a radial entrance to said channel, said terminal parts thereof being resiliently movable relative to each other in a substantially circumferential direction between a relaxed position in which said entrance is narrower than the cross sectional width of said resilient hinge of said coupon clip and a distended position in which said entrance is at least as wide as the cross sectional width of said resilient hinge and wherein

said clamping member is adapted for attachment to said elongated support member and wherein said securing means is adapted for attachment to said hinge of said coupon clip.

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**4,292,750**

## WRITING INSTRUMENT WITH HOLDER OR GRIP PORTION INCORPORATING A PARTIALLY VISIBLE MOVABLE RIBBON

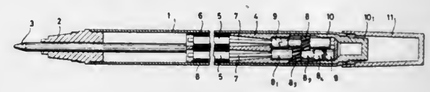
**Giuseppe Zuffellato, Via Colombo no 90, Grugliasco, Torino, Italy**

**Filed Jan. 3, 1980, Ser. No. 109,454**

**Claims priority, application Italy, Jan. 17, 1979, 67094 A/79**

**Int. Cl.³ B43K *29/12, 29/14***

**U.S. Cl. 40—334** **5 Claims**



1. A writing instrument comprising a hollow body having a writing point at one end, a knob at the other end rotatable relative to the hollow body, a pair of flexible shafts extending lengthwise of the hollow body in side-by-side relationship, a flexible sheet wound on the shafts in such a way that turning one shaft in one direction winds up the sheet on said one shaft and unwinds the sheet from the other shaft, and turning the other shaft in the opposite direction winds up the sheet on the other shaft and unwinds it from the one shaft, and means interconnecting said knob and said shafts whereby turning said knob in one direction turns said one shaft in said one direction and turning said knob in the opposite turns said other shaft in said opposite direction, the ends of said flexible shafts opposite said knob being free to move in a direction perpendicular to the length of said shafts thereby to permit the rolls of sheet to shift laterally as they change in size during rolling and unrolling.

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**4,292,751**

## ROLL TYPE DISPLAY SIGN

**H. Kent Snyder, Jr., River Forest, Ill., assignor to Chicago Display Company, Chicago, Ill.**

**Filed May 5, 1980, Ser. No. 146,226**

**Int. Cl.³ G09F *11/18, 23/00, 17/00***

**U.S. Cl. 40—517** **13 Claims**

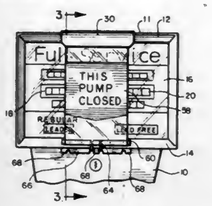
1. A roll type display sign for a pump having a pump face, said sign comprising:

a message bearing display sheet;

means for mounting the display sheet to the pump such that the display sheet is movable across the pump face to a selected one of a plurality of mounting positions spaced across the pump face;

means for retracting the display sheet such that the display sheet is movable between an extended position, in which the sheet extends over a selected one of a plurality of

portions of the pump face, and a retracted position, in which the sheet exposes the selected one of the plurality of portions of the pump face, each of the plurality of portions of the pump face corresponding to a respective one of the plurality of mounting positions; and




means for releasably holding the display sheet in the extended position in any one of the plurality of mounting positions such that the display sheet simultaneously covers the portion of the pump face corresponding to the selected one of the mounting positions and displays the message on the display sheet.

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**4,292,752**

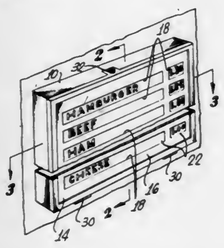
## DISPLAY SIGN

**William D. Clark, 465 Alpine Heights Rd., Alpine, Calif. 92001**

**Continuation-in-part of Ser. No. 914,014, Jun. 9, 1978, abandoned. This application Apr. 19, 1979, Ser. No. 31,437**

**Int. Cl.³ G09F *13/04***

**U.S. Cl. 40—576** **6 Claims**




1. A back-lighted display sign comprising:
a display housing having a substantially transparent outer face panel;
a light source mounted in said housing;
a copy frame positioned behind said outer face panel and having at least one aperture therethrough;
a plurality of relatively thin copy inserts having display characters and a background area with contrasting optical properties, said display characters being positioned in different desired locations over the surfaces of said inserts;
copy retaining means affixed to the rear face of said copy frame adjacent to said aperture to hold said copy inserts in a fully overlapping relationship in said copy frame, and to provide a desired, essentially two-dimensional arrangement of said display characters; and
copy insert registration means, including an integral tab on each of said copy inserts and tab retaining means defined at least in part by said copy retaining means.

**4,292,753**

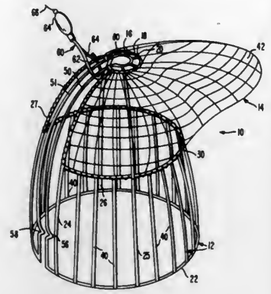
## FISH LANDING NET

**Richard J. Yesuratnam, Apt. 15, 9002 Manchester Rd., Silver Spring, Md. 20901**

**Filed Jun. 2, 1980, Ser. No. 155,240**

**Int. Cl.³ A01K *77/00***

**U.S. Cl. 43—5** **5 Claims**



1. A fish landing net comprising:
a frame including top and bottom supports and a plurality of rib means secured between said supports, said top and bottom supports each having an open portion and at least two of said plurality of rib means cooperating with said supports to define an opening into the interior of said net;
first and second spaced, parallel slide bars secured at opposite ends to said top and bottom supports and cooperating with the open portions of said supports to define a slot adapted to receive a fishing line and guide it into the center of the fish landing net;
clip means securable to and slidable on said slide bars to close said slot and secure a fishing line within said net; and
shoulder means at the bottom of at least one of said slide bars, said shoulder means being adapted to engage said clip means to prevent said clip means from sliding upwardly on said slide bars, whereby lowering of said clip means and subsequent raising thereof inverts said net.

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**4,292,754**

## BAT-LIKE, BUBBLE-BLOWING DEVICE

**Charles Lukaszewski, 178 William St., Port Ewen, N.Y. 12466**

**Filed Sep. 19, 1980, Ser. No. 188,816**

**Int. Cl.³ A63H *33/28***

**U.S. Cl. 46—6** **3 Claims**

1. A bat-like, bubble-blowing device in combination with a bubble solution for use in blowing bubbles, said device having a size and shape similar to a conventional baseball bat including a handle portion and a body portion, said device being of hollow-cylindrical construction, said handle portion having a blowing orifice at its end and said body portion having an open end, a residual film over and covering said open end of said device being formed by dipping said open end in said bubble solution, and said blowing orifice being adaptable for a child to position and place his mouth over said handle portion such that his lips are disposed around said blowing orifice to thereby blow through said blowing orifice to form a bubble on said open end.



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**4,292,755**

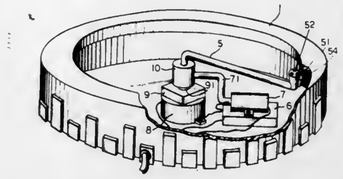
## AIR FLOATING SAUCER TOY

**Lin P. Houn, No. 6, La. 107, Sec. 1, Tzu Yen Rd., Shih Pai, Peitou, Taipei, Taiwan**

**Filed Jul. 25, 1979, Ser. No. 60,785**

**Int. Cl.³ A63H *29/16***

**U.S. Cl. 46—44** **6 Claims**



1. An air-floating saucer toy, comprising: an air pump; an electric motor; electric batteries for powering said motor and said pump; a speed-reducing device driven by said motor; a connector mounted on said speed-reducing device; a radially extending pneumatic tube journaled through said connector and operably associated with said speed-reducing device for rotation thereby, said tube having an outer end travelling in a generally horizontal circular path and connected pneumatically to said pump through said connector and tube; a housing in which said pump, motor, batteries, speed-reducing device, connector, and tube are contained, said housing having a circular slot coinciding with and superjacent the path of travel of said outer end of said tube; said outer end of said tube opening to said slot for pneumatic discharge therethrough; a saucer disposed for floating above said slot and outer end of said tube under the influence of the pneumatic discharge for spaced disposition above said housing and for generally horizontal circular movement with said end along an orbit corresponding to said circular slot; and control means for controlling operation of said pump and motor.

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**4,292,756**

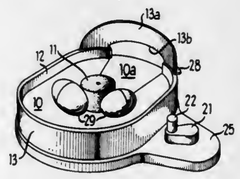
## TOY LAUNCHING DEVICE

**Eugene Jaworski, Park Ridge, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Oct. 20, 1980, Ser. No. 198,839**

**Int. Cl.³ A63H *1/00***

**U.S. Cl. 46—72** **6 Claims**



1. An egg spinning toy comprising a dish-shaped platform adapted to support one or more eggs to be spun, said platform being provided with a manually movable segment which is adapted to be manually operated to permit an egg spinning on said platform to move off of said platform onto an adjacent supporting surface, a friction wheel disposed at least in part above the bottom surface of said dish and adapted to contact the outer surface of an egg disposed in said platform, and means for producing relative rotation between said platform and said wheel, thereby to affect spinning of an egg disposed on said platform by its long axis.

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**4,292,757**

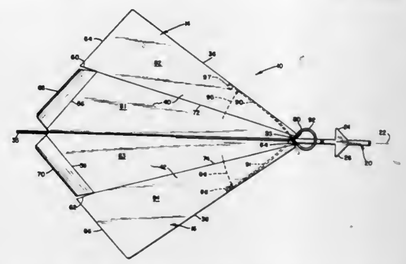
## COLLAPSIBLE WING AIRCRAFT

**George L. Cahen, Jr., 130 Appletree Rd., Charlottesville, Va. 22903**

**Continuation-in-part of Ser. No. 813,976, Jul. 8, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,805**

**Int. Cl.³ A63H *27/00***

**U.S. Cl. 46—80** **20 Claims**



1. An aircraft of the heavier than air type which comprises wings deployable between a launch configuration in which said wings are collapsed and a flight configuration in which said wings are extended and a power source for deploying said wings from the launch configuration to the flight configuration, said power source comprising a hairpin spring which is rotatably restorable in its entirety about an axis of the aircraft, as an adjunct to the removal of a restraint maintaining said wings in the collapsed configuration, from a first orientation in which energy is stored therein in potential form to a second orientation in which said means is in a condition which has, in the course of being arrived at, permitted the energy stored therein in potential form to be converted to kinetic form and thereby deploy said wings, said power source being housed in the wings of said aircraft.

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**4,292,758**

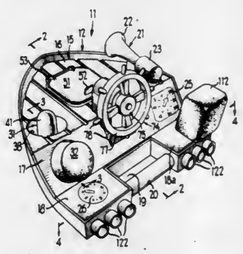
## JET TOY BOAT

**Wayne A. Kuna, Oak Park; James G. Thibault, Chicago, and Palmer J. Schoenfield, Evanston, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Jan. 30, 1980, Ser. No. 116,928**

**Int. Cl.³ A63H *23/02***

**U.S. Cl. 46—93** **1 Claim**



1. A tub toy comprising:
a hull including a pair of laterally spaced rearward extensions;

a hollow handle spanning the gap between said extensions to allow fluid communication therebetween;
an elevated front deck, a lower level rear deck and an instrument panel intermediate said front deck and said rear deck covering said hull;
jet propulsion means including a plurality of air tubes projecting rearwardly from said extensions;
a source of renewable air supply;
a passageway between said air supply source and said air tubes extending along said hollow handle;
valve means sealing said air supply source against influx of water from said air tubes;
bow spray generating means including a water discharge nozzle adjacent said elevated front deck, refillable water discharge means connected to said nozzle, said discharge means being selectively operable to eject water from said bow spray generating means through said nozzle, a catch basin means defined in said front deck surrounding said bow spray generating means to catch discharged water and return it to said discharge means;
sound generating means including a housing mounted on said front deck and said instrument panel, a rotatable simulated steering wheel having a central shaft rotatably supported in said housing, a mechanical sound generator responsive to rotation of said central shaft provided in said housing; and
a marine life observation compartment contained in said hull having a transparent top wall and containing buoyant miniature specimens of simulated aquatic life and including port means and valve means for flooding said compartment with water ambient to said hull, a cover hingedly mounted on said hull for covering said transparent top wall.

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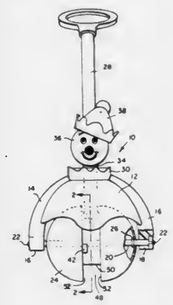
**4,292,759**
**PUSH-PULL WHEEL ACTION TOY**
**Larry R. Nagode, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.**
**Filed Jan. 22, 1980, Ser. No. 114,417**
**Int. Cl.³ A63H *11/10***
**U.S. Cl. 46—205** **4 Claims**



1. A push-pull wheel action toy comprising:
a body;
a wheel rotatably supported by said body;
a vertical opening in said body generally extending above said wheel;
a push rod mounted within said opening for alternate up and down rotational movements;
a figure head secured to the upper end of said push rod;
a plurality of angularly spaced radially extending fins secured to the lower end of said push rod;
at least one cam member on said wheel arranged in alignment with said push rod for engaging said lower end of said push rod and imparting up and down movement to said push rod and figure head upon rotation of said wheel; and
at least one lug on said wheel separate from said cam member and arranged laterally offset from said push rod and in alignment with at least one of said fins for intermittently engaging and rotating said fin, said push rod and said figure head through a preselected angle upon rotation of said wheel, said cam member and said lug further being angularly displaced on said wheel for alternately imparting up and down and rotational movement to said push rod and said figure head.

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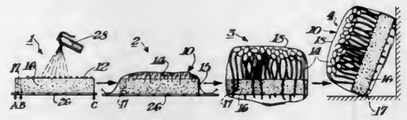
**4,292,760**
**METHOD, APPARATUS AND PACKAGE FOR SPROUTING SEEDS**
**Carl A. Krave, 5531 Limeric Cir., #16, Wilmington, Del. 19808**
**Filed Jul. 19, 1979, Ser. No. 58,820**
**Int. Cl.³ A01G *31/02***
**U.S. Cl. 47—14** **13 Claims**



1. A seed-germinating combination for growing sprouts from seeds, comprising a pad of porous material supporting a layer of germinating seeds, the pad having a three-dimensional structure of a substantially hydrophobic porous material which is substantially nonabsorbent and having a very high percentage of interconnected voids giving it a very high degree of permeability to fluid flow, the voids providing pores ranging approximately from 8 pores per inch to 50 pores per inch, the porous material having surface properties which in conjunction with the stated pore concentration and size retains droplets of moisture disposed therein sufficient to provide a humid growing environment without retaining localized water in an excess which can promote decay or block free flow of the water and moisture through the pad, and the pad is held on an open support whereby most of any water applied to the pad is caused to flow through and drain out of the pad.

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**4,292,761**
**METHOD, APPARATUS AND PACKAGE FOR SPROUTING SEEDS**
**Carl A. Krave, 5531 Limeric Cir., #16, Wilmington, Del. 19808**
**Continuation-in-part of Ser. No. 58,820, Jul. 19, 1979. This application Mar. 31, 1980, Ser. No. 135,872**
**Int. Cl.³ A01G *31/02***
**U.S. Cl. 47—14** **20 Claims**

1. A method of growing and packaging sprouts comprising the steps of providing a container having a floor for supporting seeds, and upstanding walls encircling the floor, the floor containing openings that permit ready drainage of excess water, spreading seeds substantially uniformly over said floor, growing the seeds into sprouts by watering the contents of the container and subjecting them to an environment conducive to good growth, but controlling the growth to cause the sprouts to grow together as a compact bundle in the container, removing the bundle from the container, and securing the bundle in a closely encircling wrapper.



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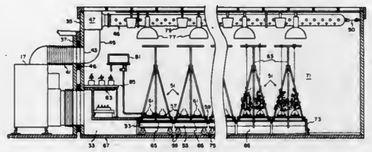
**4,292,762**
**MODULAR TRANSPORTABLE CONTROLLED ENVIRONMENT AGRICULTURE FACILITY**
**Lewis W. Fogg, Cazenovia; Robert W. Metzler, Baldwinsville; H. Eugene Satterfield, North Syracuse, and Eion G. Scott, Fayetteville, all of N.Y., assignors to Control Data Corporation, Minneapolis, Minn.**
**Filed Jul. 30, 1979, Ser. No. 61,670**
**Int. Cl.³ A01G *9/24, 9/14***
**U.S. Cl. 47—17** **3 Claims**



1. A controlled environment agriculture facility comprising:
(a) wall and floor means defining a plant growth module within which a controlled atmosphere may be maintained;
(b) air handling means including means for supplying air into said module and means for receiving return are therefrom;
(c) a plurality of plant grow rack assemblies disposed within said module, each assembly including a panel member spaced apart from said floor means, each panel member having means defining a plurality of apertures therein; and
(d) means mounting each of said rack assemblies for movement relative to said floor means thereby to enable access to each rack assembly, and further to enable movement of said rack assemblies to and from an arrayed position in which said panels cooperate to form a continuous rack array surface in spaced relation to said floor means and defining therewith a continuous air return duct extending substantially the length of said module and connecting at one end with said return air receiving means whereby return air flow from the module is constrained to flow through said apertures, said apertures controlling said return air flow and tending to equalize said flow over said rack array surface.

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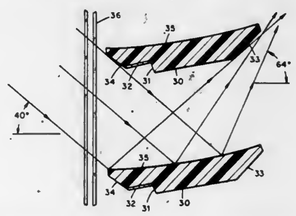
**4,292,763**
**REFLECTIVE INSULATING BLINDS FOR WINDOWS AND THE LIKE**
**Paul R. Barnes, Lenoir City, and Hanna B. Shapira, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**
**Filed Dec. 7, 1979, Ser. No. 101,367**
**Int. Cl.³ E06B *7/08***
**U.S. Cl. 49—64** **2 Claims**



1. In combination with a window for transmitting sunlight into a room, an improved blind comprising a plurality of coupled, horizontally extending thermally insulating slats, each having a front face, a rear face, and a pair of longitudinally extending edge faces, each front face being a reflective transversely concave surface, said slats being rotatable about their axes between (1) a blind-closed position where adjacent slats are in partially overlapping relation and form a substantially continuous, generally vertical surface for providing window insulation and (2) a blind-open position where said slats are in spaced, superimposed relation, with their reflective concave surfaces facing upward and directly exposed to said sunlight, said reflective surfaces having a curvature reflecting most of said sunlight incident thereon directly onto the ceiling of said room to maximize solar energy input to the room while minimizing glare, the transitions between each of said edge faces of a slat and said back face thereof being sloped toward each other to enlarge the light-entrance and light-exit regions defined by adjacent slats.

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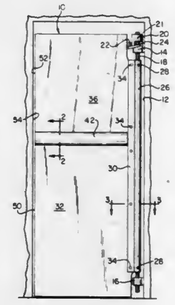
**4,292,764**
**MULTI-PANEL CLOSURES**
**August J. Kochis, 89 Brooktrail Rd., Concord, Mass. 01742**
**Filed Apr. 18, 1977, Ser. No. 788,422**
**Int. Cl.³ E05F *1/04***
**U.S. Cl. 49—237** **4 Claims**



1. A closure comprising:
a post rotatably supported in a pair of bearings mutually spaced in a vertical direction and each adapted to be mounted on a fixed surface;
a cam track integral with the upper one of said bearings;
a cam follower fastening to said post and adapted to rotate therewith, said cam follower being adapted to ride on said cam track and to return to a preferred position thereon;
a horizontal boss integral with said cam follower;
a plurality of coplanar panels mutually aligned along at least one edge of each panel, said last-recited edges jointly being substantially coextensive in length to said post and parallel thereto, adjacent ones of said panels being spaced from each other along a pair of mutually facing, substantially horizontal edges;
a first split sleeve coaxially mounted on said post so as to rotate therewith, said first sleeve including a pair of substantially parallel flanges substantially coextensive in length with said first sleeve, said flanges being secured to opposite sides of said plurality of panels along said one edge of each panel;
a second split sleeve coaxially mounted on said boss at right angles to said post so as to rotate with said post, said second sleeve including a pair of substantially parallel flanges substantially coextensive in length with said second sleeve, said last-recited flanges being secured to opposite sides of the uppermost one of said plurality of panels along the upper horizontal edge thereof; and
a substantially rigid fastening member positioned between at least one pair of said facing panel edges, said fastening

member comprising a pair of channels disposed in back-to-back relationship on opposite sides of a bridge section, each of said channels including a pair of converging side sections integral with said bridge section and frictionally gripping one of said pair of mutually facing panel edges.

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**4,292,765**

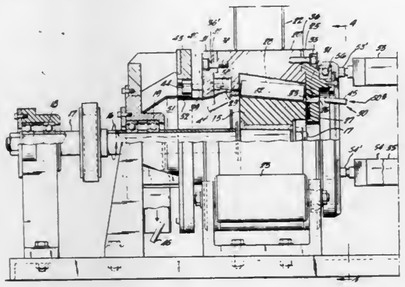
## MACHINE FOR ABRADING OUTSIDE DIAMETERS AND THE METHOD OF MAKING SAME

**Thomas S. Brawley, P.O. Box 82, Middletown, Conn. 06457**

**Continuation-in-part of Ser. No. 876,994, Feb. 13, 1978, abandoned. This application Mar. 26, 1979, Ser. No. 24,004**

**Int. Cl.³ B24B *5/18***

**U.S. Cl. 51—103 TF** **21 Claims**



1. An improved machine for high speed abrading of outside diameters of the type comprising:
(a) a frame;
(b) an abrading wheel rotatably mounted in the frame;
(c) drive means to rotate the abrading wheel; and
(d) workpiece support means affixed to the frame to hold a plurality of workpieces in abrading contact with the abrading wheel;
wherein the improvement comprises:
(e) a housing concentric to the abrading wheel rotatably attached to the frame in which the workpiece support means are attached; and
(f) drive means attached to the housing to rotate the housing in a direction opposite to that of the abrading wheel,
whereby the counter rotation of the housing causes a revolution of the workpiece support means and the workpieces about the periphery of the abrading wheel in a direction opposite to the rotation of the abrading wheel, increasing the effective grinding speed.

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**4,292,766**

## METHOD AND APPARATUS FOR GRINDING A WORKPIECE

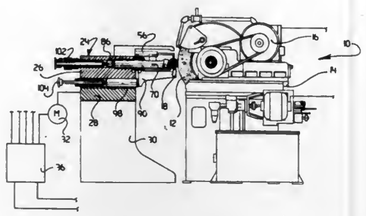
**Calvin K. Kirk, Shrewsbury; Glover C. Joyce, and Francis L. Messier, both of Worcester, all of Mass., assignors to The Warner & Swasey Company, Cleveland, Ohio**

**Division of Ser. No. 886,996, Mar. 16, 1978, Pat. No. 4,201,016. This application Dec. 31, 1979, Ser. No. 108,364**

**Int. Cl.³ B24B *5/42***

**U.S. Cl. 51—105 SP** **27 Claims**

1. An apparatus for use in grinding a plurality of crankshafts each of which has a plurality of crankpins, said apparatus comprising holder means for holding each of the crankshafts in turn during an initial grinding operation and during a second grinding operation when one of the crankpins on a crankshaft is out-of-round by more than a first distance and less than a second distance at the end of the initial grinding operation, grinding wheel means for grinding each of the crankpins on each of the crankshafts in turn during the initial grinding operation and for grinding each of the crankpins on a crankshaft when a second grinding operation is necessary, first means for detecting when the number of consecutive crankshafts requiring a second grinding operation exceeds a predetermined number, and second means connected with said first means for initiating a control function upon detection by said first means



that the number of consecutive crankshafts requiring a second grinding operation exceeds the predetermined number.

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**4,292,767**

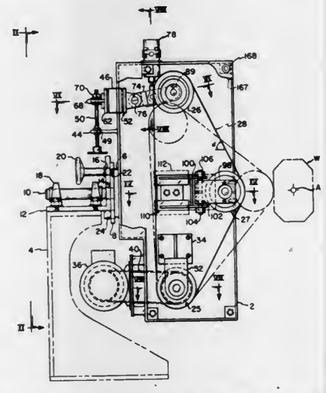
## BELT GRINDER FOR GRINDING NON-CIRCULAR WORKPIECE

**James J. Fatula, New Beaver, Pa., assignor to Ryman Engineering Company, Elwood City, Pa.**

**Filed Feb. 1, 1980, Ser. No. 117,808**

**Int. Cl.³ B24B *21/16***

**U.S. Cl. 51—145 R** **10 Claims**



1. A belt grinder for grinding a workpiece mounted for rotation on a longitudinal axis and having a non-circular cross-section which comprises three rotatable rolls mounted on axes substantially parallel to each other, said rolls being arranged in a triangular manner with one of said rolls being the work roll and the other two being non-work rolls, an abrasive belt passing around said rolls, means for rotating said rolls to drive set abrasive belt, means mounting said work roll for substantially straight line movement toward and away from the axes of said workpiece, said non-work rolls being movable toward and away from each other as the work roll moves toward and away from the axis of said workpiece, and resilient means for applying a force to urge said work roll and belt against said workpiece with the force increasing as the work roll moves toward the axis of said workpiece, said work roll being movable away from the axis of said workpiece by said workpiece when the distance of the surface of said workpiece from its axis increases.



**4,292,768**

## GRINDING TOOL

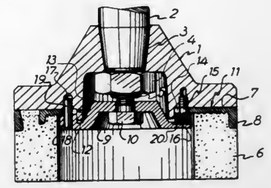
**Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland**

**Filed Oct. 29, 1979, Ser. No. 88,833**

**Claims priority, application Switzerland, Nov. 9, 1978, 11526/78**

**Int. Cl.³ B24D *5/00***

**U.S. Cl. 51—168** **2 Claims**



1. A grinding tool comprising:
(a) a support flange means adapted to be fastened to the end of a drive shaft;
(b) a cylindrical grinding wheel formed of a yoke-shaped plate means having abrasive material bonded and molded to shape therein;
(c) a clamping flange means for clamping said grinding wheel on said support flange means;
(d) retaining stud spindle means arranged on said support flange means;
(e) hole means located on said support flange means in the vicinity of said retaining stud spindle means;
(f) notch means arranged in said plate means for surrounding engagement over said retaining stud spindle means and said hole means; and
(g) locking spindle means on said clamping flange means for engagement within said notch means and said hole means.

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**4,292,769**

## BALANCING AND MONITORING APPARATUS

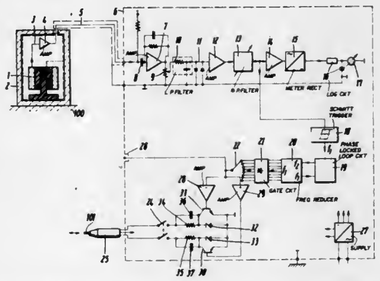
**Willi Maag, Rheinau; Hans U. Baumgartner, Winterthur; Max Vollenweider, Winterthur, and Hans J. Wolf, Freienstein, all of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland**

**Filed Sep. 29, 1978, Ser. No. 946,869**

**Claims priority, application Switzerland, Sep. 29, 1977, 011879/77**

**Int. Cl.³ G01M *1/34***

**U.S. Cl. 51—169** **21 Claims**



1. Apparatus for balancing and monitoring unbalanced vibrations of a rotating member comprising vibration pick-up means located on a mounting of the rotating member for producing an electrical signal which corresponds to a component of a unbalanced force of the rotating member and extending in an axial direction of the vibration pick-up means, an abrasion tool, an electromechanical actuator means responsive to the electrical signal and having a part for supporting the abrasion tool, the electromechanical actuator means in response to the electrical signal controlling the abrasion tool to effect working vibration of the abrasion tool at a frequency corresponding to the speed of the rotating member to remove material from the rotating member in-phase with the working vibration in the same angular region of the rotating member for effecting a balancing of the rotating member, and means for enabling adjustment of a phase relationship of the vibration of the abrasion tool with respect to a phase relationship of the unbalanced electrical signal so as to effect shifting by any number of steps of 360°/n, n being a whole number>3, irrespective of the speed of the rotating member, the means for enabling adjustment including a phase-locked loop circuit for producing a phase-locked oscillation at n-times an unbalanced frequency, the phase-locked loop circuit being connected to an n-factor frequency reducer, a signal from the frequency reducer being compared in the phase-locked loop circuit with the electrical signal from the vibration pick-up means, and the difference influencing the frequency of the phase-locked loop circuit such that the signal supplied to the frequency reducer corresponds to the electrical signal as regards frequency and phase.

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**4,292,770**

## YARN HEATER TRACK CLEANING APPARATUS AND METHOD

**John C. Newton, Jr., Shelby, N.C., assignor to Ansley, Incorporated, Shelby, N.C.**

**Filed Mar. 17, 1980, Ser. No. 130,819**

**Int. Cl.³ B24B *23/02, 1/00***

**U.S. Cl. 51—170 PT** **7 Claims**

1. An apparatus particularly adapted for use in cleaning the yarn heaters of yarn processing machines of the type wherein each yarn passes through a relatively narrow and elongated yarn heating slot and the heating of the yarn causes deposits to be built up on the sidewalls and bottom of said slot in an amount sufficient to require periodic removal of the deposits, said apparatus comprising
(a) an abrasion wheel including a configuration on the outer peripheral surface corresponding to and positioned within said slot,
(b) means for rotating said abrasion wheel,
(c) a cover guard surrounding a major portion of said abrasion wheel and leaving a minor portion of the outer peripheral surface of said wheel exposed,
(d) handle means for manually supporting said rotating abrasion wheel and for guiding the outer peripheral surface of said abrasion wheel along said slot to dislodge the accumulated deposits and to polish said slot, and
(e) fluid directing means supported adjacent said abrasion wheel for simultaneously directing a fluid stream into said slot to aid in removal of the dislodged deposits from said slot, said fluid directing means including a fluid directing jet supported on said cover guard for directing the fluid stream in the direction of rotation of said abrasion wheel, a portable liquid supply tank for containing a supply of liquid, means for directing the liquid in said supply tank to

said fluid directing jet, and means for directing air under pressure into said supply tank to force the liquid from said supply tank and to said fluid directing jet.

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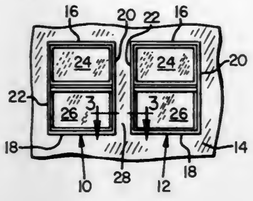
**4,292,771**

## SPLIT MULLION WINDOW FRAME DESIGN

**James D. Ellis, Tigard, Oreg., assignor to Viking Industries, Inc., Portland, Oreg.**

**Filed Apr. 20, 1979, Ser. No. 31,984**
**Int. Cl.³ E04B *1/00*; E06B *1/38***
**U.S. Cl. 52—98** **16 Claims**




1. A window frame comprising:
a pair of opposed frame members defining opposite sides of a window opening, and having means for mounting a window panel in said opening;
an attachment flange extending lengthwise of and outwardly from each of said frame members, for attaching opposite sides of said frame to a supporting structure;
said flanges each having an inner portion and an outer portion, the outer portions being positionable in a common plane for attachment of said pair of frame members to a common face of said supporting structure;
the outer portion of at least one of said flanges being removable and the inner portion thereof being laterally offset from the outer portion to an extent such that, when said outer portion is removed and said window frame is mounted side-by-side with another such frame, said inner portion overlies the adjoining flange of said other frame.

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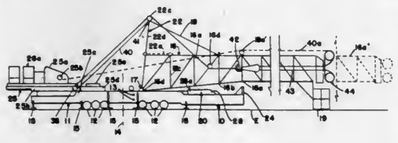
**4,292,772**

## TRAILER MOUNTED HIGH FLOOR DRILLING MAST AND SUBSTRUCTURE ARRANGEMENT

**Paul E. Borg, and Terry M. Lechinger, both of Houston, Tex., assignors to PRE Corporation, Houston, Tex.**

**Filed Jan. 14, 1980, Ser. No. 111,915**
**Int. Cl.³ B66B *23/06***
**U.S. Cl. 52—118** **1 Claim**



1. A trailer mounted high floor telescopable drilling mast and substructure arrangement comprising:
a. first trailer means;
b. telescoping drilling mast means pivotally connected to and transportable in reclined position on said first trailer means;
c. setback tower means pivotally connected to said drilling mast means and to said first trailer means;
d. said drilling mast means comprising a rectangular framed structure having four sides with one of said sides having an open face and which when in reclined position on said first trailer means has said open face side supported in part by said setback tower means on said first trailer means and another of said sides laterally spaced and elevated in relation to said first trailer means;
e. second trailer means;
f. elevatable drawworks support means with drawworks, power source and rotary table thereon pivotally mounted and transportable on said second trailer means;
g. means to secure said first and second trailer means in end to end relation to position said drawworks support means and drilling mast means in longitudinal alignment;
h. load bearing means to support said first and second trailer means in position;
i. lifting frame means connected to said drilling mast means; and
j. cable means extending between said lifting frame means and drilling mast means to retain said lifting frame means in laterally and upwardly extending relation to said drilling mast means when lifting cable means are connected to said lifting frame means to simultaneously elevate said drilling mast means and setback tower means from a reclined position to an upright position on said first trailer means.

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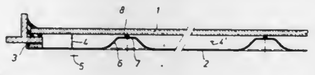
**4,292,773**

## DOUBLE PANE SYSTEMS WITH LITTLE REFLECTION, IN PARTICULAR FOR GREENHOUSES

**Karsten Laing, Herrenstrasse 57, 7500 Karlsruhe; Ingeborg Laing, Hofener Weg 37, 7148 Remseck 2 - Aldingen, and Oliver Laing, Weissdornweg 14, 7400 Tübingen, all of Fed. Rep. of Germany**

**Filed Aug. 21, 1979, Ser. No. 68,333**
**Claims priority, application Austria, Aug. 22, 1978, 6118/78; Sep. 21, 1978, 6831/78; May 15, 1979, 3606/79; Jun. 15, 1979, 4268/79**
**Int. Cl.³ E06B *7/12***
**U.S. Cl. 52—171** **22 Claims**



1. A transparent double pane construction forming a double webbed plate for use as a building panel comprising a first pane of a transparent organic material having a superficial layer of a hydrophilic material the surface of which is superficially saponified spaced from a second pane of a transparent material to form an enclosed space between said panes, where the first pane is adapted to be on the inside of a building, where the surface of the first pane which faces the inside of the building comprises said superficial layer and where the surface of the first pane which faces towards the enclosed space has regions along a fall line which are hydrophilic.

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**4,292,774**

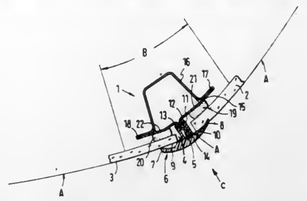
## WINDOW MOUNTING FOR AUTOMOTIVE VEHICLES

**Hans Mairle, Rennjngen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 20, 1979, Ser. No. 105,705**
**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855526**
**Int. Cl.³ E06B *3/26*; E04B *1/62***
**U.S. Cl. 52—208** **11 Claims**

1. Mounting arrangement for windowpanes of an automotive vehicle comprising a cover strip and a column receiving windowpanes, said column including a flange, characterized in that windowpanes of the vehicle are arranged along a contour line of the vehicle and are placed adjacent each other with a joint formed therebetween, wherein the flange is a base leg of





a locking plate having a T-shaped cross section, top legs of the T-shaped locking plate being joined to a cap-shaped profile to define the column, said column being located adjacent to and outside of said joint except for its flange which extends within the joint and is fashioned for fastening the cover strip in a manner hiding the joint.

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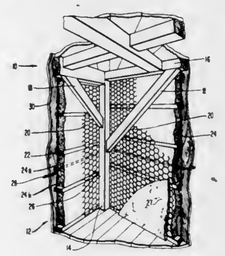
**4,292,775**

## BUILDING WALL STRUCTURE

**David Howard, P.O. Box 295, Alstead, N.H. 05602**

**Continuation of Ser. No. 680,063, Apr. 26, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,536**
**Int. Cl.³ E04B *5/48*; E04F *17/00, 13/04***
**U.S. Cl. 52—220** **6 Claims**



1. A wall structure for enclosing a frame adapted to support a building, the frame including interconnected vertical and horizontal frame members and an inside surface and an outside surface, said wall structure comprising:
A. a mesh secured to the outside surface of the frame,
B. a plurality of rigid insulating panels,
C. a plurality of reinforcing stringers, said panels and stringers being arranged alternatively to form a wall outside said mesh and adjacent the outside surface of the frame, the inside surface of the frame thereby being left exposed by the wall,
D. means for securing said panels and said stringers to the frame, and
E. a plaster finish layer applied to said mesh between the exposed members of the frame, said plaster finish layer adhering to and being reinforced by said mesh and being supported by said mesh and said insulating panels.

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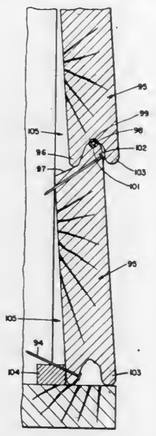
**4,292,776**

## UNITARY COMBINED BACKER AND SIDING BOARD

**Milton MacDonald, 5 Holly St., Woodsville, N.H. 03785**

**Filed Aug. 13, 1979, Ser. No. 66,030**
**Int. Cl.³ E04B *1/66***
**U.S. Cl. 52—394** **7 Claims**

1. A unitary combined backer board and clapboard comprising:
a standard wood board of uniform thickness having parallel front and rear faces, an upper edge and a lower edge;
said board being sufficiently thick and strong to be affixed with other identical said boards, horizontally one upon another, each at a slight incline from the vertical, directly onto vertical studs of a building;
said upper edge having an integral, elongated, upstanding tongue, of predetermined curvature, extending along the front edge portion thereof to shed rainwater, and having an elongated, downward-sloping surface, extending along the rear edge portion thereof from said upstanding tongue to said rear face to shed rainwater;
and said lower edge having an elongated tongue groove of predetermined curvature, for receiving the upstanding tongue of the next lower board, said groove extending



longitudinally along the intermediate portion of said lower edge;
said lower edge having an integral, depending, rear, lower tongue extending longitudinally along the rear portion thereof and adapted to seat on the downward sloping surface of the next lower board and said lower edge having an integral, depending, front, lower, cover tongue extending longitudinally along the front portion thereof for covering the joint with the said next lower board;
the upstanding tongue of each said lower board fitting in the tongue groove of the next higher board with a predetermined clearance to form a front, air space for ventilating said joint;
and said board being free of any upstanding rear upper tongue, and free of any groove in the upper edge thereof, capable of retaining water.

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**4,292,777**

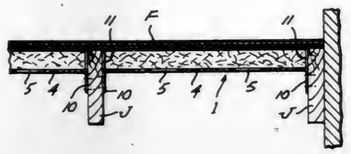
## INSULATION-CONFINING PANEL AND METHOD OF USING THE SAME

**Edward R. Story, 4985 N. Cascade Pl., Oak Harbor, Wash. 98277**

**Continuation-in-part of Ser. No. 949,895, Oct. 10, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,517**
**Int. Cl.³ E04B *2/00***
**U.S. Cl. 52—407** **20 Claims**

1. A panel for confining blowable insulation material against a generally planar surface of a building structure comprising a sheet of substantially rigid material having two substantially parallel scores each spaced inward of an edge of said sheet, said scores dividing said sheet into a substantially rectangular central portion and opposite marginal tabs adjacent to said central portion which tabs are bendable along said scores so as to be disposed substantially perpendicular to said sheet central por-

tion, said sheet central portion having several ventilation apertures scattered substantially uniformly throughout the area of said sheet central portion for permitting circulation of air



through said sheet central portion, said apertures being small enough to prevent passage of a substantial amount of the blowable insulation material through said apertures.

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**4,292,778**

**Patent Not Issued For This Number**

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**4,292,779**

**SUPPORTING SYSTEM FOR PANEL ASSEMBLY**

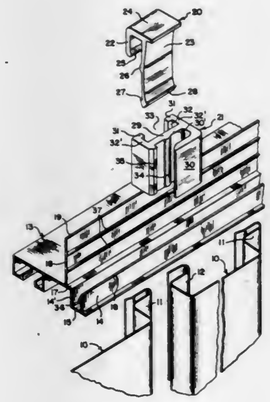
**Hugo A. J. Landheer, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Netherlands**

**Filed Feb. 23, 1979, Ser. No. 14,712**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807942**

**Int. Cl.³ E06B *3/54***

**U.S. Cl. 52—486** **11 Claims**



1. In a panel assembly having a plurality of elongated panels, the improvement comprising a support member including a flange lying in a plane parallel to and spaced rearwardly of the plane of the panels, a two part clamp, having a first part to engage a panel edge and a second part to engage the first part as well as said support member, said first clamp part being a securing member having a hook portion, a passage extending through said securing member, said second clamp part being a locking member having two locking legs, the hook of said securing member being engaged with one longitudinal edge of a panel on the rearward side thereof, one of said locking legs extending through the passage in said securing member, and the other of said locking legs being in bearing engagement with said flange; and the cross-member being uniform throughout its length, whereby each forms a cut-to-length part of an extruded profile.

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**4,292,780**

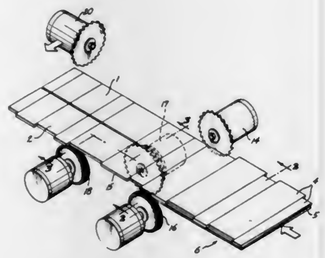
**STAGGERED BUTT SIDEWALL SHINGLE PANEL AND METHOD OF MAKING THE SAME**

**Craig S. Barker, Deerfield, Fla., and Joe L. Bockwinkel, Winlock, Wash., assignors to Shakertown Corporation, Winlock, Wash.**

**Filed Jan. 25, 1980, Ser. No. 115,212**

**Int. Cl.³ E04D *1/00***

**U.S. Cl. 52—541** **4 Claims**



1. In a process for making wood shingle sidewall panels of substantially uniform thickness including laying up a continuous sheet laminated shingle panel blank having a face layer of high quality tapered wood shingles in edge-abutting relationship arranged in a row transversely of their lengths and tapered in one direction, a backing layer of low quality tapered wood shingles opposite the face layer shingles and tapered in the direction opposite the direction of taper of the face layer shingles, and an intermediate veneer layer between the face and backing layers, bonding the face and backing layers of wood shingles to the opposite sides, respectively, of the intermediate veneer layer with the opposite rows of shingles substantially in registration lengthwise, severing the panel blank so formed along a line located generally centrally between its opposite edges, and cutting the panel blanks to length, the improvement comprising arranging the shingles in the face layer in staggered relationship prior to bonding the face layer to the veneer and thereby forming the sheet blank to be severed to form two sidewall panel blanks each of a width approximately one-half the length of the sheet blank shingles, one sidewall panel blank having face layer butt edges in staggered relationship and the other sidewall panel blank having substantially even butt edges.



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**4,292,781**

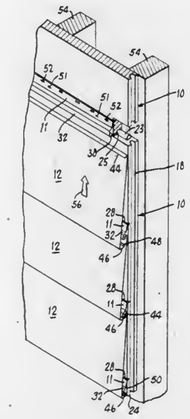
**SIDING PANEL SYSTEM WITH MODULAR INSULATING AND MOUNTING UNITS**

**Alexander A. Chalmers, Warren, and J. Lynn Gailey, Newton Falls, both of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio**

**Filed Aug. 8, 1979, Ser. No. 64,927**

**Int. Cl.³ E04D *1/00***

**U.S. Cl. 52—547** **14 Claims**



1. A siding system for a building wall or the like, comprising
(a) a plurality of horizontally elongated siding panels mountable on the wall in an overlapping interlocked array in successive courses, one above another, each of said siding panels having a top edge with a first longitudinal locking projection and a bottom edge with a second longitudinal locking projection for interlocking with the first projection of an immediately subjacent siding panel in the array;
(b) a plurality of modular insulating and mounting units mountable on the wall in coplanar relation inwardly of the siding panels, each of said modular units having an outer surface with a vertical extent corresponding to the height of a plurality of the courses of siding panels; and
(c) means mountable in predetermined position on said outer surface for positioning and mounting the siding panels on the modular units, said mounting means comprising for each modular unit a plurality of horizontally elongated resiliently flexible retainer strips, each of said strips having a hook portion for snap-fittingly engaging a first locking projection of one of said siding panels along the length thereof to secure said one siding panel to an associated modular unit;
(d) each of said retainer strips having a horizontally extending inwardly projecting portion and the outer surface of each of the modular units defining a plurality of recesses extending inwardly from said outer surface for receiving the inwardly projecting portions of said strips to properly position said strips, said recesses being spaced apart vertically by distances equal to the distance between the second locking projections of siding panels in successive courses of said array.

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**4,292,782**

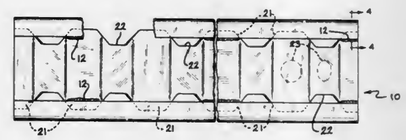
**SHEET METAL STRUCTURAL BEAM**

**Jack A. Schaeffer, Reading, Pa., assignor to Dana Corporation, Toledo, Ohio**

**Filed Jul. 18, 1979, Ser. No. 58,681**

**Int. Cl.³ E04C *3/02***

**U.S. Cl. 52—696** **3 Claims**



1. A structural element comprising: a first U-shaped elongate member having a first flat planar base with first and second spaced parallel planar sides extending integrally from said first base; a second U-shaped elongate member having a second flat planar base with first and second spaced parallel planar sides extending integrally from said second base, said first and said second U-shaped elongate members opening toward one another with said first sides coplanar and with said second sides coplanar; an elongate corrugated web extending between said first and second U-shaped members, said web having a plurality of spaced first coplanar flats and a plurality of second coplanar flats disposed parallel to and alternately spaced with said first coplanar flats, said first sides overlapping a portion of each of said first flats and said second sides overlapping a portion of each of second flats; means permanently connecting said first flats to said first sides; and means permanently connecting said second flats to said second sides, and wherein said web has edges spaced from both said first base of said first U-shaped member and said second base of said second U-shaped member.

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**4,292,783**

**INSULATED BUILDING STRUCTURE AND METHOD FOR MAKING SAME**

**Dan R. Mulvihill, 603 W. 3rd St., Coffeyville, Kans. 67337**

**Filed May 21, 1979, Ser. No. 40,546**

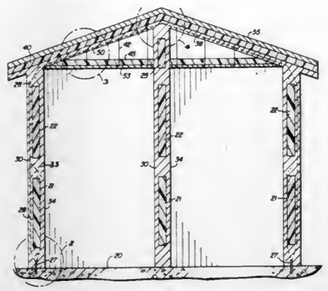
**Int. Cl.³ E04B *1/00***

**U.S. Cl. 52—741** **4 Claims**

1. A method for constructing a building comprising the steps of:

vertically orienting performed slabs of insulating material removable temporary supports aligned to place a wall in location on a foundation member;

covering the at least one side of said slabs with structurally rigid wire mesh;



spraying gunite concrete onto said at least one surface of said wall over said mesh to form a structurally rigid insulated wall; and

removing said temporary supports.

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**4,292,784**

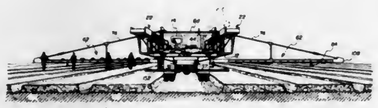
## FIELD CROP HARVESTING AND LOADING MACHINE

**Cinto A. Abatti, 1296 W. Evan Hewes Hwy., El Centro, Calif. 92243, and Harold T. Ash, 1907 Orchard Rd., Holtville, Calif. 92250**

**Filed Jun. 16, 1980, Ser. No. 159,941**

**Int. Cl.³ A01D** *67/00*; **B65B** *67/00*

**U.S. Cl. 53—391** **19 Claims**



6. A harvesting and local transport system for field crops utilizing a plurality of substantially identical trucks any one of which is adaptable to become a field crop harvester with the balance of the trucks being shuttle trucks, said system comprising:

(a) a plurality of substantially identical trucks each having a loading bed with conveyor means therein disposed at substantially the same height and having mateable rear ends for facilitating the free longitudinal movement of containers therebetween;

(b) one of said trucks being designated a harvester truck and the rest of said trucks being shuttle trucks, said harvester truck having a pair of longitudinally extended sorter conveyors removably mounted along opposite sides of the bed;

(c) a pair of conveyor assemblies removably mounted to said harvester truck on opposite sides thereof and having wing conveyors extending laterally outwardly from said harvester truck over the field and also having elevator conveyors for delivering crops from said wing conveyors to said sorter conveyors; and

(d) powered means for translating containers from the loading bed of said harvester truck to the loading bed of the respective shuttle truck whereby said conveyor assemblies and sorter conveyors can be removed from said harvester truck and installed on one of said shuttle trucks such that the latter becomes the harvester truck.

**4,292,785**

## TILE PACKAGING

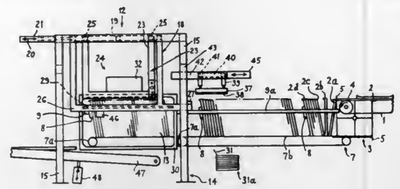
**Leslie G. Hammond, Leighton Buzzar, England, assignor to Anchor Building Products Limited, England**

**Filed Sep. 12, 1979, Ser. No. 75,283**

**Claims priority, application United Kingdom, Sep. 20, 1978, 37540/78**

**Int. Cl.³ B65B** *13/18*

**U.S. Cl. 53—399** **13 Claims**



1. A method of packaging tiles, each having projections on at least one face thereof, said method comprising positioning said tiles one behind the other on one edge thereof to form an elongate stack having a top surface, a base surface and four side surfaces with opposite ends of said stack being formed by faces of the end tiles of the stack, conveying said stack of tiles in the direction of the longitudinal central line of the stack through a packaging station having inlet and outlet ends, supporting the stack of tiles, whilst being conveyed through the packaging station, along the base surface of the stack on one side only of the longitudinal central line of the stack leaving the base surface of the stack, on the opposite side of the longitudinal central line of the stack, unsupported and along another surface of the stack, thereby to maintain the integrity of the stack without interfering with the packaging operation, and, during the passage of the stack through the packaging station, wrapping a strap around that section of the stack which is unsupported along its base surface so that the strap extends around the top and base surface and end faces of the stack and then securing the strap.

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**4,292,786**

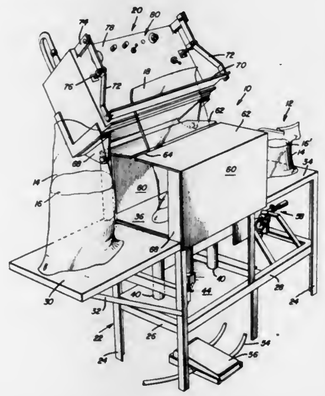
## CHOPPED LEAFY VEGETABLE PACKAGING MACHINE

**Howard W. Long, and Robert L. Flowers, both of Wheeling, W. Va., assignors to Coronet Foods, Inc., Wheeling, W. Va.**

**Filed Sep. 28, 1979, Ser. No. 80,133**

**Int. Cl.³ B65B** *1/24, 31/00*

**U.S. Cl. 53—434** **9 Claims**



1. A packaging machine for compressing and closing a flexible bag having a predetermined quantity of compressible product therein to reduce the volume of the product and provide a completed package of less volume than the product in its bulk form prior to compression, said machine comprising a supporting surface for the flexible bag and product with the lower end of the bag adapted to be supported by the surface, an overlying surface engaging the bag where it is in contact with the upper surface of the product in the bag, said supporting surface and overlying surface adapted to approach each other to compress the bag and product therein in a manner to leave the open upper end of the bag accessible for closing the bag after the product and bag have been reduced in volume thereby forming a completed package, said supporting surface being a vertically movable platform, said overlying surface including a pair of plates having adjacent edges slightly spaced from each other to define a slot for passage of the free, open upper end of the bag, and means for elevating the platform a predetermined distance to compress the product and bag after the bag has been positioned on the platform and the free upper end thereof positioned in the slot, said means for elevating the platform including a fluid pressure operated piston and cylinder assembly having one end connected to the platform, a supporting framework for the platform with the other end of the piston and cylinder assembly operatively associated with the framework, guide means interconnecting the framework and platform for guiding vertical reciprocation of the platform, and foot operated means for controlling operation of the piston and cylinder assembly for causing reciprocation of the platform, said framework including a supporting surface in alignment with each end of the platform when the platform is in lowered position to facilitate sliding movement of a bag with the product therein onto the platform, and sealing means for the open upper end of the bag disposed above the slot between the plates.



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**4,292,787**

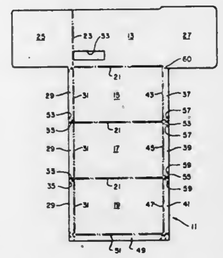
## PAPERBOARD CARTON

**Josef J. Buschor, Los Gatos, and Frederick R. Jennings, Cupertino, both of Calif., assignors to Pneumatic Scale Corporation, Quincy, Mass.**

**Continuation-in-part of Ser. No. 911,990, Jun. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 822,500, Aug. 8, 1977, abandoned. This application Dec. 4, 1979, Ser. No. 100,092**

**Int. Cl.³ B65B** *3/02, 7/20*; **B31B** *49/02*

**U.S. Cl. 53—456** **13 Claims**



1. A method of closing the top end of a carton comprising:

forming a carton as a tube having a polygonal cross-section and a closed bottom end, said carton having plural substantially flat side panels, one of which extends above the others, to form a polygonal top end closure panel, each of said others having a top perimeter edge which extends, unbroken, through the entire width of said side panel and, unbroken, into the top edge of an adjacent side panel;

filling said carton with a liquid;

folding said top end closure panel with respect to said one of said flat sides to a position wherein said top panel is substantially perpendicular to each of said side panels;

pressing the perimeter edges of said top panel and said top edges of said other side panels together to crease said perimeter and top edges into a mutually aligned, face-to-face, sealing relationship, both said perimeter and said top edges being continuous and unbroken throughout their length; and

inducing ultrasonic energy into said perimeter and top edges to seal said end closure panel to said others of said side panels.

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**4,292,788**

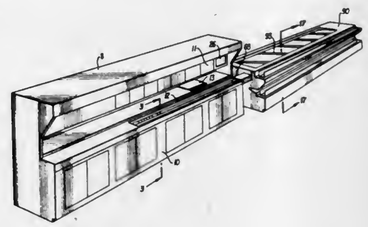
## NUCLEAR FUEL ROD LOADING APPARATUS

**Harold B. King, Wrightsville Beach, N.C., assignor to General Electric Company, San Jose, Calif.**

**Filed Feb. 11, 1980, Ser. No. 120,231**

**Int. Cl.³ B65B** *5/10, 57/06, 57/14*

**U.S. Cl. 53—500** **22 Claims**



1. An apparatus for loading fuel rods with fuel pellets repetitively in first and second sequences of operation comprising:

(a) first and second elongated members for receiving fuel pellets to be loaded alternately in first and second fuel rods;

(b) a fuel rod indexer for positioning first and second fuel rods for receiving said fuel pellets, said fuel rod indexer being effective for positioning said first fuel rod to be loaded with pellets from said first elongated member and for positioning said second fuel rod to be loaded with pellets from said second elongated member;

(c) first means for transferring pellets from said first elongated member into said first fuel rod in a first sequence of operation, and second means for transferring pellets from said second elongated member into said second fuel rod in a second sequence of operation subsequent to said first sequence of operation; and

(d) means for actuating said fuel rod indexer upon completion of said second sequence to reinitiate said first and second sequences of operation.

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**4,292,789**

## SPRING WIRE BLADES FOR DRUM TYPE MOWERS

**Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014**

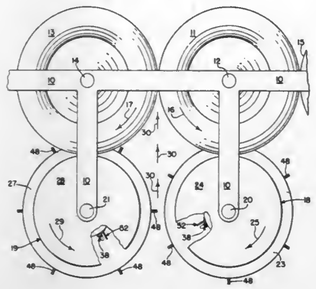
**Filed Apr. 15, 1980, Ser. No. 140,617**

**Int. Cl.³ A01D** *35/264*

**U.S. Cl. 56—12.7** **11 Claims**

1. A mower including rotatable drums, each drum constructed with a vertically disposed cylindrical sleeve and a large diameter horizontally disposed disc at the bottom of the cylindrical sleeve, a blade comprising an L-shaped spring wire, a vertically disposed leg of the L-shaped wire disposed adjacent the wall of the cylindrical sleeve, means attaching the upper end of said vertical leg to said cylindrical sleeve, said disc having a hole therethrough closely adjacent said cylindrical sleeve to permit passage of said vertical leg, a horizontally disposed leg of the L-shaped wire adjoining the vertical leg immediately beneath the disc, said horizontal leg extending

radially outwardly of the disc, said horizontal leg having a portion thereof arranged and constructed to cut hay, and



whereby when said horizontal leg strikes an obstruction it may yield rearwardly by a torsional twisting of said vertical leg.

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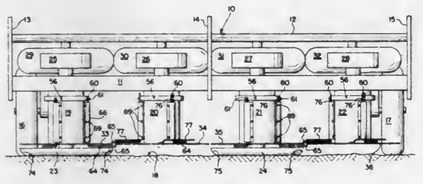
**4,292,790**

## BLADE ARRANGEMENT FOR MULTIPLE ROTOR MOWERS

**Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014**

**Filed Sep. 18, 1980, Ser. No. 188,505**
**Int. Cl.³ A01D *55/18***
**U.S. Cl. 56—13.6** **7 Claims**



1. A mower comprising a frame structure, a series of adjacent, horizontally disposed discs carried on said frame structure, said discs arranged in a single horizontal plane and having the circumferences of adjacent discs spaced slightly apart from one another, mowing blades associated with each of said discs, said mowing blades in their cutting position having a radial extent greater than the circumferences of the discs and continuing radially outwardly through the space between adjacent discs, the mowing blades of alternate discs being disposed beneath the discs and the mowing blades of the intermediate alternate discs being disposed above the discs, whereby although the blades of adjacent discs overlap the extent of each other they do not contact one another by reason of their being vertically offset.

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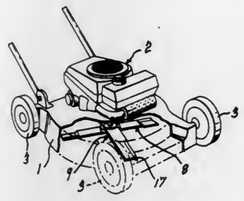
**4,292,791**

## CUTTING AND MULCHING LAWN MOWER BLADE ASSEMBLY

**Jean-Paul Lalonde, 2 ouest, rue Saint-Jean Baptist, Rigaud, Quebec, Canada (JOP 1PO)**

**Continuation of Ser. No. 9,451, Feb. 6, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,035**
**Int. Cl.³ A01D *55/18***
**U.S. Cl. 56—255** **1 Claim**

1. A cutting and mulching blade assembly for a rotary lawn mower having a motor and a depending shaft projection, said assembly comprising a mulching blade and a hub member operatively used in cooperation with a cutting blade, said assembly being operatively securable to said depending shaft projection, each of said blades being of substantially equal length and each having a pair of opposite end portions, said hub member operatively connecting said blades at generally right angles to each other for bodily rotation about the axis defined by said shaft projection and with the mulching blade spaced above the cutting blade by said hub member which is located between the two blades, each of said end portions of said two blades having a cutting leading edge, each end portion of the cutting blade having, transversely of the cutting blade, a rearwardly and upwardly inclined trailing edge portion, which extends longitudinally of said cutting blade from the outer end of the respective end portions of said cutting blade to a termination point short of said hub member, each end portion of the mulching blade having, transversely of said mulching blade, a rearwardly and downwardly inclined trailing edge portion terminated by a trailing edge, said trailing edge portion of said



mulching blade extending longitudinally of said mulching blade from the outer end of the respective end portions of said mulching blade to a termination point closer to said hub member than the corresponding termination point of the trailing edge portion of said cutting blade, said trailing edge portion of said mulching blade operatively producing a downward flow action upon rotation and further having at its outer end a downwardly and rearwardly bent trailing edge tip portion forming an underface which is inclined relative to the longitudinal axis of the mulching blade radially inwardly in the direction of said trailing edge, said tip portion operatively impelling the grass cuttings radially inward away from the internal surface of the shroud housing operatively surrounding the assembly.

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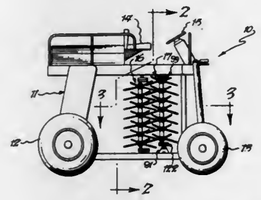
**4,292,792**

## ADJUSTABLE HARVESTING MACHINE FOR BLUEBERRIES AND OTHER PLANTS

**Charles G. Burton, Lewiston, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.**

**Filed Jul. 2, 1979, Ser. No. 53,817**
**Int. Cl.³ A01D *46/00***
**U.S. Cl. 56—330** **19 Claims**



1. An adjustment mechanism for the spoke-carrying shaft of a harvesting machine comprising first shaft means for defining a first axis, a second shaft having a second axis offset from and substantially parallel to said first axis, a plurality of vertically spaced spokes on said second shaft, means mounting said second shaft for movement in an orbit about said first axis, and adjusting means for adjusting the position of said second axis relative to said first axis to thereby vary the size of said orbit.

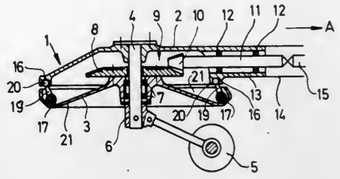


**4,292,793**

## HAY HARVESTING MACHINE

**Hans-Ulrich Hauser, Niederweningen, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland**

**Filed Nov. 15, 1979, Ser. No. 94,968**
**Claims priority, application Switzerland, Nov. 21, 1978, 11900/78**
**Int. Cl.³ A01D *81/00***
**U.S. Cl. 56—378** **11 Claims**



1. A hay harvesting machine comprising:
at least one rake wheel rotatable about an upright axis;
said rotatable rake wheel comprising:
an essentially upright shaft defining said upright axis;
a rotatable housing portion;
means for rotatably mounting said rotatable housing portion for rotation about said upright shaft;
a number of tine supports each having a lengthwise axis mounted for pivotable movement about their lengthwise axis at the rotatable housing portion;
each of said tine supports having rake tines;
each of said tine supports extending essentially in tangential direction with respect to said rotatable housing portion;
control track means connected non-rotatably with said upright shaft for pivoting said tine supports;
said control track means extending in a plane disposed essentially perpendicular to said upright shaft;
said control track means being arranged above said tine supports;
said tine supports extend rearwardly with respect to the direction of rotation; and
said control track means comprising a first track portion arranged essentially coaxially with respect to the upright shaft and a second track portion which, in relation to the first track portion, extends at a greater spacing from said upright shaft.

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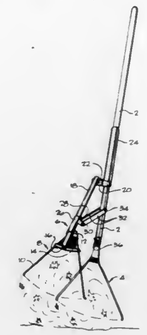
**4,292,794**

## RAKE

**Lorenzo Gascon, 175 Archambault St., Hull, Quebec, Canada**

**Filed Feb. 12, 1980, Ser. No. 120,787**
**Int. Cl.³ A01D *7/00***
**U.S. Cl. 56—400.16** **2 Claims**

1. A pick-up rake comprising a rake handle having a main rake head secured to its lowermost end,
and an auxiliary rake head assembly including an auxiliary rake head having a plurality of tines carried by the rake handle and selectively movable from an upper storage position enabling normal raking to a lower position enabling leaves, grass and debris to be gathered and held between the two rake heads,
the auxiliary rake head assembly also including a shaft pivotally secured at its upper end to a handle sleeve which is slidable along the rake handle,
the upper ends of the tines of the auxiliary rake head being secured closely together on a tine-plate which is secured to a shaft sleeve freely slidable along the shaft, the tines being slidably movable through a tine-guide which is fixedly secured to the lower end of the shaft,
and a pair of links pivotally interconnecting the rake handle and the shaft sleeve,
full upward movement of the handle sleeve along the handle moving the auxiliary rake head to storage position and downward movement moving the auxiliary rake head to gathering position,
in gathering position the shaft sleeve being downwardly positioned with respect to the shaft to extend the tines



through the tine-guide spreading the lower ends of the tines of the auxiliary head, and in storage position the shaft sleeve being upwardly positioned with respect to the shaft to draw the tines through the tine-guide to bring the lower ends of the tines together,
and a flange on the lower end of the rake handle to receive and hold the lower end of the shaft when the auxiliary rake head is in storage position.

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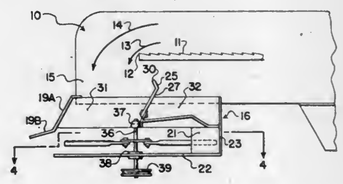
**4,292,795**

## STRAW AND CHAFF CHOPPER AND SPREADER

**Orville J. Linn, Box 188, Lang, Saskatchewan, Canada**

**Filed Nov. 19, 1979, Ser. No. 95,671**
**Int. Cl.³ A01D *49/00***
**U.S. Cl. 56—503** **22 Claims**



1. A chopper and spreader for attachment below a straw and chaff discharge of a grain threshing machine such as a combine or the like and adapted to be driven by a source of power on the machine in which said grain threshing machine includes a straw walker assembly and a sieve assembly both situated spaced forwardly of the straw and chaff discharge of the threshing machine; said chopper and spreader comprising in combination a substantially horizontally located casing securable to said machine below the straw and chaff discharge thereof, straw and chaff intake means on the upper side of the casing operatively connected to the straw and chaff discharge, rotatable straw chopping means journalled for rotation substantially horizontally, in said casing and chopped straw discharge means through at least part of the wall of said casing, said straw chopping means being operatively connectable to the source of power on the associated machine, and a transverse divider in the upper side of said casing dividing said straw and chaff intake means into a front straw intake portion

and a rear chaff intake portion, said transverse divider being adjustable in height to vary the position of the upper edge thereof relative to said chaff discharge.

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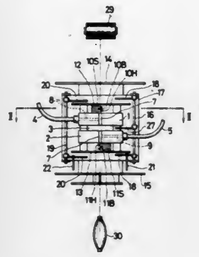
**4,292,796**

## PNEUMATIC YARN SPLICING APPARATUS

**Hiroshi Mima, Joyoshi, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,856**
**Claims priority, application Japan, Feb. 9, 1979, 54-14607**
**Int. Cl.³ D01H *15/00***
**U.S. Cl. 57—22** **3 Claims**



1. Yarn splicing apparatus comprising a yarn end cutting and holding device for the lower yarn end, a yarn end cutting and holding device for the upper yarn end, two air jet nozzles having an elongated yarn inserting hole into which spun yarn ends are introduced, said air jet nozzles being arranged between the yarn end cutting and holding devices so that a space is formed between the two air jet nozzles, and air jet means communicating with the hole to create a swirling air stream, wherein said air nozzles are disposed to produce jetted air streams swirling in directions opposite to each other in the respective holes.

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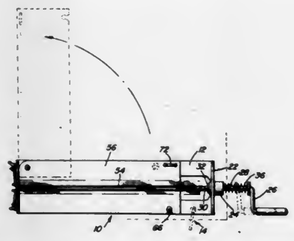
**4,292,797**

## DUBBING WINDER

**Arnold J. Auger, 1482 Zener, Pocatello, Id. 83201**

**Filed Feb. 13, 1980, Ser. No. 121,302**
**Int. Cl.³ D02G *3/42***
**U.S. Cl. 57—24** **12 Claims**



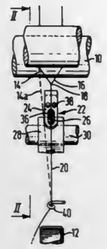
1. A device for twisting dubbing on a thread, comprising: a base member having a substantially planar upper surface and opposite ends, a rotatable hook mounted on one of said ends of said base member, means for rotating said hook, said hook extending over said base member and being substantially parallel thereto; anchor means mounted on the other of said ends for tieing two ends of the thread at fixed laterally spaced positions, and means on the base member for inserting the dubbing on the thread.

**4,292,798**

## STRAND BREAK-OUT DEVICE

**Colin E. Gore, Ilkley, and John P. Coulter, Shipley, both of England, assignors to Wool Development International Limited, London, England**

**Filed Jan. 29, 1980, Ser. No. 116,500**
**Claims priority, application United Kingdom, Feb. 6, 1979, 04177/79; Apr. 23, 1979, 14066/79; Aug. 1, 1979, 26777/79**
**Int. Cl.³ D01H *13/16***
**U.S. Cl. 57—86** **32 Claims**



1. A strand break-out device for prevention of faults due to strand breakage when combining two unspun fibrous strands into a yarn on a common twisting spindle, the device comprising a member having passage means to which, in use, said strands converge from opposite sides of a centre line of said passage means so that both said strands pass through said passage means and may bear thereon to apply force to the said member, a support, means mounting said member on said support, said support and said member being such that said member may move freely under forces applied by said strands in normal operation between limits of displacement from a mean, stable position relative to said support and may additionally move beyond either said limit on breakage of one of said strands only by overcoming a resistance to such additional movement, each such additional movement being to a further position wherein said passage means introduces a distortion into the path that the remaining one of said strands would normally take so causing said remaining strand to break.

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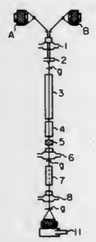
**4,292,799**

## SPUN YARN-LIKE TEXTURED YARNS AND PROCESS FOR PRODUCING SAME

**Yukio Otaki; Kazuo Umeda, and Kiyoshi Nakagawa, all of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Oct. 17, 1979, Ser. No. 85,635**
**Claims priority, application Japan, Oct. 26, 1978, 53/131798; Nov. 24, 1978, 53/144254**
**Int. Cl.³ D02G *3/04, 3/24;* D02J *3/02***
**U.S. Cl. 57—246** **10 Claims**



1. A spun yarn-like textured yarn comprised of two types of polyester multifilament component yarns A and B, the difference in monofilament denier $\Delta[d]_{B-A}$ of the component yarn B from the component yarn A being not less than 1.8 denier, the monofilament denier of the component yarn A being not more than 1.6 denier, and the textured yarn having a broken filament count of not more than 40 per meter of its length, a crimp stretchability of not more than 23%, a difference in length between the component yarns A and B of not less than 1% and a bulk factor of not less than 9 cc/g.



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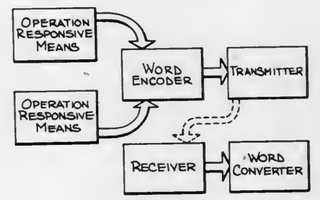
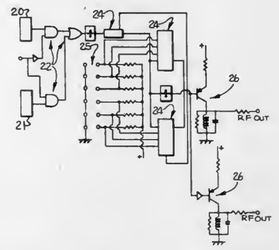
**4,292,800**

## TEXTILE MACHINE DATA LINK APPARATUS

**Lyman L. Werst, Acton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.**

**Filed Sep. 28, 1979, Ser. No. 79,798**
**Int. Cl.³ D01H *13/32;* H03K *13/24***
**U.S. Cl. 57—264** **11 Claims**




1. In the combination of a traveling unit, moving past spindle locations at which ends of yarn normally are formed along one or more textile yarn forming machines and having means responsive to certain operations such as formation of ends of yarn for signaling certain states of said operations such as an end down at a spindle location, with data link means having transmitter means for communicating data concerning said operations, the improvement in said data link means wherein said transmitter means comprises:

first and second oscillators generating signals of predetermined first and second frequencies,

data signal input gates operatively connected to said oscillators for selectively passing signals of one of said frequencies and for frequency shift keying binary data,

a phase locked loop circuit operatively connected to said gates for receiving signals passed therethrough as a reference signal and for generating an output signal of a predetermined frequency correlated to said reference signal and having programming means for selecting a channel of frequencies for operation of said data link means,

said oscillators and said phase locked loop circuit cooperating to function as a frequency synthesizer, and

radio frequency output means operatively connected to said phase locked loop circuit for emitting a radio frequency signal in response to and at a frequency determined by said output signal from said phase locked loop circuit.

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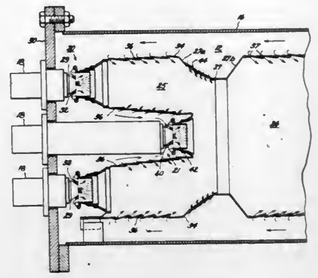
**4,292,801**

## DUAL STAGE-DUAL MODE LOW NOX COMBUSTOR

**Colin Wilkes, Scotia, and Milton B. Hilt, Sloansville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 11, 1979, Ser. No. 56,510**
**Int. Cl.³ F23R *3/34***
**U.S. Cl. 60—39.06** **19 Claims**



1. A method of operating a gas turbine combustor to achieve low emissions of nitrogen oxide, said combustor including first and second combustion stages separated by a throat region of reduced diameter relative to said combustion stages with a plurality of fuel nozzles and air swirlers for introducing fuel and air respectively into said first stage and a single fuel nozzle and air swirler positioned adjacent said throat region for introducing additional fuel and air respectively into said second stage, said method comprising:

introducing fuel and air into said first stage from said plurality of fuel nozzles and air swirlers for mixing therein to create a combustible fuel-air mixture;

introducing additional fuel and air into said second stage from said single fuel nozzle and air swirler, said additional fuel and air mixing with the combustible fuel-air mixture in said second stage for combustion therein and wherein the step of introducing additional fuel and air into said second stage from said single fuel nozzle and air swirler includes locating said single fuel nozzle and air swirler relative to said throat region and dimensioning said throat region relative to said combustion stages to minimize flashback from said second combustion stage to said first combustion stage;

introducing additional air into said second stage from said throat region for further reducing the possibility of flashback into said first stage from said second stage;

introducing dilution air into the downstream end of said second stage to reduce residence time of the products of combustion at NOx producing temperatures in said second stage; and

adjusting the fuel flow to said single fuel nozzle and said plurality of fuel nozzles while maintaining a substantially constant total fuel flow until a majority of the total fuel flow is equally distributed among said plurality of fuel nozzles.

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**4,292,802**

## METHOD AND APPARATUS FOR INCREASING COMPRESSOR INLET PRESSURE

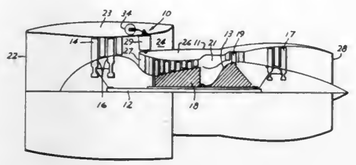
**Barton H. Snow, Wyoming, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Dec. 27, 1978, Ser. No. 973,766**
**Int. Cl.³ F02K *3/075***
**U.S. Cl. 60—204** **5 Claims**

1. A method of facilitating air starts in a turbofan engine of

the type having a core, a fan, and a bypass duct, comprising the steps of:

(a) blocking the flow of air in the bypass duct; and



(b) increasing the inlet pressure to the compressor to a level which will allow an air start.

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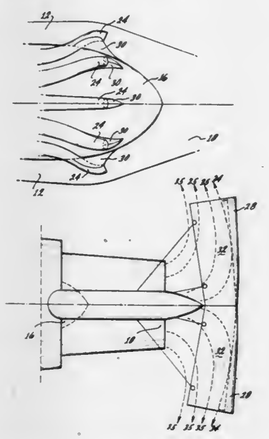
**4,292,803**

## TURBO FAN ENGINE MIXER

**Barry Prior, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.**

**Filed Jan. 19, 1979, Ser. No. 4,674**
**Int. Cl.³ F02K *1/00***
**U.S. Cl. 60—230** **3 Claims**



1. Apparatus for a turbo-fan engine having a central core and an elongated cowl section spaced from said central core forming a fan duct therebetween, an engine plug attached to said central core and extending downstream thereof, the aft surface of said engine plug defining the aft boundry of said fan duct, said engine having primary and fan gas streams directing aft through said fan duct comprising:

nozzle means for introducing said primary gas stream into said fan duct, said nozzle means comprising a plurality of individual tubes attached around said central core by aerodynamic fairings whereby a substantial mixing of the gas streams is accomplished within said fan duct.

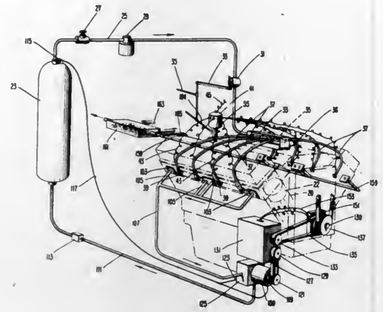
2. The apparatus as defined in claim 1, wherein said apparatus additionally includes blocker doors for reversing the direction of said gas streams, said nozzle means and said aerodynamic fairings being positioned so that when said blocker doors are displayed to their gas stream reversing position, a layer of fan gas impacts and insulates said blocker doors from the mixed gas streams.

**4,292,804**

## METHOD AND APPARATUS FOR OPERATING AN ENGINE ON COMPRESSED GAS

**Leroy K. Rogers, Sr., #5 Capistrano Ct., Ft. Myers, Fla. 33908**

**Filed Jun. 10, 1980, Ser. No. 158,303**
**Int. Cl.³ F15B *11/06***
**U.S. Cl. 60—407** **22 Claims**



1. An apparatus for operating an engine having at least one cylinder and a reciprocating piston therein comprising:

a source of compressed gas;

distributor means connected with the source of compressed gas for distributing the compressed gas to the at least one cylinder;

valve means for admitting the compressed gas to the at least one cylinder when the piston is in approximately a top dead center position within the cylinder;

altering means for increasing the duration of each engine cycle over which the valve means admits compressed gas to the at least one cylinder as the speed of the engine increases; and

exhaust means for exhausting gas as the piston subsequently approaches approximately the top dead center position.

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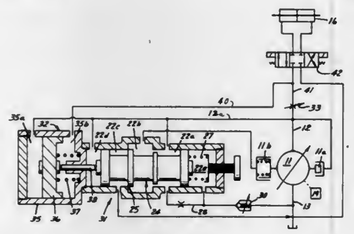
**4,292,805**

## SERVO-VALVE CONVERTIBLE CONSTRUCTION

**John L. Acheson, Franklin, Wis., assignor to Rexnord Inc., Milwaukee, Wis.**

**Filed Sep. 24, 1979, Ser. No. 78,332**
**Int. Cl.³ F04B *1/26, 49/08;* F16H *39/46***
**U.S. Cl. 60—450** **8 Claims**



1. A control valve in combination with a hydraulic system which includes a variable displacement pump and a flow restrictor, an output line therebetween, a delivery line from the restrictor for connection to a load, a return line and a control displacement line to the pump, means responsive to output line pressure acting to reduce pump dislacement, the pump displacement being varied directly by pressure variations in said displacement control line acting on pressure responsive displacement control means; said valve including a valve body and a spool which is axially movable therein and defines therewith first and second restricted passages, said valve body having means for connection with said output, displacement controls, and return lines to provide a pilot flow of fluid from the output line and through said passages to the return line and to the displacement control of line for varying pump displacement by the pressure intermediate said passages, a spring biasing said spool in one direction and toward one end of the valve body to close said second passage to the return line to raise the pressure in the displacement control line whereby pump displacement is increased, and means for connecting said one end of the valve body with the output line whereby pump output pressure is effective to move the spool in the other direction and against said spring and to open said second passage to the return line to lower pressure in the displacement control line whereby pump displacement is decreased; said valve further including a spool abutment device comprising a cylinder, a piston movable therein, a spring biasing said piston in one direction and toward one end of the cylinder, an axially movable pin extending from the piston and through the other end of the cylinder, means removably connecting said other end of the cylinder to said one end of the valve body whereby the pin is engageable by abutting the spool and only limits movement of the spool in said one direction only, and means for connecting said one end of the cylinder with the output line and the other end of the cylinder with the delivery line such that the pressure differential effected by the restrictor and operating against said piston and last named spring positions said pin in accordance with said pressure differential and allows pump displacement to be varied only up to a selected maximum pump output and without otherwise interfering with the operation of the control valve.



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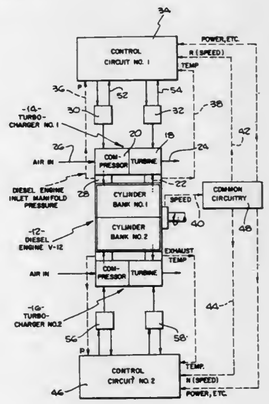
**4,292,806**

## TURBOCHARGER CONTROL SYSTEM

**M. Samuel Moore, and Charles F. Paluka, both of Northridge, Calif., assignors to Semco Instruments, Inc., North Hollywood, Calif.**

**Filed Feb. 28, 1979, Ser. No. 15,956**
**Int. Cl.³ F02B *37/12***
**U.S. Cl. 60—600** **4 Claims**



1. A control system for a diesel engine having a turbocharger with a turbine section operated by the exhaust gases from said engine, and a compressor section powered by said turbine section for supplying air to the inlet manifold of said engine, and including means for variably controlling the flow of the gases passing through both the turbine and the compressor sections of said turbocharger, and means for independently adjusting the variable controlling means for said compressor and said turbine sections, comprising:

first and second actuators for shifting the variable controlling means for the gases passing through said compressor and said turbine sections, respectively;

electronic circuit means for controlling said first compressor actuator in accordance with a substantially linear function of the speed of the engine, and with an incremental additional actuation in accordance with the inlet manifold pressure;

electronic circuit means for controlling said second, turbine actuator in accordance with the theoretical optimum or desired engine input manifold pressure as derived from the speed of the engine and the temperature at the input of the turbine, modified by an error signal obtained by comparing the actual manifold pressure with the derived manifold pressure, whereby said turbine and compressor are operated just below "stall" or "cavitation" conditions, whereby substantially optimum operation is achieved; and

said turbine actuator controlling means including circuitry responsive to the product of the speed and the temperature for determining the theoretical engine input manifold pressure.

3. A control system for an engine having a turbocharger with a turbine section and a compressor section powered by said turbine section for supplying air to the inlet manifold of said engine, and including means for variably controlling the flow of gases passing through both the turbine and the compressor sections of said turbocharger, and means for independently adjusting the variable controlling means for said compressor and said turbine sections, said engine having a cooling fan and associated clutch means for actuating said cooling fan, comprising:

first actuator means for shifting the variable controlling means for the gases passing through said compressor sections of said turbocharger;

second actuator means for shifting the variable controlling means for the gases passing through said turbine section of said turbocharger;

electronic circuit means for controlling said first compressor actuator in accordance with a substantially linear function of the speed of the engine;

electronic circuit means for controlling said second, turbine actuator in accordance with the theoretical optimum or desired engine input manifold pressure as a function of the power output of said engine to operate said turbine and compressor just below "stall" or "cavitation" conditions, whereby substantially optimum operation is achieved;

means included in said electronic circuit means for changing the control signal applied to said turbine actuator and maintaining desired operating conditions substantially continuously as the speed of said engine varies; and

maximum acceleration electronic control means for declutching the engine cooling fan and for overriding said turbine actuator control circuitry and rapidly increasing the flow in the turbine section of the turbocharger, thereby increasing the input manifold pressure.

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**4,292,807**

## VARIABLE GEOMETRY TURBOSUPERCHARGER SYSTEM FOR INTERNAL COMBUSTION ENGINE

**George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

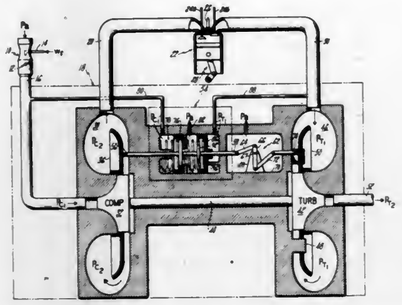
**Filed May 2, 1979, Ser. No. 35,185**
**Int. Cl.³ F02B *37/12***
**U.S. Cl. 60—601** **18 Claims**

1. In a turbosupercharger system for an internal combustion engine, said turbosupercharger including a compressor having an outlet diffuser and a turbine having an inlet nozzle, said turbine being driven by exhaust gases from said engine and being connected to drive said compressor to raise the pressure of air supplied to said engine;

means including a first movable member connected to said compressor outlet diffuser and adapted to vary the geometry thereof such that the effective diffuser area at the exit

of said compressor is varied in response to said first member;

means including a second movable member connected to said turbine inlet nozzle and adapted to vary the geometry thereof such that the effective turbine nozzle area at the inlet to said turbine is varied in response to said second member;



means for sensing a condition of operation of said engine and producing a signal indicative thereof;

and actuator means connected to said first and second movable members and responsive to said signal for simultaneously moving said members and thereby varying the geometry of said compressor outlet diffuser and said turbine inlet nozzle in a fixed geometrical relationship.

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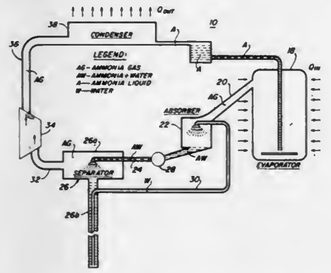
**4,292,808**

## ENERGY CONVERTER

**Edward W. Lohmiller, 2445 S. 13th Ave., Broadview, Ill. 60153**

**Filed Apr. 2, 1979, Ser. No. 26,007**
**Int. Cl.³ F01K *25/06***
**U.S. Cl. 60—673** **4 Claims**




1. An energy converting system for converting energy from a relatively low thermal source into useful energy comprising:

a carrier fluid;

a compressible working medium absorbable by said carrier fluid and convertible between the liquid and gaseous states;

evaporator means receiving heat energy from a relatively low thermal source for transferring the working medium from the liquid to the gaseous states;

absorption means connected to receive the gaseous working medium from said evaporator and to receive said carrier fluid for absorbing the gaseous working medium into said carrier fluid to provide a concentrated fluid-medium mixture;

separator means receiving the concentrated fluid-medium mixture separating the working medium from said concentrated fluid-medium by compressing the concentrated fluid-medium mixture;

conduit means returning said carrier fluid from the separator to said absorption means;

condenser means discharging heat energy connected to receive the working medium from said separator means for converting the gaseous working medium to a liquid state;

conduit means connecting said condenser means to said evaporator means;

energy converting means operatively connected with said separator means between the said absorption means and the said condenser means for converting energy from said working medium to another form of energy.

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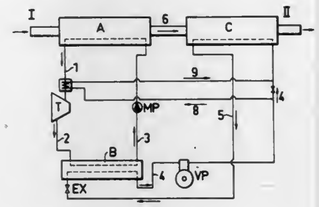
**4,292,809**

## PROCEDURE FOR CONVERTING LOW-GRADE THERMAL ENERGY INTO MECHANICAL ENERGY IN A TURBINE FOR FURTHER UTILIZATION AND PLANT FOR IMPLEMENTING THE PROCEDURE

**Björn A. Björklund, Västerhaninge, Sweden, assignor to AB Svenska Fläcktfabriken, Fack, Stockholm, Sweden**

**Filed Jul. 17, 1979, Ser. No. 58,135**
**Claims priority, application Sweden, Jul. 24, 1978, 7808104**
**Int. Cl.³ F01K *13/00, 25/08;* F25B *27/02***
**U.S. Cl. 60—676** **12 Claims**




1. A method for converting low-grade thermal energy into mechanical energy in a turbine for further utilization, comprising evaporating a first cooling medium in a heating device by means of a low-grade heating medium coming from outside, carrying the evaporated steam from said heating device to at least one turbine for energy conversion, following which the moist steam leaving said turbine is carried to a first cooling device for condensing, pumping the condensate via a feed pump back to the heating device, the heat removed during condensing being absorbed by a second evaporating cooling medium, the steam of which created thereby is pumped via at least one heat pump in order to obtain a higher condensing temperature, after which condensing is caused to take place in a second cooling device which is cooled by outgoing cooled medium from the heating device, carrying the condensate via an expansion valve back to the first cooling device while outgoing cooled medium from the heating device is heated in its entirety to a level lower than the temperature level at the entrance of the heating device.

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**4,292,810**

## GAS TURBINE COMBUSTION CHAMBER

**Robert G. Glenn, Lower Moreland Township, Montgomery County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

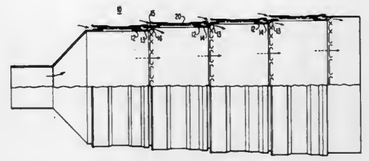
**Filed Feb. 1, 1979, Ser. No. 8,318**
**Int. Cl.³ F02C *7/20***
**U.S. Cl. 60—757** **4 Claims**

1. A combustion chamber for a combustion turbine engine, said chamber defining a generally cylindrical configuration having an inlet end and an opposed discharge end and with a portion intermediate the opposed ends defining an outwardly stepped configuration comprising a plurality of axially extending serially arranged cylindrical segments with each downstream segment having a larger diameter than the adjacent upstream segment and annular transition means integrally connecting the trailing edge of each downstream segment to the leading edge of each adjacent upstream segment,

said annular transition means defining apertures for admitting air therethrough into said chamber;

a cylindrical baffle means encircling each cylindrical segment in spaced relation therewith defining an annular airflow passage therebetween, said baffle means axially extending from generally adjacent the upstream transition means to generally adjacent the openings in the downstream transition means whereby air flowing through said passage is directed into said downstream openings in said transition piece;





a plurality of spring means interposed in said passage between each segment and said encircling baffle means and biased to maintain a separating force therebetween, said spring means attached only to either said baffle means or said segment to accommodate relative thermal growth both radially and axially between said segment and baffle means;

said plurality of spring means including a plurality of generally circumferentially oriented leaf spring elements forming an annular array, with a pair of such arrays respectively disposed generally adjacent the upstream and downstream portions of each baffle means; and

abutment means for limiting axial movement of the free ends of said leaf spring elements and thereby limiting relative axial movement of said baffle means and said segments.

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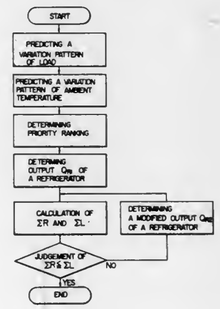
**4,292,811**

## OPERATING METHOD FOR REFRIGERATING MACHINE

**Kohji Kamejima; Hideki Tanaka; Minoru Kano, and Toshihiko Fukushima, all of Shimoinayoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 16, 1979, Ser. No. 57,651**
**Claims priority, application Japan, Jul. 14, 1978, 53-85115**
**Int. Cl.³ F24D *11/00;* F25D *3/00***
**U.S. Cl. 62—56** **7 Claims**




1. An operating method for refrigerating machines having a load predictor for predicting a load on a prearranged day for refrigerating operation, an ambient temperature predictor for predicting a variation of the ambient temperature on the prearranged day, and heat accumulating means for accumulating the output of the refrigerating machine, comprising the steps of operating the refrigerating machine during a predetermined air-conditioning period by:

(1) operating said load predictor at a point in time prior to said predetermined air-conditioning period for producing a load variation pattern indicative of the load that would be experienced by said refrigerating machine during said air-conditioning period;

(2) operating said ambient temperature predictor at a point in time prior to said predetermined air-conditioning period for producing an ambient temperature variation pattern indicative of the ambient temperatures that would be experienced during said air-conditioning period;

(3) dividing said ambient temperature variation pattern into a plurality of time intervals and assigning a priority ranking to each interval as a function of a temperature value of said temperature variation pattern produced for each interval;

(4) determining the output capacity of said refrigerating machine;

(5) determining the number of said time intervals, in order of priority ranking, and the refrigerating output capacity producible therein for the output of said refrigerating machine to at least equal an integrated value of said load variation pattern and producing a refrigerating machine operating schedule in accordance therewith; and

(6) controlling the operation of said refrigerating machine during said predetermined period in accordance with said operating schedule.

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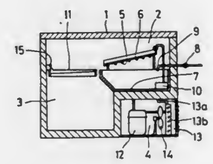
**4,292,812**

## CONTROL DEVICE FOR ICE MAKING MACHINE

**Mitsuru Kakinuma, Sakaimachi, and Yoshitaka Takahashi, Gumma, both of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of Osaka, Japan**

**Filed Apr. 29, 1980, Ser. No. 144,930**
**Claims priority, application Japan, May 2, 1979, 54-54494**
**Int. Cl.³ F25C *1/00***
**U.S. Cl. 62—157** **8 Claims**



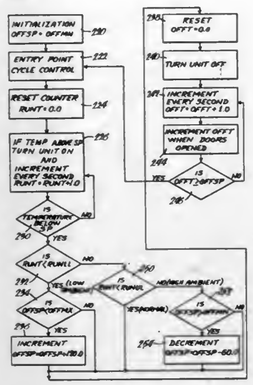

1. In a control device for an ice making machine to make ice by circulating ice-making water to an ice making member having a refrigerating system, control device comprising a timer circuit to be operated to control a period of time during which an ice making operation is performed, and a temperature sensing element whose impedance varies with the variations of temperature for sensing an operating condition of said refrigerating system, so that an input voltage applied to said timer circuit varies with the variations of an impedance of said temperature sensing element, thereby to automatically control the period of time during which an ice making operation of one cycle is performed.

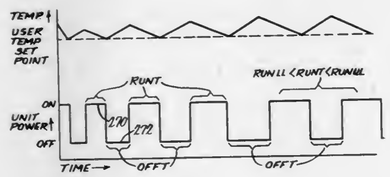
**4,292,813**

## ADAPTIVE TEMPERATURE CONTROL SYSTEM

**Stephen W. Paddock, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Mar. 8, 1979, Ser. No. 18,762**
**Int. Cl.³ G05D *23/32*; F23N *5/20***
**U.S. Cl. 62—158** **27 Claims**




1. A temperature control system for a heating or cooling device, comprising:

a temperature sensor for monitoring the temperature of a space;

means for repeatedly operating the device in cycles, each cycle having an on portion during which the device is energized and an off portion during which the device is deenergized;

means coupled to the temperature sensor for controlling the duration of one of the repeated portions of the cycle in accordance with the sensed temperature;

measurement means for measuring the temperature controlled portions of the cycle;

means operative during the normal cyclic operation of the device for varying the duration of the repeated other portion of the cycle in response to the measurement of at least one of the temperature controlled portions of the cycle.

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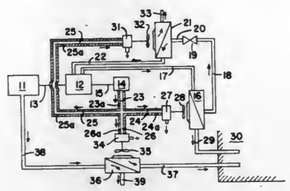
**4,292,814**

## HEAT PUMP

**Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435**

**Filed Jun. 13, 1979, Ser. No. 48,527**
**Int. Cl.³ B60H *3/04***
**U.S. Cl. 62—243** **5 Claims**

1. A heat pump having internal combustion engine driven compressor means, a condenser, an evaporator and closed fluid flow circuit means between said compressor means, condenser and evaporator, characterized in that said condenser has fluid actuatable fan means arranged to force air through said condenser, said evaporator has fluid actuatable fan means arranged to force air through said evaporator and each of said fluid




actuatable fan means has a fluid flow connection with said compressor means.

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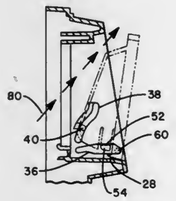
**4,292,815**

## DOOR ASSEMBLY FOR A SELF-CONTAINED AIR CONDITIONING UNIT

**Theodore S. Bolton, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Jul. 25, 1979, Ser. No. 60,327**
**Int. Cl.³ F25D *23/12***
**U.S. Cl. 62—262** **7 Claims**




1. An air conditioning unit having a flow path through which conditioned air is discharged to a space which comprises:

a casing defining a discharge opening through which the conditioned air may flow, said opening having side surfaces which each define a pair of slots;

a door to cover the discharge opening, said door having a pair of pins extending from each end surface of the door, said pins being adapted to engage the slots defined by the side surface of the casing whereby the door may be rotated to various open positions; and

a friction wedge mounted to extend from the door to engage the side surface of the casing for securing the door in a position, said friction wedge including an inclined surface extending from the door to engage an edge of a slot in the casing such that the door may be partially opened to the position at which the inclined surface engages the slot edge by the force exerted against the door by the conditioned air conducted along the flow path through the opening.

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**4,292,816**

## ICE MAKING APPARATUS

**Rudolph E. Gartzke, 2326 Superior St., Madison, Wis. 53704**

**Continuation-in-part of Ser. No. 936,233, Aug. 24, 1978, and Ser. No. 793,936, May 5, 1977, abandoned. This application Dec. 26, 1979, Ser. No. 106,706**
**Int. Cl.³ F25C *1/10***
**U.S. Cl. 62—345** **12 Claims**

1. An ice making machine for producing ice in discrete small pieces by use of mechanical refrigeration, comprising in combination,

(a) a stationary plate provided with at least two separate, integral passages containing fluid refrigerant wherein said passages are operably communicated by sealed connections to refrigerant lines external to said plate,

(b) a refrigeration compressor wherein the outlet of said compressor is communicable to at least one said passage individually for providing hot, compressed vaporous refrigeration fluid in said passage to heat said plate and thaw ice deposited on a surface in proximity of said passage,

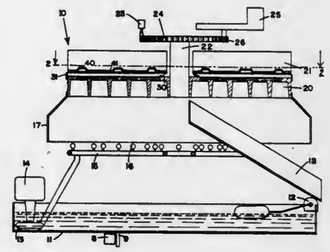
(c) a refrigerant condenser for liquifying refrigerant vapor wherein the outlet of said condenser is communcable to at least another said passage individually for providing cold, rarified vaporous refrigeration fluid in said passage through means of an expansion valve to refrigerate said plate and freeze moisture deposited on a surface in proximity of said passage,

(d) concavities configured in a surface underlying said plate,

(e) pressurized water spray means wherein water spray is directed to impinge against said concavities,

(f) means for effecting mutual progression of said concavities repetitively from proximity to one said passage heated to






thaw ice deposited on said surface to proximity to another said passage refrigerated to freeze moisture deposited on said surface.

6. In a refrigerator having a freezing compartment, apparatus for making discrete ice pieces comprising in combination,

a drive motor,

a heat transfer plate driven rotatably about an axis by said drive motor,

said plate having a planar surface in facing contact with an enclosure for said freezing compartment,

said plate being configured with an exposed surface configured with concavities recessed therein,

a water recirculating pump, said pump being connected to a water supply and to a drive motor,

water discharge means associated with said pump for directing water to be deposited in said concavities,

defrosting means fixedly disposed to warm and defrost a sector of said heat transfer plate as said plate passes in sliding contact therewith, said warming causing ice formed in said concavities to loosen and fall by gravity from said plate as discrete pieces of ice.

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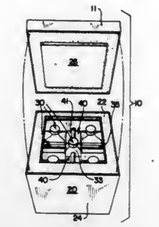
**4,292,817**

## CONTROLLED TEMPERATURE SHIPPING ASSEMBLY

**Terry L. Loucks, Spring Valley, Ohio, assignor to The Mead Corporation, Dayton, Ohio**

**Filed May 12, 1980, Ser. No. 149,092**
**Int. Cl.³ F25D *3/08***
**U.S. Cl. 62—457** **8 Claims**

1. A controlled temperature shipping assembly comprising a container, a plurality of liquid retention members, temperature control means, and a top closure insulating member, said container including an outer protective layer and an inner insulating layer, said protective layer and said insulating layer defining a shipping cavity; said liquid retention members being removably positioned in said shipping cavity, said liquid retention members being arranged such that at least one surface of each of said retention members is in direct contact with at least one surface of said temperature control means; temperature control means positioned in said shipping cavity such that the temperature of each of said liquid retention members can be




controlled below predetermined levels and wherein said top closure insulating member is fitably received by said shipping cavity and at least one of said liquid retention members and which encloses and insulates the shipping cavity during actual transport or storage.

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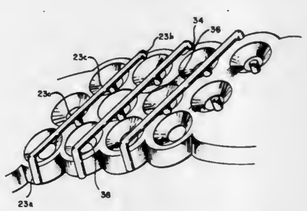
**4,292,818**

## SETTING AND METHOD FOR MOUNTING PRECIOUS STONES AND THE LIKE THEREIN

**Jean Vitau, 18 Ackerman Ave., Oradell, N.J. 07649**

**Filed Sep. 17, 1979, Ser. No. 76,135**
**The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.**
**Int. Cl.³ A44C *17/02*; B23P *5/00*; A44C *17/04***
**U.S. Cl. 63—28** **12 Claims**




1. A setting for precious stones or the like comprising: mounting means having a top surface and comprising at least two rows of cavities each row having at least two adjacent cavities and aligned connecting portions connecting adjacent cavities, each cavity configured to receive a stone or the like from the top surface with a peripheral portion of each stone extending over the contiguous connecting portions; and securing means defining securing slots with the top surface of selected connecting portions for receiving the peripheral portions of the stones to be mounted to secure same in position in their cavities, the securing means comprising at least one deformable securing rod positionable parallel to the top surface and spaced therefrom in alignment with the aligned connecting portions and at least one elongated support member mounted at one of its ends to the mounting means between the two rows of two adjacent cavities in alignment with the connecting portions with the longitudinal axis thereof substantially normal to the top surface and fixed at the other of its ends to the securing means intermediate of the end portions thereof.

7. A method for mounting precious stones or the like, comprising the steps of:

providing a setting having a top surface, at least two rows of cavities each row having at least two adjacent cavities and aligned connecting portions connecting adjacent cavities, each cavity configured to receive a precious stone or the

like therein from the top surface with a peripheral portion of each stone extending over the contiguous connecting portions;

forming a deformably enlargeable and compressible securing slot at each connecting portion above the top surface of the setting and receptive of the peripheral portions of the stones by fixing one end of at least one elongaged support member to the setting between the two rows of two adjacent cavities to dispose same in alignment with the connecting portions with the longitudinal axis thereof normal to the top surface and fixing an intermediate portion of at least one deformable securing rod to the other end of the support member to dispose same parallel to and spaced from the top surface and in alignment with the aligned connecting portions;

deforming the slots to enlarge same and inserting the stones in the cavities with the peripheral portions in the slots; and

deforming the slots to compress same to secure the stones in place.

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**4,292,819**

## SHEAR PIN COUPLING

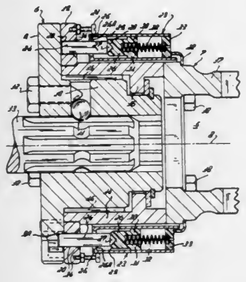
**Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands**

**Filed Jan. 17, 1979, Ser. No. 4,165**

**Claims priority, application Netherlands, Jan. 18, 1978, 7800577**

**Int. Cl.³ F16D** *3/56, 7/00*

**U.S. Cl. 64—28 R** **21 Claims**



1. A shear pin coupling comprising a first coupling part connected to a second coupling part through a shear pin that prevents relative displacement between the two parts in at least one direction, said pin having a longitudinal axis and guide means urging the pin in a direction generally parallel to said axis to establish an operative connection between said two parts, said pin being fractured upon overload to permit relative movement between the parts in said one direction and the remainder of said pin being urged in the pin's axial direction by said guide means to re-establish said operative connection between the two parts, an end portion of said guide means cooperating with said pin to oppose non axial movements of the pin.

**4,292,820**

## METHOD OF AND APPARATUS FOR KNITTING THE HEEL OF A HOSIERY ARTICLE

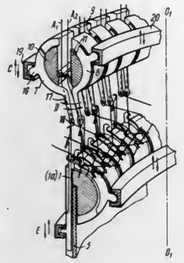
**Igor V. Ragoza, Moskovsky prospekt, 7, kv. 114; Petr M. Begunov, ulitsa Shirokaya, 30, kv. 5; Robert T. Tonikian, ulitsa Chkalova, 11, korpus 10, kv. 92, and Petr J. Vasiljuk, ulitsa Chkalova, 11, korpus 12, kv. 79, all of Vitebsk, U.S.S.R.**

**Filed Jul. 30, 1979, Ser. No. 62,181**

**Claims priority, application U.S.S.R., Oct. 20, 1978, 2686186; Jan. 17, 1979, 2704501; Jan. 23, 1979, 2707351**

**Int. Cl.³ D04B** *9/00*

**U.S. Cl. 66—8** **8 Claims**



1. A method of knitting the heel of a hosiery article with two warp thread systems in a circular warp-knitting machine, including: guiding or laying two systems of warp threads on knitting needles by means of two systems of thread guides, actuating these thread guides for displacement both along the front presented by the knitting needles and intermediate these needles, knitting main loop courses and additional loop courses; knitting said additional loop courses between the main loop courses and making them shorter than the main loop courses, from some of the warp threads of the two warp thread systems, by disengaging some of the knitting needles along a portion of the circumference of the knitting cylinder; while knitting said additional loop courses, and actuating both systems of the thread guides along the front presented by the knitting needles, behind their backs, through steps which are greater than the steps through which these thread guides are actuated, while knitting the main loop courses.

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**4,292,821**

## NEEDLE SELECTION MECHANISM IN A HAND-OPERATED KNITTING MACHINE

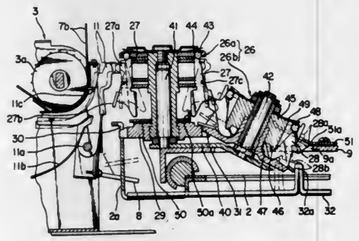
**Mitsuhito Koike, and Yasuhiro Iwasaki, both of Kodaira, Japan, assignors to Silver Seiko, Ltd., Kodaira, Japan**

**Filed Nov. 27, 1979, Ser. No. 98,335**

**Claims priority, application Japan, Dec. 4, 1978, 53/149002**

**Int. Cl.³ D04B** *7/00, 15/66*

**U.S. Cl. 66—75.2** **6 Claims**



1. Needle selection mechanism in a hand-operated knitting machine of the type having a needle bed with a plurality of



knitting needles mounted therein and a carriage mounted for longitudinal slidable movement of the needle bed, the mechanism comprising a program carrier mounted alongside the needle bed and carrying a patterning program in the form of punched holes arranged in rows and columns thereon, the mechanism further comprising a first drum means having thereon a plurality of settable elements adapted to be set from their initial position in accordance with a row of the punched holes when the carriage passes over the program carrier in a direction, the first drum means being mounted for rotation about an upright shaft fixed on the carriage and having thereon an integral gear adapted to be engaged, at one diametrical position thereof, with a rack provided along the needle bed, the gear being engaged, at the other diametrical position thereof, with a second gear which is integrally attached to a second drum means, the second drum means being rotatable about an inclined shaft fixed on the carriage and having thereon a plurality of settable elements mounted for engagement with the corresponding settable elements on the first drum means to be set thereby from their initial position in accordance with the settings of the first drum means, the second drum means being operable to select the knitting needles in accordance with the settings of the settable elements thereon during movement of the carriage in the other direction on the needle bed, all the settable elements on the first and second drum means being restored to their initial positions by a clearing means mounted on the carriage after completion of selection of the knitting needles in accordance with the settings on the second drum means, and the clearing means including a common clearing member which is mounted for pivotal motion from an initial inoperative position to an operative position in which it is engaged with the settable elements of the first and the second drum means in their set positions to restore same to their initial positions.

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**4,292,822**

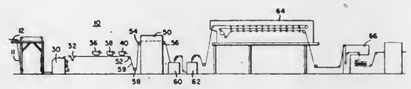
## APPARATUS FOR RANDOMLY COLORING PILE FABRIC

**James Toland, Dalton, Ga., assignor to World Carpets, Inc., Dalton, Ga.**

**Division of Ser. No. 832,905, Sep. 13, 1977, Pat. No. 4,189,302. This application Jan. 4, 1978, Ser. No. 866,913**

**Int. Cl.³ D06B** *21/00*

**U.S. Cl. 68—5 D** **6 Claims**



1. A system for coloring the pile yarns of a carpet web or the like including means for continuously conveying the web through several successive operating stations, means for pretreating the pile yarns to be colored with a wetting agent at one of said operating stations, roll applicator means for applying to the surface tips of the pile yarns a continuous layer of viscous gum coating approximately ⅛ to ¼ inch thick at a second operating station, roll applicator means at a third operating station for applying on said viscous gum coating a continuous layer of dyeing agent approximately ⅛ to ¼ inch thick to color the surface of the lower body portion of the yarns beneath the tips of said pile yarns coated with said gum coating as said web is conveyed and steamer means at a fourth operating station for subjecting said web to an elevated temperature for setting said dye color, said steamer means being disposed downstream of said third station a sufficient distance such that said applied dyeing agent penetrates said gum layer before reaching said fourth station such that only the lower body portions of the pile yarns are colored and the tips of said pile yarns are substantially undyed.

**4,292,823**

## CYLINDER LOCK WITH PLATE TUMBLERS

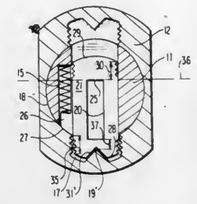
**Theodor Reinhard, Böblingen; Rolf Krügener; Hermann W. Kurth, both of Sindelfingen; Diether Blaich, Stuttgart; Franz Rothmaier, Velbert; Dieter Kopperschläger, Sprockhövel; Heinz Schmitz, and Edgar Nill, both of Velbert, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Apr. 3, 1979, Ser. No. 26,602**

**Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2815380**

**Int. Cl.³ E05B** *15/14, 29/02*

**U.S. Cl. 70—364 R** **13 Claims**



1. A cylinder lock including a plurality of plate tumblers disposed in a lock cylinder rotatably received in a lock casing; a locking channel means arranged in the lock casing; an escape channel means arranged in the lock casing at a position diametrically opposed to the locking channel means for enabling a free resetting motion of the plate tumblers during an insertion of a key into the cylinder lock; each of the plate tumblers including a locking end that is operable to be displaced a predetermined distance into the locking channel means when said key is removed from the cylinder lock; a counter end operable to be displaced a predetermined distance into the escape channel means during said resetting motion; and tumbler governing edges adapted to be arranged at levels corresponding with cutout depths of the key; and means for normally urging the locking ends of the plate tumblers into the locking channel means when the cylinder lock is in a locked position with the key removed, characterized in that security means are provided for preventing a determination of respective heights of the tumbler governing edges of the plate tumblers, said security means comprising stop means provided in at least the escape channel means for limiting said resetting motion of the individual plate tumblers to its respective predetermined distance into said escape channel in cooperation with blocking stop means on said counter ends that are cooperable with the stop means for controlling a positioning of the individual plate tumblers, the blocking stop means being arranged in dependence on the respective heights of associated tumbler governing edges, at least some of which are different, so that the tumbler governing edges of the at least some of the plate tumblers which have edges of different height are positioned at the same level when said plate tumblers are maximally displaced into said escape channel.

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**4,292,824**

## DOUBLE SIDED TUMBLER CYLINDER FOR A SECURITY LOCK

**Ernst Keller, Quertrasse 6, Richterswil, Switzerland (8805)**

**Filed Apr. 30, 1979, Ser. No. 34,558**

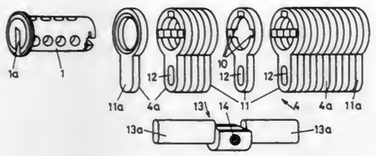
**Claims priority, application Switzerland, May 12, 1978, 5239/78**

**Int. Cl.³ E05B** *9/04*

**U.S. Cl. 70—373** **1 Claim**

1. A pin tumbler cylinder for a security lock including a cylinder housing and rotatably disposed therein a cylinder core, said core having recesses for receiving individual chambers in each of which are disposed a locking pin and a pin spring and wherein said cylinder housing is composed of an

axial stack of discs which are immovably joined, each of said discs having a tang portion, a plurality of said discs having an opening in said tang portion, said openings together constituting a channel for receiving a reinforcing bar, and a reinforcing bar having an enlarged central portion provided with a radial threaded bore for receiving a locking screw.



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**4,292,825**

## GAUGE AND TENSION CONTROL SYSTEM FOR TANDEM ROLLING MILL

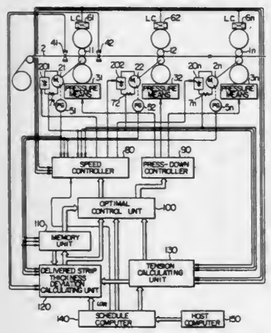
**Yasuo Morooka; Shinya Tanifuji, and Masaya Tanuma, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 21, 1980, Ser. No. 123,418**

**Claims priority, application Japan, Feb. 23, 1979, 54/19663**

**Int. Cl.³ B21B *37/00***

**U.S. Cl. 72—8** **4 Claims**




1. A control system for a continuous mill which incudes at least two rolling stands, comprising means for detecting delivered strip thicknesses of a strip-like material rolled and delivered from each of said rolling stands; means for detecting interstand tensions applied to said strip-like material between every two successive ones of said rolling stands; transfer means for shifting signals representing said delivered strip thicknesses at said rolling stands in dependence on the feeding speed of said strip-like material; means for setting desired values of said delivered strip thicknesses and said interstand tensions; and means for correctively controlling a roll gap or a roll rotation speed at each of said rolling stands on the basis of the detected thicknesses, the delivered strip thicknesses as shifted by said transfer means, the detected interstand tensions and desired values set for said delivered strip thicknesses and said interstand tensions so that dispersion of deviations in the detected thickness and tension from said desired values is reduced to a minimum within a succeeding predetermined time interval.

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**4,292,826**

## WIRE DRAWING APPARATUS EMPLOYING MACROSONIC TECHNIQUES

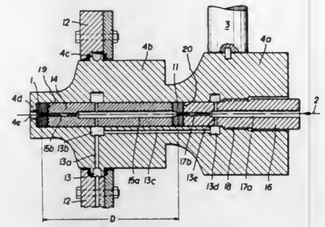
**Bertwin Langenecker, 8253 Waldbach (Steiermark), Austria**

**Division of Ser. No. 833,288, Sep. 14, 1977, abandoned. This application Jun. 27, 1979, Ser. No. 52,584**

**Claims priority, application Austria, Sep. 16, 1976, 6865/76**

**Int. Cl.³ B21C *9/00, 3/10***

**U.S. Cl. 72—45** **8 Claims**



1. Apparatus for the drawing of wire-like elements, such as, wires, rods, pipes and the like, employing macrosonics and hydrodynamic lubrication comprising:

means for supplying a wire-like element for drawing;

an ultrasonic transducer for generating ultrasonic waves;

a horn responsive to said ultrasonic transducer for amplifying the ultrasonic waves, said wire-like elements being passed along a longitudinal axis of the horn;

a pipe being disposed in said horn;

a drawing die arranged in the displacement antinode of the horn and extending substantially perpendicular to the drawing axis, said pipe having a channel of predetermined diameter arranged before the drawing die with respect to the drawing direction, said channel diameter being selected to be sufficiently larger than the diameter of the wire-like element ahead of the drawing die to assure hydrodynamic lubrication, said drawing die and pipe having respective end faces which closely and completely contact each other to prevent lubricant from acting on said end faces; and

means for supplying a lubricant to said channel.

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**4,292,827**

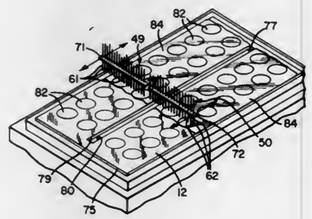
## METHOD FOR MAKING DECORATIVE EMBLEMS

**Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio**

**Continuation-in-part of Ser. No. 903,829, May 8, 1978, abandoned. This application Jul. 5, 1979, Ser. No. 54,548**

**Int. Cl.³ B21D *28/06, 53/44***

**U.S. Cl. 72—46** **7 Claims**



1. A method for producing decorative emblems, plaques or panels, comprising:

(a) providing a substrate having a top surface and a bottom surface and a series of designs applied to its top surface, said substrate having formed therein slits, embossed ridges, or other sharp edges so as to provide within the substrate and around each area to be coated sharply defined peripheral sides which intersect with said top surface,

(b) holding said substrate flat and horizontal on a supported surface free from surrounding side walls,

(c) flow coating a clear viscous fluent curable plastic onto said top surface of said substrate from multiple orifices such that the area coated includes said designs, said plastic being one which only partially wets the surface of said substrate and which is sufficiently slow curing that it will flow on said substrate to said sharply defined peripheral sides without flowing over said sharply defined peripheral sides said plastic being applied in an amount sufficient to form a uniform thickness coating approximately 0.020 to 0.030 inch thick,

(d) allowing said fluent plastic to cure while maintaining said substrate flat and horizontal to bond said uniformly thick coating to said substrate, and

(e) stamping said emblems, plaques, or panels out of said substrate having said cured plastic thereon by application of a cutting die to said bottom surface of said substrate so as to cut contiguous with each individual design of said series of designs, and impart a slightly convex shape to each said emblem, plaque or panel when viewed from the top surface thereof.



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**4,292,828**

## APPARATUS FOR MANUFACTURING COLD-WORK HARDENED CYLINDERS

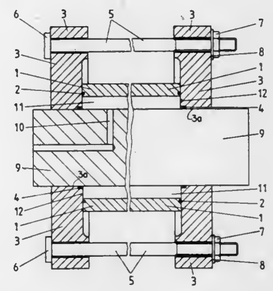
**Willy Germann, Würenlos, Switzerland, assignor to BBC Brown, Boveri & Company Ltd., Baden, Switzerland**

**Filed Jan. 8, 1979, Ser. No. 1,850**

**Claims priority, application Switzerland, Jan. 25, 1978, 787/78**

**Int. Cl.³ B21D *22/10***

**U.S. Cl. 72—54** **1 Claim**



1. Apparatus for cold-working a cylinder comprising two flanges, each having a central opening, a shaft extending through both of said openings, means supporting said cylinder concentrically with said shaft and said openings of the flanges, the opposite ends of said cylinder being in sealing relation with said flanges, said shaft having a head on one end and a threaded portion at the other end, one of said flanges being positioned in abutting relation with said head and the other of said flanges being restrained from axial movement away from the one of said flanges by a support plate threadedly engaged on said screw threads of said shaft, and hydraulic cylinder means between said support plate and the other of said flanges.

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**4,292,829**

## PROCESS FOR THE PRODUCTION OF METALLIC FORMED MEMBERS

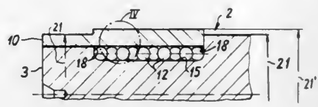
**Adolf Weber, Neunkirchen, and Siegfried Rhau, Nuremberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany**

**Filed Nov. 19, 1979, Ser. No. 95,564**

**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852658**

**Int. Cl.³ B21J *7/16;* F42B *13/48;* B21J *7/18***

**U.S. Cl. 72—76** **1 Claim**



1. In a process for the production of a formed member, including discrete particles embedded in a metallic matrix, the improvement comprising: arranging said particles intermediate a metallic basic support member and a metallic outer casing; embedding said particles in said basic support member and said outer casing through annular cold working of said outer casing; and having shaping wedges which extend along and over only a partial number of said particles concurrently work over the full length of said outer casing in conformance with the length of the particle arrangement along the axial direction of said formed member during rotation of said formed member.

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**4,292,830**

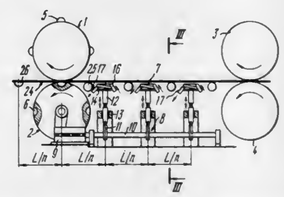
## MILL FOR MAKING TRANSVERSE DEFORMATIONS ON SHEET METAL

**Igor S. Trishevsky, ulitsa 23 Avgusta, 47, kv. 42; Oleg I. Trishevsky, ulitsa Dzerzhinskogo, 34, kv. 7; Vladimir N. Bosy, ulitsa Oktyabrskoi Revoljutsii, 63, kv. 5; Rustem J. Deberdeev, ulitsa Bairona, 148, kv. 52, all of Kharkov; Leonid V. Radjukevich, ulitsa Tukhachevskogo, 22, korpus 2, kv. 253, Moscow; Vyacheslav I. Anisimov, ulitsa Metallurgov, 11, kv. 16, Magnitogorsk; Jury A. Plesnetsov, ulitsa Darvina, 20, kv. 6, and Valery V. Chukhno, ulitsa Darvina, 16, kv. 5, both of Kharkov, all of U.S.S.R.**

**Filed Nov. 30, 1979, Ser. No. 98,967**

**Int. Cl.³ B21B *45/00;* B21D *37/16***

**U.S. Cl. 72—197** **4 Claims**



1. A mill for making transverse deformations on a sheet metal, comprising:

at least one rolling stand having rolls with congruent lengthwise arranged forming elements;

at least one drive stand with feed rolls;

means for locally heating the sheet metal at its portions to be transversely deformed, which means includes inductors and a cam mechanism which is adapted to move the inductors up to and down from the sheet metal and is provided with a horizontal distributing shaft having cams and pushers connected to said inductors; and

a transfer mechanism operatively connecting said horizontal distributing shaft of the cam mechanism with one of the rolls of said rolling stand, and the gear ratio of the transfer

mechanism being equal to the number of the forming elements on one of the rolls of said rolling stand.

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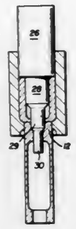
**4,292,831**

## PROCESS FOR EXTRUDING A METAL TUBE WITH INWARDLY THICKENED END PORTIONS

**Joseph A. Simon, 237 Lothrop, Grosse Pointe Farms, Mich. 48236**

**Filed Oct. 24, 1979, Ser. No. 87,717**
**Int. Cl.³ B21C** *25/08*
**U.S. Cl. 72—260** **2 Claims**



1. A process for extruding a metal tube with inwardly extending, annular, ring-like thickened end portions, comprising the steps of:

positioning a relatively short, tubular blank within an open ended, tubular die having an inlet end through which the blank is inserted and an opposite extrusion end formed by an annular, inwardly extending, continuous shoulder forming a die extrusion throat, through which the blank is extruded, with the throat diameter being larger than the inner diameter of the blank;

inserting a punch into the die inlet end, which punch has a portion closely fitted within the die and is provided with an annular shoulder for engaging against the free end of the blank, and also having a punch extension, axially aligned with the blank and die throat, with the punch extension having a series of successively smaller diameter extension portions;

arranging the largest diameter punch extension, i.e., the extension portion closely fitted within and in face to face contact with the inner wall of the blank, within the die throat while moving the punch towards the die throat so that its shoulder pushes the trailing end of the blank to thereby extrude a portion of the blank through the annular space between said larger diameter extension portion and the die throat to consequently form a relatively thin wall tube portion;

removing the punch and inserting a second blank within the die, and reinserting the punch into the die so that movement of the punch engages and pushes the trailing end of the second blank, which in turn, pushes the first, partially extruded blank through the die throat;

next, skipping the next smaller diameter punch extension portion and instead aligning the following smaller punch extension portion within the die throat while continuing to move the punch so as to extrude a portion of the blank through the annular space in the die throat formed thereby, to thereby form a thickened, ring-like formation within the interior of the tube;

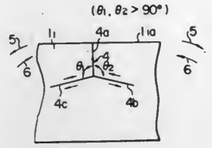
then, aligning the previously skipped extension portion within the die throat and continuing the movement of the punch to extrude a successive portion of the blank through the die throat annular space formed thereby to produce a tube wall portion of greater interior diameter than the previously mentioned thickened ring-like interior formation.

**4,292,832**

## METHOD OF PRODUCING VIBRATION ATTENUATING METALLIC MATERIAL

**Hideo Nakae, Kashiwa; Toshinori Ozaki; Takashi Shimaguchi, both of Minorimachi, and Syogo Morimoto, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 25, 1979, Ser. No. 88,142**
**Claims priority, application Japan, Oct. 27, 1978, 53-131652**
**Int. Cl.³ B21B** *1/38*
**U.S. Cl. 72—365** **9 Claims**



1. A method of producing a vibration attenuating material having a high vibration attenuating performance, said method having the steps of forming a multiplicity of grooves in the surface of a ductile raw material, and subjecting said raw material to a drawing or a rolling work thereby to form a multiplicity of fine friction interfaces in the surface region of said vibration attenuating material, wherein the improvement comprises that said vibration attenuating material is formed such that each of said friction interfaces is composed of a vertical component perpendicular to the surface of said vibration attenuating material and inclined components inclined to said surface of said vibration attenuating material.

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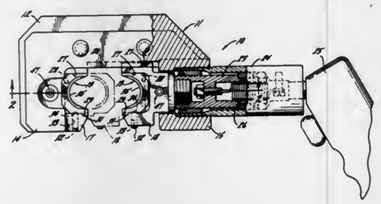
**4,292,833**

## CRIMPING TOOL

**Ellsworth W. Lapp, c/o Lapp Engineering, Inc., 4701 Hydraulic Rd., Rockford, Ill. 61109**

**Filed Jun. 22, 1979, Ser. No. 51,101**
**Int. Cl.³ B21D** *37/4*
**U.S. Cl. 72—416** **4 Claims**



1. A tool for crimping a workpiece and comprising a head having a pair of opposing die holders, means for moving one of said die holders toward and away from the other of said die holders, each of said die holders having a pocket, a first die seated within each pocket, first means for securing each first die releasably to the respective die holder, each of said first dies having a concavely curved die cavity, a second die seated within the die cavity of each first die, each of said second dies having a concavely curved die cavity for crimping said workpiece and having a convex surface adapted to be received in the die cavity of the respective first die, a pair of laterally spaced arms extending from the convex surface of each second die and straddling the respective first die, notches opening out of the free ends of said arms, and second means comprising laterally shiftable pins supported by and extending laterally of said head and adapted to be received in said notches to secure said second dies releasably to said head, the die cavities of said first dies being adapted to crimp said workpiece in the absence of said second dies.



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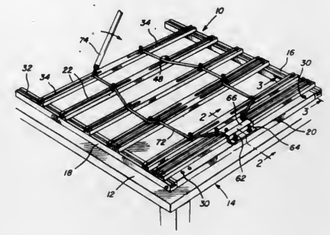
**4,292,834**

## IRREGULAR SHAPE ROD BENDING APPARATUS

**Albert Tishler; Murray Tishler; William Tishler; Irving Tishler, and Joseph Lucchesi, all of Norwalk, Conn., assignors to Norwalk Investment Club, Norwalk, Conn.**

**Filed Mar. 28, 1980, Ser. No. 135,200**
**Int. Cl.³ B21D** *7/024*
**U.S. Cl. 72—482** **10 Claims**



1. An apparatus operable to perform selected rod bending operations, said apparatus including a pair of generally parallel support members, a plurality of laterally spaced elongated transverse guide members extending between said support members, the opposite ends of said guide members and said support members including first coacting clamp and guide structure supporting said guide member ends from said support members for adjustable shifting therealong and operative to releasably anchor said guide member ends in adjusted shifted positions along said support members, at least one post for each guide member, said posts and guide members including second coacting clamp and guide structure supporting said posts from said guide members for adjustable shifting therealong and operative to releasably anchor said posts in adjusted shifted positions along said support members, said posts being disposed substantially normal to a plane paralleling said support members and guide members.

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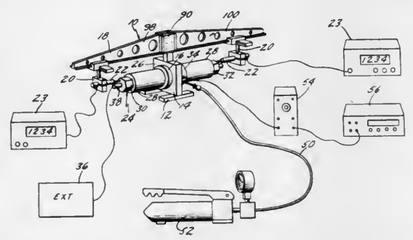
**4,292,835**

## CALIBRATION APPARATUS AND METHOD FOR STRAIN MEASURING INSTRUMENTS

**John H. Bickford, Middletown, Conn., assignor to Raymond Engineering, Inc., Middletown, Conn.**

**Filed Feb. 25, 1980, Ser. No. 124,300**
**Int. Cl.³ G01L** *25/00*
**U.S. Cl. 73—1 B** **17 Claims**



1. Apparatus for calibrating a strain measuring instrument, the calibrating apparatus including:

test stand means;

first and second probe means mounted in spaced apart relationship on said test stand means, said probe means being capable of sensing elongation of a test specimen;

mounting means in said test stand for mounting a test specimen between said first and second probe means;

load cell means mounted in said test stand for imposing a tension load on a test specimen;

load measuring cell means mounted in said test stand for sensing the load imposed on a test specimen by said load cell means; and

coupling means for coupling to a test specimen a strain measuring instrument to be calibrated.

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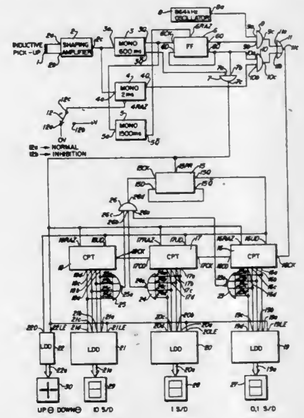
**4,292,836**

## APPARATUS FOR MEASURING THE RATE OF AN ANALOG-DISPLAY ELECTRONIC TIMEPIECE

**Fridolin Wiget, Neuchatel, Switzerland, assignor to Ebauches S.A., Switzerland**

**Filed Nov. 26, 1979, Ser. No. 97,531**
**Claims priority, application Switzerland, Nov. 24, 1978, 12063/78**
**Int. Cl.³ G04D** *7/12*
**U.S. Cl. 73—6** **4 Claims**



1. Apparatus for measuring the rate of an electronic timepiece responding to an interrogation signal by emitting a wave formed by trains of pulses, said apparatus comprising means for detecting said wave, computing means responding to said detection means and providing a representation of the rate of the timepiece, and means for displaying said representation, wherein said computing means comprises means for producing a first number of pulses representing the period of said trains of pulses, means for producing a second number of pulses representing the content of said trains of pulses, and means for combining said first and second number of pulses and providing said representation.

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**4,292,837**

## LIQUID TESTING APPARATUS

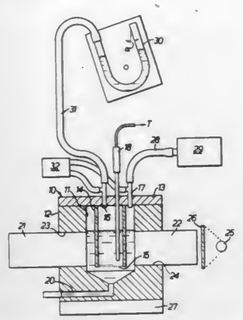
**Ronald A. Oakman, Wraysbury, near Staines, England, assignor to Stanhope-Seta Limited, Egham, England**

**Filed Feb. 4, 1980, Ser. No. 118,323**
**Claims priority, application United Kingdom, Feb. 2, 1979, 03772/79**
**Int. Cl.³ G01N** *25/12*
**U.S. Cl. 73—17 R** **9 Claims**

1. Liquid testing apparatus, comprising

(a) housing means (**10**) including separable body block and cover plate members (**12,13**) which cooperate to define a closed testing chamber (**11**), an inlet (**20**) for introducing a

quantity of the liquid to be tested into said chamber, a vertical tubular divider (**14**) suspended from said cover member and terminating at its lower end beneath the level of the liquid in the chamber, said divider dividing the upper end of said chamber into concentrically arranged inner and annular outer chamber portions, and an outlet (**17**) communicating with one of said chamber portions;



(b) means (**30**) connected with said housing means for establishing flow of the liquid along a flow path;
(c) flow restricting means (**15**) arranged in said flow path;
(d) detecting means (**32**) for detecting variations in the resistance to flow of the liquid produced by said flow restricting means; and
(e) means (**18**) for indicating the temperature of the liquid.

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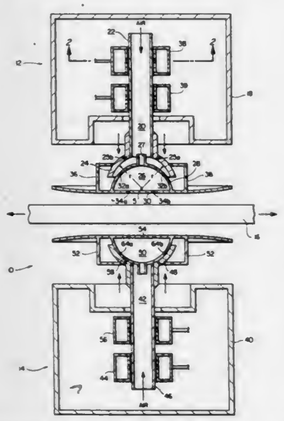
**4,292,838**
**CALIPER GAUGE FOR THE MEASUREMENT OF SHEET MEMBERS OVER A WIDE RANGE OF THICKNESSES**
**Tor G. Larsen, Saratoga, Calif., assignor to Measurex Corporation, Cupertino, Calif.**
**Filed Nov. 26, 1979, Ser. No. 97,394**
**Int. Cl.³ G01B** *13/04*
**U.S. Cl. 73—37.7** **6 Claims**



1. An apparatus for measurement of the thickness of a sheet having a portion of said apparatus to one side of said sheet and another portion of said apparatus to the other side of said sheet comprising:
a housing;
a member coupled to said housing capable of being extended in a direction substantially perpendicular to the sheet, said member including:
(i) a hollow shaft positioned to extend in the direction substantially perpendicular to the sheet;
(ii) a cup, connected to one end of said shaft which is closer to the sheet, and with the concavity of the cup facing the sheet;
(iii) said cup having a hole in line with the hollow portion of the shaft;
(iv) a body comprising a dome and a flat cover with the flat cover covering the opening of the dome, said body having an opening in said dome near the apex, a plurality of outlets in said dome and a plurality of orifices in the flat cover;
(v) means for pivotally attaching said body to said cup such that the dome of said body is inside the cup; and
fluid means capable of directing fluid through said member.

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**4,292,839**
**CROWN RELEASE PRESSURE TESTER**
**Thomas S. Hartness, Greenville, S.C., assignor to Hartness International, Inc., Greenville, S.C.**
**Filed Sep. 4, 1979, Ser. No. 71,864**
**Int. Cl.³ G01M** *3/32*
**U.S. Cl. 73—49.2** **5 Claims**

1. A crown release pressure tester for a container having a neck portion upon which said crown is placed for sealing said container, the neck portion and crown removed from said container, comprising:
an elongated housing;
an elongated bore provided in said housing;
means for securing said removed neck portion with said crown provided thereon on a top portion of said housing with the interior of said crown in communication with one end of said elongated bore and said interior of said crown and said elongated bore being sealed from the atmosphere;
a piston extending in said other end of said elongated bore;
a seal provided between said piston and housing surrounding said bore; and
means for moving said piston axially within said bore for gradually increasing the pressure on said crown for determining the pressure that said crown fails.

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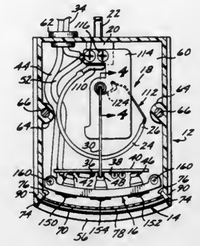
**4,292,840**
**FUEL CONSUMPTION EFFICIENCY GAUGE**
**Liem Nguyen, Garden Grove, Calif., assignor to Orion Industries, Inc., Compton, Calif.**
**Filed May 7, 1980, Ser. No. 147,397**
**Int. Cl.³ G01L** *3/26, 9/00*
**U.S. Cl. 73—115** **12 Claims**

1. A fuel consumption efficiency indicator for use with a direct current power source having d.c. terminals of opposite polarity and an internal combustion engine having a vacuum manifold with a monitoring connection thereto comprising:
a hollow, rigid casing,
a pressure gauge mounted in said casing and having a movable member responsive to pressure in said vacuum manifold to deflect in one direction responsive to pressure increases and in an opposite direction responsive to pressure decreases,
a hollow circuit leading from said pressure gauge to said monitoring connection,



an electrically conductive pointer mechanically coupled to said movable member of said pressure gauge for movement and electrically connected to a first of said opposite d.c. terminals,
a low vacuum electrical contact and a high vacuum electrical contact secured relative to said casing to transversely bracket said pointer at opposite limits of movement thereof,



a first electrically actuated illuminator coupled between a second of said opposite d.c. terminals and said low vacuum electrical contact,
a second electrically activated illuminator coupled between said second of said opposite d.c. terminals and said high vacuum electrical contact, and
a third electrically actuated illuminator and a load coupled between said second and said first d.c. terminals.

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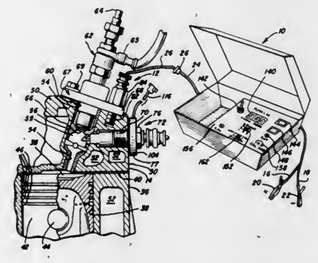
**4,292,841**
**COMPRESSION RATE ANALYZER**
**William M. Wesley, Kildeer, Ill., assignor to Creative Tool Company, Lyons, Ill.**
**Filed Jul. 11, 1979, Ser. No. 56,501**
**Int. Cl.³ G01M** *15/00*
**U.S. Cl. 73—119 A** **27 Claims**



17. A method for monitoring the performance of an internal combustion engine comprising the steps of
attaching a piezoelectric transducer to a selected cylinder to develop a signal corresponding substantially to the first derivative of the pressure within the selected cylinder,
electrically quantizing the magnitude of said transducer signal to obtain a numerical manifestation of said transducer output signal as a measure of the performance of said selected cylinder.

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**4,292,842**
**TOOL FOR TESTING EARTH FORMATIONS IN BOREHOLES**
**Bobby J. Hallmark, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.**
**Division of Ser. No. 42,431, May 25, 1979, Pat. No. 4,270,385.**
**This application May 5, 1980, Ser. No. 146,702**
**Int. Cl.³ E21B** *49/00*
**U.S. Cl. 73—155** **2 Claims**

1. A tool for testing earth formations in boreholes, comprising:
formation isolation means including hydraulically controlled extendable and retractable seal pad means and backup pad means;
first electrically powered means controllable at aboveground equipment for generating and applying setting pressure to extend and set said seal pad means and said backup pad means to accomplish isolation of the formation at the seal pad location;
means for generating first signals to be transmitted to aboveground equipment, which signals are a measure of said hydraulic pressure;
a formation fluid mini-sample chamber having variable volume, and fluid passage means for communicating between said mini-sample chamber and the formation at said seal pad location;
second electrically powered means controllable at aboveground equipment to vary at the will of an operator the volume of said mini-sample chamber;
means for generating second signals to be transmitted to aboveground equipment, which second signals are a measure of fluid pressure within said mini-sample chamber; and
means for generating third signals to be transmitted to aboveground equipment, which third signals are a measure of the volume of said mini-sample chamber.

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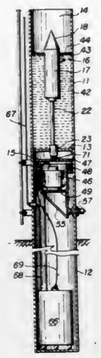
**4,292,843**
**TEMPERATURE-COMPENSATED PRECIPITATION GAUGE**
**Charles E. Luchessa, San Rafael, and Timothy E. Brown, Danville, both of Calif., assignors to Sierra Misco, Inc., Berkeley, Calif.**
**Filed Jan. 16, 1980, Ser. No. 112,654**
**Int. Cl.³ G01W** *1/14*
**U.S. Cl. 73—171** **5 Claims**

1. A precipitation gauge comprising a first cylindrical pipe, a second cylindrical pipe superimposed upon and concentric with said first pipe, said pipes meeting at a joint, said first pipe

having a water-tight compartment immediately above said joint, said first pipe having an open top admitting precipitation into said first pipe, a module in said first pipe comprising a body, a perforate bottom for said body and overflow collecting means, said overflow means comprising an inlet near the top of said body and a drain pipe receiving the liquid entering said inlet and extending through said compartment and having first coupling means at said joint, said second pipe having a tipping bucket liquid measuring member at its upper end having a top



having second coupling means cooperable with said first coupling means to secure said pipes together at said joint and also to conduct liquid into said tipping bucket member, a transmitter at the bottom of said second pipe, said tipping bucket member tipping as liquid enters same and emitting an electric signal as it tips, said transmitter emitting a radio signal dependent on the number of times said tipping bucket member tips, whereby upon uncoupling said coupling means, said first pipe may be lifted from said second pipe providing access to the contents of both said pipes.

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**4,292,844**

## TEMPERATURE DETECTING DEVICE

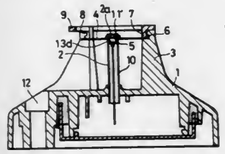
**Hiroshi Sawa, Yokohama, and Yukio Yamauchi, Kawasaki, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,527**

**Claims priority, application Japan, Apr. 11, 1979, 54-46986[U]**

**Int. Cl.³ G01K** *7/00*

**U.S. Cl. 73—359 A** **7 Claims**



1. A temperature detecting device comprising: a protective tube; heat detecting means disposed within said tube, said heat detecting means including a stem member, a semiconductor device mounted in a resin package mounted upon one side of said stem, said resin package of said semiconductor device having a relatively thin portion with respect to a semiconductor pellet within said resin package on the side disposed away from said stem and said package having a plurality of electrodes extending therefrom, and a plurality of leads extending through said stem member and being connected to said electrodes of said semiconductor device; a heat collector disposed in thermal conduct with said protective tube in the vicinity of said heat detecting device; casing means, said protective tube being mounted at the end thereof opposite said heat detecting device to said casing means, said casing means having a plurality of rib portions; and a protective member for holding said heat collector in engagement with said rib portions of said casing means.

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**4,292,845**

## CONNECTION ASSEMBLY FOR RIGID STEM DIAL GAUGE

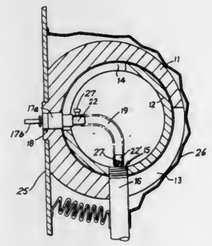
**John J. Gilbert, 98 W. Park Dr., Porthcawl, Mid Glamorgan, Wales**

**Filed Nov. 8, 1969, Ser. No. 92,474**

**Claims priority, application United Kingdom, Nov. 23, 1978, 45732/78**

**Int. Cl.³ G01K** *5/50*

**U.S. Cl. 73—362.1** **3 Claims**



1. In a rigid-stem dial gauge comprising a pointer shaft, a thermometer stem, a flexible drive member connecting said pointer shaft and said thermometer stem and a coupling assembly mounting said stem and said shaft, the improvement wherein said coupling assembly comprises an outer housing, an inner housing coaxially and rotatably mounted within the outer housing, said pointer shaft extending radially through aperture means in one of said housings and said thermometer stem extending radially through aperture means in the other of said housings, said two aperture means being in spaced relation, and an arcuate slot in each of said housings whereby the relative angular position of the housings about their common axis can be adjusted to change the angle between said stem and said shaft.

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**4,292,846**

## LIQUID PROPORTIONING CONTAINER

**Loren A. Barnett, P.O. Box 786, Grove, Okla. 74344**

**Filed Nov. 2, 1979, Ser. No. 90,877**

**Int. Cl.³ G01F** *14/00*

**U.S. Cl. 73—427** **8 Claims**

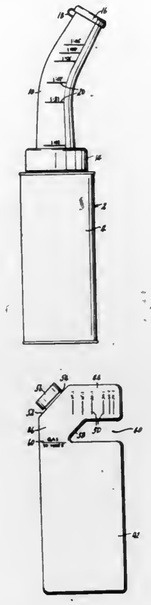
1. A liquid proportioning container comprising:

a. a main reservoir having a given capacity, and constituting a container having a pouring neck,

b. a measuring vessel calibrated to be filled with a first liquid selectively to any of a series of predetermined levels, said levels being so determined that when filled to any selected level and its contents added to a second liquid to fill said main reservoir, said first and second liquids will be mixed in proportions determined by the selected calibration of said measuring vessel, said measuring vessel constituting a



pouring spout detachably connected at one end to said neck, and



c. a cap applied removably to the outer pouring end of said pouring spout, whereby to serve as a closure for the entire container.

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**4,292,847**

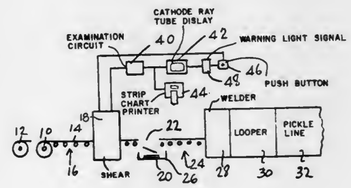
## TESTING THE MATERIAL OF A PRODUCT FOR DEFECTS THEREIN AND PROCESSING THE MATERIAL EMPLOYING SUCH A METHOD

**William H. Tait, Hamilton, Canada, assignor to Dofasco Inc., Hamilton, Canada**

**Filed Jan. 28, 1980, Ser. No. 116,122**

**Int. Cl.³ G01N** *29/04*

**U.S. Cl. 73—587** **8 Claims**




1. A method of testing a product for the presence of a defect in the material thereof, including the steps of;

(a) cutting a piece of the product;

(b) automatically detecting the noise of the cutting and producing an electric signal representative thereof; and

(c) examining the said electric signal to detect therein an acoustic component representative of a defect therein.

**4,292,848**

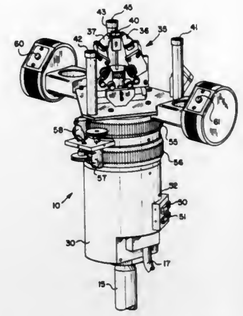
## WALKING-GATE ULTRASONIC FLAW DETECTOR

**J. Montgomery Rainey, Dayton, and Francis M. Taylor, Xenia, both of Ohio, assignors to Systems Research Laboratories, Inc., Dayton, Ohio**

**Filed Apr. 11, 1980, Ser. No. 139,537**

**Int. Cl.³ G01N** *29/04*

**U.S. Cl. 73—602** **4 Claims**



3. Apparatus for ultrasonic detection of flaws located within solid material, said apparatus including

transducer means for transmitting a beam of ultrasonic energy into the material and for receiving signals reflected from within the material, which can be positioned at various angular and positional coordinates on the surface of said material,

means for indexing said transducer over the surface of the material, such that suspected defect areas are scanned,

means for sensing the angular and positional coordinates of said transducer means referenced to said material geometry,

means for sensing reflected signals received by said transducer within a limited period of time,

means for dividing said received signals within said period of time into a plurality of equally spaced segments,

means for causing said transducer to transmit a pulse or series of pulses each time the transducer indexes,

a plurality of memory means for storing said received signals and said angular and positional coordinates,

means for adding the representations of amplitude of the received signals from said time segments in such a manner that all ultrasonic signals received during a scan which are reflected from a small specific spacial volume within the material are summed together and stored in memory,

means for interrogating said memories after said transducer has scanned the suspected flaw locations and extracting the summed flaw amplitudes and the location of such flaws referenced to the material geometry,

means for displaying and/or transmitting to external devices said summed flaw amplitudes and location.

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**4,292,849**

## METHOD FOR CORRECTING THE SENSITIVITY OF AN ELECTROMAGNETIC ULTRASONIC PROBE

**Hisao Yamaguchi, Akashi, and Kazuo Fujisawa, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Dec. 17, 1979, Ser. No. 104,462**

**Claims priority, application Japan, Mar. 28, 1979, 54-37553**

**Int. Cl.³ G01N** *29/00*

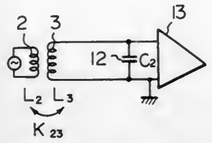
**U.S. Cl. 73—643** **1 Claim**

1. In ultrasonic flaw detection using an electromagnetic ultrasonic probe for both transmission and reception or for only reception, a method for correcting the sensitivity of the electromagnetic ultrasonic probe, comprising the steps of:

previously obtaining the relationship between resonance

frequency and transmission-reception sensitivity in the range between the maximum and the minimum lifts-off of said electromagnetic ultrasonic probe;

creating electrically a relationship therebetween having an inverse sensitivity-frequency characteristic to said relationship; and




adding said two relationships together, thereby obtaining a constant reference sensitivity;

wherein said correction of the sensitivity is performed by an amplifier which is added to a circuit on the reception side of said electromagnetic ultrasonic probe and wherein a frequency filter is disposed before said amplifier.

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**4,292,850**

**AIR PRESSURE TRANSMITTER**

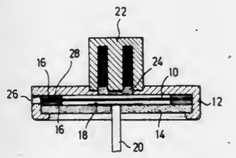
**Christian Bachem, St. Andreasberg, Fed. Rep. of Germany, assignor to Albin Sprenger KG GmbH & Co., Andreasberg, Fed. Rep. of Germany**

**Filed Jan. 23, 1980, Ser. No. 114,614**

**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903994**

**Int. Cl.³ G01L** *9/12*

**U.S. Cl. 73—702** **7 Claims**




1. An air pressure transmitter with a circular diaphragm arranged in a measuring chamber, said diaphragm being surrounded on both sides by thin layers of the air to be measured and limited by rigid walls, whereby the body of the air layers is influencing the natural frequency of the diaphragm, characterized thereby that the diaphragm (**10**) is configured as a plate of hard beaten material and at its edge is clamped between the rigid walls (**12, 14**) with distance rings (**16**) of such a thickness that the readjusting power of the air layers located within the distance rings (**16**), at atmospheric pressure will be three to ten tims more than the readjusting power of the diaphragm (**10**).

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**4,292,851**

**COPPER GRID FOR STRAIN ANALYSIS OF SHEET METAL DEFORMATION**

**Earl G. Brewer, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 4, 1980, Ser. No. 137,316**

**Int. Cl.³ G01B** *5/30*

**U.S. Cl. 73—762** **3 Claims**

3. In the method of analyzing the deformation of a noncupreous base metal sheet comprising decorating at least a portion of the sheet surface prior to deformation with a grid pattern of noncontacting uniform solid circles in a matrix, deforming the sheet, and measuring distortion in the circles, said measurement being carried out by photographing the distorted grid and analyzing the photograph with the aid of a computer, the improvement comprising

plating a thin film of metallic copper onto the portion of the sheet surface,

defining the pattern with a photoresist mask that overlies the copper film where circles are desired and exposes the copper film where the matrix is desired,

stripping the exposed copper to expose without etching the sheet surface thereunder while protecting the remaining copper with the photoresist mask,

removing the photoresist mask, whereupon the desired grid pattern is produced comprising circles formed of thin copper film and exposed sheet surface,

deforming the sheet, whereupon the copper circles are distorted, and

heating the deformed sheet in air to at least oxidize the copper to enhance the contrast between the distorted circles and the matrix and thereby produce a grid that is reliably photographable for computer analysis.

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**4,292,852**

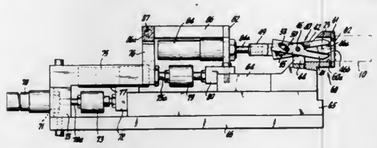
**METHOD AND APPARATUS FOR PHYSICALLY TESTING THE INTEGRITY OF THE CONNECTION BETWEEN AN ELECTRODE ASSEMBLY AND A TERMINAL CONDUCTOR OF AN ELECTROCHEMICAL CELL**

**Jesse L. Morris, Archer, Fla., assignor to General Electric Company, Gainesville, Fla.**

**Filed Jan. 30, 1980, Ser. No. 116,844**

**Int. Cl.³ G01N** *3/10*

**U.S. Cl. 73—827** **14 Claims**



13. Apparatus for physically testing the mechanical integrity of the joint formed between an electrode for an electrochemical cell and a terminal conductor mechanically attached thereto, comprising:

a first carriage having mounted thereto a restraining member, said carriage being controllably movable between a first position wherein said restraining member is remote from the electrode and a second position in which said restraining member is positioned closely adjacent the electrode so as to prevent longitudinal movement thereof;

terminal conductor grasping means operable between a conductor-engaging condition, in which said conductor is fixedly held, and a disengaged condition in which said conductor is released;

a second carriage slidably movable between a withdrawn position, in which the electrode and terminal conductor are free of said grasping means, and a longitudinally forward, operative position in which said conductor-grasping means may engage the conductor, said first and second carriage means being slidably movable independently of each other; and

first and second actuator means connected to said first and second carriages, respectively, for independently and controllably moving each thereof.



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**4,292,853**

**FLUID FLOW MEASURING APPARATUS**

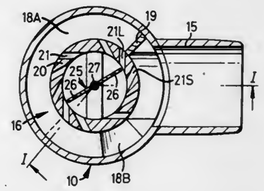
**Garnet M. E. Williams, London; Stanley P. Hutton, Southampton, and John A. Bushman, London, all of England, assignors to Ferraris Development and Engineering Co., Ltd., London, England**

**Filed Apr. 22, 1980, Ser. No. 142,803**

**Claims priority, application United Kingdom, Apr. 23, 1979, 14015/79**

**Int. Cl.³ G01F** *1/06*

**U.S. Cl. 73—861.79** **24 Claims**




1. Apparatus for measuring volume of flow of a fluid comprising a casing; a tubular stator which is housed within the casing so that the casing forms a circumferential gallery around it; inlet and outlet ports formed by the casing so that one of them communicates with the gallery and projects radially outwardly therefrom and the other one communicates with the bore of the tubular stator from which it projects axially; a rotor which is journaled within the casing for rotation within the bore of the stator coaxially therewith; oblique slots which are formed in the tubular wall of the stator so that a path for flow of fluid to be measured between the inlet and the outlet is formed by the bore of the tubular stator, the oblique slots and the gallery, the oblique slots being orientated so that fluid directed along said path forms a spirally swirling fluid flow which drives the rotor; and means by which a readout indication of the fluid flow volume is derived from rotation of the rotor; wherein the effective cross-sectional area of one of the slots differs from the effective cross-sectional area of all the other slots.

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**4,292,854**

**GYROSCOPIC APPARATUS HAVING THREE-AXIS INERTIAL PLATFORM WITH RAPID WARM-UP**

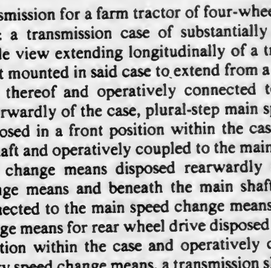
**Alan P. Liebing, West Linton, Scotland, assignor to Ferranti Limited, Cheadle, England**

**Continuation-in-part of Ser. No. 733,884, Oct. 19, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 4,871**

**Int. Cl.³ G01C** *19/30*

**U.S. Cl. 74—5.34** **6 Claims**

1. Gyroscopic apparatus which includes a platform carried in three-axis gimbal system, a shaft encoder and a torque motor connected to each axis of the gimbal system, at least one dynamically-tuned free-rotor gyro carried on the platform and having two sensitive axes, a gyro pick-off carried on each sensitive axis of the gyro, two accelerometers carried on the platform and having their sensitive axes aligned with the two sensitive axes of the gyro, resolving means responsive to the outputs of the gyro pick-off on each sensitive axis of the gyro to apply resolved signals to the gimbal torque motors as appropriate, and signal combining means operable when the gyro is running up to its normal operating speed to combine with the output of each gyro pick-off the output of the accelerometer on the other gyro sensitive axis.



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**4,292,855**

**TRANSMISSION FOR A FARM TRACTOR OF FOUR WHEEL DRIVE TYPE**

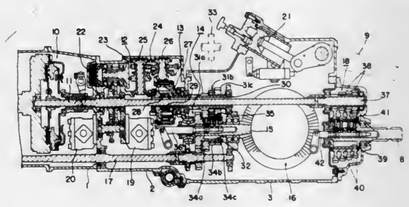
**Yoshinobu Murayama, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 909,790, May 26, 1978. This application Oct. 11, 1978, Ser. No. 950,297**

**Claims priority, application Japan, Jan. 28, 1978, 53-8646; Feb. 7, 1978, 53-13802; Feb. 7, 1978, 53-13803**

**Int. Cl.³ F16H** *37/00, 3/08, 37/08*

**U.S. Cl. 74—15.4** **6 Claims**



1. A transmission for a farm tractor of four-wheel drive type comprising: a transmission case of substantially rectangular shape in side view extending longitudinally of a tractor body, a main shaft mounted in said case to extend from a front end to a rear end thereof and operatively connected to an engine disposed forwardly of the case, plural-step main speed change means disposed in a front position within the case and above the main shaft and operatively coupled to the main shaft, auxiliary speed change means disposed rearwardly of the main speed change means and beneath the main shaft and operatively connected to the main speed change means, differential speed change means for rear wheel drive disposed in a rear and lower position within the case and operatively connected to the auxiliary speed change means, a transmission shaft for front wheel drive disposed to extend forwardly of the case from a position beneath the auxiliary speed change means and adjacent a bottom inner surface of the case and operatively connected to the auxiliary speed change means, power takeoff shaft speed change means disposed in a rear end position of the case and operatively connected to the main shaft, a hydraulic cylinder disposed in an upper rear position within the case for vertically oscillating a lift arm attached to a rear portion of said case, and a hydraulic pump disposed in a lower front position

within the case for actuating said cylinder, said hydraulic pump being operatively connected to said main shaft and utilizing lubricating oil in said case as pumping oil.

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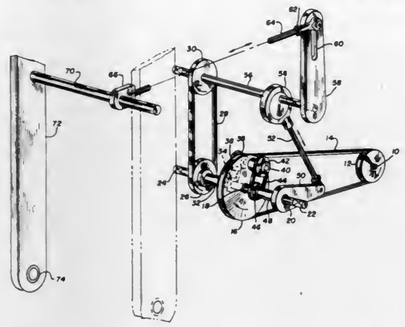
**4,292,856**

## CONTROLLED FILM ADVANCE APPARATUS WITH DIFFERENTIAL SPEED

**Joel A. Hamilton, 101 Hardenburgh, Demarest, N.J. 07627**

**Filed Jun. 20, 1979, Ser. No. 50,308**
**Int. Cl.³ F16H *21/12, 25/08***
**U.S. Cl. 74—63** **10 Claims**



1. A film advancing apparatus in which the film is moved by a pitman arm mechanism, this improvement providing drive means by which a forward and rearward motion is imparted by the pitman arm at a differential speed, the improvement including:

(a) a support means;

(b) a motor drive with the output disposed to move said pitman arm mechanism and with it a film advance apparatus with and in a back and forth motion and at a selected speed;

(c) a support shaft carried by said support means;

(d) a disk-like driven member carried by bearing means and rotatable on said support shaft, this driven member movable at a reduced speed and operatively connected to the output of said motor drive;

(e) a short shaft carried by and in a web portion of said disk-like driven member;

(f) at least two substantially circular drive means carried on said short shaft and providing at least first and second drive means;

(g) a first circular driven means carried by first sleeve means rotatable on said support shaft and means for positively driving the first driven means by the first drive means;

(h) a second circular driven means carried by second sleeve means rotatable on said support shaft and means for positively driving said second driven means by said second drive means;

(i) a crankshaft supported by bearing means carried by the support means, said crankshaft carrying and moving said pitman arm;

(j) an eccentric carried by and secured to the crankshaft, said eccentric rotatably carrying a strap means thereabout;

(k) means for rotating said crankshaft by rotative forces derived from one of the circular driven means, and

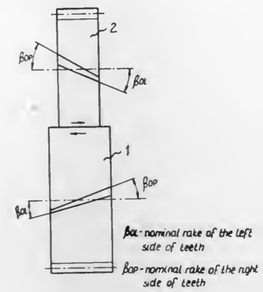
(l) an arm having one end operatively connected to the other circular driven means and the other end operatively connected to the eccentric by the strap means, the movement of the crankshaft by said means for rotating causing the eccentric to move said arm to thereby speed up and then slow down the speed of revolution of the crankshaft.

**4,292,857**

## CYLINDRICAL GEAR WITH HELICAL TOOTH WHEELS

**Zbigniew Matusz, Warsaw, Poland, assignor to Fabryka Obrabiarek Precyzyjnych "Ponar-Pruszkow" Zaklad "1 Maja", Pruszkow, Poland**

**Filed Sep. 25, 1978, Ser. No. 946,207**
**Claims priority, application Poland, Sep. 29, 1977, 201125**
**Int. Cl.³ F16H *55/08***
**U.S. Cl. 74—466** **3 Claims**




1. A gear train comprising first and second cylindrical gears having helical teeth, each tooth having left hand and right hand sides with respective different pitch diameters, the teeth of the first and second gears having different nominal angles of inclination and different mesh correction for the left hand and right hand mating flanks of conjugate teeth whereby within the normal module range of 2 to 6 mm, corresponding to the normal pitch range of $2\pi$(mm) to $6\pi$(mm), and pitch diameters up to 500 mm, tooth convergencies up to 3° are provided, the addendum modification coefficient value not exceeding 0.8.

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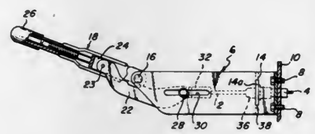
**4,292,858**

## BRAKE CABLE OPERATING MEANS OF THE OVERCENTER TOGGLE TYPE

**Eugene C. Lipshield, Moberly, Mo., assignor to Orscheln Brake Lever Mfg. Co., Moberly, Mo.**

**Division of Ser. No. 806,963, Jun. 16, 1977, Pat. No. 4,127,042.**
**This application Aug. 28, 1978, Ser. No. 937,539**
**Int. Cl.³ F16C *1/10*; G05G *1/04***
**U.S. Cl. 74—501 R** **3 Claims**



1. In a brake cable operating device for operating a coaxial brake cable assembly having a tubular outer sheath member, and an inner cable member axially displaceable within said outer sheath member, said operating device including mounting plate means adapted for connection with a fixed support, said mounting plate means including a pair of spaced parallel mounting plates; anchor means rigidly connecting one end of the outer sheath member between said plates at one end of said mounting plate means, thereby to prevent axial displacement of said outer sheath member relative to said mounting plate means, said inner cable member extending axially beyond said outer sheath member and through said anchor means into the space between said plates; guide means connecting one end of the inner cable member with said mounting plate means for linear axial displacement relative to said outer sheath member; and an operating lever pivotally connected at one end about a pivot axis with the other end of said mounting plate means, the pivot axis of said operating lever being normal to said plates; and a connecting link pivotally connected at opposite ends about pivot axes with an intermediate portion of said lever and with the one end of said inner cable member, respectively, the pivot axes of said connecting link being parallel with the pivot axis of said operating lever; the improvement wherein said anchor means comprises a first pair of coplanar tab portions bent inwardly from, and extending normal to, said mounting plates, respectively, each of said tab portions extending from the associated mounting plate transversely across the space between said mounting plates and including at its free end a projection that extends within a corresponding opening contained in the other mounting plate, thereby to maintain said mounting plates in spaced relation, said tab portions having adjacent parallel edges containing aligned recesses that define an opening (**240**) in which the end of the associated outer cable sheath is mounted.



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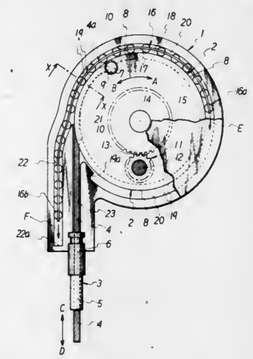
**4,292,859**

## STEERING DEVICE

**Makoto Teraura, Takarazuka, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,231**
**Claims priority, application Japan, Jan. 24, 1979, 54-7962**
**Int. Cl.³ F16C *1/18***
**U.S. Cl. 74—501 R** **3 Claims**



1. In a steering device having a disc drive member rotatably mounted in a casing and an expansion and contraction-durable, flexible inner wire one end of which is fastened to an outer peripheral surface of said drive member, said device being improved in that

(a) said inner wire is fitted into an annular groove provided in the outer peripheral surface of said drive member,

(b) a series of bearings located or pivoted by a proper length of a flexible separator is interposed in a gap between the outer peripheral surface of said drive member and an inner surface of said casing,

(c) one end of the series of bearings is at substantially the same position as the fastening position of said inner wire, when the inner wire is completely wound in said groove about said drive member,

(d) the other end of the series of bearings is able to enter into a guide path which is provided in said casing so that the series of bearings separates from said inner wire near a tangential contact position of the inner wire with said drive member, and

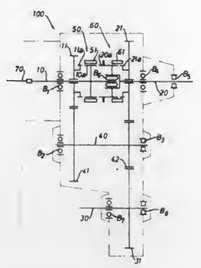
(e) the series of bearings is provided with an engaging means at its one end, said engaging means being able to engage with a further engaging means provided on said one end of the inner wire or said drive member at least in the direction of winding the inner wire.

**4,292,860**

## TRANSFER DEVICE ASSOCIATED WITH POWER TRANSMISSION

**Hiroyoshi Kako, and Hajime Arai, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Dec. 1, 1978, Ser. No. 965,335**
**Claims priority, application Japan, Apr. 20, 1978, 53-47335**
**Int. Cl.³ F16H *3/08, 37/06*; B60K *17/34***
**U.S. Cl. 74—665 GA** **2 Claims**



1. In a transfer device associated with a power transmission unit for an automotive vehicle, comprising:

an input shaft for connection to an output shaft of said transmission unit;

a first output shaft rotatably coupled at the inner end thereof with said input shaft;

a countershaft arranged in parallel with said input and first output shafts and being integrally provided with low and high speed counter-gears;

a second output shaft arranged in parallel with said countershaft and being integrally provided with an output gear meshing with said high speed counter-gear;

a low speed drive gear rotatable on said input shaft and being in mesh with said low speed counter-gear; and

a high speed drive gear rotatable on said first output shaft and being in mesh with said high speed counter-gear, said high speed drive gear having the same number of teeth as those of said output gear;

the improvement comprising:

first and second selector gear units arranged adjacent to each other on a common axis between said low and high speed drive gears, said first selector unit being mounted on said input shaft for selectively connecting said input shaft to said low speed drive gear or to said first output shaft; and said second selector gear unit being mounted on the inner end of said first output shaft for connecting said high speed drive gear to said first output shaft to provide four wheel drive and for disconnecting said high speed drive gear from said first output shaft to provide two wheel drive.

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**4,292,861**

## EARTH SELF-ORIENTING APPARATUS

**John Thornhill, Jr., Tewksbury, and Richard B. Elder, Acton, both of Mass., assignors to RCA Corporation, New York, N.Y.**

**Filed Apr. 25, 1979, Ser. No. 33,266**
**Int. Cl.³ B23Q *17/00***
**U.S. Cl. 74—813 R** **19 Claims**

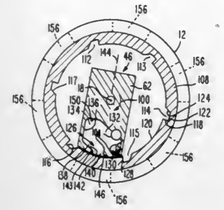
1. An earth self-orienting apparatus, comprising:

a body including a plurality of spaced elements lying in a plane at least one of which corresponds to a predetermined orientation of said body with respect to the earth regardless the orientation of the body with respect to earth, said body including means for orientating said body about an axis approximately normal to the force of gravity,

a member to be oriented to said predetermined orientation

rotatably mounted to said body for rotation in said plane including locking means having a first neutral position on said member as it rotates and a second locking position which when engaged with any of said elements locks said member to said body in accordance with the orientation of that element, said locking means including means responsive to the earth orientation of said member for causing said locking means to move from said first to said second positions in response to the force of gravity and engage said at least one element and thereby lock said member to said body in said predetermined orientation, and

means for rotating said orientating member with respect to said body.



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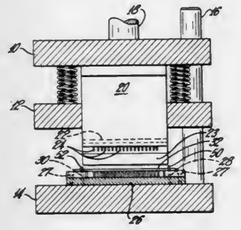
**4,292,862**

## METHOD AND APPARATUS FOR PRODUCTION OF A STREAM FEEDER

**Thomas K. Thompson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Sep. 12, 1979, Ser. No. 74,585**
**Int. Cl.³ B21K** *5/20*
**U.S. Cl. 76—4** **5 Claims**



1. A method of producing a stream feeder for flowing streams of molten mineral material from which filaments are attenuated comprising:

a. providing two round locating pins;

b. providing a workpiece which has two rows of locating holes wherein one row has round holes adapted to fit snugly around one of the round locating pins and the other row has elongated holes, the elongated holes being adapted to accommodate for the stretching of the workpiece between the rows of locating holes from formation of orificed projections;

c. locating the workpiece such that one of the pins enters a first locating hole of one row and the other pin enters first locating hole of the other row;

d. forming a first row of orificed projections in the workpiece between the first locating hole of the one row and the first locating hole of the other row;

e. subsequently locating the workpiece such that the pin enters a second locating hole of the one row and the other pin enters a second locating hole of the other row; and

f. forming a second row of orificed projections in the workpiece between the second locating hole of the one row and the second locating hole of the other row.

4. Apparatus for producing a stream feeder for flowing streams of molten mineral material from which filaments are attenuated comprising:

a. two round locating pins;

b. means for locating a workpiece having two rows of locating holes such that one of the pins enters a first locating hole of one row and the other pin enters first locating hole of the other row, one row having round holes adapted to fit snugly around one of the round locating pins and the other row having elongated holes, the elongated holes being adapted to accommodate for the stretching of the workpiece between the rows of locating holes from the formation of orificed projections;

c. means for forming a first row of orificed projection in the workpiece between the first locating hole of the one row and the first locating hole of the other row;

d. means for subsequently locating the workpiece such that one of the pins enters a second locating hole of the one row and the other pin enters a second locating hole of the other row; and

e. means for forming a second row of orificed projections in the workpiece between the second locating hole of the one row and the second locating hole of the other row.

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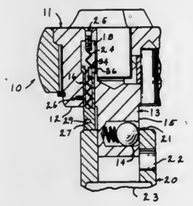
**4,292,863**

## AUTOMATIC SOCKET EJECTOR

**Jack L. Hickman, 1809 Plaza Way, Walla Walla, Wash. 99362**

**Continuation-in-part of Ser. No. 119,932, Feb. 8, 1980, abandoned. This application Aug. 5, 1980, Ser. No. 175,431**
**Int. Cl.³ B25B** *13/58*
**U.S. Cl. 81—184** **10 Claims**



1. In a tool for engaging interchangeable sockets each having a drive end with a polygonal drive opening and a working end with a socket opening;

a body having an outer face and an integral drive fitting projecting outward from said face, said drive fitting being complementary to the drive opening of a socket and being formed about a center axis;

an ejector pin having an inner end and an opposed outer end, said ejector pin being slidably mounted within the body for relative movement parallel to said axis between a retracted position wherein its outer end is adjacent said face and an extended position wherein its outer end protrudes outward from said face at a location alongside the drive fitting;

biasing means operably connected between the body and the ejector pin for urging said ejector pin to its extended position;

and latch means movably mounted on the body and operably engageable with the ejector pin when said pin is in its retracted position for normally retaining the ejector pin in the retracted position when a socket is mounted on the drive fitting; said latch means being manually actuable for selectively disengaging the ejector pin to permit said pin to move to its extended position by operation of said biasing means.

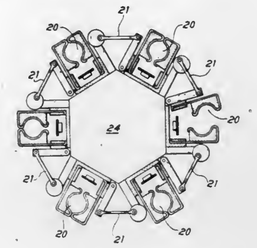


**4,292,864**

## AUTOMATIC MAGAZINE AND FEEDER FOR AUTOMATIC MULTI-MANDREL LATHE

**Pietro Cucchi, and Giovanni Cucchi, both of Bussero, Italy**

**Filed Oct. 3, 1979, Ser. No. 81,445**
**Claims priority, application Italy, Oct. 5, 1978, 28441 A/78; Mar. 16, 1979, 21041 A/79; Sep. 12, 1979, 25656 A/79**
**Int. Cl.³ B23B** *13/00, 25/00*
**U.S. Cl. 82—2.7** **5 Claims**



1. An automatic feeder for a multi-mandrel lathe having as many channels as said lathe has mandrels, wherein: each of said channels comprise, a fixed channel forming element (3) and a movable channel forming element (4); each of said elements (3), (4) is modular being mechanically and functionally interchangeable with one other; further, each of said elements comprise a covering part formed of harmonic steel (25) stiffened with a continuous desounding dampening bar (27) of an elastomer.

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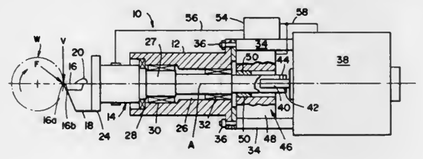
**4,292,865**

## TOOL HOLDER FOR VARYING TOOL RAKE ANGLE

**Chunghorng R. Liu, 765-8 San Antonio Rd., Palo Alto, Calif. 94303; Jnaneshwar H. Nayak, Stanford, Calif.; Herbjorn Stenberg; Felipe J. Huerta, both of Palo Alto, Calif., and Woodrow A. Hall, San Jose, Calif., assignors to Chunghorng R. Liu, West Lafayette, Ind.**

**Continuation of Ser. No. 824,530, Aug. 15, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 101,980**
**Int. Cl.³ B23B** *29/12*
**U.S. Cl. 82—36 R** **2 Claims**



1. Apparatus for removing material from a workpiece with a cutting member having a rake face and a cutting tip, the rake face and a line perpendicular to the relative movement of the workpiece and the cutting member forming a rake angle, comprising:

(a) rotatable means for holding the cutting member;

(b) means for rotating said rotatable holding means to change the rake angle; and

(c) brake means for releasably gripping said rotatable holding means to securely hold the cutting member when removing the material from the workpiece, including an energizable coil and brake pads movable in response to energization of said coil.

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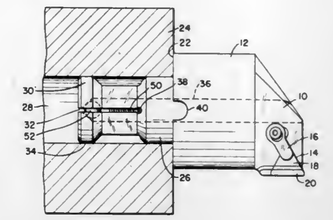
**4,292,866**

## TOOLHOLDER WITH EXPANSIBLE SHANK

**Thomas E. Kaczynski, Willoughby, Ohio, assignor to Kennametal Inc., Latrobe, Pa.**

**Filed Jan. 10, 1980, Ser. No. 111,128**
**Int. Cl.³ B23B** *29/00, 5/22;* **B26D** *1/12*
**U.S. Cl. 82—36 R** **11 Claims**



1. A toolholder comprising: a tool body having an insert seat thereon and having an abutment surface thereon for abutting a tool support member and with means thereon to keep said tool body nonrotational with respect to the tool support member; expansible shank connected to said tool body and said expansible shank receivable in a bore of a tool support member; reciprocally movable means comprising a convex abutment surface for expanding said expansible shank so as to lock said shank in the bore of the tool support member.

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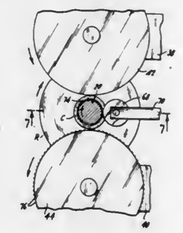
**4,292,867**

## APPARATUS AND METHOD FOR SLITTING ELONGATED ROLLS OF MATERIAL

**Carl A. Stoffels, Flemington, and Nicholas J. Genovese, Union, both of N.J., assignors to Judelshon Industries Division, John Dusenbery Co., Inc., Randolph, N.J.**

**Filed Nov. 6, 1979, Ser. No. 91,697**
**Int. Cl.³ B23B** *1/00, 7/00, 3/04*
**U.S. Cl. 82—47** **25 Claims**



1. A method of slitting elongated rolls of web material rolled upon a tubular core comprising the steps of:

(a) rotating a web of material rolled upon a tubular core about an axis of said core;

(b) cutting through said web of material with a rotating circular knife blade moving transversely to said axis of said core in a cutting plane;

(c) simultaneously sawing through said web of material with a powered rotary circular saw blade moving transversely to said axis of said core through a plane common with said cutting plane;

(d) cutting through said core with a rotating core cutting knife moving through said cutting plane subsequent to said simultaneous cutting and sawing through said web material.

**4,292,868**

## TEXTILE SPOOLING MACHINE, AN APPARATUS AND METHOD TO PREVENT THE FORMATION OF LOOSE CUT THREAD PIECES

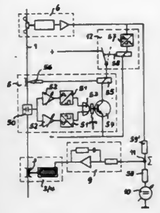
**Hermann Werffeli, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland**

**Filed Feb. 27, 1980, Ser. No. 125,137**

**Claims priority, application Switzerland, Mar. 8, 1979, 2243/79**

**Int. Cl.³ B65H** *63/02, 63/06*

**U.S. Cl. 83—13** **7 Claims**



1. In a spooling machine, a method to prevent formation of stray cut filament pieces, wherein the filament is spooled with controlled tension from a payout spool (**2**) to a takeup spool (**8**), and which includes sensing means (**50**) and a thread cutting apparatus (**56**) positioned in the path of the thread from the payout spool to the takeup spool, and responsive to an "off-size" signal to sever the thread if an "off-size" signal is sensed.

which comprises, in accordance with the invention, the steps of

sensing thread tension and deriving a tension signal;

and inhibiting application of the "off-size" signal to the thread cutting apparatus (**56**) upon failure to sense the tension signal, to prevent cutting of thread which has broken, resulting in failure of filament tension, regardless of the presence of an "off-size" signal from the thread size sensing means (**5**).

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**4,292,869**

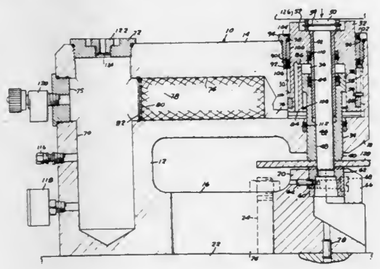
## UNITARY PUNCH AND DIE ASSEMBLY

**Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124**

**Filed Apr. 18, 1980, Ser. No. 141,678**

**Int. Cl.³ B21D** *45/00;* **B26D** *7/00;* **B26F** *1/00*

**U.S. Cl. 83—137** **18 Claims**



1. A unitary punch and die assembly comprising a generally C-shaped holder having a pair of vertically opposed jaws at one side thereof, the lower jaw having a die button secured thereon, the upper jaw having a vertical bore therein defining a main cylinder the lower end portion of which is adapted to be connected to a source of gas under pressure, said upper jaw having a smaller diameter bore concentric with the main cylinder and extending downwardly from the lower end of the main cylinder through the lower end of said upper jaw, a main piston arranged for vertical sliding movement in said main cylinder and projecting upwardly through the upper end thereof, a punch secured to said main piston to move vertically therewith and extending downwardly through said main piston and said smaller bore in vertical alignment with said die button, said main piston having a vertical bore on the under side thereof which defines an auxiliary cylinder, a hold down sleeve slideably arranged on said punch and extending downwardly through said main cylinder and said smaller bore, the upper end of said hold down sleeve forming an auxiliary piston slideably arranged within said auxiliary cylinder, said auxiliary piston having an outer diameter larger than the outer diameter of the lower end portion of the sleeve so that the sleeve is biased upwardly on the punch by the pressure of the gas acting against the under side of the auxiliary piston, means acting between the main piston and said hold down sleeve and biasing said sleeve downwardly on the punch with a force greater than that exerted against the under side of the auxiliary piston by the gas pressure in said cylinder such that the lower end of the sleeve normally extends downwardly below the leading end of the punch, interengageable abutment means on said main and auxiliary piston for limiting the extent of downward movement of said sleeve relative to the punch and for lifting the sleeve with the punch when the abutments are interengaged whereby, when a downward force is applied to the upper end of the punch which is of sufficient magnitude to overcome the pressure exerted by the gas against the under side of the main piston, the punch and sleeve descend as a unit until the lower end of the sleeve engages and clamps a workpiece down on said die button and, thereafter, the punch continues to move downwardly to punch the workpiece and when said downward force on the upper end of the punch is relieved, the pressure of the gas in said main cylinder raises the punch and, upon interengagement of said abutments, lifts the hold down sleeve with the punch.

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**4,292,870**

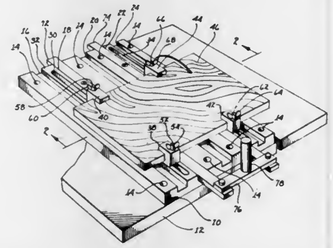
## GUIDE PLATE FOR WOOD WORKING TOOLS

**John E. Mericle, 2202 Torrey Pines, Tucson, Ariz. 85710**

**Filed Mar. 25, 1980, Ser. No. 132,506**

**Int. Cl.³ B27B** *5/18*

**U.S. Cl. 83—471.2** **10 Claims**



1. Apparatus for working a true line in a workpiece with a tool, said apparatus comprising in combination:

(a) a guide plate defining an upper plane for guiding relative movement between the workpiece and the tool, said guide plate including a plurality of parallel channels and a slot disposed in each of at least two of said channels;

(b) a pair of tracks for slidably engaging two slotted ones of said channels;

(c) means for interconnecting said tracks to preclude relative movement therebetween;

(d) means for suspending the tool and an attached working member from said pair of tracks through said slots to locate the working member in penetrable relationship with the upper plane for working the workpiece;

(e) means for interconnecting said suspending means and said tracks to obtain translatory movement of the tool commensurate with translatory movement of said interconnecting means; and

(f) means for positioning and maintaining the workpiece in fixed relationship to said guide plate and in interfering relationship to the working member;

whereby, upon translation of said pair of tracks under urging by said interconnecting means the working member of the tool works the workpiece along a true line with a precision commensurate with the degree of fit of said pair of tracks in said channels.



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**4,292,871**

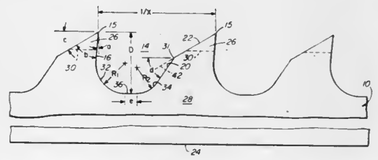
## WELDED EDGE BAND SAW TOOTH GEOMETRY

**Tom A. Neumeyer, and Francis W. Foster, both of Athol, Mass., assignors to The L. S. Starrett Company, Athol, Mass.**

**Filed Feb. 1, 1979, Ser. No. 8,755.**

**Int. Cl.³ B27B** *33/02;* **B23D** *61/12*

**U.S. Cl. 83—661** **10 Claims**



1. In a welded edge band saw blade for high speed, heavy duty cutting, said blade having a tooth structure wherein

each tooth has a substantially triangularly-shaped tip portion of a high hardness, high strength material welded along a plane parallel to the direction of blade movement to a band base of strong, flexible material, and

at least some of said teeth have a positive rake angle,

the improvement wherein at least some of said teeth with said positive rake angle have

a rake angle of between about 4° and 7°,

a wedge angle between about 53° and 61°,

a first relief surface having a first relief angle between about 25° and 31°, said first relief surface lying in a plane substantially normal to lateral sides of said tip portion, and

a second relief angle of between about 50° and 60° defining in part an associated gullet space which extends in part beneath a reference line extending from a tooth apex at said first relief angle, said gullet space having a configuration for promoting the formation of a curled chip in said gullet during metal cutting.

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**4,292,872**

## APPARATUS FOR PERFORATING HOLLOW CYLINDERS

**Reiner G. Brinker, Mechanicsville, Va., assignor to Philip Morris Incorporated, New York, N.Y.**

**Filed Nov. 21, 1979, Ser. No. 96,432**

**Int. Cl.³ B26F** *1/24*

**U.S. Cl. 83—866** **2 Claims**

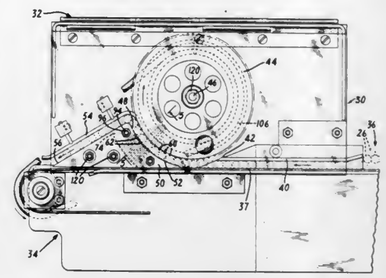
1. Apparatus for perforating a hollow cylinder of relatively rigidized paper with a plurality of axially spaced circumferentially extending rows of perforations, said apparatus comprising

a rotary drum,

a rolling shoe disposed adjacent said drum and having a concave rolling surface spacedly juxtaposed with the periphery of said drum to define therewith an arcuate sectional passage of fixed dimension through which a hollow paper cylinder can be advanced in a sideways travel thereof, from an entry end of said passage toward an exit end of said passage,

first needle perforating means comprising a plurality of needles carried in the rolling surface of said rolling shoe, and

second needle perforating means comprising a plurality of needles carried on the periphery of said rolling drum, rotation of said rotary drum effecting rolling of the paper cylinder along said rolling surface and perforation thereof by both said needle perforating means, the positioning of the first needle perforating means being staggered axially of the hollow cylinder with respect to the positioning of the second perforating means whereby the perforations



formed in adjacent ones of the rows of perforations are produced at opposite sides of said passage, said rolling shoe comprising an assembly of side-by-side arranged plates each having an edge surface alignable with like surfaces of the other plates to define the shoe rolling surface, each needle of the first needle plurality being received in a bore carried in the meeting surfaces of adjacent pairs of said plates, and biasing means urging each plate into side face-to-face contact with an adjacent plate for fixedly securing the needles in their respective bores.

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**4,292,873**

## ELECTRONIC MUSICAL INSTRUMENT

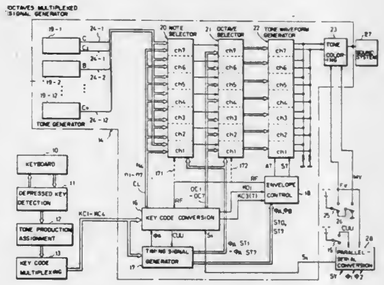
**Takatoshi Okumura; Seiya Hamada, and Akio Imamura, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Dec. 10, 1979, Ser. No. 101,904**

**Claims priority, application Japan, Dec. 12, 1978, 53/154411**

**Int. Cl.³ G10H** *1/057, 5/00*

**U.S. Cl. 84—1.01** **9 Claims**



1. An electronic musical instrument comprising:

keys for playing notes of the instrument:

a key detection circuit for producing per each of depressed ones of said keys a key identifying signal which represents a name of the key and a key-on signal which represents an on-off state of the key;

a tone generator circuit for generating musical tone signals each with a respective amplitude envelope and respectively corresponding to the key identifying signals;

a key on-off memory circuit for receiving said key-on signal and storing the on-off state of said key;
a key-on pulse generation circuit for generating a key-on pulse at the beginning of the key depression;
a counter which starts counting upon receipt of said key-on pulse;
a control circuit for generating a control signal which controls the start of said amplitude envelope in response to a count value of said counter and on condition that said key on-off memory circuit stores an on-state of the key;
a key-off pulse generation circuit for generating a key-off pulse at the beginning of a release of the depressed key, said counter being reset and its counting started again by this key-off pulse;
a release finish signal generated circuit for generating a release finish signal when the count valve of said counter has reached a preset value on condition that said key-on memory circuit stores an off-state of the key; and
a prevention circuit for preventing, responsive to said release finish signal, generation of said musical tone signal corresponding to the key which has caused the key-off pulse to be generated.

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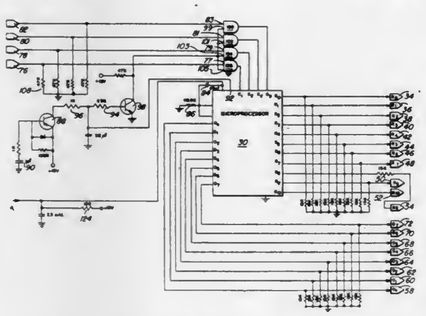
**4,292,874**

## AUTOMATIC CONTROL APPARATUS FOR CHORDS AND SEQUENCES

**Edward M. Jones, Cincinnati, Ohio, and Carlton J. Simmons, Jr., Florence, Ky., assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio**

**Filed May 18, 1979, Ser. No. 40,107**
**Int. Cl.³ G10H** *1/38, 1/42*
**U.S. Cl. 84—1.03** **40 Claims**



1. In an electronic musical instrument, an automatic rhythm generating device for generating selectable rhythm patterns of musical tones comprising:
an array of playing keys;
a plurality of rhythm switches for selecting rhythm patterns of tones, each rhythm switch in said plurality of rhythm switches corresponding to a rhythm pattern of tones and being operable to select the corresponding rhythm pattern;
rhythm counter means for providing timing signals to control the timing of the beats of the rhythm patterns generated by the automatic rhythm generating device;
memory storage means in which is stored binary data for each beat of each rhythm pattern, said binary data for each beat including trigger signal data indicating whether a trigger signal is required by each rhythm pattern and frequency deviation data indicating the value of the frequency deviation for the tone specified by each selectable rhythm pattern;
logic control circuit means responsive to the timing signals from said rhythm counter means for selecting said trigger signal data from said memory storage means in accordance with a rhythm pattern selected by operation of a rhythm switch in said plurality of rhythm switches and for providing a trigger signal during the depression of a playing key during each beat on which a tone is specified by a selected rhythm pattern, and for selecting from said memory storage means in accordance with a selected rhythm pattern the frequency deviation data corresponding to each beat on which a tone is specified by a selected rhythm pattern;
programmable signal generator means responsive to the actuation of a playing key in said array of playing keys and to said frequency deviation data selected by said logic control circuit means for generating a tone signal of a frequency related to the frequency of the actuated playing key by the frequency deviation value selected by said logic control circuit means for a selected rhythm pattern;
gating means for receiving said tone signal from said programmable signal generator means and for receiving said trigger signal from said logic control circuit means, said gating means passing said tone signal in response to the receipt of said trigger signal; and
audio output means for receiving said tone signal passed by said gating means, said audio output means converting said tone signal into an audible tone.

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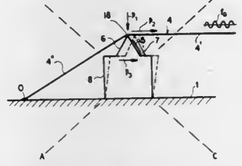
**4,292,875**

## STRAIN-GAUGE SOUND PICKUP FOR STRING INSTRUMENT

**Carl-Ernst Nourney, Am Wagenrast 6, D 4000 Düsseldorf 12, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 935,916, Aug. 23, 1978, Pat. No. 4,228,715. This application Mar. 27, 1980, Ser. No. 134,622**
**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738256**
**Int. Cl.³ G10H** *3/18*
**U.S. Cl. 84—1.14** **9 Claims**



1. A musical instrument comprising:
an instrument body;
a plurality of strings anchored under tension to said body while extending with major portions of their length in a plane generally parallel to a surface of said body;
support means on said surface holding said strings separated from said body, said support means including a plurality of webs of hard elastic material engaged by respective strings under a pressure transverse to said plane, said webs being free to vibrate in a direction parallel to said major portions in response to changes in the effective lengths of the respective strings; and
transducer means for converting vibrations of said strings into electrical signals, said transducer means including a plurality of strain gauges respectively disposed on said webs with a direction of maximum sensitivity inclined to said plane at an acute angle.

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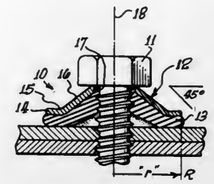
**4,292,876**

## WASHER

**Henry R. De Graan, 20520 Walnut Ave., Walnut, Calif. 91789**

**Filed Aug. 2, 1979, Ser. No. 63,269**
**Int. Cl.³ F16B** *43/00*
**U.S. Cl. 411—542** **6 Claims**

1. An improved steel and neoprene bonded washer of the type having a crowned steel washer having an elastomeric washer adjacent the concave surface of the crowned washer, wherein the improvement comprises:
a steel washer having a generally flat outer ring and a conical portion extending from the flat outer ring to an opening at the center thereof, the angle of the sides of said conical portion being between 30° and 50°, said conical portion meeting the undersurface of the head of the screw



with which it is used at an angle of between 30° and 50°, and wherein the flat portion is between 15% and 33% of the outside diameter of the washer; and
an elastomeric washer bonded to the concave surface of the steel washer, said elastomeric washer having an outside diameter which extends under a portion of said flat outer ring.

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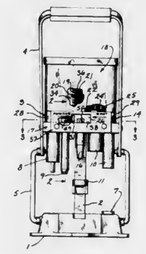
**4,292,877**

## AMMUNITION LOADER WITH IMPROVED CHARGE BAR

**Richard J. Lee, Highway "U", Hartford, Wis. 53027**

**Filed Oct. 21, 1976, Ser. No. 734,397**
**Int. Cl.³ F42B** *33/02*
**U.S. Cl. 86—31** **14 Claims**



1. In an ammunition loader:
(a) a head member having a feed opening therein,
(b) a hopper for containing shell loading material and with said hopper having a discharge opening disposed above said head member,
(c) a movable charge bar disposed between said feed opening and said discharge opening and with said charge bar having a passage adapted to selectively receive shell loading material from said discharge opening and to transfer said material to said feed opening,
(d) a sizing and material metering bushing adapted to be removably disposed in said passage; said bushing being adapted to receive, hold and discharge shell loading material therefrom,
(e) and means for spilling said shell loading material out of said passage when said bushing is not disposed in the latter,
(f) said material spilling means comprising a leakage opening communicating between said passage and the outside of said charge bar, said leakage opening being blocked by said bushing when the latter is disposed in said passage.

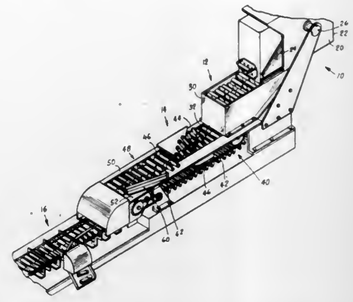


**4,292,878**

## AMMUNITION ORIENTATION MECHANISM

**George D. Brooks, Burlington, and Donald J. Bushey, Sr., Milton, both of Vt., assignors to General Electric Company, Burlington, Vt.**

**Filed Aug. 24, 1979, Ser. No. 69,461**
**Int. Cl.³ F42B** *39/10*
**U.S. Cl. 86—48** **2 Claims**



1. An ammunition handling system for a plurality of fixed cased rounds of ammunition, each round having a center of gravity which is spaced a first distance from a first end thereof and a second distance from the second end thereof, the first distance being greater than the second distance, each said round having a removable sleeve disposed on a portion thereof adjacent one of said ends, said system comprising:
a longitudinally advancing endless conveyor having an upper flight having a train of transversely elongated, open top and bottom passageways, each passageway for receiving through its open top a respective round of ammunition in either of a first or second end to end orientation, and for discharging through its open bottom such round of ammunition;
a table surface disposed under said upper flight for precluding the discharge through said open bottoms of said passageways the rounds of ammunition respectively received therein;
a longitudinally extending recess in said table surface having a floor surface disposed below said table surface and so located transversely, that when a round of ammunition is in a passageway passing over said recess and in said first orientation, its respective center of gravity lies over said recess, thereby causing said second end of such round of ammunition to tilt downwardly into said recess while such round of ammunition is advancing longitudinally with said passageway, and when a round of ammunition is in a passageway passing over said recess and in said second orientation, its respective center of gravity lies over said table surface, thereby causing such round of ammunition to remain undisturbed while such round of ammunition is advancing longitudinally with said passageway;
a cam surface extending progressively longitudinally and transversely adjacent said conveyor for engaging in sequence any upwardly projecting of said first ends of any rounds of ammunition which have their said second ends tilted downwardly into said recess to shift the angle of tilt beyond the perpendicular, whereby to change the orientation of such round of ammunition within its respective passageway;
a ramp surface providing a continuum between said floor surface and said table surface disposed adjacent said conveyor longitudinally downstream of said cam surface, for engaging in sequence any downwardly tilted said second ends of rounds of ammunition for restoring in sequence such rounds of ammunition back into their respective passageways; and

sleeve removing means disposed downstream of said ramp surface for automatically removing the sleeve from each round of ammunition in sequence.

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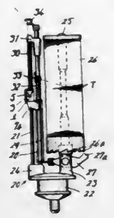
**4,292,879**

## HOOK ASSEMBLY FOR SPRING TENSION CARRIER IN BRAIDING MACHINE

**Shusuke Kokubun, Shizuoka, Japan, assignor to Kokubun Inc., Shizuoka, Japan**

**Filed May 12, 1980, Ser. No. 149,055**
**Int. Cl.³ D04C *3/18*; B65H *59/04***
**U.S. Cl. 87—57** **9 Claims**



1. In a spring tension carrier for a braiding machine comprising a main body having a leaf-shaped portion adapted to be guided along a meandering groove in the base of the braiding machine, a bobbin support shaft supported by and extending uprightly from the main body and rotatably mounting a bobbin thereon, the bottom of the bobbin having a ratchet, a stopper lever pivoted at a mid-point between the opposite ends thereof and having a pawl at one end adapted to engage and disengage from the ratchet, an operation frame guide rod supported by and extending uprightly from the main body and having an intermediate thread guide mounted thereon, a substantially U-shaped vertical operation frame mounted on the operation frame guide rod to be guided for movement therealong, the operation frame being operatively connected at the lower end thereof to the other end of the stopper lever, a first spring mounted on the operation frame guide rod in a compressed state between the upper leg of the operation frame and the intermediate thread guide to normally urge the pawl into engagement with the ratchet, a hook assembly support rod supported by and extending uprightly from the main body in parallel relation to the bobbin support shaft and operation frame guide rod, a thread hook assembly mounted on the hook assembly support rod, a rod support member fitted on the operation frame guide rod and hook assembly support rod, and a second spring mounted on the hook assembly support rod in a compressed state between the hook assembly and rod support member, the improvement comprising a hook assembly which comprises a substantially U-shaped weight including a pair of opposed legs having aligned through holes therein adapted to receive the hook assembly support rod and a hook body positioned removably in said weight, said hook body having a through hole alignable with said holes in the legs of the weight, said hook body having a hook portion extending horizontally and then bending downwardly to form a thread guide recess in the underside thereof, said hook body and hook portion being integral and formed of a wear resistant material.

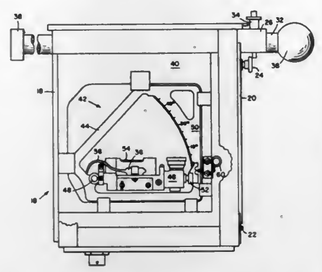
5. A hook assembly for a spring tension carrier of a braiding machine comprising a substantially U-shaped weight including a pair of opposed legs, said legs having aligned holes extending therethrough, and a hook body positionable removably in said weight between said legs thereof, said hook body having a through hole therein alignable with the holes in the legs of said weight, said hook body having a hook portion extending horizontally and then bending downwardly to thereby form a thread guide recess in the underside thereof, said hook body and hook portion being integral and formed of a wear resistant material.

**4,292,880**

## QUADRANT ELEVATION CONTROL DEVICE

**Bennie F. Lopez; Billy H. Campbell; Bobby D. Collier; William J. Laird; Edward J. Debona, and James E. Eubanks, Jr., all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Sep. 4, 1979, Ser. No. 72,507**
**Int. Cl.³ F41F *3/04***
**U.S. Cl. 89—1.815** **3 Claims**



1. A quadrant elevation control device for a rocket launcher for controlling actuation of the rocket launcher to a predetermined launch angle relative to gravity, said quadrant elevation control device including means for selecting a predetermined angle to which the launcher is to be elevated and automatic means for interrupting an electrical circuit when said predetermined angle has been reached, said means for selecting a predetermined angle including a support structure on which a gunner's quadrant is mounted, said support structure being pivotably and slidably mounted relative to a housing structure to allow said support structure to be moved in and out of said housing structure and to be adjusted to a vertical position, said support structure having a first level vial mounted horizontally thereon, and said gunner's quadrant including a triangular shaped body and an adjustable pivotable arm pivotably connected to said triangular shaped body at a base corner thereof, said pivotable arm having an index pointer for adjusting said pivotable arm relative to an arcuate surface of said triangular shaped body, said arcuate surface having indica thereon for indicating the adjusted position of said pivotable arm, and said automatic means being mounted on said pivotable arm.

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**4,292,881**

## AUTOMATIC FIREARM CONSTRUCTION

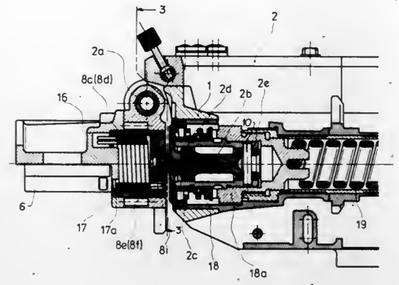
**Gerhard Hupp, Oberndorf, and Helmut Mäder, Schramberg, both of Fed. Rep. of Germany, assignors to Mauser-Werke Obendorf GmbH, Fed. Rep. of Germany**

**Filed Jun. 6, 1979, Ser. No. 45,965**
**Claims priority, application Fed. Rep. of Germany, Jun. 8, 1978, 2825091**
**Int. Cl.³ F41D *10/04***
**U.S. Cl. 89—33 CA** **1 Claim**

1. In an automatic firearm of the type having a reciprocating breech block, a cartridge feed mechanism which is driven by the gas pressure through a piston, which extends parallel to the longitudinal axis of the firearm, which is capable of receiving at least two different sorts of ammunition and which is operated to feed a plurality of different types of ammunition into the counter recoil path of the breech block, the improvement comprising a rotatable bushing mounted in the drive head having an end drive face adjacent the feed mechanism with a slot therein which tapers inwardly, means for pivotally mounting the cartridge feed mechanism to said drive head, the cartridge feed mechanism including a housing portion, a drive hub rotatably mounted in said housing portion, a transfer element in said drive hub having a coupling projecting outwardly therefrom and being tapered inwardly in an outward direction and being engageable in said slot of said end drive face for



transmitting the drive motion for the cartridge feed mechanism, and means operatively connecting said transfer element



to said drive hub for resiliently centering said transfer element for reception in said slot.

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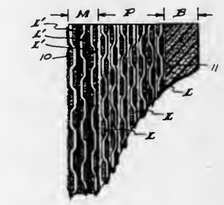
**4,292,882**

## ARMOR COMPRISING A PLURALITY OF LOOSELY RELATED SHEETS IN ASSOCIATION WITH A FRONTAL SHEET COMPRISING METAL ABRADING PARTICLES

**Carol W. Clausen, 1715 E. Florence, Los Angeles, Calif. 90001**

**Continuation-in-part of Ser. No. 804,230, Jun. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 966,385**
**Int. Cl.² B32B *5/28, 7/00*; F41H *1/02, 5/04***
**U.S. Cl. 89—36 A** **10 Claims**



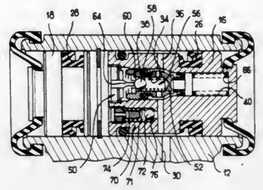
1. A bullet proof armor panel structure including a pad comprising a multiplicity of normally flat sheets of fabric in loosely related surface to surface relationship, said pad having front and rear surfaces, and a flat metal abrading means with front and rear surfaces arranged with its rear surface opposing the front surface of the pad, said abrading means including a mass of hard metal abrading particulate material arranged with its particles in substantial bridging contact with each other and binding means normally maintaining the particles in substantial fixed position.

**4,292,883**

## WHEEL CYLINDER

**Christian Riquart, Paris, and Roland Levrai, Stiarns, both of France, assignors to Societe Anonyme DBA, Drancy, France**

**Filed Jul. 2, 1979, Ser. No. 54,320**
**Int. Cl.³ F15B *13/042***
**U.S. Cl. 91—29** **2 Claims**



1. A wheel cylinder comprising:

a body defining a bore therein, said bore having at least one open end;

an actuating piston reciprocably received in said bore and sealingly cooperating with said body to define a pressure chamber;

supply passage means defined in said wheel cylinder for communicating pressurized fluid from a source thereof to said pressure chamber, said supply passage means including an inlet orifice communicating with said bore, an annular groove on said actuating piston communicating with said inlet orifice, an axially-extending blind stepped bore having an end wall in said actuating piston, said stepped bore defining a small diameter portion adjacent the end wall thereof and a large diameter portion opening to said pressure chamber, and a radially extending flow path communicating said annular groove and said stepped bore;

pressure-responsive valve means received in said stepped bore for opening and closing fluid communication through said supply passage means, said valve means including a stepped pressure-responsive piston reciprocably received in said stepped bore and sealingly cooperating with said actuating piston, said stepped piston including a large diameter part received in said large diameter portion of said bore and a small diameter part received in said small diameter portion and communicating with atmospheric pressure via a vent port defined in said actuating piston, said large and small diameter parts cooperating to define a differential area on said stepped piston;

said stepped piston defining an axially-extending blind bore opening to said pressure chamber and a radially-extending bore communicating said blind bore with said inlet orifice via said radially-extending flow path and said annular groove;

said blind bore of said stepped piston receiving a movable valve member, a resilient member biasing said valve member toward the open end of said blind bore, and an annular valve seat secured in said blind bore at the open end thereof for movement with said stepped piston, said valve seat being sealingly engageable with said valve member;

said valve means further including an annular abutment member mounted in said stepped bore and secured to said actuating piston for movement in unison therewith, said abutment member carrying an axially-extending projection extending through said annular valve seat and engaging said valve member;

a resilient member received in said stepped bore biasing said stepped piston to a first position in engagement with said annular abutment member in which said valve seat is disengaged from said valve member by said axially-extending projection so that said valve means is open;

said stepped piston moving toward the end wall of said stepped bore in response to pressurized fluid from said pressure source to engage said valve seat with said valve

member to close said valve means at a predetermined pressure level, said stepped piston reciprocating to open and close said valve means so as to allow a selected pressure increase in said pressure chamber responsive to a pressure increase above said predetermined pressure level.

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**4,292,884**

## CONTROL ARRANGEMENT FOR A HYDRAULICALLY OPERATED DEVICE

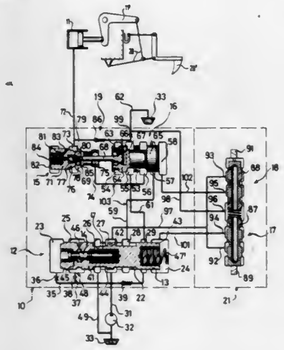
**Werner Schumacher, Asperg, and Günther Schwerin, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 2, 1979, Ser. No. 9,045**

**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816212**

**Int. Cl.³ F15B** *11/08, 13/043*

**U.S. Cl. 91—445** **7 Claims**



1. A control arrangement comprising a hydraulically operated cylinder and piston unit having a cylinder and a piston reciprocable therein for raising a load during feeding of hydraulic fluid into said cylinder of the unit, and lowering a load during discharge of said fluid therefrom, said arrangement further comprising a source of hydraulic fluid under pressure; an outlet conduit leading to a tank; an inlet conduit connected to said source; first valve means connected to said inlet conduit and movable between a first position connecting said inlet conduit with said outlet conduit and a second position connecting said inlet conduit with working conduit means leading to said cylinder of the unit; precontrol valve means coordinated with said first valve means for controlling the position thereof, said precontrol valve means having a return terminal connected to a return conduit leading to said tank and inlet terminal means leading over said first valve means to said source; second valve means in said working conduit means including a release piston movable between a first position directing flow of fluid through said working conduit means to said cylinder of the unit and a plurality of second positions permitting flow of fluid from said cylinder to said return conduit, said second valve means including a damping compartment and a control compartment on opposite sides of said releasing piston; passage means connecting said damping compartment to said return conduit and conduit means connecting said control compartment to said precontrol valve means; and a throttle in said return conduit, said return terminal of said precontrol valve means being connected to a point of said return conduit located downstream of said throttle so that upon increase of outflow of fluid from said cylinder the pressure in said damping compartment rises and said second valve means being constructed to decrease outflow of fluid from said cylinder as the pressure in said damping compartment rises, whereby the speed of lowering of the load will be independent of the magnitude of the load.

**4,292,885**

## BELLOWS APPARATUS

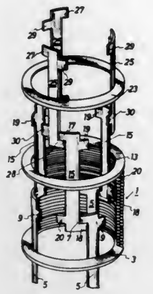
**Takeshi Jinnouchi, 774, Tsukagoshi, Sakado-shi, Saitama-ken, Japan**

**Division of Ser. No. 834,445, Sep. 19, 1977, Pat. No. 4,183,289. This application Jul. 19, 1979, Ser. No. 59,109**

**Claims priority, application Japan, Sep. 22, 1976, 51/128026**

**Int. Cl.³ F16J** *3/04*

**U.S. Cl. 92—43** **1 Claim**



1. A bellows apparatus comprising a bellows main body and restriction means for restricting elongation and contraction, said restriction means comprising,

a plurality of annular, first, second and third guide metals arranged integrally with said bellows main body with a predetermined spacing therebetween in the axial direction;

a plurality of first, second and third guide members, each secured integrally to each of said first, second and third guide metals respectively and extending in the axial direction and terminating in edge sections;

a plurality of first, second and third stoppers, each integrally extending in the circumferential direction from the edge sections of each of said first, second and third guide members respectively;

a plurality of first, second and third protuberances, each integrally extending in the circumferential direction from near the edge sections of said first, second and third guide members respectively;

said first and third guide metals being positioned to interpose said second guide metal therebetween and provided, respectively, with said first and third guide members being displaced at said first and third guide metals with respect to each other in the circumferential direction and extending oppositely to each other in the axial direction; and

said first, second and third guide members being disposed such that they do not overlap each other in the circumferential direction and restrict the elongation and contraction of said bellows main body in cooperation with said first, second and third stoppers and protuberances, said first stoppers being abutted by said second protuberances and said second stoppers being abutted by said third protuberances when said bellows main body is fully contracted.

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**4,292,886**

## HYDRAULIC ACTUATOR CUSHIONING DEVICE IMPROVEMENT

**William R. Weber, 4200 - 50th Ave., NE., Seattle, Wash. 98105**

**Filed Dec. 31, 1979, Ser. No. 108,490**

**Int. Cl.³ F15B** *15/22*

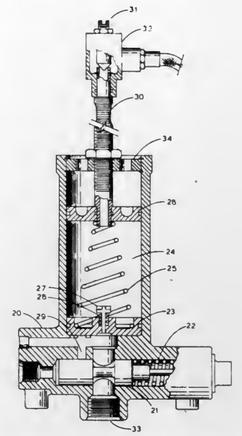
**U.S. Cl. 92—85 B** **1 Claim**

1. In a device for cushioning an actuator of the type wherein return fluid from the actuator passes through an expansion chamber and thence to drain through a restriction for cushioning, wherein the improvement comprises:



a. A piston with an orifice, mounted slidably in the expansion chamber, and a resilient means to bias the piston toward drain,

b. A valve mounted slidably in the orifice, with resilient means to bias the valve toward the restriction, and, The valve to hold return fluid pressure on the piston face as it



travels the length of the expansion chamber, until the valve bottoms allowing return fluid to pass through the orifice and then through the restriction to cushion the actuator, and said piston to return toward drain in the absence of return fluid pressure to hasten the emptying of the expansion chamber.

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**4,292,887**

## POWER SERVO BOOSTER

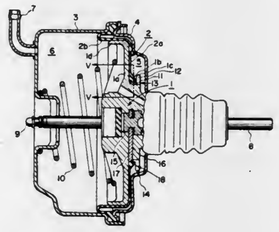
**Ryuji Ohta, Higashimatsuyama, and Yoshimichi Inoue, Kawashima, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan**

**Filed Oct. 26, 1978, Ser. No. 954,952**

**Claims priority, application Japan, Nov. 8, 1977, 52-149809[U]**

**Int. Cl.³ F01B** *19/00*

**U.S. Cl. 92—94** **9 Claims**



1. A power servo operable by differential pressure comprising: a housing, a unitary piston disposed in said housing, a control member coupled to said piston, said unitary piston including a disc element and a flange portion with an annular groove formed between said disc and said flange, a diaphragm member secured at its outer periphery to said housing to divide said housing into two compartments one compartment a negative pressure chamber and the other an atmospheric pressure chamber, said diaphragm member having a generally cylindrical section and an inner peripheral portion secured in said annular groove, means disposed in said negative pressure chamber for biasing said unitary piston toward said atmospheric pressure chamber and means associated with said annular groove for defining a path of fluid communication from the atmospheric pressure chamber to a space formed between said diaphragm and said disc.

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**4,292,888**

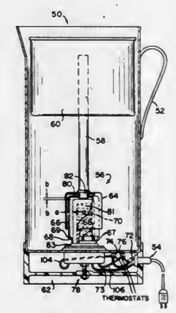
## FOUNTAIN PUMP FOR ELECTRIC COFFEE PERCOLATORS

**Alton R. Wells, 1500 S.W. 40th St., Ft. Lauderdale, Fla. 33315; Robert M. Wells, 4371 Ira Rd., Akron, Ohio 44313, and James L. Heir, 11515 Stafford Rd., Trumbull County, Burton, Ohio 44021**

**Continuation-in-part of Ser. No. 877,315, Feb. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 704,461, Jul. 12, 1976, abandoned. This application Oct. 15, 1979, Ser. No. 84,666**

**Int. Cl.³ H05B** *1/02;* **A47J** *31/053;* **F04B** *19/24*

**U.S. Cl. 99—312** **3 Claims**



1. Apparatus for making coffee brew from coffee grounds comprising:

a container having a top and a bottom;

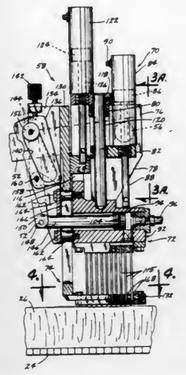
an upwardly projecting, flat-topped, cylindrical encased heating element centrally received within the container and maintained at the bottom thereof;

a flat-topped, open bottom, cylindrical member supported on the heating element, said cylindrical member surrounding said heating element in spaced relation thereto, the cylindrical member having a hollow stem in communication with the interior thereof and extending upwardly from the center of the flat top, the flat-topped cylindrical member being spaced from the top of the heating element from between 1/16" and ⅛" to form a chamber for receiving and retaining a volume of steam bubbles therein, said stem having a lower end that protrudes into the said space between the top of said heating element and the flat top of said cylindrical member, and the side wall of the cylindrical member being characterized by a conically inwardly and downwardly extending lower end fluid-tightly circumferentially engaging the sidewall of the heating element and by six to ten uniformly circumferentially spaced uniform holes in the conical portion of said lower end such that said holes are downwardly and outwardly facing with relation to the heating element, the total area of said holes being between about 0.0258 and 0.043 square inches.

## 4,292,889
## METHOD AND MEANS FOR INJECTING FLUIDS INTO MEAT PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed May 25, 1979, Ser. No. 42,315
Int. Cl.[3] A23B *4/02*; A23L *3/34*
U.S. Cl. 99—533 11 Claims



1. A machine for injecting fluid into a food product comprising meat, fish or poultry, said machine comprising:

a needle assembly having a needle manifold and a plurality of downwardly extending hollow needles each in communication adjacent its upper end with said needle manifold and each having an opening adjacent its lower end;

said needle assembly having a metering chamber therein, said metering chamber having an inlet opening in communication with a pressurized source of fluid and an outlet opening in communication with said manifold;

one way check valve means in said inlet and outlet openings for permitting fluid to enter into said chamber through said inlet opening and to pass from said chamber to said manifold through said outlet opening while at the same time preventing backflow of said fluid from said chamber through said inlet opening towards said fluid source and from said manifold through said outlet opening toward said chamber;

a metering piston within said metering chamber movable in a first direction for drawing fluid into said metering chamber and being movable in a second direction for forcing fluid from said chamber into said manifold and out through said lower ends of said needles;

ram means for moving said needle assembly downwardly to cause said needles to penetrate said meat and for moving said needle assembly upwardly to withdraw said needles from said meat;

sensing means for sensing the depth to which said needles penetrate said meat;

metering control means connected to said sensing means and said metering piston for controlling the stroke length of said piston in response to the depth of needle penetration into said meat whereby said piston will draw into and expel from said chamber a volume of fluid substantially equal to the volume of the cavities in said meat formed by said needles penetrating therein;

said sensing means comprising a stripper plate movably mounted to said needle assembly, first spring means yieldably holding said stripper plate against movement with respect to said needle assembly;

said stripper plate being positioned adjacent said lower ends of said needles so as to engage the upper surface of said meat when said needles begin penetration of said meat,

said first spring means being yieldable to permit continued downward movement of said needles to penetrate said meat while said stripper means is held against further downward movement by said upper surface of said meat.

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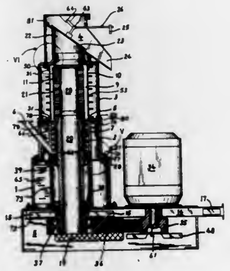
## 4,292,890
## GRAIN POLISHING AND WHITENING MACHINE

Felipe Salete-Garces, Avenida Ano de Juarez 198, Granjas San Antonio, Iztapalapa, Mexico (13, D.F.)

Filed Nov. 21, 1979, Ser. No. 96,269
Claims priority, application Mexico, Jan. 24, 1979, 176383
Int. Cl.[3] B02B *3/04, 3/06*
U.S. Cl. 99—603 13 Claims



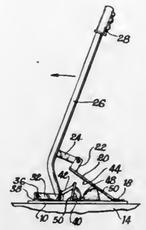
1. A grain polishing and whitening machine comprising base box means, housing means having first, second, third and fourth coaxially arranged separate housing sections, said first housing section being fixedly mounted on said base box means, said first and second housing sections having an inner concentric cylindrical member forming annular passage means therethrough, concentric hollow rotor means extending through said first, second and third housing sections and opening into said base box means, bearing means in said first housing section to rotatably support said rotor means, drive means in said base box means to rotate said rotor means, fan means to cause air to flow into and through said hollow rotor means and out of the machine through said annular passage means, grain inlet means arranged through the wall of said second housing section, screw conveyor means engaged to said rotor means within said second housing section and capable of pushing the grain from said grain inlet means to said third housing section, said screw conveyor means having a helical rib lined with an abrasive layer at least on its forward surface, cylindrical indented screen means in said third housing section and having inclined elongated slots and inwardly extending indentations throughout its surface, said screen means being concentrically arranged around said rotor means and forming a grain treating chamber therebetween, a plurality of radial bores in said rotor means to allow air to flow in said treating chamber and through the mass of grains and outwardly of the slots of said screen means, said rotor means having a pair of longitudinally arranged, diametrically opposed, tangentially mounted, adjustable diagonally fluted, removable knife means directly confronted and spaced from said screen means, the flutes of said fluted knife means being inclined in a direction such that rotation thereof will cause a flow of grain opposed to the flow of grain produced by said screw conveyor means in order to compact the mass of grains in said treating chamber, a pair of longitudinally arranged, diametrically opposed, diagonally fluted, removable knife means mounted on said screen means to cooperate with said knife means mounted on said rotor means, and grain outlet means arranged in said fourth housing section.



## 4,292,891
## ALUMINUM CAN CRUSHER

James D. Shelley, 3574 Buena Vista, Lemon Grove, Calif. 92045

Filed Jun. 23, 1980, Ser. No. 162,014
Int. Cl.[3] B30B *1/04*
U.S. Cl. 100—193 5 Claims



1. A can crusher comprising:

(a) a base;

(b) a crusher plate havng one end pivoted to said base and the other end free of said base;

(c) a lever arm being pivotally connected at a first pivot point along its length to the free end of said crusher plate, said lever arm being pivotally connected at a second pivot point to one end of a pivotal link, the other end of said pivotal link being pivoted to said base;

(e) said lever arm having an extended foot defined on the underside thereof on the side of said first pivot towards said second pivot, whereby, upon raising said lever arm said plate is raised, and upon inserting a can between said base and said plate and further raising said lever said foot buckles one end of said can, and upon subsequently lowering said lever arm said can is crushed against said base by said crusher plate.

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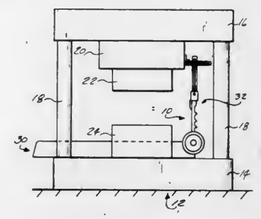
## 4,292,892
## CONVEYOR APPARATUS FOR PRESS MACHINES

William Combs, 6131 Canmoor, Troy, Mich. 48084

Filed Jul. 30, 1980, Ser. No. 173,466
Int. Cl.[3] B30B *15/32*
U.S. Cl. 100—218 8 Claims



1. A conveyor apparatus for use with a press machine having a movable head comprising:

means for conveying material from said press machine, said conveying means including a drive rod coupled to said conveying means for moving said conveying means; and means for advancing said conveying means, said advancing means comprising:

a rachet wheel fixedly mounted on said drive rod, said rachet wheel including a plurality of circumferentially spaced finger engaging members; and an arm adapted to be connected to said press head for movement therewith, said arm having a plurality of linearly spaced fingers extending outward therefrom, wherein successive ones of said fingers engage said finger engaging members on said rachet wheel causing rotation of said rachet wheel and said drive rod to advance said conveying means upon movement of said press head.

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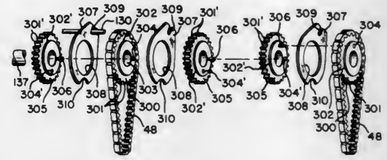
## 4,292,893
## ENDLESS BAND PRINTER WITH SPACERS BETWEEN DRIVE WHEELS

Raymond L. Kirby, Jr., Vandalia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 941,352, Sep. 11, 1978, abandoned, which is a continuation-in-part of Ser. No. 811,239, Jun. 29, 1977, abandoned, which is a division of Ser. No. 642,037, Dec. 18, 1975, Pat. No. 4,052,938, which is a continuation-in-part of Ser. No. 537,630, Dec. 30, 1974, Pat. No. 3,933,092. This application Jul. 21, 1980, Ser. No. 170,409
Int. Cl.[3] B41J *1/20*
U.S. Cl. 101—111 14 Claims



1. Printing apparatus, comprising: a print head having a plurality of rotatably mounted drive wheels having gear teeth, a support, a series of printing bands trained about the support and the drive wheels, a shiftable drive gear selectively cooperable with the gear teeth on any drive wheel, the improvement comprising at least one non-printing spacer disposed between a pair of adjacent drive wheels, each spacer having adjacent tooth surfaces and an intervening space in line with a space between adjacent teeth on the drive wheels to enable a smooth transition as the gear is shifted from contact with the teeth of one drive wheel on one side of the spacer and the teeth of another drive wheel on the other side of the spacer.

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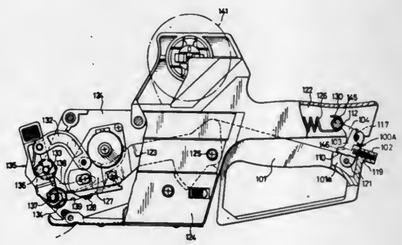
## 4,292,894
## CONSTANT PRINTING PRESSURE MECHANISMS FOR LABEL PRINTING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Division of Ser. No. 866,991, Jan. 5, 1978, Pat. No. 4,207,816, which is a continuation-in-part of Ser. No. 819,103, Jul. 26, 1977, abandoned. This application Oct. 22, 1979, Ser. No. 87,315
Claims priority, application Japan, Jul. 29, 1976, 51-089701; Jan. 8, 1977, 52-0505
Int. Cl.[3] B41J *5/00*
U.S. Cl. 101—291 15 Claims



1. A label printing machine, comprising:

a machine frame; a printing lever supported to be movable

with respect to said machine frame; a printing head connected to said printing lever to be movable thereby; an operating lever rigidly connected to said printing lever for operating said printing lever in a print direction and in a return direction; said frame including a portion attached thereto toward which said operating lever is movable;

a platen opposable to said printing head; said printing head being movable to said platen upon movement of said printing lever in said print direction;

a constant printing pressure mechanism, comprising:

pressure applying means attached to said frame portion;

pressure receiving means attached on said operating lever to be movable with respect to said pressure applying means; said pressure receiving means being provided for being engaged by and being positioned to be engaged by said pressure applying means upon movement of said operating lever toward said frame portion; said pressure receiving means being adapted to resist its movement past said pressure applying means until said pressure applying means applies more than a predetermined pressure thereto and said pressure receiving means then passing said pressure applying means, whereupon said printing head is thereafter freed by said pressure receiving means to move to said platen for printing a label.

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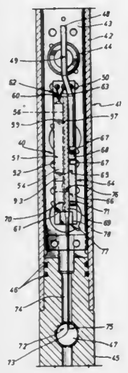
**4,292,895**

## EXPLOSIVE SAFE-ARMING APPARATUS FOR PERFORATING GUNS

**William T. Bell, and Jose B. Garcia, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.**

**Filed Oct. 9, 1979, Ser. No. 82,686**
**Int. Cl.³ F42C *15/34***
**U.S. Cl. 102—306** **14 Claims**



9. An explosive safe-arming apparatus, for use with a well bore perforator having a receptor detonating explosive and a donor detonating explosive adapted for detonating said receptor explosive, comprising:

a fixed barrier adapted to be disposed between the donor detonating and receptor detonating explosives;

a movable barrier adapted to be disposed between laterally facing portions of said donor detonating and receptor detonating explosives; and

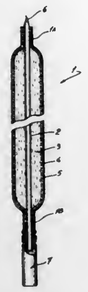
a movable barrier actuating means for selectively translating the movable barrier either into engagement with the fixed barrier whereby the donor detonating and receptor detonating explosives are separated by the fixed and movable barriers and are in a predetermined perforator disarming operating position, or into a spaced relationship from the fixed barrier whereby the laterally facing portions of said donor detonating and receptor detonating explosives are in a predetermined perforator-arming operating position.

**4,292,896**

## DETONATING DEVICE

**William B. Morrey, and David M. Welsh, both of Brownsburg, Canada, assignors to CXA Ltd./CXA Ltee, Montreal, Canada**

**Filed Apr. 21, 1980, Ser. No. 141,890**
**Claims priority, application Canada, May 31, 1979, 328796**
**Int. Cl.³ F42B *3/10***
**U.S. Cl. 102—275.8** **1 Claim**



1. An elongated, flexible, unitary detonating device of determinate length for detonating one or more explosive booster charges within an explosive-charged borehole, the said detonating device comprising in combination:

(a) a core member consisting of a low energy shock wave conductor comprising a hollow, elongated flexible tube having a reactive substance distributed as a thin layer on the inner surface thereof, and

(b) a sheath member surrounding said core member over substantially its whole length except for a short non-surrounding section at each end of said core member, said sheath member comprising a standard detonating cord construction capable of detonating a selected booster charge in contact therewith,

the said core member being incapable of laterally explosively initiating the said surrounding standard detonating cord sheath member.

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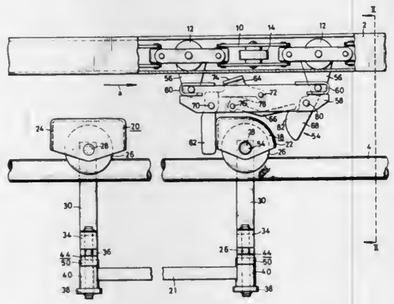
**4,292,897**

## TROLLEY ROTATION STABILIZING DEVICE

**Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan**

**Filed Apr. 25, 1979, Ser. No. 33,254**
**Claims priority, application Japan, Apr. 26, 1978, 53-56536[U]**
**Int. Cl.³ B61B *3/00, 13/12*; B61C *13/04*; B61F *5/00***
**U.S. Cl. 104—172 S** **6 Claims**



1. A device for preventing turn-around motions of free trolleys in a power-and-free conveyor having a power rail and a free rail, the device comprising:

(a) a connecting link which interconnects the free trolleys and has holes on the opposite ends thereof;

(b) downwardly directed rods extending from the free trolleys, one from each trolley, each of the rods rotatably and slidably passing through a hole of the connecting link and having a stopper at its lower end, wherein the stopper receives and supports the connecting link when the free trolleys are on the free rail; and

(c) turn-preventing means operatively coupled between the free trolleys and the connecting links for preventing rotation of the free trolleys when the connecting link is moved along the rods towards the free trolleys as the free trolleys are removed from the free rail.

3. A device for preventing turn-around motions of the free trolleys in a power-and-free conveyor having a power rail and a free rail, the device comprising:

(a) a connecting link which interconnects the free trolleys and has holes on the opposite ends thereof;

(b) downwardly directed arms extending from the free trolleys, one from each trolley;

(c) downwardly directed rods extend from the lower portions of the arms, one from each trolley, each of the rods rotatably and slidably passing through a hole of the connecting link and having a stopper at its lower end, wherein the stopper receives and supports the connecting link when the free trolleys are on the free rail; and

(d) turn-preventing means operatively coupled between the free trolleys and the connecting links for preventing rotation of the free trolleys when the connecting link is moved along the rods towards the free trolley as the free trolleys are removed from the free rail.



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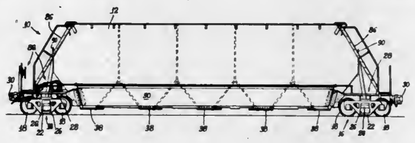
**4,292,898**

## FILAMENT COMPOSITE RAILROAD CAR

**Robert Gordon, Arcadia; Harry A. King, Yorba Linda, both of Calif.; James V. Springrose, Edina, and Robert W. Cuddihy, Fridley, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn. and Structural Composite Industries, Inc., Azusa, Calif.**

**Continuation of Ser. No. 864,243, Dec. 27, 1977, abandoned.**
**This application Jan. 18, 1980, Ser. No. 113,240**
**Int. Cl.³ B61D *7/00***
**U.S. Cl. 105—238 R** **3 Claims**



1. A railway hopper car comprising: an elongated load bearing railroad car body having sloping end walls at each longitudinal end thereof and substantially continuous longitudinal side and bottom walls intermediate said sloping end walls, said longitudinal side and bottom walls being substantially straight in a direction along the railroad car longitudinal axis to form a car body, said end walls and said longitudinal side and bottom walls being formed of a fiber-reinforced organopolymeric resin composite comprising from about 60 to about 75 weight percent of glass reinforcing filaments and from about 25 to about 40 weight percent of a structural polyester organopolymeric matrix resin, said matrix having a heat distortion temperature of at least about 90° C., a flexural strength of at least about 20,000 psi, a flexural modulus of at least about $5.0\times10^5$ psi, and a tensile elongation of at least about 3.0 percent, said glass reinforcing filaments of said resin composite of said car body being oriented in said car body at an angle such that said glass filaments and said matrix resin are capable of providing a composite comprising from about 70 to about 80 percent by weight of glass fibers and from about 20 to about 30 percent of said matrix resin and in the direction of winding having a tensile strength of at least about 100,000 psi, a flexural modulus of at least about $6\times10^6$ psi, an interlaminar shear strength of at least about 5,000 psi, an interlaminar shear strength after 24 hour water boil of at least about 5,000 psi, a flexural strength at room temperature of at least about 100,000 psi, a flexural fatigue strength for $1\times10^6$ completely reversed cycles of at least about 30,000 psi, and a density of from about 0.07 to about 0.08 pounds per cubic inch, a bearing strength of at least about 25,000 psi and a self-extinguishing flammability rating; coupling means at each end of the car for coupling the car to other cars; a truck at each end of the car body, and supporting means pivotably mounted on each of said trucks for supporting said car body at each respective sloping end wall thereof for transport on rails.

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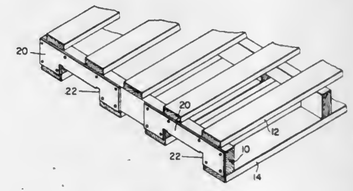
**4,292,899**

## PROTECTIVE ELEMENT FOR FORK-LIFT PALLETS

**Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659**

**Filed Sep. 11, 1978, Ser. No. 941,189**
**Int. Cl.³ B65D *19/38***
**U.S. Cl. 108—51.1** **4 Claims**



1. For use with a fork-lift pallet having an elongated, horizontal wooden stringer provided with an inverted U-shaped opening affording entry of a tine of a fork-lift truck, a protective element comprising:

a generally rectangular plate having an inverted U-shaped opening for substantial register with the stringer opening, said plate having such length and height as to protectively overlie the front face of the stringer to both sides of and above the stringer opening, said plate opening affording entry of the fork-lift truck tine to the stringer opening while the remainder of the plate protects the front face of the stringer from damage by the tine, said plate provided with perforations to receive fasteners for affixation of the plate to the stringer, at least two of which said perforations lie above and within the confines of the ends of the plate opening extended, in order to reinforce the narrow portion of the plate and stringer against buckling and

a lip integral with the plate and extending rearwardly from the upper edge of the plate opening so as to engage and underlie that portion of the stringer opening along the upper edge of the stringer opening, wherein the length of the lip is spaced an appreciable distance from the edges of the plate opening and is substantially centered therein.

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**4,292,900**

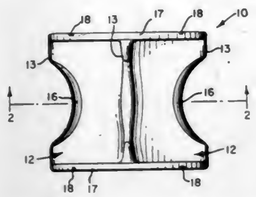
## ROTATABLE PALLET POST FOR PLASTIC PALLETS

**Russell P. Bula, Whitby, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 7, 1979, Ser. No. 73,327**
**Claims priority, application Canada, Sep. 8, 1978, 310985**
**Int. Cl.³ B65D *19/32, 19/42*; F16M *11/20***
**U.S. Cl. 108—51.1** **19 Claims**

1. A pallet post adapted to be positioned between a plastic upper deck and a plastic lower deck of a pallet, the pallet post having a longitudinal axis, means for rotatably mounting the pallet post about said axis between the upper deck and the lower deck of the pallet, and at least three winglike arms

projecting radially from the axis and extending longitudinally therealong, the winglike arms being substantially equally spaced about the axis, with each of said arms being joined to an adjacent arm by a smoothly curved concave surface, and each



arm having a smoothly curved convex surface along its outer edge when viewed from a direction parallel to the axis, and a concave surface at the mid portion of its outer edge when viewed from a direction perpendicular to its radial plane passing through the axis.

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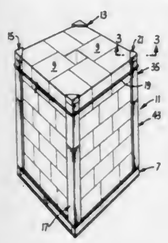
**4,292,901**

## CORNERBOARD FOR PALLETS

**Clayton E. Cox, 1371 Eureka Canyon Rd., Watsonville, Calif. 95076**

**Continuation-in-part of Ser. No. 907,096, May 18, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 63,949**
**The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.**
**Int. Cl.³ B65D** *19/06*
**U.S. Cl. 108—55.1** **6 Claims**



1. A generally L-shaped corner structure for a pallet comprising in combination:

a. a top member **21** or **68**, said member having a top cap **25** or **82** adapted to extend over the corner of a loaded pallet and having a thin L-shaped fin extending downward from said top cap, said L-shaped fin being composed of two thin flat elements **31** and **33** or **76** and **78** held at right angles to each other:

b. a bottom member **43** or **70** said bottom member having an L-shaped right angle configuration **47** or **86** to fit over the outside of the flat elements of said top member and having at least one inwardly extending member **45** or **90** and **92** to cover the edges and at least a portion of the inner surface of said side member by providing a bight (junction of **43** and **57**) or **94** and **96** whereby

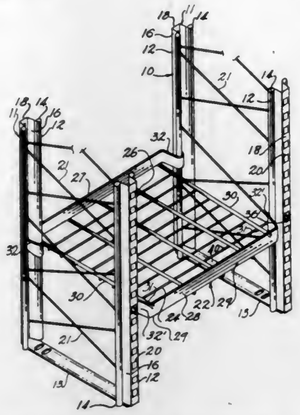
c. said top member can telescope into said bottom member to form a load-supporting corner structure for pallet.

**4,292,902**

## SHELF SYSTEM

**Wade H. Barrineau, 5159 E. Shore Dr., Conyers, Ga. 30207**

**Continuation of Ser. No. 628,133, Nov. 3, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,401**
**Int. Cl.³ A47B** *57/16*
**U.S. Cl. 108—146** **10 Claims**



1. An adjustable and removable shelf assembly comprising:

a pair of rear vertical spaced supports having a plurality of vertically spaced openings therein;

a pair of opposed, spaced front vertical supports having a plurality of vertically spaced openings therein; and

a removable shelf to be supported between the rear supports and the front supports, said shelf comprising;

a first rigid, non-flexing unitary edge member defining the outermost rear edge of the shelf and terminating in outwardly facing hooked projections for insertion into the openings of the rear vertical supports,

a second unitary edge member defining the outermost front edge of the shelf and terminating in outwardly facing hooked projections, said second edge member being a flat strap with resiliently flexural ends permitting the hooked projections on opposing ends to be flexed inwardly for inserting said hooked projections into the openings of the front vertical supports while the hooked projections of the first edge member are engaged in the openings of the rear vertical support,

shelf means formed of a rigid, non-flexing network of transverse and longitudinal supports, said transverse supports rigidly interconnecting substantially the full length of said first unitary edge member to a partial centrally located length of the second unitary edge member to provide a rigid, non-flexing support surface of the shelf and to define resiliently flexural ends on only the second edge member.

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**4,292,903**

## ADJUSTABLE BOX STOOL

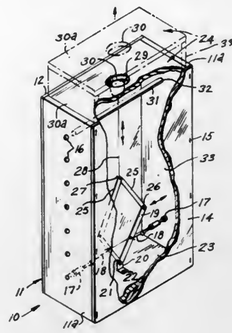
**Robert J. Hockema, 1200 Ridgeway, Lafayette, Ind. 47904**

**Filed Nov. 2, 1979, Ser. No. 90,580**
**Int. Cl.³ A47B** *9/12, 9/14, 9/20*
**U.S. Cl. 108—146** **1 Claim**

1. An adjustable box stool, comprising, in combination, an outer hollow box, an inner hollow box vertically slidable in said outer box, a vertical row of spaced-apart openings on opposite sides of said outer box, a horizontally slidable clevis pin latch in each opposite side wall of said inner box being outwardly slidable into selective of said openings in said outer box, for securement of said boxes together; each said clevis pin latch being connected by a first wire to a longitudinally intermediate portion of a first pair of link rods which at one ends are



attached to a bracket mounted on a bottom of said inner box; a second pair of link rods attached at their one ends to opposite ends of said first link rods, and opposite end of each said second pair of link rods being hooked together to one end of a singular, upwardly second wire extending slidably through a trans-



verse hole in a horizontal dowel secured between said side walls of said inner box, and an upper opposite end of said second wire being fitted with a pull ring; and an access hole in a top wall of said inner box for a person's hand to reach therein and pull said pull ring.

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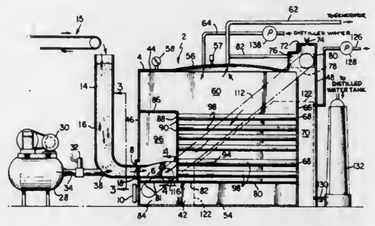
**4,292,904**

## FURNACE AND BOILER SYSTEM AND METHOD OF OPERATION THEREOF

**Cecil R. Brandt, P.O. Box 35, Westfield, Ill. 62474**

**Filed Mar. 13, 1980, Ser. No. 130,088**
**Int. Cl.³ F23B** *1/10*
**U.S. Cl. 110—198** **4 Claims**



1. In a combination furnace system, combustion chamber means located adjacent the bottom of said furnace for supporting combustible fuel material to be burned, supply means for supplying combustible fuel material to said combustion chamber means, said supply means including compressed air means for carrying and directing combustible fuel material into said combustion chamber means in response to the demand of the furnace system, means for receiving burned fuel and ash for discharge from said furnace system, water source means for introducing distilled water into associated furnace boiler means to produce steam from said distilled water in the system in response to a demand generated by steam demand means connected to said furnace system, and means for generating a work output in response to steam pressure delivered by said furnace system in response to said steam demand means, a pair of spaced down-comer tube means for recirculation of gases and ash generated by said furnace system to said combustion chamber means, said down-comer tube means being located adjacent the furnace system in heat transfer relationship thereto and in part in proximity to said water source means and in heat transfer relation therewith, raw water tank means adjacent one side of and in heat transfer relationship with said furnace and in part to said down-comer tube means, said water source means being located adjacent the opposite side of the furnace for indirect heat exchange therewith.

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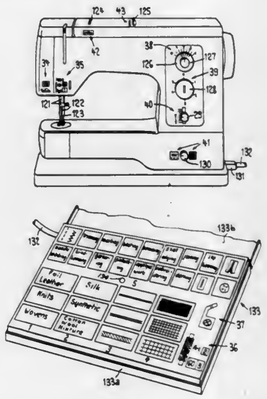
**4,292,905**

## DATA DISPLAY DEVICE FOR SEWING MACHINE ADJUSTMENT AND SET-UP

**Hans Widmer, Magglingen, Switzerland, assignor to Fritz Gegauf AG, Bernina-Naehmaschinenfabrik Steckborn, Steckborn, Switzerland**

**Filed Feb. 29, 1980, Ser. No. 126,158**
**Claims priority, application Switzerland, Mar. 15, 1979, 2442/79; May 2, 1979, 4084/79**
**Int. Cl.³ D05B** *19/00*
**U.S. Cl. 112—121.11** **15 Claims**



1. A device for selecting and displaying optimum conditions for set-up of sewing machine controls and elements, comprising:

an input unit having a plurality of means for manually producing data fully characterizing a material type and any type of sewing operation desired to be performed;

a memory accessed by said data produced by said input unit and in which is stored all optimum sewing machine adjustment values including ranges for performing any selected sewing operation on different materials in addition to accessory data characterizing foot, needle and thread settings; and

means connected to said memory for displaying said optimum sewing machine adjustment values and said accessory data corresponding to said manually produced data, whereby the sewing machine can be fully set-up for optimum operation.

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**4,292,906**

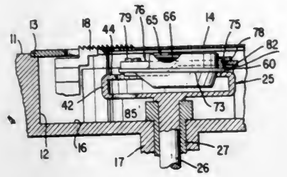
## ROTATABLE LOOP TAKER AND BOBBIN CASE ASSEMBLY

**Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Dec. 10, 1979, Ser. No. 102,075**
**Int. Cl.³ D05B** *57/14, 57/26*
**U.S. Cl. 112—184** **9 Claims**

1. In a lockstitch sewing machine, a work supporting bed, a loop taker mounted for rotation about a vertical axis in the bed and including a rim with a beak for seizing thread carried by a reciprocating needle, a bobbin case within the loop taker, a bracket affixed in the bed and loosely connected to the bobbin case to constrain the bobbin case rotationally and radially and permit the passage of said thread between the bobbin case and

bracket during the formation of the lockstitches on the machine, the bobbin case being vertically supported at one location on the bracket and at another location on the rim of the



loop taker, the bobbin case being tilted relative to the loop taker by the bracket to limit the area of contact between the bobbin case and looptaker rim.

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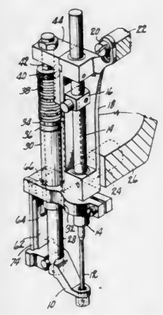
**4,292,907**
**PRESSER-FOOT APPARATUS**
**Andrew J. Gilbride, Swampscott, and Francis A. Wickers, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.**
**Filed Jun. 28, 1979, Ser. No. 53,021**
**Int. Cl.[3] D05B *29/00*; D05C *9/02***
**U.S. Cl. 112—236** **20 Claims**



1. In a sewing machine having at least one reciprocating needle bar, apparatus for maintaining the workpiece in a proper position during sewing, said apparatus comprising:
a presser-foot assembly including a presser-foot;
means, affixed to said needle bar, for slidably holding said presser-foot assembly;
means for biasing said presser-foot assembly initially against said slidably holding means until said presser-foot contacts the workpiece whereupon said biasing means exerts a steady pressure on the workpiece said biasing means being mounted to a stationary point which does not move in conjunction with the movement of said needle bar so as to thereby exert the steady pressure on the workpiece.

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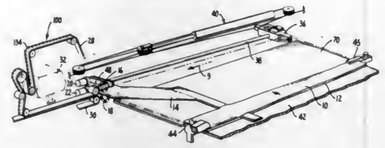
**4,292,908**
**HEMMER-SEAMER**
**Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.**
**Filed Oct. 2, 1978, Ser. No. 947,598**
**Int. Cl.[3] D05B *33/00, 35/10, 21/00***
**U.S. Cl. 112—306** **7 Claims**

6. Apparatus for seaming together two overlaid workpieces comprising a sewing machine, means acting traversely to the intended seam for guiding the edges of the workpieces independently of each other into a predetermined alignment, opposed, moving belt transport means for clasping the workpieces together as they leave the edge guiding means and drawing them in one direction through the sewing machine as it seams them together, means for grasping the trailing edges of the workpieces and for maintaining the workpieces in tension



while the workpieces are drawn by the belt transport means, and a loader carriage for inserting the leading edges of the workpieces into position for engagement with the belt transport means.

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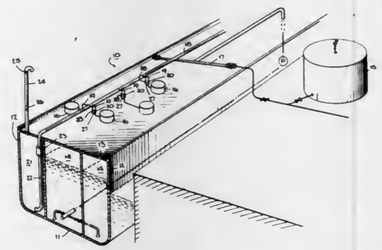
**4,292,909**
**SPILL OVERFLOW PREVENTION SYSTEM FOR TANKER VESSELS**
**Charles S. Conway, Featherbed La., New Vernon, N.J. 07976**
**Filed Dec. 21, 1979, Ser. No. 106,276**
**Int. Cl.[3] B63B *25/12***
**U.S. Cl. 114—74 R** **9 Claims**



1. In a tanker vessel for the transportation of fluid chemical and petroleum products in water, which vessel includes a hull comprising a bottom and sides, a top deck, a plurality of watertight cargo compartments disposed within the hull between the top deck and the hull bottom for receiving the fluid chemical and petroleum products, and means coupled to said cargo compartments for filling said compartments with said fluid chemical and petroleum products, the improvement comprising,
longitudinally disposed trunk line means,
branch line means coupled at one end to said trunk line means and at the other end to said cargo compartments,
valve means, coupled to said branch line means intermediate the ends thereof, for permitting the free flow of fluid chemical and petroleum products from said cargo compartments to said trunk line means through said branch line means, said branch line means being dimensioned so as to prevent overpressurization of said cargo compartments during the flow of said fluid chemical and petroleum products from said compartments to said trunk line means,
retention tank means disposed in said vessel and coupled to said trunk line means for receiving fluid chemical and petroleum products from said trunk line means,
vent means for said cargo comparments including bypass line means coupled to said branch line means intermediate the ends thereof and in parallel relationship therewith, and pressure/vacuum relief valve means, coupled to said bypass line means intermediate the ends thereof,
whereby fluid chemical and petroleum products overflowing from said cargo compartments during filling thereof are directed from said cargo compartments through said



branch line means and said trunk line means to said retention tank means thereby preventing the spillage of said fluid chemical and petroleum products externally of said cargo compartments.

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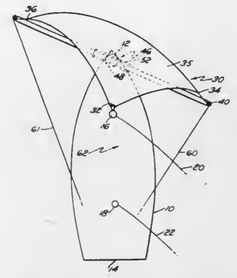
**4,292,910**
**SPINNAKER POST FOR SAILING VESSEL**
**John G. Hoyt, G.P.O. Box "CN", San Juan, P.R. 00936**
**Filed Apr. 28, 1980, Ser. No. 144,677**
**Int. Cl.[3] B63H *9/4***
**U.S. Cl. 114—102** **4 Claims**



1. In a sailing vessel having a hull with a bow and stern sections, a mast mounted to be supported in a general vertical direction from the hull with a substantial area ahead of the mast, that improvement comprising a rigid post forward of and spaced from the mast rigidly fastened to the vessel and rising to a height above the sheer of the hull, a pole, means rotatably secured to the upper end of the post for releasably holding said pole to permit transverse sliding of the pole relative to the post, a triangular sail having head, tack and clew corners, said pole having fittings at each end thereof to which the tack and clew of said sail and suitable sheets or guys may be attached, said sheets and guys leading aft for trimming said pole and said sail and the head of said said being supported by said mast.

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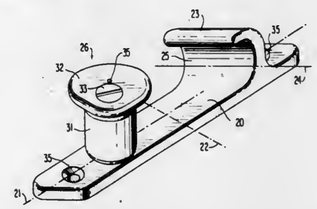
**4,292,911**
**ROLLER CHOCK**
**John Lindsay, 16 Harbor St., Manchester, Mass. 01944**
**Continuation of Ser. No. 879,726, Feb. 21, 1978, abandoned. This application May 5, 1980, Ser. No. 146,914**
**Int. Cl.[3] B63B *21/08***
**U.S. Cl. 114—218** **1 Claim**



1. A roller chock for use with a line on a boat comprising:
A. an elongated base portion;
B. an arm having a curved generally L-shaped vertical cross-section extending upwardly from said base portion and having a generally vertical portion having a generally linear line-contacting surface skewed with respect to said base portion to align said line-contacting surface with the normal orientation of the line through said chock when the line is in contact with said line-contacting surface, and a horizontal portion having a free end extending rearwardly from the top of the vertical portion generally parallel to the baseplate;
C. a stationary vertical shaft having a lower end mounted to the base portion spaced rearwardly from said arm and a free upper end;
D. A roller mounted for bidirectional rotation about said shaft, said roller having a smooth cylindrical line-contacting surface;
E. a plate supported solely by the free end of said shaft above said roller parallel to said base, said plate extending from said shaft laterally of said roller inwardly of the boat and forwardly of said roller toward, but spaced apart from, said free end of said curved arm, and
F. means for inhibiting rotation of said plate around said shaft, whereby said horizontal portion of said curved arm and said plate tend to capture the line passing through said chock, said vertical portion and said roller serving to limit lateral movement of the line.

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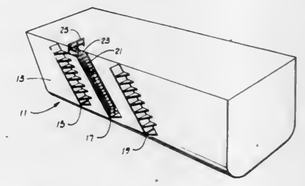
**4,292,912**
**TRANSFER AND DOCKING APPARATUS FOR USE ON VARIABLE DRAFT MARINE VESSELS**
**Andrew F. Hunter, Houston, Tex., assignor to Conoco, Inc., Ponca City, Okla.**
**Filed May 30, 1979, Ser. No. 43,718**
**Int. Cl.[3] B63B *59/02***
**U.S. Cl. 114—219** **14 Claims**



11. A boarding and fender apparatus for use in transferring passengers to and from boats which reside at varying levels with respect to a marine structure, the apparatus comprising:
at least two sloping fenders;
means for ascending and descending mounted adjacent and parallel to at least one of said two fenders and inboard of said at least one of said two fenders; and
means for fixedly attaching said two fenders and said ascending and descending means to said marine structure so that at least two fenders are presented to a docking boat and passengers from said docking boat may disembark directly from said docking vessel onto said means for ascending and descending.

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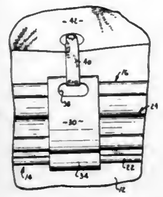
**4,292,913**
**BOAT RUB RAIL**
**Lee S. Siebert, Leawood, Kans., and Charles J. Ritsch, Odessa, Mo., assignors to Mark Twain Marine Industries, Inc., West Frankfort, Ill.**
**Filed Jun. 18, 1979, Ser. No. 49,434**
**Int. Cl.[3] B63B *59/02***
**U.S. Cl. 114—219** **6 Claims**

1. A rub rail assembly for a vehicle, which may be employed to secure a device to said rub rail comprising:
a channel member adapted to be secured to the side of said vehicle to provide a channel thereon;
a resilient bumper strip disposed in the channel and projecting outwardly from the plane of said channel member;
a protrusion projecting downwardly from the bottom of said channel member to provide a first coupling member extending substantially continuously along the length of the channel member, said protrusion having a generally rounded exterior surface; and

means for presenting a second coupling member adapted to be complementally joined with said first coupling member and characterized by means for attaching said device, said



second coupling member presenting a channel recess therein substantially complemental to said protrusion to closely embrace the protrusion in a snap fit therewith.

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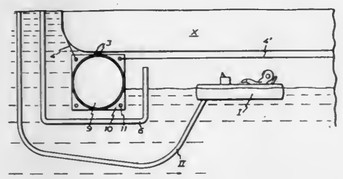
**4,292,914**

## METHOD AND APPARATUS FOR FACILITATING UNDERWATER WORK ON SHIP HULLS AND LIKE OBJECTS

**Carldavid Jönsson, S-585, 90 Linköping, Sweden**

**Filed May 9, 1979, Ser. No. 37,272**
**Claims priority, application Sweden, May 9, 1978, 7805277**
**Int. Cl.³ B63B** *59/00*
**U.S. Cl. 114—222** **8 Claims**



1. An apparatus for facilitating working on especially horizontal underwater portions of ship hulls, pontoons and other floating objects, comprising a screen structure having means for tightly fitting said screen structure against the edges of the surface on which operations are to be carried out, said screen structure projecting downwardly from said surface, said screen structure having a top edge which is sealed against said surface, said screen structure having a bottom which is open for a major portion of the area circumscribed by said screen structure so that said circumscribed area is filled with water, and means for introducing air into the volume associated with said circumscribed area and said screen structure with a pressure adapted to the water pressure prevailing at the actual depth into the volume within said screen structure in order to provide an air volume serving as a work-space under said surface, said pressurized air being essentially the sole means for preventing contact between said water and said surface within said circumscribed area.

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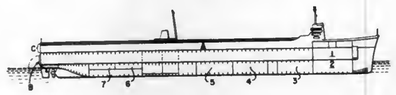
**4,292,915**

## OCEAN-GOING BARGE CARRIER

**Frank A. Nemec, New Orleans, La., assignor to Lykes Bros. Steamship Co., Inc., New Orleans, La.**

**Division of Ser. No. 508,631, Oct. 22, 1965, Pat. No. 3,318,276, which is a continuation-in-part of Ser. No. 416,053, Dec. 4, 1964, abandoned. This application Jul. 7, 1966, Ser. No. 574,523**
**Int. Cl.³ B63B** *35/40*
**U.S. Cl. 114—260** **5 Claims**

1. In a marine carrier of the type comprising a hull, a plurality of storage decks arranged one above the other and each having at least one loading opening extending through the carrier hull at the level thereof, elevator means fastened to said hull and capable of submerging, receiving floating barges thereon, and lifting said barges to each respective storage deck level at the loading opening on said deck, means at said open-



ing on each of said decks for engaging and positioning said barges, and support means for said barges on each of said decks over which they may be easily re-positioned.

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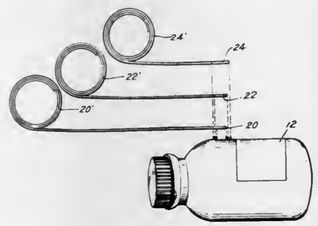
**4,292,916**

## TIMER AND STORAGE CONDITION INDICATOR

**Robert F. Bradley, and Lindell P. Bradley, both of New Buffalo, Mich., assignors to Micro-Circuits Company, New Buffalo, Mich.**

**Filed Jun. 18, 1979, Ser. No. 49,082**
**Int. Cl.³ G01K** *01/02;* **G04F** *01/00;* **G01N** *31/22*
**U.S. Cl. 116—205** **12 Claims**



1. A device for indicating time lapse alone or time lapse integrated with various ambient physical environmental conditions: said device comprising a first layer to be placed on the article to be timed when timing is to begin, a carrier mixture contained in said first layer, a transfer layer of substantially the same size as said first layer adapted to accept said carrier mixture within various elapsed time limits, said transfer layer being initially separate and remote from said first layer and placed in contact with said first layer when the timing and integration are to begin, a component in said device responsive to one or more of the ambient conditions and said time limits varying as at least one of the ambient physical conditions varies, a means of notification of progress of said carrier mixture in said transfer layer, a cover layer larger than said first layer and said transfer layer for enclosing the top and sides of said layers against the article to be timed, said cover layer being initially separate and remote from said first and transfer layers and placed over said layers when the timing and integration are to begin, and an adhesive layer on said cover layer to seal said layers to the article when said device is assembled.

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**4,292,917**

## PASTRY TOPPING DEPOSITING MACHINE

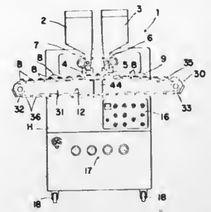
**Norio Ezaki, 2-7-33, Kohama-nishi Suminoe-ku, Osaka, Japan**

**Filed Apr. 8, 1980, Ser. No. 138,563**
**Claims priority, application Japan, Nov. 1, 1979, 54-142538**
**Int. Cl.³ B05C** *5/02*
**U.S. Cl. 118—16** **9 Claims**

1. In a machine for automatically dispensing pastry topping materials to the top surfaces of successive articles of cake or pastry comprising nozzle means for intermittently depositing portions of pastry topping material, pastry supporting means for supporting cakes underneath said nozzle means to deposit successive portions of said topping material on said cakes, said pastry supporting means including first support means for



depositing topping on cakes in a circular pattern and also including second support means for conveying successive pastries underneath said nozzle means to deposit successive portions of said topping material on successive pastries, said first support means including vertically movable and selectively rotatable cake supporting plate means and said second support means including pastry supporting endless conveyor



means, and shaft means selectively coacting with said cake supporting plate means for controlling the vertical distance between a cake and the nozzle means and for rotating the cake under the nozzle means, said shaft means selectively coacting alternatively with said endless conveyor means to control the distance between the nozzle means and successive pastries positioned under the nozzle means.

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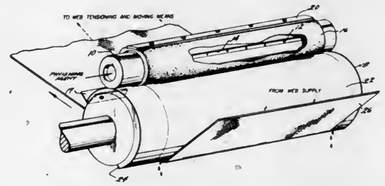
**4,292,918**

## APPARATUS FOR APPLYING LIQUID CHEMICALS TO A MOVING WEB

**Gayron N. Davis, Opelika; Larry S. Sellers, Shawmut, both of Ala., and Winston E. Hagborg, Columbus, Ga., assignors to West Point Pepperell, Inc., West Point, Ga.**

**Continuation-in-part of Ser. No. 110,454, Jan. 8, 1980, abandoned. This application Jul. 22, 1980, Ser. No. 171,826**
**Int. Cl.³ B05C** *3/18*
**U.S. Cl. 118—33** **14 Claims**



1. Apparatus for applying a liquid chemical to a movable web, comprising:

a manifold for receiving and discharging said chemical, said manifold including a pipe to receive said chemical, said pipe being provided with a plurality of spaced orifices located along its length for discharging the chemical;

a length of porous material positioned along said manifold adjacent the orifices for receiving and dissipating the jets of chemical discharged by the manifold;

a fixed member engaging said porous material and having a curved surface terminating in a straight edge, said member being oriented with respect to the porous member such that the chemical is transferred to the member from the porous material, said chemical moving under the force of gravity as a thin film along said curved survace to said edge; and

means for tensioning the web against said edge and for moving the web with respect to the fixed member whereby said chemical is applied to the web.

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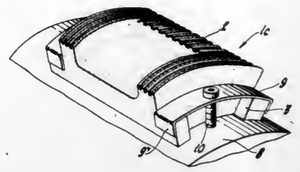
**4,292,919**

## NON-METALLIC PASTE SECTORS AND METHODS OF FABRICATING AND UTILIZING SAME

**Walter C. Taylor, 60690 Nine Mile Rd., South Lyon, Mich. 48178**

**Filed Sep. 24, 1979, Ser. No. 78,466**
**Int. Cl.³ B05C** *1/00;* **B41F** *13/10, 27/06;* **B32B** *27/00*
**U.S. Cl. 118—212** **7 Claims**



1. A paste sector for mounting to a paste sector shaft of a bag making machine so as to apply paste to the open bottom of a bag being manufactured, said paste sector comprising:

a main body including a central non-pasting upper surface portion having a raised upper surface portion extending integrally upwardly therefrom along at least opposite end portions of said central upper surface portion for applying paste in a predetermined pattern to the open bottom of a bag being manufactured;

said main body including a lower surface which is concave and is curved so as to be directly closely fitted against a curved mounting surface portion of said paste sector shaft;

said main body having a generally arcuate cross-sectional configuration;

said main body being substantially imperforate;

said main body including integral opposite end fastening portions for mounting said paste sector to said paste sector shaft; and

said main body of said paste sector, including said raised upper surface portion, said non-pasting upper surface portion and said end fastening portions being integrally injection molded from a substantially resilient non-metallic material comprising a rubber-like urethane material.

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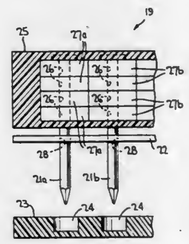
**4,292,920**

## MAGNETIC ATTRACTION TRANSFER DEVICES FOR USE IN SOLID PHASE RADIOIMMUNOASSAYS AND IN OTHER ASSAY METHODS

**Kendall O. Smith, 133 Trillium La., San Antonio, Tex. 78312, and Warren D. Gehle, 6815 Forest Haven, San Antonio, Tex. 78240**

**Division of Ser. No. 680,506, Apr. 26, 1976, abandoned. This application Dec. 20, 1979, Ser. No. 105,707**
**Int. Cl.³ B05C** *3/00*
**U.S. Cl. 118—425** **12 Claims**



1. A device for use in solid phase immumoassays, for simultaneously transferring a plurality of antigen-antibody absorbent

units from one location to another, comprising a transfer element in combination with a tray of non-magnetic material having a plurality of spaced receptacles therein for containing an appropriate liquid and for containing units each comprising a core of ferromagnetic material, each said core being covered with at least one coating for preventing chemical interactions between said core and aqueous chemical solutions and for absorbing antigens or antibodies on the outer surface thereof, said transfer element having a first portion of ferromagnetic material overlying said spaced receptacles in a transfer condition of said element, and said element having a second portion of non-magnetic material overlying spaces between said receptacles when in said transfer condition, and one of said ferromagnetic core and transfer device materials having magnetic properties to effect a magnetic attraction between said units and said transfer device, whereby said units are removable from said receptacles by magnetic attraction while being maintained in spaced apart relationship by said non-magnetic material during said transfer condition.

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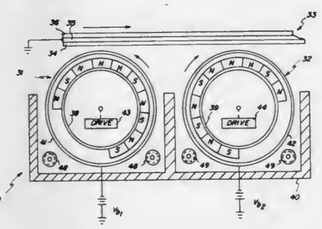
**4,292,921**

## ELECTROGRAPHIC DEVELOPMENT APPARATUS

**Arthur S. Kroll, Spencerport, and Frank A. Shuster, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 4, 1979, Ser. No. 27,115**
**Int. Cl.³ G03G *15/06***
**U.S. Cl. 118—648** **17 Claims**




1. In electrographic apparatus of the type constructed to move an electrostatic-image-bearing member in a first direction through a development zone at a predetermined absolute velocity, an improved developing device comprising:

(a) first applicator means for transporting successive quantities of partially-conductive developer, at a predetermined transport rate, through one portion of said development zone in transfer relation with said member and in a direction generally opposite said first direction;

(b) second applicator means for transporting successive quantities of partially-conductive developer, at a predetermined transport rate, through another portion of said development zone in transfer relation with said member and in a direction generally the same as said first direction; and

(c) electrode means spaced opposite said development zone for electrically coupling each of such quantities of developer to reference potential while in transfer relation with said member;

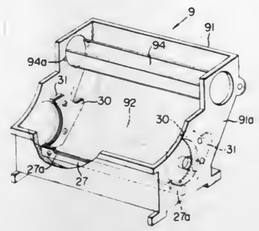
at least one of: (1) the relative transport rate of said first and second applicator means and (2) the reference potential of said electrode means, being predeterminedly constructed to balance development of leading and trailing edge portions of solid-area electrostatic images.

**4,292,922**

## DEVELOPING DEVICE FOR AN ELECTROPHOTOGRAPHIC COPYING MACHINE

**Yoshio Yamazaki; Nin-ichi Kamogawa, and Yasuyuki Iwai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Feb. 19, 1980, Ser. No. 122,769**
**Claims priority, application Japan, Feb. 24, 1979, 54-21101**
**Int. Cl.³ G03G *15/09***
**U.S. Cl. 118—657** **10 Claims**




1. In a magnetic brush type developing device for single component developer and including a casing, an axially elongated sleeve of a non-magnetic material in the casing, and a plurality of magnets disposed in the sleeve for relative rotation therebetween so as to form a layer of developer adhering to the peripheral surface of the sleeve, the improvement comprising;

a regulating plate extending axially along and substantially adjacent the sleeve surface for regulating the height of the layer of developer adhering thereto; and

a pair of partition plates, each arranged substantially perpendicular to the sleeve axis and predeterminately adjacent a circumferentially-disposed portion of the sleeve surface proximate one of the axially opposite ends of the sleeve for preventing axial flow of developer along the sleeve beyond said partition plates.

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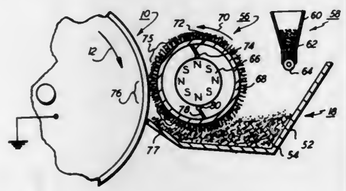
**4,292,923**

## DEVELOPMENT SYSTEM

**Raymond W. Huggins, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jul. 16, 1979, Ser. No. 57,868**
**Int. Cl.³ G03G *13/09***
**U.S. Cl. 118—658** **16 Claims**



1. An apparatus for developing image areas of a surface having image areas and background areas recorded thereon with the electrical potential of the image areas being greater than the electrical potential of the background areas, including:

a tubular member made from a resistive material having conductive particles dispersed substantially uniformly therethrough, said tubular member being positioned adjacent the surface to define a development zone for transporting particles into contact with the surface;

a magnetic member disposed interiorly of said tubular member;



a pair of voltage sources for supplying different fixed voltages; and

a pair of second conductors, having no other conductors interposed therebetween one of said conductors being positioned prior to the development zone with the other of said conductors being positioned after the development zone, each of said pair of conductors having one end region thereof slidably engaging said tubular member with the other end region thereof being connected to one of said pair of voltage sources to electrically bias said tubular member so that the electrical potential thereof, in the development zone, varies substantially continuously from a level substantially equal to the electrical potential of the background areas to a level greater than the electrical potential of the background areas so that particles deposited on the surface adhere to the image areas with the background areas being substantially particle free.

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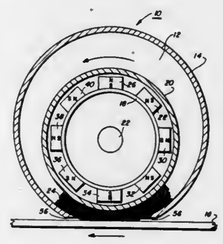
**4,292,924**

## MAGNETIC BRUSH APPARATUS

**Nero R. Lindblad, Palmyra; Ivan Rezanka, Pittsford, and John V. Cassidy, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 3, 1979, Ser. No. 81,411**
**Int. Cl.³ G03G *15/09***
**U.S. Cl. 118—658** **9 Claims**



1. A magnetic brush apparatus for use in an electrostatographic printing machine, including:

a tubular member journaled for rotation about the longitudinal axis thereof;

a magnetic member mounted stationarily and interiorly of said tubular member, said magnetic member generating a radial magnetic field extending outwardly therefrom in a direction substantially normal to the longitudinal axis of said tubular member and an axial magnetic field extending outwardly from opposed ends of said magnetic member in a direction substantially parallel to the longitudinal axis of said tubular member; and

means, positioned radially interiorly of said tubular member in the region of opposed ends of said magnetic member and cooperating therewith, for substantially suppressing the axial magnetic field.

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**4,292,925**

## TONER CONCENTRATION DETECTING APPARATUS

**Isamu Terashima, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 12, 1979, Ser. No. 84,455**
**Claims priority, application Japan, Oct. 18, 1978, 53-127381**
**Int. Cl.³ G03G *15/09***
**U.S. Cl. 118—690** **18 Claims**

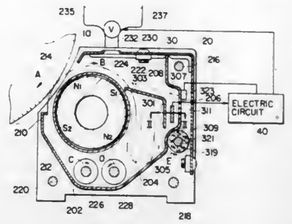
1. An apparatus for detecting a toner concentration of developing powder comprising:

a chamber for storing the developing powder therein;

means for transporting the developing powder to a photosensitive member to develop a latent image;

a hollow body having an inlet and outlet for passage of developing powder through said hollow body;

means for diverting a portion of the developing powder from said transporting means and directing the diverted portion of the developing powder to said hollow body;




detecting means for detecting the toner concentration of the developing powder within said hollow body and for detecting whether the developing powder is passing through said hollow body.

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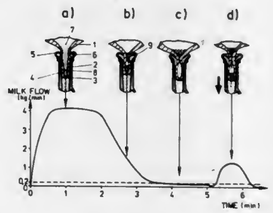
**4,292,926**

## METHOD FOR THE AUTOMATIC FINISH MILKING DURING A MECHANICAL MILK REMOVAL PROCEDURE

**Hoefelmayr Tilman, Niederteufen, Switzerland, assignor to Bio-Melktechnik Swiss Hoefelmayr & Co., Niederteufen, Switzerland**

**Filed Oct. 5, 1979, Ser. No. 82,202**
**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844562**
**Int. Cl.³ A01J *5/04***
**U.S. Cl. 119—14.02** **7 Claims**

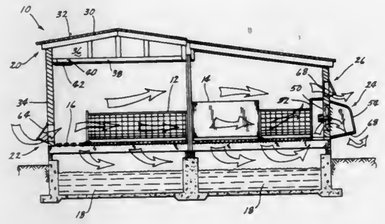



1. In a method for the automatic finish milking during a mechanical milk removal procedure, in which the teat which is introduced into an elastic teat rubber of the milking cup is exposed to a predetermined underpressure, a pulsating underpressure is applied to a space between a milking cup housing and the teat rubber which encloses the teat, a continuous milk flow measurement is carried out and the milking intensity is reduced dependent on the result of the measurement, the improvement comprising wherein the continuous measurement detects the change of the milk flow per unit of time and the reduction of the milking intensity occurs directly after a reduction of the milk flow rate of more than 1 kg/min², which reduction was determined during a period of time of five to ten seconds.

## 4,292,927
## SWINE SHELTER VENTILATING SYSTEM

Stanley W. Sassmann, Denver, Iowa, assignor to Farmstead Industries, Div. of Farmhand, Inc., Waterloo, Iowa

Filed Jun. 1, 1979, Ser. No. 44,378
Int. Cl.[3] A01K *1/00*; F24F *7/06*
U.S. Cl. 119—16 6 Claims



1. A ventilation system for a swine shelter house having an interior spaced defined by a roof, first, second, third, and fourth sidewalls, the first and third sidewalls being disposed opposite to each other, and a manure pit; a slotted floor being disposed above the manure pit, said ventilation system comprising:

a first air inlet means disposed approximately at the juncture of the first sidewall and the roof, for permitting air flow from the outside atmosphere into the interior space;

a second air inlet means disposed in a lower portion of the first sidewall, for permitting flow of outside atmospheric air into the interior space;

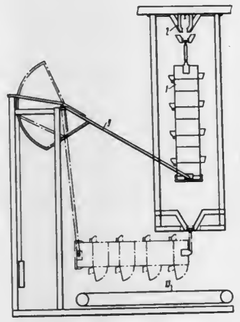
a first air exhaust means formed in the third sidewall above the level of the slotted floor, for permitting air flow into the outside atmosphere from only the interior air space within the manure pit below the floor;

a second air exhaust means, formed in the upper portion of the third sidewall, for permitting air flow from the interior space into the outside atmosphere; said system being operable in a winter mode and a summer mode; said winter mode comprising a winter ventilation system wherein said first air inlet means is open and said second air inlet means is closed, and said first air exhaust means is open and said second air exhaust means is closed; said summer mode comprising a summer ventilation system wherein said first air inlet means is closed and said second air inlet means is open, and said first air exhaust means and said second air exhaust means are open; and only said first air exhaust means employs powered ventilation in the form of an exhaust fan disposed in said third sidewall to draw outside air through said first sidewall across said house into said manure pit and thru said third sidewall via a vent chamber which extends from said slotted floor and surrounds said exhaust fan.

## 4,292,928
## POULTRY BROODING PLANT

Alexei A. Kopylov, ulitsa Lenina, 9/11, kv. 18; Valentin T. Kuzmenko, B. Bulvarnaya ulitsa, 8, kv. 29; Alexandr N. Stepanov, pereulok Turgenevsky, 23; Viktor P. Gaschenko, B. Prospekt, 46, kv. 45, all of, Taganrog; Nikolai A. Kaznacheevsky, ulitsa imeni Grecheskogo goroda Volos, 25/98, kv. 18, Rostov-na-Donu; Alexandr Y. Nosovitsky, ulitsa Pushkinskaya, 38, kv. 4, Rostov-na-Donu; Ivan I. Misikov, ulitsa Pushkinskaya, 181, kv. 18, Rostov-na-Donu; Alexandr I. Shapiro, ulitsa imeni Grecheskogo goroda Volos, 25/98, kv. 38, Rostov-na-Donu; Ivan G. Skakunov, ulitsa B. Cherkizovskaya, 8, kv. 10, Moscow; Valentin G. Markin, prospekt Kommunisticheskiy, 38/2, kv. 16, Rostov-na-Donu; Alexei K. Konstantinov, ulitsa Svobody 15 kv. 86, Taganrog; Eduard S. Abramian, ulitsa B. Cherkizovskaya, 9a, kv. 11, Moscow; Arseny M. Soroka, ulitsa Gerasima Kurina, 42, kv. 33, Moscow, and Yakov A. Zinchenko, ulitsa 2 Krasnodarskaya, 70/1, kv. 10, Rostov-na-Donu, all of U.S.S.R.

Filed Nov. 19, 1979, Ser. No. 95,389
Int. Cl.[3] A01K *31/06*
U.S. Cl. 119—17 12 Claims



1. A self-contained automated poultry brooding plant, comprising:

a plurality of multilevel container cages with means for housing and rearing poultry from chicks until the end of the poultry growing period;

said cages being rotatably mounted on a horizontal frame which is affixed to a conveyer system with means for automatically advancing the cages at a rate of movement in accordance with established poultry growth patterns;

said cages having doors which open when the cage is horizontally rotated through a predetermined angle;

said cages having means which engage with a bell crank located near the conveyer system at a location corresponding to the end of the poultry growing period, whereby the engagement of the cage with the bell crank serves to horizontally rotate the cage at the end of the poultry growing period to said predetermined angle which automatically opens the cage door and unloads the pountry.

## 4,292,929
## CALF INCUBATOR

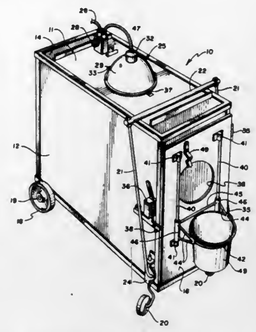
Donald W. Tellers, R.R. 2, Chaska, Minn. 55318

Filed Dec. 28, 1979, Ser. No. 108,238
Int. Cl.[3] A01K *1/02, 5/01, 9/00*
U.S. Cl. 119—27 14 Claims

1. An incubator particularly for calves and the like comprising:

a wheel supported box-like structure consisting of a single pen structure for a single calf or the like and having front, rear, top, bottom and opposing side walls, at least one of said front and rear walls including a door to permit placement of the calf into, and removal of the calf from, the incubator and at least the front, rear, bottom and side walls constructed of an insulative material to substantially reduce drafts of air into the incubator;

a heat source disposed in said top wall for providing head to the interior of the incubator;



an opening in said front wall sufficiently large to permit the calf to poke its head through for eating purposes; and

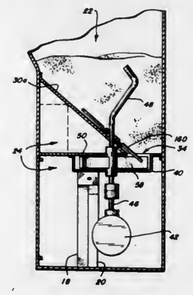
a pail support assembly for supporting a feeding pail proximate said opening.



## 4,292,930
## HORSE-FEEDING APPARATUS

Edward C. Olsen, 1109 S. 17th St., Escanaba, Mich. 49829

Continuation-in-part of Ser. No. 818,736, Jul. 25, 1977, Pat. No. 4,183,327. This application Oct. 4, 1979, Ser. No. 81,863
Int. Cl.[3] A01K *5/02*
U.S. Cl. 119—51.11 7 Claims



1. A system for automatically dispensing horse feed comprising:

a feed storage chamber having side surfaces which converge toward a lower aperture to channel feed to said aperture;

feed transfer means including a substantially closed cylindrical housing aligned below said storage chamber, said housing having an upper surface with an inlet opening disposed below the aperture of said storage chamber, a lower surface having an outlet opening, and an impeller blade spanning the diameter of said cylindrical housing, said inlet and outlet openings being in non-overlapping segments of said upper and lower surfaces;

a drive mechanism including a drive shaft coupled to said impeller blade to cause a continuous flow of feed from said storage chamber through said transfer means to said outlet opening during operation of said drive shaft;

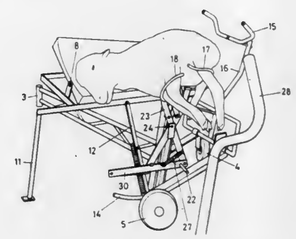
means driven by said impeller blade for agitating the feed within said storage chamber to facilitate feed flow near the lower aperture thereof, said agitating means comprising a freely turning base having a plurality of radial extensions adapted to sweep across an interior surface of the hopper in close proximity thereto; and

means for channeling feed from said outlet opening to a feed area.

## 4,292,931
## METHOD AND MEANS FOR HOLDING A SHEEP

Donald L. Hopkins, Heywood, Australia, assignor to Alf Hannaford & Co. Pty. Ltd., Beverley, Australia

Filed Mar. 6, 1980, Ser. No. 127,756
Claims priority, application Australia, Mar. 7, 1979, PD7941
Int. Cl.[3] A61D *3/00*; A01K *15/00*
U.S. Cl. 119—103 6 Claims



1. Apparatus for handling of sheep including the restraining of sheep for purposes such as shearing including a frame, a table positioned on said frame and adapted to support a sheep in a first instance on its back and subsequently in a position where the sheep is rolled over to its side while still being supported by the table and finally being fully supported in an upright position to a side of the table, an open ended yoke means adapted when the sheep is on the table on its back to push the rear legs jointly of the sheep while on its back at a location at the upper position of the legs forwardly into its body to such an extent as to restrain its movements while at such position, said yoke means being on said frame adjacent an end of said table, being spaced from said table in its normal inoperative position, and being open at its portion closest to said table, and means located at a side of the table and movably positioned to be adapted to engage jointly both front the rear legs at or about the upper end and hold these by engagement close to the body of the sheep and adapted so that the sheep while being maintained in the condition of having its legs held, can nonetheless be turned over so as to be upright although restrained by its holding of the legs.

## 4,292,932
## VEHICULAR PET ANCHOR

Charles R. Wooderson, 5572 Baronridge, #5, Mehlville, Mo. 63129

Filed Dec. 13, 1979, Ser. No. 103,060
Int. Cl.[3] A01K *27/00*
U.S. Cl. 119—109 4 Claims

1. In combination with a vehicle, said vehicle having a body within which is located an openable door, a pet tether connectable with said vehicle, said pet tether comprising:

an elongated, thin, integral, flexible member having an outer end and an inner end connected together by a middle section, said middle section being sufficiently thin to be locatable between said openable door and said body with said openable door closed and not hinder the opening and closing movement of said openable door, removal of said member from said openable door to occur upon opening of said openable door, said outer end having a substantially greater thickness than said middle section, whereby said outer end prevents disassociation of said member

from said openable door when said openable door is closed;

an attaching opening formed within said inner end, said inner end being substantially thicker than said middle section, the thickness of said inner end being for the pur-

pose of providing extra strength about said attaching opening; and

attaching means connected to said attaching opening, said attaching means for connecting to a pet to restrict the movement of the pet defined by the length of said attaching means.

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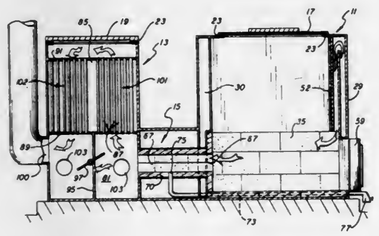
**4,292,933**

## FURNACE

**Daniel Meier, and Carl Maendel, both of Rifton, N.Y., assignors to Hutterian Society of Brothers, Rifton, N.Y.**

**Filed Nov. 8, 1979, Ser. No. 92,550**
**Int. Cl.³ F22B *9/02***
**U.S. Cl. 122—114** **7 Claims**




1. A furnace for burning solid fuel in the presence of air whereby products of combustion are produced, said furnace comprising:

a fire-box compartment being rectangularly-shaped with four vertical walls, three of said four vertical walls being double walls to form a liquid chamber, said fire-box compartment having a means for supplying air into the fire-box compartment and for preheating the air so supplied, said fire-box compartment further including an opening for supplying solid fuel into the fire-box compartment;

a lid pivotably mounted on said fire-box compartment over the opening in the fire-box compartment for sealing the opening in said fire-box compartment for supplying solid fuel into the fire-box compartment;

a heat-exchanger compartment having a top and a bottom, said heat-exchanger compartment including a liquid container with a series of fire-tubes vertically oriented through the liquid container, the liquid container being located below the top of the heat-exchanger compartment to form an upper flue gas passage over the liquid container, said heat-exchanger compartment further including a lower flue gas passageway beneath said liquid container;

a baffle located in said lower flue gas passageway of said heat-exchanger compartment, said baffle having a damper pivotable mounted in it;

a means located partially outside said heat-exchanger compartment for pivoting said damper to open and close said damper;

a channel connecting the fire-box compartment with the lower flue gas passageway in the heat-exchanger compartment to supply products of combustion from the fire-box compartment to the heat exchanger compartment, said lower heat-exchanger compartment having a flue gas exit for discharging the products of combustion, said flue gas exit being located in said lower flue gas passageway opposite from said channel, said baffle being located substantially midway between the channel and the flue gas exit;

a secondary air inlet located in said channel for supplying additional air to the products of combustion in the channel for further combustion; and

means for supplying and removing liquid from said liquid chamber and said liquid container.

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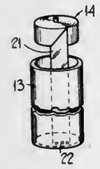
**4,292,934**

## STARTING AIDS FOR INTERNAL COMBUSTION ENGINES

**Richard P. Knowles, Farnborough, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Oct. 18, 1976, Ser. No. 733,366**
**Claims priority, application United Kingdom, Oct. 24, 1975, 43736/75**
**Int. Cl.³ F02P *19/02*; F02B *9/08***
**U.S. Cl. 123—145 A** **11 Claims**




1. A starting aid for a diesel engine the aid being of the kind which in use is mounted within the cylinder head of an engine so that the heated portion of the aid is exposed within a combustion space of the engine, the aid comprising a spirally coiled heating element formed from conductive tape which is located within and at the end of a tubular member, the outer end of the heating element being electrically connected to the tubular member, the inner end of the heating element being electrically connected to a conductive rod extending within the tubular member, and a length of tape connected to the outer end of the heating element extends in a direction transversely to the plane of the heating element, said length of tape being secured at or adjacent its free end to the tubular member or body of the aid at a position removed from the heating element.

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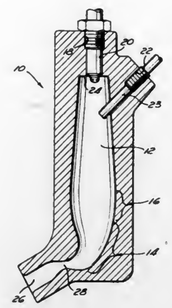
**4,292,935**

## LOW NITROUS OXIDE (NOX) PRECOMBUSTOR

**William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Mar. 31, 1980, Ser. No. 136,140**
**Int. Cl.³ F02B *19/14***
**U.S. Cl. 123—285** **5 Claims**

1. A precombustor for use in diesel engines, wherein the improvement comprises defining the internal geometry of the precombustion chamber in accordance with the following equation:




$$\left(\frac{dT}{T}\right) = \frac{(\gamma - 1)M^2}{1 - M^2}\left(\frac{dA}{A}\right) + \frac{(1 - \gamma M^2)\left(1 + \frac{\gamma - 1}{2}M^2\right)}{(1 - M^2)}\left(\frac{dT_o}{T_o}\right)$$

where T is static temperature, A is area of precombustion chamber, $\gamma$ is ratio of specific heats, and M is mach number of the gas flow.

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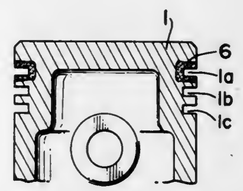
**4,292,936**

## ALUMINUM BASED ALLOY PISTONS FOR INTERNAL COMBUSTION ENGINES

**Tuyoshi Morishita; Kenji Miyake, and Kouji Tobita, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan**

**Filed May 15, 1979, Ser. No. 39,289**
**Claims priority, application Japan, May 16, 1978, 53-58367**
**Int. Cl.³ F02F *3/04***
**U.S. Cl. 123—193 P** **9 Claims**




1. A piston for internal combustion engines including a crown and peripheral wall, said piston being formed at the peripheral wall with a plurality of piston ring grooves including a top ring groove which is located closest to the crown among the piston ring grooves, insert means being casted in the piston to define at least partly at least said top ring groove, said insert means being made of a sintered particulate homogeneous alloy comprising in weight 8 to 25% of Ni, 4.5 to 7.5% of Cu, less than 2% of C and the balance substantially of Fe and having a density of 5.5 to 6.8 g/cm$^3$ and a coefficient of thermal expansion of 17 to $23 \times 10^{-6}$ cm/°c.cm, and total amount of Ni and Cu being not less than 15% in weight.

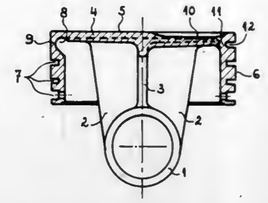


**4,292,937**

## PISTON FOR INTERNAL COMBUSTION ENGINES

**Jean-Pierre Vallaude, Orsay, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France**

**Filed Sep. 18, 1979, Ser. No. 76,598**
**Claims priority, application France, Sep. 22, 1978, 78 27173**
**Int. Cl.³ F02F *3/24*; F16J *1/00***
**U.S. Cl. 123—193 P** **2 Claims**




1. In a piston assembly having a piston crown, a side portion with grooves formed therein for receiving sealing piston rings, and at least one recessed portion in the piston crown, the improvement comprising means for reducing heat diffusion from the piston crown to the side portion, said means for reducing comprising:

an internal partially circular groove formed in the piston assembly for reducing the thickness of a portion of the piston assembly connecting the piston crown and side portion, said internal partially circular groove having an interrupted portion adjacent said at least one recessed portion; and

an external cut tangentially formed in the side portion above the grooves, said cut being positioned adjacent said interrupted portion whereby the at least one recessed portion in the piston crown in combination with the internal groove does not excessively reduce the thickness of the connecting portion.

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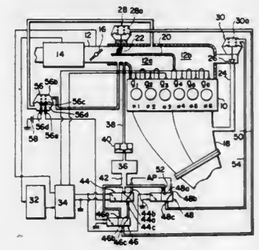
**4,292,938**

## INTERNAL COMBUSTION ENGINE

**Toshiaki Tanaka, Fujisawa, and Yukihiro Etoh, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,747**
**Claims priority, application Japan, Dec. 8, 1978, 53-169278**
**Int. Cl.³ F02D *17/03*; F02M *25/06***
**U.S. Cl. 123—198 F** **8 Claims**




1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) an intake passage provided therein with a throttle valve and divided downstream of said throttle valve into first and second branches, said first branch communicating with said first group of cylinders, said second branch communicating with said second group of cylinders;

(c) an exhaust passage;

(d) first valve means provided in said second branch for opening and closing the same;
(e) an EGR passage having its one end opening into said second branch and the other end opening into said exhaust passage for recirculation of a portion of exhaust gases thereinto;
(f) second valve means provided in said EGR passage for opening and closing the same;
(g) a fuel injection control unit for providing, in synchronism with rotation of said engine, a drive pulse signal having its pulse width varying as a function of intake air flow rate;
(h) first and second fuel supply means responsive to the drive pulse signal for supplying fuel into said first and second groups of cylinders, respectively;
(i) a load detector responsive to engine load conditions for allowing application of the drive pulse signal to said first and second fuel supply means and providing a first control signal under high load conditions, and for allowing application of the drive pulse signal to said first fuel supply means but stopping application of the drive pulse signal to said second fuel supply means and providing a second control signal under low load conditions;
(j) first valve control means responsive to the first control signal from said load detector for opening said first valve means but holding said first valve means closed as long as the pressure in said second branch is substantially higher than the pressure in said first branch, said first valve control means responsive to the second control signal therefrom for closing said first valve means; and
(k) second valve control means responsive to the first control signal from said load detector for closing said second valve means and responsive to the second control signal for opening said second valve means.

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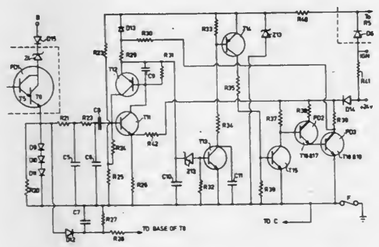
**4,292,939**

## FAIL SAFE DEVICES FOR USE WITH DEVICES FOR LIMITING THE SPEED OF REVOLUTION OF AN INTERNAL COMBUSTION ENGINE

**John P. Coates, London, England, and David H. Lewis, Swansea, Wales, assignors to Lumenition Limited, London, England**

**Filed Dec. 13, 1979, Ser. No. 102,907**
**Int. Cl.³ F02P** *9/00*
**U.S. Cl. 123—335** **10 Claims**



1. A fail-safe device for isolating an electronic revolution limiter associated with an electronic ignition system for an internal combustion engine including a spark ignition coil, the revolution limiter being of the type having an output stage including a semiconductor breakdown device in series with a semiconductor switch for connection in parallel with an output stage of the electronic ignition system, wherein the semiconductor switch is rendered conductive at engine speeds above a predetermined limiting speed to prevent the generation of ignition pulses by limiting the voltage applied to operate the ignition coil; the fail-safe device comprising detecting means arranged to be coupled to the output stage of the revolution limiter for detecting if the semiconductor switch is conductive such as to prevent the generation of ignition pulses at an engine speed lower than the predetermined limiting speed thus indicating that a fault has developed in the revolution limiter, and for providing a corresponding detecting signal containing pulses at a rate proportional to the engine speed; and interrupt means coupled to said detecting means and arranged to be connected to the revolution limiter for isolating the revolution limiter from the electronic ignition system in accordance with said detecting signal.

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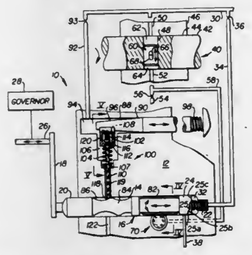
**4,292,940**

## APPARATUS FOR CONTROLLING THE QUANTITY OF FUEL DELIVERY TO AN ENGINE AND ENGINE TIMING

**John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00657, § 371 Date Aug. 27, 1979, § 102(e) Date Aug. 27, 1979**
**PCT Filed Aug. 27, 1979, Ser. No. 99,140**
**Int. Cl.³ F02D** *7/00*
**U.S. Cl. 123—387** **17 Claims**




1. Apparatus (**10**) for controlling the quantity of fuel delivery to an engine in response to engine operating conditions, comprising:
(a) first means (**16, 22, 32, 34, 38**) for controlling the maximum quantity of fuel delivery to the engine in response to engine load;
(b) second means (**16, 40, 70**) for controlling the maximum quantity of fuel delivery to the engine in response to engine speed; and
(c) wherein said first controlling means (**16, 22, 32, 34, 38**) and said second controlling means (**16, 40, 70**) include a control rod (**16**) having a control surface (**25**) of predetermined shape defining various axial rod lengths, said control rod (**16**) being rotatable to any one of a plurality of positions in response to engine speed and being axially movable in response to engine load and in dependence on the rotatable position of said control rod (**16**).

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**4,292,941**

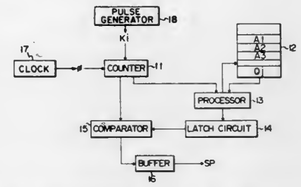
## ELECTRONIC IGNITION CONTROL SYSTEMS

**Seigo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan**

**Continuation of Ser. No. 876,176, Feb. 8, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 176,292**
**Claims priority, application Japan, Feb. 8, 1977, 52-12833**
**Int. Cl.³ F02P** *5/04*
**U.S. Cl. 123—416** **5 Claims**

1. An electronic ignition control system for an internal combustion engine comprising:
timing pulse means for generating a plurality of timing pulse signals the interval between successive ones of said pulse signals corresponding to each of successive rotations of said engine;
clock means for generating a plurality of clock pulses proportional to actual time;
counting means connected to said timing pulse means and said clock means for measuring the number of said clock pulses between successive ones of said timing pulse signals, said number representing the actual speed of rotation of said engine for the preceding revolution thereof, said counting means including means for storing said measured number;
a read-only memory containing a plurality of constants corresponding to the differences between the time a spark is generated in a cylinder of said engine and the time at which the flame generated by that spark has been propagated throughout the cylinder, each of said constants being correlated with a predetermined range in the speed of rotation of said engine;
calculating means for reading out one of said constants from said memory corresponding to the measured number stored in said counting means at a given time, and calculating from said measured number and said correlated constant, a value representing the time at which the next succeeding spark should be generated in a cylinder of said engine;






latch means connected to said calculating means for temporarily storing said value;
comparator means connected to said latch means and said counting means for comparing the number of said clock pulses occurring since the last of said timing pulse signals with the value in said latch means, and for producing a coincidence pulse when the number of clock pulses and the value coincide; and
buffer means connected to said comparator means and responsive to receipt of said coincidence pulse for generating an output signal to create a spark in a cylinder of said engine.

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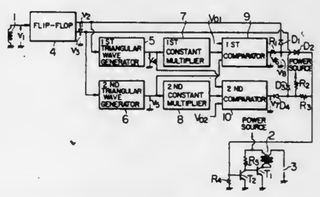
**4,292,942**

## IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Hiroshi Katada, Katsuta, and Yoshito Kyogoku, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 4, 1980, Ser. No. 109,506**
**Claims priority, application Japan, Jan. 10, 1979, 54-681**
**Int. Cl.³ F02P** *5/08*
**U.S. Cl. 123—418** **4 Claims**




1. An ignition system for an internal combustion engine comprising:
a pulser for producing positive and negative output pulses responsive to the rotation of the engine;
first triangular wave generator means for generating a triangular wave output signal in response to the positive output pulse of said pulser;
second triangular wave generator means for generating a triangular wave output signal in response to the negative output pulse of said pulser;
a first constant multiplier circuit multiplying the output signal of said first triangular wave generator means by a constant to produce an output signal;
a second constant multiplier circuit multiplying the output signal of said second triangular wave generator means by a constant to produce an output signal;
first comparator circuit means comparing the output signal of said first triangular wave generator means with a signal which is formed by adding the output signal of said second constant multiplier circuit with a fixed voltage to produce an output signal which controls the current conduction start position of ignition coil primary current; and
second comparator circuit means comparing the output signal of said second triangular wave generator means with a signal which is formed by adding the output signal of said first constant multiplier circuit with a fixed voltage to produce an output signal which controls the ignition position of the engine.

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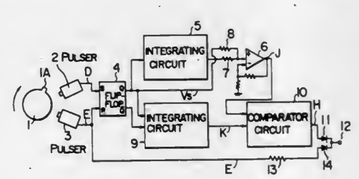
**4,292,943**

## CONTACTLESS IGNITION SYSTEM FOR USE WITH INTERNAL COMBUSTION ENGINES

**Yoshito Kyogoku, Mito, and Hiroshi Katada, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 26, 1979, Ser. No. 15,132**
**Claims priority, application Japan, Feb. 24, 1978, 53/19632; Jul. 10, 1978, 53/83026**
**Int. Cl.³ F02P** *5/08*
**U.S. Cl. 123—427** **10 Claims**




1. A contactless ignition system for use with an internal combustion engine comprising:
a magnetic rotor with means rotatable in synchronism with the engine for detecting an ignition angle,
means for controlling the advance of ignition timing,
a semiconductor switching circuit actuatable with an ignition signal delivered from said advance angle controlling means, and
an ignition coil connected to said semiconductor switching circuit,
said advance angle controlling means comprising:
means for detecting a predetermined maximum advance angular position of ignition timing in cooperation with said magnetic rotor,
means for detecting a predetermined minimum advance angular position of ignition timing in cooperation with said magnetic rotor,
a first integrating circuit which starts an integration in response to the detection of the maximum advance angular ignition position and terminates the integration in response to the detection of the minimum advance angular position to generate an output of a first triangular wave form,
adder means for adding a signal of a predetermined, fixed level to the output of said first integrating circuit,
a second integrating circuit which starts an integration in response to the detection of the minimum advance angular position and terminates the integration in response to the detection of the maximum advance angular position to generate an output of a second triangular wave form, and

a comparator circuit which produces said ignition signal when the output level of said adder means coincides with the output level of said second integrating circuit,

said second integrating circuit including a constant current source, a first switching element and a capacitor connected in series with said constant current source, an output terminal connected to a junction of said first switching element and said capacitor, and a second switching element connected in parallel with said capacitor, wherein said constant current source starts charging said capacitor when said first switching element is rendered conductive by an output of said minimum advance angular position detecting means, the charging to said capacitor is stopped when said first switching element is rendered non-conductive by an output of said maximum advance angular position detecting means, and said capacitor is discharged when said second switching element is rendered conductive by the output of said minimum advance angular position detecting means, whereby said second triangular wave form is delivered out from said output terminal.

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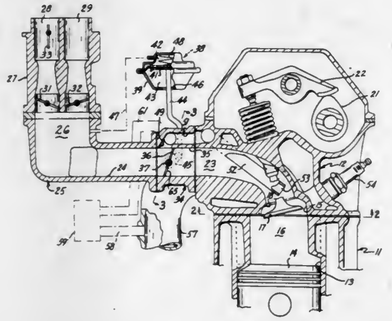
**4,292,944**

## INTAKE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Hiromitsu Matsumoto, Haamatsu; Keiichi Sugiyama, Shizuoka, and Kazuo Uchiyama, Hamamatsu, all of Japan, assignors to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan**

**Filed Feb. 7, 1980, Ser. No. 119,211**
**Claims priority, application Japan, Feb. 8, 1979, 54-14066**
**Int. Cl.³ F02M *13/06***
**U.S. Cl. 123—432** **7 Claims**



1. In an induction system for an internal combustion engine having a chamber of variable volume in which combustion occurs, main induction passage for delivering a charge to said chamber, an auxiliary induction passage for delivering a charge to said chamber, said auxiliary induction passage having a substantially lesser effective cross-sectional area than said main induction passage so that a given mass flow of charge delivered to said chamber through said auxiliary induction passage will enter said chamber at a significantly greater velocity, valve means for controlling the ratio of communication between said induction passages and said chamber during a given cycle of operation, said valve means being effective to direct substantially all of the idle charge flow to said chamber through said auxiliary induction passage, said valve means comprising at least a butterfly type throttle valve for controlling the flow through said main induction passage, the improvement comprising a relief formed in said butterfly type throttle valve formed at a location spaced above its lower peripheral edge for reducing the velocity of the charge entering said chamber through said auxiliary induction passage when said engine is operating at its idle condition, said relief being oriented so that the charge flowing therethrough when said butterfly type throttle valve is substantially closed will intersect the charge introduced to said chamber through said auxiliary induction passage to increase the turbulence in said chamber.

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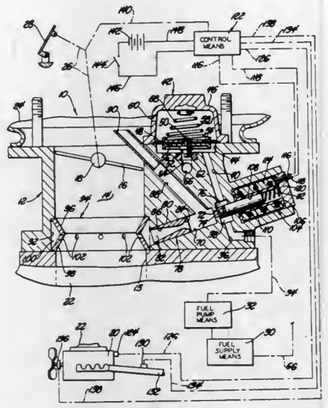
**4,292,945**

## FUEL INJECTION APPARATUS AND SYSTEM

**Norbert W. Kiesling, Mount Clemens, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.**

**Filed May 2, 1980, Ser. No. 146,135**
**Int. Cl.³ F02B *33/00***
**U.S. Cl. 123—438** **4 Claims**



1. Fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, throttle valve means situated in said induction passage means for variably controlling the rate of flow of air through said induction passage means, fuel-air mixture discharge means situated in said induction passage means downstream of said throttle valve means, air passage means communicating between a source of air and said fuel-air mixture discharge means, said air passage means comprising flow restriction means, said flow restriction means being calibrated as to provide for sonic flow therethrough at conditions of idle engine operation, fuel metering means for metering liquid fuel in response to engine demands and indicia of engine operation, said liquid fuel when metered by said fuel metering means being discharged into said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means, said flow restriction means comprising sonic venturi type restriction means, said fuel metering means for metering liquid fuel comprising a duty-cycle type metering solenoid assembly, said metering solenoid assembly comprising armature means, a valve member operatively carried by said armature means, and a field winding, said field winding being intermittently energizable during metering of said liquid fuel as to cause said armature means and said valve member to move toward and away from a closed position and thereby result in an average rate of flow of fuel past said valve member which constitutes the then metered rate of liquid fuel flow, unmetered fuel passage means for supplying unmetered fuel to said fuel metering means upstream of said fuel metering means, pressure regulator means operatively communicating with said unmetered fuel for regulating the pressure thereof to a reselected superatmospheric magnitude, said fuel-air mixture discharge means comprising generally annular means defining generally annular passage means, said air-passage means in communicating with said fuel-air mixture discharge means communicates with said generally annular passage means, and discharge port means communicating between said generally annular passage means and said induction passage means for directing the flow of the fuel-air mixture within said generally annular passage means to said induction passage means, said discharge port means comprising a plurality of discharge ports spaced from each other and directed generally radially inwardly of said induction passage means.



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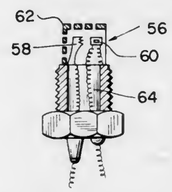
**4,292,946**

## AIR-FUEL RATIO CONTROL SYSTEM

**Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Oct. 5, 1979, Ser. No. 82,337**
**Claims priority, application Japan, Nov. 15, 1978, 53-140667; Nov. 15, 1978, 53-140668**
**Int. Cl.³ F02B *33/00***
**U.S. Cl. 123—440** **5 Claims**



1. An air-fuel ratio control system for use with an engine carburetor including an air-fuel induction passage provided therein with a throttle valve, a float chamber, and a main fuel passage connected at its one end to said float chamber and at the other end to said induction passage downstream of said throttle valve, comprising:

(a) a control unit responsive to various engine operating factors for judging the condition under which the engine is operating and providing first and second pulse signals each having a constant period and a pulse width corresponding to the engine operating condition;

(b) a main control valve provided in said main fuel passage, said main control valve responsive to the first pulse signal for opening and closing said main fuel passage so as to control the flow of fuel passing therethrough;

(c) fuel supply means for supplying fuel;

(d) an auxiliary fuel passage connected at its one end to said fuel supply means and at the other end to said induction passage downstream of said throttle valve;

(e) an auxiliary control valve provided in said auxiliary fuel passage, said auxiliary control valve responsive to the second pulse signal for opening and closing said auxiliary fuel passage so as to control the flow of fuel passing therethrough, thereby providing an optimum air-fuel ratio corresponding to the engine operating condition; and

(f) an air-fuel ratio sensor provided in said induction passage downstream of said throttle valve, said sensor responsive to the air-fuel ratio of a mixture flowing thereover to provide an air-fuel ratio indicative signal to said control unit for feedback control of the air-fuel ratio, said air-fuel ratio sensor comprises a heater responsive to a signal from said control unit for catalytic oxidization of the mixture flowing into contact therewith, an oxygen sensitive element for detecting the oxygen density of the gases resulting from the catalytic oxidization, and a perforated flame stabilizer covering said heater and said oxygen sensitive element.

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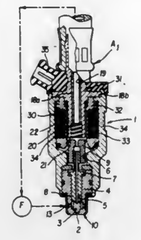
**4,292,947**

## SPILL TYPE SWIRL INJECTOR

**Yasusi Tanasawa, Nagoya; Norio Muto, Aichi; Akinori Saito, and Kiyomi Kawamura, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan**

**Filed Nov. 7, 1979, Ser. No. 92,036**
**Claims priority, application Japan, Nov. 7, 1978, 53-137630**
**Int. Cl.³ B05B *1/32*; F02B *3/00*; F02G *3/00***
**U.S. Cl. 123—445** **6 Claims**



1. A spill type swirl injector comprising:

a nozzle body having an inner cylindrical wall;

a pressurized fluid supply source;

an injection port opening at one end of said nozzle body for injecting pressurized fluid;

pressurized fluid supply passage means;

a pressurized fluid induction passage provided within said nozzle body, said pressurized fluid induction passage being connected to said pressurized fluid supply source through said pressurized fluid supply passage means;

valve means including a movable member interposed into said injection port for controlling the fluid injection by on-off controlling the fuel supply to said injection port;

a swirl chamber comprising an annular chamber formed between said inner cylindrical wall of said end of said nozzle body and an outer cylindrical wall of said movable member of said valve means, at a position adjacent to said injection port within said nozzle body, said swirl chamber being connected to said injection port;

first and second tangential pressurized fluid supply passages formed within said nozzle body in communication with said pressurized fluid induction passage and opening into said inner cylinder wall of said nozzle body of said swirl chamber in the tangential direction thereof for forming swirling flow of said pressurized fluid within said swirl chamber; and

spill means comprising said movable member having first and second spill openings formed therein communicating with said outer cylindrical wall of said movable member of the valve means and opened into said outer cylindrical wall of said movable member in said swirl chamber;

said first and second spill openings being diametrically opposite each other, and

said first and second spill openings being positioned at a distance farther from said fuel injection port than said tangential pressurized fluid supply passages when said injecton port is closed by said valve means; and

first spill passage means comprising said movable member having an axial hole formed therein communicating with said two spill openings, and said nozzle body having second spill passage means formed therein communicating with said axial hole and said pressurized fluid supply source, thereby spilling a predetermined quantity of the pressurized fluid from said outer cylindrical wall of said movable member in said swirl chamber through said first and second spill openings, said axial hole and said second spill passage means, without decreasing the swirling energy of the swirling flow in said swirl chamber, such that

the fluid is injected in the form of a liquid film flow having a sufficiently high swirling velocity immediately after the valve is opened so that the sprayed liquid droplets are fine and uniform and the atomozing characteristics and response of atomization to the injection pressure are improved.

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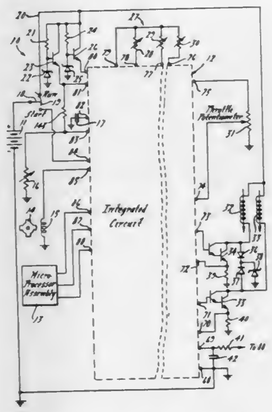
**4,292,948**

## METHOD FOR EXTENDING THE RANGE OF OPERATION OF AN ELECTROMAGNETIC FUEL INJECTOR

**William J. Graessley, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Oct. 9, 1979, Ser. No. 83,016**
**Int. Cl.³ F02M** *51/00;* **F02D** *5/02*
**U.S. Cl. 123—490** **1 Claim**



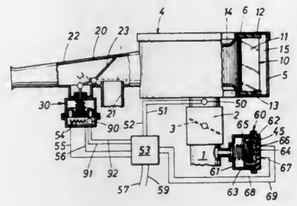

1. A method for extending the range of operation of an electromagnetic fuel injector having an inductive element which, when supplied with an electrical potential causes the fuel injector to open to permit delivery of pressurized fuel supplied to the injector, the opening rate of the fuel injector being a function of the magnitude of the electrical potential applied to the inductive element and the closing rate of the fuel injector being a function of the current in the inductive element upon reduction of the magnitude of the electrical potential to a level below that required to hold the fuel injector open, the method comprising the steps of applying substantially full available DC electrical supply potential across the inductive element of the fuel injector to cause it to open, sensing the current in the inductive element by a sensing resistor which generates a sensing voltage, applying the sensing voltage to a threshold detector, comparing the applied voltage to a reference voltage coupled to the threshold detector, continuing the current in the electromagnetic injector inductive element, establishing a reset logic state in a flip flop when the applied voltage exceeds the reference voltage, applying the flip flop output to a transistor so that the transistor becomes conductive and causing a reduced reference potential to be applied to the positive input of an operational amplifier, reducing the output voltage of the operational amplifier and the driving voltage for a Darlington transistor, reducing the conductivity of the Darlington transistor and decreasing the current level in the inductive element and thereafter holding the current in the inductive element at a level sufficient to maintain it open and at a current level less than that which occurs due to prolonged application of the substantially full available DC electrical supply potential, thereby reducing the time required to close the injector.

**4,292,949**

## ELECTRONICALLY CONTROLLED COMBUSTION AIR MIXING VALVE FOR INTERNAL COMBUSTION ENGINES

**Lothar Bendig, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany**

**Filed Sep. 2, 1980, Ser. No. 183,152**
**Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935009**
**Int. Cl.³ F02M** *31/00*
**U.S. Cl. 123—556** **8 Claims**



1. A device for controlling the temperature of the combustion air in the air intake system of an internal combustion engine, the device comprising in combination:
- a cold air intake duct for the intake of air of ambient temperature;
- a warm air intake duct for the intake of preheated air coming from an air heater which is associated with the engine;
- a duct junction where the cold air intake duct and the warm air intake duct are joined;
- a combustion air duct leading from the duct junction to the cylinder or cylinders of the internal combustion engine;
- an air flow proportioning valve associated with the cold air and warm air intake ducts, at the duct junction, the valve being adjustable in its position so as to progressively open one of the two ducts while correspondingly closing the other, thereby adjusting the relative flow rates at which cold air and preheated air are drawn into the combustion air duct;
- means for sensing the combustion air temperature in the combustion air duct and for generating an electrical signal indicative of the temperature level; and
- means for adjusting the position of the air flow proportioning valve in response to the electrical control signal supplied by the temperature sensing means so that, when the air temperature in the combustion air duct rises, the corresponding control signal induces the valve position adjusting means to adjust the position of the air flow proportioning valve in the direction of closing the warm air intake duct and opening the cold air intake duct; and wherein
- the valve position adjusting means includes a pneumatic actuator with an enclosed pressure chamber of variable volume and a return-biased drive linkage connecting a movable wall portion of the pressure chamber to the flow proportioning valve; and
- the pneumatic actuator further includes a heat source of variable output arranged to adjustably raise the temperature in the pressure chamber above the ambient temperature, in response to changes in the electrical control signal.

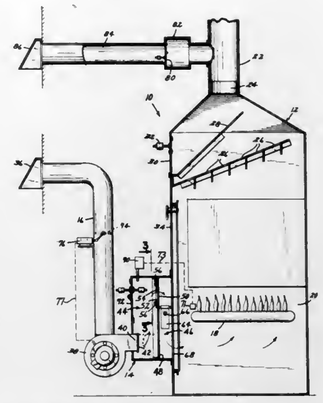


**4,292,950**

## GAS BURNER SYSTEM

**George W. Schossow, 2316 Lilac La., White Bear Lake, Minn. 55110**

**Filed Jun. 3, 1977, Ser. No. 803,041**
**Int. Cl.³ F23J** *11/00;* **F24H** *3/02*
**U.S. Cl. 126—110 A** **3 Claims**



1. A gas burning furnace system comprising:
(a) a pressure box having downstream outlet providing fluid communication with a gas burner in a firebox, and an upstream inlet;
(b) a blower for pressurizing said pressure box with outside air, said blower having an inlet end and an outlet end in fluid communication with said upstream inlet end of said pressure box;
(c) a conduit extending from an outside air vent into said blower, whereby the blower draws air exclusively from outside the home and forces it into the pressure box;
(d) a baffle plate mounted within the pressure box between the pressure box inlet and outlet, dividing the interior of the pressure box into an upstream and a downstream chamber, said baffle plate having a plurality of apertures therein;
(e) a movable grate mounted on the baffle plate in superposed relationship to said plurality of apertures, whereby the grate may be moved to selectively adjust the size of the openings defined by the grate and the apertures;
(f) means extending outside the pressure box for moving the grate;
(g) a flapper plate pivotally mounted in an exterior wall of the downstream chamber of the pressure box, said flapper plate being adapted to swing in response to pressure changes within said downstream chamber;
(h) safety means for supplying air from inside the home to the burner, should the outside air supply become inadequate to satisfy the combustion air demands of the burner;
(i) means for preventing a back draft down a chimney from blowing out the burner flame, including at least one barometric draft regulator plate pivotally mounted in an exterior wall of the furnace and diverter means situated between the burner and the chimney for diverting any such drafts to said plate, whereby said plate may swing open to allow any such drafts to escape from the furnace before reaching the burner flame;
(j) means for preventing the ignition of the burner until a predetermined pressure has been reached within the pressure box, said ignition preventing means including a pressure sensitive switch mounted in said pressure box and operably connected with means for igniting the burner; and
(k) a normally open butterfly valve mounted in the outside air conduit, and means for closing said valve after a time delay following shut-off of the burner.

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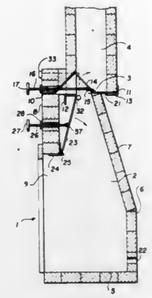
**4,292,951**

## FIREPLACES AND ATTACHMENTS

**George E. Gould, 13406 Arctic Ave., Rockville, Md. 20853**

**Filed Feb. 9, 1979, Ser. No. 10,805**
**Int. Cl.³ F24B** *1/18;* **F 23L** *11/00*
**U.S. Cl. 126—120** **9 Claims**



1. A fireplace in a building which substantially prevents smoke from entering the room in which the fireplace is situated, comprising,
a fireplace opening comprised of a cavity, a throat, and a flue, the flue being situated above the cavity and leading to the exterior of the building for the elimination of smoke, and the throat being situated at the transition between the cavity and the flue,
the cavity including a floor, side walls, a rear wall, and a front wall extending partially to the floor and forming a front opening,
movable damper means situated above the throat for selectively changing the size of a first opening to the flue, and
adjustable controller means situated below the throat and operable independently of such damper means for controlling the size of a second opening to the flue disposed beneath and in series with the first opening,
the adjustable controller means being tiltable about its lower edge and being movable toward the rear wall at its upper portion to form in cooperation with such rear wall a venturi-type opening at said throat, whereby the second opening may be adjusted to ensure that substantially all smoke passes up the flue and not into the room.

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**4,292,952**

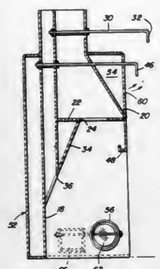
## FIREPLACE FURNACE

**Charles B. McDonald, Rte. 1, Atkins, Ark. 72823**

**Filed Aug. 16, 1979, Ser. No. 67,016**
**Int. Cl.³ F24B** *7/00*
**U.S. Cl. 126—121** **9 Claims**

1. A fireplace structure for use in heating a building environment, said fireplace structure comprising:
- a firebox having enclosing opposite side walls, a rear wall and a top wall;
- a first flue having an opening in said top wall and extending upwardly from said opening for removing products of combustion from said firebox;
- a first damper disposed across said first flue for selectively closing said first flue; and
- a second flue having an opening disposed below the opening of said first flue, said second flue extending upwardly from its respective opening, including jacket means defining a heat exchange area around said firebox for heating air passed therethrough, an air intake duct having an intake end positioned exteriorly of said building and an outlet

end positioned in said firebox for channeling combustion supporting air to said firebox, a damper disposed in said air intake duct; a building air circulation duct opening into said heat exchange area and having an intake end opening into said building for circulating building air through said heat exchange area, and an outlet port in said heat exchange area for reintroducing building air into said building interior, said building air circulation duct including a damper flap disposed therein, said damper flap and said air intake duct damper being connected to a common shaft, said damper flap being positioned across said air circulation duct so as to be displaced by air movement therethrough, thereby causing displacement of said damper in said air intake duct.



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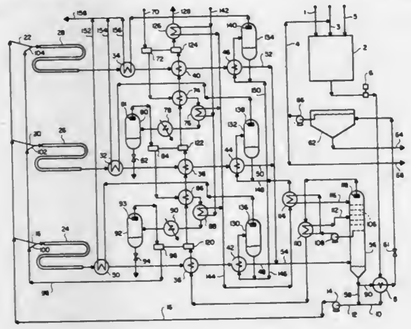
**4,292,953**

## POLLUTANT-FREE LOW TEMPERATURE SLURRY COMBUSTION PROCESS UTILIZING THE SUPER-CRITICAL STATE

Norman L. Dickinson, Box 211, Lavallette, N.J. 08735

Filed Oct. 5, 1978, Ser. No. 948,682
Int. Cl.[3] F24J 3/00
U.S. Cl. 126—263 16 Claims



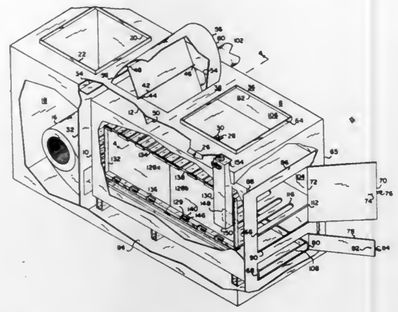
1. A process for converting the heating value of a fuel to useful heat comprising the steps of:
charging the fuel together with air and water to a pressurized combustion zone in which liberation of combustion heat causes the temperature to rise above the critical temperature of water;
extracting useful heat so as to cool the combustion products below their dewpoint;
separating an aqueous condensate from the cooled combustion products; and
recycling a portion of the aqueous condensate to the combustion zone as a source of the water charged thereto.

**4,292,954**

## WOOD BURNING HEATER

Murray O. Wilhoite, Huntsville, Ala., assignor to Martin Industries, Inc., Florence, Ala.

Filed May 25, 1979, Ser. No. 42,560
Int. Cl.[3] F23L 3/00; F01B 25/00; F27D 19/00
U.S. Cl. 126—290 11 Claims



1. A combustion type heater comprising:
a firebox comprising a combustion chamber heated by the burning of fuel therein;
a plenum around and over said firebox and forming in said plenum an air space, and said plenum having separate inlet and outlet openings;
a third opening in a top region between said inlet and outlet openings of said plenum; and
control means including a door movably positioned in said third opening and operable between positions of opening and closure of said third opening, and responsive to a selected magnitude of air movement between said inlet and outlet openings for operating said door to a said closed position, and responsive to less than said selected magnitude of air movement for operating said door to said open position, and said control means comprising:
means for supporting said door in a normally, without substantial air flow, open position with a region of said door extending into said plenum and in a path otherwise traversed by air movement between said inlet and outlet openings, whereby upon the occurrence of air movement, said region of said door is engaged by air movement and said door moved to a said closed position.

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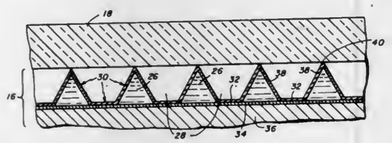
**4,292,955**

## SOLAR ENERGY COLLECTOR

Harold W. Smith, 37 Moseley Ave., Needham, Mass. 02192

Filed Feb. 24, 1978, Ser. No. 880,806
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—417 12 Claims



1. A solar energy panel comprising
a frame having an aperture therein adapted to face the sun,
a continuous base member supported in said frame,
a solar energy absorber supported in said frame against said base member and adapted to be exposed to the sun's radiation through said aperture,
said absorber being formed of a thin, heat conducting sheet material of high corrosion resistance formed into a convoluted absorber member which, together with said base member, defines walls of a multiplicity of fluid channels of small cross section positioned close to one another,
each of said channels including a pair of upwardly converging side walls of said absorber sheet material, said side walls thereby adapted to absorb most of the sun's radiation which enters said aperture and reflect substantially all of the remainder away from said aperture,
fluid inlet and outlet means connected to said channels to enable fluid to flow to and through said channels,
a cover member substantially transparent to solar radiation positioned across said aperture and in close proximity to said absorber to define small air spaces between said cover and adjacent fluid channels,
said fluid channels being spaced in proximity to each other such that the aggregate area defined by the inner surfaces of the walls of the channels as formed by the absorber member is substantially greater than the area of the frame aperture.



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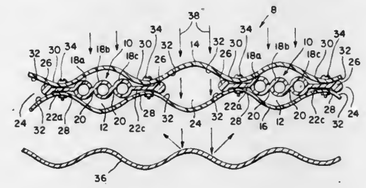
**4,292,956**

## CORRUGATED PANEL SOLAR COLLECTOR

Kurt J. Wasserman, Westtown, N.Y., assignor to Insolar Inc., Port Jervis, N.Y.

Filed May 19, 1980, Ser. No. 150,819
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—439 5 Claims



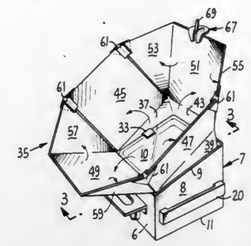
1. A solar collector apparatus comprising:
generally planar top and bottom housing members, having opposed corrugated surfaces of substantially the same pitch facing each other so as to define a series of side-by-side longitudinally directed cavities between said housing members, said top housing member being translucent; and
a plurality of elongated elastomeric solar energy absorbing elements, each element being substantially centrally located in a different one of said cavities and running substantially the entire length of said cavities, each said element being an integral element of substantially constant transverse cross-section, each said element including a series of side-by-side longitudinally directed conduits for heat transfer fluid, a pair of generally planar left and right margins directed transversely respectively from the leftmost and rightmost conduits in said series respectively toward the cavities neighboring on the left and right of each said cavity in which each said solar energy absorbing element is substantially centrally located, each of said left and right margins carrying bead means respectively lying within said neighboring cavities on the left and right and respectively engaging said left and right neighboring cavities along substantially the entire length of said neighboring cavities, said left and right margins of said solar energy absorbing elements being transversely stretched to provide a force holding said bead means in substantially sealing engagement with said neighboring cavities.

**4,292,957**

## SOLAR OVEN

John C. Golder, P.O. Box 854, Santa Cruz, Calif. 95061

Filed Nov. 23, 1979, Ser. No. 96,820
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—451 6 Claims



1. A portable foldable solar oven comprising in combination:
a. a base consisting primarily of a box-like member having four sides and a bottom and an open top;
b. insulating means within said box lining all four sides and the bottom of said box and forming the interior surfaces of the oven;
c. a glazing element supported over the top of said insulating material and
d. a generally funnel-shaped reflective element supported over said glazing element, said reflective element having downward extending flaps, said flaps extending between the sides of said box and said insulating material whereby friction between said flaps and said box holds said reflective member at a desired elevation angle.

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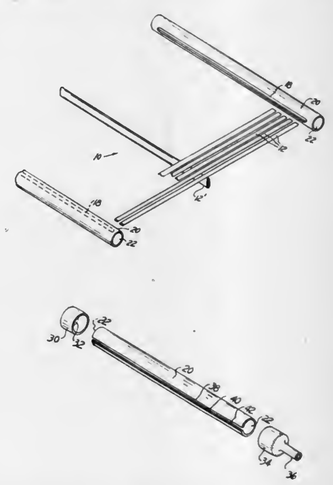
**4,292,958**

## SOLAR HEAT ABSORBER FOR SOLAR HEAT COLLECTORS

Marlow Lee, Clawson, Mich., assignor to H & H Tube & Mfg. Co., Southfield, Mich.

Filed Dec. 10, 1979, Ser. No. 102,117
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—448 5 Claims



1. A solar heat energy absorber panel comprising an inlet

header and an outlet header, a slot extending through a lateral wall of each of said headers, a plurality of separate elongated tubular members placing said headers in fluid communication, each of said elongated tubular members being in the form of a substantially flat thin walled tube having a pair of relatively wide sidewalls disposed substantially parallel and integrally interconnected by a pair of opposite relatively narrow sidewalls, said tubes being disposed side by side with their relatively wide sidewalls coplanar and each of their relatively narrow sidewalls contiguous with the relatively narrow sidewall of an adjoining tube, at least one reinforcing cross-member extending laterally on one side of said panel and affixed to a relatively wide sidewall of each of said tubes and maintaining said relatively wide sidewalls on each side of said panel substantially co-planar, wherein said headers are each a length of pipe, said slot is formed radially through the wall of said length of pipe, said slot extends from one end to the other of said length of pipe, each end of each of said tubes is disposed transverse said slot in one of said headers and is affixed to the edge of said slot, and each end of each of said headers has a tubular member affixed thereover and covering the end of said slot wherein said reinforcing cross-member is a length of said substantially flat thin walled tube having its relatively narrow sidewall affixed to the relatively wide sidewall of each of said tubes.

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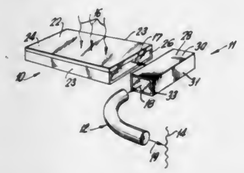
**4,292,959**

## SOLAR ENERGY COLLECTION SYSTEM

**John F. Coburn, Jr., Cranford, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Feb. 25, 1980, Ser. No. 124,278**
**Int. Cl.³ F24J 3/02; G01J 1/00; G02B 17/00**
**U.S. Cl. 126—438** **8 Claims**



1. A system for the collection of solar radiation and the transmission thereof to a point of utilization in the form of light comprising:

a solar collector for the receipt and concentration of solar radiation, said solar collector being a planar fluorescent concentrator having a major surface for receipt of instant solar radiation and an edge for transmission of the solar radiation collected and concentrated by said collector;

second concentrator means optically coupled to said edge of said collector for receipt of concentrated solar radiation from said collector and for the further concentration of said solar radiation;

a light transmission pipe optically connected to said second concentrator, whereby light from the collector which is concentrated in the second concentrator is introduced into said light transmission pipe for transmission to a point of use; and,

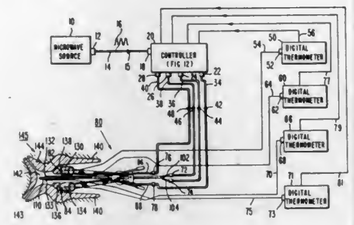
a utilization device remote from said solar collector whereby solar radiation incident on said collector is transmitted to said point of utilization in the form of light.

**4,292,960**

## APPARATUS AND METHOD FOR APPLICATION OF RADIOACTIVE AND MICROWAVE ENERGY TO THE BODY

**Robert W. Paglione, Robbinsville, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Apr. 30, 1979, Ser. No. 34,744**
**Int. Cl.³ A61N 5/12**
**U.S. Cl. 128—1.1** **12 Claims**



1. An apparatus for use with a radioactive substance for applying radioactive and microwave energy to the walls of a body cavity comprising:

a source of microwave signals having a predetermined amplitude and frequency,

means including a radiator responsive to said microwave signals for radiating said signals,

means for coupling said microwave signals to said radiating means,

a container having a first compartment adapted for receiving a quantity of said radioactive substance and having in a second compartment thereof said radiator, and

means for supporting said container in said body cavity.

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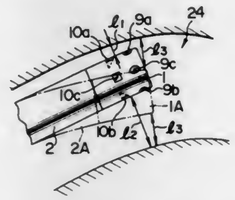
**4,292,961**

## APPARATUS FOR AUTOMATICALLY CONTROLLING THE POSITION OF ENDOSCOPES OR SIMILAR DEVICES IN A CAVITY

**Kazuma Kawashima, Tokyo, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,160**
**Claims priority, application Japan, Dec. 26, 1978, 53-162730**
**Int. Cl.³ A61B 1/06**
**U.S. Cl. 128—6** **23 Claims**



1. Apparatus for controlling the position of a device adapted for insertion in a cavity, comprising a bendable distal portion on said device, light emitter means located on said distal portion of the device for directing light toward an internal wall of a cavity in which said distal portion is being inserted, light sensing means located on said distal portion for sensing light emitted from said light emitting means and reflected from an internal wall of a cavity in which said distal portion is being inserted and for producing signals in response to the amount of sensed light, control means located at the proximal portion of said device and responsive to the amount of reflected light sensed by said light sensing means, said control means including comparison means for comparing signals produced by said light sensing means to determine the position of said distal portion in a cavity in which said distal portion is being inserted, and drive means responsive to the position determination made by said comparison means for automatically controlling the position of said distal portion in a cavity in which said distal portion is being inserted.



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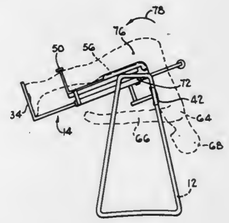
**4,292,962**

## APPARATUS FOR POSTURAL TREATMENT OF HUMANS

**Nicolaas J. P. R. Krause, 35 Machine St., Elsburg, Transvaal Province, South Africa**

**Filed Apr. 19, 1979, Ser. No. 31,518**
**Int. Cl.³ A61F 5/00**
**U.S. Cl. 128—68** **24 Claims**



1. An apparatus for effecting postural treatment of humans, the apparatus including

a supporting structure;

a platform structure that is pivotally mounted on the supporting structure to be pivotal about a horizontal pivotal axis;

a platform adjustably secured on the platform structure, having a support surface on which a human may be supported in the region of his hip in a bent over, face down attitude;

a first adjusting mechanism for adjusting the position of the platform relative to the platform support structure in a first direction transverse to the pivotal axis of the platform support structure; and

a second adjusting mechanism for adjusting the position of the platform relative to the platform support structure in a second direction transverse to the pivotal axis of the platform support structure and substantially orthogonal to the first direction,

the position of the centre of gravity of the platform and a human supported thereon thus being adjustable relative to the pivotal axis of the platform support structure.

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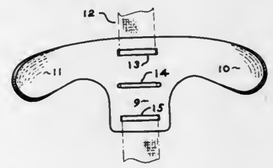
**4,292,963**

## TRAINING SPLINT FOR WRIST-GANGLION

**Robert S. Ford, 701 Beach Blvd., Pascagoula, Miss. 39567**

**Division of Ser. No. 875,940, Feb. 7, 1980, abandoned. This application Jul. 25, 1979, Ser. No. 60,574**
**Int. Cl.³ A61F 5/04**
**U.S. Cl. 128—87 R** **3 Claims**



1. In an orthopedic appliance adapted for attachment to the distal end of the forearm by lashing means embracing the said forearm adjacent to the wrist, an appliance having a shape analogous to the letter "T", combining a central base plate comparable to the stem of a T to be secured across the distal end of the forearm by lashing means including lashing attachment means provided on the said plate, an arcuate double-ended splint member comparable to the combined upper arms of a letter T extending across and containing the upper end of the said central base plate comparable to the T stem, the said arcuate member being formed in a curving shape with the tips drooping toward the base of the letter T, whereby one tip of the said arcuate splint arm will appose the dorsum of the hand to prevent dorsiflexion without contacting a wrist-ganglion, while the opposite tip will serve as a footing lever against the forearm, the whole device being reversible at will to obtain optional or right positions of the active splint arm upon either wrist, so as to permit dodging ganglions wherever they may lie.

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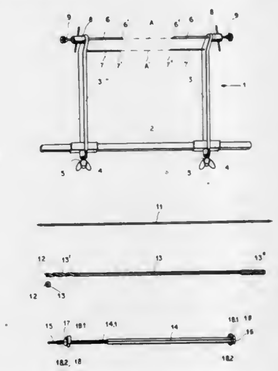
**4,292,964**

## METHOD OF AND APPARATUS FOR PINNING A FRACTURED PELVIS

**Max B. Ulrich, Amselweg 55, 7900 Ulm, Fed. Rep. of Germany**

**Filed Jan. 17, 1980, Ser. No. 112,821**
**Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2901962**
**Int. Cl.³ A61F 5/04**
**U.S. Cl. 128—92 EB** **10 Claims**



1. A method of pinning a bone using a guide apparatus comprising an elongated member provided with a pair of longitudinally spaced and transversely projecting arms having outer ends provided with respective coaxially aligned cannulas having points directed at each other and separated by a space, said method comprising the steps of sequentially;

positioning a fractured bone in said space between said cannulas with said points engaging said fractured bone; inserting

a relatively small-diameter guide rod axially through said cannulas and through the fractured bone engaged therebetween;

disengaging said apparatus from said bone while leaving said small-diameter guide rod in place in said bone;

fitting a tubular drill bit over said guide rod engaged in said bone and drilling a bore through said bone along said guide rod while guiding said bit through said bone along said guide rod;

withdrawing said guide rod from said bit while leaving same engaged through said bore in said fractured bone;

axially retracting said bit from said bone while simultaneously and synchronously axially inserting a bone pin through said bore; and

bracing the ends of said bone pin axially oppositely on said fractured bone.

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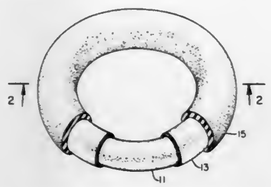
**4,292,965**
**INTRAVAGINAL RING**

**Harold A. Nash, Harrington Park, N.J., and Daniel R. Mishell, Jr., Palos Verdes Estates, Calif., assignors to The Population Council, Inc., New York, N.Y.**

**Filed Dec. 29, 1978, Ser. No. 974,490**
**Int. Cl.³ A61M *7/00***
**U.S. Cl. 128—260** **13 Claims**



1. A shell design intravaginal ring comprising in combination a core made of an inert elastomer, a medicated layer encircling the core, and an outer inert elastomer layer having a thickness of about 0.1 to 0.6 mm, the medicated layer comprising an inert elastomer and a combination of estradiol with a progestogen selected from the group consisting of levonorgestrel, d,l-norgestrel and norethindrone and the medicated layer having a thickness of not more than twice the thickness of the outer layer.

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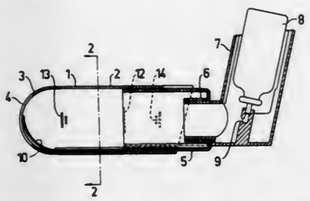
**4,292,966**
**AEROSOL INHALATION DEVICE**

**Rune G. Monö, Täby; Nils F. E. Moren, Malmö, and Kjell I. L. Wetterlin, S. Sandby, all of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden**

**Filed Feb. 5, 1980, Ser. No. 118,750**
**Claims priority, application Sweden, Feb. 16, 1979, 7901417**
**Int. Cl.³ A61M *11/04***
**U.S. Cl. 128—200.23** **2 Claims**

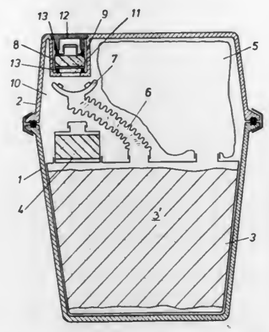


1. An aerosol inhalation device comprising an elongated chamber, provided at one end with means for connection thereof to an aerosol dispenser and having an outlet opening at the opposite end which opening is arranged to be brought to the mouth of a patient, characterized in comprising an outer chamber part and an inner chamber part each having a substantially rectangular cross section, said outer chamber part comprises the outlet opening and is telescopically displaceable over said inner chamber part, said inner chamber part at its outer end being provided with a flexible tongue, which on telescoping said chamber parts together will guide close said outer chamber part including guide means said flexible tongue to said outlet opening.

**4,292,967**
**RESPIRATOR HAVING OXYGEN DELIVERING CHEMICAL CARTRIDGE**

**Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 14, 1979, Ser. No. 103,491**
**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856349**
**Int. Cl.³ A62B *7/08***
**U.S. Cl. 128—202.26** **4 Claims**



1. A respirator, comprising, a housing having a wall with a sealable opening, a chemical cartridge in said housing spaced from said sealable opening having a material capable of generating oxygen upon being started, breathing tube means connected into said cartridge for the circulation of respiratory gases therethrough, a first starter associated with said cartridge and located in said housing for starting the material so that it will generate oxygen, and a control element disposed in said housing adjacent to said sealable opening in said wall so as to be accessible from the outside of the housing upon the opening of the sealable opening, said control element having a starting material therein which is spaced from said cartridge and which may be actuated to generate oxygen so as to provide an indication of the operability of said chemical cartridge while not starting the material of said cartridge.

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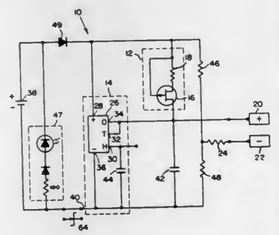
**4,292,968**
**ELECTRIC SUPPLY FOR ION THERAPY**

**Franklin H. Ellis, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.**

**Filed Nov. 26, 1979, Ser. No. 97,535**
**Int. Cl.³ A61N *1/30***
**U.S. Cl. 128—207.21** **1 Claim**



1. Apparatus for ion therapy characterized by having two modes of operation and comprised of:
two electrodes for making electrical contact with a patient;
current means electrically connected to said electrodes for providing constant direct current flow through the electrodes during a first mode;
voltage means electrically connected to said electrodes for providing a constant predetermined direct current voltage of less than 1.1 volts across the electrodes during a second mode; and
voltage responsive means for causing an abrupt transition from the first mode to the second mode if the voltage across the electrodes reaches said predetermined voltage.



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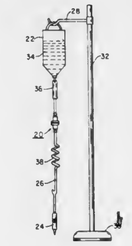
**4,292,969**
**FLUID REGULATING DEVICE WITH TORSIONAL CONTROL**

**Donald A. Raible, 1262 Camden Dr., Santa Ana, Calif. 92705; Stuart M. Poticha, 2800 N. Lake Shore Dr., Apt. 2216, Chicago, Ill. 60613, and Rita Stauffer, 1016 W. Hollywood, Chicago, Ill. 60660**

**Filed Dec. 19, 1979, Ser. No. 105,028**
**Int. Cl.³ A61M *5/00*; E16L *55/14***
**U.S. Cl. 128—214 R** **10 Claims**



1. An improved fluid regulating device for use in a parenteral administration system having a fluid supply container, a parenteral needle and torsionally flexible tubing, comprising:
a first body member having a first channel wall and a first channel wall, the first channel wall defining a first channel for a first tubing portion of flexible tubing and the first chamber wall defining a first open-ended portion of a chamber along the first channel, the first chamber wall having a minimum diametric dimension greater than the maximum outer dimension of the flexible tubing;
first securing means on the first body member for securing the first body member to the first tubing portion for common rotation about a first axis through the chamber;
a second body member having a second channel wall and a second chamber wall, the second channel wall defining a second channel for a second tubing portion of the flexible tubing and the second chamber wall defining a second open-ended portion of the chamber along the second channel, the second chamber wall having a minimum diametric dimension greater than the maximum outer dimension of the flexible tubing;
second securing means on the first body member for securing the second body member to the second tubular portion for common rotation about a second axis through the chamber;
mounting means on the first body member and the second body member for mounting the first body member to the second body member with the axes coincident for rotation about the axes, and with the first portion of the chamber open to the second portion of the chamber such that an unsecured portion of flexible tubing that is intermediate and jointed to the first tubing portion and the second tubing portion passes through the chamber, and with the first body member being rotatable relative to the second body member such that in a first relative rotational position, the unsecured tubing portion is in a first condition of torsional flexure and in a second relative rotational position, the unsecured tubing portion is in a second condition of torsional flexure;
whereby the unsecured portion of the flexible tubing is torsionally flexed by relative rotation of the first and second body member so as to regulate fluid flow therethrough.

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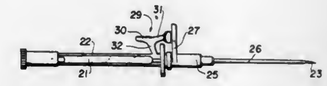
**4,292,970**
**APPARATUS FOR INTRAVENOUS CATHETER STARTER**

**William M. Hession, Jr., 317 Lee Dr., Thibodaux, La. 70301**

**Filed Jan. 24, 1980, Ser. No. 115,123**
**Int. Cl.³ A61M *5/00***
**U.S. Cl. 128—214.4** **3 Claims**



1. An I.V. placement needle with plastic outside catheter comprising:
(a) a backflow chamber within a chamber guard,
(b) a vein puncture needle in communication with the backflow chamber,
(c) a catheter hub,
(d) a catheter tube secured to said hub and receivable over said vein puncture needle concentrically therewith, and
(e) a plastic drive plate upstanding from said catheter hub and having its major plane transverse to the axis of said hub and catheter tube for engagement by a driving force to advance the hub and catheter tube coaxially over said vein puncture needle, and a resilient potentially biased striking means carried by said backflow chamber guard positioned to when released engage said plastic drive plate and with an energy thrust to advance the catheter tube and its hub axially over the vein puncture needle to cause the catheter tube to be introduced in a vein following entry of the vein puncture needle into the vein.

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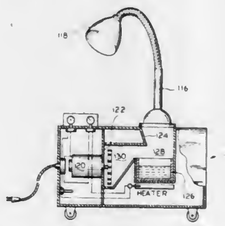
**4,292,971**
**ACNE SKIN TREATMENT APPLIANCE AND METHOD**

**Helen Smit, and Julie Smit, both of 1045 Hinman Ave., Evanston, Ill. 60202**

**Continuation-in-part of Ser. No. 801,850, May 31, 1977, Pat. No. 4,182,329. This application Aug. 8, 1979, Ser. No. 64,730**
**Int. Cl.³ A61M *1/00***
**U.S. Cl. 128—256** **11 Claims**



1. Apparatus for treating human skin, said apparatus comprising heater means for producing a draft of heated air directed against an area of skin, the heat of said air being sufficient to cause a physical change to occur within the pores of the heated skin without damage to said skin, said heater means being disposed within a passageway which is in direct communication with said area of skin to be heated in order to direct the heat directly on to only said area of skin, said passageway

guarding said draft of air to prevent an ambient cooling thereof and to prevent any change of state of the heated air within said passageway, said physical change in said pores being an enlargement of their openings and a melting and softening of solidified debris within a follicle in said pore respective to said heated air, vacuum-producing means for applying an air suction through said passageway to said area of skin to draw the melted and softened debris out of the enlarged skin pores, said removed debris being drawn by said vacuum-producing means from said heated area of skin through said passageway and into means for collecting said removed debris, said last-named means being removable so that it may be washed and cleaned, the apparatus further comprising a motor chamber sealed and separated from the sauna chamber by a vertical wall, an air directing conduit extending from the wall to the water container within the sauna chamber, the said conduit formed by an upper horizontal wall and a lower inclined wall to define a tapering air path in the direction toward the water container, a blower positioned within the conduit at the wider extremity of the taper, the said closed passageway extending from the steaming area being provided with a funnel stream applicator at its extremity with a smaller dimension of the funneel secured to the passageway and the wider dimension having a sponge material around its peripheral circumference.

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**4,292,972**

## LYOPHILIZED HYDROCOLLOIO FOAM

**John M. Pawelchak, Belle Mead; Yu-Chang J. Wang, North Brunswick, and Anthony L. LaVia, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Jul. 9, 1980, Ser. No. 167,257**
**Int. Cl.³ A61F *13/00***
**U.S. Cl. 128—296** **30 Claims**

1. A medically useful lyophilized sponge product having a density of from about 0.01 to about 0.10 gm/cc, said sponge product comprising a mixture of the hydrocolloids, gelatin, pectin, and sodium carboxymethylcellulose, said pectin and sodium carboxymethylcellulose each being at from about 10% to about 50% by weight of the final product and said gelatin being present at from about 20% to about 80% by weight of the final product.

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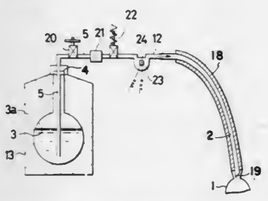
**4,292,973**

## APPARATUS FOR REFRIGERATION TREATMENT

**Toshima Yamauchi, Oita; Sadao Nogami, Beppu; Kengi Sawada, Oita; Jyunichiro Moriya, Kokubunji; Hiroomi Sawada, Ichikawa, and Keizou Kobayashi, Hanno, all of Japan, assignors to Kabushiki Kaisha Kurio-Medikaru, Tokyo, Japan**

**Continuation of Ser. No. 944,079, Sep. 20, 1978, abandoned. This application Jan. 3, 1980, Ser. No. 109,271**
**Claims priority, application Japan, Sep. 25, 1977, 52-114967; Feb. 28, 1978, 53-22900**
**Int. Cl.³ A61B *17/36***
**U.S. Cl. 128—303.1** **2 Claims**




1. An apparatus for refrigeration treatment comprising a liquefied gas source, an evaporator for evaporating the liquefied gas at an optimum temperature, an exhaust tube connected between said gas source and said evaporator to conduct the liquefied gas from said gas source to said evaporator, a conduit for introducing the gas vaporized by said evaporator, and a cup provided with a non-return expansion valve attached at the end of said conduit, said cup adapted to apply said vaporized gas to an affected portion of a patient in order to refrigerate said portion with said vaporized gas, said evaporator being provided with an evaporator chamber for evaporating the liquefied gas to a gaseous state to be blown out from the cup at a specified temperature and said conduit being connected to said evaporator by means of an outflow port, wherein said exhaust tube is provided with an electromagnetic valve for preventing the inflow of liquefied gas into said evaporating chamber and said evaporating chamber is provided with a detector element which actuates said electromagnetic valve by sensing a specified level height of the liquid of the liquefied gas fed to said chamber.

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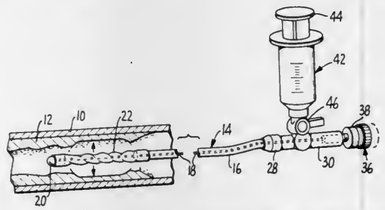
**4,292,974**

## DILATATION CATHETER APPARATUS AND METHOD

**Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304, and Albert K. Chin, San Francisco, Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.**

**Filed Jan. 30, 1980, Ser. No. 116,816**
**Int. Cl.³ A61M *29/02***
**U.S. Cl. 128—344** **8 Claims**




1. A dilatation catheter comprising an elongated flexible tubular body member, a tip member in spaced relation to the distal end of said body member, an annular inflatable bag interconnecting said tip member and said distal end of said body member, a wire extending through said body member and said bag and secured to said tip member, and knob means attached to the proximal end of said wire enabling said wire to be rotated about its longitudinal axis to rotate said tip member and axially twist said bag and thereby decrease the diameter of said bag in its noninflated condition.

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**4,292,975**

## BRASSIERE

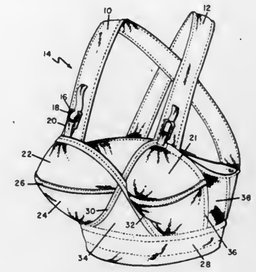
**Carolyn Champion, 34 Theroux Dr., Chicopee, Mass. 01020; Judith Wolcott, 107 Clairmont Ave., Chicopee, Mass. 01013; Barbara Hart, 131 Woodbridge St., South Hadley, Mass. 01075, and Zulma C. Garcia, 114-40 22 1st St., Queens Village, N.Y. 11429**

**Filed Aug. 20, 1979, Ser. No. 67,724**
**Int. Cl.³ A41C *3/00***
**U.S. Cl. 128—498** **2 Claims**

1. An exercise brassiere comprising:
first and second upper cup members;
first and second lower cup members;
first and second compression seams joining each of said first and second upper cup members respectively to said first and second lower cup members, said first and second compression seams extending horizontally at a position located over the nipples of the wearer, said first and second upper and lower cup members each having an outer side portion, an innerside portion, a top and a bottom;
attachment means positioned at the top of each of said first and second upper cup members;
first and second strap members extending respectively from the inner side of the bottom of said first and second lower cup members crossing over one another to said attachment means;



a wide midriff band extending and affixed beneath each of said first and second lower cup members;
a triangular panel positioned between said first and second strap members and said midriff band;
an outer strap member extending along the outer side of said first and second upper and lower cup members from said midriff band to said attachment means;
first and second stretchable side panels affixed to said outer strap member and said midriff band;
first and second rear closure members affixed to said midriff band and said first and second rear side panels adapted to




extend around behind the wearer and include means for removably attaching one rear closure member to the other; and
first and second 2½" wide shoulder straps, each affixed to a section of said first and second rear closure members respectively adapted to be crossed over the back and passed over the wearer's shoulders over the trapezius muscles rather than over the acromio clavicular joints as in standard brassieres with each strap having attachment means at its opposite end adapted to be affixed to said attachment means on the top of each of said upper cup members.

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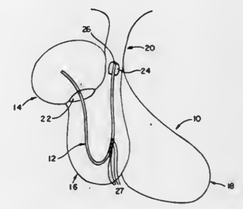
**4,292,976**

## RIGHT VENTRICULAR INJECTION CATHETER; RIGHT VENTRICULAR ANGIOGRAPHIC METHOD; AND METHOD OF MONITORING SEPTAL WALL MOTION

**Vidya S. Banka, 237 Stacey Rd., Penn Valley, Narberth, Pa.**

**Filed Aug. 8, 1979, Ser. No. 64,973**
**Int. Cl.³ A61B *6/00***
**U.S. Cl. 128—656** **7 Claims**




1. A method of right ventricular angiographic catheterization comprising the steps of:
(a) providing a catheter of sufficient length for insertion through the right ventricle and into the pulmonary artery of a patient to be catheterized, said catheter having at least one lumen therein, and said lumen communicating with a plurality of injection orifices 4–10 cm from the tip of said catheter, so that the tip of said catheter when inserted into the pulmonary artery positions said orifices in the ventricle;
(b) inserting said catheter, tip end first, through said right ventricle and into said pulmonary artery to a point where said injection orifices are located within said right ventricle; and
(c) injecting a contrast medium through said catheter and out said orifices into said right ventricle.

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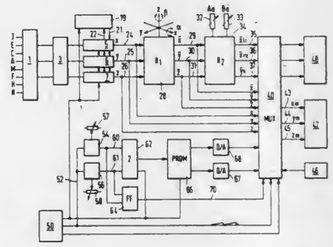
**4,292,977**

## METHOD AND DEVICE FOR REPRESENTING ELECTRICAL SPATIAL LINES AND SPATIAL IMAGES

**Heinz Krause, and Bert Sanner, both of Freiburg, Fed. Rep. of Germany, assignors to J. F. Tönnies Erben K.G., Freiburg im Breisgau, Fed. Rep. of Germany**

**Filed May 8, 1979, Ser. No. 37,119**
**Claims priority, application Fed. Rep. of Germany, May 8, 1978, 2819999; Mar. 2, 1979, 2908424**
**Int. Cl.³ A61B *5/04***
**U.S. Cl. 128—712** **3 Claims**



1. Method for representing electrical spatial curves and spatial images of electrically reproduced ultrasonic images, X-ray images or cardiac vector loops to a stationary viewer on a fixed screen, which comprises separately storing in an electronic memory amperage value coordinates occurring in time for the spatial curves or images to be represented, calculating transformed coordinates of the spatial curves or images of the amperage values in a computer after tilting and rotating relative to the earth by desired angles, two-dimensionally displaying a line from the transformed coordinates on an oscilloscope screen, viewing three-dimensionally through the tilting and rotating relative to the earth, inserting time markers in the form of arrow-shaped lateral jags pointing in the traverse direction of the spatial curves for marking the course in time and direction of traversal of the spatial curves, and determining the size of the jags in dependence on the velocity of the curves.

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**4,292,978**

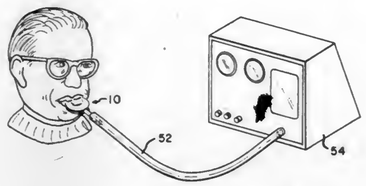
## BREATH TEST MOUTHPIECE

**Richard U. Guth, 439 N. 46th St., Harrisburg, Pa. 17111**

**Filed Dec. 26, 1979, Ser. No. 107,429**
**Int. Cl.³ A61B *10/00***
**U.S. Cl. 128—730** **23 Claims**

1. A handheld mouthpiece of the type used in conducting a breath test including a hollow central collector, a mouth pipe and a tube pipe extending from the collector and communicating with the interior of the collector, a breath baffle within the interor of the collector for changing the direction of the breath blown through the mouthpiece and trapping solids and liquid entrained with the breath, wherein the improvement comprises said pipes being located on opposite sides of the collector, the collector adjacent the mouth pipe including a first wall, a second wall and an edge joining the two walls, the mouth pipe extending outwardly of the collector at the edge between the walls, and the first and second walls joining the edge at an

interior angle of about 90°, whereby the mouth pipe may be held within the mouth of a subject taking a breath test with the




lips of the subject seated on the walls of the collector to form a breath-tight seal on the mouthpiece.

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**4,292,979**

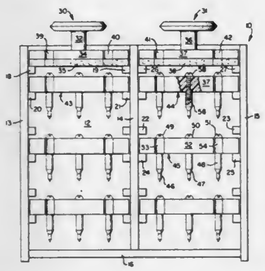
**ALLERGY TESTING APPARATUS**

**Joseph T. Inglefield, Jr., 210 E. Broad St., Falls Church, Va. 22046, and William L. Mahood, 3404 Executive Ave., Falls Church, Va. 22042**

**Filed Apr. 9, 1979, Ser. No. 28,344**

**Int. Cl.³ A61B *10/00***

**U.S. Cl. 128—743** **13 Claims**



1. Allergy-testing apparatus comprising:

a needle block comprising a block member having a plurality of separately-located-needle members extending from one side thereof, each of said needle members having a point on the distal end thereof;

vial-holding apparatus comprising a planar-plate member with a plurality of apertures formed therein, each aperture holding a single removable vial adapted to hold a liquid allergen; said apertures being positioned so that if said needle block is inserted on said holding apparatus with said one side of said block member facing said holding apparatus, then each of said needle members is separately received in a vial held in said plate member.

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**4,292,980**

**ELECTRODE ASSEMBLY FOR USE IN ELECTRIC FIELD THERAPY APPARATUS**

**Shotaro Suzuki, Chofu, Japan, assignor to Hakuju Institute for Health Science Co., Ltd., Tokyo, Japan**

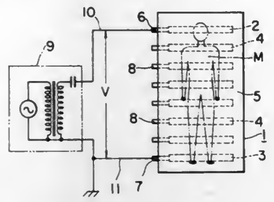
**Filed Oct. 31, 1979, Ser. No. 89,923**

**Claims priority, application Japan, Oct. 31, 1978, 53-148924[U]**

**Int. Cl.³ A61N *1/04***

**U.S. Cl. 128—783** **2 Claims**

1. An electric field therapy apparatus comprising electrode means and a high voltage source, said electrode means including an insulating member on which the body of a patient being treated is received, and a plurality of elongate electrical conductors incorporated in said insulating member and extending transversely to the longitudinal axis of said member, said conductors being spaced apart in serial relationship along the longitudinal axis of said insulating member and being insulated from one another by the insulation of said insulating member, and said apparatus further comprising means for selectively connecting said conductors at least two at a time to said high




voltage source such that an electric field is produced between the two connected conductors and the unconnected conductor or conductors located between the at least two connected conductors serve to confine the electric field to an area between the at least two connected conductors.

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**4,292,981**

**COMBINE HARVESTER CONVEYOR**

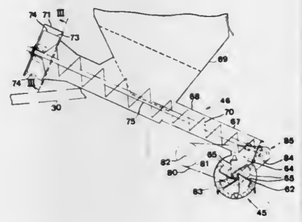
**Cyriel R. J. De Busscher, Sijsele-Damme, and Francois Van Herpe, Houtem (Vlierzele), both of Belgium, assignors to Sperry Corporation, New Holland, Pa.**

**Filed Jul. 1, 1980, Ser. No. 165,152**

**Claims priority, application United Kingdom, Jul. 6, 1979, 23774/79**

**Int. Cl.³ A01D *45/02*; A01F *12/18***

**U.S. Cl. 130—27 F** **6 Claims**



1. A combine harvester conveyor comprising:

a cylindrical rethresher portion having a rethresher rotor;

an auger portion including an auger tube extending from a first end adjacent said rethresher portion to a second end adjacent a grain pan;

means for guiding crop material to said auger portion, said means including a chute connected to said auger tube between said first and second ends; and

a shaft rotatably mounted in said harvester, said shaft extending between said first and second ends, said shaft rotatably mounted in said auger portion and carrying an auger member and an impeller, and said auger member having a first diameter portion and a second diameter portion greater than said first diameter portion, said first diameter portion extending from said first end to said chute and said second diameter portion extending from said chute to said second end.



**4,292,982**

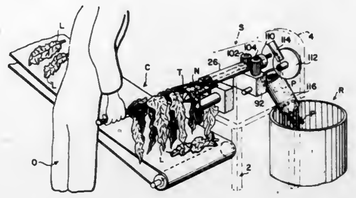
**LEAF STRIPPER FOR TOBACCO STALKS AND THE LIKE**

**Lawrence D. Butcher, P.O. Box 465, Point Pleasant, W. Va. 25550**

**Continuation-in-part of Ser. No. 846,664, Oct. 28, 1977, abandoned. This application Nov. 1, 1978, Ser. No. 956,667**

**Int. Cl.³ A01D *1/00***

**U.S. Cl. 130—30 R** **74 Claims**



1. A leaf stripper for tobacco stalks and the like including:

(a) generally horizontally disposed cooperating leaf stripping means

(b) means for moving said stripping means to form a generally horizontal nip

(c) means for supporting said stalk in a generally horizontal position having a generally horizontal axis

(d) stalk in-feeding means

(e) said means for supporting said stalk in a generally horizontal position mounted adjacent said leaf stripping means, and

(f) the axis of said nip and the horizontal axis of said stalk supporting means fixed in spaced relation relative to each other,

(g) whereby when said stalk is fed into said stalk supporting and in-feeding means, said leaves are engaged by said nip and angularly stripped from said stalk with respect to the direction of in-feeding.

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**4,292,983**

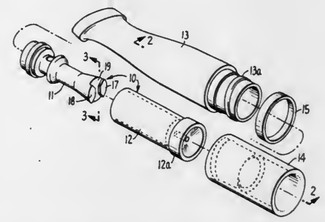
**FILTER CARTRIDGE ASSEMBLY**

**John A. Mensik, 124 Creekdale Rd., Walnut Creek, Calif. 94595**

**Filed Apr. 4, 1980, Ser. No. 137,513**

**Int. Cl.³ A24F *5/04***

**U.S. Cl. 131—187** **4 Claims**



1. A filter cartridge assembly for filtering tars from tobacco smoke comprising:

a cylindrical sleeve having an integral obstruction formed at one end, coaxial restricted inlet passage extending through said obstruction; and a filter core member received within said sleeve, said core member being formed with a central body portion including an annular enlargement, a stand-off contact projecting from an impingement surface at one end, and a cylindrical plug having a restricted outlet passage at the other end, the central body portion of said core member and inner surface of said sleeve defining a smoke passageway between the restricted inlet passage and the cylindrical plug, a transverse passage being formed through the central body portion of said core member communicating the restricted outlet passage with the interior of said sleeve on the downstream side of said annular enlargement, said stand-off contact engaging the obstruction within said sleeve and spacing the impingement surface of said core in predetermined spaced relation to the opening of said restricted inlet passage, said cylindrical plug being received within the sleeve in sealing relation thereto and supporting said filter core member therefrom, the cross sectional area of the restricted outlet passage being smaller than the area between the inner surface of said cylindrical sleeve and the annular enlargement of said core member and selected to control the quality of filtration.

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**4,292,984**

**FILTER FOR CIGARETTE SMOKE**

**Hideo Sawada, Osaka; Koji Shinohara, Kawachinagano, and Makoto Shiga, Sakai, all of Japan, assignors to Daicel Ltd., Osaka, Japan**

**Filed Apr. 23, 1979, Ser. No. 32,428**

**Claims priority, application Japan, Apr. 22, 1978, 53/48245**

**Int. Cl.³ A24D *3/02, 3/04***

**U.S. Cl. 131—345** **5 Claims**

1. A cigarette filter comprising a bundle of cellulose acetate filaments, each filament being substantially uniform in its denier size, said bundle being composed of a plurality of filaments having at least two different filament denier sizes, said filaments running parallel to the longitudinal axis of said filter and being randomly distributed in the direction perpendicular to the longitudinal axis of said filter and wherein said filaments having at least two different filament denier sizes have a number average filament denier of not more than about 4 denier, and wherein the ratio of the weight average filament denier to the number average filament denier size of the bundle is at least about 1.03.

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**4,292,985**

**HAIR WAVING APPLIANCE**

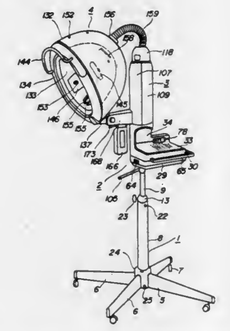
**Zirou Itogawa, Takaishi, and Yoshiyuki Aoto, Yoa, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 16, 1979, Ser. No. 30,434**

**Claims priority, application Japan, Apr. 14, 1978, 53-49907**

**Int. Cl.³ A45D *20/00***

**U.S. Cl. 132—9** **11 Claims**



2. A heating type hair waving appliance comprising:

a bonnet in which the head of a patron is positioned;

a plurality of heating means provided within said bonnet for heating different hairline areas of the head of a patron;

atomizer means operatively connected to said bonnet for generating moisture-laden air mist at room temperature;

controller means containing a plurality of controlling elements for controlling the operation of said plurality of the heating means;

a movable prop structure for securing said bonnet, said atomizer means and said controller means, said controller means being movable with respect to said bonnet;

a supporting structure including a base member, adapted to be positioned on a floor surface, a stationary prop structure attached to said base member and extending upwardly therefrom, and said movable prop structure being slidable mounted within said stationary prop structure and attached to said bonnet to permit an adjustment of the height of said bonnet relative to said floor surface; and

a rotatable supporting means including a sleeve extending through a housing for said controller and being rotatably positioned on said movable prop structure, a slide fitting being positioned adjacent to said sleeve including at least one raised strip extending therefrom, a restricting means including at least one protrusion adapted to mate with said raised strip of said slide fitting to limit the rotation of said controller housing relative to said bonnet.

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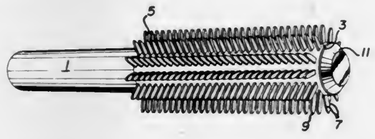
**4,292,986**

## ELECTRIC HAIR BRUSH

**Nevenka Ergaver, and Rayko Ergaver, both of Toronto, Canada, assignors to Capella Inc., Freeport, The Bahamas**

**Filed Feb. 22, 1977, Ser. No. 770,549**
**Claims priority, application Canada, Feb. 2, 1977, 270926**
**Int. Cl.³ A45D *24/00***
**U.S. Cl. 132—11 R** **6 Claims**



1. In a hair styling brush having a handle and a heating element, an improved attachment therefor consisting of an open ended tube of heat conducting material securable over the heating element, a plurality of rows of radially projecting heat conducting teeth extending from the outer surface of said tube, each tooth having a base with a substantially rectangular cross section, parallel transverse faces and longitudinal edges convergent towards an apex, the length of each tooth from its base to its apex being from ¼" to ⅜", and a non-heat conducting cap secured to the end of said tube which is furthest from said handle to prevent inadvertent burning of the person using said brush, said teeth being disposed on that portion of said tube which is adjacent to said cap.

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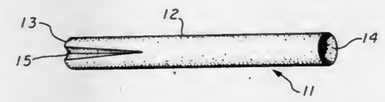
**4,292,987**

## FINGERNAIL HONE

**David W. Alley, Houston, Tex., assignor to Neal J. Mosely, Houston, Tex., a part interest**

**Filed May 1, 1980, Ser. No. 145,441**
**Int. Cl.³ A45D *29/00***
**U.S. Cl. 132—73** **8 Claims**



1. A fingernail hone for polishing and smoothing fingernails comprising

a body of ceramic material having a concave unglazed surface of substantially spherical curvature, and

said unglazed surface being substantially smooth, uncoated and free from additional abrasive and constituting the sole abrasive surface for use in polishing and smoothing fingernails.

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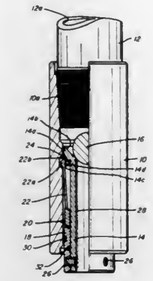
**4,292,988**

## SOFT SHOCK PRESSURE PLUG

**James W. Montgomery, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.**

**Filed Jun. 6, 1979, Ser. No. 45,988**
**Int. Cl.³ F16K *13/04***
**U.S. Cl. 137—68 R** **15 Claims**



1. Releasable closure apparatus for selectively closing and opening a flowway in a tubular conduit comprising:

a seating body having a main passage therethrough and adapted to be mounted in said tubular conduit with said main passage in register with said flowway, said seating body defining a seat for receipt of a plug member operative to close said main passage and support a pressure differential across said seat;

release control means releasably connected to one of said seating body or said tubular conduit and releasable upon the presence of a pressure differential across said seat in excess of a first magnitude to open bypass passageway means bypassing said seat to permit a relatively slow decrease in said pressure differential;

and lack means releasably locking said seating body to said tubular conduit, said lock means being releasable upon decrease of said pressure differential to a second magnitude to release said seating body from said tubular conduit.

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**4,292,989**

## FIRE SAFE SEAL

**Italo Cazzaniga, and Ottorino Pasquinelli, both of Milan, Italy, assignors to Grove Valve and Regulator Company, Oakland, Calif.**

**Filed Dec. 3, 1979, Ser. No. 99,932**
**Claims priority, application Canada, Jun. 1, 1979, 328898**
**Int. Cl.³ F16K *13/04***
**U.S. Cl. 137—72** **5 Claims**

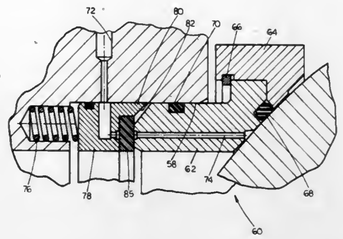
1. For a valve having a valve body, a closure member mounted in said body for movement between open and closed positions, a cylindrical, internal surface in said body adjacent to said closure member, a metallic seat ring slidable in said internal surface, the leading face of said seat ring being finished to seal off fluid flow when urged against said closure member, biasing means urging said seat ring against said closure member, and a resilient elastomer seal ring sealing between the outer surface of said seat ring and said internal surface; a fire-safe seal comprising:

a metallic, emergency seal ring slidable in said internal surface and interposed between said seat ring and said biasing means;

a sharp, internally chamferred, annular lip around the periphery of said emergency seal ring extending forwardly thereof;

an external chamfer around the trailing end of said seat ring at the periphery thereof;

said annular lip being receivable in the sliding clearance around said seat ring;



said external chamfer being at a slightly greater angle than said internal chamfer so that when said emergency seal ring is driven forward said annular lip is cammed radially outward by said external chamfer into said sliding clearance; and,

means to prevent operation of said emergency seal at temperatures below that which will destroy said elastomer seal ring.



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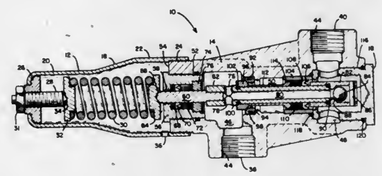
**4,292,990**

## HIGH PRESSURE UNLOADER VALVE

**Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.**

**Filed Feb. 7, 1980, Ser. No. 119,364**
**Int. Cl.³ F16K *11/00, 31/12***
**U.S. Cl. 137—115** **6 Claims**



1. A bypass/unloader valve comprising:

(a) a valve body having an inlet port, an outlet port and a bypass port, said inlet port communicating with an inlet chamber formed in said valve body, said outlet port communicating with an outlet chamber formed in said valve body and said bypass port communicating with a bypass chamber formed in said valve body, said inlet, outlet and bypass chambers being generally aligned along the longitudinal axis of said valve body with said bypass chamber being disposed intermediate said inlet and outlet chambers, said valve body including an axially extending bore connecting said chambers;

(b) a tubular plunger member disposed in said bore and journaled along its length for reciprocal motion therein, said tubular plunger having a radial aperture through its side wall in communication with said inlet chamber and an open end disposed in said outlet chamber;

(c) a poppet valve carried by said plunger adjacent abutment means and disposed in said axially extending bore which, when closed, isolates said inlet chamber from said bypass chamber;

(d) an axially displaceable seal assembly concentrically mounted on said tubular plunger for isolating said bypass chamber from said outlet chamber and exposed to the pressure of fluid in said outlet chamber when fluid, under pressure, is introduced through said inlet port into said chamber and made to flow through said radial aperture and said tubular plunger;

(e) a ball check valve assembly disposed in said outlet chamber and secured to said open end of said tubular plunger for blocking fluid flow through said open end when the pressure in said outlet chamber exceeds that in said inlet chamber;

(f) means coupling said axially displaceable seal assembly to said poppet valve for urging said poppet valve to an open position when said outlet pressure exceeds a predetermined value; and

(g) spring means for applying a compressive force to said tubular plunger for urging said poppet valve through said abutment means to its closed position.

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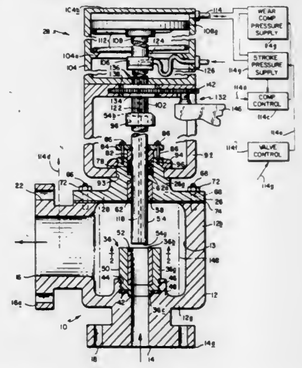
**4,292,991**

## EROSION RESISTANT VALVE

**Paul Wing, Hingham, Mass., assignor to Masoneilan International, Inc., Norwood, Mass.**

**Filed Dec. 17, 1979, Ser. No. 104,301**
**Int. Cl.³ F16K *43/00, 47/00***
**U.S. Cl. 137—329.05** **15 Claims**



1. A throttling valve comprising:

A. a valve housing defining a chamber,

B. means in the housing wall defining a first fluid passage into the chamber,

C. means in the housing wall defining a second fluid passage into the chamber, said second passage being spaced from said first passage,

D. tubular throttling means mounted to the housing wall, said throttling means being in fluid communication with the first passage, and having a mouth projecting into the chamber,

E. a throttling plug having an end,

F. means for positioning the plug inside the chamber substantially in line with the throttling means,

G. means for moving an uneroded segment of the plug end between a first, extended position and a second, retracted position, such extended and retracted positions defining the plug stroke, and

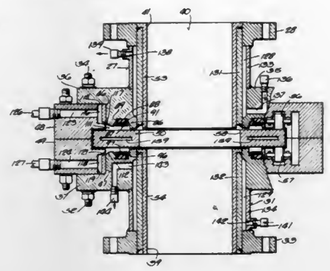
H. means for moving the plug progressively further toward the throttling means, independent of plug stroke, as fluid flowing into the valve erodes the end of the plug, thereby compensating for erosion of the plug end and changing the portion of the plug stroked between said extended and retracted positions whereby in the first, extended position the uneroded segment of the plug end obstructs the mouth of the throttling means to achieve maximum throttling effect.

**4,292,992**

## VALVE FOR HANDLING SOLIDS CAPABLE OF GAS-PRESSURE-TIGHT CLOSURE AGAINST A GAS PRESSURE DIFFERENTIAL

**Yeshwant K. Bhide', New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Jul. 23, 1979, Ser. No. 59,966**
**Int. Cl.³ F16K** *49/00, 25/00*
**U.S. Cl. 137—340** **3 Claims**



1. A valve,
a first plate member having an opening therein;
a second plate member having an opening therein, said first and second plate members cooperating to define a space therebetween and having their openings in axial alignment;
a slide gate having an opening therein movably supported with the space defined by said first and second plate members, said slide gate being selectively positionable within the space defined by said cooperating plate members in a manner to have its opening positioned in axial alignment with the openings in said first and second plate members, or into a position wherein a solid surface portion of said slide gate interrupts the communication between the axial aligned openings in said first and second plate members;
a first valve body portion having an axial opening, said first valve body portion having one end thereof secured in the opening in said first plate member in a manner to have the axis of its opening coincide with the axis of the opening in said first valve plate;
a second valve body portion having an axial opening, said second valve body portion having one end thereof secured within the opening in said second plate member in a manner to have the axis of its opening coincide with the axis of the opening in said second plate member to thereby establish a flow through opening in the valve wherein the engagements of said first and second valve body portions in the openings in said first and second plate members cooperate to define first and second circular chambers;
a plurality of radially extending, spaced-apart passages formed in said first plate member constructed and arranged so as to communicate with said first circular chamber and an area at one side of said slide gate around the said flow through opening;
a plurality of radially extending passages formed in said second plate member constructed and arranged so as to communicate with said second circular chamber and an area at the other side of said slide gate around said flow through opening;
means operably connected to selectively supply a fluid under pressure to said first and second chambers,
whereby the area around said flow through opening may be purged of particle fines as desired regardless of said slide gate position to ensure a clear slide gate surface for the engagement of said inflatable seals;
a first inflatable seal carried by said first valve body portion in a position surrounding the axial opening therein and to be engageable with the adjacent surface of said slide gate;
a second inflatable seal carried by said second valve body portion in a position surrounding the axial opening therein and to be engageable with the adjacent surface of said slide gate;
pressure fluid supply means operably connected to supply a fluid under pressure to said first and second inflatable seals to effect their engagement with the adjacent surface of said slide gate to effect a gas tight seal therebetween; and,
actuating means operably connected to effect a selective positioning movement of said slide gate.

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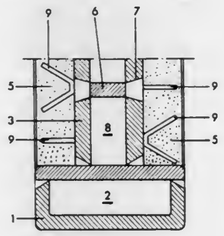
**4,292,993**

## CLOSURE PLATE FOR HOT BLAST SLIDE VALVES

**Jacob Felthuis, Alkmaar, and Jacobus A. Rumphorst, Uitgeest, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., IJmuiden, Netherlands and Zimmermann & Jansen GmbH, Duren/Thld, Fed. Rep. of Germany, a part interest**

**Filed Nov. 9, 1979, Ser. No. 92,863**
**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1978, 2848570**
**Int. Cl.³ F16K** *49/00, 3/00*
**U.S. Cl. 137—340** **6 Claims**



1. In a closure plate for hot blast slide valves of the type having a hollow ring of box-like cross section cooled by running water, to whose inner circumference a body is attached by welding, which is formed by parallel plates and is likewise cooled by running water, the thickness of the body in axial direction being smaller than the axial length of the hollow ring, and the outer surfaces being coated to about the height of the front faces of the ring with refractory concrete, the coating being secured to these outer surfaces by anchoring means, the improvement comprising:
(a) said anchoring means being attached to the outer surfaces of the plate body, and being V-shaped and extending into the refractory coating with their free flanks for at least ⅔ and at the most ¾ of the coating thickness;
(b) said anchoring means being arranged in regular distances in rows and columns extending normally to each other, the extending planes being alternately parallel and transverse to the direction of the respective row or column; and
(c) the distance between the centers of said anchoring means corresponding to at least the thickness of the refractory coating layer.

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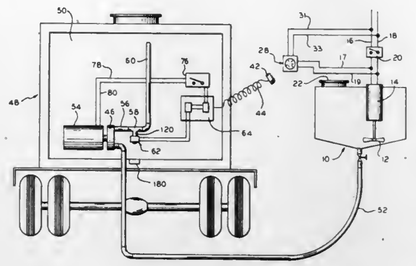
**4,292,994**

## RAW MILK TRANSFER SYSTEMS

**Julius T. Johnson, 348 - 20th St., S.E., Cedar Rapids, Iowa 52406, and Robert R. Johnson, 416 Jacolyn Dr., N.W., Cedar Rapids, Iowa 52405**

**Filed Feb. 25, 1980, Ser. No. 124,597**
**Int. Cl.³ B67D** *5/02*
**U.S. Cl. 137—351** **7 Claims**

1. A system for transferring milk from a holding tank having an electric motor driven agitator to the tank of a milk transport vehicle which comprises milk transfer conduit means for conveying milk from the holding tank to the vehicle's tank, a pump driven by an electric motor for pumping milk through said conduit means, an electrical circuit including power wires for energizing the electric motor of said agitator through an on-off switch, an electrical socket having a first set of socket contacts wired to said power wires whereby said first set of contacts are energized when said on-off switch is closed and are deenergized when said switch is open, an electrical connector having a first set of connector contacts removably engageable with said first set of socket contacts, an electrical component enclosure, an electrical timer in said enclosure, an electric cable with wires connecting said first set of connector contacts



with said timer whereby said timer is energized when said agitator's electric motor is energized, and wires connecting said pump's electric motor to a power source through open-close contacts closeable by said timer after it has run a predetermined time whereby said pump's electric motor is idle during the initial agitation of said milk in said holding tank while the timer runs its predetermined time and becomes energized at the expiration of said predetermined time by the closing of said open-close contacts by said timer to pump the milk from said holding tank to the vehicle tank.

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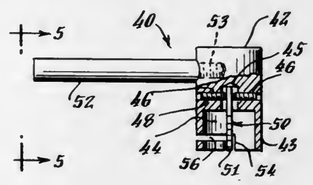
**4,292,995**

## LOCKING VALVE APPARATUS

**Mario Mazzola, New Canaan, Conn., assignor to Richardson-Vicks Inc., Wilton, Conn.**

**Filed Feb. 13, 1980, Ser. No. 121,028**
**Int. Cl.³ F16K** *35/06*
**U.S. Cl. 137—384.2** **11 Claims**



1. In locking valve apparatus including a housing containing a flow control valve and a rotatable lock cylinder for locking the valve, said lock cylinder having a keyway extending therein from one end into which a key must be engagingly inserted when said lock cylinder is in an initial locked position in order to unlock the lock cylinder for turning the lock cylinder into a different position for unlocking the valve and wherein said housing includes a stationary cylindrical portion encircling the lock cylinder, the invention comprising:
a removable handle unit including a hollow portion defining a socket,
said hollow socket portion having an effective inside diameter (ID) slightly larger than the outside diameter (OD) of said stationary cylindrical portion of the valve housing for seating thereon in snug freely turning relationship,
a key mounted in said socket,
interengageable alignment means on said valve housing and on said hollow portion of the handle unit in predetermined positions for preventing said socket from being fully seated onto said portion of the valve housing unless said alignment means are interengaged for assuring insertion of the key into said keyway in proper position when said lock cylinder is in its initial position,
keeper means for preventing said handle unit from being removed from the valve housing when the handle unit is turned away from its initial position, and
stop means for limiting the turning movement of the handle to correspond with the desired turning limit of the lock cylinder.

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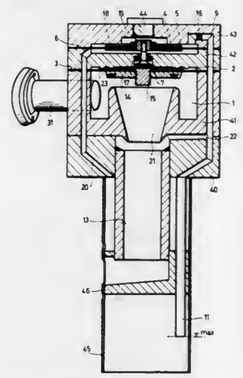
**4,292,996**

## STOP VALVE

**Jozsef Pataki; Jozsef Bucsi; István Bóna; Endre Szilvasi; András Gazdag; Antal Kóty, all of Budapest, and Ferenc Hidvegi, Torokbalint, all of Hungary, assignors to OMUV Orvosi Muszer es Vasipari Szovetkezet, Torokbalint, Hungary**

**Filed Oct. 24, 1979, Ser. No. 87,714**
**Claims priority, application Hungary, Oct. 24, 1978, PA 1331**
**Int. Cl.³ F15C** *1/14;* **F16K** *21/18*
**U.S. Cl. 137—393** **3 Claims**



1. A stop valve of the liquid level sensor type comprising a housing having an input stub, an exit opening (**21**) formed as a valve seat, characterized by a membrane space (**1**) opening upwardly and located in the valve housing (**41**), an auxiliary valve housing (**42**) with a membrane space (**2**) opening downward, on the upper side of the auxiliary valve housing (**42**) there is formed a membrane space (**4**) opening upward, and communicating with the lower membrane space (**2**) of the auxiliary valve housing (**42**) through a passage including the auxiliary valve seat (**17**), the auxiliary valve housing (**42**) is closed by a valve cover (**43**) including a membrane space (**5**) opening also downward, and the membrane spaces (**1,2**) located between the valve housing (**41**) and the auxiliary valve housing (**42**) are separated from each other by a membrane (**3**) carrying a main valve disc (**14**) and having a transit flow opening (**23**) therethrough, the membrane spaces (**4,5**) located between the auxiliary valve housing (**42**) and the valve cover (**43**) are separated from each other by a membrane (**6**) carrying auxiliary valve disc (**7**), a liquid level sensor means located within the valve housing and comprising said exit opening (**21**) constructed in a tapered fashion and extending beyond a portion of a suction pipe (**11**) and to the bottom part of which said suction pipe (**11**) reaching to the desired fluid level at the other end thereof is connected and, is in communication with the membrane space (**5**) located in the valve cover (**43**), said tapered exit opening (**21**) exerting an injector-like suction effect through said suction pipe (**11**) for sucking in only air as long as

the mouth of said suction pipe (11) is open, the membrane space (4) located at the upper side of the auxiliary valve housing (42) communicates with a fluid removal passage (20) when the rising fluid level closes the lower opening of said suction pipe (11), a low pressure condition is created in the membrane space (5) of the auxiliary valve housing (42) for closing said auxiliary valve disc (7), when the pressure increases in membrane space (2) for forcing the membrane (3) with the disc (14) thereof against the valve seat of exit opening (21), thereby closing said main valve disc 14.

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**4,292,997**

## CARTRIDGE VALVE

**Georg Bernat, Menden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany**

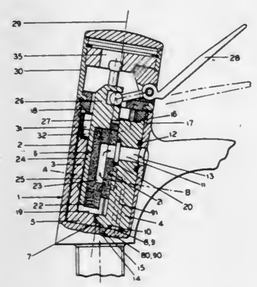
**PCT No. PCT/DE78/00014, § 371 Date Apr. 30, 1979, § 102(e) Date Apr. 30, 1979, PCT Pub. No. WO79/00114, PCT Pub. Date Mar. 8, 1979**

**PCT Filed Jul. 26, 1978, Ser. No. 47,713**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 27391547**

**Int. Cl.³ F16K** *11/06*

**U.S. Cl. 137—454.6** **6 Claims**



1. A valve assembly comprising:

a valve body having a central bore having a mean longitudinal axis, and having a plurality of inlet apertures and an outlet aperture;

a valve cartridge adapted to be inserted into said central bore, said valve cartridge comprising first and second semicylindrical members, said second member, having a plurality of first apertures, each of said first apertures in communication with a corresponding one of said plurality of inlet apertures and a first outlet aperture in communication with said outlet aperture, said first and second members each having corresponding mating surfaces which are bonded together, said first and second members jointly forming a chamber about said mean axis; and

first and second valve plates disposed within said chamber parallel to said mean axis, said first valve plate having a first plurality of in flow apertures each in communication with one of said first apertures and an outflow aperture in communication with said first outlet aperture, said second valve plate having a mixing passage adapted for communicating between said first plurality of inflow apertures and said outflow aperture, said second plate being movable relative to said first plate to control the flow and mixture of fluids; and means for moving said second plate parallel to said axis, said first and second members being arranged such that the interior surfaces of said first and second members pretension said first and second valve plates.

**4,292,998**

## PRESSURE REDUCING VALVE

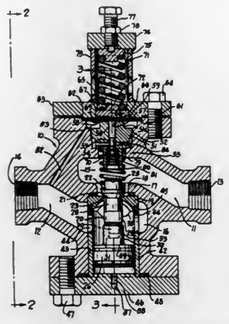
**Michael E. Winiasz, Lorain, Ohio, assignor to The Clark-Reliance Corp., Cleveland, Ohio**

**Division of Ser. No. 867,114, Jan. 5, 1978, Pat. No. 4,197,877.**

**This application Jul. 30, 1979, Ser. No. 61,635**

**Int. Cl.³ F16K** *31/34*

**U.S. Cl. 137—489.5** **2 Claims**



1. A pressure reducing valve for an expandable fluid at high pressure comprising a housing having an inlet passage leading to an inlet chamber, an outlet chamber and a discharge passage leading therefrom, a partition separating the inlet chamber from said outlet chamber, an opening in said partition providing communication between said inlet chamber and said outlet chamber, means for controlling the flow of said expandable fluid through said opening comprising a removable valve seat member disposed in said opening, said valve seat member having a valve seat positioned adjacent said inlet chamber, and a flow control portion extending downstream of said partition and into said outlet chamber, a valve spool slidably mounted relative to said valve seat member and having a valve head extending upstream from said valve seat, said valve head having a portion adapted to make sealing engagement with said main valve seat, means for controlling the position of said valve spool with respect to said valve seat comprising a spring in said inlet chamber urging said valve head into engagement with said valve seat, a sleeve disposed in said outlet chamber, and a piston operatively connected to said main valve spool and reciprocable in said sleeve, said valve seat member being slidably received in said housing and seated against an annular shoulder provided in the downstream side of said partition, said sleeve being disposed in said outlet chamber coaxial with said valve seat member, the upstream end of said sleeve engaging a shoulder on said valve seat to retain said valve seat member in position, the portion of said sleeve remote from said valve seat member being disposed in and fitting closely within an opening concentric with said valve seat member and being retained in said opening by a closure plate secured to said housing, said sleeve being dimensioned to retain said valve seat member firmly in place when said sleeve is engaged by said closure plate, and wherein upon removal of said closure plate from said housing, said sleeve, piston, valve spool, valve seat member and spring can all be removed from said housing through the opening that is normally closed by said closure plate, said flow control portion of said valve seat member comprises a plurality of radially extending, circumferentially spaced, internal grooves disposed downstream from said main valve seat, said grooves being separated by intermediate lands having arcuate inner surfaces lying in a circle that is coaxial with said main valve seat, said lands being in sliding engagement with a portion of said valve spool whereby said valve spool is slidably supported with respect to said valve seat member for movement coaxial with the axis of said main valve seat.



**4,292,999**

## VALVE FOR TOY BALLOONS

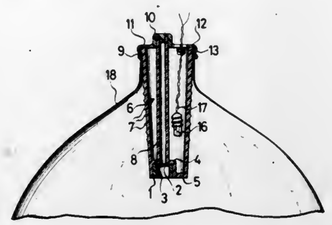
**Anton Szollmann, Augartenstrasse 21, 7500 Karlsruhe, Fed. Rep. of Germany**

**Filed Feb. 7, 1980, Ser. No. 119,351**

**Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904514**

**Int. Cl.³ F16K** *15/20;* **G09F** *21/06;* **A63H** *27/10*

**U.S. Cl. 137—560** **5 Claims**



1. A valve assembly for toy balloons and the like, comprising a container (6) having a bottom (5) and an upper open rim (9), a ring (1) having a bore, a thin valve flap (2) connected on one end of said ring by a flexible connecting portion (3), said valve flap extending laterally of and spaced from the bore of said ring, a tube (8), an annular valve seat (4) in said tube adjacent the inner end thereof, said tube (8) and annular valve seat (4) connected at the inner end and on the side of said tube to the bottom (5) of said container (6), said container (6) flaring conically in the upward direction and spaced in surrounding relation to said tube (8) forming an open top interior cavity therebetween, said ring connected in the inner end of said tube such that said annular valve seat (4) is disposed in front of and in moveable contact with said valve flap (2), said tube having an outer end projecting above the upper open rim (9) of said container, and a removable cap (10) adapted for sealing engagement with the outer end of said tube.

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**4,293,000**

## LOAD RESPONSIVE FLUID CONTROL VALVE

**Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022**

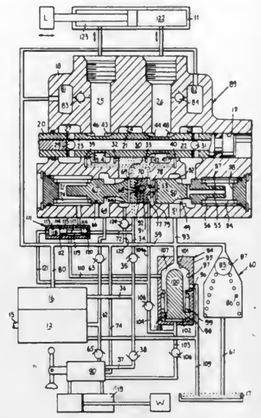
**Continuation of Ser. No. 949,250, Oct. 6, 1978, Pat. No. 4,222,409. This application Nov. 1, 1979, Ser. No. 90,249**

**The portion of the term of this patent subsequent to Sep. 16, 1997, has been disclaimed.**

**Int. Cl.³ F15B** *13/08*

**U.S. Cl. 137—596.2** **9 Claims**

1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, positive load pressure sensing means, negative load pressure sensing means, and exhaust means, first valve means for selectively interconnecting said fluid load chambers with said positive load pressure sensing means and said negative load pressure sensing means, said supply chamber, and said exhaust means, first variable metering orifice means responsive to movement of said first valve means between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means between said load chambers and said exhaust means, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber and control means of said fluid throttling means having force means responsive to fluid pressure in said positive load pressure sensing means, deactivating means of said force means having valve means operable to connect said second valve means with said exhaust means, exhaust relief valve means in said exhaust means, and isolating means on said second valve means having



means responsive to pressure upstream of said exhaust relief valve means.

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**4,293,001**

## LOAD RESPONSIVE FLUID CONTROL VALVE

**Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022**

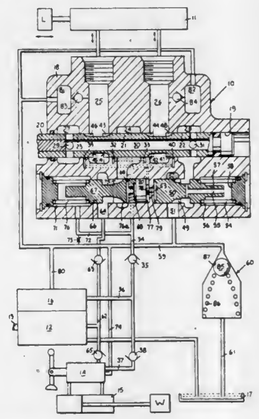
**Division of Ser. No. 949,250, Oct. 6, 1978, Pat. No. 4,222,409.**

**This application Jan. 30, 1980, Ser. No. 104,083**

**The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.**

**Int. Cl.³ F15B** *13/08*

**U.S. Cl. 137—596.13** **8 Claims**



1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, at least one outlet chamber, positive load pressure sensing means operable to transmit a control signal to said pump, negative load pressure sensing means between one of said load chambers and said outlet chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said positive load pressure sensing means, said negative load pressure sensing means, said fluid supply chamber and said fluid outlet chamber, first variable metering orifice means responsive to movement to said first valve means between said fluid supply chamber and said load chambers, sec-

ond variable metering orifice means responsive to movement of said first valve means between at least one of said load chambers and said outlet chamber, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber responsive to pressure differential across said first variable metering orifice means, said second valve means having inlet fluid isolating means between said fluid inlet chamber and said fluid supply chamber, synchronizing means having means responsive to pressure in said negative load pressure sensing means and means responsive to pressure in said supply chamber, said synchronizing means having actuating means of said inlet fluid isolating means, and fluid replenishing means operable to supply fluid flow from said fluid exhaust means to one of said load chambers which is not pressurized when said fluid isolating means isolate said fluid supply chamber from said fluid inlet chamber.

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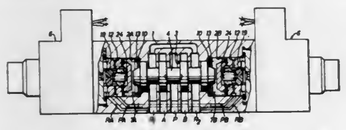
**4,293,002**

## ELECTRICALLY OPERATED FLUID CONTROL DEVICE

**Yoshiki Moriyama, Okazaki, and Masayuki Kuwana, Aichi, both of Japan, assignors to Toyooki Kogyo Kabushiki Kaisha, Okazaki, Japan**

**Filed Dec. 4, 1979, Ser. No. 100,134**
**Claims priority, application Japan, Dec. 7, 1978, 53-151835**
**Int. Cl.³ F15B** *13/043*
**U.S. Cl. 137—625.64** **7 Claims**



1. In an electrically operated fluid control device for controlling fluid flow under high pressure to be supplied into a fluid actuator, the control device comprising:

(a) a housing provided with: (i) an inlet passage for connection to a source of fluid under high pressure, (ii) an outlet passage for connection to said fluid actuator, (iii) a drain passage for connection to a low pressure area, and (iv) a cylindrical main bore, said main bore being, at the intermediate portion thereof, in open communication with each of said inlet, outlet and drain passages;

(b) first and second pilot passages provided through said housing for communicating one end portion of said main bore with said inlet and drain passages respectively;

(c) a main spool axially reciprocable within the intermediate portion of said main bore to control the flow of fluid passing through said inlet, outlet and drain passages, said main spool forming a fluid chamber at one end thereof within said end portion of said main bore;

(d) valve means disposed within said end portion of said main bore for selectively connecting said fluid chamber to said first and second pilot passages;

(e) resilient means for biasing said main spool towards said fluid chamber; and

(f) an electromagnetic actuator fitted to said housing and including a movable core operatively connected with said valve means upon energization of said electromagnetic actuator; the improvement wherein said valve means comprises:

(A) a stationary pilot valve body disposed within said end portion of said main bore to defined said fluid chamber at its inner wall, said pilot valve body comprising (i) an inner bore coaxial with said main spool, and (ii) inlet, outlet and drain ports respectively communicating said inner bore with said first pilot passage, said fluid chamber, and said second pilot passages;

(B) a pilot spool axially slidable within the inner bore of said pilot valve body for selectively connecting said outlet port with said inlet and drain ports through said inner bore, said pilot spool being operatively connected to said movable core of said electromagnetic actuator; and

(C) a spring disposed within the inner bore of said valve body for biasing said pilot spool toward said movable core.

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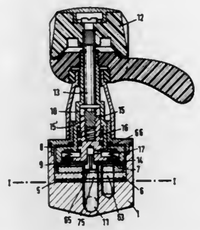
**4,293,003**

## MIXTURE CONTROL DEVICE FOR SERVICE WATER INSTALLATIONS HAVING A LOW SUPPLY TEMPERATURE

**Karlheinz Raetz, Brunswick, Fed. Rep. of Germany**

**Filed Sep. 6, 1979, Ser. No. 72,923**
**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839152**
**Int. Cl.³ F16K** *11/22*
**U.S. Cl. 137—637.4** **8 Claims**



1. A mixture control device for use in connection with a service water installation having a relatively low supply temperature, comprising:

a housing enclosing a mixing chamber and having three inlets and an outlet, said inlets being connectable respectively to a hot water conduit, a warm water conduit and a cold water conduit and said outlet communicating with said mixing chamber;

control means arranged between said inlets and said chamber, said control means being operable between a first temperature control range in which it establishes a communication of said hot water inlet and said warm water inlet with said chamber while closing said cold water inlet and a second control range in which it establishes a communication of said warm water water inlet and of said cold water inlet with the chamber while closing said hot water inlet; said control means including two superimposed disks, one of the disks being a stationary one having three inlet bore holes arranged on a concentric circle at predetermined angular intervals relative to the center of the disk and each communicating with one of said inlets, the other disk being rotatable about its center and having three control bore holes arranged on a similar concentric circle at such angular intervals relative to each other as to overlap always two adjacent inlet bore holes in said stationary disk.

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**4,293,004**

## ELECTRONIC VALVE ASSEMBLY FOR GLASSWARE FORMING MACHINERY

**Earl L. Lowe, Winchester, Ind., assignor to Ball Corporation, Muncie, Ind.**

**Continuation-in-part of Ser. No. 12,862, Feb. 16, 1979. This application Aug. 20, 1979, Ser. No. 68,276**
**Int. Cl.³ F15B** *13/08*
**U.S. Cl. 137—884** **32 Claims**

1. A valve block for an IS glassware forming machine, adapted for cooperation with at least one valve means for selectively effecting fluid communication between a first port and a second port thereof, and for selectively effecting fluid communication between said second port and a third port thereof, said valve block comprising:

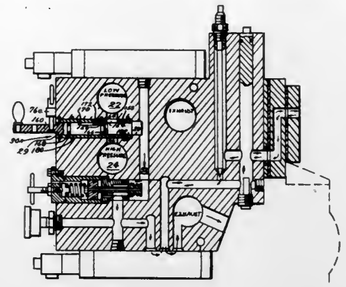


a body;

first, and second plenums formed in said body, said first and second plenums being respectively coupled to fluid supplies at differing pressures;

a first fluid passageway formed in said body, communicating with said valve means first port;

an output passageway, formed in said body, communicating



with said valve means second port, said output passageway being adapted for connection to said IS glassware forming machine;

an exhaust means for exhausting said fluid, communicating with said valve means third port; and

selector means, disposed in said valve means for selectively coupling said first or second plenums to said first fluid passageway.

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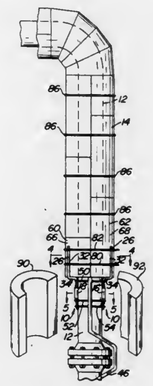
**4,293,005**

## APPARATUS FOR FASTENING INSULATION TO A PIPE

**James J. Kelly, 2310 Clearview La., Aston Township, Delaware County, Pa. 19014**

**Filed Apr. 23, 1979, Ser. No. 32,169**
**Int. Cl.³ F16L** *9/14, 9/22*
**U.S. Cl. 138—149** **9 Claims**



1. An insulation fastening system for a pipe surrounded by a layer of insulation comprising at least one crib, said crib including a sleeve and first and second members, said sleeve lying along the outer wall of the pipe that is being insulated, each of said members including first and second portions, said first and second portions being laterally spaced from each other and being connected by a third portion, said first portions being disposed adjacent to the outer wall of said layer of insulation, means for securing said first portions to said pipe, means for securing said second portions to the outer wall of said layer of insulation, at least the second portion of each of said members being spaced from each other on said layer of insulation, and said first portion of each of said members are rotatably supported by said sleeve so that said members can be pivoted to bring said second portions adjacent the outer wall of said layer of insulation.

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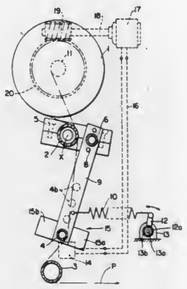
**4,293,006**

## PILE WARP THREAD UNWINDING DEVICE FOR A TERRY CLOTH LOOM

**Erich Peter, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH., Fed. Rep. of Germany**

**Filed Mar. 5, 1979, Ser. No. 17,336**
**Int. Cl.³ D03D** *49/10*
**U.S. Cl. 139—102** **7 Claims**



1. In a pile warp thread-unwinding device for a terry cloth weaving machine with an intermittent drive for a pile warp beam controlled by an oscillatable feeler for the pile warp threads,

the improvement comprising two rotatable reversing means mounted in a stationary manner following the pile warp beam in the drawingoff direction of the threads,

said oscillatable feeler being positioned therebetween and movable between two limit positions, said feeler in one limit position thereof being located essentially in a plane formed by the pile warp thread extending in a straight path between said two reversing means,

means urging said feeler in a direction out of said one limit position toward said other limit position so as to deflect said pile warp threads from said straight path,

and means on said feeler for influencing electrical control switches for the pile warp beam drive in the limit positions of the feeler.

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**4,293,007**

## HOLDING DEVICE FOR THE ELECTRICAL CONTACT ELEMENTS OF A WRAP STOP MOTION OF A WEAVING MACHINE

**Hans Baumann, Horgen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

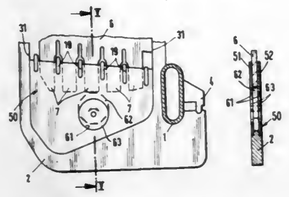
**Filed Apr. 25, 1980, Ser. No. 143,772**
**Claims priority, application Switzerland, May 8, 1979, 4299/79**
**Int. Cl.³ D03D** *51/28*
**U.S. Cl. 139—358** **15 Claims**

1. A holding device for electrical contact elements of a warp stop motion of a weaving machine, said holding device comprising

a fixedly mounted support;

a plate-shaped element movably mounted on said support

and having a plurality of slots at one end for receiving a plurality of contact elements therein; and



a shaped body movably mounted between said element and said support for displacing said element relative to said support.

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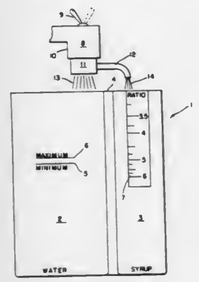
**4,293,008**

## RATIO GRADUATE FOR USE WITH POST-MIX BEVERAGE DISPENSER

**Charles E. Coleman, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.**

**Filed Dec. 10, 1979, Ser. No. 101,523**
**Int. Cl.³ B67D *5/22*; B65B *1/04***
**U.S. Cl. 141—95** **8 Claims**




1. In a system for measuring the volume ratio of a first fluid to a second fluid using a ratio graduate and an on-off valve means by dispensing the first fluid and second fluid into said graduate, the improvement comprising:

said ratio graduate having;

(a) a first fluid chamber for containing said first fluid having a minimum line and a maximum line disposed thereon at a predetermined distance from each other; and

(b) a second fluid chamber for containing said second fluid adjacent to said first fluid chamber, said second fluid chamber having graduations indicative of various first fluid to second fluid volume ratios disposed thereon;

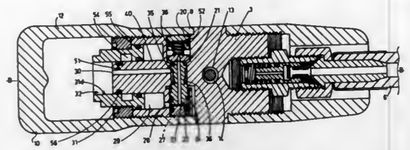
(c) said minimum and maximum lines and said first fluid to second fluid ratio graduations being related such that when said first fluid is at a level between said minimum line and said miximum line, the first fluid to second fluid ratio may be read directly off said first fluid to second fluid ratio graduation to provide a first fluid to second fluid ratio within a predetermined accuracy determined by the predetermined distance between said minimum line and said maximum line, wherein said valve means is turned off to stop the flow of said first and second fluids when said first fluid level reaches said minimum line.

**4,293,009**

## PRESSURIZED GAS FILLING HEAD

**Hugh C. Fulton, 2A Akatea Rd., Glen Eden, Auckland, New Zealand**

**Filed Sep. 11, 1979, Ser. No. 74,333**
**Claims priority, application New Zealand, Sep. 12, 1978, 188395**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—311 R** **2 Claims**



1. A gas cylinder filling head having a body incorporating a clamp bar spaced outwardly thereof; said body including:

a gas inlet port adapted for connection to a pressurized gas supply, and a gas outlet port disposed towards and spaced inwardly of the clamp bar;

a control bore between said inlet and said outlet ports, said control bore housing a two position, ON and OFF respectively, reciprocally operative control valve member, the ends thereof being disposed on the exterior of the body to form control buttons;

a delay chamber having a spool valve reciprocally mounted therein, said spool valve dividing said delay chamber into:

(i) an inlet-sub-chamber

(ii) an outlet-sub-chamber, and,

(iii) a bobbin-sub-chamber;

the inlet-sub-chamber being at one end of the delay chamber with the bobbin-sub-chamber at the other end of the delay chamber, the bobbin-sub-chamber having a larger cross-sectional area than the inlet-sub-chamber, a restricted passage extending through said spool connecting said inlet-sub-chamber to said bobbin-sub-chamber;

means for biasing said spool valve towards said bobbin-sub-chamber;

the outlet-sub-chamber being adapted to interconnect the inlet-sub-chamber to the gas outlet when the spool valve moves away from the bobbin-sub-chamber and towards the inlet-sub-chamber;

an annular shaped recess formed in said body and adjacent the gas outlet port;

said recess communicating with said bobbin-sub-chamber;

a bobbin slidably mounted within said recess and capable of extending and clamping against the inlet of a gas cylinder to be charged when gas pressure is applied to said bobbin-sub-chamber and hence to said recess;

the bobbin having a bore therethrough which forms an extension of the gas outlet port when the bobbin is extended;

a gas inlet passage extending from said gas inlet port to said inlet-sub-chamber of the delay chamber and capable of being switched ON or OFF by said control valve member; and

a pressure release passage connecting the gas outlet port to atmosphere and capable of being switched ON or OFF by said control valve member in opposition to the switching of said gas inlet passage;

whereby in use, switching of the control valve member to the ON position will allow gas pressure applied to the inlet port to firstly extend the bobbin into its clamping position and then to move the spool valve away from the bobbin-sub-chamber to connect the inlet-sub-chamber via the outlet-sub-chamber to the gas outlet port to enable gas to flow from said inlet port to said outlet port.

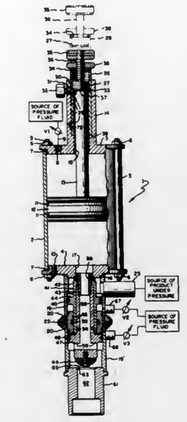


**4,293,010**

## ADJUSTABLE VOLUMETRIC FILLER HEAD

**Michael E. Winiasz, Lorain, Ohio, assignor to A-T-O Inc., Willoughby, Ohio**

**Filed Oct. 25, 1979, Ser. No. 88,134**
**Int. Cl.³ B65B *3/32***
**U.S. Cl. 141—392** **15 Claims**



1. A filler head for delivering a preselected volume of product to a container comprising a charging cylinder, piston means movable in said cylinder to define therewith a product chamber, means for delivering product under pressure to said chamber, said piston means being movable under product pressure in a direction enlarging said chamber, means limiting movement of said piston means in said chamber-enlarging direction thereby determining said preselected volume, a tubular body, means defining a first product passage between said body and said chamber, a first valve seat around said first passage, a piston valve movable in said tubular body, said valve having a first valve seal at one end engageable against said first valve seat in a first position of said valve, means defining a second product passage from said body, a second valve seat around said second passage, a second valve seal at the opposite end of said piston valve engageable against said second valve seat in a second position of said valve, means defining a third product passage through said valve, said third passage having a product inlet opening through said first valve seal and a product outlet opening adjacent said opposite end of said valve, means for moving said valve between said first and second positions, said product delivering means communicating with said body between said valve and said first passage for delivery of product to said chamber in said second position of said valve, said valve interrupting the delivery of product to said chamber when in said first position, and means for moving said piston means in a direction discharging product through said first and third passages and through said second passage when said valve is in said first position.

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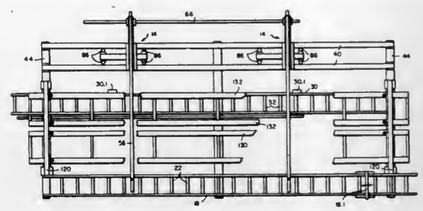
**4,293,011**

## RAFTER CUTTING MACHINE

**Thomas M. White, Hartland, Vt.; Edwin A. Barton, East Hampton, Conn., and Jesse P. Ware, Kittery Point, Me., assignors to Vermont Log Buildings, Inc., Hartland, Vt.**

**Filed May 21, 1979, Ser. No. 40,686**
**Int. Cl.³ B27C *9/04*; B27M *3/00***
**U.S. Cl. 144—3 R** **18 Claims**

1. Apparatus for cutting and notching beams to predetermined specification comprising spaced loading and discharge stations for receiving a beam for treatment and for discharging the beam which has been treated, conveyor means at the receiving station for moving a single beam longitudinally onto the receiving station, conveyor means at the discharge station for moving a single treated beam longitudinally of the discharge station, transfer means supported for reciprocal movement between the receiving and discharge stations, said transfer means being structured to, at the receiving station, take hold of a single beam at longitudinally-spaced position lengthwise thereof and, at the discharge station, to release the beam, means operably connected to the transfer means for effecting its reciprocation and for causing the transfer means to on the one hand take hold of a mean at the receiving station and on the other hand to release the treated beam at the discharge



station, a plurality of operating instrumentalities, means supporting the operating instrumentalities above the path of travel of the beam from the receiving station to the discharge station in a position to be engaged by the beam as it is moved from one station to the other, said instrumentalities being positioned to produce the required cuts in precisely predetermined positions as controlled by the position of the beam at the receiving station and the transfer of said prepositioned beam from said predetermined position at the receiving station relative to the operating instrumentalities, and means at the receiving station for controlling the longitudinal portion of the beam relative to said instrumentalities.

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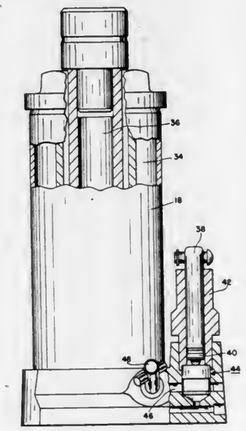
**4,293,012**

## LOG SPLITTER WITH OVERLOAD PROTECTION

**Michel A. Pierrat, 48 Farrwood Dr., Andover, Mass. 01810**

**Continuation-in-part of Ser. No. 873,060, Jan. 27, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,198**
**Int. Cl.³ B27L *7/00***
**U.S. Cl. 144—193 A** **6 Claims**



1. In a log splitter comprising first and second guide members, means supporting said guide members in spaced parallel relationship, a support positioned between said guide members for supporting a log to be split, a carriage extending between

said guide members, and a splitting wedge carried by said carriage, the improvement comprising drive means for moving said support into closing relationship with said wedge including a hydraulic jack having a supply of hydraulic fluid, a high pressure compartment, a one-way valve communicating with said high pressure compartment and arranged to permit the flow of hydraulic fluid into said high pressure compartment, a low pressure reservoir, a cylinder communicating with said one-way valve, a piston in said cylinder, arranged to pump said fluid from said low pressure reservoir through said one-way valve into said high pressure compartment, and pressure-responsive relief valve means communicating with said cylinder at a point on the side of said one-way valve opposite from said high pressure compartment and arranged to permit the flow of said fluid from said cylinder into said low pressure reservoir whenever the pressure in said cylinder exceeds a predetermined level.

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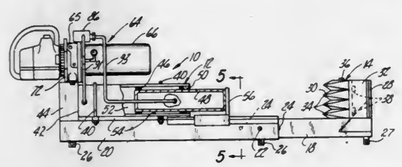
**4,293,013**
**LOG SPLITTER**
**Harold E. Phelps, 1916 Cornett Place, and Byron J. Gansley, 1049 Spring Meadows, both of Kissimmee, Fla. 32741**
**Filed Jul. 30, 1979, Ser. No. 61,843**
**Int. Cl.³ B27L** *7/00*
**U.S. Cl. 144—193 A** **2 Claims**



1. A portable log splitter comprising: a longitudinally extending base member, a blade assembly fixed on said base member for penetrating one end of a log, a hydraulic actuator mounted on said base member, a source of hydraulic fluid pressure including a rotatable hydraulic pump, power means for said pump including a sprocket drivingly connected to said pump, a guide bar in alignment with said sprocket and having a mounting slot, said slot receiving a chain saw engine on said guide bar for driving said pump and a chain extending over said guide bar and between said engine and said sprocket for driving said pump, valve control means disposed between said pump and said actuator and being manually operable to control the delivery of hydraulic fluid to extend said actuator into engagement with a log and force it into engagement with said blade assembly to split said log and being operable in an opposite direction to retract said actuator said engine being radially detachable from said guide bar for transport purposes and for use in a chain saw assembly.

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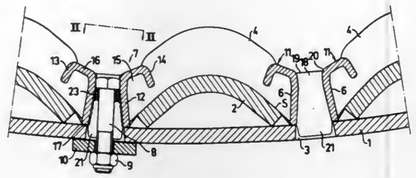
**4,293,014**
**BARKING DRUM**
**Lorentz Lundmark, Ersmark, Sweden, assignor to Skega Aktiebolag, Ersmark, Sweden**
**Filed Oct. 23, 1979, Ser. No. 87,563**
**Claims priority, application Sweden, Feb. 11, 1978, 7811372**
**Int. Cl.³ B02C** *17/22*
**U.S. Cl. 144—208 B** **7 Claims**

1. In a rotary barking drum having a shell plate, internal longitudinal laterally spaced-apart barking means, longitudinally spaced-apart bark outlets in the shell plate at locations between the barking means and wear rubber elements on the barking means, an improved device for attaching the wear rubber elements comprising: pairs of laterally spaced-apart mounting bars located parallel to the barking means and inside the shell plate between the barking means so as to form channels extending between the mounting bars to the respective bark outlets, said channels having widths which increase toward the bark outlets, said mounting bars having flanges which engage in grooves in adjacent rubber wear elements and thereby retain the elements against the barking means; means



connecting the mounting bars of each pair together; and means attaching each pair of mounting bars to the shell plate, said attaching means including elements extending through the bark outlets and locked against the outside of the bark outlets.

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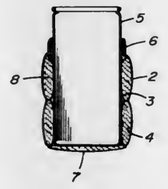
**4,293,015**
**INSULATED BEVERAGE COZY**
**Bonnie McGough, 1104 Teton Ave., Caldwell, Id. 83605**
**Filed Jun. 10, 1980, Ser. No. 158,168**
**Int. Cl.³ B65B** *11/00*
**U.S. Cl. 150—52 R** **4 Claims**



1. A jacket for use with cold drinking utensils comprising:
a cylindrical body open at its top and having a bottom; and said cylindrical body having an inner and outer wall formed of resilient fabric material fastened together so as to form a plurality of compartments between said inner and outer wall; and
insulation material disposed within said compartments formed of resilient fabric; and
a circular elastic band attached to the opening of said cylindrical body for snugly fitting around the drinking utensil.

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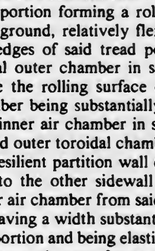
**4,293,016**
**PNEUMATIC TIRE ASSEMBLY**
**Dennis E. Bible, Stow; Richard N. Crano, Akron, and John A. Welch, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Co., Akron, Ohio**
**Filed Mar. 24, 1980, Ser. No. 133,178**
**Int. Cl.³ B60C** *17/04*
**U.S. Cl. 152—158** **3 Claims**

1. A pneumatic tire assembly capable of supporting a vehicle wheel rolling for a limited distance when the air contained in said assembly has escaped, including a wheel rim with flanges forming bead seats on the lateral sides of said rim, a pneumatic tire having bead portions mounted on said bead seats, and an annular elastomeric insert extending around the circumference of said rim inside said pneumatic tire, said insert having radially inner edges mounted on the flanges of the rim and engaging said beads of the said pneumatic tire, said pneumatic tire assembly characterized by said annular insert having
(1) a plurality of spaced apart first sections disposed about the circumference of said insert, each of said first sections having a rectangular radially outward wall substantially concentric with the tread of said pneumatic tire and having four side edges, two of said side edges being each substantially parallel with one of said radially inner edges of the insert engaging said beads of said tire, each of said first sections also having a first pair of sidewalls extending between said two side edges of said radially outward wall and said radially inner edges of the insert, and further having a second pair of sidewalls extending radially inwardly from the other two of said four side edges of said rectangular radially outward wall, each of said sidewalls



being substantially perpendicular to said radially outward wall, and
(2) a plurality of circumferentially spaced second sections connecting said first sections together, said second sections having lateral walls extending between said second pairs of side walls of said first sections and extending radially outwardly and axially toward each other from the radially inner edges of said insert engaging said beads of said tire.

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**4,293,017**
**DUAL-CHAMBER PNEUMATIC TIRE**
**Donald M. Lambe, 111 Abbey, Birmingham, Mich. 48008**
**Continuation-in-part of Ser. No. 856,294, Dec. 1, 1977, abandoned. This application Sep. 27, 1979, Ser. No. 79,315**
**Int. Cl.³ B60C** *5/06, 17/00*
**U.S. Cl. 152—339** **2 Claims**

1. A dual-chamber tubeless pneumatic tire consisting of a single casing mounted on a conventional wheel rim, said casing comprising a tread portion forming a rolling surface for engagement with the ground, relatively flexible sidewalls integrally attached at edges of said tread portion, a peripheral substantially toroidal outer chamber in said casing disposed internally proximate the rolling surface of said casing, said toroidal outer chamber being substantially elliptical in cross-section, an annular inner air chamber in said casing disposed concentrically to said outer toroidal chamber, an annular elastically deformable resilient partition wall extending internally from one sidewall to the other sidewall of said casing and separating said outer air chamber from said inner air chamber, said partition wall having a width substantially larger than the width of said tread portion and being elastically bowed toward said inner air chamber, and means for separately inflating said outer air chamber and said inner air chamber at different pressures whereby the pressure in said outer chamber is greater than the pressure in said inner chamber, said inflating means comprising a first air valve disposed through said rim in direct communication with said inner air chamber and a second air valve disposed through said rim placed in communication with said outer air chamber by a flexible conduit disposed through said inner air chamber and connected to an orifice through said partition wall, wherein said outer chamber is formed by a toroidal inner tube peripherally disposed in said casing and held in position by a pair of symmetrically disposed projecting annular beads on the internal surface of the sidewalls of said casing and said inner tube has a pair of lateral projecting annular beads engaged each in a corresponding annular groove in the surface of said beads on the internal surface of the sidewalls of said casing.

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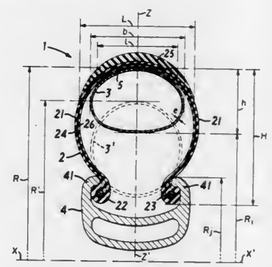
**4,293,018**
**TIRE FOR TWO-WHEEL VEHICLE**
**Gerard Dubois, Sayat, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France**
**Filed Apr. 8, 1980, Ser. No. 138,339**
**Claims priority, application France, Apr. 9, 1979, 79 09122**
**Int. Cl.³ B60C** *5/04, 15/04, 21/08*
**U.S. Cl. 152—347** **5 Claims**



1. A tire for two-wheel vehicles comprising a casing formed of a crown with a tread and two sidewalls each terminating in a bead intended to rest on a tire rim and an inner tube glued in manually removable manner to the inner wall of the casing in the region of the crown, said tire being characterized by the fact that, in uninflated state, the glued inner tube has a wall of constant thickness and is glued under circumferential tension to the casing so that the inside equatorial radius of the glued inner tube is greater than the outside radius of the flanges of the rim and so that the cross section of the glued inner tube has an oval contour whose equatorial radial height is less than both the maximum axial width of said contour and the average diameter of said contour.

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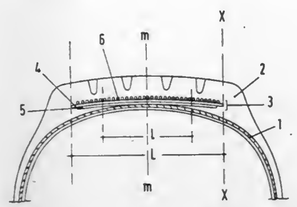
**4,293,019**
**BREAKER FOR RADIAL TIRE**
**Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy**
**Filed Mar. 8, 1979, Ser. No. 18,666**
**Claims priority, application Italy, Mar. 9, 1978, 20994 A/78**
**The portion of the term of this patent subsequent to Oct. 2, 1996, has been disclaimed.**
**Int. Cl.³ B60C** *9/20*
**U.S. Cl. 152—361 R** **6 Claims**

1. A pneumatic tire for motor vehicles comprising a carcass, a tread band and a reinforcing annular structure inserted between said carcass and said tread band, said reinforcing annular structure comprising at least three layers of metal cords, said layers being substantially as wide as the tread band, two layers which are arranged in a radially inner position with respect to the third layer comprising metal cords having an ultimate elongation of about 3%, said metal cords being parallel to one

another in each layer and crossed with respect to those of the other layer, said cords in said two layers being symmetrically inclined with respect to the longitudinal direction of the tire and forming an angle between 5° and 30°, the third layer being arranged in a radially outer position and comprising metal cords having an ultimate elongation between 4% and 8%, the cords of said third layer being substantially parallel to one




another and arranged substantially parallel to the longitudinal direction of the tire, said third layer consisting essentially of a central portion extending astride of the center line and having a width between 40% and 80% of the total width of said layer, and two lateral portions extended side by side with said central portion, each of said lateral portions having a greater resistance to tension and compression stresses than that of said central portion.

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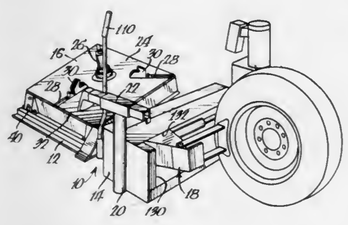
**4,293,020**

## TIRE CHANGING APPARATUS

**Charles G. Leeper, Antioch, and John F. Wood, Nashville, both of Tenn., assignors to Hennessy Industries, Inc., Elk Grove Village, Ill.**

**Filed Sep. 7, 1978, Ser. No. 940,831**
**Int. Cl.³ B60C *25/06***
**U.S. Cl. 157—1.28** **11 Claims**



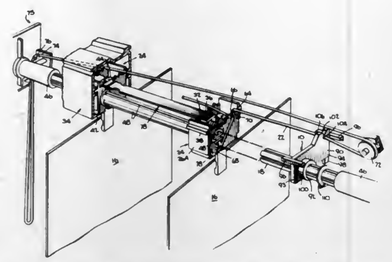

1. A tire changer comprising:
a base having a lower extremity to support the base on an underlying surface;
a table top having wheel securing means;
means mounting said tabletop on said base for pivotal movement about a generally horizontal axis between a generally horizontal, tire changing position and a generally vertical, wheel loading and unloading position whereat said securing means is in sufficiently close proximity to the underlying surface supporting the base so as to be engageable with and securable to an upright wheel and tire on the underlying surface; and
means for selectively pivoting said table top between said position.

**4,293,021**

## SUPPORT FOR TRAVERSING WINDOW COVERING DEVICE

**Joseph P. Arena, 254-43 Pembroke Ave., Great Neck, N.Y. 11020**

**Filed Jun. 6, 1979, Ser. No. 45,938**
**Int. Cl.³ E06B *9/38***
**U.S. Cl. 160—178 R** **18 Claims**



1. In a vertical blind which includes a plurality of vanes, a plurality of carriers for traversably supporting the vanes, a track structure in which the carriers are traversably mounted, means including a horizontally-extending rod for rotating the vanes and means including a cord for traversing the carriers, the improvement comprising a support for supporting the horizontally-extending rod between predetermined locations in the track structure, the support comprising means for traversably mounting the support in the track structure, an opening in the support through which the horizontally-extending rod extends such that the support in cooperation with the track structure slidably supports the rod between the predetermined locations, means for frictionally engaging the cord such that the support is traversed between the predetermined locations upon movement of the cord, and cooperating means associated with the support and the track structure for limiting movement of the support between the predetermined locations, the engaging means frictionally engaging the cord to traverse the support between the predetermined locations upon movement of the cord to traverse the carriers along a portion of the track structure and releasing the support from engagement with the cord in cooperation with the limiting means at the predetermined locations such that the support remains stationary with respect to the track structure at the predetermined locations upon further movement of the cord.

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**4,293,022**

## METHOD FOR CONTINUOUS CASTING OF METAL STRIPS

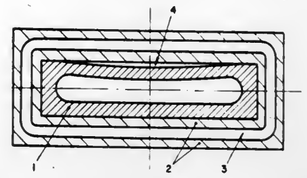
**Salvador Arena, Caminho do Mar Ave., 2562 Rudge Ramos, Sao Bernardo do Campo - Sao Paulo, Brazil**
**Continuation-in-part of Ser. No. 859,263, Dec. 9, 1977, abandoned. This application Oct. 10, 1979, Ser. No. 83,269**
**Claims priority, application Brazil, Sep. 20, 1977, 7608417**

**Int. Cl.³ B22D *11/12*; B21B *1/24*; B21C *47/02***
**U.S. Cl. 164—476** **1 Claim**

1. A method of continuously forming flat metal strips comprising the steps of:
continuously casting two semi-cylindrical members simultaneously from one circular die provided with a generally cylindrical mandrel extending into a cylindrical casting cavity defined by said die, said mandrel having external surface portions in contact with said cylindrical die thereby cooperating to define two semi-cylindrical cavities for casting said two semi-cylindrical members, continuously drawing the two semi-cylindrical members between a first set of rollers disposed downstream of said die with the rollers exerting pressure on exterior surfaces of said two members to press them together to form two flat metal strips,



continuously withdrawing and separating the two flat metal strips by pulling on each of said strips by a respective second set of at least one pair of rollers arranged downstream of said first set of rollers,




winding each said separated flat metal strip around a respective spool, and
cutting the flat metal strips after winding to a preselected length with a cutting tool positioned between the first and second sets of rollers.

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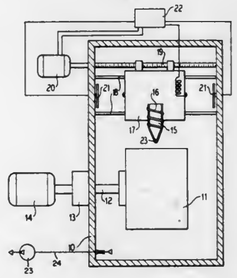
**4,293,023**

## METHOD AND DEVICE FOR THE MANUFACTURE OF METAL BANDS

**Hans-Reiner Hilzinger, Maintal, and Hans Hillmann, Rodenbach, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany**

**Filed Sep. 4, 1979, Ser. No. 72,094**
**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842421; Oct. 26, 1978, 2846628**
**Int. Cl.³ B72D *11/06***
**U.S. Cl. 164—479** **8 Claims**




1. In a method for the manufacture of straight metal bands, particularly of an amorphous metal alloy, where a stream of the molten metal from a supply container strikes a quickly moving surface of a cooling body having a width transverse to said melt stream from which it is then removed as a substantially straight band after solidification, the improvement comprising:
additionally moving said supply container transversely relative to and substantially across the entire width of said cooling body at right angles to the direction of the melt stream for optimum utilization of the cooling property of the entire surface of said cooling body, wherein the velocity of the transverse movement of the melt stream is sufficiently small with respect to the surface velocity of the cooling body for generating a substantially straight metal band on said cooling body.

6. A device for manufacturing a straight metal band comprising:
a supply container for dispensing a stream of molten metal alloy;
a drum disposed below said supply container having a cylindrical cooling surface extending a full width of said drum;
a means for rotating said drum;
a means for moving said supply container in a slowly reciprocating path transverse to said stream across substantially the entire width of said cooling surface for optimum utilization of the cooling property of substantially the entire cooling surface,
the velocity of said supply container being substantially less than the rotational velocity of said drum and cooling surface for applying said stream thereto such that said stream is cooled by said surface for removal as a substantially straight band.

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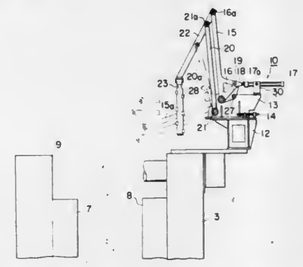
**4,293,024**

## SPRAY DEVICE FOR A DIE CASTING MACHINE

**Tsuyoshi Kikuchi, Atsugi, and Kiyoshi Takusagawa, Zama, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 10, 1979, Ser. No. 102,126**
**Int. Cl.³ B22D *17/20***
**U.S. Cl. 164—303** **3 Claims**




1. In a die casting machine of the type comprising a pair of relatively movable die plates, a pair of mold halves attached to the opposing surfaces of said die plates, respectively, and means for spraying mold releasing agent to inner surfaces of said mold halves, the improvement in which said spray means comprises a support movably mounted on one of said die plates, a cylinder-piston assembly secured to said support, a link mechanism consisting of a quadrilateral linkage connected to a piston rod of said cylinder-piston assembly and pivotably attached to said support, and a spray head supported by and fixed relative to one end of said link mechanism and provided with a plurality of spray guns, said spray guns being positioned in a space between said mold halves when said link mechanism is moved to a predetermined inclined position by the operation of said cylinder-piston assembly.

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**4,293,025**

## METHOD AND APPARATUS FOR THE DISTRIBUTION OF LIQUID-VAPOR MIXTURE

**Stanley Ohlswager; Robert R. Edison, both of Olympia Fields, and Thorpe Dresser, Markham, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.**

**Division of Ser. No. 561,441, Mar. 24, 1975, Pat. No. 4,140,178, and a continuation-in-part of Ser. No. 399,204, Sep. 20, 1973, Pat. No. 3,899,000. This application Jan. 8, 1979, Ser. No. 1,981**
**Int. Cl.³ F28F *9/22*; B01D *45/08*; F25B *39/04***
**U.S. Cl. 165—1** **22 Claims**

1. A method for distributing a mass of fluid comprising a liquid-vapor mixture into at least two (2) separate streams which comprises:
A. providing an apparatus comprising:
1. a hollow vessel having at least one fluid inlet means;
2. at least two hollow distributor pipe means each having a top opening located at a first end of said pipe means which extends into said vessel, each of said pipe means providing outlet means from said vessel for a different

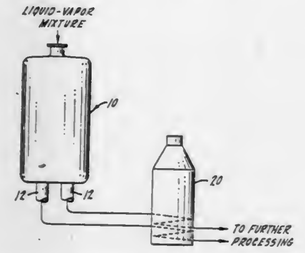
portion of said fluid, provided that said fluid inlet means is located at a level above said top openings of said pipe means;

3. at least one aperture located in that part of each said pipe means extending into said vessel below said first end of said pipe means to provide fluid communication between the interior of said vessel and the hollow space of said pipe means;

and

4. restrictive means located within said hollow vessel at a level above the top openings of said pipe means to restrict the flow of fluid from said fluid inlet means directly into the hollow space of said pipe means through the top openings of said pipe means; and

B. causing said fluid to enter said vessel through said fluid inlet means and forming a liquid level up to at least the level of said aperture whereby at least a major portion of said liquid enters said pipe means through said aperture.




9. A distribution apparatus for distributing a mass of fluid comprising a liquid-vapor mixture into at least two separate streams each of which flows to a different chemical reaction zone which comprises:

1. a hollow vessel having at least one fluid inlet means
2. at least two hollow distributor pipe means each having a top opening located at a first end of said pipe means which extends into said vessel, each of said pipe means providing outlet means from said vessel for a different portion of said fluid each of said pipe means being in fluid communication with a different chemical reaction zone;
3. at least one aperture located in that part of each said pipe means extending into said vessel below said first end of said pipe means to provide fluid communication between the interior of said vessel and the hollow space of said pipe means; and
4. restrictive means located at a level above the top openings of said pipe means to restrict the flow of fluid from said fluid inlet means directly into the hollow space of said pipe means through the top openings of said pipe means.

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**4,293,026**

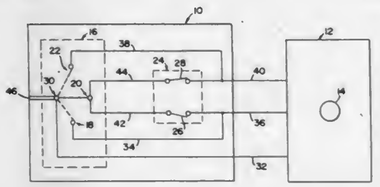
## ENERGY CONSERVER

**Jerome A. Day, 14205 Les Palms Cir., No. 3, Lutz, Fla. 33549**

**Filed Dec. 10, 1979, Ser. No. 101,835**

**Int. Cl.³ G05D** *23/00*

**U.S. Cl. 165—11** **1 Claim**




1. An energy conserver for use with a heating and air conditioning unit, said energy conserver comprising a three position lock switch electrically coupled to the heating and air conditioning unit, selectively moveable between a first, second and third position and a thermostatic control unit including a cooling control switch and a heating control switch electrically coupled between the heating and air conditioning unit and said third position lock switch, each said cooling control switch and heating conditioning control switch selectively moveable between a first and second position such that the heating and air conditioning unit operates continuously in the cooling mode and heating mode when the three position lock switch is in said first and third position respectively and selectively operates in the cooling or heating mode when within either of two preselected temperature ranges when in said second position.

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**4,293,027**

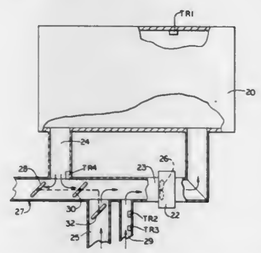
## CONTROL SYSTEM FOR HEATING AND COOLING UNITS

**James R. Tepe, Montgomery; Robert P. Sandor, Fairfield, both of Ohio; Bernard W. Wesselman, Independence, Ky., and David R. Woeste, Williamsburg, Ohio, assignors to Energetics Systems Corp., Cincinnati, Ohio**

**Filed Oct. 25, 1977, Ser. No. 845,459**

**Int. Cl.³ F25B** *29/00*

**U.S. Cl. 165—12** **37 Claims**




1. In combination with a cooling system for an enclosed space which includes a cooling stage, a conduit for directing return air from the space to the cooling stage, a conduit for directing outside air to the cooling stage, damper means in the conduits for controlling flow in the conduits, and vent means for the space, a control unit which includes means for sensing outside air temperature, means for sensing return air temperature, means for sensing space temperature, a comparing device connected to the outside air temperature sensing means and to the return air temperature sensing means for providing a first signal when the outside air temperature is at least a selected amount cooler than the return air temperature and means for modulating the damper means connected to the comparing device and to the space temperature sensing means so as to increase the flow of outside air and decrease the flow of return air as the space temperature rises above a minimum selected space temperature when said first signal is provided.

23. In combination with a cooling system for an enclosed space which includes a cooling stage, a conduit for directing return air from the space to the cooling stage, a conduit for directing outside air to the cooling stage, damper means in the conduits for controlling flow in the conduits, and vent means for the space, a control unit which includes means for sensing outside air temperature, return air temperature, and space temperature, a plurality of heating stages, and means for modulating the damper means to increase the flow of outside air and decrease the flow of return air as the space temperature rises above a minimum selected space temperature when the outside air temperature is at least a selected amount cooler than the return air temperature, stages of heating above one stage being delayed on startup for a period of time in excess of 30 minutes regardless of space temperature requirements.



**4,293,028**

## ARRANGEMENT FOR CONTROLLING ROOM TEMPERATURE

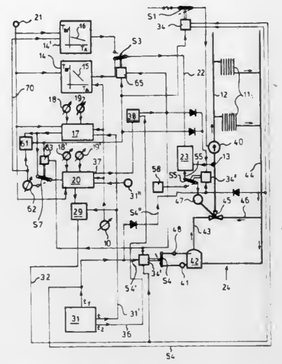
**Alois Knoll, Schönaich, Fed. Rep. of Germany, assignor to Centra-Burkle GmbH & Co., Schönaich, Fed. Rep. of Germany**

**Filed Oct. 9, 1979, Ser. No. 82,494**

**Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2843929**

**Int. Cl.³ F23N** *5/20;* **F24F** *3/00*

**U.S. Cl. 165—12** **21 Claims**



1. An arrangement in the form of an electrical circuit or the like for controlling in common the room temperature of a group of rooms intended for human occupancy in a building or the like in accordance with the weather including the outside temperature by controlling the output of a heat transfer system, such as a heating system or a cooling system, for said group of rooms, including:

timing means for defining a series of predetermined first and second time intervals, each of said second time intervals beginning at the end of a first time interval and ending at the beginning of the next successive first time interval;

first system control means for controlling the output of said heat transfer system, i.e. the transfer of heat energy with respect to said group of rooms, during said first time intervals to maintain a normal room temperature value;

system shut-off means for reducing the output of said heat transfer system to a minimum value at the beginning of said second time interval;

maximum output means for increasing the output of said heat transfer means to a maximum value before the termination of said second time interval to effect a rapid transfer of heat energy with respect to said group of rooms, whereby as a result of the rapid heat transfer, the normal value for the room temperature is at least substantially attained toward the end of said second time interval;

first computer means for computing the change to be expected in the room temperature as a result of said rapid heat transfer as a rapid heat transfer curve, taking into consideration building values, values of said heat transfer system and the instantaneous weather,; and

second computer means for computing an actual value curve ($T_{RJ}$) of the room temperature (TR) from the beginning of each second time interval until the beginning of said rapid heat transfer, taking into consideration the building values, the values of said heat transfer system and the instantanteous weather;

wherein said maximum output means includes first comparator means for initiating said rapid heat transfer whenever the actual value curve at that time attains the computed rapid heat transfer curve.

**4,293,029**

## TEMPERATURE CONTROL DEVICE FOR A HEAT PUMP

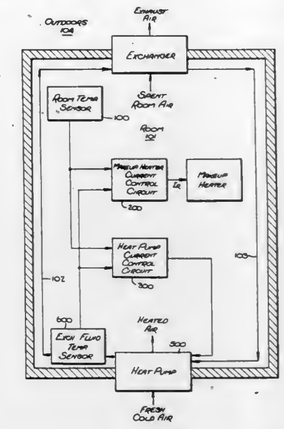
**Pierre Godard, Tremblay Les Gonesse, and Jean-Claude Geoffroy, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France**

**Filed Jul. 24, 1979, Ser. No. 60,185**

**Claims priority, application France, Jul. 31, 1978, 78 22616**

**Int. Cl.³ F25B** *29/00*

**U.S. Cl. 165—29** **3 Claims**




1. A device for controlling the ambient temperature t of a space heated by means of an electrically actuated heat pump operating with an exchange fluid at a temperature $\theta$, the value of which must not drop below a temperature $\theta_1$, and by means of an electrically actuated makeup heater, $t_1$ being the ambient space temperature desired to be achieved, the device including first means for limiting the current of the heat pump to the lower of two values, the first value being determined by an increasing function $f_1(\theta)$ when $\theta$ is between $\theta_1$ and $(\theta_1+\delta\theta_1)$, $\delta\theta_1$ being a predetermined constant temperature interval of a few degrees, and the second value being determined by a decreasing function $f_2(t)$ when t is between a temperature $t_1-\delta t_1$ and $t_1$, $\delta t_1$ being a predetermined constant temperature interval of a few degrees, and for shutting off the heat pump current when t reaches $t_1$, and second means for controlling the current of the makeup heater, as a decreasing function of t when t is between $t_1-\delta t_2$ and $t_1-(\delta t_2-\delta t_3)$, $\delta t_2$ and $\delta t_3$ being predetermined intervals of a few degrees of temperature, and $\delta t_2-\delta t_3$ being always positive, and for shutting off the current of the makeup heater when t reaches the value $t_1-(\delta t_2-\delta t_3)$, wherein the improvement comprises means for maintaining $\delta t_3$ at a predetermined constant value and means for varying the value of $\delta t_2$ as a function of the current of the heat pump when said pump operates in the predetermined temperature limitation zone for the exchange fluid between $\theta_1$ and $(\theta_1+\delta\theta_1)$.

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**4,293,030**

## METHOD OF AND MEANS FOR PASSIVELY COOLING A SHELTER CONTAINING A HEAT SOURCE

**Claude Rambach, Rehovot, Israel, assignor to Ormat Turbines, Ltd., Yavne, Israel**

**Filed Dec. 13, 1978, Ser. No. 969,153**

**Claims priority, application United Kingdom, Dec. 14, 1977, 51979/77**

**Int. Cl.³ F28D** *15/00;* **F28F** *27/00*

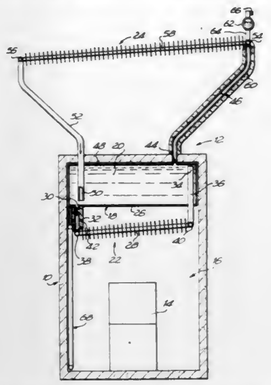
**U.S. Cl. 165—40** **8 Claims**

1. Apparatus for passively cooling the interior of a shelter containing a heat source and located in a diurnal environment

which is periodically hotter and cooler than the interior of the shelter comprising:

(a) an accumulator containing a thermal liquid;

(b) a first heat transfer loop, including thermosyphonic means, for transferring heat by transferring the liquid from the interior of the shelter to the liquid in the accumulator



when the liquid is cooler than the interior of the shelter; and

(c) a second heat transfer loop, including thermosyphonic means, for transferring heat by transferring the liquid from the liquid in the accumulator to the environment when the latter is cooler than the thermal liquid in the accumulator.

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**4,293,031**

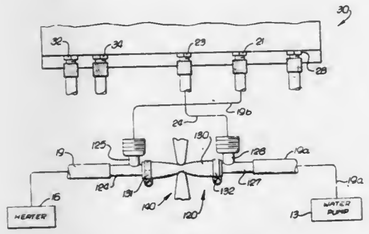
## ENGINE COOLING SYSTEM FLUSHING APPARATUS AND METHOD

**John A. Babish, Glendora; Larry K. Arnot, Duarte, and Douglas C. Appel, Glendora, all of Calif., assignors to Wynn Oil Company, Fullerton, Calif.**

**Division of Ser. No. 856,537, Dec. 1, 1977, Pat. No. 4,209,063. This application Nov. 20, 1978, Ser. No. 962,389**

**Int. Cl.³ F28G *9/00*; F16L *55/14***

**U.S. Cl. 165—95** **1 Claim**



1. A special adapter useful to connect flushing apparatus with a vehicle heater and water pump, said vehicle heater and water pump being components normally connected in the engine cooling system, said apparatus having a first outlet to be connected to the water pump and a second outlet to be connected to the vehicle heater, said adapter comprising

(a) a pair of tees, each having three ports, and

(b) a flexible hose interconnecting a first port of one tee and a first port of the other tee, said hose adapted to be pinched off to stop said interconnection, the hose removably connected to said tees,

(c) the second and third ports to one tee being respectively connected with the vehicle heater and said second outlet of said apparatus, and the second and third ports of the other tee being respectively connected with the water pump and the first outlet of said apparatus,

(d) and a clamp clamping said hose to stop communication between said tees via said hose.

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**4,293,032**

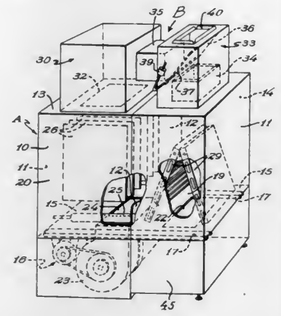
## COMBINATION FORCED AIR FURNACE AND AIR COOLER

**Donald J. Asp, 1140 E. Hawthorne, St. Paul, Minn. 55106**

**Filed Dec. 6, 1979, Ser. No. 100,738**

**Int. Cl.³ F23F *27/02***

**U.S. Cl. 165—101** **5 Claims**



1. A combination forced air furnace and cooling unit, comprising:

a. a main housing having a separate heating chamber, cooling chamber and a compartment containing a single blower;

b. a separate inlet opening for blowing air into said heating chamber and said cooling chamber from the blower;

c. a separate outlet opening for passing air out of said heating chamber and said cooling chamber to a common plenum;

d. means for selectively positioning said blower to blow air into the inlet opening of only one of said chambers; and

e. means for automatically closing off the outlet opening from the other of said chambers to the common plenum when the blower is blowing air into said one chamber.

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**4,293,033**

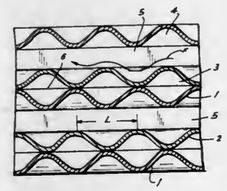
## PLATE-TYPE HEAT EXCHANGER

**Gamal E. D. Nasser, Puchheim, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany**

**Filed Jun. 29, 1979, Ser. No. 53,277**

**Int. Cl.³ F28F *3/08***

**U.S. Cl. 165—166** **5 Claims**



1. A plate-type heat exchanger comprising:

a plate stack composed of a multiplicity of substantially identical elongated sheet metal plates each formed with longitudinal and transverse intersecting arrays of corrugations having a generally sinusoidal cross section, each two plates forming a plate pair, and being disposed in mirror-image relationship with troughs of corresponding transverse corrugations opening toward one another and defining tubular transverse passages for one fluid medium, the corrugations in the longitudinal direction of the plates of each plate pair lying above one another, the corrugations in the transverse direction of each plate of one plate pair being offset from the transverse corrugations of a juxtaposed plate of the next plate pair by a half wavelength;

bars disposed between juxtaposed plates of successive plate pairs and in continuous contact with crests of the respective longitudinal corrugations whereby undulating longitudinal flow passages are formed between said bars for another fluid medium and said longitudinal flow passages are separated from one another by said bars; and

means for feeding at least one of said mediums to the corresponding passages of said stack.



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**4,293,034**

## WELL SAFETY SYSTEM METHOD AND APPARATUS

**James D. Mott, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.**

**Division of Ser. No. 2,197, Jan. 9, 1979. This application Dec. 12, 1979, Ser. No. 102,751**

**Int. Cl.³ E21B *23/04***

**U.S. Cl. 166—208** **3 Claims**

1. A subsurface tubing hanger apparatus, including:

a tubular housing having a flow passage formed therethrough;

means for connecting a string of well tubing below said tubular housing with said flow passages in communication with the bore of the well tubing;

slip means movably mounted on said housing for releasably securing said tubular housing at a subsurface location in a well to support a string of well tubing connected therebelow in the well;

means for moving said slip means between positions for securing said tubular housing in the well and for enabling movement of said tubular housing in the well, said means for moving including a first expansible setting chamber communicating with said flow passage through a first port for moving said slip means to secure said tubular housing in the well;

a tubular stinger for sealingly engaging said flow passage for forming a flow passageway above said tubular housing;

means for releasably connecting said stinger and said tubular housing to enable said stinger to sealingly engage said flow passage to block communication of well fluid pressure in said flow passage to said first port when said tubular housing is secured in the well; and

said means for releasably blocking relative rotation is disengaged when said stinger moves to isolate said first port from the fluid pressure in said passageway.

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**4,293,035**

## SOLVENT CONVECTION TECHNIQUE FOR RECOVERING VISCOUS PETROLEUM

**John L. Fitch, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Jun. 7, 1979, Ser. No. 46,275**

**Int. Cl.³ E21B *43/22***

**U.S. Cl. 166—273** **3 Claims**

1. A method of recovering viscous petroleum from a viscous petroleum-bearing subsurface formation penetrated by at least one injection well and one production well comprising:

(a) establishing a high mobility channel through the lower portion of said subsurface formation intermediate said injection well and said production well wherein said high mobility channel is established by injecting a brine having a density greater than the density of said petroleum into the lower portion of said subsurface formation and continuing to inject said brine until breakthrough at said production well;

(b) injecting a solvent for said viscous petroleum via said injection well into said high mobility channel and producing petroleum from said formation via said production well;

(c) continuing step (b) until the ratio of produced petroleum to solvent becomes unfavorable and thereafter terminating the injection of solvent; and

(d) thereafter injecting gas via said injection well into said high mobility channel and producing solvent and petroleum from said formation.

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**4,293,036**

## SHEAR-THICKENING COMPOSITIONS

**Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

**Division of Ser. No. 868,965, Jan. 12, 1978, Pat. No. 4,212,747. This application Jan. 8, 1980, Ser. No. 110,439**

**Int. Cl.³ E21B *43/26, 43/22***

**U.S. Cl. 166—302** **6 Claims**

1. A process for hydraulically fracturing a subterranean formation penetrated by at least one well which comprises

injecting into the formation at a pressure sufficient to fracture the formation an aqueous shear-thickening composition containing as essential ingredients:

(a) a small but effective amount in the range of 0.1 to 3 weight percent of a high molecular weight polyalkylene oxide selected from the group consisting of polyethylene oxides, polypropylene oxides, and polybutylene oxides having a molecular weight of about 10,000 to about 10,000,000 and

(b) a small but effective amount in the range of 0.025 to 2.5 weight percent of a synthetic resin comprising the reaction product formed by heating an aqueous alkaline mixture of an aldehyde having from one to four carbon atoms and a phenol compound selected from the group consisting of phenol, catechol, resorcinol and cresol at a reaction temperature in the range of 100° F. to 212° F. for a period of time in the range of 5 minutes to 48 hours and a molar ratio of aldehyde to phenol in the range 0.1:1 to 2:1 and a pH of about 7 to 12,

the amounts of (a) and (b) being sufficient to form a shear-thickening composition that is fluid in a quiescent state but becomes gel-like in character on agitation, and

(c) the balance of the composition being water

maintaining said composition in said formation in contact therewith for a period of time sufficient to significantly

increase formation permeability and fracturing said formation to stimulate the production of fluids therefrom.

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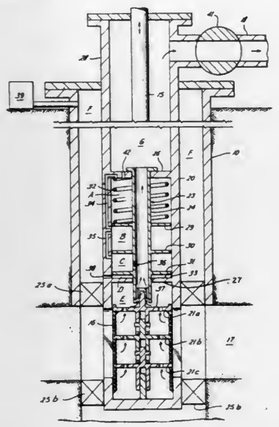
**4,293,037**

## METHOD OF FORMING AND ASSEMBLING A SELF-CLEANING HELICAL SPRING SCREEN

**Reynaldo Calderon, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Division of Ser. No. 12,934, Feb. 16, 1979, Pat. No. 4,227,576.**
**This application Feb. 28, 1980, Ser. No. 125,418**
**Int. Cl.³ B01D** *25/34;* **E03B** *3/20;* **E21B** *37/08, 43/08*
**U.S. Cl. 166—312** **7 Claims**



1. A method for assembling a self-cleaning helical spring sand screen comprising,

(a) attaching a helical spring sand screen to the lower end of a production tube for being lowered into a well to the liquid level for producing sand-free liquid from the production tube,

(b) mounting a spring biased valve means on the production tube,

(c) providing valve means for the production tube for controlling the outlet thereof, and

(d) connecting a source of high pressure liquid to the spring biased valve means for storing energy in the spring biased valve means, for opening the spring biased valve means, and for injecting high pressure liquid into the helical spring sand screen for expansion and cleaning thereof.

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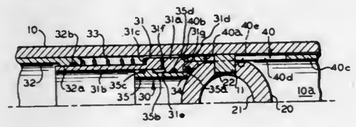
**4,293,038**

## BALL VALVE ASSEMBLY

**Robert W. Evans, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.**

**Filed May 24, 1979, Ser. No. 42,257**
**Int. Cl.³ E21B** *34/12*
**U.S. Cl. 166—331** **15 Claims**



1. A rotary ball valve, comprising: a valve housing defining a fluid passage; a ball having an axially disposed fluid passage extending therethrough; a pair of diametrically opposed trunnion bearings fixedly mounted in said housing and supporting said ball for rotational movement between an open position wherein said ball passage is aligned with and open relative to said housing passage and a closed position wherein said ball passage is closed relative to said housing passage; an annular seal structure axially slidably mounted in said housing passage on the normally upstream side of said ball, said structure including an annular surface engageable with said ball in sealing relationship, said seal structure being axially biased toward said ball by the fluid pressure produced in said housing passage by movement of said ball to closed position; an actuator mounted in said housing passage; means for shifting said actuator relative to said housing in an opening or closing stroke, said actuator being first engageable with said seal structure in its opening stroke to axially shift said seal structure out of engagement with said ball; and means on said actuator for rotating said ball to its open position during the remainder of the opening stroke of said actuator.

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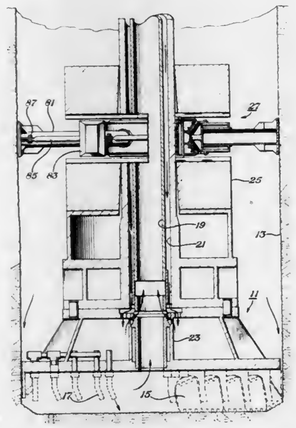
**4,293,039**

## NON-ROTATING STABILIZER FOR DRILL STRING

**John M. Mullins, and Joseph L. Kelly, Jr., both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.**

**Filed Feb. 15, 1979, Ser. No. 12,277**
**Int. Cl.³ F16C** *1/26;* **F21B** *17/10*
**U.S. Cl. 166—341** **9 Claims**



1. An apparatus for maintaining a drill string in the center of a shaft while drilling, comprising:

a hub carried by the drill string for rotation therewith;

centralizing means extended laterally outward of the hub and having a width substantially the diameter of the shaft for preventing the drill string from moving substantially from the center of the shaft;

the centralizing means having passage means for allowing fluid in the shaft to flow past the centralizing means; and

bearing means mounted between the hub and the centralizing means for allowing the drill pipe and hub to rotate with respect to the centralizing means;

the bearing means including a metal bearing surface and a plurality of individual resilient pads spaced apart from each other and in sliding contact with the bearing surface, the pads and bearing surface being exposed to the fluid in the shaft.



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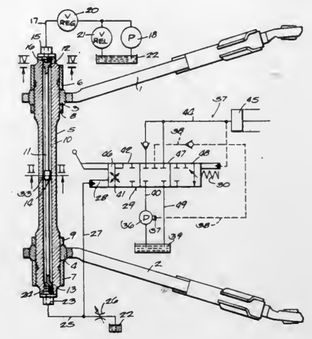
**4,293,040**

## HYDRAULIC DRAFT LOAD SENSING SYSTEM INCLUDING QUILL SHAFT BENDABLE IN RESPONSE TO DRAFT LOADS

**John W. O'Connor, Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Aug. 6, 1979, Ser. No. 64,097**
**Int. Cl.³ A01B** *63/112*
**U.S. Cl. 172—7** **10 Claims**



1. A hydraulic draft load sensing system on a draft vehicle comprising, a source of constant pressure hydraulic fluid, a sump, at least one path of fluid flow from said source of constant pressure hydraulic fluid to said sump, including, a pilot valve controlling flow of hydraulic fluid through said hydraulic system, a variable orifice in series with said pilot valve to vary the rate of flow of hydraulic fluid through said system, a control valve adapted for controlling flow of hydraulic fluid to a hydraulic actuator, a hydraulic valve operator connected intermediate said pilot valve and said variable orifice operating said control valve responsive to pressure changes, at least one draft arm, means connecting said draft arm to said pilot valve including a quill shaft defining a fluid passage, a rod coaxially supported within said quill shaft to form said pilot valve, said connecting means being so connected to said draft arm that said quill shaft bends responsive to draft loads on said draft arm, said pilot valve controlling the rate of flow through said hydraulic system upon the bending of said quill shaft responsive to draft loads on said draft arm and thereby controlling the raising and lowering of an implement responsive to draft loads on said draft vehicle.

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**4,293,041**

## POWER CULTIVATOR WITH DEBRIS EXCLUDING BARRIER AND SCRAPER

**Ronald J. Holmstadt, Bloomington, and Robert C. Comer, Hopkins, both of Minn., assignors to The Toro Company, Minneapolis, Minn.**

**Filed May 17, 1979, Ser. No. 39,944**
**Int. Cl.³ A01B** *1/06, 33/06*
**U.S. Cl. 172—39** **9 Claims**

1. A hand held power driven ground working tool, which comprises:

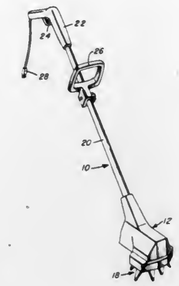
(a) a housing having an upwardly extending handle suited to be held by an operator;

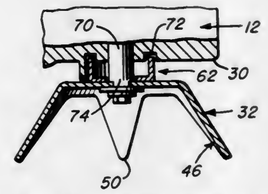
(b) an elongated rotatably mounted shaft projecting vertically downwardly from the housing;

(c) a ground working head fixed on the shaft, exteriorly of the housing, for rotation therewith, the working head being oriented on the lower end of the shaft with the housing thereabove;

(d) power means within the housing engaged with the shaft for a rotational driving of the shaft and the working head thereon;

(e) barrier means extending between the working head and the housing, the barrier means freely and rotatably surrounding the shaft in outwardly spaced relation thereto with the shaft being independently rotatable relative to the barrier means, wherein the barrier means comprises an annular member of a length substantially coextensive with the length of the shaft between the working head and the housing, wherein the annular member rests by gravity on top of the working head and has sufficient frictional engagement with the working head to be rotated thereby





until debris engages the annular member to prevent rotation thereof; and

(f) scraper means fixed to the housing and projecting inwardly toward the annular member between the working head and the housing, the scraper means including an inner edge positioned in closely spaced relation to the annular member for effecting a scraping action against the annular member during rotation of the member precluding accumulation of debris thereon.

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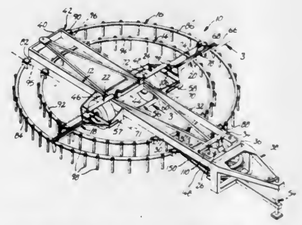
**4,293,042**

## PORTABLE OSCILLATING-RING HARROW

**August M. Reuber, 2840 S. Railroad, Albany, Oreg. 97321**

**Filed Jan. 21, 1980, Ser. No. 113,817**
**Int. Cl.³ A01B** *19/10, 33/06*
**U.S. Cl. 172—110** **4 Claims**



3. An oscillating-ring harrow comprising:

an elongate frame and means on the frame for supporting the frame for movement over the ground,
a harrow ring disposed under and spaced below said frame having a plurality of spaced downwardly projecting tines secured thereto, said ring being mounted for oscillatory movement relative to said frame,
oscillating means interposed between the frame and said ring for producing such oscillatory movement,
said ring including a central portion disposed directly under said frame and a pair of opposed side segments pivotally connected to opposite sides of said central portion for swinging movement between laterally outwardly extending positions and upwardly extending positions,
a pair of wing members pivotally mounted on opposed sides of said frame for pivotal movement between operative positions extending substantially laterally of said frame and transport positions extending substantially upwardly relative to said frame, one wing member being spaced above and associated with one side segment and the other wing member being spaced above and associated with the other side segment,
power-operated means operatively connecting said frame and said wing members for shifting the wing members between their operative and transport positions, and
means coupling each wing member to its associated side segment whereby the side segment swings from its laterally outwardly extending position to its upwardly extending position and is drawn toward the wing member upon the wing member being shifted from its operative to its transport position.

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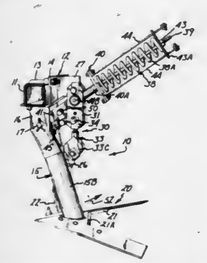
**4,293,043**

## SOIL UNDERCUTTER WITH TRIP RELEASE FOR PIVOTALLY MOUNTED SHANK

**Chester G. Neukom, Jamestown, and Ivyl D. Kopecky, Ypsilanti, both of N. Dak., assignors to Haybuster Manufacturing, Inc., Jamestown, N. Dak.**

**Filed Sep. 12, 1979, Ser. No. 74,818**
**Int. Cl.³ A01B *61/04***
**U.S. Cl. 172—267** **7 Claims**



1. A shank assembly for a cultivator or the like which must be held rigidly in place but being permitted to release under excessive loads when striking an obstacle comprising a mounting bracket, a shank, an earth working sweep mounted at the lower end of said shank, the upper end of said shank being pivotally mounted on said mounting bracket. and a toggle linkage extending between said shank and portions of said mounting bracket, including first and second links, said first link being pivotally mounted to said mounting bracket at a first end thereof, and said second link being pivotally mounted to said shank at a first end thereof, and said first and second links being pivotally mounted together at second ends thereof at a center pivot between the first ends of the respective links, spring means, means to mount said spring means to the assembly including a spring support pivotally mounted on the same pivot axis as the pivotal mounting of said shank, said spring support having an end portion remote from its pivot to support the spring means from movement in direction away from the pivot, and means slidably carried by said spring support and connected to portions of the toggle linkage and supporting the end of the spring means adjacent said spring support pivot, the spring means acting to urge the toggle linkage toward a position wherein the center pivot approaches a plane defined by the pivots of the first ends of the first and second links, and stop means to prevent the center pivot from moving toward said plane more than a desired amount.

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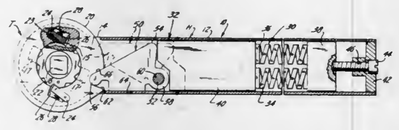
**4,293,044**

## MANUALLY-ACTUATED ROTARY-IMPACT TOOL

**J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Marquette Metal Products Co., Fountain Inn, S.C.**

**Filed Dec. 5, 1979, Ser. No. 100,365**
**Int. Cl.³ B25D *15/02***
**U.S. Cl. 173—93.5** **5 Claims**



1. In a manually operable impact tool comprising a rotatable tool head for engaging a fastening member, a rotational inertia member surrounding said tool head and capable of rotation relative to said tool head, a driving connection between said inertia member and tool head, an operating handle having its longitudinal axis extending through the rotational axis of said inertia member disposed adjacent to and capable of movement relative to said inertia member, means coacting with said driving connections for effecting disengagement of said driving connections when movement of said tool head is resisted by a predetermined force and the handle moves relative to the inertia member and for effecting reengagement of said driving connections in another operative condition, spring means disposed in said handle, force transmission means coacting with said handle and inertia member to actuate said spring for the storage of energy upon said relative movement of the handle and inertia member and to transmit such stored energy to the inertia member to rotate said inertia member and thereby effect the application of an impact force on said tool head upon re-engagement of said driving connections, said force transmission means includes a lever arm pivotally connected to said handle so as to engage said inertia member and connected to be rotationally accelerated about the pivotal connection by said spring means to thereby rotatively drive said inertia member, and said lever arm pivotal connection being offset from the longitudinal axis of said handle.

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**4,293,045**

## IMPACTING DEVICE

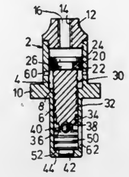
**Zvi Zeidman, 81 Hacarmel St.; Carol Goldenberg, 21/21 Jerusalem St., and Zvi Grinbaum, 50 Ben-Gurion St., all of Kfar-Saba, Israel**

**Filed Dec. 6, 1979, Ser. No. 100,980**
**Int. Cl.³ B25D *9/04***
**U.S. Cl. 173—121** **10 Claims**

1. An impacting device comprising:
a housing formed with a first cylindrical bore at one end and with a second cylindrical bore at the opposite end coaxial with but of smaller diameter than said first bore so as to define an internal annular shoulder at the juncture of the two bores;
a driving element movable within said first cylindrical bore and having an outer diameter greater than that of said internal annular shoulder so as to limit thereagainst;
a plunger movable within said first and second cylindrical bores and having its inner end face engageable with the inner end face of said driving element;



an impacting element carried by the opposite end face of said plunger;
a spring interposed between said housing and said plunger urging the plunger into engagement with the driving element, and also urging said driving element to an initial position away from said internal annular shoulder;



and an air-vent opening formed through the housing wall communicating with said first bore at a location thereof so as to be between the inner face of the driving element and the internal annular shoulder when the driving element is in its initial position, and to be at the opposite face of the driving element when the latter is in its driven position limiting against the internal annular shoulder.

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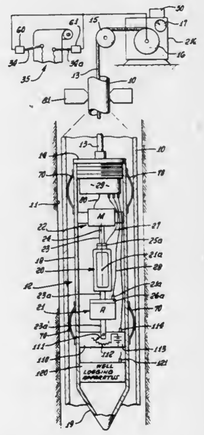
**4,293,046**

## SURVEY APPARATUS, METHOD EMPLOYING ANGULAR ACCELEROMETER

**Donald H. Van Steenwyk, San Marino, Calif., assignor to Applied Technologies Associates, San Marino, Calif.**

**Filed May 31, 1979, Ser. No. 44,047**
**Int. Cl.³ G01P *15/00*; G01C *9/00***
**U.S. Cl. 175—45** **28 Claims**



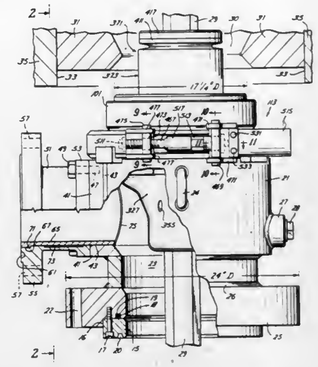
1. In the method of determining azimuth, and employing an angular accelerometer, the steps that include
(a) rotating the accelerometer about a first axis while the accelerometer is carried on a body which is itself rotating about a second axis, and
(b) detecting the acceleration output of the accelerometer which is caused by said rotation about the second axis.

**4,293,047**

## DRILLING HEAD

**David E. Young, Friendswood, Tex., assignor to Smith International, Inc., Newport Beach, Calif.**

**Filed Aug. 24, 1979, Ser. No. 69,324**
**Int. Cl.³ E21B *3/04***
**U.S. Cl. 175—195** **23 Claims**



1. Drilling head comprising:
a tubular body adapted at its lower end for connection to a lower well control element,
closure means for closing the annulus between the body and a drive tube when extended axially through the body, and
securement means for releasably securing said closure means to said body,
said closure means including a stator, a rotor rotatably mounted relative to the stator, and seal means to seal between the stator and rotor,
said seal means comprising annular packing means carried by the rotor and an annular sealing surface on the stator in sealing engagement with said packing means,
said rotor including sealing means to seal between the rotor and said drive tube,
said rotor including a metal annular body,
said sealing means and said packing means each including a metal annular support member having a metal radial annular flange for securement to said metal annular body, the metal flange on said sealing means extending radially outwardly and the metal flange on said packing means extending radially inwardly between the sealing means flange and said annular body, and means securing said flanges to said body.

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**4,293,048**

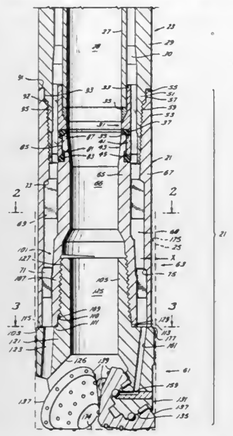
## JET DUAL BIT

**Joseph A. Kloesel, Jr., Midland, Tex., assignor to Smith International, Inc., Newport Beach, Calif.**

**Filed Jan. 25, 1980, Ser. No. 115,228**
**Int. Cl.³ E21B *9/10***
**U.S. Cl. 175—340** **7 Claims**

1. Dual flow passage jet bit comprising
an annular body providing a central flow passage,
a tubular pin coaxial with said body and rising therefrom and connected thereto, said pin being externally threaded, said pin having a smaller outer diameter than said body forming an annular upwardly facing shoulder at the juncture of said pin and body,
a plurality of legs connected to and extending down from said body and symmetrically spaced therearound, the envelope of said legs having a smaller diameter than that of said body, the portion of said body extending radially outwardly beyond said legs providing a seal belt,
a generally radially inwardly pointing cone rotatably

mounted on the inwardly facing side of each leg, each cone having earth formation reducing means on its outer periphery, the axis of each cone pointing inwardly downwardly whereby the bottom edges of the cones as the cones roll in the bottom of a well bore define a surface that is nearly flat, being in a range between conical pointing up and conical pointing down, at least one of said cones having a portion carrying earth formation reducing means extending radially outwardly beyond said seal belt a distance sufficient to provide a rotating clearance between the seal belt end and an earth bore drilled with said bit,



a plurality of off-axial passages extending from said shoulder downwardly through said annular body, and

a nozzle connected to the lower end of each passage, each said nozzle being disposed in between said legs to carry fluid in between said cones and direct it to said bottom, said nozzles lying radially outside the cylindrical volume defined by a downward continuation of said central passage.

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**4,293,049**

## METERING AND BALANCING DEVICE AND FILLING MACHINE INCLUDING SUCH A DEVICE

**Noël Launay, Beauvais, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland**

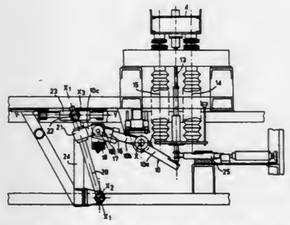
**PCT No. PCT/CH79/00085, § 371 Date Mar. 17, 1980, § 102(e) Date Mar. 17, 1980, PCT Pub. No. WO80/00245, PCT Pub. Date Feb. 21, 1980**

**PCT Filed Jun. 7, 1979, Ser. No. 192,507**

**Claims priority, application France, Jul. 20, 1978, 78 21507**

**Int. Cl.³ G01G** *1/38, 1/36*

**U.S. Cl. 177—212** **4 Claims**



1. A device for metering and balancing the total load of a container during filling, characterized in that it comprises a beam rotatable about a fixed horizontal axis constituting a simple lever, on the end of the first arm of which rests the end of a vertical rod guided for axial movement and of which the other end is affixed to the inside surface of the platform supporting the container during filling, and of which the other arm is made up of two mutually pivoted parts the first being directly attached to the first arm and rotatable simultaneously therewith about the axis of the beam and provided, at its free end, with a rail in which may slide a counterweight pivoted for rotation about a horizontal axis parallel to the axis of the beam, a bearing acting as the support of the axis of the counterweight being provided with means for allowing it to slide in the rail and being connected to an element forming the second part of the second arm of the beam, which part comprises, at its free end opposed to that provided with the bearing, a slide movable along a straight inclined rail acting as a guide, the straight rail being disposed in a vertical plane perpendicular to the axis of rotation of the beam and the counter-weight and being inclined at a pre-determined angle related to the amount of product to be discharged into each container, the lengths of the arms of the beam and the weight of the counter-weight and the slope of the straight rail co-operating with the second arm being selected so that the moments of the forces acting on each of the arms are at all times substantially equal.

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**4,293,050**

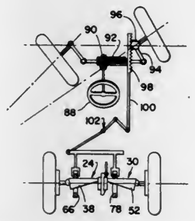
## TRANSMISSION-DIFFERENTIAL COMBINATION

**Alexander Goloff, East Peoria, and Ralph E. Denning, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Feb. 27, 1978, Ser. No. 881,218**

**Int. Cl.³ B62D** *11/12*

**U.S. Cl. 180—6.26** **11 Claims**



1. A transmission-differential combination having a steering capability, comprising:

a drive wheel;

means for imparting rotary motion to said drive wheel;

a first output shaft spaced from said drive wheel;

a first transmission delivering rotary motion from said drive wheel to drive said first output shaft;

means for selectively varying the drive ratio of said first transmission;

a second output shaft spaced from said drive wheel;

a second transmission delivering rotary motion from said drive wheel to drive said second output shaft; and

means for selectively varying the drive ratio of said second transmission,

both of said drive ratio selective varying means providing infinite drive ratio variation within a selected range,

said first and second transmissions including frictional mechanical transmissions,

said combination driving a pair of generally parallel ground engaging means of a vehicle, and including means for simultaneously setting said first and second transmission drive ratios varying means to provide higher speed to a first of said ground engaging means which moves a greater distance and lower speed to a second of said ground engaging means which moves a lesser distance,

said drive wheel including first bearing means at the first side thereof spaced from an axis thereof and second bearing means at the second side thereof spaced from said axis thereof;

said first transmission including a first generally conically surface roller having a shaft extending from an apex end thereof to rotatingly fit in said first bearing means and a base end thereof having universal joint means drivingly connected to said first output shaft;

said first transmission selective drive ratio varying means including a first ring having an infacing friction surface fitting about said first roller coaxially with said drive wheel, said first roller nutating within said first ring in contact with said friction surface; and means for selectively axially adjusting the position of said first ring relative to said first roller;

said second transmission including a second generally conically surfaced roller having a shaft extending from an apex end thereof to rotatingly fit in said second bearing means and a base end thereof having universal joint means drivingly connected to said second output shaft; and

said second transmission selective drive ratio varying means including a second ring having an infacing friction surface fitting about said second roller coaxially with said drive wheel, said second roller nutating within said second ring in contact with said friction surface; and means for selectively axially adjusting the position of said second ring relative to said second roller.

4. A transmission-differential combination having a steering capability, comprising:

a drive wheel;

means for imparting rotary motion to said drive wheel;

a first output shaft spaced from said drive wheel;

a first transmission delivering rotary motion from said drive wheel to drive said first output shaft;

means for selectively varying the drive ratio of said first transmission;

a second output shaft spaced from said drive wheel;

a second transmission delivering rotary motion from said drive wheel to drive said second output shaft; and

means for selectively varying the drive ratio of said second transmission,

said first transmission including a first driven wheel having a first output shaft extending axially therefrom, a lateral surface of said first driven wheel frictionally engaging a first peripheral portion of said drive wheel;

said second transmission including a second driven wheel having a second output shaft extending axially therefrom, a lateral surface of said second driven wheel frictionally engaging a second peripheral portion of said drive wheel;

means for selectively moving said first driven wheel parallel to the rotational axis of said drive wheel to thereby adjust the speed of said first output shaft; and

means for selectively moving said second driven wheel parallel to the axis of said drive wheel to thereby adjust the speed of said second output shaft.

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**4,293,051**

## POWER STEERING DEVICE FOR VEHICLES

**Masao Nishikawa, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 17, 1978, Ser. No. 952,097**

**Claims priority, application Japan, Oct. 17, 1977, 52-124316**

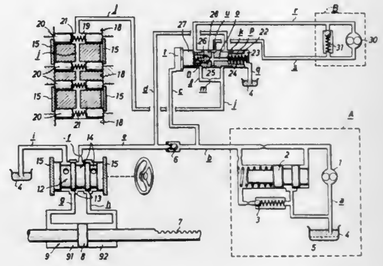
**Int. Cl.³ B62D** *5/08*

**U.S. Cl. 180—133** **6 Claims**

1. In a power steering device for vehicles having a directional control valve movable in either one of two directions in accordance with the turning of a steering shaft so that an oil passage connected to a delivery side of an engine-operated main hydraulic pump is selectively connected to one of two chambers of a hydraulic cylinder, a hydraulic motor driven in proportion to vehicle speed while being supplied with pressure fluid from said main pump, a pressure control valve being arranged so as to modify the flow of pressure fluid from said main pump in accordance with the rotation of said hydraulic motor, a plurality of hydraulic reaction chambers arranged around said directional control valve and operatively cooperating therewith so as to resist movement of said directional control valve in either direction, said hydraulic reaction chambers being supplied with pressure fluid from said main pump modified by said pressure control valve so as to vary the resistance to movement of said directional control valve in accordance with vehicle speed, the improvement comprising:

means for switching over to use of said hydraulic motor as a substitute power source in response to significant reduction or interruption of oil supply from said main pump, including:

a pipe line (c) connected between the delivery side of said main pump and said pressure control valve for supplying fluid under pressure from said main pump to normally



hold said pressure control valve against movement to a first end position thereof and to permit said pressure control valve to move to said first end position thereof upon any significant reduction or interruption of said main pump supply through said pipe line (c);

a communicating passage (j) arranged so as to provide communication between said hydraulic reaction chambers;

a groove (k) provided in said pressure control valve; and

a delivery side of said hydraulic motor being connected through said groove (k) of said pressure control valve with said communicating passage (j) and a pipe line (d) connected with said directional control valve when said pressure control valve is released to move to said first end position thereof.

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**4,293,052**

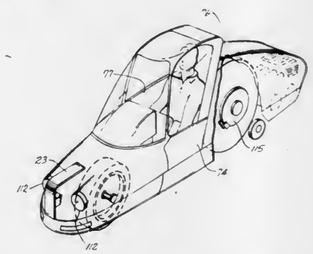
## LIGHTWEIGHT TWO-WHEELED VEHICLE

**Alexander C. Daswick, 647 Orange Grove, S. Pasadena, Calif. 91030, and Archie C. Landry, 7855 Oakdale Ave., Canoga Park, Calif. 91306**

**Filed Jul. 17, 1978, Ser. No. 925,422**

**Int. Cl.³ B62D** *61/02;* **B60R** *21/02*

**U.S. Cl. 180—219** **8 Claims**



1. A lightweight vehicle comprising a frame, a single rear drive wheel, means rotatably securing the wheel to the frame at the rear and above the frame, a front wheel rotatably secured to the front of the frame, means including a seat sup-

ported on the frame between the front and rear wheels for carrying a passenger, an engine mounted on the frame, transmission means drivably connected the engine to the rear wheel, the center of mass of the vehicle being below the horizontal plane of the axis of rotation of the rear wheel, means for turning the plane of the front wheel to steer the vehicle and means securing the means for carrying a passenger to the frame including a first pair of parallel links pivotally connected at one end to the passenger carrying means along a first common axis parallel to the axis of rotation of the rear wheel and at the other end to the frame to the rear of the seat along a second common axis, the first pair of links extending substantially horizontally, a second pair of links pivotally connected at one end to the passenger carrying means along a third common axis parallel to the first common axis, the third common axis being positioned forward of and below the first common axis, the other end of the links of said second pair being pivotally connected to the frame along a fourth common axis parallel to the other common axes below and to the rear of the second common axis, and means responsive to frontal impact for rotating the first and second links relative to the frame to lift and tilt back the passenger carrying means to protect the passenger.

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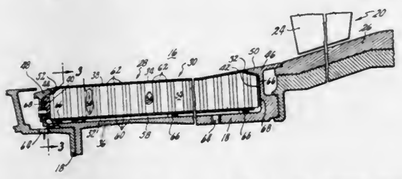
**4,293,053**

## SOUND ABSORBING STRUCTURE

**Richard G. Shuttleworth, South Windsor, and Gene R. Snyder, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 18, 1979, Ser. No. 105,009**
**Int. Cl.³ E04B** *1/82;* **F02K** *1/00*
**U.S. Cl. 181—213** **4 Claims**



1. A sound absorbing structure for a gas turbine engine having an axially extending flowpath which comprises:
an engine case,
a liner extending coextensively with the engine case which has
at least one sound absorbing panel having one or more first cavities therein and spaced from the engine case to form one or more second cavities between the panel and the case,
a first plurality of passages in the liner connecting each first cavity with one or more second cavities,
a second plurality of passages in the liner connecting each first cavity with the working medium flowpath;
a means for removing fluid from each second cavity;
wherein the first cavity and the second cavity cooperate to absorb acoustic vibrations and wherein liquid which enters the liner and the second cavity enables the drainage of fluid from the first cavity.

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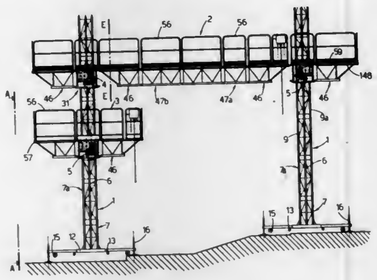
**4,293,054**

## SCAFFOLDING FOR SUPPORTING LIFTING WORKING BRIDGES AND PLATFORMS

**Antonio Pieri, Montebelluna, Italy, assignor to PIAT Impalcature Automatiche S.p.A., Italy**

**Filed May 19, 1980, Ser. No. 150,975**
**Int. Cl.³ E04G** *1/20, 7/20*
**U.S. Cl. 182—63** **6 Claims**

1. A disassemblable scaffolding for supporting lifting working bridges and platforms comprising uprights or posts and at least one lift bridge or platform which can be let ascend or descend along said posts, each bridge including at least two carrying frameworks and each platform including one carrying framework, each framework supporting a motor unit and a braking unit, said motor units serving to move the respective bridge or the platform up and down along a respective post and the braking units serving to the locking thereof at any desired level, characterized by the fact that the scaffolding is constituted of modular elements which can be assembled to each other by means of releasable joint means, each post (**1**) having a lattice structure and being formed; by a base section (**7**) made integral with a first base frame (**12**) mounted on wheels (**13**), and this first base frame (**12**) being mounted on and connected, in disasseblable manner, to a wider second frame (**14**) provided with other wheels (**15**) and with feet (**15**) of adjustable height, so that each post (**1**) and the parts connected thereto and supported thereby can selectively let slide along the ground or respectively rest stably thereon; by a plurality of other post sections (**7***a*) to be mounted in superimposed relationship on the base section (**7***a*), said post seconds (**7**, **7***a*) being triangular in horizontal cross section and including a vertical corner bar **9***a* and two tubular corner vertical rods (**9**) forming in their assembled condition vertical guide rails for engaging sliding guide wheels (**36**) supported by respective frameworks (**31**), forming a part of the carrying struc-



ture of each bridge (**2**) or platform (**3**), this carrying structure also comprising modular lattice carrying elements (**46**, **47***a*, **47***b*) connectable to each other in longitudinal alignment, each carrying structure supporting a footplane (**148**), as well as a front (**149**) and a rear parapet (**150**), each parapet (**149** or **150**) being constituted of frames (**56**), the frames (**56**) forming each front parapet (**149**) being connected to the carrying elements (**46**, **47***a*, **47***b* and **31**) by means of joints comprising tubular seats designed to receive the lower ends of the posts of the frames (**56**), and arranged in bodies (**57**) fixed to the carrying structure close upper longitudinal front edges of the elements (**46**, **47***a*, **47***b*, **31**) while the frames (**56**) forming the parapet (**150**) designed to face the building is connected to the elements (**46**, **47***a*, **47***b*, **31**) by joints comprising tubular seats arranged into bodies (**57***a*) connected to the opposite upper longitudinal edges of said elements with the interposition of telescopic connections so as to allow to vary the distance of each parapets (**150**) from the building and as result thereof, the width of each bridge (**3**) or platform (**2**), each post element (**7***a*) comprising a device for contemporaneansly inserting surety locking pins (**17** and **29**) through the female and male joint members (**8** and **8***a*) connecting the post menbers (**7** and **7***a*).

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**4,293,055**

## RETRACTABLE SAFETY HANDLE MEANS FOR A LADDER

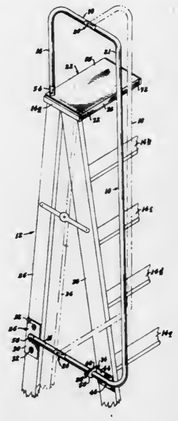
**Oneida O. Hooser, 313 N. Church (Brooklyn), Mooresville, Ind. 46158**

**Filed Feb. 21, 1980, Ser. No. 123,301**
**Int. Cl.³ E06C** *7/18*
**U.S. Cl. 182—106** **15 Claims**

1. Retractable safety handle means for a ladder, comprising, in combination:



an elongated handle member of a length to span a plurality of steps of the ladder;
support means securely supporting the handle member to the ladder at at least two locations vertically spaced along the ladder;
the support means including attaching means attaching the handle's support means to the ladder at the said locations;
a hinge means associated with each of the said support means, and located with respect to the ladder and handle member in a manner such that the handle member may be positioned in and between a handle-operable position relatively non-adjacent the ladder and a retracted position relatively adjacent the ladder;
the parts thereby providing, that in the handle-position of the handle member, the handle member may be manually



grasped by the user of the ladder as a sturdy and sturdily-supported handle for the ladder, but providing that in the retracted position of the handle member it is retracted operatively adjacent the ladder thereby providing a reduced shape and size of the combination of ladder and handle member as for storage and/or transport thereof, but not requiring dis-assembly of the handle member from the ladder, nor re-assembly thereof to the ladder when desiring to use the ladder with a handle provided therefor;
the hinge means and support means providing that the axis of the hinge means is generally vertical and that the movement of the handle member between its said handle-operable position and its said retracted position is generally horizontal without any significant amount of vertical movement, and thereby avoiding any significant amount of handle-raising effort or handle-lowering effort.

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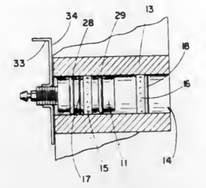
**4,293,056**

## DEVICE FOR LUBRICATING A HUB WITH BEARINGS

**Robert R. Setree, II, 820 S. Buckeye, Kokomo, Ind. 46901**

**Filed Feb. 26, 1979, Ser. No. 14,970**
**Int. Cl.³ F01M** *11/00*
**U.S. Cl. 184—1 D** **6 Claims**

1. A device for lubricating a hub and bearings mounted therein comprising:
a one-piece main body sized to fit through said bearings and into said hub, said main body having a first end and second end;
a grease fitting mounted on said first end to receive and apply a flow of grease through said main body;
passage means in said main body and having an outlet opening between said first end and second end and aligned and in communication with said fitting to receive a flow of grease and direct same out of said main body to the bearing being lubricated;
sealing means on said main body and located adjacent the bearing being lubricated when said main body is located in said hub and being operable to stop grease from flowing out of said hub; and



locating means connected to said main body and having a first surface adjustable to and from said sealing means to locate said sealing means on opposite sides of the bearing being lubricated when said main body is positioned within said hub and said first surface is in contact with said hub while also positioning said outlet adjacent the bearing being lubricated.

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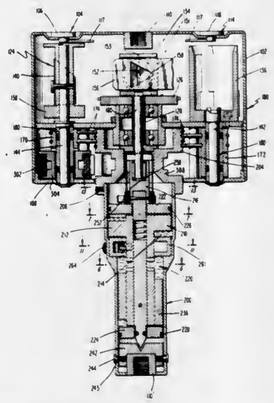
**4,293,057**

## SPRING MOTOR ESPECIALLY SUITABLE FOR USE IN A PANORAMIC CAMERA

**Ronald P. Globus; Richard D. Globus, and Stephen E. Globus, all of New York, N.Y., assignors to Globuscope, Inc., New York, N.Y.**

**Division of Ser. No. 963,739, Nov. 27, 1978, Pat. No. 4,241,985.**
**This application Apr. 25, 1979, Ser. No. 33,317**
**Int. Cl.³ F03G** *1/00;* **F16D** *57/02*
**U.S. Cl. 185—37** **14 Claims**



1. A motor, comprising:
a first member;
a second member rotatably connected to the first member;
drive means for selectively rotating the first member with respect to the second member including a ribbon spring and first and second spring spools, the ribbon spring being reversely wound on the first spring spool;
speed governing means for limiting the speed of rotation of the first member relative to the second member, the speed governing means including a chamber containing a fluid and brush means for contacting the fluid, the brush means including a brush which is rotatably mounted within the chamber; and
one-way clutch means for operatively connecting the speed

governing means to the drive means during a forward rotation of the first member with respect to the second member and for permitting the ribbon spring of the drive means to be freely rewound during a reverse rotation of the first member with respect to the second member.

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**4,293,058**

## BRAKE

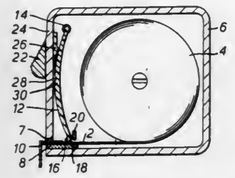
**Stanley J. Burton, Leigh-on-Sea, England, assignor to Fisco Products Limited, Essex, England**

**Filed Nov. 8, 1979, Ser. No. 92,286**

**Claims priority, application United Kingdom, Nov. 14, 1978, 44349/78**

**Int. Cl.³ B65H** *75/48*

**U.S. Cl. 188—65.1** **19 Claims**




1. A brake for an elongate member wound on a drum, comprising a control member having a cam portion, and a non-linear recoverable elongate brake member having a cam surface coactable with said cam portion, said brake member being mounted at one end and having its other end free to engage and effect braking of the elongate member; in which the control member is movable in a direction generally parallel to the elongate orientation of said brake member to a braking position to effect braking of the elongate member by an increase in the effective linear length of the brake member and to a brake release position at which the free end of the brake member is disengaged from the elongate member and the brake member has returned to its original unstrained condition.

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**4,293,059**

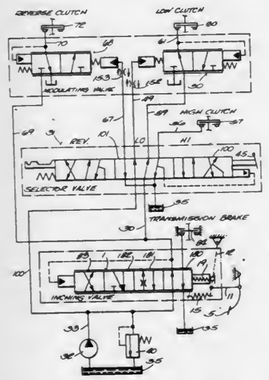
## DETENT MECHANISM AND TRANSMISSION SPEED RANGE SELECTOR VALVE

**James H. Lucas, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.**

**Filed Sep. 5, 1979, Ser. No. 72,362**

**Int. Cl.³ B60K** *41/24;* **F16D** *67/04;* **F16K** *11/10;* **F15B** *11/15*

**U.S. Cl. 192—3.57** **10 Claims**




1. A transmission selector valve having a detent mechanism and operating in a pressurized hydraulic fluid system comprising, a valve housing defining a central opening, a spool reciprocably mounted in said central opening selectively defining at least three speed range positions including a high and a low position, resilient means normally biasing said spool to the low speed range position, said housing and spool defining a fluid pressure chamber receiving pressurized fluid from the hydraulic system for biasing said spool against the resilient means to the high speed range and holding said spool in the high speed range position when the valve spool is in the high speed range position, a plurality of grooves in said housing defining reverse, low and high detent stop positions of said valve spool, a detent mechanism including detent elements biased radially for selective reception in said grooves, throttling means in said hydraulic fluid system upstream from said selector valve for reducing pressure of hydraulic fluid supplied to said selector valve and the hydraulic fluid in said pressurizing chamber thereby releasing said spool allowing said resilient means of said valve to return said spool from the high speed range position to the low speed range position, said detent mechanism arresting movement of said valve spool and retaining said valve spool in the low speed range position responsive to the predetermined decrease in pressure in said pressurizing chamber.

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**4,293,060**

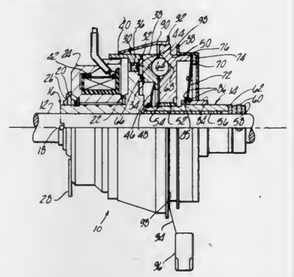
## ELECTROMAGNETIC FRICTION CLUTCH WITH OVERLOAD RELEASE

**Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.**

**Filed Oct. 24, 1978, Ser. No. 954,372**

**Int. Cl.³ F16D** *7/02, 27/10*

**U.S. Cl. 192—56 R** **7 Claims**



1. A torque overload electromagnetically operated friction clutch for establishing drive between a pair of primary clutch members, said clutch comprising:

a ferromagnetic inner body rotatably connected to one of said primary clutch members, said inner body having a radially extending portion formed with radial friction face portions;

a ferromagnetic armature disposed opposite and adjacent to said inner body friction face portions, said armature having corresponding radial surfaces constituting mating friction face surface;

means of mounting said inner body and said armature for relative axial movement to bring said friction faces into and out of frictional engagement;

electromagnetic coil means for generating magnetic flux drawing said inner body and armature into frictional engagement;

means for rotatably connecting said armature to said other primary clutch members, said means including:

a backing plate disposed adjacent said armature;

a torque booster means interconnecting said backing plate and said armature, said torque boosting means including a plurality of balls disposed in corresponding conical pockets formed in opposite radial face portions formed on said armature and said backing plate;

means rotatably connecting said backing plate to said other primary clutch member;

means mounted for rotation with said backing plate, for allowing limited axial movement of said backing plate away from said armature member while exerting a corresponding spring force resisting said relative axial movement and providing an axial spring force restraining the movement of said backing plate; and

torque overload means including a means for deenergizing said electromagnetic coil means upon the attainment of a predetermined torque level through said clutch unit, said means including means responsive to a predetermined extent of said relative axial travel of said backing plate relative said armature whereby drive through said unit is discontinued.



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**4,293,061**

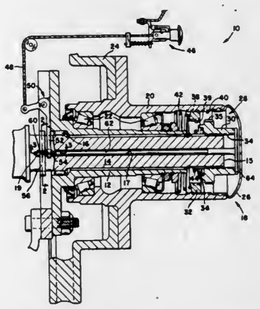
## REMOTE CONTROLLED HUB CLUTCH

**Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jul. 11, 1979, Ser. No. 56,483**

**Int. Cl.³ F16D** *1/06, 11/00, 25/061*

**U.S. Cl. 192—67 R** **5 Claims**



1. In a vehicle:

wheel support means rotatably mounted on said vehicle;

an axle assembly rotatably mounted on said vehicle for transmitting torque to said wheel support means;

clutch means interconnecting said wheel support means and said axle for engaging and disengaging said wheel support means with said axle;

control means remote from said wheel support means for engaging or disengaging said clutch means when the vehicle is stationary, said control means including operator actuated means in an operator's compartment in the vehicle;

structure interconnecting said operator-actuated means and said clutch means to engage and disengage the latter from said operator's compartment by operation of said operator-actuated means;

said axle assembly defining a bore therewithin, said bore comprising a portion of said interconnecting structure, said interconnecting structure further comprising a mechanical linkage,

said mechanical linkage comprising a rod slidable within said bore in response to actuation of said operator-actuated means, one end of said rod having a portion operatively engageable with said clutch means;

said axle assembly defining a slot extending from said bore to a surface of said axle assembly;

said mechanical linkage further comprising an arm connected to said rod and extending through said slot, a bell crank with an arm pivotal in response to actuation of said operator-actuated means, and a ring coaxially mounted on said axle assembly and engageable with said arms, at least one of said arms including roller cams to permit rotation of said rod and of said axle assembly relative to said bell crank, said bell crank arm pivoting in response to actuation of said operator-actuated means to translate said ring and said rod to engage and disengage said clutch means.

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**4,293,062**

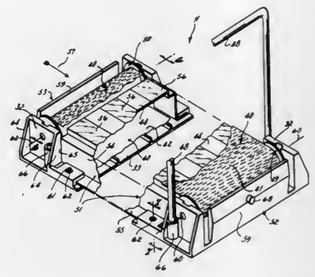
## CONVEYOR BELT ASSEMBLY FOR A DISPLAY RACK

**Rafael T. Bustos, Clarkston, Ga., assignor to Leggett & Platt, Inc., Carthage, Mo.**

**Filed Feb. 21, 1979, Ser. No. 13,246**

**Int. Cl.³ A47F** *5/00*

**U.S. Cl. 193—2 D** **11 Claims**



1. An improved conveyor belt assembly for use with a display rack, said assembly functioning to gravity feed a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said assembly comprising

a conveyor belt positionable on said rack at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said conveyor belt, the upper surface of said conveyor belt having a frictional relation with said containers that inhibits movement on said belt of said containers relative one to the other, said support floor and the undersurface of said conveyor belt having a friction relation with one another that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction relationships being such that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack,

a molded plastic end cap mounted on each end of said support floor, each end cap including an idler spool connected in freely rotating relation therewith, said conveyor belt being an endless conveyor belt carried on said idler spools, and said support floor being disposed beneath the upper run of said conveyor belt,

latch means partially carried by said end cap and partially carried by said floor, said latch means being flexible to permit easy snap-on assembly of said end cap with said floor, and

a bumper mounted in one of said end caps and positionable adjacent the front edge of said assembly, said conveyor belt conveying all of said containers in said column forward together toward said bumper in response to gravity on the remaining containers in said column after removal

of the lead container from said column, said conveyor belt and said container column being stopped by contact of the container in back of the lead container with said bumper, thereby positioning a new lead container adjacent the front edge of said shelf.

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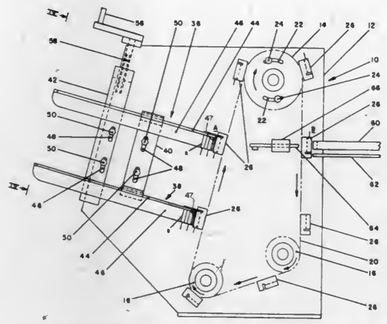
**4,293,063**
**APPARATUS FOR INVERTING AND TRANSPORTING ARTICLES**
**Walter Shields, 181-41 Henley Rd., Jamaica, N.Y. 11432**
**Filed Jun. 22, 1979, Ser. No. 51,327**
**Int. Cl.³ B65G** *47/24*
**U.S. Cl. 198—404** **12 Claims**



1. An apparatus for receiving articles at a first station and discharging them with different orientation at a second station, comprising an endless conveyor having article holding means affixed thereto at equally spaced apart locations in the direction of movement of the conveyor, each holding means having N article holders spaced normal to said direction, wherein N is an integer at least equal to two, N article feeders positioned to feed articles to separate article holders of each holding means, said feeders being spaced in said direction to be alignable with different holding means to enable simultaneous feeding of articles to the article holders of different holding means by the different feeders, and a holding station positioned adjacent said conveyor spaced from said feeders, for receiving articles from said article holders.

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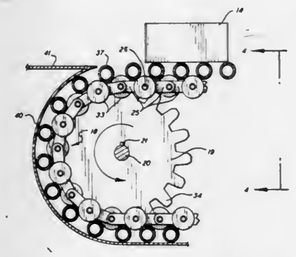
**4,293,064**
**ROLL CONVEYOR**
**James A. L. Robinson, Fayetteville, N.Y., assignor to Syracuse Supply Company, Syracuse, N.Y.**
**Filed Apr. 11, 1980, Ser. No. 139,573**
**Int. Cl.³ B65G** *17/00, 17/24*
**U.S. Cl. 198—779** **14 Claims**



1. Apparatus for conveying articles that includes
a frame having a planar conveying zone situated in the top portion thereof,
an endless transport movably mounted within said frame having a flat upper run which passes through the conveying zone,
two parallel rows of equally-spaced rollers rotatably supported in the endless transport for movement therewith wherein the rollers in one row are axially aligned with the rollers in the other row along a common axis of rotation that is perpendicular to the path of travel of said endless transport, and
a series of elongated cylinders seated upon the top of the endless transport over the two rows of rollers, said cylinders resting in contact with two adjacent rollers in each row whereby the cylinders create a moving platform within the conveying zone.

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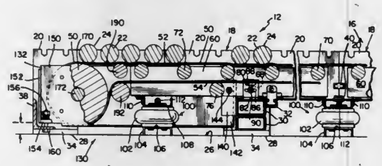
**4,293,065**
**DRIVE/TAKE-UP ASSEMBLY FOR ACCUMULATING LIVE ROLLER CONVEYOR SYSTEMS**
**Thomas A. Dyer, Greenwood, and Richard L. Huelster, Indianapolis, both of Ind., assignors to Pentek Corporation, Indianapolis, Ind.**
**Filed Apr. 28, 1980, Ser. No. 144,236**
**Int. Cl.³ B65G** *13/07, 15/20*
**U.S. Cl. 198—781** **20 Claims**



13. In a live conveyor system of the type including a power-driven endless conveying means having an upper frictional driving pass for engaging a plurality of load-carrying rollers and a lower return pass, means for propelling the conveying means, and means for tensioning the conveying means, an accumulating section comprising laterally spaced outer support members for supporting a plurality of load-carrying rollers for rotation about transverse axes which are suitably spaced apart and arranged in a common load-transporting array in the longitudinal direction of the conveyor, inner frame members for supporting one of the propelling means and the tensioning means, means for mounting the inner frame members to a portion of the outer support members to allow movement of the inner frame members relative to the load-carrying rollers, laterally spaced inner support members for supporting a plurality of pressure rollers for carrying the upper frictional driving pass of the endless conveying means, means for mounting the inner support members to the portion of the outer support members to allow movement of the inner support members relative to the load-carrying rollers independent of the movement of the inner frame members, and jack means for raising and lowering the inner frame members and the inner support members.

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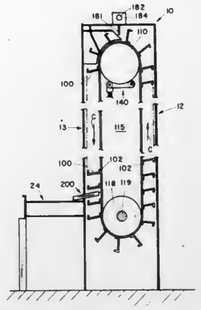
**4,293,066**
**EGG TRANSPORTING SYSTEM**
**Jerome J. Kennedy, Marietta; Harold S. Wayne, Douglasville, and Charles A. White, Woodstock, all of Ga., assignors to U.S. Industries, Inc., New York, N.Y.**
**Filed Jan. 22, 1980, Ser. No. 114,341**
**Int. Cl.³ B65G** *23/44*
**U.S. Cl. 198—813** **8 Claims**

7. In a system for tensioning an endless loop conveying element which includes frame means including an axle for rotatably supporting first rotatable endless loop guide and support means, second rotatable endless loop guide and support means movable with respect to said frame means and positioned remotely from said first endless loop guide and support means, an endless loop conveying element extending between said first and second endless loop guide and support means and supported thereby, the improvement comprising:
roller means engaging said second endless loop guide and support means for rotatably supporting said second end-





less loop guide and support means with respect to said frame, wherein said roller means is movable with respect to said frame to shift said second endless loop guide and support means with respect to said first endless loop guide and support means to adjust the tension of said conveying element means.

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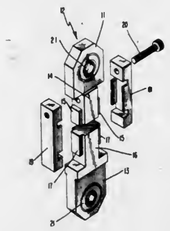
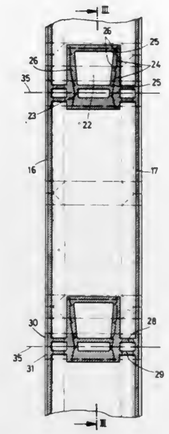
**4,293,067**
**CONVEYOR ASSEMBLY FOR A WRAPPING MACHINE**
**Andrew W. Anderson, West Caldwell, N.J., assignor to Scandia Packaging Machinery Co., Clifton, N.J.**
**Filed Jul. 3, 1979, Ser. No. 54,499**
**Int. Cl.³ B65G** *17/06, 17/38, 29/00, 25/00*
**U.S. Cl. 198—851** **30 Claims**



23. A link member longitudinally self-adjustable along a fixed longitudinal axis, said link member comprising:
(a) two separated linking element end sections having outer opposed ends and inner opposed ends,
(b) bearing means mounted only on said outer opposed ends of each end section, and
(c) coupling means fixedly secured to one of the inner opposed ends and shiftingly secured to the other inner opposed end to cause the end sections to be movable only in a direction parallel to the fixed longitudinal axis of the link member.

**4,293,068**
**MULTI-LAYERED FOIL CIGARETTE PACK WITH STRIP SEALED TEAR FLAP**
**Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany**
**Filed Oct. 2, 1979, Ser. No. 81,241**
**Claims priority, application Fed. Rep. of Germany, Oct. 30, 1978, 2847161**
**Int. Cl.³ B65D** *75/20, 75/26, 85/10*
**U.S. Cl. 206—264** **5 Claims**



1. A cigarette pack, comprising:
(a) a rectangular container folded from a laminated blank including an outer layer (**10**) of metal foil and an inner layer (**11**) of paper bonded thereto,
(b) an opening flap (**22**) disposed on adjoining top and upper front surfaces of the container, said flap being defined by a tear line (**23**) formed by aligned but discontinuous perforations (**24**) extending completely through the metal foil and paper layers, and
(c) a localized band-like layer (**27**) of aroma and moisture-proof, severable adhesive material bonded to the interior surface of said paper layer, overlying and straddling the tear line, and extending laterally outwardly therefrom to a limited degree on the interior of the container, whereby said opening flap may be torn off from the container to gain access to the contents thereof.

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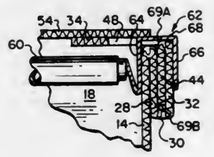
**4,293,069**
**WARDROBE CONTAINER**
**James H. Partain, Norcross, Ga., assignor to Stone Container Corporation, Chicago, Ill.**
**Filed Feb. 27, 1980, Ser. No. 125,155**
**Int. Cl.³ B65D** *85/18*
**U.S. Cl. 206—279** **4 Claims**



1. In a wardrobe container formed from a one piece blank having at least two side walls, two end walls and a bottom wall connected together and including a hanger bar having opposed

end portions each defined by inside and outside legs and a connecting top portion, the improvement comprising;

a pair of top flaps each hingedly connected along a top free edge of one of said two side walls and having a uniform thickness, each of said flaps including first and second panels connected together along a double score line segment spaced from a said free edge with said first panel connected to said side wall, said first and second panels being folded in planes parallel to said side wall adjacent said top free edge thereof and being spaced apart by said segment, each of said top flaps including a third panel connected to said second panel and foldable across the top of the container, said third panel including hinged support flap means foldable to a position sandwiched between said first and second panels to form a four ply assemblage adjacent said top free edge, said flap means defining an opening in said third panel through which said hanger bar end portions are inserted with said inner and outer legs containing at least a part of said four ply assemblage therebetween and said top portion engaged adjacent said top free edge and on said support flap means, said support flap means reaching to adjacent said double score line segment so that the weight of said hanger bar carried by said end portions is transmitted in part by said support flap means to said segment.

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**4,293,070**

**FOR PROTECTING PRINTED CIRCUIT BOARDS AND OTHER ITEMS AGAINST THE RAVAGES OF A DISCHARGE OF STATIC ELECTRICITY**

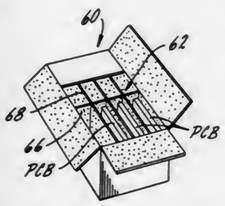
**Ralph C. Ohlbach, 417 Green Park Ct., Deerfield, Ill. 60015**

**Continuation-in-part of Ser. No. 25,336, Mar. 30, 1979, abandoned. This application Jul. 19, 1979, Ser. No. 58,786**

**The portion of the term of this patent subsequent to Jul. 10, 1996, has been disclaimed.**

**Int. Cl.³ B65B** *81/24, 85/42*

**U.S. Cl. 206—328** **14 Claims**




12. An inexpensive but effective carbon black circumvallate trap for static electricity originating outside the trap so that goods inside the trap, which may be ruined by a discharge of static electricity, are protected by the carbon black circumvallate, said trap comprising:

a paper board box having on the bottom wall and four side walls a carbon black facing layer deposited from a liquid dispersion on the side facing the interior of the box, a partitioner means inserted into the box, opposed surfaces of said partitioner means respectively facing one of said sides also being faced with a carbon black layer deposited from a liquid dispersion, the opposed surfaces of the partitioner means and each of said walls being characterized in that at least the interior thereof is not penetrated by the carbon black so deposited, so that the interior of the box is divided into individual cells each having at least a five-sided circumvallate of carbon black.

**4,293,071**

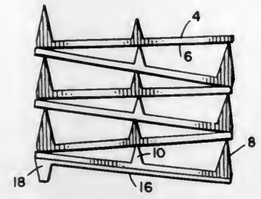
**SLANT STACKING TRAY SYSTEM**

**John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Nashville, Tenn.**

**Continuation of Ser. No. 704,357, Jul. 12, 1976, abandoned. This application Nov. 4, 1977, Ser. No. 848,763**

**Int. Cl.³ B65D** *21/02*

**U.S. Cl. 206—503** **6 Claims**




1. A stack of trays, each tray having a tray body with a continuous upper surface for holding food holding containers and a lower surface, a stacking element extending from said upper surface above every other portion of said upper surface and above any food holding containers which may be placed thereon and wherein each tray positioned relative to each other in the stack so that a stacking element on a tray under another tray engages a portion of the lower surface of the tray above while another portion of the upper surface of a tray under another tray engages still another portion of the lower surface of the tray above to cause the body of each tray to be at an angle to the horizontal, said upper surface of each tray provided with at least two discrete item holding areas.

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**4,293,072**

**STACKABLE EQUIPMENT CONTAINERS**

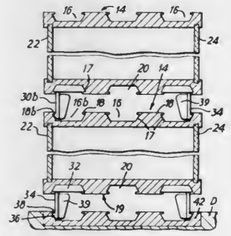
**David A. Hill, and Abraham Lomnitzer, both of Johannesburg, South Africa, assignors to Qualetron (PTY) Ltd., Germiston, South Africa**

**Filed Aug. 21, 1979, Ser. No. 68,353**

**Claims priority, application South Africa, Aug. 23, 1978, 78/4787**

**Int. Cl.³ B65D** *21/02*

**U.S. Cl. 206—512** **27 Claims**




1. A parallelipipedical container comprising

(a) at least two grooves extending along the length of each of its upper and lower sides,

(b) each said groove having a base and a pair of inclined sides extending therefrom and leading to a lip that extends over the grooves,

(c) end closure means at the ends of the grooves closing off the said ends of the grooves,

(d) a pair of removable engagement means in each of the grooves on one of said sides of the container, each said engagement means, having a base contained within a groove, a narrow resilient leg extending from the base and lying parallel to the groove, and a nose at the end of the leg and

(e) spacers respectively within the grooves on the upper side extending between and engaging the bases of the engagement means and holding them against the end closure means at the ends of the grooves.



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**4,293,073**

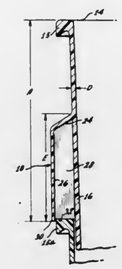
**CONTAINER WITH COLLAR**

**George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio**

**Continuation of Ser. No. 649,712, Jan. 16, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,862**

**Int. Cl.³ B65D** *21/02*

**U.S. Cl. 206—519** **5 Claims**




1. A container comprising:

a side wall in the shape of a tapered cylinder including an open upper end and a lower closed end smaller than said upper end, said upper end terminating in an outwardly extending bead having an outer surface; and an annular integral collar extending outwardly around said sidewall, said annular collar comprising a downwardly extending first section including an upper end and a free lower end, and a second section interconnecting the upper end of said first section and said side wall; said collar at the free end of said first section being spaced outwardly of said sidewall by a distance substantially equal to the outward extension of the bead; and a plurality of radial ribs interconnecting said first section of said collar and said sidewall, said ribs terminating in coplanar free ends spaced from the free lower end of said collar and disposed within said collar; said collar having an inner surface facing said side wall and extending below the coplanar free ends of said ribs, said inner surface having a configuration corresponding to the outer surface of said bead; said container being configured to nest with another like container, wherein the upper end of one container is received within the collar of the other container in abutting relationship with the free ends of said radial ribs and said inner surface of said collar is in sealing engagement with the outer surface of said bead.

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**4,293,074**

**ROOT CANAL EQUIPMENT PACKAGING**

**Joel L. Dunsky, 665 Beacon St., Boston, Mass. 02215**

**Filed Dec. 4, 1979, Ser. No. 99,994**

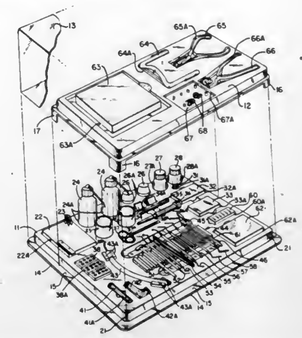
**Int. Cl.³ B65D** *1/34;* **A45C** *11/26*

**U.S. Cl. 206—572** **10 Claims**

1. A root canal treatment kit comprising,

first reusable tray means of plastic material resistant to chemicals used in root canal treatment formed with recesses for accommodating apparatus and materials used in root canal treatment,

second reusable tray means of said plastic material formed with recesses for accommodating said apparatus and materials for root canal treatment formed with means for support by said first tray means spaced above said first tray means by an amount sufficient to allow apparatus and materials for root canal treatment to be accommodated in said recesses in said first tray means when said second tray means is seated thereon,



said second tray means being readily removable from said first tray means,

said recesses accommodating in one package substantially all the instruments and supplies needed by a dentist for performing root canal work.

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**4,293,075**

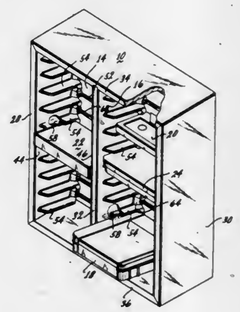
**CABINET FOR HOLDING MAGNETIC TAPE CARTRIDGES AND CASSETTES**

**Guy G. Veralrud, Canoga Park, Calif., assignor to Kustom Kreations, Inc., Northridge, Calif.**

**Filed Oct. 11, 1979, Ser. No. 83,790**

**Int. Cl.³ A47B** *81/00*

**U.S. Cl. 211—40** **9 Claims**



1. A holder for receiving and supporting magnetic tape cartridges, cassettes or containers for the cassettes each having a particular height and width dimension and with the holder including

a pair of spaced sidewalls and with the distance between the spaced sidewalls approximately equal to the width of the containers for the cassettes,

a plurality of pairs of spaced shelf supports extending from the sidewalls and forming a column of separate openings for receiving and supporting the cartridges, cassettes and containers for the cassettes and with the distance between the adjacent shelf supports on the same sidewall approximately equal to the height of the cartridges,

a plurality of pairs of spaced stepped portions each extending from a sidewall and one shelf support and within an opening and with the distance between each stepped

portion and the other adjacent shelf support on the same sidewall approximately equal to the height of the containers for the cassettes and with the distance between each pair of spaced stepped portions on opposite sidewalls approximately equal to the width of the cartridge, and

a plurality of pairs of spaced projecting locking portions each extending from a sidewall and within one opening and with the height of each locking portion approximately equal to the height of the cassette and the distance between each pair of spaced locking portions on opposite sidewalls approximately equal to the width of the cassette.

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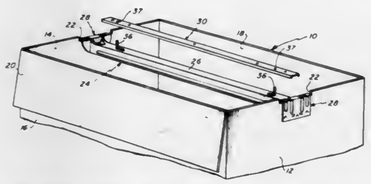
**4,293,076**

## HANGER BAR

**Herbert S. Collin, 35 Lombard St., Newton, Mass. 02158**

**Filed Apr. 30, 1979, Ser. No. 34,270**
**Int. Cl.³ A47B *47/00***
**U.S. Cl. 211—124** **15 Claims**



1. A garment hanger bar for a portable clothes container or the like comprising:

an elongate channel-shaped main bar having a top wall and a pair of downwardly extending sidewalls;

an end support formed at each end of and integrally with the main bar, each end support defining a downwardly opening channel which extends along a direction transverse to the longitudinal dimension of the main bar, each end support being adapted to receive and rest on the upper end of a wall of the container;

each end support having a top wall and a downwardly extending outer sidewall adapted to face the outer surface of the container wall;

each end support having inner sidewall segments which extend downwardly from the top wall of the end support, the inner sidewall segments being integrally connected to and forming a continuation of the sidewalls of the main bar;

said inner sidewall segments having at least portions lying in a plane substantially parallel to that of the outer sidewall of the end support, said inner sidewall members being adapted to face the inner wall surface of the container;

a depression formed in the top wall of the main bar adjacent its juncture with the end support;

said main bar and end support being formed from a single unitary sheet of metal.

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**4,293,077**

## CONTAINER HANDLING APPARATUS

**Kazuhiro Makino, Kudamatsu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 13, 1979, Ser. No. 66,237**
**Claims priority, application Japan, Aug. 30, 1978, 53-104924**
**Int. Cl.³ B66C *17/00*; B65G *67/60***
**U.S. Cl. 212—219** **2 Claims**

1. A container handling apparatus comprising:

a container crane with elongated legs capable of travelling,

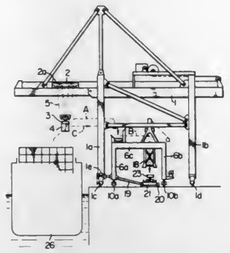
a self-supporting portal frame having leg portions and being disposed within a region defined by said elongated legs of said container crane,

travelling wheels being mounted to said leg portions of said portal frame,

connecting means being connected between said portal frame and said container crane,

said portal frame comprising an elevating device thereon and a container transfer space,

said portal frame further comprising first and second pluralities of guides located in the vicinity of said container transfer space,



wherein said second plurality of guides comprises a plurality of low guides disposed remote from said elevating device and a plurality of high guides more proximate to said elevating device,

whereby a container delivered to said guides by said container crane is first positioned by said high guides.

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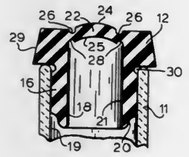
**4,293,078**

## VACUUM INDICATOR CLOSURE FOR A BLOOD COLLECTION TUBE

**Edward P. Percarpio, North Haledon, and William J. Holderith, Wyckoff, both of N.J., assignors to Becton, Dickinson and Company, Paramus, N.J.**

**Filed Nov. 1, 1979, Ser. No. 90,389**
**Int. Cl.³ B65D *47/36***
**U.S. Cl. 215—247** **14 Claims**



1. A readily penetrable vacuum indicator closure for sealing an open end of an air evacuated blood collection tube comprising:

a tubular elastomeric body having flexible, elastic side walls, an open first end and a closed second end formed by a cannula-penetrable, flexible, elastic end wall intergral with said side walls, said end wall having an outer surface and an inner surface, said outer surface being convexly curved and said inner surface being concavely curved when pressure on said inner and outer surfaces is equal, said end wall being sufficiently flexible to deflect under the influence of a pressure differential on said end wall so that when pressure against said outer surface substantially exceeds the pressure against said inner surface, said outer surface becomes concavely curved and said inner surface becomes convexly curved, said outer surface being readily visible to an observer with its changeable nature serving as an indicator of relative pressures on opposite sides of said end wall, said outer surface being only slightly displaced from the flattened condition when concave to



attribute a radially directed outward force to said end wall; and

a flange annularly disposed about the periphery of said side walls adjacent to said second end.

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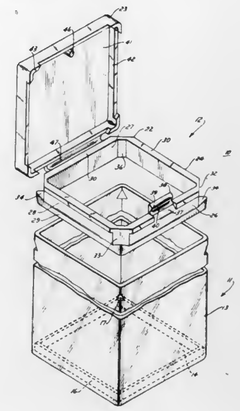
**4,293,079**

## HINGED CLOSURE

**Thomas G. Lytle, Norwalk, Conn., assignor to TLB Plastics Corporation, Brewster, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 133,623**
**Int. Cl.³ B65D *41/16, 41/18***
**U.S. Cl. 220—306** **10 Claims**



1. A receptacle comprising a receptacle body member including a peripheral wall with a top border delineating an opening and having formed in said top border, a plurality of resilient, hollow open bottomed, inwardly directed locking elements each of which includes an inwardly projecting downwardly outwardly tapering wall integrally joined along its side edges to said body member border and terminating at its bottom in a horizontally extending edge, a coupling member including a frame member telescoping said body member border and having an outerface substantially corresponding to the body member border inner face and having recesses in said outer face with upwardly directed bottom faces engaging the said bottom edges of said locking elements and a closure member movable between closed and open positions in and out of closing engagement with said frame member.

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**4,293,080**

## CONTAINER CONSTRUCTION

**Ilija Letica, Oxford, Mich., assignor to Letica Corporation, Rochester, Mich.**

**Filed Jul. 16, 1980, Ser. No. 169,330**
**Int. Cl.³ B65D *41/16, 41/18***
**U.S. Cl. 220—306** **19 Claims**

1. A resealable plastic container assembly, comprising:

a generally cylindrical container having a bottom, a sidewall extending upwardly from said bottom and an open top, said container including:

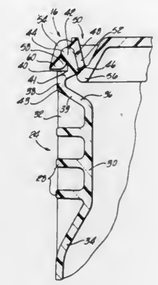
(1) a plurality of circumferential reinforcement ribs adjacent said top thereof, said ribs being defined within a radially inset area in said sidewall, the outside diameter of each of said ribs being substantially equal to or less than the outside diameter of said side wall below said inset area,

(2) a connecting flange above said circumferential ribs extending upwardly toward said open top, and

(3) a rim connected to and disposed above said connecting flange, said rim having an arcuately shaped bead on the upper extremity thereof extending radially outward and defining said open top, a locking lip on the opposite end of said rim and interior of said container, and a substantially flat sealing surface essentially interior of said container and extending between said container and extending said bead and said locking lip to provide a continuous seal between said bead and said locking lip; and,

a lid for removable attachment to said container comprising a substantially flat disc having a channel in the periphery thereof adapted to receive said rim therewithin, said channel being defined by—

(1) a substantially flat wall surface adapted to sealingly engage said flat sealing surface and being essentially coextensive with the latter,



(2)an interior locking portion on the lower extremity of said flat wall surface and including an arcuately shaped interior locking edge adapted to conformingly grip said locking lip, and

(3) an exterior locking portion on the upper extremity of said flat wall surface and including an arcuately shaped exterior locking edge adapted to conformingly engage and grip said bead, said exterior locking edge being spaced from said connecting flange to define a pry opening between said lid and said container rim into which a tool may be inserted for removing said lid,

said rim and said channel providing a tight, continuous lid-to-container seal between said exterior and interior locking portions of said lid.

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**4,293,081**

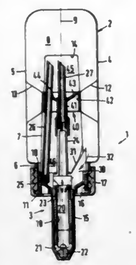
## METHOD AND DEVICE FOR METERED DISPENSING OF LIQUIDS, IN PARTICULAR CONCENTRATES OR SYRUPS, FOR THE PRODUCTION OF BEVERAGES

**Alexander Kückens, Hamburg, Fed. Rep. of Germany, assignor to Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG, Fed. Rep. of Germany**

**Filed Aug. 1, 1979, Ser. No. 62,695**
**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834095; May 22, 1979, 2920747**
**Int. Cl.³ B67B *7/26***
**U.S. Cl. 222—83** **12 Claims**

1. A device for metered dispensing of liquids, in particular concentrates or syrups, for the production of beverages, comprising a conveying and dispensing container for the liquid having at least two oppositely arranged flexible wall portions, a hood-like compensating vessel constantly connected with the outlet opening of the container and arranged within said container and being open towards said outlet opening only, and a dosing means which, before the device is put into operation, can be connected with the outlet opening of the container and is provided with a dosing means of which the inlet and outlet is controlled by a valve, said dosing means being provided with venting passages which, when the dosing means is connected with the container, open into the compensating vessel, con-

necting the same at the one side with the ambient atmosphere and at the other side with the dosing chamber, characterized in that the container and the dosing means are provided with



rigid supporting members which, in connected condition of container and dosing means, form a continuous reinforcing bridge between the two opposed flexible wall portions of the container.

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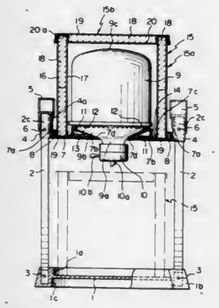
**4,293,082**

## LIQUID DISPENSING STAND WITH COOLING SUPPORT

**Shinji Matsueda, Yokohama, Japan, assignor to Nippon Light Metal Co., Ltd., Tokyo, Japan**

**Filed Feb. 7, 1980, Ser. No. 119,436**
**Claims priority, application Japan, Feb. 13, 1979, 54-15883**
**Int. Cl.³ B67D *3/00*; B65D *5/62***
**U.S. Cl. 222—131** **8 Claims**



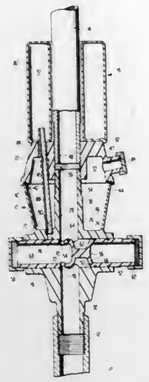
1. Liquid dispensing stand for use with a liquid containing vessel having a mouth piece to which a manual liquid dispensing means is attached, wherein the improvement comprises a supporting seat member having a central opening, a pair of legs having the upper portions thereof secured to said supporting seat member and a base member to which the lower ends of said legs are secured so as to support said supporting seat member in position above said base member by means of said legs, said supporting seat member being adapted to support thereon said liquid containing vessel in upside-down position so that said liquid dispensing means of said vessel projects downwardly through said central opening of said supporting seat member with an appropriate vertical distance held between said liquid dispensing means and said base member thereby permitting the liquid in said vessel to be dispensed in a receiving member located on said base member underneath said liquid dispensing means by operating the same, and cooling medium located between said supporting seat member and said vessel, said cooling medium supporting said vessel and cooling the liquid therein.

**4,293,083**

## SHOWER DISPENSER

**Harry E. Meares, Jr., Coral Gables, Fla., assignor to Walter S. Klements, Coral Gables, Fla.**

**Filed Mar. 13, 1979, Ser. No. 20,137**
**Int. Cl.³ B05B *7/26***
**U.S. Cl. 222—133** **2 Claims**



1. A shower dispenser comprising housing means having a water passage extending therethrough, means for connecting said water passage at one end to a water supply pipe and at the opposite end to a shower head, a transverse bore extending through said housing and intersecting said water passage at right angles thereto, a reservoir disposed in said housing adjacent said bore, spool valve means slidably mounted in said bore, a measuring chamber having inlet and outlet ports located in said spool valve means adjacent one end thereof, said spool valve means having a reduced thickness portion adjacent said measuring chamber which is always disposed in at least partial alignment with said water passage to permit the flow of water in said water passage past said spool valve, a dispensing port in said housing communicating said reservoir with said bore and said inlet and outlet ports in said spool valve means communicating said chamber with said bore, said ports being located such that said inlet port is disposed in communication with said dispensing port when said reduced thickness portion of said spool valve means is in full alignment with said water passage and said inlet and outlet ports are in communication with said water passage when said reduced thickness portion of said spool valve is only partially aligned with said water passage to allow a portion of the water passing through said water passage to flow through said chamber, said housing being comprised of an upper and lower housing which are detachably secured together to define said reservoir, auxiliary reservoir means mounted on said upper housing and having a substantially U-shaped configuration adapted to partially surround the water supply pipe, complementary passage means formed in said upper housing and said auxiliary reservoir and conduit means extending through said housing means for communicating the interior of said auxiliary reservoir with said dispensing port.

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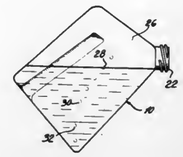
**4,293,084**

## DISPENSING CONTAINER WITH INGREDIENT LEVEL INDICIA

**Claude Lussier, 2825 Place Darlington, Apt. 3, Montreal, Quebec, Canada**

**Filed Oct. 26, 1979, Ser. No. 88,374**
**Int. Cl.³ G01F *11/26***
**U.S. Cl. 222—158** **1 Claim**

1. A dispensing and volume-measuring container for pourable ingredients comprising a body having relatively uniform, light-permeable sidewalls, a bottom wall and a top having a free-pouring open spout, a single series of dual-functioning calibrated separate indicia on at least one of the sidewalls which always indicate the volume of pourable ingredients in relation to the level of the ingredients in said container, said



single series of indicia being arranged so that the plane of the horizontal level of said ingredients at a given volume always passes through a common point of intersection in the series of indicia at any position of the container when the container is moved between an upright and the pouring positions of the container.



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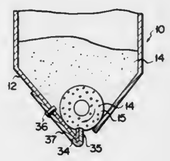
**4,293,085**

## TONER FEEDING DEVICE

**Shunichi Nakajima, Yokohama, and Haruyoshi Hasegawa, Matsudo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 12, 1979, Ser. No. 47,930**
**Claims priority, application Japan, Sep. 14, 1978, 53-126221[U]; Sep. 14, 1978, 53-126222[U]; Sep. 14, 1978, 53-126223[U]**
**Int. Cl.³ B65D *88/54*; G01F *11/42***
**U.S. Cl. 222—311** **13 Claims**



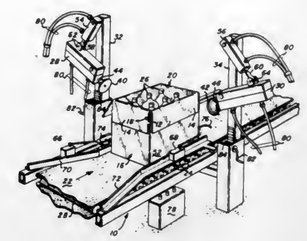
1. A toner feeding device comprising:
a toner box having a toner outlet port formed at the bottom thereof;
a roller housed in the toner box in a manner to close the toner outlet port;
said roller being formed of a porous elastic material and serving to carry the toner housed in the toner box to the toner outlet port;
a toner catching plate engageable with said roller so as to bite a surface region of said roller so as to free toner from the pores thereof, said toner catching plate being mounted on a slidable member such that its degree of engagement with said roller is adjustable to control the flow of toner; and
at least a second toner catching plate, the biting edges of said toner catching plates being superimposed on one another.

**4,293,086**

## APPARATUS AND METHOD FOR SEPARATING CASE FLAPS

**Paul A. Fincher, 1042 #3 Reed Ter., Sunnyvale, Calif. 94086, and David R. Eklund, 3407 Victoria Ave., Santa Clara, Calif. 95051**

**Filed Apr. 11, 1980, Ser. No. 139,543**
**Int. Cl.³ B26F *3/02***
**U.S. Cl. 225—1** **16 Claims**



7. Apparatus for separating downturned flaps of a case joined by a tab and lying over sides of said case, which comprises:
a conveyor for moving the case through said apparatus,
a first means for engaging one of the flaps,
a first thrust means positioned proximate to said conveyor and connected to said flap engaging means for moving said flap engaging means against the side of the case over which the one of the flaps lies and below the one of the flaps,
a first means for moving said flap engaging means along the side of the case until at least a portion of said flap engaging means extends between the one of the flaps and the side against which it lies, and
a first means for retracting said flap engaging means with sufficient force to break the tab.

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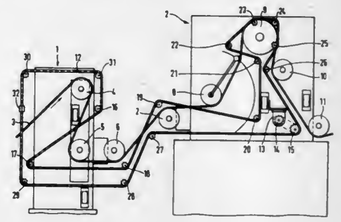
**4,293,087**

## APPARATUS FOR INTRODUCING THE HEAD END OF A WEB INTO A TREATING STATION

**Rolf Schmitz, Monchengladbach, Fed. Rep. of Germany, assignor to Jagenberg Werke, Dusseldorf, Fed. Rep. of Germany**

**Filed Mar. 28, 1980, Ser. No. 135,015**
**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915747**
**Int. Cl.³ B65H *17/34***
**U.S. Cl. 226—172** **7 Claims**



1. In an apparatus for the treatment of a web of material having rolls defining a conveying path for the web, the improvement comprising means for leading the head end of a web along the conveying path comprising means forming an endless loop on both sides of the conveying path, each having a run thereof extending along the conveying path and means connected across the two loops for securing the head end of a

web during the leading thereof along the conveying path, wherein the means for securing comprises a crossbeam connecting the two loops, the crossbeam comprising two rods and means mounting the rods with parallel axes for movement relative to each other between a closed position wherein the head end of a web is clamped therebetween and an open position wherein a clearance is obtained through which the head end can be threaded.

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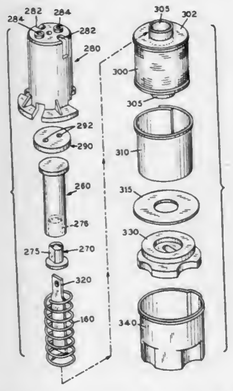
**4,293,088**

## ELECTRONICALLY OPERATED PORTABLE FASTENER DRIVING TOOL

**Edward E. Barrett, Massapequa Park; Steven Hahn, East Hampton; Albert Lensky, Fresh Meadow; Morris Pinczewski, New York, and Seymour Sobelman, Brooklyn, all of N.Y., assignors to Swingline Inc., Long Island City, N.Y.**

**Filed Oct. 12, 1979, Ser. No. 84,450**
**Int. Cl.³ B25C** *1/06*
**U.S. Cl. 227—131** **14 Claims**




1. In an electrically powered driving tool having a hollow body comprising an elongated head portion for housing a cylinder, a solenoid, a magnetic plunger positionable in the cylinder, a driver blade and comprising a hollow handle portion projecting rearwardly from said head portion having trigger means and an electronic trigger control circuit mounted therein for producing two driving strokes to a fastener in response to actuation of said trigger means, a magazine for holding a plurality of fasteners secured to said head portion in driving engagement with said driver blade, means for preventing the advancement of a second fastener into the axial path of said driver blade while a first fastener is being driven the improvement comprising:

(a) said hollow body being made of electrically insulating material;

(b) a cavity in the magnetic plunger; and

(c) a molded blade cap which is secured to the blade and in turn positioned in fitting engagement into a cavity in the plunger to structurally hold the cap and blade and to electrically insulate the blade from the plunger, whereby the blade is supported and insulated to prevent the conduct of electricity from the tool interior to the blade.

7. In an electrically powered portable fastener driving tool, the combination comprising: driving means for driving a fastener, a solenoid including a coil for producing a magnetic field and an armature connected to said driving means for propelling said driving means axially of the coil when the coil is energized, an electronic trigger control circuit connected to the solenoid for supplying the solenoid with two unidirectional current pulses from a source of alternating current supplied to the trigger control circuit, and means for preventing more than one fastener from being driven during a single actuation of the tool, said trigger control circuit including:

(a) unidirectional controlled conduction means for rectifying alternating current comprising at least three terminals including a gate;

(b) first circuit means connecting said solenoid and said controlled conduction means in series with said source of alternating current;

(c) switch means operable at random times relative to the cycles of said alternating current;

(d) second circuit means controlled by said switch means for supplying current to said gate upon actuation of said switch means to place said controlled conduction means in a conductive state two times, firstly immediately following a properly poled half-cycle of said alternating current and secondly, immediately following the next such half-cycle, said circuit including a capacitor which supplies such current;

(e) third circuit means for providing sufficient holding current to the controlled conduction means to enable the controlled conduction means to conduct during two successive like-poled half-cycles of said alternating current; and

(f) fourth circuit means for draining sufficient current during the first two successive like-poled half-cycles of said alternating current to assure that no more than two successive current pulses are transmitted to the solenoid during a single actuation of the tool, said fourth circuit means including pulse means which pulses the gate and deactivating means which deactivates the pulse means.

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**4,293,089**

## BRAZING METHOD

**James T. McCormick, Simi; Paul B. Ferry, Encino, both of Calif., and John C. Hall, Schaumburg, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 8, 1979, Ser. No. 37,076**
**Int. Cl.³ B23K** *1/04, 1/20*
**U.S. Cl. 228—215** **14 Claims**

1. A method of brazing a thin porous membrane selected from the class consisting of iron, nickel, copper and alloys thereof to a backing material comprising preselecting the surface area of the thin porous membrane to be brazed, soaking the thin porous membrane in a braze flow barrier dispersed in a volatile carrier and thereafter removing the braze flow barrier from the preselected porous surface area, preselecting the surface area of the backing material to be brazed, electrolessly plating a metal alloy on the backing material, placing said preselected surface areas in registered contact, heating in the absence of oxygen to a temperature in excess of the melting point of the electroless plated metal alloy for a time sufficient to volatilize the carrier and to form a braze joint between the preselected surface areas, and thereafter cooling to ambient temperatures to provide a brazed backing and porous membrane with the pores of the membrane being open except at the braze joint.

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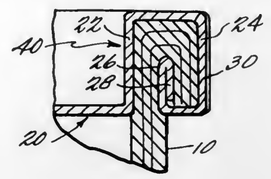
**4,293,090**

## CONTAINER SEAM

**Roland C. Gardner, Doylestown, Pa., and Ronald Mortellito, Monmouth Junction, N.J., assignors to Clevepak Corporation, White Plains, N.Y.**

**Filed Mar. 28, 1980, Ser. No. 135,146**
**Int. Cl.³ B65D** *6/34, 3/10*
**U.S. Cl. 229—5.6** **6 Claims**

1. A sealed container having primary container wall means for defining an internal space and an opening at least at one end thereof, edge means extending about the opening at said at least one end for cooperating with an end closure for forming a seam about the opening; an end closure for closing the opening at said at least one end and forming together with said edge means a seal sealing said container, said end closure having a substantially planar central section and a crimpable sealing periphery, said periphery having an outer reinforced area extending about said end closure in a predetermined area, said




seam having a vertically extending outer wall, said outer wall containing a plurality of spaced apart vertically extending reinforcing grooves extending around the entire outer wall and across the height thereof.

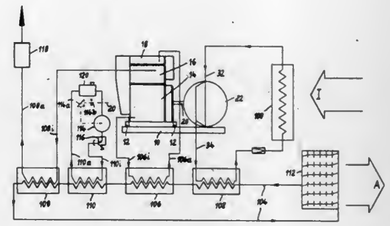


**4,293,092**

## HEATING SYSTEM WITH HEAT PUMP AND AUXILIARY HEATER

**Ernst Hatz; Heinz Eibl, both of Ruhstorf; Erwin Peter, Wendlingen, and Rolf Blumhardt, Wernau, all of Fed. Rep. of Germany, assignors to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany**

**Filed Jul. 5, 1979, Ser. No. 54,913**
**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 2837248**
**Int. Cl.³ B60H** *1/02;* **F24C** *9/00*
**U.S. Cl. 237—12.1** **6 Claims**



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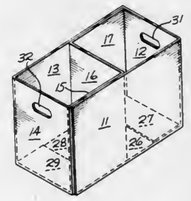
**4,293,091**

## REINFORCED CONTAINER WITH INTEGRAL DIVIDER

**Thomas J. Gerard, Winter Haven, Fla., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jan. 2, 1980, Ser. No. 108,976**
**Int. Cl.³ B65D** *5/48, 5/50*
**U.S. Cl. 229—27** **3 Claims**




1. A container having an integral divider panel and reinforcing panels comprising

first, second, third and fourth upstanding side walls, said first and third side walls being of equal width and said second and fourth side walls being of equal width,

a divider panel extending between said first and third side walls,

a first reinforcing panel extending along said first side wall from the junction of said first and fourth side walls to said divider panel, said reinforcing panel being the same height as said first side wall and being completely adhered to said first side wall, said reinforcing panel being attached to said divider panel;

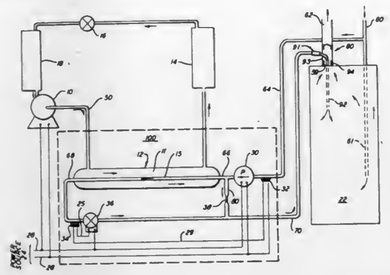
a second reinforcing panel extending along said third side wall from said divider panel to the juncture of the third side wall with the second side wall, said second reinforcing panel being the same height as said third side wall and being completely adhered to said third side wall, said second reinforcing panel being attached to said divider panel.

1. In a heating system comprising a main heating network including a heat carrier and an internal combustion engine and a heat pump having a condenser, said condenser of said heat pump being driven by the internal combustion engine for supplying heat to said heat carrier of said main heating network, said internal combustion engine also driving an additional aggregate which transforms the mechanical drive power fed to it by the engine into heating power and transmits such heating power as additional heat to the heat carrier of said main heating network, the improvement comprising a circulating system which is self-contained and is separate from said main heating network, which circulating system incorporates said additional aggregate, said circulating system further incorporating a heat exchanger for transmitting the heat provided by the additional aggregate by way of a fluid which circulates in said circulating system to said heat carrier in said main heating network, means for scavenging heat energy from the coolant and exhaust gas of said internal combustion engine and supplying said heat to said main heating network, said additional aggregate being a fluid brake, said brake being mechanically driven by said internal combustion engine for operation at a speed proportional thereto, said separate self-contained circulating system including a regulating member associated with said fluid brake, said regulating member being a valve responsive to the surrounding temperature and hence to the heat required to be supplied by the main heating network, there being a relatively low surrounding temperature below which heat pump gas pressure and gas specific weight and therefore heat pump efficiency fall below a preselected limit and accordingly reduce loading of the engine to below a preselected limit, said regulating member being arranged for actuating said fluid brake at said relatively low temperature for thereby increasing the heat fed to said main heating network, by adding heat to said main heating network from said fluid brake and its separate circulating system, and also by increasing the amount of heat added to said main heating network from the exhaust gas and coolant of said engine due to increased engine loading.

## 4,293,093
## CO-AXIAL FITTING FOR USE WITH A REFRIGERATION CIRCUIT HEAT RECLAIM APPARATUS

**Glendon A. Raymond, Fulton; Fred V. Honnold, Fayetteville, and Herbert J. Spath, Clay, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Oct. 25, 1979, Ser. No. 88,319**
**Int. Cl.³ F24H *1/22*; F25B *27/02***
**U.S. Cl. 237—19** **7 Claims**

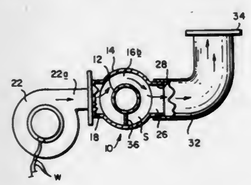


1. Apparatus for preheating hot water for a hot water system using heat energy from a refrigeration circuit including a refrigerant to water heat exchanger, the hot water system including a tank adapted to contain a reservoir of stratified water such that warmer water is at the top of the tank and colder water is at the bottom of the tank, a tank outlet located in the top of the tank through which heated water is withdrawn and inlet means located in the top of the tank adapted to provide water to the tank which comprises:
- a fitting adapted to be connected to the tank outlet in the top of the tank, the fitting including;
- a conduit portion through which heated water from the tank may flow;
- a return line connected to the water outlet for supplying heated water from the heat exchanger to the tank, and
- a return line extension connected to the return line and extending through the top of the tank into the reservoir of water in the tank such that water from the heat exchanger is discharged into the reservoir a sufficient distance from the conduit portion to allow for mixing of the water from the heat exchanger with the water in the reservoir prior to the water from the heat exchanger being withdrawn from the tank outlet.

## 4,293,094
## SUPPLEMENTAL HEATING SYSTEM

**Hugh D. McGillis, 78 Manomet St., Brockton, Mass. 02401, assignor to Hugh D. McGillis, Brockton, Mass.**

**Filed Aug. 20, 1979, Ser. No. 67,815**
**Int. Cl.³ F24B *7/00***
**U.S. Cl. 237—55** **6 Claims**

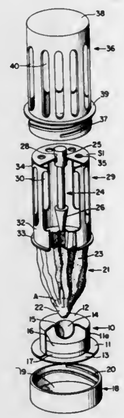


1. A supplemental heating system for installation in a furnace flue which includes a flue pipe and a chimney, connecting the furnace to the atmosphere, said system comprising an inner pipe section, arranged to be connected in the flue, a sleeve having a diameter appreciably larger than that of the pipe section and positioned concentric therewith, closure means connected between the ends of the sleeve and the wall of the pipe section for defining with the section and the sleeve an annular space; means defining a first opening in the sleeve; a blower mounted to the sleeve, said blower having its outlet communicating with said first opening such that air can be forced into said first opening in a direction substantially normal to the wall of the sleeve; one or more additional openings in the sleeve being circumferentially positioned from said first opening; a baffle connected between the outer wall of the pipe section and the inner wall of the sleeve and being circumferentially positioned approximately midway between said first opening and said one or more additional openings in said sleeve, said baffle extending longitudinally along said pipe section and substantially abutting said closure means whereby when the system is connected in said flue pipe between the furnace and the flue and the furnace is turned on, the hot products of combustion therefrom pass through the inner pipe section thereby heating it so that when the blower is turned on, the air discharged thereby into said annular space is forced in one direction around the outer surface of the inner pipe section thereby to heat the air as it is discharged through said additional openings.

## 4,293,095
## AIR TREATING DEVICE

**Peter W. Hamilton, Cincinnati, and William P. Lewis, Westchester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Nov. 9, 1979, Ser. No. 93,090**
**Int. Cl.³ A61L *9/04***
**U.S. Cl. 239—35** **8 Claims**



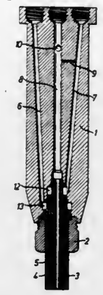
1. An air treating device having an indicator system to signal exhaustion of the operative fluid therein, said device comprising a reservoir containing the operative fluid and a signal fluid having a hue different from that of the operative fluid, and a substrate that is capable of capillary transport of each of said fluids from said reservoir to an evaporative surface portion of said substrate and that is in contact with both fluids simultaneously in use, at least a part of said substrate being visible when the device is in its operative mode, said fluids being immiscible and having relative surface tension properties and interfacial tension properties which require that the substrate in use first selectively transport substantially all of the operative fluid toward said evaporative surface portion prior to commencing transport of said signal fluid.



## 4,293,096
## ARRANGEMENT IN A BURNER

**Stellan Braun, Dalby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden**

**Filed Feb. 29, 1980, Ser. No. 125,924**
**Claims priority, application Sweden, Mar. 1, 1979, 7901836**
**Int. Cl.³ F23D *11/16***
**U.S. Cl. 239—419.3** **3 Claims**



1. In a cutting burner comprising a burner body for connection with a valve body to which supply lines for respective gases are connected, a nozzle, and a cutting oxygen gas channel, a heating oxygen gas channel and a burner gas channel being provided in the burner and connected with the nozzle, the improvement comprising a connection channel between the heating oxygen gas channel and the cutting oxygen gas channel, at least a part of the connection channel being of cross section much smaller than the cross section of the heating oxygen channel, and a check valve member located in said cutting oxygen gas channel before the connection channel, said connection channel and check valve member enabling a certain portion of the heating oxygen gas flow to permanently pass from the heating oxygen gas channel through the connection channel and the front part of the cutting oxygen channel toward the nozzle orifice, said certain portion of the heating oxygen gas flow preventing hot gases from passing up into the cutting oxygen gas channel from the heating procedure during use of the burner.

## 4,293,097
## METHOD FOR BRIGHTENING NATURAL CALCITIC ORES

**Herbert I. Lewis, Wrens; Anthony D. McConnell, Sandersville, both of Ga., and William M. Price, St. Austell, England, assignors to Anglo-American Clays Corporation, Sandersville, Ga.**

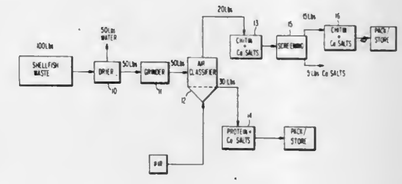
**Continuation-in-part of Ser. No. 868,392, Jan. 10, 1978, Pat. No. 4,165,840, and Ser. No. 892,931, Aug. 3, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,362**
**The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.**
**Int. Cl.³ B02C *23/18, 23/36, 23/38***
**U.S. Cl. 241—16** **17 Claims**

1. A method for processing a natural calcitic ore to yield a finely divided calcium carbonate particulate of relatively very high brightness characteristics, comprising in sequence the steps of:
- coarse-milling said natural calcitic ores to produce a coarse-milled product;
- subjecting said coarse-milled product as an aqueous slurry including less than 40% solids to a froth flotation, and separating with the froth discoloring contaminants;
- dewatering the underflow product from said froth flotation to at least 60% solids by weight; and
- wet-milling the dewatered product to yield an output product wherein at least 80% by weight of the resultant particulate has an E.S.D. of less than 2 microns;
- said flotation step being conducted utilizing as a collector agent a 1-substituted-2-alkyl imidazoline or salt derivative thereof; and said collector agent being employed in conjunction with a promoter comprising a substantially non-polar aliphatic compound having from 10 to 20 carbon atoms in its longest straight chain.

## 4,293,098
## RECOVERY OF ACTIVE CHITIN AND ENHANCED PROTEIN MEAL

**H. S. Muralidhara, Falls Church, Va., assignor to Systems Consultants, Inc., Washington, D.C.**

**Filed Apr. 20, 1979, Ser. No. 31,846**
**Int. Cl.³ B02C *19/00***
**U.S. Cl. 241—19** **4 Claims**

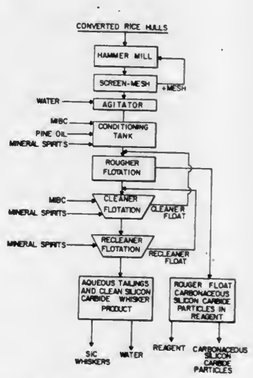



1. In a process for recovering active chitin from shellfish waste consisting essentially of the steps:
- (a) drying said shellfish waste,
- (b) mechanically reducing the particle size of said dried shellfish waste to within the range of 10 to 400 microns,
- (c) subjecting the dried, reduced shellfish waste to the action of a gaseous stream to classify and separate a lighter fraction comprising active chitin and residual salts and a heavier fraction comprising protein and salts.

## 4,293,099
## RECOVERY OF SILICON CARBIDE WHISKERS FROM COKED, CONVERTED RICE HULLS BY FROTH FLOTATION

**Bhupendra K. Parekh, and William M. Goldberger, both of Columbus, Ohio, assignors to Silag, Inc., Greer, S.C.**

**Filed Jul. 2, 1979, Ser. No. 53,737**
**Int. Cl.³ B02C *23/18***
**U.S. Cl. 241—24** **7 Claims**




1. A method for separating silicon carbide whiskers produced from a high temperature conversion of rice hulls and

containing a mixture of silicon carbide whiskers with carbonaceous silicon carbide particles, consisting:

(i) shredding the mixture in a controlled manner down to a specified particle size of approximately −10 mesh in order to liberate the silicon carbide whiskers from the carbonaceous silicon carbide particles without removing the carbonaceous material coating from said carbonaceous silicon carbide particles;

(ii) dispersing the shredded mixture in water so as to contain about 1 to 15% by weight of solids to form an aqueous mixture of hydrophilic silicon carbide whiskers and hydrophobic carbonaceous silicon carbide particles;

(iii) agitating the aqueous mixture to further liberate said hydrophilic silicon carbide whiskers from said hydrophobic carbonaceous silicon carbide particles;

(iv) adding surface active reagents to the aqueous mixture, which surface active reagents wet the carbon surface of said carbonaceous silicon carbide particles;

(v) agitating the resulting water-reagent mixture;

(vi) subjecting the water-reagent mixture to froth flotation having at least three stages;

(vii) removing tailings therefrom containing water and silicon carbide whiskers and removing float therefrom containing reagents and carbonaceous silicon carbide particles; and

(viii) performing a solid-liquid separation on the tailings, thereby obtaining silicon carbide whiskers from the aqueous mixture tailings.

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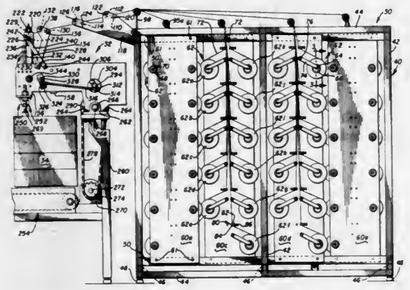
**4,293,100**

## APPARATUS FOR GANGING AND CUTTING A PLURALITY OF LAYERS OF STRIP MATERIAL

**Roger C. Sharlow, Plano, Tex., assignor to Liquid Paper Corporation, Dallas, Tex.**

**Division of Ser. No. 906,441, May 17, 1978, Pat. No. 4,218,945.**
**This application May 29, 1979, Ser. No. 42,894**
**Int. Cl.³ B65H** *19/04, 23/00, 23/10*
**U.S. Cl. 242—55** **12 Claims**



1. An apparatus for ganging and transporting a plurality of layers of strip material, comprising:

supply means for feeding the layers of material therefrom, said supply means comprising rack means for supporting a plurality of rolls each with one of the layers of material thereon, roller guide means for receiving the layers of material thereover in a stacked relationship, and second roller guide means for maintaining the alignment of the stacked layers of strip material, said second roller guide means being aligned between said rack means and said drive roller means,

said second guide means including a convex roller spaced from a concave roller with said rollers in contact with and on opposite sides of the layers of strip material as the layers move from said rack means to said guide plate means, said convex roller having a diameter intermediate of the ends greater than the diameter at the ends and said concave roller having a diameter intermediate of the ends less than the diameter at the ends,

drive roller means for receiving a plurality of layers of strip material from said supply means in a stacked relationship, said drive roller means including a drive roller engaged against an adjacent driven roller for grabbing the layers of material therebetween to simultaneously draw all the layers of material beyond said drive roller means, and

tension means associated with each layer of material for applying tension to said layers of material as the layers are fed into said drive roller means.

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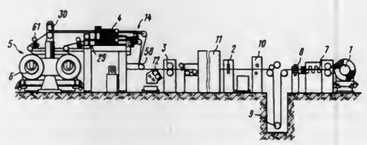
**4,293,101**

## APPARATUS FOR HELICALLY COILING BANDS AFTER SLITTING WIDE STRIP

**Vladimir I. Dunaevsky, ulitsa Oktyabrskoi revoljutsii, 27, kv. 9; Nikolai G. Boidenko, ulitsa Lenina, 39, kv. 20, both of Slavyansk Donetskoi oblasti; Alexei P. Samarin, ulitsa Bolshaya Sadovaya, 60, kv. 4, Kramatorsk; Viktor M. Levit, pereulok Silikatny, 10, Slavyansk Donetskoi oblasti; Boris M. Zapara, ulitsa Vrachebnaya, 23, kv. 59, Kramatorsk; Boris N. Ivanov, ulitsa Profinterna, 42; Sergei A. Frolov, pereulok Generala Batjuka, 3, kv. 54, both of Slavyansk Donetskoi oblasti; Rostislav A. Voronin, ulitsa Komsomolskaya, 25, Kramatorsk; Nikolai P. Belozerov, ulitsa Sotsialisticheskaya, 71, kv. 14, Kramatorsk; Valery I. Momot, ulitsa Voznesenskogo, 19, kv. 78, Kramatorsk; Jury A. Stusenko, ulitsa Yasnaya, 25, kv. 42, Slavyansk Donetskoi oblasti, and Vladimir A. Samoilov, ulitsa Vorovskogo, 233, Kramatorsk, all of U.S.S.R.**

**Filed Dec. 21, 1979, Ser. No. 105,960**
**Int. Cl.³ B65H** *35/02;* **B21C** *47/00*
**U.S. Cl. 242—56.4** **4 Claims**



1. In an apparatus for helically coiling bands after slitting a wide strip, comprising:

a strip uncoiler,

a strip-joining device,

a slitter for lengthwise slitting strips into bands,

a coiler installed on a support for rectilinear movement and including a coiling drum having an axis arranged in a horizontal plane,

a drum shaft freely carrying said coiling drum for rotation thereof on said shaft,

a friction drive for said coiling drum actuating from said drum shaft,

a hydraulic cylinder for reciprocal movement of said coiling drum in the direction of the axis of said coiling drum, and

an electrohydraulic converter for controlling by said hydraulic cylinder the reciprocal movement of said coiling drum;

a device for maintaining a constant slip in the friction drive of said coiling drum, including:

a first ring and a second ring, each having ports in a portion adjacent their periphery, the first ring being installed on said coiling drum, and the second ring being installed on said drum shaft,

a first yoke and a second yoke, each of which spacedly receives respective said portion of the first ring and of the second ring, said first yoke and said second yoke each having ports, and each being mounted on a support, and

light transmitters and light receivers, one of said light transmitters and one of said light receivers being installed, respectively, at opposite portions of said first yoke and of said second yoke, respectively, on both sides of said first



ring and said second ring for transmitting and receiving, respectively, pulses representing the rotation speed of said coiling drum and of said drum shaft, respectively;

a comparison circuit connected to each of said light receivers for comparing the number of said pulses representing the rotation speed of said coiling drum and of said drum shaft to deliver a control signal;

a circuit for receiving the control signal from said comparison circuit and for controlling drive of said drum shaft and the rotation speed of said drum shaft;

an electric control circuit for controlling said hydraulic cylinder for reciprocating movement of said coiler drum, and connected to said light receiver of said first yoke, and comprising:

a comparison device for comparing an actual movement of said coiler drum with a predetermined movement, and connected to said electrohydraulic converter for regulating hydraulic mixture supply to said hydraulic cylinder for reciprocating said coiling drum,

a pulse converter for converting said pulses from said light receivers into electric signals corresponding to said predetermined movement of said coiler drum,

a coiling pitch setting device connected to said pulse converter,

a setting device connected to said pulse converter for setting the number of convolutions in one layer of the coil being wound, and

a coiler position detector for detecting actual movement of said coiler, and providing a corresponding signal as an input to said comparison device;

a band tension regulator including a double-arm lever pivotally mounted on a support;

a deflecting roller carried on one end of said lever; and

control means connected to the other end of said double-arm lever, and having a control output, and responsive to a decline in tension of the bands passing around said deflecting roller for adjusting said control output;

said control means comprising a hydraulic control circuit for controlling said hydraulic cylinder to control said friction drive, and comprising:

a pressure regulator, and

a further hydraulic cylinder having a piston provided with a first rod and a second rod, said rods being disposed on opposite sides of said piston, the first rod being pivotally connected with the other end of said double-arm lever, and the second rod being coupled with said pressure regulator.

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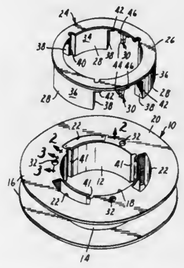
**4,293,102**

## REEL WEIGHT ASSEMBLY

**Gerald J. Niles, St. Paul, and Norman C. Ritter, Mounds View, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jun. 13, 1980, Ser. No. 159,290**
**Int. Cl.³ B65H** *75/18*
**U.S. Cl. 242—71.8** **6 Claims**



1. A weight assembly adapted for use with a polymeric reel comprising a hub portion having opposite side surfaces, a through central opening between said side surfaces, and a plurality of sockets opening through one side surface of said reel and spaced around said through opening, said weight assembly comprising:

a support plate having a central opening; a plurality of weights spaced around and projecting axially from one side of said support plate, said weights being shaped and spaced along said support plate so as to enter the sockets in a said reel hub portion when said weight assembly is brought coaxially adjacent one side surface of a said reel; and

means for releasably attaching said weight assembly to a said reel with said weights in said sockets and said support plate adjacent said one side surface.

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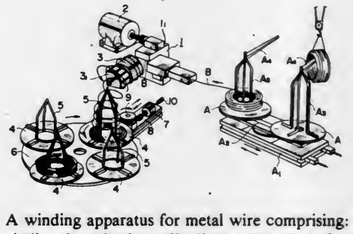
**4,293,103**

## METAL WIRE WINDING APPARATUS

**Kotaro Tsukamoto, 7-8, Kashima 4-chome, Yodogawa-ku, Osaka City, Osaka Prefecture, Japan**

**Filed Dec. 17, 1979, Ser. No. 104,463**
**Int. Cl.³ B21C** *47/00;* **B65H** *54/80*
**U.S. Cl. 242—83** **2 Claims**



1. A winding apparatus for metal wire comprising:

a winding drum horizontally disposed on a base for winding turns of wire therearound;

at least one carrier table disposed below said winding drum;

a carrier guide mounted on said at least one carrier table for guiding said wire turns from said winding drum therealong onto said table, thereby forming a coil of said turns of wire on said table;

a motor means mechanically connected to said winding drum for rotating said winding drum at a fixed rotational speed;

an additional motor means mechanically connected to said at least one carrier table for rotating said table independently of said winding drum;

wherein said rotational speed of said at least one carrier table is periodically varied in a step wise fashion in accordance with the following equation:

$$n(t_1+t_2)=n_1t_1+n_2t_2$$

where

n=the rotational speed of said winding drum;

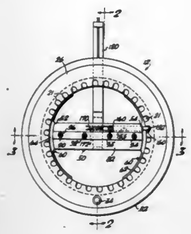
$n_1$=the maximum rotational speed of said at least one carrier table;

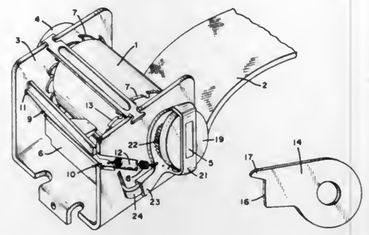
$n_2$=the minimum rotational speed of said carrier table;

$t_1$=the time during which said at least one carrier table rotates at the maximum rotational speed;

$t_2$=the time during which said at least one carrier table rotates at the minimum rotational speed.

**4,293,104**
## HAND-HELD FISHING REEL
**Armando Guim, 803 SW. 36 Ave., Miami, Fla. 33135**
**Filed Apr. 28, 1980, Ser. No. 144,602**
**Int. Cl.³ B65H** *75/40*
**U.S. Cl. 242—96** **6 Claims**





1. A hand-held fishing reel comprising:
a reel of predetermined diameter having an outer recessed circumferential surface defining a seat for a fishing line and a predetermined radius of curvature and an inner surface having an annular groove with a recessed surface of a predetermined diameter,
said reel having a first side surface and a second side surface spaced from said first side surface and said side surfaces sandwiching the outer and inner surfaces at rim zones of juncture, defining a first and a second rim zone, respectively,
the reel having a plurality of equispaced, generally coplanar, radially extending sockets extending depthwise into the inner surface,
an assembly extending diametrically across the inner surface, said assembly having a first end and a second end, said assembly comprising,
a first member having a first end, a second member having a first end, said first ends being of common size and dimension and each having an outer surface of a radius of curvature substantial equal to but slightly less than the radius of curvature of the recessed surface,
each of said members extending toward but not to one another, and
hand-grip means securing said members together with said first ends rotatably received in said annular groove for spinning movement of the reel relative to said assembly,
a line guide means carried by said assembly and extending radially outwardly of said circumferential seat to guide a line, and
detent means carried by said assembly and including a generally diametrically movable pin including means normally biasing said pin into an extended position and into one of said equispaced sockets and retractable to permit, selectively, free spinning of said reel relative to said assembly for normally maintaining said reel and assembly in a fixed position relative to one another.

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**4,293,105**
## BI-LEVEL WEB SENSITIVE RETRACTOR
**Per O. Weman, Heverlee, Belgium, assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.**
**Continuation of Ser. No. 753,764, Dec. 23, 1976, abandoned. This application May 19, 1978, Ser. No. 907,427**
**Int. Cl.³ B65H** *75/48;* **A62B** *35/00*
**U.S. Cl. 242—107.4 B** **7 Claims**

1. In a safety belt retractor having a rotatable reel to which a seat belt is attached, said reel being journaled in a support adapted for attachment to the frame of a vehicle, said reel having as a flange at least one ratchet wheel, said reel being biased in the wind direction, and a pawl adapted to engage the ratchet wheel in the unwind direction in response to the action of an inertial device sensitive to an accelerating rate of rotation of the reel, to halt rotation of the reel, the improvement which ocmprises: a webbing follower sharing the biasing means with the inertial device, whereby, when the reel of webbing is substantially full, the shared biasing means is under considerable tension, rendering the inertial device relatively insensitive to an accelerating rate of rotation of the reel in the unwind direction, and when the roll of webbing on the reel has been substantially diminished by the withdrawal of webbing from the retractor, the bias in slight, rendering the inertial device more sensitive to an accelerating rate of rotation of the reel in the unwind direction.

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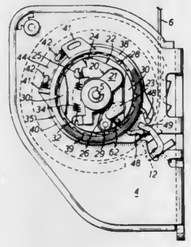
**4,293,106**
## EMERGENCY LOCKING SEAT BELT RETRACTOR
**David L. Standing, Carlisle, England, assignor to Kangol Magnet Limited, Carlisle, England**
**Filed Sep. 11, 1979, Ser. No. 74,335**
**Claims priority, application United Kingdom, Sep. 11, 1978, 36311/78**
**Int. Cl.³ A62B** *35/02;* **B65H** *75/48*
**U.S. Cl. 242—107.4 A** **4 Claims**



1. A vehicle seat belt retractor, said retractor comprising:
seat belt means;
reel means rotatable in a first direction to wind said seat belt means thereon and in a second direction to unwind said seat belt means therefrom;
spring means urging said reel means to rotate in said first direction;
ratchet means carried by said reel means for rotation therewith;
pawl means movable from a normal inoperative position spaced from said ratchet means to an operative position engaging said ratchet means to prevent rotation of said reel means in said second direction;
a first rotatable member;
means linking said first rotatable member to said pawl means so that rotation of said first rotatable member in a locking direction effects movement of said pawl means to said operative position thereof;
a second member rotatable coaxially of said first rotatable member;



acceleration sensitive means responsive to at least one of a predetermined acceleration of the belt means in the unwinding direction and a predetermined acceleration of the retractor to rotate said second rotatable member in the locking direction;
drive means operable between said first and said second rotatable members so that said rotation of said second rotatable member in the locking direction drives said first rotatable member to rotate in the locking direction,
said drive means incorporating spring means acting between said first and said second rotatable members in opposition to said drive to thereby accommodate relative movement of said first and said second rotatable members needed to effect full engagement of said pawl means with said ratchet means.

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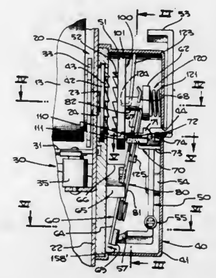
**4,293,107**
## TENSION RELIEVING SELECTIVE ENGAGEMENT MECHANISM WITH MEMORY
**Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, San Fernando, Calif.**
**Filed Aug. 23, 1979, Ser. No. 68,944**
**Int. Cl.³ A62B** *35/02;* **B65H** *75/48*
**U.S. Cl. 242—107.7** **23 Claims**



12. An improved tension-relieving mechanism for use with a vehicle seat belt system having a rotatably journalled spool for windably retracting a seat belt and emergency locking means for preventing protraction of said seat belt in an emergency condition, said mechanism comprising:
tension-relieving means operable in response to a single spool protractive movement for preventing retractive rotation of said spool;
means for mounting said entire tension-relieving means for movement between spool connected and spool unconnected positions, said tension-relieving means being operable only when in said spool connected position; and
manually operated means for selectively moving said tension-relieving means between said positions.

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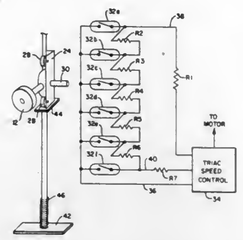
**4,293,108**
## TAKE-UP DEVICE SPEED CONTROLLER USING MAGNETIC SENSING MEANS
**Harry M. Randel, 574 W. Court, Scotch Plains, N.J. 07076**
**Filed Mar. 7, 1980, Ser. No. 128,141**
**Int. Cl.³ B65H** *59/38*
**U.S. Cl. 242—189** **14 Claims**

1. A control system for controlling the speed of a take-up device upon which an elongated strip is being wound from a supply means, comprising:
a slack indicating means provided between the supply means and the take-up device so that the strip passes over the slack indicating means, wherein the position of the slack indicating means along a predetermined path is determined by the amount of slack in the strip as it passes from the supply means to the take-up device;
means for sensing the position of the slack indicating means including a magnet coupled to the slack indicating means for movement with it, and a plurality of magnetically actuatable means arranged along the predetermined path, wherein the operative condition of the magnetically actuatable means is controlled by the position of the magnet relative to the magnetically actuatable means; and




speed control means coupled to the magnetically actuatable means for controlling the take-up device in accordance with the operative state of the magnetically actuatable means.

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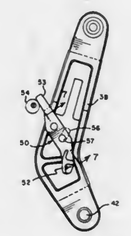
**4,293,109**
## PIVOTABLE CABLE GUARD FOR RETAINING A SWINGABLE-MOVABLE CABLE
**Frank Bramwell, Hamden, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**
**Filed Sep. 19, 1979, Ser. No. 76,896**
**Int. Cl.³ B64C** *27/04, 27/50*
**U.S. Cl. 244—17.11** **6 Claims**



1. Cable retaining apparatus for use in a system utilizing a tensioned cable passed around at least a pair of pulleys one of which is arcuately swingable relative to the other between open and closed positions comprising:
an elongate radius arm mounted at one end on a pivotal axis and carrying at its other end an arcuately swingable pulley,
an elongate cable guard member having a cable-retaining flange at one of its ends and an abutment flange at the other,
said member extending lengthwise of said radius arm and being pivotally mounted medially of its ends on said arm with its retaining flange end closest to said pivotal axis of the arm; said arm and its guard member being so disposed that said retaining flange is carried into close proximity with the cable on the other of said pair of pulleys when said swingable pulley is in its closed position,
a stop means for engaging said abutment flange in said closed position and pivotally fixing said retaining flange proximity, and

means for limiting the range of the pivotal movement of said retaining flange relative to said arm,

said guard member disposition further being such that its retaining flange engages said cable as it moves from said closed to said open position and said pivotal range being such that the retaining flange can pivot responsively to said engagement an amount sufficient to relieve the engagement pressure and prevent undue cable bending.

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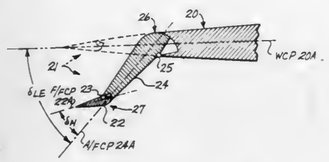
**4,293,110**

## LEADING EDGE VORTEX FLAP FOR WINGS

**Wilbur D. Middleton, and John A. Paulson, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Mar. 8, 1979, Ser. No. 18,497**
**Int. Cl.³ B64C *23/06***
**U.S. Cl. 244—199** **65 Claims**




1. Apparatus for streamwise airflow control over the upper surface of an airfoil, comprising: said airfoil having a drooped leading edge segment; and means mounted forward on said drooped leading edge segment for generating a vortex airflow circulation on the forward facing surface of said drooped leading edge segment; said drooped leading edge segment being positioned at a forward and downward angle-of-deflection relative to said airfoil for confining said vortex airflow circulation to the forward facing surface area of said drooped leading edge segment, so as to control both the separation of the streamwise airflow and its re-attachment to the upper surface of the airfoil, downstream of said drooped leading edge segment.

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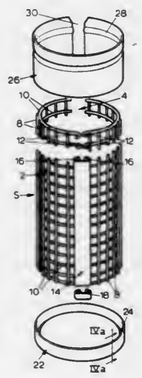
**4,293,111**

## BAG FILTER SUPPORT CAGE

**Paul Henri, Sarnia, Canada, assignor to Kennecott Corporation, Stamford, Conn.**

**Continuation of Ser. No. 388,180, Aug. 14, 1973, abandoned.**
**This application Mar. 31, 1975, Ser. No. 563,537**
**Int. Cl.³ B01D *46/02***
**U.S. Cl. 248—95** **2 Claims**




1. A support cage for insertion into a filter bag for supporting said bag in an open condition, said support cage being comprised of an elongated double ended tube formed of a bent sheet of open wire mesh and having opposite marginal portions disposed adjacent to each other and extending longitudinally of said tube, a fillet having channel means formed therein, said opposite marginal portions of said tube being disposed within said channel means, said fillet being clinched upon said opposite marginal portions and forming a smooth seam for minimizing snagging of said filter bag during contact of said support cage with said filter bag, said wire mesh including a plurality of wires extending longitudinally of said support cage and a plurality of wires extending peripherally of said support cage, wherein said wires extending peripherally of said support cage include hook-shaped end portions with said end portions being clinched by said fillet, and wherein said wires extending longitudinally of said support cage are disposed outwardly of and overlie the wires extending peripherally of said support cage such that said fillet, when engaged with said hook-shaped end portions, lies substantially flush with said wires extending longitudinally to form said smooth seam.

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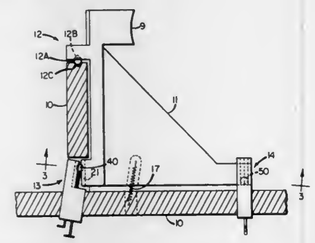
**4,293,112**

## COMPACT MIRROR MOUNT

**James A. Horton, Kennewick, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.**

**Filed Oct. 29, 1979, Ser. No. 89,160**
**Int. Cl.³ G02B *7/18***
**U.S. Cl. 248—487** **7 Claims**




1. Apparatus for mounting and aligning an optical member on a support structure comprising:

means for pivotally mounting such optical member onto such support structure in such a manner than the member can pivot about axes in two substantially orthogonal directions;

first alignment means for pivoting said member about a first of said axes comprising (a) first and second surfaces on said member and said support structure, respectively, said surfaces being inclined to each other and being oriented for guiding said plunger means generally along a line through said pivotal mounting, and (b) first plunger means for moving between said surfaces thereby to rotate said member; and

second alignment means for pivoting said member about the second of said axes.

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**4,293,113**

## UNIVERSAL FISHING ROD SUPPORT

**David L. Gray, 720 Courtland, Richmond, Calif. 94805**

**Filed Nov. 5, 1979, Ser. No. 91,302**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—518** **12 Claims**

1. A fishing rod support comprising:

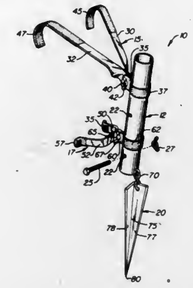
means for receiving the handle of a fishing rod and restricting motion of said handle transverse to the axis of said rod;

upper bracket means attached at a first end thereof to a normally upper portion of said receiving means, said upper bracket means being capable of withstanding tension;

lower bracket means attached at a first end thereof to a normally lower portion of said receiving means, said lower bracket means being capable of withstanding compression, said lower bracket means being configured to straddle a vertical portion of a railing;

hooking means carried by said upper bracket means at a second end thereof, said hooking means being configured to pass over the outer portion of a vehicle door and downwardly into the space between the vehicle door and the vehicle window, said hooking means being further configured to fit over a horizontal portion of said railing to provide spaced support points; and






footing means carried by said lower bracket means at a second end thereof for confronting the outer surface of said vehicle door;

said fishing rod support being thus adapted to support said fishing rod from said vehicle door with said hooking means and said footing means together providing at least three points of contact with said vehicle door to provide a spaced stable attachment thereto, downward forces on said rod putting said upper bracket means in tension and said lower bracket means generally in compression to enhance the stability of said support;

said fishing rod support being thus further adapted to support said fishing rod from said railing.

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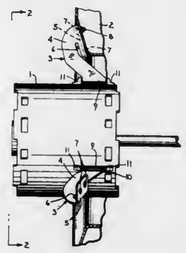
**4,293,114**

## FLEXIBLE MOTOR MOUNTING

**Robert E. Lykes, Troy, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.**

**Filed Oct. 10, 1978, Ser. No. 950,152**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—604** **7 Claims**




1. A flexible vibration dampening assembly for securing an electric motor having a main frame to a housing having bolt hole means therein to receive bolts and the dampening assembly being adapted to lie against the motor frame during shipping of the motor, which comprises at least one mounting arm of generally thin heat treated steel extending from the main frame of the motor, an elongated hook disposed at the inner end of the arm with the axis of said hook being generally parallel to the axis of the motor, a mounting pad having bolt holes therein secured to the outer end of the arm and extending circumferentially of the axis of the motor, and a cold formed non-rotatable hinge pin fixed to the main frame of the motor prior to assembly of the mounting arm with the hinge pin and in slightly spaced relation therefrom, and the hook at the inner end of the arm being of substantially the same length as the hinge pin and latched over the hinge pin to secure the inner end of the arm to the latter but permitting rotation of the hinge pin to line up at least one bolt hole in the pad with the bolt hole means in the housing to receive a bolt to secure the mounting arm and housing together and at the same time permit the attachment of the generally thin heat treated steel mounting arm to the frame of the electric motor so as to completely eliminate the possibility of embrittlement of the mounting arm due to heat generated by a welding operation.

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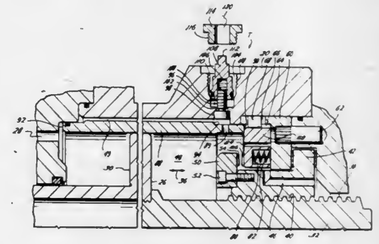
**4,293,115**

## TESTING MECHANISM FOR BLOWOUT PREVENTER RAM LOCK

**Glenn C. Parks, Jr., and Clark W. Beam, both of Houston, Tex., assignors to Hydril Company, Houston, Tex.**

**Filed Sep. 24, 1979, Ser. No. 78,092**
**Int. Cl.³ E21B *33/06*; F15B *15/26***
**U.S. Cl. 251—1 A** **8 Claims**



1. In a blowout preventer having at least one blowout preventer ram movable therein to adjustable closed positions for sealing contact with a well pipe or the like in a bore of the blowout preventer, and having a ram lock comprising:

(a) ram carrier means comprising a ram piston having a piston rod with a threaded surface formed thereon for moving the ram to the adjustable closed positions in the blowout preventer;

(b) cylinder means for receiving opening and closing fluid pressures to operate against said piston to move the ram to and from open and closed positions, respectively;

(c) lock means for locking said ram carrier means at the closed positions, comprising:

(1) a lock nut having a threaded surface formed thereon and engaged by said threaded surface on said ram piston tail shaft for rotational movement with respect thereto during movement of the ram;

(2) a ram carrier clutch plate mounted with said lock nut for rotational movement therewith, said clutch plate having ratchet teeth formed thereon;

(3) a body clutch plate having ratchet teeth formed thereon; and

(4) means for mounting said body clutch plate with the blowout preventer against relative rotational movement with respect thereto; and

(d) means for urging said ratchet teeth of said body clutch plate and said lock nut clutch plate into engagement to lock said ram carrier means; and

(e) means for unlocking comprising cylinder sleeve means

mounted in said cylinder enclosing said piston of said ram carrier means;

(f) said cylinder sleeve means including surface means responding to the opening fluid pressure to engage said body clutch plate to disable said means for urging and unlock said ram lock;

(g) the improvement comprising locking plug means for locking said cylinder sleeve means to permit testing of said lock means without allowing said lock means to become unlocked.

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**4,293,116**

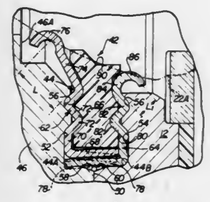
## METALLIC SEAT ASSEMBLY FOR VALVES

**John M. Hinrichs, Bryan, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.**

**Continuation of Ser. No. 214, Jan. 2, 1979, abandoned. This application Sep. 19, 1979, Ser. No. 77,076**

**Int. Cl.³ F16K** *25/00*

**U.S. Cl. 251—173** **20 Claims**



1. A seat assembly adapted to fit within an inner annular groove in a valve body having a closure member with a peripheral sealing surface movable between open and closed positions, said seat assembly comprising an annular metal housing having spaced inner end portions extending radially inwardly beyond the groove and a base portion at the bottom of the groove, each end portion flaring laterally outwardly of the groove and terminating at an end spaced laterally of the groove; and

a resilient soft seal mounted within the metal housing between the spaced inner end portions at a location to seal with said peripheral sealing surface in the closed position of the closure member, each end portion having a free unrestrained length and being flexible in both a radial direction and a lateral direction, each end portion adapted to contact in metal-to-metal sealing relation the adjacent peripheral sealing surface of the closure member when the closure member moves to a closed position and to be flexed radially and laterally outwardly by the closure member to maintain a tight sealing relation therewith.

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**4,293,117**

## PLUG VALVE ACTUATOR

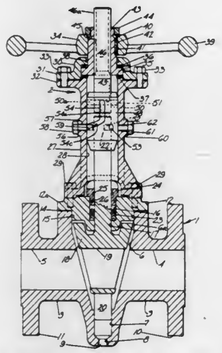
**John H. Mueller, Houston, Tex., assignor to Intercontinental Valve Manufacturing Company, Cincinnati, Ohio**

**Filed Apr. 13, 1979, Ser. No. 29,678**

**Int. Cl.³ F16K** *31/50, 31/52*

**U.S. Cl. 251—229** **8 Claims**

1. In a plug-type valve having a body with a plug chamber and diametrically opposed inlet and outlet ports communicating with said chamber, a plug in said chamber having a transverse passage therethrough and an upstanding stem, said plug being shiftable between a first, upper, valve-open position with its transverse passage in alignment with said inlet and outlet ports and a second, lower, valve-closed position wherein the axis of said transverse plug passage is oriented at 90° to the axes of said inlet and outlet ports, seal means on said plug, said seal means being in engagement with the interior surface of said chamber about said inlet and outlet ports when said plug is in said second, valve closed position, a bonnet closing the upper end of said chamber, a packing gland mounted in said bonnet through which said plug stem extends, the improvement comprising a yoke having a vertical axial bore therethrough, said yoke having a lower end affixed to said bonnet with the stem of said plug extending into said axial bore of said yoke, said yoke having an upper end, a bearing cap mounted on said upper end of said yoke, a drive nut having a vertical, threaded, axial bore, said drive nut being rotatively mounted in said bearing cap, a valve stem, the upper portion of said valve stem being threaded and being engaged in said threaded axial bore of said drive nut, said valve stem and said plug stem being coaxial, a single cylindrical coupling located within said axial bore of said yoke and being both rotatable and shiftable vertically therein, the lower end of said valve stem and the upper end of said plug stem both being non-rotatively affixed to said coupling, one of said yoke and said coupling having a single pair of diametrically opposed identical cam slots formed



therein, a cam follower for each of said cam slots being supported by the other of said yoke and said coupling, said cam slots being so configured that when said cam slots are located in said yoke they are in an inverted position from that which they occupy when located in said coupling, such that upon turning said drive nut in one direction, said plug in said valve-open position will be simultaneously partially lowered and turned 90° and thereafter lowered without rotation to said valve-closed position with said plug seals in engagement with said chamber interior surface about said inlet and outlet ports, and upon turning said drive nut in the opposite direction, said plug will first be lifted vertically without rotation out of sealing relationship with said chamber inlet and outlet ports and thereafter will be simultaneously lifted and rotated 90° to said valve-open position, whereby to provide a structure which is simple in construction, compact and self-locking.

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**4,293,118**

## MULTI-FUNCTION OPERATOR FOR CONTROL VALVE DEVICE

**Paul E. Olson, and Michael D. Lyons, both of Lexington, Ky., assignors to American Standard Inc., Lexington, Ky.**

**Filed Nov. 26, 1979, Ser. No. 97,265**

**Int. Cl.³ F16K** *31/524;* **F15B** *13/04;* **F16H** *53/00*

**U.S. Cl. 251—297** **5 Claims**

1. A control valve device comprising:

(a) a valve assembly operable to deliver fluid pressure in accordance with the degree of deflection of said valve assembly from a normal position;

(b) an operating handle assembly;

(c) a cam member connected to said operating handle assembly for rotation in response to actuation thereof, the outer periphery of said cam member being engageable with said valve assembly and having a contour to effect said deflection of said valve assembly in response to rotation of said cam member; wherein the improvement comprises:

(d) said cam member having adjusting means for altering the contour of said outer periphery thereof to accordingly

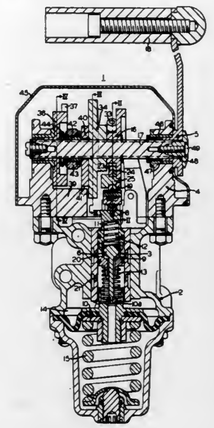


vary said deflection of said valve assembly and consequently the output fluid pressure of said valve assembly, said adjusting means comprising:

(i) a carrier member connected to said handle assembly for rotation therewith;

(ii) a pin projecting from one face of said carrier member;

(iii) at least one cam segment pivotally connected to said pin and providing said outer periphery of said cam member; and



(iv) an adjusting screw threadedly carried by said carrier member and having a ball formed at one end for connection with said at least one cam segment at a socket thereof spaced apart from said pin, whereby said adjusting screw is adapted to effect rotation of said cam segment about said pin to vary the contour of the periphery of said cam member for a given position of said handle assembly.

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**4,293,119**

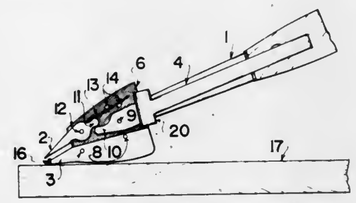
## TOOL FOR REMOVING STAPLES

**John M. Diederichs, 3011 Ala Ilima, Apt. #203, Honolulu, Hi. 96818**

**Filed Jul. 31, 1980, Ser. No. 173,978**

**Int. Cl.³ B25C** *11/00*

**U.S. Cl. 254—28** **1 Claim**



1. A tool for removing staples from wood and the like by clamping the staple to the tool as the staple is pried loose from the wood comprising:

a. a first substantially rectilinear lever;

b. a first tapered needle nose jaw;

c. a first pivot operably connecting said first jaw to said first lever;

d. a second tapered needle nose jaw;

e. a second pivot operably connecting said second jaw to said first jaw in such a position that the end of said first lever adjacent to said first pivot can engage the end of said second jaw distant from the tapered needle nose whereby relative movement of the first lever and the first jaw will open or close the space between said first and second jaws;

f. a spring bias operably attached to the first and second jaws so as to normally open the space between the first and second jaws; whereby when the first jaw is forced between the bridge of a staple and the material to which the staple is anchored, and the second end of the first lever is forced in such a direction as to pry the staple out of said anchoring material, the relative movement between the first lever and first jaw will close the space between the first and second jaws thus clamping the jaws against the staple bridge as the staple is pried loose;

g. a second rectiliniear lever; and

h. a third pivot operably connecting the second lever to the first lever at a point on the first lever near the end of the first jaw which is distant from the tapered needle nose and near the end of said second lever to which the second lever is pivotably connected whereby said first and second levers lie alongside one another and as they are squeezed together, the second lever abuts the first jaw to close the space between said jaws in a clamping action.

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**4,293,120**

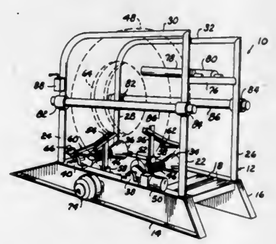
## TIRE HOLDER AND BEAD EXPANDER

**Robert R. Robins, 721 N. Woodland, Minneapolis, Kans. 67467**

**Filed Mar. 3, 1980, Ser. No. 126,923**

**Int. Cl.³ G01M** *17/02;* **B60C** *25/14*

**U.S. Cl. 254—50.2** **1 Claim**



1. A tire holder and bead expander, comprising:

an upright generally rectangular frame, said frame including a standard at the respective corner of the frame interconnected at their upper limits by horizontal cross bars at respective lateral sides of the frame,

a pair of horizontal elongated parallel spaced-apart base members respectively underlying the interconnected standards and having inclined upper edge surfaces at their respective ends projecting beyond the vertical axis of the respective standard,

an upwardly inclined ramp at one end of the frame supported by the base member inclined surfaces and terminating upwardly in the horizontal plane of the upper limit of the base members,

a pair of sleeves respectively connected in horizontal alignment to the interconnected standards intermediate their ends, and a pair of tubes respectively supported by said pairs of sleeves;

tire support roller means substantially coextensive with the spacing between said base members and transversely journalled by said base members intermediate their ends,

said tire support roller means including, a pair of support rollers disposed in spaced relation,

each support roller of said pair of support rollers having an axle journalled at its respective end portions by bearings overlying said base members,

a pair of truncated conical members surrounding the axle adjacent the respective bearing with the truncated ends disposed in spaced confronting relation, and,

a cylindrical tread member loosely surrounding said axle and secured to the respective truncated conical member;
motor means drivably connected with at least one said support roller means;
tire bead engaging means pivotally supported by said base members for vertical pivoting movement toward and away from the central portion of said frame,
said tire bead engaging means including a pair of upstanding links pivotally supported intermediate their ends by said base members medially the spacing between said pair of support rollers,
a pair of arms respectively pivotally connected at one end portion with the upper end portion of the respective link of said pair of links,
the other end portion of each arm of said pair of arms being bifurcated and disposed in lateral diverging relation, and,
a tire bead engaging roller journalled by the end portion of the respective diverging arm opposite the respective said link;
fluid pressure operated means for moving said tire bead engaging
means in opposing directions,
said fluid pressure means comprising, a pair of brake chambers respectively supported by said base members,
each brake chamber of said pair of chambers having a piston pivotally connected with the depending end portion of the respective link of said pair of links;
a cross brace extending horizontally between said standards at the end of said frame opposite said ramp; and,
tire guiding means including a pair of elongated guide rollers journalled at one end portion by said cross brace and projecting in diverging relation into said frame on opposing sides of a tire when support by said support rollers.

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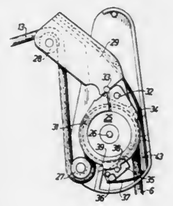
**4,293,121**
**WINCH ARRANGEMENT**
**Carl O. H. Wallin, Bergliden 20, S-131 42 Nacka, Sweden**
**Filed Sep. 11, 1979, Ser. No. 74,417**
**Claims priority, application Sweden, Aug. 10, 1979, 7906716**
**Int. Cl.³ B66D *3/02***
**U.S. Cl. 254—370** **10 Claims**



1. A winch arrangement comprising:
a feed device for feeding a hauling line through the winch arrangement, the hauling line having an ingoing part coupled to a load and feeding into the feed device, and an outgoing part leaving the feed device;
drive means for reciprocatingly driving said feed device;
said drive means including a pivotable lever for engaging the outgoing part of the hauling line and arranged to be pivoted from a first position to a second position by means of tension applied to the outgoing part of the hauling line for driving the feed device in the feed direction; and means coupled to said pivotable lever for automatically returning said pivotable lever from its second position back to its first position after each working stroke of said pivotable lever; and
said feed device including a non-return latch for selectively preventing return movement of the hauling line through the feed device, and means for automatically releasing said non-return latch immediately upon commencement of each working stroke and for reengaging said non-return latch at the latest when said working stroke is completed.

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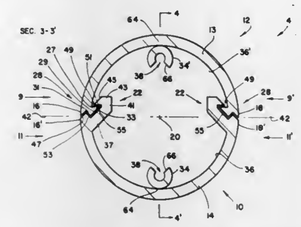
**4,293,122**
**PIPE RAILING SYSTEM**
**William J. Coleman, 645 Louden Ave., Dunedin, Fla. 33528, and Jay Logue, 2339 Orangeside Rd., Palm Harbor, Fla. 33563**
**Filed Jun. 13, 1979, Ser. No. 48,262**
**Int. Cl.³ E04H *17/14***
**U.S. Cl. 256—69** **10 Claims**



1. An improved pipe railing structure, comprising:
a first half-cylindrical, hollow body member having first and second terminal edges parallel with a cylindrical axis;
a first fastening member disposed along said first terminal edge of said body member, having a first fastening contour;
a second fastening member disposed along said second terminal edge of said body member, having a second fastening contour;
a first fastener anchorage member disposed along an inner surface of said body member, having a longitudinal recess therein parallel with said axis, for receiving and anchoring a fastener in said axial direction;
said first fastener anchorage member further comprising:
an annular cylinder connected along one side to said inner surface of said first body member, having a longitudinal slot in the surface thereof to enable a threaded fastener to be axially anchored therein;
the structure further comprising:
a second half-cylindrical, hollow body member having first and second terminal edges parallel with said cylindrical axis;
a third fastening member disposed along said first terminal edge of said second body member, having a third fastening contour complementary to said first fastening contour of said first fastening member on said first body member;
a fourth fastening member disposed along said second terminal edge of said second body member, having a fourth fastening contour complementary to said second fastening contour of said second fastening member on said first body member;
a second fastener anchorage member disposed along an inner surface of said second body member, having a longitudinal recess therein parallel with said axis, for receiving and anchoring a fastener in said axial direction;
said first and third fastening members joining along their respective, complementary contours and said second and fourth fastening members joining along their respective, complementary contours to thereby join said first and second body members to form a unitary, cylindrical pipe railing;
said second fastener anchorage member further comprising:
an annular cylinder connected along one side to said inner surface of said second body member, having a longitudi-



nal slot in the surface thereof to enable a threaded fastener to be axially anchored therein;
said first fastening contour of said first fastening member and said second fastening contour of said second fastening member being a male fastening contour;
said third fastening contour of said third fastening member and said fourth fastening contour of said fourth fastening member being a female fastening contour;
said first and second terminal edges of said first body member defining a reference plane;
said male fastening contour having a first planar surface approximately parallel with said reference plane, extending from said inner surface of said cylindrical body member from which it depends, a second planar surface intersecting said first planar surface at an acute angle forming an edge parallel with said axis, and a third planar surface intersecting said second planar surface at approximately a right angle and coincident with said terminal edge of said cylindrical body member from which it depends;
said female fastening contour having a first cantilever portion extending from said inner surface of said cylindrical body member from which it depends and terminating in a segment approximately perpendicular to said reference plane, a second cantilever portion extending from said segment and terminating in a second planar surface approximately parallel with said second planar surface of said male fastening contour, said first cantilever portion, said inner surface from which it depends, and said second cantilever portion forming a cavity with said body member inner surface therein forming a third planar surface approximately parallel with said third planar surface of said male fastening contour and said second cantilever portion having an inwardly facing first planar surface approximately parallel with said first planar surface of said male contour member, said first and third planar surfaces of said female fastening contour terminating in an opening for said cavity;
said male fastening contour being joined to said female fastening contour by forcing said second surface of said male contour against said second surface of said female contour thereby bending said first cantilever portion and said second cantilever portion of said female contour to enlarge said opening of said cavity to enable said edge of said male contour to enter said cavity through said opening and said first and third surfaces of said female contour to clamp against said first and third surfaces of said male contour, respectively.

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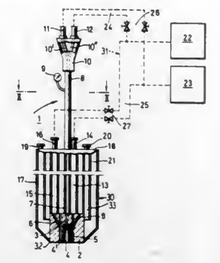
**4,293,123**
**BLOW LANCE**
**Fried Sauert, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**
**Filed Dec. 20, 1979, Ser. No. 105,495**
**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855499**
**Int. Cl.³ C21B *7/16***
**U.S. Cl. 266—268** **13 Claims**

1. A lance assembly for directing treatment gas flows onto the surface of a molten metal bath, said assembly comprising:
a lance comprised of a casing having mounted therein a plurality of concentric feed tubes and a separate nozzle block having channels therethrough in direct, sealed fluid communication with downstream ends of said feed tubes, a center channel in said nozzle block in fluid communication with a center feed tube, and



a removable, interchangeable central nozzle means mounted in said nozzle block and having a passage therethrough to receive fluid from said center channel.

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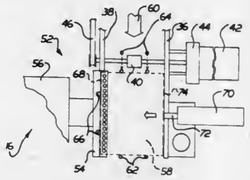
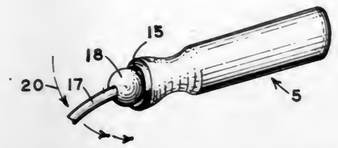
**4,293,124**
**SYSTEM FOR AUTOMATICALLY LOADING PLANAR FILM SHEETS ONTO A FILM POSITIONING DEVICE**
**David C. Bailey, Cocoa Beach, and Floyd F. Keesler, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.**
**Filed Aug. 24, 1978, Ser. No. 936,365**
**Int. Cl.³ B65H *9/10***
**U.S. Cl. 271—233** **10 Claims**



1. Apparatus for precisely positioning a planar film sheet at a known location, comprising: transporting means for transporting said film sheet along a film path; film stop means for blocking said path at a first location so as to prevent movement of said film sheet past said first location; film guide means for contacting the trailing portion of said film sheet after the leading portion has contacted said stop means so as to thereby confine said film sheet to a known location along said path; film locator means located transversely adjacent said known location; means for mechanically contacting said film sheet so as to force said film sheet transversely against said film locator means, whereby said apparatus precisely positions said film sheet precisely in two dimensions; film holding means for grasping said film sheet after said film sheet has been positioned; means for positioning said film holding means; and means for disengaging said film stop means, film guide means, and film contacting means from said film sheet after said film sheet has been grasped by said film holding means, so as to thereby permit said film sheet to be withdrawn by said positioning means; wherein said film holding means has a planar surface adapted to receive a portion of said film sheet, said holding means including means for applying a vacuum between said surface and said portion of said film sheet and further wherein said apparatus includes cam means for forcing said portion of said film against said surface so that said portion of said film sheet will be held firmly against said surface of said film holding means by said vacuum.

**4,293,125**
**JUMP ROPE HANDLE**
Robert S. Hinds, 1803 Regent St., Madison, Wis. 53705
Continuation-in-part of Ser. No. 866,818, Jan. 4, 1978, abandoned. This application Jul. 27, 1979, Ser. No. 60,994
Int. Cl.[3] A63B *5/20*
U.S. Cl. 272—75 5 Claims




1. In a jump rope comprising a cord, two handles, said handles comprising apertures extending therethrough, said cord received in said apertures, said handles retained on said cord by an enlarged portion associated with said cord at each end and a plurality of bead members strung substantially solidly on said cord between said handles, each of said handles having an inner end and an outer end, the combination of
a deep recess in the outer end of each of said handles,
an annular surface portion at the inner end of each of said recesses for retaining said cord in said handle by said enlarged portion bearing thereon disposed near the center of said handle,
the inner end of each said aperture diverging substantially in the form of a bell to receive in engagement the adjacent portion of said cord during use of said jump rope,
said bead members disposed next adjacent said handles configured with at least the handle-facing portions thereof configured substantially hemispherically to perform in contact with said handles in the manner of a ball and a hollow bell.

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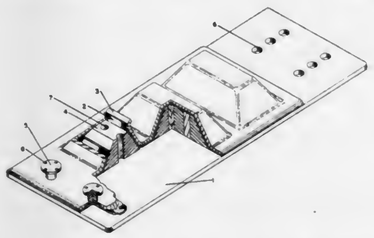
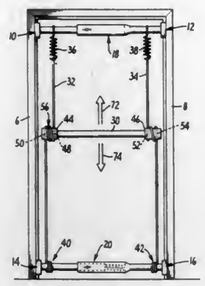
**4,293,126**
**LEG WEIGHTS**
Donald F. Havens, 1225 S. Chace Ct., Lakewood, Colo. 80226
Filed Mar. 20, 1980, Ser. No. 132,339
Int. Cl.[3] A01B *21/26*
U.S. Cl. 272—119 2 Claims



1. A one-piece latex rubber belt having a plurality of weights completely sealed therein, said weights including openings extending entirely therethrough, a layer of gauze positioned over said weights, a layer of liquid latex covering said gauze and filling the openings in said weights to completely seal said gauze and said weights, means for securing the ends of said belt around the ankle of a user comprising a plurality of openings in one end of said belt and a plurality of buttons secured to the opposite end thereof.

**4,293,127**
**MONO-KINETIC EXERCISE DEVICE**
Peter B. Dudley, Los Gatos, Calif., assignor to Mono-Kinetics, Los Gatos, Calif.
Continuation-in-part of Ser. No. 970,486, Dec. 18, 1978, abandoned. This application Apr. 4, 1980, Ser. No. 137,809
Int. Cl.[3] A63B *21/00*
U.S. Cl. 272—133 21 Claims



1. An exercise device for mounting within a generally rectangular frame comprising:
a first elongated rope member extending in the plane of the frame;
a second elongated rope member extending within the plane of the frame;
fastening means for securely and rigidly fastening one end of the first and one end of the second rope member at opposite points within the frame with respect to the major axis of the frame;
support means for supporting the remote portions of the first and second elongated rope members at positions within the frame displaced in the direction of the major axis from the fastening means;
an exercise bar assembly slidably mounted upon the first elongated rope member and the second elongated rope member so as to provide frictional resistance to movement of said assembly at points on said rope members intermediate the fastening means and the support means said exercise bar assembly being substantially perpendi-cular to the major axis of the frame during an exercise; and
tensioning means for tensioning said rope members, said tensioning means being attached to the first elongated rope member and second elongated rope member such that the exercise bar assembly is intermediate the tensioning means and the fastening means.

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**4,293,128**
**CENTER OF GRAVITY-APPRAISAL BLOCK GAME**
John C. Ebel, 525 Anchor Dr., Joppa, Md. 21085
Filed Nov. 5, 1979, Ser. No. 91,386
Int. Cl.[3] A63F *9/00*
U.S. Cl. 273—1 GF 2 Claims

1. In game apparatus employing a plurality of blocks for balancing, the improvement comprising: all said blocks being



respective identical oblique quandrangular prisms in shape; the proportions of each block being such as to permit stacking first and second of said blocks on the oblique faces thereof with the rectangular shape faces in-plane, without tipping over, but such as to cause tipping over of the stack when a third said block is added to the top of said stack with the rectangular shape faces thereof in-plane with those of the first and second blocks, a plurality of parallel-spaced indicia on each block parallel with one or more faces thereof but vertically inclined, said parallel spacing of the indicia being uniform; said proportions of each block being as follows: the ratio of the standing height to the perpendicular distance between rectangular faces being three-to-two, and the acute angles of the bases of the prism shape being substantially 75.5 degrees.

2. The method of playing a balancing game consisting of the steps:
a. forming a stack of a plurality of identical blocks of oblique quandrangular prism shape;
b. lifting the stack by the lowermost block thereof; and
c. depositing the stack upon a single said block in balance preventing the stack from toppling over; thereby playing said balancing game.

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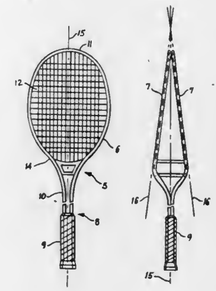
**4,293,129**
**GAME RACKETS AND PADDLES WITH NONPARALLEL PLAYING SURFACES**
Leo N. Planakis, 1701 Pebble Beach Dr., Vienna, Va. 22180
Filed May 21, 1979, Ser. No. 40,924
Int. Cl.[3] A63B *49/02, 59/04*
U.S. Cl. 273—67 R 10 Claims



1. A game racket comprising a head and a handle, said head having two discrete, nonparallel strung surfaces, each of said strung surfaces being a mesh of tensioned stringing, said handle comprising a hand grip portion and a shank portion, said shank portion joined to the shoulder portion of said head, and the line of intersection of the planes of said strung surfaces being generally normal to and intersecting the longitudinal axis of said racket generally at the crown portion of said head, said head being formed of two generally oval frames, and said frames being fixedly joined at said crown portion.

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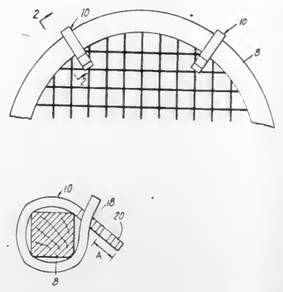
**4,293,130**
**GUARD FOR TENNIS RACKETS AND LIKE ARTICLES**
Miroslav Beranek, 847 Constitution Dr., Foster City, Calif. 94404
Filed Feb. 12, 1979, Ser. No. 11,218
Int. Cl.[3] A63B *49/14*
U.S. Cl. 273—73 R 4 Claims

1. In combination with a racket having a frame,
a length of resilient flexible homogenous material of sufficient thickness to act as a bumper and having a portion intermediate its ends of a thickness equal to at least one-third its width,
said length being formed adjacent its ends with interengaging elements to permit said length to be looped around the frame of a racket at the upper portion thereof with said interengaging elements holding said loop on said frame thereby providing a sufficient length of the material to protect the frame from damage due to striking an object,



said interengaging elements comprising an opening at one end adapted to receive the opposite end of said length therethrough and a protruberance at the opposite end adapted to engage the material of said length adjacent said opening.

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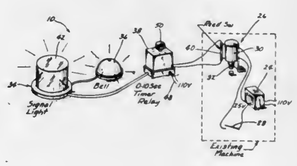
**4,293,131**
**ELECTRICAL AWARD SIGNALING MEANS FOR A PINBALL MACHINE**
Marc M. Fellman, 1010 S. 67th St., and Wade S. Wright, 5648 Jones, both of Omaha, Nebr. 68106
Filed Dec. 27, 1977, Ser. No. 864,595
Int. Cl.[3] A63D *13/00*
U.S. Cl. 273—121 A 7 Claims



1. In combination,
a pinball machine which includes an internal electrical circuit having an electronic award means including a solenoid actuated upon the accomplishment of a predetermined feat,
a first electrical wire means electrically connected at one end to said internal electrical circuit and adapted for connection at the other end to a source of electric power,
an award signaling circuit including a magnetic operated switch means positioned within the magnetic field of said solenoid for closing of said switch means in response to actuation of the solenoid, a relay,
means operatively electrically connecting said switch means to said relay whereby the relay is energized in response to closing of said switch means,
a signal means actuatable for signaling to the area surrounding the machine that an award has been won,
means for operatively electrically connecting said signal means to the relay for actuating said signal means when the relay is energized, and
a second electrical wire means electrically connected at one end to said award signaling circuit and adapted for connection at the other end to a source of electric power,
said award signaling circuit being free of any electrical

connection to said pinball machine circuit apart from said first and second electrical wire means.

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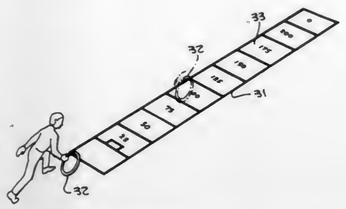
**4,293,132**
**SKIDWHEEL GAME**
**Louis J. Starr, 1460 S. Norton Ave., Los Angeles, Calif. 90019**
**Filed Jul. 30, 1979, Ser. No. 61,630**
**Int. Cl.³ A63F** *3/00*
**U.S. Cl. 273—126 R** **6 Claims**



1. A skidwheel game comprising:
a longitudinally disposed generally flat surface having a design thereon;
said design comprising a plurality of zones, said zones being defined and separated from each other by boundary markers, said game including value indicating indicia associated with individual ones of said zones; and an automobile steering wheel having a central axis and a periphery, said wheel being adapted to be projected linearly with a reverse spin along the longitudinal axis of said surface so that the periphery of said wheel normally travels in contact with said longitudinally disposed generally flat surface whereby said wheel normally travels over said surface in first one direction and then rolls in a reverse direction in such a fashion that said wheel remains within said design and comes to rest within one of said zones, said reverse spin being about the central axis of said wheel and being in a direction which is opposite to that induced by the periphery of said wheel traveling over said surface in said first direction.

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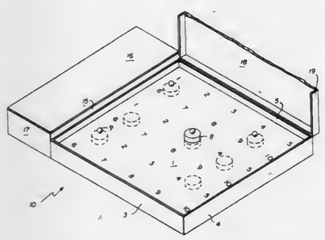
**4,293,133**
**GAME DEVICE**
**Martin Baron, 7804 Skander Dr., Box 28222, Sacramento, Calif. 95828, and Ronald J. Retterer, 9030 Leatham Ave., Fair Oaks, Calif. 95628**
**Filed Jul. 7, 1980, Ser. No. 165,984**
**Int. Cl.³ F41J** *1/00*
**U.S. Cl. 273—345** **11 Claims**



1. A game device comprising in combination:
a playing surface having game scoring indicia thereon defined by plural regions each having discreet values thereon,
a sealed chamber underlying and coextensive with said playing surface,
first magnetic means disposed within said chamber randomly deployed and having a single polarity proximate to said playing surface,
and marker means magnetized of a polarity opposite to said first magnetic means proximate to said playing surface castable on said playing surface whereby when so cast, said marker means migrates towards said first magnetic means and on said regions thereby providing an indication.

10. A method for playing a game having a playing surface, and underlying chamber with plural magnets therein, the steps including:
shaking the chamber to reorient the magnets,
casting markers on the playing surface and computing a value reflective of the marker's relative disposition on the playing surface.

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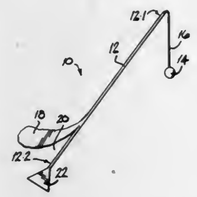
**4,293,134**
**TOY**
**Andries Retief, 207 Nedholm Flats, Devenish St., Sunnyside, Pretoria, and Gert J. Zovitsky, 220 Upingtonia Ave., Grootfontein, both of South Africa**
**Filed Dec. 20, 1979, Ser. No. 105,675**
**Claims priority, application South Africa, Dec. 28, 1978, 78/7361**
**Int. Cl.³ A63B** *65/00*
**U.S. Cl. 273—428** **11 Claims**



1. A flight article comprising a rod; a weight; a flexible element connected to one end (referred to as the head end) of the rod and to the weight; and a flight (also referred to as the larger flight) of a manufactured material connected to the rod, in which the ratio of the surface area of one side of the larger flight to the total mass of the article is about 1000 square millimeters to one gram.

9. A flight article comprising a rod, a weight, a flexible element, and a flight of manufactured material (also referred to as the larger flight), said flexible element is connected to one end of said rod (referred to as the head end) and to the said weight, said flight is connected entirely asymmetrically to said rod, an additional flight connected to that end of the rod (the tail end) which is remote from the head end, said two flights are spaced apart along the axis of the rod, the spacing being between one-fifth and two-fifths of the rod length.

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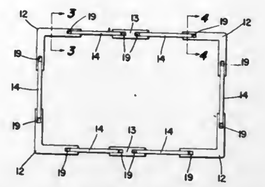
**4,293,135**
**SEGMENTED SEAL**
**Joseph E. Wallace, Calabasas, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio**
**Filed Feb. 25, 1980, Ser. No. 124,391**
**Int. Cl.³ F16J** *15/02*
**U.S. Cl. 277—9** **9 Claims**

1. A sectional gasket comprising a junction member, an extension member, said junction member having a center region and two end portions, said end regions each having a recess, said recesses each having parallel laterally inwardly facing sealing surfaces spaced a predetermined distance apart, and said extension member having parallel laterally outwardly facing sealing surfaces spaced a predetermined distance apart and extending continuously along its entire axial extent, whereby said extension member is adapted to be laterally



severed at any location along its entire axial extent and sealingly received in one of said recesses.



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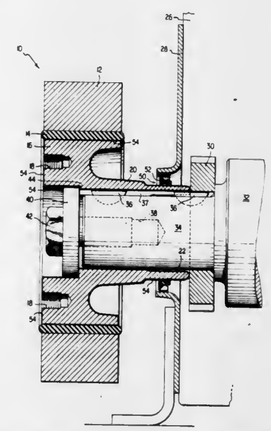
**4,293,136**
**ANODIZED SEAL NOSE FOR DAMPER**
**Larry T. George, Greenfield, Ind., assignor to Wallace Murray Corporation, New York, N.Y.**
**Filed Mar. 14, 1980, Ser. No. 130,380**
**Int. Cl.³ F16J** *15/32;* **F16F** *15/12*
**U.S. Cl. 277—12** **6 Claims**



1. A seal construction for a rotating hub nose seal for the nose of the hub of a torsional vibration damper of the type having an outer inertia ring, a radially intermediate elastomer member, and an innermost hub member, the seal being of the type including an elastomer seal lip having a portion surrounding and being in surface engagement with the hub nose at an axial portion of the hub, the improvement comprising, the hub being formed of aluminum, the hub nose having an anodized solid lubricant coating at least at its surface of contact with the said elastomer seal lip, the said coated hub nose having a surface roughness in the range of 60–70 micro inches, whereby the rotary seal between the elastomer seal lip and the rotating hub nose functions in a manner equivalent to a conventional rotating hub nose construction wherein the hub is formed of cast iron having an uncoated surface roughness in the range of 10–20 micro inches.

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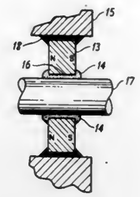
**4,293,137**
**MAGNETIC LIQUID SHAFT SEALING**
**Frederick D. Ezekiel, 75 Allen St., Lexington, Mass. 02173**
**Filed Dec. 11, 1978, Ser. No. 968,370**
**Int. Cl.³ F16J** *15/16, 15/40*
**U.S. Cl. 277—80** **10 Claims**



1. Magnetic liquid shaft sealing apparatus for sealing between a shaft and a housing comprising,
thin permanent magnet means characterized by a cross section having a thickness dimension between opposed end faces of the magnet means that is smaller than a height dimension and magnetized along an axis parallel to said thickness dimension for establishing a magnetic field along at least one exposed surface thereof between said end faces which magnetic field is generally parallel to said axis,
and a closed loop of magnetic fluid along said at least one exposed surface maintained thereat by said magnetic field thereat,
said magnetic liquid sealing apparatus forming a sealed assembly which consists of in combination a housing member and a shaft member in relative rotational relationship wherein said thin permanent magnet means is a single thin permanent magnetic disc formed with an opening enclosed by a peripheral exposed surface closely adjacent to and surrounding said shaft member and being axially magnetized,
said magnetic disc being mounted on said housing with said peripheral surface being in closely spaced, rotatable relationship with said shaft member,
said closed loop of magnetic fluid being a quantity of magnetic liquid occupying and limited to the space between said shaft member and said peripheral surface by the field of said magnetic disc,
whereby said shaft member is arranged for rotating in contact with said closed loop of magnetic liquid whereby relative rotation with said permanent magnetic disc may occur while said closed loop of magnetic liquid seals the gap therebetween.

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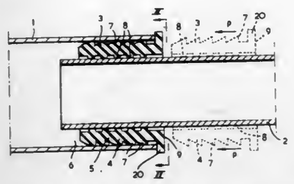
**4,293,138**
**SEALING DEVICE**
**Klaus B. M. Swantee, Mt. Eemnes, Netherlands, assignor to Pidou B.V., Mt. Eemnes, Netherlands**
**Filed Sep. 11, 1979, Ser. No. 74,322**
**Claims priority, application Netherlands, Sep. 12, 1978, 7809260**
**Int. Cl.³ F16J** *15/10;* **F16L** *17/02*
**U.S. Cl. 277—207 A** **6 Claims**

1. A cylindrical sealing device which seals in an excellent manner though easy to mount and remaining reliably in place without extra fixation means being provided for sealingly connecting coaxial conduits and the like of a conduit arrangement including a first conduit and a second conduit sealed mutually in situ, wherein said second conduit is disposed a predetermined distance coaxially in said first conducit to provide between them an annular space adapted to receive said sealing device radially between the first and second conduits having different diameters, said sealing device comprising in combination:
a longitudinal hollow body member of elastic material un-

compressible per se and including two separate parts together being cylindrical in complementary relationship to each other with a central axis therein;

a plurality of first unflexible projections only compressibly arranged circumferentially on and projecting radially outwardly from said hollow body member, with the outer diameter of said first projections being selected to be greater than the inner diameter of said first conduit to effect said sealing connection; and



a plurality of second unflexible projections only compressibly arranged circumferentially in and projecting radially inwardly towards the central axis of said hollow body member, said second projections projecting to an imaginary circle having a diameter which is at most equal to the outer diameter of said second conduit, with at least one of said first projections and at least one of said second projections being arranged when pressed together to transmit compression forces at least in part in a common radial section of a predetermined axial length.

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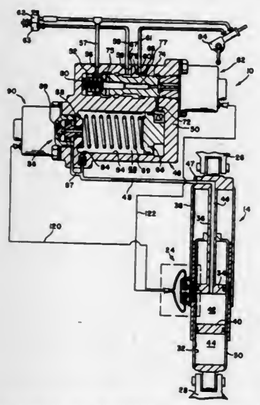
**4,293,139**

## POWER STEERING PUMP POWERED LOAD LEVELER

**Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Dec. 17, 1979, Ser. No. 104,597**
**Int. Cl.³ B60G *17/04***
**U.S. Cl. 280—6 H** **10 Claims**



1. A load-leveling mechanism for controlling the separation of a sprung mass and an unsprung mass of a vehicle, the load-leveling mechanism comprising:

a source of fluid pressure;

a fluid-receiving extendible strut connected between the masses for controlling the separation of the masses depending upon the fluid pressure within the strut;

a housing defining a first chamber communicated with the fluid pressure source and with a fluid reservoir and defining a second chamber communicated with the first chamber and with the strut;

first valve means for controlling communication between the second chamber and the strut;

first servo means for operating the first valve means;

second valve means movable within the first chamber for controlling communication of the second chamber with the reservoir and with the fluid pressure source;

second servo means for operating the second valve means; and

sensor means for sensing the separation of the masses and operatively connected to the first and second servo means, the sensor means and the first and second servo means cooperating with the first and second valve means to control the fluid pressure within the extendible strut to thereby maintain the separation of the sprung and unsprung masses substantially within a predetermined range.

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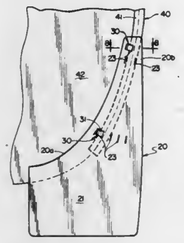
**4,293,140**

## AUTOMOBILE SPLASH GUARD AND ATTACHMENT MEANS THEREFOR

**Ted A. Bell, Coshocton, and Daniel F. Lehner, Lafayette, both of Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio**

**Filed Dec. 4, 1978, Ser. No. 966,505**
**Int. Cl.³ B62D *25/16***
**U.S. Cl. 280—154.5 R** **22 Claims**



1. A splash guard assembly for an automotive vehicle having a thin, sheet-form mounting plate extending in a generally vertically oriented direction at a wheel opening thereof comprising

a sheet-form guard member adapted to be supported on said mounting plate and having an elongated marginal edge portion of a configuration to be co-extensive with said mounting plate, said guard member provided with at least two sockets formed in the marginal edge portion and disposed in relatively vertically spaced relationship along the marginal edge portion and a predetermined distance relatively inward of a peripheral edge thereof, and

fastening means for securing said guard member to the vehicle mounting plate including a fastening clip secured in each of said sockets, each of said clips being fabricated from an elongated, flat strip of resilient material folded into a predetermined shaped configuration having first and second legs defining respective independent clamping elements, said fastening clips each including an interconnecting bar with said first and second legs connected to opposite ends thereof and extending in superposed relationship thereto to receive the guard member and mounting plate between respective ones of said first and second legs and said interconnecting bar, said first leg adapted to project through a selected one of said sockets to frictionally engage with said guard member in clamped relationship and said second leg adapted to mechanically couple with the vehicle mounting plate in clamped relationship.

22. A splash guard assembly for an automotive vehicle having a thin, sheet-form mounting plate extending in a generally vertically oriented direction at a wheel opening thereof comprising

a sheet-form guard member adapted to be supported on said mounting plate and having an elongated marginal edge portion of a configuration to be coextensive with at least a portion of said mounting plate, said guard member provided with at least two sockets formed in the marginal edge portion and disposed in relatively vertically spaced relationship along the marginal edge portion and a predetermined distance relatively inward of a peripheral edge thereof, and

fastening means for securing said guard member to said mounting plate including a fastening clip secured in each of said sockets, each of said clips having first and second legs and an elongated interconnecting bar carrying said first and second legs, said interconnecting bar and said first leg formed from an elongated, flat strip of resilient material folded into a U-shaped configuration, thereby defining a clamping element adapted to receive a sheet-form mounting plate in edgewise clamped relationship therebetween and to mechanically interengage therewith, said first leg secured to and resiliently biased toward said interconnecting bar and extending in superposed, substantially coplanar relationship thereto at one side thereof, said second leg carried by said interconnecting bar at a side thereof opposite to said first leg and adapted to project through a selected one of said sockets, said second leg including a clamping surface extending in superposed relationship to said interconnecting bar to mechanically engage with said guard member and clamp said guard member in secured relationship to said interconnecting bar and to thereby secure said guard member with said mounting plate in supported relationship.

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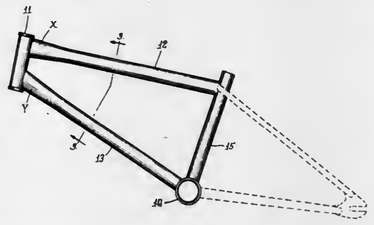
**4,293,141**

## FRAME FOR LIGHTWEIGHT BICYCLE

**Frank Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.**

**Filed Feb. 22, 1979, Ser. No. 14,075**
**Int. Cl.³ B62K *3/04, 19/06***
**U.S. Cl. 280—281 R** **2 Claims**



1. A frame for a high performance light weight bicycle, comprising a head tube, and top and bottom tubes having their forward ends secured to said head tube and extending rearwardly therefrom, with the major portions of said top and bottom tubes being round, and the forward end portions thereof being oval with a lateral width the same as the diameter of said round portions as a minor axis and tapering rearwardly from a maximum major axis adjacent said head tube.

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**4,293,142**

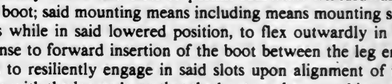
## VIBRATION DAMPED SKI

**Alan J. Davignon, Vashon, Wash., assignor to K-2 Corporation, Vashon Island, Wash.**

**Filed Jul. 16, 1979, Ser. No. 57,576**
**Int. Cl.³ A63C *5/12***
**U.S. Cl. 280—610** **6 Claims**

1. In a ski having a top surface and a bottom surface, the improvement comprising a vibration damping core disposed between the top and bottom surfaces, said core including a thin layer of viscoelastic material fixedly positioned at the neutral axis of the ski at every point along the length of said core, wherein:

said core includes an upper constraining layer of high modulus of elasticity material which is bonded to the upper surface of said layer of viscoelastic material; and a lower constraining layer of high modulus of elasticity material which is bonded to the lower surface of said layer of visoelastic material; and



said core further includes an upper core layer of lightweight, low modulus of elasticity material disposed above said upper constraining layer of rigid material; and a lower core layer of lightweight, low modulus of elasticity material disposed below said lower constraining layer of rigid material.

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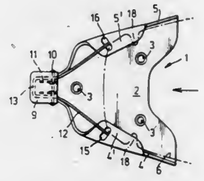
**4,293,143**

## SKI BINDING FOR CROSS-COUNTRY SKIS

**Arne W. Johansen, Oslo, Norway, assignor to Adidas Fabrique de Chaussures de Sport, Dettwiller, France**

**Filed Apr. 19, 1977, Ser. No. 788,880**
**Int. Cl.³ A63C *9/08***
**U.S. Cl. 280—615** **2 Claims**



1. A ski binding for a boot having a converging toe and laterally opening slots at each side of a forward portion of the sole of the boot comprising: a toe iron to be fixed to a ski, said toe iron being adapted to receive the forward portion of the boot upon forward movement of the boot relative to the toe iron; a locking device comprising a U-shaped bowed rod of spring material having rearwardly extending legs resiliently urged toward each other, each leg having an end bent to extend downwardly substantially perpendicular to the ski; mounting means mounting said locking device for pivotal movement of said legs from a lowered boot retaining position in which said ends of the legs engage in said slots, to an elevated boot releasing position in which said ends of the legs are vertically above said slots to permit rearward withdrawal of the boot; said mounting means including means mounting said legs while in said lowered position, to flex outwardly in response to forward insertion of the boot between the leg ends and to resiliently engage in said slots upon alignment of the slots with the leg ends, so that the boot can be moved into and locked in the toe iron without first moving said leg ends upwardly to said released position; and spring means for urging said leg ends to said lowered boot retaining position.

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**4,293,144**

## PROTECTIVE HANDRAIL FOR FOLDING BABY CARRIAGE

**Minoru Ida, Yamatokoriyama, Japan, assignor to Manten Co., Ltd., Osaka, Japan**

**Filed Mar. 4, 1980, Ser. No. 127,061**
**Int. Cl.³ B62B *7/08***
**U.S. Cl. 280—644** **3 Claims**

1. A folding baby carriage or the like structure comprising a

pair of side frames each having an upper bar and a lower bar pivoted to said upper bar and carrying a wheel at lower end thereof, a pair of leg members pivoted to said upper bar near the lower end thereof and carrying a wheel at lower end thereof, two X-shape coupling elements each having two intersecting members, said X-shape coupling elements each having their inner corresponding ends pivoted to said leg members near the lower end thereof and their outer end pivoted to said side frames, and a lockable toggle bar pivoted to and between said leg members for keeping said coupling elements extended, further comprising a protective means comprising a pair of first bars having their one end pivoted to said upper bars, a pair of second bars pivoted to the other end of the first bars, a coupling bar pivoted to and between said second bars, and a flexible tube for covering the protective means to protect the baby's finger.

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**4,293,145**

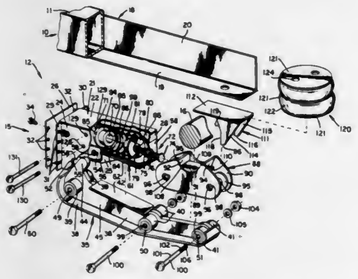
**AUXILIARY LIFT AXLE WHEEL ASSEMBLY**

**Glenn E. Taylor, 1345 Bankhead Ave. NW., Atlanta, Ga. 30318**

**Continuation-in-part of Ser. No. 882,234, Feb. 28, 1978, Pat. No. 4,166,639. This application May 8, 1979, Ser. No. 37,326**

**Int. Cl.³ B60G** *11/56*

**U.S. Cl. 280—704** **10 Claims**



9. A lift axle wheel assembly comprising an axle, and at each end of said axle a wheel for engaging the ground surface, a housing for connection to the frame of a vehicle, an approximately L-shaped lift lever pivotally mounted at the intersection of its arms to said housing about an axis approximately parallel to the axis of rotation of said wheel, said L-shaped lift lever including an upwardly extending arm and an arm extending longitudinally with respect to the direction of travel of said wheel, a saddle assembly mounted on the longitudinally extending arm of said lift lever, resilient connection means connecting said saddle assembly to said lift lever, said axle being mounted at one of its ends to said saddle assembly, a pneumatically inflatable means mounted on said saddle assembly and bearing against said housing to urge said lift lever in a first pivotal direction with respect to said housing to move the wheel downwardly toward the ground surface, and spring means mounted in said housing and positioned over the longitudinally extending arm of said lift lever and having one end portion thereof resiliently bearing against the upwardly extending arm of said lift lever to urge said lift lever in a second pivotal direction with respect to said housing to move the wheel upwardly away from the ground surface.

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**4,293,146**

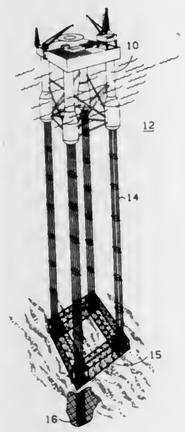
**VMP CASING TIEBACK**

**Pierre A. Beynet, Tulsa, Okla.; James E. Lucksinger, Carbondale, Colo., and Martin B. Jansen, Jr., Houston, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Oct. 4, 1978, Ser. No. 948,466**

**Int. Cl.³ F16L** *35/00*

**U.S. Cl. 285—24** **11 Claims**



1. A tieback tool with self-energizing seal for sealingly securing a first tubular member suspended from a vessel floating on a body of water to a casing hung in a wellbore in the bottom of the body of water comprising:

a male tubular member having a J-slot on its exterior and a neck having a wall thickness $t_1$ and an outer cylindrical surface;

a female tubular member adapted to fit over said male tubular member and having a lug on the interior thereof insertable into said J-slot to prevent relative longitudinal movement of said members, said female tubular member having a section overlying the neck of said tubular member with a wall thickness of $t_2$ which is greater than $t_1$, the inner surface of said neck of said male tubular member being free of contact with said section of said female tubular member; and

a seal sealingly engaging the outer cylindrical surface of said neck of said male tubular member and said section of said female tubular member

the thickness $t_1$ to extend from terminal end of said neck to beyond said seal whereby for a given internal pressure said neck of said male tubular member expands radially more than said section of said female tubular member.



**4,293,147**

**METHOD AND APPARATUS FOR SECURING A PIPE TO A FITTING**

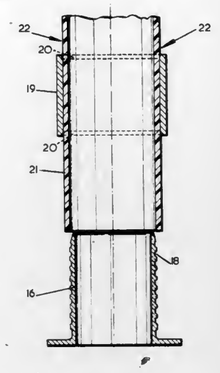
**Ronald S. Metcalfe, Sale, and John M. Greig, Whitley Bay, both of England, assignors to RM Fabrications Limited, Skelmersdale and British Gas Corporation, London, both of, England**

**Filed Mar. 30, 1979, Ser. No. 26,138**

**Claims priority, application United Kingdom, Mar. 31, 1978, 12782/78**

**Int. Cl.³ F16L** *35/00*

**U.S. Cl. 285—39** **2 Claims**



1. A method for connecting a plastic pipe to a fitting incorporating an externally grooved insert, the insert being a tight fit in the pipe, comprising pushing a sleeve onto the pipe and away from the pipe end, forcing the insert into the end of the pipe by gripping the pipe in a first element of a clamp, supporting the fitting in a second element of the clamp with the insert coaxial with the end of the gripped pipe, and moving the first and second elements of the clamp towards each other; wherein said sleeve is positioned on the pipe between said first and second elements of the clamp, and thereafter forcing the sleeve to the end of the pipe by releasing the grip of the first clamp element on the pipe, and again moving said first and second clamp elements towards each other such that the first clamp element slides along the pipe, engages the sleeve and pushes the sleeve onto the pipe end, so that the pipe end is tightly gripped between the insert and the sleeve.

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**4,293,148**

**PILE CONNECTOR**

**Lionel J. Milberger, Spring, Tex., assignor to FMC Corporation, Chicago, Ill.**

**Filed Feb. 20, 1980, Ser. No. 123,158**

**Claims priority, application United Kingdom, Feb. 22, 1979, 06369/79**

**Int. Cl.³ F16L** *37/14*

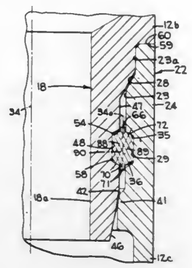
**U.S. Cl. 285—90** **10 Claims**

1. A mechanical pipe connector comprising:

a tubular inner member having a wall with a first groove cut in an outside face thereof;

a tubular outer member having a wall with a second groove cut in an inside face thereof and at least one hole extending through said outer member wall and communicating with said second groove, said outer member also having a passage to receive said inner element with said first and said second grooves juxtaposed to form a common annular channel between said inner and said outer members;

a flexible locking tape insertable through said hole into said annular channel, said tape having a shape to fill said channel and lock said inner and said outer members together, said tape and said annular channel each having a polygon cross-sectional shape with internal obtuse angles to minimize the stress concentration on said tape and on the walls of said channel as a separating force is applied between said inner and said outer members; and



a tape web extending axially from said tape and positioned between said outside face of said inner member and said inside face of said outer member to aid in positioning said tape in said common annular channel.

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**4,293,149**

**RAPID COUPLING FOR PLASTIC PIPES**

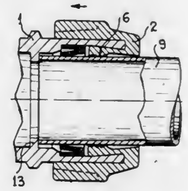
**Federico A. Bonel, Barcelona, Spain, assignor to Industrias Neoplast, S.A., Barcelona, Spain**

**Filed Sep. 27, 1979, Ser. No. 79,593**

**Claims priority, application Spain, Oct. 2, 1978, 238468**

**Int. Cl.³ F16L** *17/02*

**U.S. Cl. 285—111** **5 Claims**



1. A coupling device for a pipe comprising:

(a) a male piece of generally cylindrical cross-section, said male piece having an end portion, said end portion having slots therein defining tongues;

(b) a female piece of generally cylindrical cross-section, said female piece having an opening for receiving said pipe and a longitudinally extending seat for receiving the end portion of said male piece, the end portion and the seat being arranged to cause the tongues of said end portion to be deflected radially inwardly when said end portion is received by said seat, said female piece further including a inner wall disposed substantially concentrically inwardly of said seat said inner wall having slots therein defining tongues and being arranged to deflect outwardly in response to said pipe penetrating said female piece, the tongued inner wall and said end portion interlocking to form a fluid-tight seal.

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**4,293,150**

**FLUID CONDUIT ASSEMBLY**

**Irving D. Press, West Orange, N.J., assignor to Resistoflex Corporation, Roseland, N.J.**

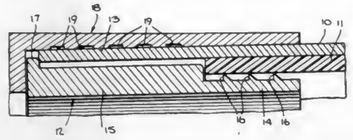
**Filed Jan. 17, 1977, Ser. No. 760,108**

**Int. Cl.³ F16L** *39/00, 33/20*

**U.S. Cl. 285—149** **9 Claims**

1. A fluid conduit assembly comprising a fluid conduit with end fittings at opposite ends, characterized in that said conduit

includes at least two snug-fitting concentric pipes each of which is independently impervious to fluid, the outermost being solid metallic and the innermost being non-metallic, and



said end fittings each have separate portions joined, respectively, to a different one of both of said pipes with a separate fluid tight seal therebetween.

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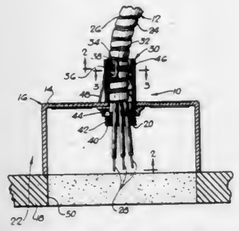
**4,293,151**

## CONNECTORS FOR ELECTRICAL CABLES

**Ernest V. Manzel, 2235 76th Ct., Elmwood Park, Ill. 60635**

**Filed Sep. 22, 1977, Ser. No. 835,482**
**Int. Cl.³ F16L *3/04***
**U.S. Cl. 285—161** **6 Claims**



1. A connector for an electrical cable having an electrically conductive sheath, said connector comprising

a tubular electrically conductive generally cylindrical connector body,

said connector body having a rear end portion with clamping means thereon for clamping the sheath of the electrical cable within said connector body to afford solid electrical contact between said connector body and the sheath,

said connector body having a threaded front end portion with external screw threads thereon, and

an internally threaded nut in screw threaded engagement with said front end portion,

said connector body having an intermediate portion with a plurality of conductive latching arms slanting outwardly and forwardly therefrom,

said intermediate portion of said connector body being between said front end portion and said rear end portion which are at opposite ends of said connector body,

said conductive latching arms having front ends,

said latching arms being resiliently yieldable to pass through an opening in a conductive mounting wall and to snap outwardly behind such wall,

said nut being operable to bring said nut and the front ends of said latching arms into clamping arrangement with the opposite sides of such wall to afford solid electrical contact between said arms and the wall,

the front end portion of the cable being insertable into said rear end portion of said connector body with the cable threaded forwardly through the opening in the mounting wall,

said clamping means being operable from the front side of the mounting wall for clamping the sheath of the electrical cable within said connector body,

said rear end portion and said intermediate portion of said connector body and the cable clamped therein being movable rearwardly through the opening in the mounting wall to cause the latching arms to pass rearwardly through the opening and to snap outwardly behind the wall,

said rear end portion of said connector body and said clamping means being of a cross-sectional size smaller than the cross-sectional size of said intermediate portion with said latching arms whereby said rear end portion and said clamping means are adapted to fit through the opening in the mounting wall,

said nut being operable from the front side of the mounting wall to tighten the nut and the front ends of said latching arms into clamping engagement with the front and rear sides of such wall to afford solid electrical contact between said arms and the wall,

whereby access to the front of the mounting wall is all that is needed for clamping the connector body to the conductive sheath and for solid clamping of the mounting wall between said latching arms and said nut, there being no need for access to the rear of the mounting wall.

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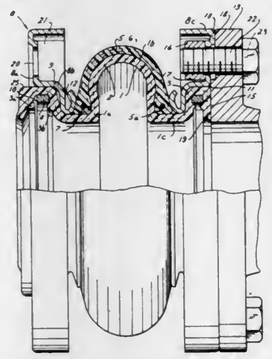
**4,293,152**

## FLEXIBLE PIPE-CONNECTING FITTING

**Hans Berghöfer, Alte Landstrasse 274, 2000 Hamburg 65, Fed. Rep. of Germany**

**Filed Apr. 3, 1978, Ser. No. 892,387**
**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2714963**
**Int. Cl.³ F16L *51/02***
**U.S. Cl. 285—229** **30 Claims**



1. A flexible pipe-connecting fitting for connecting two pipe ends located opposite to and at an axial distance from each other, comprising an elastically deformable tubular hose member having a radially outwardly bulging central portion, two substantially cylindrical transition portions adjoining said central portion at the opposite axial ends thereof, and two holding portions each adjoining a corresponding transition portion at the axially outer end thereof and projecting radially outwardly beyond its corresponding transition portion, each of said holding portions having at its radially outer end a radially inwardly projecting sealing web which sealingly abuts upon assembly an annular end face of the respective pipe end and together with the respective holding portion forms an inner annular groove; a separate reinforcing bellows of elastomeric material surrounding said bulging central portion of said hose member in surface contact therewith and having two end portions each abutting the respective transition portion of said hose member and having a conical outer surface; and two annular connecting members each engaging behind the respective holding portion of said hose member and arranged to be secured to a corresponding pipe end, each of said connecting members having an abutment web for abutting upon assembly directly against an end face of the respective pipe end, an inner annular



groove provided at its side remote from said central portion of said hose member and accommodating the respective holding portion of the latter, an inner margin abutting the respective transition portion of said hose member, and a support collar having an outwardly projecting resiliently deflectable lip resiliently abutting said conical outer surface of the respective end portion of said reinforcing bellows in an axial direction thereof.

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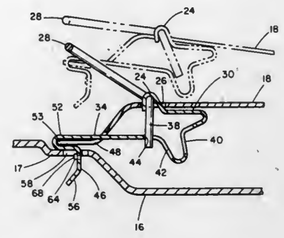
**4,293,153**

## PANELBOARD VENT ASSEMBLY

**Harris I. Stanback; Theodore L. Brann, and Larry D. Polston, all of Lexington, Ky., assignors to Square D Company, Palatine, Ill.**

**Filed May 7, 1979, Ser. No. 36,954**
**Int. Cl.³ E05C *19/06***
**U.S. Cl. 292—85** **10 Claims**



1. An improved vent assembly for an enclosure including a door pivotally supported on said enclosure adjacent one edge of said door to move another edge of said door to a closed position and to an open position to enable access to a circuit interrupting device in said enclosure, said device generating arc gases exerting pressure for moving said door from said closed position to said open position in response to a fault current passing through said device, the improvement comprising:

an elongate planar spring steel member assuming a serpentine configuration and having a main body portion, a projecting main latch portion and a resilient bend having a reduced cross section from said main body portion resiliently connecting said latch portion to said body portion, said main latch portion having a latch shoulder located between said main latch portion and said body portion;

support means for supporting said member in a first position on said door with said latch portion located adjacent said other edge and projecting toward said enclosure in response to the movement of said other edge to said closed position;

means for optionally moving said latch portion towards said other edge, said spring member automatically returning said latch portion to said first position;

a latch passage in said enclosure with said latch passage spaced for receiving said latch portion in response to movement of said other edge to a closed position; and

detent means located between said latch passage and said one door edge for interlocking engagement between said latch shoulder and body portion in response to the engagement of said latch portion in said latch passage with said member in said first position, said latch portion including a nose in camming relationship with said detent means urging said latch portion towards said other edge and aligning said latch with said latch passage in response to movement of said other edge to a closed position, said latch being received by said passage upon movement of said other edge to a closed position and said latch automatically returning to said first position whereby said latch shoulder engages said detent means, said resilient latch portion adapted to flex to provide limited movement of said door from said closed position in response to the generation of a predetermined amount of pressure caused by said arc gases whereby venting of said gases is accomplished:

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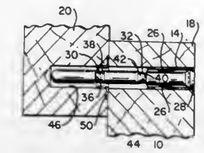
**4,293,154**

## SAFETY LOCK FOR WINDOW SASHES AND THE LIKE

**Melvin K. Cassells, 67 Vinehill Rd., Elmwood, Conn. 06110**

**Filed Sep. 28, 1979, Ser. No. 79,793**
**Int. Cl.³ E05C *1/04***
**U.S. Cl. 292—144** **8 Claims**



1. In combination, a pair of relatively movable members having a selected position in which portions of said members overlap, a safety lock for preventing relative movement of said members away from said selected position comprising a cylindrical sleeve, an elongated bolt of greater length than the sleeve slidably received in the sleeve, an enlarged head at one end of the bolt adapted to abut against one end of the sleeve and having substantially the same outer diameter as the sleeve, one of said positions which overlap at the selected position of the members having a through hole registering with a mating hole partially extending through the other of said portions, said sleeve having a press fit with the said through hole and being of shorter length than the drilled hole and being positioned in the hole with its outer end spaced inwardly from the outer surface of the member surrounding the periphery of the hole with the head of the bolt substantially flush with said outer surface, said bolt being of sufficient length to extend into the mating hole when the head of the bolt is flush with said outer surface and also when the bolt is partially withdrawn sufficiently to permit the head of the bolt to be grasped manually, and detent means operative between the sleeve and bolt for yieldably retaining the bolt in a fully inserted locking position in the sleeve, a partially withdrawn locking position in the sleeve, and a further withdrawn unlocking position.

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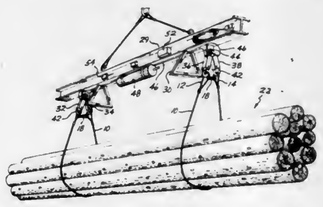
**4,293,155**

## LOG HANDLING AND TRANSPORT SYSTEM

**Peter S. Grant, Federal Way, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Nov. 19, 1979, Ser. No. 95,859**
**Int. Cl.³ B66C *1/12***
**U.S. Cl. 294—75** **11 Claims**



1. An apparatus for handling and transporting loads of elongated objects, comprising:

transport means having space on board for receiving and stowing flexibly unitized loads of elongated objects,

at least a pair of slings, each extending about the load of

objects and having lengths greater than the peripheral distance about the load and spaced toward the ends of the objects, having eyes in each end and means for releasably connecting the eyes together into a unitary sling,

an elongated frame having spaced pairs of releasable grasping means depending downwardly therefrom for sequential attachment and detachment to individual eyes in corresponding slings, and

means for lifting the frame with a load of elongated objects resting within the slings and having the grasping means attached to the eyes of the slings.

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**4,293,156**

**HOOK**

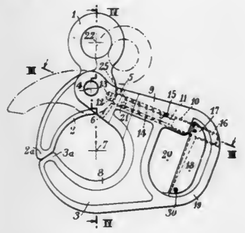
**Jean-Pierre Chapalain, 8-18, rue de Mery, 95310 Saint-Ouen L'Aumone, France**

**Filed Jul. 11, 1979, Ser. No. 56,616**

**Claims priority, application France, Aug. 3, 1978, 78 22949**

**Int. Cl.³ B66C *1/36***

**U.S. Cl. 294—82 R** **3 Claims**



**1**. A load hoisting hook pivotally mounted under a suspension ring having a convex hub-like portion surrounding a pivot member and a depending shank extension adapted to act as a safety pawl of which the free end is adapted to engage the free end of the hook in order to convert the latter into a closed ring, said hub portion having a blind hole and a recess formed therein in spaced relation to one another, means for locking said pawl in a closed hook position with the free end of said pawl engaging the free end of said hook comprising a rectilinear lock bolt having an inner end and adapted to slide in a rectilinear bore formed in the thickness of a backward extension of the hook, and a coaxial spring encircling said bolt and constantly urging said inner end of said bolt into said blind hole, a handle pivotally attached to the backward extension of the hook and to the rear end of said sliding lock bolt to facilitate the retraction of said bolt against said spring to withdraw the inner end of said bolt from said blind hole to permit the inner end of said bolt to engage said recess under the action of said spring to lock said pawl in an open hook position.

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**4,293,157**

**SPLIT CABLE GRIP CLOSURE AND METHOD OF FORMING SAME**

**Alfred W. Fidrych, Stonington, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.**

**Filed Oct. 22, 1979, Ser. No. 87,150**

**Int. Cl.³ F16L *3/00***

**U.S. Cl. 294—86 CG** **18 Claims**

**1**. A cable grip comprising:

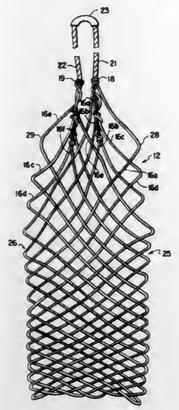
a tubular body portion comprising a split sleeve adapted to enclose a cable and formed of a plurality of flexible, elongated members interwoven to form an open mesh structure with two series of loops, one series along each longitudinal edge of said split sleeve,

said mesh structure of said body portion being capable of varying in a radial direction to increase and decrease the cross-sectional area enclosed thereby,

said two series of loops being longitudinally aligned and interfingered except for two adjacent end loops at one end of said two longitudinal edges; and

locking means for interconnecting said two series of loops,

said locking means comprising a flexible locking member coupling said two adjacent end loops together and extending through each of the remaining longitudinally aligned and interfingered loops,



said flexible locking member comprising two elongated elements, both of which extend through each of the remaining longitudinally aligned and interfingered loops in a side-by-side relationship.

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**4,293,158**

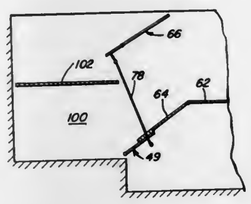
**GATE WITH RAMP DEVICE FOR LIVESTOCK TRAILER WITH LIFT DECK**

**Mack A. Lewis, Sioux City, Iowa, and Mike R. Spencer, Hubbard, Nebr., assignors to Wilson Trailer Company, Sioux City, Iowa**

**Filed Oct. 12, 1979, Ser. No. 84,117**

**Int. Cl.³ B62D *33/04***

**U.S. Cl. 296—24 C** **3 Claims**



**1**. In a compartment for transporting and storing livestock having two sidewalls, a base floor and at least one platform disposed between said sidewalls and being vertically movable within said compartment; a framework pivotally connected to one of said sidewalls for movement between a first position transversely of said compartment and a second position adjacent one of said sidewalls; a lower gate; a first hinge means connecting said lower gate to said framework for movement about a horizontal axis; an upper gate; a second hinge means connected to said framework and vertically spaced from said first hinge means, said second hinge means being connected to said upper gate for pivoting said upper gate about a horizontal axis; a rod hingedly connected to said upper gate and to said lower gate; a ramp hingedly connected to said at least one platform, and further including a plurality of gates hingedly connected to a second one of said sidewalls, said plurality of gates being vertically spaced and capable of movement between a position transverse of said compartment aligned with said framework and a position adjacent said second of said sidewalls, and a deck support member attached to and movable with said framework, said deck support member including height adjustment means for effecting vertical adjustment of said deck support member, said deck support member further including one angle member having a plurality of keyhole slots formed therein and a pair of support plates attached to said framework and containing a plurality of projections for interconnection with said keyhole slots, said angle member being transversely positionable with respect to said support plates so as to optionally locate said deck support member in positions whereby the same will not interfere with rotational movement of the operably associated gates.



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**4,293,159**

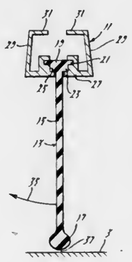
**FLEXIBLE WIND DEFLECTOR**

**John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236**

**Filed May 16, 1979, Ser. No. 39,263**

**Int. Cl.³ B62D *37/02***

**U.S. Cl. 296—91** **9 Claims**



**1**. In an article carrier for roof top mounting on an automotive type vehicle, a pair of mounting rails for mounting on the surface of the vehicle roof to extend lengthwise of the vehicle, and a relatively resilient wind deflector to extend transversely of the length of the vehicle and adapted to direct air flow down across the rear side of the vehicle, means attached to said deflector along the entire length thereof for mounting the wind deflector on said mounting rails so that it extends transversely of the length of the vehicle and so that it is deformable under influence of wind in the direction of the length of the vehicle.

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**4,293,160**

**SIDE GUARD FOR MOTOR VEHICLE**

**Hans Lütze, Aidlingen; Helmut Weisshappel, Sindelfingen; Wolfgang Klie, Korntal, and Dieter Weidemann, Weil der Stadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

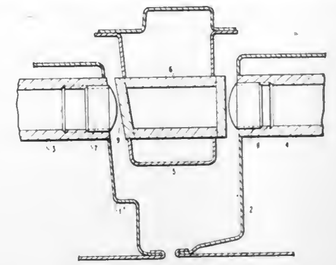
**Filed Jul. 25, 1979, Ser. No. 60,479**

**Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836213**

**Int. Cl.³ B62D *25/02***

**U.S. Cl. 296—188** **8 Claims**

**1**. A lateral protection arrangement for side doors of a motor vehicle, the arrangement including at least one reinforcement means arranged within each of the side doors of the vehicle so as to extend substantially in a longitudinal direction of the vehicle, each of the reinforcement means being adapted to be braced responsive to an application of a compressive force effective in a longitudinal direction of the vehicle, one of directly and indirectly against a fixed vehicle component, characterized in that means are provided for adjusting a length of the reinforcement means so as to bridge a space between an



end of the reinforcement means and the fixed vehicle component.

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**4,293,161**

**VEHICLE ROOF**

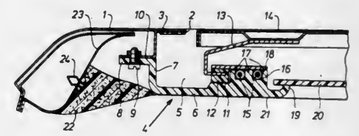
**Alfons Lutz, Emmering, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany**

**Filed Dec. 14, 1979, Ser. No. 103,713**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856015**

**Int. Cl.³ B60J *7/10***

**U.S. Cl. 296—213** **19 Claims**



**1**. Vehicle roof with an aperture surrounded by a frame, a sliding top displaceable by drive cables being guided by means of sliding blocks in said frame, and with a headliner covering the vehicle roof on an interior side thereof, characterized in that the frame is formed of synthetic resin and comprises, on the one hand, sliding surfaces for the sliding blocks and, on the other hand, guide ducts for the drive cables; and that an underside of the frame facing the interior of the vehicle constitutes at least in part the headliner, wherein portions of the frame constituting said headliner, at least in part, are unitarily formed with parts of said frame comprising said sliding surfaces and guiding ducts.

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**4,293,162**

**SUN SHADE FOR INFANT SEAT AND THE LIKE**

**Joe P. Pap; Marilyn D. Pap, both of 19742 Trident La., Huntington Beach, Calif. 92646; Arvil L. Beyler, and Doris M. Beyler, both of 10331 Calle Independencia, Fountain Valley, Calif. 92708**

**Filed Mar. 17, 1980, Ser. No. 130,750**

**Int. Cl.³ A47C *7/62***

**U.S. Cl. 297—184** **4 Claims**

**1**. A sun-shade device for infant seats and the like defining a canopy that is adjustable vertically, horizontally and angularly, wherein the device comprises:

a frame structure having a peripheral frame member, including a pair of parallel longitudinal strut members;

a canopy cover adapted to be removably supported by said frame structure;

a linear-adjusting means slidably mounted to said strut member, whereby said frame structure may be adjusted longi-

tudinally along said strut members, wherein said linear-adjusting means comprises:

a housing having an upper plate and a lower plate secured together by support members; and

restraining means mounted in said housing and adapted to slidably receive said strut members for longitudinal movement therein;

a universal connecting means mounted to said linear adjusting means to allow said canopy to be arranged at a selected angular position; and

a multi-adjustable support structure attached between said universal connecting means and said seat.

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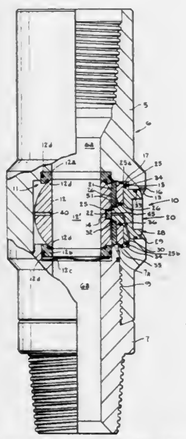
**4,293,163**

## VALVE FOR CLOSING THE FLUID PASSAGE OF A WELL BORE TUBULAR MEMBER WITH BALANCED OPERATING ARRANGEMENT

**Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.**

**Filed Apr. 26, 1977, Ser. No. 790,959**
**Int. Cl.³ F16K *39/00***
**U.S. Cl. 251—283** **3 Claims**



1. A valve arrangement for the fluid passage of a tubular member used in a well bore wherein the tubular member has a lateral, circular opening with an annular shoulder intermediate the ends of the opening, the valve arrangement including:

a. spherical core means rotatably mounted in the tubular member;

b. operating means connected to said spherical core means and rotatably supported in the tubular member to open and close said spherical core means for controlling flow through the fluid passage of the tubular member;

c. seal means between said spherical core means and tubular member and between said operating means and tubular member;

d. said spherical core means and operating means having fluid passage means for conducting fluid from the fluid passage of the tubular member to act on said seal means between said operating means and tubular member for substantially counterbalancing the fluid pressure in the tubular member acting on said operating means;

e. said operating means fitting in the circular opening in the tubular member and including:

1. disc means having a non-circular opening therein and a projection extending laterally thereof;

2. retainer means having a circular opening therein;

3. a cylindrical member having a first annular portion fitting on one side of the shoulder in the circular opening in the tubular member; a second annular portion of larger diameter than the first annular portion and abutting the shoulder in the circular opening in the tubular member; a third annular portion having a diameter smaller than the first annular portion and fitting in the circular opening of said retainer means; and a non-circular portion extending from said third annular portion and fitting in the non-circular opening of said disc means;

f. said spherical core means having a recess on the outer surface thereof with which said projection on said disc means is engaged; and

g. said first annular portion of said cylindrical member having a non-circular surface facing outwardly of the lateral opening in the tubular member whereby said cylindrical member of said operating means may be engaged and rotated whereupon said spherical core means may be rotated to open and close the fluid passage in the tubular member.

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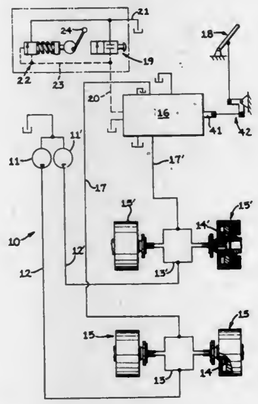
**4,293,164**

## BRAKE CONTROL CIRCUIT WITH PARKING AND RETARDING VALVES

**Wayne A. Hoefer, Blue Springs, Mo., and Paul J. Tanty, Manhattan, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00599, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 13, 1979, PCT Pub. No. WO81/00387, PCT Pub. Date Feb. 19, 1981**
**PCT Filed Aug. 13, 1979, Ser. No. 93,075**
**Int. Cl.³ B60T *15/16***
**U.S. Cl. 303—13** **29 Claims**



1. In a fluid control circuit (**10**) having fluid actuated coupling means (**15**) for being actuated upon controlled communication of pressurized fluid thereto, and first valve means (**25**) for controlling the level of pressurized fluid in said coupling means (**15**) and the degree of engagement thereof, said first valve means (**25**) having an inlet (**28**) connected to said coupling means (**15**), the improvement comprising

a pilot line (**20**),

second valve means (**47**) for actuation between a closed position and an open position venting pressurized fluid at the inlet (**28**) of said first valve means (**25**) and connected to said pilot line (**20**), and

third valve means (**19** or **22**) for closing said pilot line (**20**) and said second valve means (**47**), or for venting said pilot line (**20**) to open said second valve means (**47**) to vent pressurized fluid at the inlet (**28**) of said first valve means (**25**) and in said coupling means (**15**).



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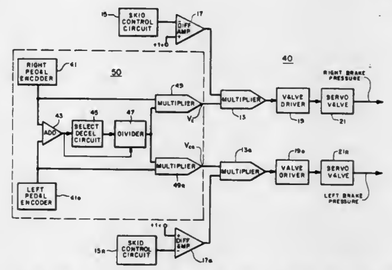
**4,293,165**

## ELECTRONIC CONTROL BRAKE AND SKID CONTROL SYSTEM

**Edgar A. Hirzel, Granada Hills, Calif., assignor to Crane Co., New York, N.Y.**

**Filed Jan. 26, 1978, Ser. No. 872,654**
**Int. Cl.³ B60T *8/20***
**U.S. Cl. 303—93** **27 Claims**



1. In a braking system having a valve driver and a brake pressure modulating servo valve, a brake and skid control comprising:

brake command means for generating a brake command signal indicative of a commanded brake pressure;

skid control means for generating a skid control signal which is independent of said brake command signal; and

modification means responsive to said brake command signal and said skid control signal for providing to the valve driver a modified brake command signal indicative of a modified brake pressure, wherein said modification means includes means for setting said modified brake pressure to a value less than said commanded brake pressure by an amount which is a function of both said brake command signal and said skid control signal.

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**4,293,166**

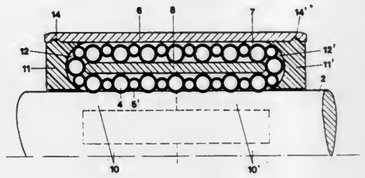
## ROLLING BEARING FOR RELATIVE LINEAR MOVEMENT ON A SHAFT

**Horst M. Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany**

**Continuation of Ser. No. 925,947, Jul. 19, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,317**
**Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 260312; Jul. 19, 1978, 925947**
**Int. Cl.³ F16C *29/06***
**U.S. Cl. 308—6 C** **12 Claims**

1. In a rolling bearing for relative linear movement between the bearing and a cylindrical machine element, with several continuous courses of spool shaped rolling bodies distributed about the circumference of a multipart annular body, the improvement wherein barrel shaped guide rollers are positioned to float between the spool shaped rolling bodies, the guide rollers held in continuous line contact with the roll surfaces of adjacent rolling bodies, the distance between the longitudinal axes of adjacent rolling bodies being less than the sum of the distances between the longitudinal axis of a guide roller between said adjacent rolling bodies and the longitudinal axes of said adjacent rolling bodies continuously throughout said courses.

12. In a rolling bearing for linear movement with respect to a machine element having a cylindrical surface, wherein a plurality of rolling elements are mounted to engage said surface, the central portions of the rolling elements having longitudinal cross sections with concave central portions, and the rolling bearing having means for guiding said rolling elements to follow a continuous path including linear path sections for



loaded and unloaded elements joined by turn-around path sections; the improvement wherein said bearing further comprises a plurality of separating rollers having convex longitudinal cross section adapted to engage the concave regions of said rolling elements in mutually continuous line contact, with one of said separating rollers between each pair of adjacent rolling elements and separating said rolling elements from mutual contact, the axes of said rolling elements and separating rollers being parallel, wherein said rolling elements and rollers are packed to hold the axes of said rollers closer to said machine element than the axes of said rolling elements in said linear path for loaded elements and to hold the axes of said rollers further from said machine element than the axes of said rolling elements in said linear path for unloaded elements.

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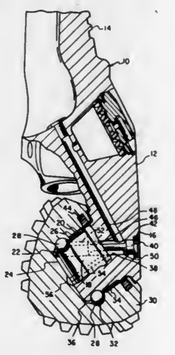
**4,293,167**

## ROLLING CUTTER DRILL BIT WITH IMPROVED JOURNAL CONFIGURATION

**Terry H. Mayo, and John D. Parrish, both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.**

**Continuation of Ser. No. 876,969, Feb. 13, 1978. This application Mar. 24, 1980, Ser. No. 133,221**
**Int. Cl.³ F16C *17/12***
**U.S. Cl. 308—8.2** **5 Claims**



1. A rolling cutter drill bit comprising:

a bit body;

at least one lug extending downward from said body;
each said lug having a journal shaft formed thereon, said shaft extending downward and comprising: a cylindrical radial bearing portion defining the main diameter of said shaft, a single, generally flat, free end on said radial bearing portion covering substantially the entire diameter thereof and being substantially perpendicular thereto, and an axial bearing portion on said free end of said journal shaft, extending across substantially all of said main diameter of said shaft;
a cutter rotatably mounted on each said journal shaft and having formed therein a radial bearing portion arranged to be located over said journal shaft radial bearing portion, and an axial bearing portion arranged for rotatable bearing action with said shaft axial bearing portion;
first bearing means located between and rotatably conjoining said shaft radial bearing portion and said cutter radial bearing portion;
second bearing means arranged for rotatable interaction with said cutter axial bearing portion and said shaft axial bearing portion; and,
retention means between said cutter and said journal shaft arranged to retain said cutter on said shaft.

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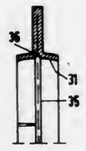
**4,293,168**
**HOUSING FOR Y-BEARING**
**Hendrikus J. M. Timmer, Tiel, Netherlands, assignor to SKF Industrial Trading & Development, B.V., Nieuwegein, Netherlands**
**Division of Ser. No. 814,349, Jul. 11, 1977, Pat. No. 4,213,225. This application Mar. 18, 1980, Ser. No. 131,504**
**Claims priority, application Netherlands, Jul. 9, 1976, 7607602**
**Int. Cl.³ F16C** *23/04, 23/08, 33/66*
**U.S. Cl. 308—72** **3 Claims**



1. A housing for a Y-bearing comprising a plate member having a central aperture split and shaped to define a bearing seat, a radially directed flange spaced axially from the bearing seat and means defining an annular groove in approximately the middle of the bearing seat defining a lubrication channel.

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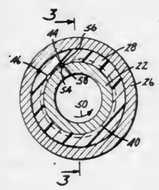
**4,293,169**
**WATER BEARING**
**Harold G. Inhofer, Hopkins, Minn., assignor to Aeration Industries, Inc., Chaska, Minn.**
**Filed Oct. 22, 1979, Ser. No. 87,004**
**Int. Cl.³ F16C** *17/14, 33/20*
**U.S. Cl. 308—121** **18 Claims**



1. A bearing for supporting a rotating shaft in a liquid environment, said bearing comprising a sleeve including a circularly cyclindrical inner support surface having a first axial end, a second axial end, and a channel formed in said surface spiraling from said first axial end about the shaft for at least 300° and less than 360°, said channel communicating at said first axial end with the liquid environment in which said bearing is disposed.

9. A bearing for supporting a rotating shaft within an outer housing in a liquid environment, comprising a sheet of material with first and second lateral edges, first and second opposing sides, and one smooth face having formed therein a channel extending diagonally from said first side, proximate said first lateral edge, said sheet being flexible so that it can be mounted within the housing closely encircling the rotating shaft with said smooth face inwardly disposed.

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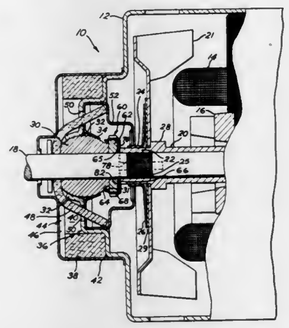
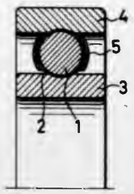
**4,293,170**
**THRUST BEARING ASSEMBLY**
**Bernard J. Brezosky, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**
**Filed Nov. 21, 1979, Ser. No. 96,713**
**Int. Cl.³ F16C** *17/08*
**U.S. Cl. 308—161** **7 Claims**



1. A thrust bearing assembly for use in a motor structure to absorb the axial thrust of the motor drive shaft, the shaft being rotatably supported by at least one nonrotating support bearing, said thrust bearing assembly comprising:
an annular thrust bearing loosely carried on the drive shaft adjacent the support bearing, having a first thrust bearing surface facing the support bearing, a second thrust bearing surface facing opposite from said first thrust bearing surface, and at least one slot formed on the outer periphery of said thrust bearing;
a drive ring carried on the drive shaft, having a thrust transmitting surface facing said second thrust bearing surface of said thrust bearing and having at least one bearing engaging finger projecting from the outer periphery of said drive ring and engaging said one slot on said thrust bearing for rotating said bearing with said drive ring; and
a collet fixedly mounted to the drive shaft, said collet having one end disposed adjacent said drive ring opposite said thrust bearing and having at least one longitudinal slot formed in said one end, and at least one collet engaging finger projecting from the inner periphery of said drive ring and received in said at least one longitudinal slot in said collet for rotating said drive ring with the drive shaft whereby said thrust bearing rotates with the drive shaft and absorbs axial thrust exerted by the drive shaft toward the support bearing.



**4,293,171**
**ANTI-FRICTION BEARING**
**Ken-Ichi Kakumoto, Kashihara, and Yoshiki Fujita, Andomura, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan**
**Filed Oct. 19, 1979, Ser. No. 86,676**
**Claims priority, application Japan, Oct. 25, 1978, 53-132041**
**Int. Cl.³ F16C** *19/02, 33/32*
**U.S. Cl. 308—188** **1 Claim**



1. An anti-friction bearing comprising metal components to be subjected to rolling friction or sliding friction, at least one of the rolling elements included in the metal components being coated with at least one intermediate metal layer by ion plating, the intermediate layer being coated by ion plating with an uppermost layer of a soft metal with lubricating property, the solid solubility of the metal of the intermediate layer in each metal adjacent thereto being higher than the solid solubility of the soft metal in the metal material of the rolling element metal, wherein the metal components are made of an iron alloy, and the rolling elements are coated with a lower intermediate layer of nickel and an upper intermediate layer of copper, the uppermost layer being made of gold or silver.

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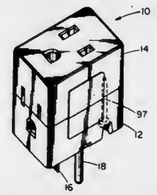
**4,293,172**
**CASE FOR ELECTRICAL MULTIPLE OUTLET**
**Bhartoor Lingaraju, Allentown, Pa., assignor to Square D Company, Palatine, Ill.**
**Filed Oct. 23, 1979, Ser. No. 88,195**
**Int. Cl.³ H01R** *4/66, 13/514*
**U.S. Cl. 339—14 P** **8 Claims**



1. An improved thin wall correlative case for use with an electrical multiple outlet having; a grounding contact assembly having a ground prong and at least two ground contact elements, two live contact assemblies each having a live contact blade and at least two live contact elements, two insulative partitions for preventing contact between the grounding contact assembly and the two live contact assemblies, and a means for holding said case together, said correlative case comprising:
a bottom section and a top section, each of said top and bottom sections having;
a floor, first and second side walls, and first and second end walls,
a receiving slot in said first end wall, said receiving slot having a rectangular notch in its bottom portion,
a planar projection extending from said second end wall with a semi-circular notch in its far end and two rectangular notches positioned in said second end wall on either side of said planar projection;
first and second substantially rectangular apertures in said floor of said bottom section, said apertures being positioned parallel to each other and parallel to said end walls, and a substantially circular aperture in said floor of said bottom section, said circular aperture being located near said first side wall;
means for positioning the grounding contact assembly, the two live contact assemblies, and the two insulative partitions within said case; and
wherein, when said top and bottom sections of said case are assembled, each of said end walls forms a surface having two rectangular apertures parallel to each other and a D-shaped aperture,
and also wherein, when said multiple outlet is completely assembled, said ground prong and said two live contact blades extend through said circular aperture and said first and second rectangular apertures, respectively, in said floor of said bottom section, and wherein said ground contact elements align with said D-shaped apertures and said live contact elements align with said rectangular apertures in said end walls.

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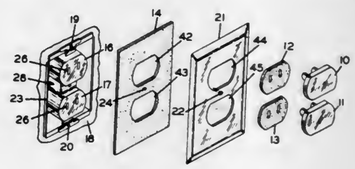
**4,293,173**
**ELECTRICAL OUTLET INSULATION SYSTEM**
**Raymond A. Tricca, Farmington Hills, Mich., assignor to Armstrong Cork Company, Lancaster, Pa.**
**Continuation-in-part of Ser. No. 878,412, Feb. 16, 1978, abandoned. This application Jan. 8, 1979, Ser. No. 1,732**
**Int. Cl.³ H01R** *13/44*
**U.S. Cl. 339—38** **3 Claims**



1. In an electrical wall outlet of the type wherein there is at least one electrical receptacle having a raised socket with slots therein adapted for receiving the blades of an appliance plug, a faceplate secured to the electrical receptacle and said raised socket extends through said faceplate, and said electrical receptacle and faceplate are mounted on an electrical box which is positioned within a wall, the improvement comprising:
(a) a first large plate of thermal insulation having a compressible and resilient character secured behind said faceplate, between said faceplate and said wall, said large plate of thermal insulation extending to the exterior edges of said faceplate and having at least one aperture therein which has the edges thereof engaging the sides of the raised socket of the electrical receptacle, said outer edges of said faceplate forming a seal around the outer edges of said faceplate between said faceplate and said wall, said edges of said aperture snugly fit around the raised socket whereby said large plate of thermal insulation functions to reduce heat conduction and reduce air infiltration through said outlet around the exterior edges of the faceplate and around the edges of the faceplate through which the socket passes;
(b) at least one non-electrically conductive dummy plug having a backing with blades adapted to fit into said receptacle slots, said dummy plug functions to prevent air infiltration through said slots, said dummy plug having a raised ridge around the edge of its backing to provide a recess in backing on the side of the backing containing the blades;

(c) at least one second small plate of thermal insulation adapted to fit removably over the front face of said receptacle socket, said small plate having slots through which the blades of said dummy plug may extend, said small plate of thermal insulation being sized to fit in and being positioned in said plug recess, said second plate also functions to reduce heat conduction and air infiltration through said outlet.

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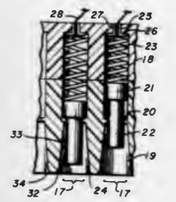
**4,293,174**
**ELECTRICAL CIRCUIT TESTER**
**Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.**
**Filed Sep. 18, 1978, Ser. No. 943,231**
**Int. Cl.³ H01R *21/28***
**U.S. Cl. 339—64 M** **4 Claims**



1. Apparatus for simultaneously establishing electrical contact with a plurality of linearly arranged conductive terminals of uneven height which protrude from a substrate, said apparatus enabling the testing of circuitry connected to said terminals, the apparatus comprising:

elongated bar means, said bar means being comprised of a non-conductive material, said bar means defining a linear array of chambers, said chambers each having an axis and the axes of said chambers being substantially parallel, said bar means further defining extensions of said chambers having a variable cross-sectional area, the first larger cross-sectional area ends of said chamber extensions lying in the plane of a first exterior surface of said bar means whereby terminals protruding from a substrate may be guided by a wall of said chamber extensions toward the chamber axis, first ends of the said chambers and the second ends of said chamber extension being in communication via apertures having a smaller cross-sectional area than the adjacent chamber whereby a shoulder is defined at the said first ends of said chambers;

electrically conductive piston means disposed for axial movement in each of said chambers, said piston means being dimensioned such that movement thereof in a first direction will be limited by said shoulders, said piston means being of shorter axial length than each of said chambers;

electrically conductive piston rod means, said piston rod means comprising conductive extensions of said piston means, said piston rod means extending into said chamber extensions via said apertures for contacting a terminal, said piston rod means being of smaller diameter than said piston means;

electrically conductive spring means positioned in said chambers to resiliently bias said piston means toward the first ends of said chambers, said spring means allowing said piston means to retract when said piston rod means contact a terminal, said spring means defining conductive paths from said piston rod means to the second ends of said chambers;

means cooperating with said bar means to define an elongated cavity, at least a portion of a second exterior surface of said bar means disposed oppositely to first exterior surface being located within said cavity; and

means extending into the second ends of said chambers for electrically connecting said spring means to individual conductors of a multi-conductor cable of a test instrument, said cable being partly positioned in said cavity.

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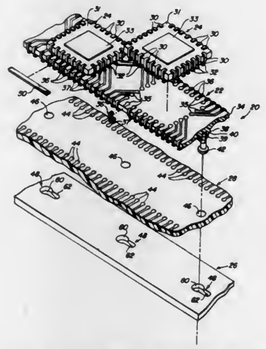
**4,293,175**
**CONNECTOR FOR INTEGRATED CIRCUIT PACKAGES**
**John M. Cutchaw, Scottsdale, Ariz.**
**Continuation-in-part of Ser. No. 913,871, Jun. 8, 1978, Pat. No. 4,166,665, which is a continuation-in-part of Ser. No. 862,582, Dec. 20, 1977, Pat. No. 4,164,003, which is a continuation-in-part of Ser. No. 754,368, Dec. 27, 1976, Pat. No. 4,063,791. This application Aug. 6, 1979, Ser. No. 64,057**
**Int. Cl.³ H01R *13/62***
**U.S. Cl. 339—75 MP** **23 Claims**



1. A connector for removably mounting an integrated circuit package on a backpanel having at least one hole formed therethrough and for electrically coupling the integrated circuit package to the terminal pads of the backpanel, said connector comprising:

(a) a carrier member of planar configuration for positioning adjacent one of the planar surfaces of the backpanel and movable toward the backpanel, said carrier member having at least one boss extending normally from one planar surface thereof for slidable positioning in the hole formed in the backpanel when said carrier member is positioned adjacent thereto;

(b) at least one integrated circuit package mounted on the other planar surface of said carrier member and having electrical contact means thereon;

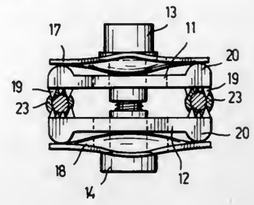
(c) electrical interconnecting means on said carrier member in conductive contact with the electrical contact means of said integrated circuit package and for pressurized conductive contact with the terminal pads of the backpanel when said carrier member is positioned adjacent thereto;

(d) stud means extending axially from the boss of said carrier member so as to extend through the hole of the backpanel when said carrier member is positioned adjacent thereto; and

(e) a mounting plate positionable in contiguous contact with the opposite planar surface of the backpanel and laterally movable relative thereto, said mounting plate having at least one aperture means formed therethrough for receiving said stud means when said carrier member and said mounting plate are positioned adjacent the opposite planar surfaces of the backpanel, said stud means interacting with the aperture means of said mounting plate upon lateral movement thereof to pull said carrier member toward the backpanel to provide the pressurized conductive contact between said electrical interconnecting means and the terminal pads of the backpanel.



**4,293,176**
**ELECTRICAL CONNECTION**
**Martti Lindlöf, Telakkatie 10, 06150 Porvoo 15, Finland**
**Filed Feb. 28, 1980, Ser. No. 125,659**
**Int. Cl.³ H01R *4/44***
**U.S. Cl. 339—98** **4 Claims**



1. An electrical connector including two jaws, each jaw having a first side facing the other jaw and a second side facing away from the other jaw, the first side of at least one of the jaws having two approximately parallel zones of teeth and the second side of said one jaw having a bead opposite each zone of teeth, and a clamping means for said jaws, said means comprising at least one bolt extending through aligned openings in said jaws and being provided with axially spaced apart shoulders, and a plate spring located between at least one of said shoulders and the second side of said one jaw, said plate spring pressing against said beads.

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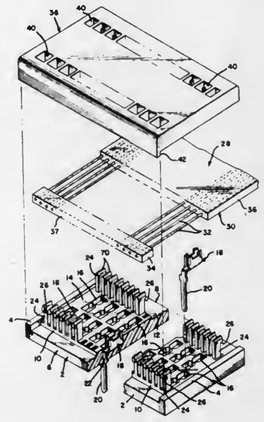
**4,293,177**
**FLAT CABLE CONNECTOR**
**Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.**
**Division of Ser. No. 853,608, Nov. 21, 1977, Pat. No. 4,160,573. This application Jan. 8, 1979, Ser. No. 1,551**
**Int. Cl.³ H01R *13/514***
**U.S. Cl. 339—99 R** **4 Claims**



1. A stamped and formed metal electrical contact, comprising:

a pair of plate portions joined entirely along first sides by an elongated common bight and facing each other to define a conductor receiving passageway elongated parallel to said bight, said passageway having an elongated open side defined by spaced apart second sides of said plate portions for receiving a conductor laterally of its axis,

said plate portions having first edge margins opposing each other across one end of said passageway and extending from said bight to said open side of said passageway,

said first edge margins projecting, at obverse angles with the remainder of respective said plate portions, diagonally toward each other and defining therebetween a first conductor receiving opening at one end of said passageway and having a width less than the width of an elongated conductor to be received along said passageway and said first conductor receiving opening,

said plate portions having second edge margins opposing each other across a second end of said passageway and extending from said bight to said open side of said passageway,

said second edge margins projecting, at obverse angles with the remainder of respective said plate portions, diagonally toward each other and defining therebetween a second conductor receiving opening having a width less than the width of a conductor to be received along said passageway and said first and said second conductor receiving openings,

said first and second edge margins comprising resiliently deflectable, conductor engaging jaws for resiliently engaging a conductor inserted laterally of its axis into and along said passageway and said first and second conductor receiving openings, and

means on said contact for connecting the same electrically to an electrical circuit.

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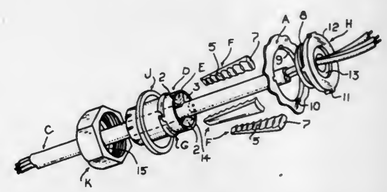
**4,293,178**
**COUPLING FOR AN ELECTRIC CABLE**
**Hop Lee, 2455 - 24th Ave., San Francisco, Calif. 94116**
**Filed Aug. 3, 1979, Ser. No. 63,393**
**Int. Cl.³ H01R *13/585***
**U.S. Cl. 339—103 R** **2 Claims**



1. In a coupling for an electric cable; the improvement comprising:

(a) a sleeve receiving the cable in extension therethrough;

(b) a liner received within the sleeve and having longitudinally extending wedge-shaped grooves, the portions of the liner lying between adjacent grooves having their inner faces contacting the cable; and

(c) wedges received in the grooves and having teeth on their inner surfaces for gripping the cable, the teeth being inclined for digging into the cable when the cable is pulled away from the coupling, whereby the teeth prevent any longitudinal movement in the sleeve.

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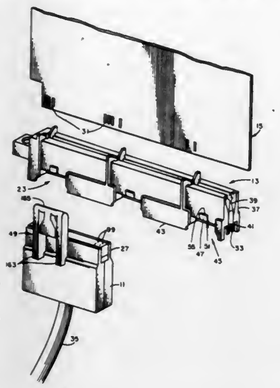
**4,293,179**
**CIRCUIT BOARD INTERCONNECTION SYSTEM**
**David L. Vonder, Addison, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.**
**Filed Oct. 3, 1979, Ser. No. 81,516**
**Int. Cl.³ H01R *23/70***
**U.S. Cl. 339—176 MP** **8 Claims**

1. A circuit board interconnection system for electrically interconnecting a plurality of conductors to one edge of a printed circuit board, said interconnection system comprising:

a circuit board connector including an elongated body having a plurality of apertures, each of said apertures includ-

ing an electrical contact retained therein, each of said contacts including a circuit board engaging portion and a terminal engaging portion, said circuit board engaging portions in contact with said circuit board and electrically connecting said contacts to said circuit board, said circuit board connector further including at least one female receptacle portion defined by spaced side walls extending from said body about said terminal engaging portions; and



a cable connector including a body having a male portion, said male portion including a plurality of terminals on one face thereof, each of said terminals electrically interconnected to one of said plurality of conductors, and said male portion inserted into said circuit board connector receptacle portion with said face engaging said circuit board connector terminal engaging portions, electrically interconnecting respective terminals to respective contacts.

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**4,293,180**

## RESILIENT BIASING MEANS

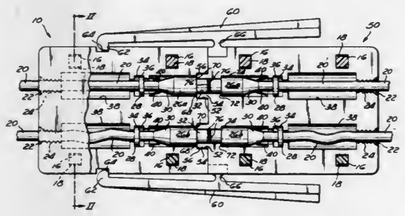
**Derek Taylor, Whitstable, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Filed May 29, 1979, Ser. No. 43,604**

**Claims priority, application United Kingdom, May 31, 1978, 25338/78**

**Int. Cl.³ H01R *13/422***

**U.S. Cl. 339—217 R** **7 Claims**



1. An optical fibre or electrical connector, comprising:

a connector body member; means defining a passageway extending through said body member; a termination member, suitable for terminating an electrical conductor or an optical fibre, said termination member being mounted for sliding movement within said passageway; means resiliently biasing said termination member against sliding movement in a first direction in said passageway relative to said connector body member, said biasing means comprising at least one resilient tine acting between said termination member and said connector body member with a free end of said tine in sliding engagement with a surface on said termination member, said surface being non-parallel with said first direction and causing said tine to be deflected about its root transverse to said first direction upon the occurrence of relative movement between said termination member and said connector body member in said first direction; and means independent of said biasing means for limiting sliding movement of said termination member in said passageway, said movement limiting means limiting sliding movement of said termination member in said passageway between spaced-apart forward and rearward limit positions.

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**4,293,181**

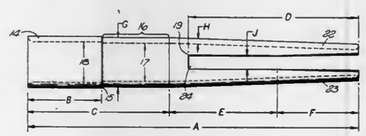
## LOW INSERTION FORCE ELECTRICAL SOCKET CONNECTOR

**Leonard Lacaze, Jr., San Juan Capistrano, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Continuation of Ser. No. 850,629, Nov. 11, 1977, abandoned. This application Nov. 7, 1979, Ser. No. 91,960**

**Int. Cl.³ H01R *13/11***

**U.S. Cl. 339—258 R** **6 Claims**



1. An electrical connector socket member for receiving a conductive pin of generally circular cross-section inserted longitudinally and extending into said socket member from a forward end thereof;

a rear longitudinal portion of said socket member extending from a rear end of said socket member to an intermediate point thereof;

a forward, hollow longitudinal portion of said socket member having generally conically converging inside and outside diameters and embodying a plurality of integral tines extending from said intermediate point to said forward end, said tines being arranged to elastically deflect radially outwardly when a pin in inserted, for maintaining a radially inward contact pressure against the pin;

said tines having longitudinally extending edges spaced from each other throughout the entire length of said tines, and the distance between said edges over a substantial length of said tines commencing from said intermediate point being substantially constant; and

the region about said intermediate point comprising the tine root region, the material of said tine root region having substantially uniform modulus of elasticity throughout.

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**4,293,182**

## ELECTRICAL CONNECTOR BODY AND METHOD OF MAKING SAME

**Lawrence Schwartz, Huntington Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Jan. 21, 1980, Ser. No. 113,610**

**Int. Cl.³ H01R *13/504***

**U.S. Cl. 339—275 R** **2 Claims**

1. A method of making a unitary electrical connector body having a shell portion surrounding an inner portion of predetermined axial length comprising the steps of:

providing a first insulation material and a second insulation material containing a conductive filler;

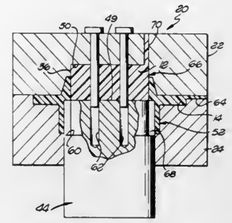
providing a mold cavity having a side wall and an end wall;



inserting a core into said cavity spaced from said side wall defining therebetween a shell mold cavity, with said core closing said end wall of said cavity;

thereafter injecting said second material into said shell mold cavity while said core is in said cavity to form the shell portion of said connector body;

partially retracting said core in said cavity said predetermined length to provide an inner mold cavity within said shell portion defined by the inner surface of said shell portion, said cavity end wall and the inner end of said core;



thereafter injecting said first material into said inner mold cavity to form the inner portion of said connector body;

said first and second materials being in substantially uncured, liquid form when injected and being curable to a solid form, said first material being injected so as to flow into intimate contact with said second material while said second material is in substantially uncured condition; and

curing said materials together in said mold cavity to form said unitary electrical connector body.

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**4,293,183**

## METHOD OF HOLOGRAPHIC RECORDING AND RECONSTRUCTION OF SPATIAL WAVES

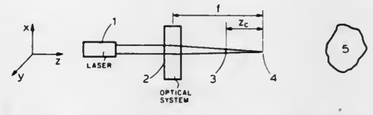
**Okan K. Ersoy, Li, Norway, assignor to Sentralinstitutt for Industriell Forskning, Oslo, Norway**

**Filed Mar. 9, 1979, Ser. No. 19,188**

**Claims priority, application Norway, Mar. 9, 1978, 780833**

**Int. Cl.³ G03H *1/28***

**U.S. Cl. 350—3.77** **3 Claims**



1. A method for the production of a hologram of at least one object wavefront and reconstruction of the same by means of a spherical reference/reconstruction wave, said method comprising:

locating a point source of the reference/reconstruction wave a very short distance from the hologram;

slightly adjusting said distance during the reconstruction process, whereby only one reconstructed image selected from a group consisting of a real image, a virtual image, images of different order of the same object, and images of different objects is focused with said source in a given position close to said hologram, while the other images are simultaneously defocused by being located very close to said hologram; and

determining said distance on the basis of the signal to noise ratio desired at the image position, geometrical dimensions which per se are known to cause defocusing, such as hologram size, distance between the hologram and the object, and the area of hologram apertures.

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**4,293,184**

## SCANNING PROJECTION DEVICE

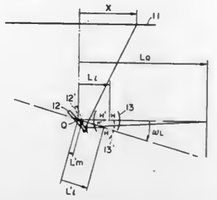
**Kazuo Minoura, Yokohama; Muneharu Sugiura, Tokyo; Setsuo Minami, Kawasaki, and Tadashi Sato, Kokubunji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 20, 1979, Ser. No. 105,881**

**Claims priority, application Japan, Dec. 28, 1978, 53-164826; May 14, 1979, 54-58975**

**Int. Cl.³ G02B *27/17***

**U.S. Cl. 350—6.3** **6 Claims**



1. A scanning projection device comprising:

a fixed first plane having a surface to be scanned;

a second plane upon which the image of said first plane is projected;

a deflector disposed between said first plane and said second plane to project the image of said first plane at a predetermined position on said second plane with lapse of time;

a projection optical system disposed between said deflector and said second plane to place said first plane and said second plane in an optically conjugate positional relation;

means for swinging and tilting said projection optical system in synchronism with the deflecting action of said deflector, wherein the center of swing and tilting of said projection optical system lies on the deflecting-reflecting surface of said deflector; and

means for varying the distance between said deflector and said projection optical system in synchronism with the deflecting action of said deflector.

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**4,293,185**

## OPTICAL CONVERSION ASSEMBLY FOR OBJECTIVE CAMERA LENSES

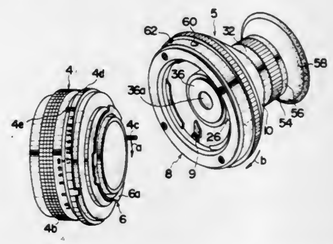
**Yasuo Yamazaki, Kawachinagano, and Takeshi Egawa, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 26, 1979, Ser. No. 106,444**

**Claims priority, application Japan, Jan. 12, 1979, 54-3276[U]**

**Int. Cl.³ G02B *21/00***

**U.S. Cl. 350—18** **8 Claims**



1. An optical attachment adapted for use with an objective camera exchangeable lens which includes a diaphragm interlocking member movable between a first position to maximize an aperture size of a diaphragm mechanism and a second position to minimize the aperture size, said diaphragm interlocking member being biased toward said second position, the optical

attachment capable of providing a view of an object without the necessity of a camera body comprising:

lens mounting means on which said camera exchangeable lens can be detachably mounted, said lens mounting means having an axis capable of alignment with an optical axis of a camera exchangeable lens when mounted thereon;

a prism erecting system for rotating an image about vertical and horizontal axes, said prism erecting system provided on said axis and including a light entrance surface perpendicular to said axis and a light emitting surface in parallel with said light entrance surface;

retaining means for retaining said diaphragm interlocking member in its first position when said camera exchangeable lens is operatively connected, and

an occular system provided in the light path of the light emitted from said light emitting surface.

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**4,293,186**

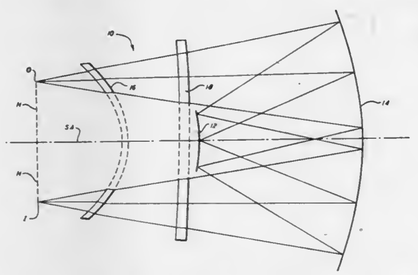
**RESTRICTED OFF-AXIS FIELD OPTICAL SYSTEM**

**Abe Offner, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Continuation-in-part of Ser. No. 938,569, Aug. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 767,906, Feb. 11, 1977, abandoned. This application Dec. 21, 1979, Ser. No. 106,415**

**Int. Cl.³ G02B *17/08***

**U.S. Cl. 350—27** **66 Claims**



1. In a restricted off-axis field optical system having a broad spectral range, which includes refracting means, the improvement comprising:

said optical system being constructed and arranged so that the Petzval sum is substantially zero, and said refracting means including means for balancing the effects of the variation in said Petzval sum due to variation in color by introducing axial chromatic aberration of the opposite sense so that the position of focus at the off-axis field remains substantially constant.

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**4,293,187**

**BINOCULAR OPTICAL SYSTEM WITH AUTOMATIC FOCUSSING**

**Isao Ishibai, Machida, and Kunimitsu Kobayashi, Higashimurayama, both of Japan, assignors to Hoya Corporation, Tokyo, Japan**

**Filed Sep. 10, 1979, Ser. No. 74,354**

**Claims priority, application Japan, Sep. 11, 1978, 53-111430**

**Int. Cl.³ G02B *7/11, 23/04***

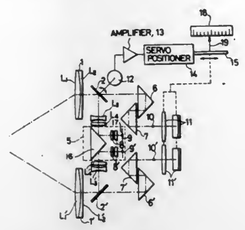
**U.S. Cl. 350—36** **16 Claims**

1. A binocular optical system for viewing an object, said system comprising:

first and second optical paths for respectively providing first and second light fluxes of an object to be viewed by said binocular optical system;

means for directing first portions of said first and second light fluxes through non-focused lenses to an image screen along first and second optical paths to produce first and second images, respectively;

means for aligning said first and second images with one another on said image screen; and




means for focussing third and fourth images to be viewed through said binocular optical system in response to said aligning means, said third and fourth images being formed by second portions of said first and second light fluxes, respectively.

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**4,293,188**

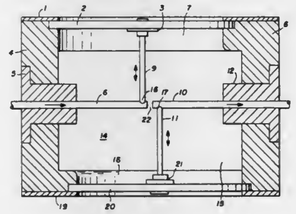
**FIBER OPTIC SMALL DISPLACEMENT SENSOR**

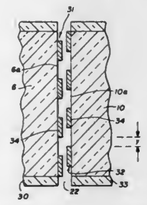
**Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 133,171**

**Int. Cl.³ G02B *5/172, 5/18***

**U.S. Cl. 350—96.29** **37 Claims**





1. Optical transducer means including:

mounting means having at least first casing means with an inert damping fluid disposed therewithin, said first casing means including first pressure sensing diaphragm means which has a first time constant,

first optical wave guide means disposed upon said mounting means and having a first longitudinal axis and a first end face,

second optical wave guide means disposed upon said mounting means and having a second longitudinal axis and a second end face,

said first and second axes being normally coincident at least in the unexcited state of said transducer means, whereby said first and second end faces then lie in substantially parallel relation and form a gap therebetween,

first and second regular grating array means interposed in substantially parallel spaced relation within said gap substantially perpendicular to said first and second longitudinal axes, and

suspension means adapted to permit relative displacement between said first and second regular grating array means in response to deflections of said first pressure sensing diaphragm means for modulation of light passing through said first and second regular grating array means.



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**4,293,189**

**LIGHT REFLECTING DEVICE**

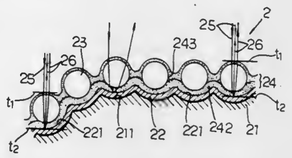
**Yoshiharu Morikawa, Toyonaka, Japan, assignor to Solid Corporation, Hyogo, Japan**

**Filed Mar. 20, 1979, Ser. No. 22,106**

**Claims priority, application Japan, Mar. 31, 1978, 53-42826[U]; Nov. 10, 1978, 53-154731[U]; Nov. 10, 1978, 53-154732[U]**

**Int. Cl.³ G02B *5/128***

**U.S. Cl. 350—105** **13 Claims**



1. A light reflective device comprising:

a support member having a surface having a substantially constant roughtness defining dents within the range of 10 to 100 microns;

a continuous light reflecting layer covering the support member surface and having a light reflecting outer surface coextensive with and formed in conformity with the contours of the underlying ueven dented surface of the support member, said light reflecting outer surface thus having a substantially constant roughess defining dents within the range of 10 to 100 microns;

substantially transparent fine spherical glass beads having a high refractive index and spaced from the light reflecting surface by a distance approximately equal to the focal distance of the glass beads, the glass beads being sized to fit in dents of the light reflecting surface; and

a resin layer covering the glass beads and light reflecting layer, said resin layer comprising a first layer portion and a second layer portion each having light transmitting properties and each comprising a synthetic resin, the first layer portion having a thickness approximately equal to the focal distance of the glass beads and covering the light reflecting layer, the glass beads being dispersed over the first layer portion whereby the glass beads are spaced from the light reflecting layer by a distance approximately equal to the focal distance of the glass beads, the second layer portion covering the first layer portion and the glass beads and forming an outer surface having projections and indentations substantially conforming to the contours of the glass beads.

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**4,293,190**

**TRANSPARENCY VIEWERS**

**George R. Clover, London, England, assignor to Oakeridge Management Services B.V., Netherlands**

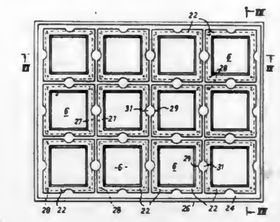
**Filed May 30, 1979, Ser. No. 43,620**

**Claims priority, application United Kingdom, May 31, 1978, 25865/78**

**Int. Cl.³ G02B *27/02***

**U.S. Cl. 350—241** **8 Claims**

1. A transparency viewer comprising a screen for supporting transparencies, and respective individual carrier modules secured over said screen in an array for retaining such transparencies on said screen in said array, each said carrier module constituting a frame to extend over and around the periphery of a transparency, and adjacent carrier modules defining with



one another and with the screen guides along which a viewing member can be slid for registration with any selected transparency in said array.

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**4,293,191**

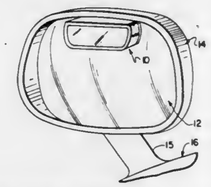
**ADJUSTABLE CONVEX REARVIEW MIRROR**

**Matthew S. Kim, 114 S. 6th St., Bangor, Pa. 18013**

**Filed May 9, 1980, Ser. No. 148,516**

**Int. Cl.³ G02B *5/12***

**U.S. Cl. 350—293** **7 Claims**



1. An adjustable convex rearview mirror comprising:

a support housing adapted to be rigidly secured to a surface and having a first hinge member at one end and a cantilever arm at the other end with a pin at the distal end of said arm;

a convex mirror;

a mirror housing having a slot for receiving the periphery of said convex mirror;

said mirror housing having a second hinge member at one end hingedly coupled to said first hinge member to hingedly couple said support housing and said mirror housing for adjusting the angular alignment of said mirror relative to said support housing,

said mirror housing having a plurality of apertures defined therein at the other end for selectively receiving said pin as said mirror housing is pivoted relative to said support housing about said hinge members,

said mirror housing telescopically receiving a part of said support housing therein.

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**4,293,192**

**SOLAR REFLECTOR WITH FLEXIBLE SHEET TIGHTLY SECURED AROUND FORM SURFACES**

**Allen I. Bronstein, 541 Bryson Ave., Palo Alto, Calif. 94306**

**Filed May 27, 1980, Ser. No. 153,016**

**Int. Cl.³ G02B *7/18, 5/10***

**U.S. Cl. 350—296** **14 Claims**

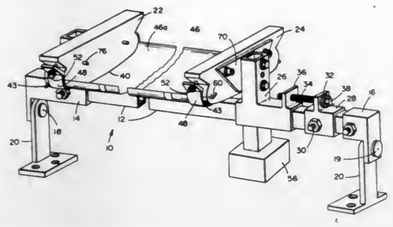
1. A solar reflector comprising:

a longitudinal slideway;

a pair of parallel form members carried on said slideway;

said form members having identical, form surfaces along a portion of the periphery thereof;

a flexible sheet of a material having a reflective surface;
means on said form members securing opposite edges of said flexible sheet tightly around said form surfaces;
a slide member slidable along said slideway;



one of said form members being supported on said slide member; and
positive mechanical means for moving said slide member to tension said flexible sheet.

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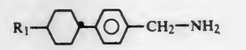
**4,293,193**
**AMINE-SUBSTITUTED LIQUID CRYSTAL COMPOSITIONS**
**Mortimer M. Labes, Philadelphia, and John H. MacMillan, Ambler, both of Pa., assignors to Temple University, Philadephia, Pa.**
**Filed Aug. 15, 1979, Ser. No. 66,811**
**Int. Cl.³ C09K *3/34*; G02F *1/13***
**U.S. Cl. 350—350 R** **14 Claims**

1. A liquid crystalline composition comprising at least two liquid crystalline compounds including one or more liquid crystal compounds from the group consisting of:

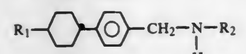
Formula 5



Formula 6

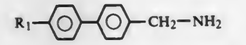


Formula 8

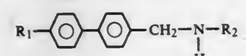


Formula 9

Formula 10

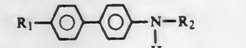


Formula 11



Formula 12

Formula 13



where $R_1$ is an alkyl or alkoxy group having 1–10 carbon atoms, and where $R_2$ is an alkyl group of 1–10 carbon atoms.

12. A liquid crystalline composition consisting of a miscible mixture of:
(a) A first material consisting of p-(trans-4-n-alkyl(or alkoxy-)cyclohexyl) aniline (Formula 16); and
(b) A second liquid crystalline material consisting of p-(trans-4-n-alkyl-(or alkoxy-)cyclohexyl) benzonitrile, the alkyl or alkoxy groups having 1–10 carbon atoms (Formula 14) or 4-n-alkyl-(or alkoxy-)-4'-cyanobiphenyls (Formula 15), the first material being present in an amount sufficient to broaden the mesogenic range of the second liquid crystalline material.

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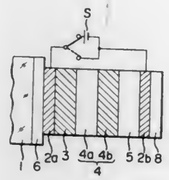
**4,293,194**
**SOLID ELECTROCHROMIC ELEMENT**
**Yosuke Takahashi, Sagamihara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**
**Filed Dec. 20, 1979, Ser. No. 105,505**
**Claims priority, application Japan, Dec. 27, 1978, 53-159927**
**Int. Cl.³ G02F *1/17***
**U.S. Cl. 350—357** **5 Claims**



1. A solid electrochromic element which comprises a dielectric material layer, an electron blocking layer, a solid electrochromic substance layer and a second electrode successively laminated on a first electrode and in which a voltage is applied between said first and said second electrode to thereby cause coloration of said solid electrochromic substance layer, the improvement residing in that said electron blocking layer is formed by at least two layers, of which the layer adjacent to the electrode to which a positive voltage is applied is formed by an N-type semiconductor and the layer adjacent to the electrode to which a negative voltage is applied is formed by a P-type semiconductor.

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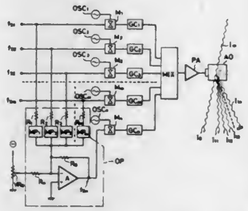
**4,293,195**
**SIMULTANEOUS MULTI-BEAM OPTICAL MODULATION SYSTEM**
**Masaaki Mori, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan**
**Filed Oct. 17, 1979, Ser. No. 85,488**
**Claims priority, application Japan, Oct. 20, 1978, 53-129174**
**Int. Cl.³ G02F *1/11***
**U.S. Cl. 350—358** **4 Claims**



1. In a simultaneous multi-beam optical modulation process of the type having the steps of obtaining a plurality of modulated signals with the amplitude of carriers having different frequencies modulated by a plurality of signals, and driving an acoustic optical element by said modulated signals, whereby a light modulation is performed by the acoustic optical element, the improvement comprising the steps of producing a dummy signal by squaring a plurality of said signals, adding and then inverting said squared signals and a setting voltage for setting an overall deflection efficiency of the acoustic optical element,



modulating the amplitude of an assigned carrier by said dummy signal to obtain a modulated output, summing said modulated output and said modulated signals into a summed signal, and applying said summed signal to the acoustic optical element.

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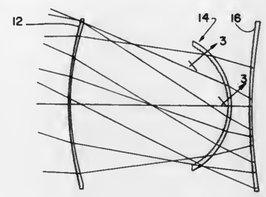
**4,293,196**
**OBJECTIVE LENS SYSTEM WITH ASPHERIC FRESNEL ELEMENTS**
**Robert S. Hilbert, La Canada, Calif., assignor to Fantacia, Del Mar, Calif.**
**Filed Aug. 13, 1979, Ser. No. 65,994**
**Int. Cl.³ G02B *3/04, 3/08***
**U.S. Cl. 350—452** **31 Claims**



1. A high speed objective lens system capable of forming images that is particularly adaptable for a television projection system comprising from a viewing screen object side to a video image side on an optical axis;
a first thin meniscus lens element convex to the object side having a curvilinear configuration on one side and a Fresnel type surface on the other side;
a second thin meniscus lens element concave to the object side having a curvilinear configuration on one side and a Fresnel type surface on the other side, and
a third weak thin aspherical meniscus lens element convex to the object side.

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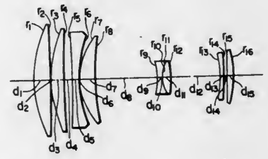
**4,293,197**
**TELEPHOTO LENS WITH SMALL TELEPHOTO RATIO**
**Koichi Kobayashi, Tokyo, and Sadao Okudaira, Ranzan, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Feb. 27, 1980, Ser. No. 125,051**
**Claims priority, application Japan, Mar. 12, 1979, 54-28394**
**Int. Cl.³ G02B *13/02***
**U.S. Cl. 350—454** **4 Claims**



1. A high performance telephoto lens having a small telephoto ratio and being composed of eight lenses grouped into seven lens groups wherein said lenses satisfy the following conditions:

| F/4 f = 100 | viewing angle ±4.5° | telephoto ratio 0.60 | | |
|---|---|---|---|---|
| | $r_i$ | $d_i$ | $N_i$ | $\nu_i$ |
| 1 | 28.45 | 3.79 | 1.49700 | 81.3 |
| 2 | −373.8 | 0.03 | | |
| 3 | 27.31 | 3.08 | 1.49700 | 81.3 |
| 4 | 162.76 | 1.88 | | |
| 5 | −335.17 | 1.64 | 1.80610 | 40.9 |
| 6 | 27.03 | 0.03 | | |
| 7 | 14.07 | 3.79 | 1.49700 | 81.3 |
| 8 | 46.93 | 14.96 | | |
| 9 | −13.97 | 1.11 | 1.79952 | 42.2 |
| 10 | 7.12 | 0 | | |
| 11 | 7.12 | 1.81 | 1.59270 | 35.3 |
| 12 | −29.56 | 11.71 | | |
| 13 | −15.42 | 0.76 | 1.88300 | 40.8 |
| 14 | −178.50 | 0.64 | | |
| 15 | 59.84 | 1.87 | 1.69895 | 30.1 |
| 16 | −16.86 | | | |

where $r_i$ is the radius of curvature of the i-th lens surface, $d_i$ is the distance between the i-th lens surface and the next lens in sequence, and $\nu_i$ is the Abbe number of the i-th lens.

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**4,293,198**
**EYE REFRACTOMETER**
**Yoshimi Kohayakawa, Yokohama; Yasuyuki Ishikawa, Kawaguchi, and Shigeo Maruyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Sep. 21, 1978, Ser. No. 944,304**
**Claims priority, application Japan, Sep. 21, 1977, 52/114348; Dec. 1, 1977, 52/144309**
**Int. Cl.³ A61B *3/10***
**U.S. Cl. 351—13** **26 Claims**

1. An eye refractometer, comprising: a projection system having test pattern generating means for generating test beams and having slits in three meridians arranged in the illumination path such that three test marks are projected into the eye and projection optical means for projecting said test beams to an eye to be inspected and forming an image of the test pattern corresponding to each of the meridians;
an inspecting system having beam detecting means for independently detecting the test beams from the eye to be inspected, and inspecting optical system for transmitting the beams to said beam detecting means;
focus adjusting means coupled to said projection system and said inspecting system for focusing of said two systems; and
beam splitting means for optically coupling said projection optical system and said inspecting optical system.

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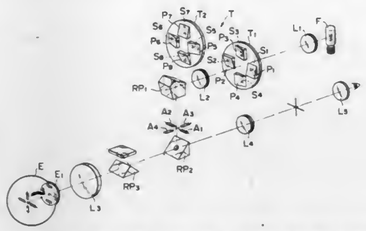
**4,293,199**
**APPARATUS FOR DETECTING ASTIGMATIC AXES AND MEASURING REFRACTIVE POWERS**
**Shinzi Wada; Ikuo Kitao; Yoshinori Oana; Yasuo Kato, and Taketoshi Ishihara, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kakushiki Kaisha, Tokyo, Japan**
**Filed Nov. 13, 1978, Ser. No. 960,056**
**Claims priority, application Japan, Nov. 14, 1977, 52-136488**
**Int. Cl.³ A61B *3/10***
**U.S. Cl. 351—13** **4 Claims**

1. An eye refractometer apparatus for detecting astigmatic axes and measuring refractive powers of a patient's eye, said apparatus comprising refractive power measuring target means including a first group of slits oriented in a first direction and

a second group of slits coplanar with the first group of slits and oriented in a second direction which is perpendicular to the first direction, each slit being associated with deflecting means having a direction of deflection perpendicular to the lengthwise direction of that slit, the direction of deflection of the deflecting means for at least one of the slits in each group being opposite to that of the deflecting means for the remainder of the slits in the same group, astigmatic axis detecting target means including at least one group of slits oriented in one direction, each of the slits in the astigmatic axis detecting target



means being associated with deflecting means having a direction of deflection parallel with the lengthwise direction of the slit, the direction of deflection of the deflecting means for at least one of the slits in the astigmatic axis detecting target means being opposite to that of the deflecting means for remainder of the slits, means for projecting images of the target means on the retina of the patient's eye along a projecting optical path, means for focusing the projected images, and means for rotating the projected images about the projecting optical path; observing optical means for observing the projected image through the pupil of the patient's eye.

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**4,293,200**

## VISUAL FACULTY TESTING APPARATUS

**John S. Dobson, 6 Broadacres, Cathorpe Park, Fleet, Hampshire, England, and Peter A. Davison, Sea View, Seapoint Rd., Bray, County Wicklow, Ireland**

**Filed Mar. 10, 1980, Ser. No. 128,816**

**Claims priority, application United Kingdom, Mar. 12, 1979, 08598/79**

**Int. Cl.³ A61B** *3/02*

**U.S. Cl. 351—36** **8 Claims**

1. Visual faculty testing apparatus comprising: means for presenting a visual target to a subject under test, said target including an array of two sets of areas of respectively different luminance in an alternating sequence in one co-ordinate direction across said array, with the areas of at least one of said sets being of progressively varying luminance towards the luminance of the other of said sets in another co-ordinate direction across said array; and control means adjustable by said subject to alter the rate of said luminance variation.

**4,293,201**

## RUBBER-PADDED FRAMES OF EYE SPECTACLES AND METHOD FOR PREPARING SAME

**Takeshi Fukuda, Annaka, and Tomiyoshi Tutida, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Mar. 13, 1980, Ser. No. 129,901**

**Claims priority, application Japan, Mar. 22, 1979, 54-33616**

**Int. Cl.³ G02C** *5/12, 5/16, 13/00*

**U.S. Cl. 351—178** **3 Claims**

1. A method for providing a covering pad member of a silicone rubber on to a portion of a frame of eye spectacles coming into contact with the human body of the wearer which comprises

(a) swelling a shaped member of a silicone rubber with a volatilizable swelling agent and placing said swollen member on the portion of the frame, wherein the swelling agent is an organosilicon compound having a boiling point in the range from 20° to 200° C., and

(b) removing the swelling agent by evaporation from the swollen shaped member of the silicone rubber to dryness whereby the shaped member shrinks to fit the portion of the frame tightly.

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**4,293,202**

## LIGHT BEAM RECORDING DEVICE

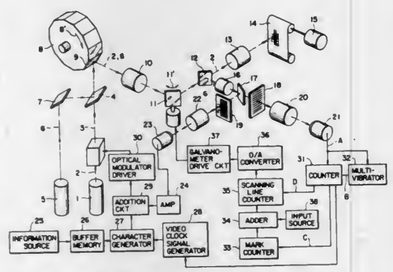
**Masahiro Ohnishi, and Tsutomu Kimura, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Oct. 17, 1979, Ser. No. 85,661**

**Claims priority, application Japan, Nov. 16, 1978, 53-141612**

**Int. Cl.³ B41B** *21/08*

**U.S. Cl. 354—5** **7 Claims**




1. A light beam recording system for carrying out a recording operation on a recording material by modulating a recording light beam, in which (i) a reading light beam and said recording light beam are deflected by the same two-dimensional optical deflection system, (ii) a form is subjected to raster scanning with a part of said reading light beam to provide a form signal while a linear encoder is subjected to raster scanning with a part of said reading light beam to provide a video clock signal, and (iii) said recording material is subjected to raster scanning with a video signal which is produced by combining a data signal and said form signal by means of said video clock signal, the improvement comprising means for detecting the drift of vertical deflection means in said two-dimensional optical deflection system from a number of scanning lines by vertically scanning said linear encoder, and means for correcting timing of generation of said data signal in accordance with the amount of drift thus detected.



**4,293,203**

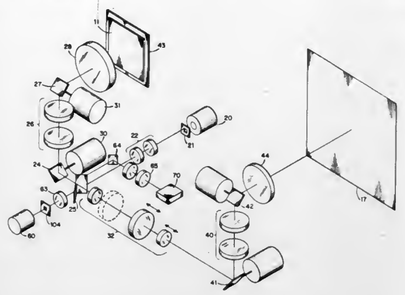
## PHOTOTYPESETTER, METHOD AND APPARATUS

**Walter E. Peery, 7-74 Pendleton, Londonderry, N.H. 03053**

**Filed Jan. 23, 1980, Ser. No. 114,710**

**Int. Cl.³ B41B** *17/12*

**U.S. Cl. 354—17** **9 Claims**



1. A method of phototypesetting comprising:

(a) illuminating an aperture to provide an illuminating beam therefrom;

(b) directing said illuminating beam by one or more rotatable reflectors to illuminate a succession of characters on a character font;

(c) optically focusing an image of said aperture on each of said characters;

(d) directing light from each illuminated character back to said one or more reflectors so as to generate an aligned image beam on a common axis for each character of said succession;

(e) disposing a photosensitive medium at an exposure station; and

(f) optically directing and focusing said aligned image beam so as to focus images of said succession of characters at selected locations on said medium.

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**4,293,204**

## PHOTOGRAPHIC CAMERA HAVING AN AUTOMATIC EXPOSURE CONTROL

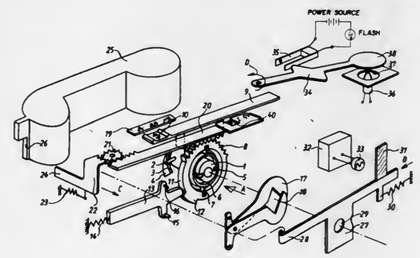
**Karl Wagner, Munich; Dieter Engelsmann, Unterhaching; Hubert Hackenberg, Holzkirchen, and Peter Stiefel, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 30, 1980, Ser. No. 116,803**

**Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905248**

**Int. Cl.³ G03B** *7/00, 15/02*

**U.S. Cl. 354—21** **16 Claims**




1. A photographic camera, comprising a manually operated control member for setting at least one exposure parameter; an axially movable objective for setting the exposure distance; a film cartridge provided with coded marks indicative of the sensitivity of the contained film; a scanner movable against said marks and being coupled to said control member to displace the same according to said marks; a stationary cam surface engaging said movable objective; transmission means coupled between said control member and said objective to move the latter according to a distance set by said control member and according to a predetermined curve of said stationary cam, said curve including a portion defining a distance range for a flash exposure; and a scale provided on said control member to display at least the exposure range and the applicable flash distance limits for the employed film sensitivity.

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**4,293,205**

## CAMERA FOCUS DETECTING DEVICE

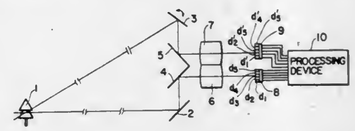
**Seijiro Tokutomi, Tokyo; Masao Jyojiki, Tsurugashima, and Kazuo Nakamura, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 4, 1979, Ser. No. 45,498**

**Claims priority, application Japan, Jun. 14, 1978, 53-71958**

**Int. Cl.³ G03B** *13/18;* **G01J** *1/36*

**U.S. Cl. 354—23 D** **14 Claims**




1. A focus detecting device for a lens system comprising: means for dividing the image of an object into two optically equal images of the object; means for shifting at least one of the two images of that object with respect to the other image; first and second photoelectric conversion element groups adapted to convert the variations in relative position of the two images of the object into electrical signals, each of said first and second groups including n photoelectric conversion elements, each photoelectric conversion element in said first group providing a current output $i_m$ and each photoelectric conversion element in said second group providing a current output $i'_m$, where m = 1, 2, 3, . . . n is the number in order of each photoelectric conversion element in its respective group and the outputs $i_1$ through $i_n$ and $i'_1$ through $I'_n$ are proportional to the quantities of light applied to respective photoelectric conversion elements; an optical system for projecting the images of the object onto the two photoelectric conversion element groups; and a calculation circuit means for receiving outputs from said conversion elements and for calculating a first voltage from the differential comparison of the outputs of conversion elements in opposite groups which are laterally offset in a first direction with respect to one another, a second voltage from the differential comparison of the outputs of conversion elements in opposite groups which are laterally offset in a second direction, opposite to said first direction, with respect to one another, and for generating a third voltage corresponding to the difference between said first and second voltages, which third voltage differs in polarity on opposite sides of the proper focalization point of said lens system.

**4,293,206**

## ELECTRICALLY OPERATED AUTOMATIC FOCALIZING CAMERA

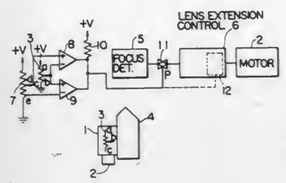
**Seijiro Tokutomi, Tokyo; Masao Jyojiki, Tsurugashima; Harumi Aoki, Kiyose; Kazuo Nakamura, Shiki, and Koichiro Watanabe, Funabashi, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 22, 1980, Ser. No. 114,174**

**Claims priority, application Japan, Feb. 16, 1979, 54/18641[U]**

**Int. Cl.³ G03B** *3/10*

**U.S. Cl. 354—25** **3 Claims**




1. An electrically operated automatic focalizing camera comprising: an electrical focus detecting device for providing a focus detection signal; means for positioning a photographing lens in response to a signal at an input thereto; means for converting a position of said photographing lens into a voltage; means for setting a range of voltage corresponding to a range of amount of extension; means for determining whether or not a voltage corresponding to an amount of extension is in said range of voltage; and means for receiving a decision output from said determining means for controlling transmission of said focus detection signal, said transmission controlling means being operatively coupled between said focus detecting device and said input of said positioning means.

**4,293,207**

## CAMERA FOCUS DETECTING DEVICE

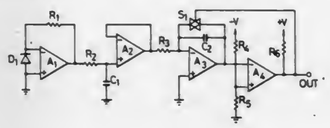
**Harumi Aoki, Kiyose; Masahiro Kawasaki, and Yoshio Sawada, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 31, 1980, Ser. No. 117,336**

**Claims priority, application Japan, Feb. 9, 1979, 54/14042**

**Int. Cl.³ G03B** *3/00*

**U.S. Cl. 354—25** **3 Claims**




1. A focus detecting device for a camera comprising: a self-scanning type photoelectric element having a plurality of microphotoelectric elements and a scanning circuit for producing a contrast signal of the image of an object to be photographed to automatically detect a point of proper focus; an average illumination detecting photoelectric element disposed at least near a position which is optically equivalent to the position of said microphotoelectric elements; a low-pass filter coupled to an output of said average illumination detecting element for removing a vibration component in an output signal thereof; and a clock pulse generator for generating a clock pulse signal of which the frequency is varied according to an output of said low-pass filter, said clock pulse generator being coupled to drive self-scanning type photoelectric element so that as the brightness of said object increases, the frequency of said clock pulse signal increases thereby to produce a contrast signal free from variations in brightness of said object and to remove variation components of said contrast signal due to movement of said object.

**4,293,208**

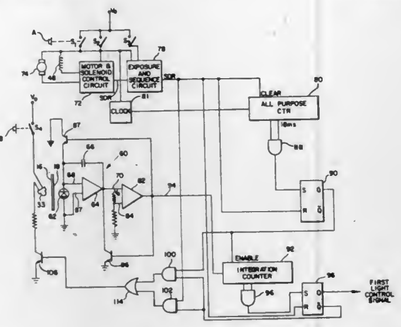
## PREBIAS FOR DIGITAL LIGHT INTEGRATOR

**Judy Bagdis, Bradford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Oct. 20, 1980, Ser. No. 198,781**

**Int. Cl.³ G03B** *7/083, 7/087*

**U.S. Cl. 354—29** **11 Claims**




1. A photographic camera apparatus of the type adapted to be energized at least in part by a source of electrical energy and including means for defining a film plane comprises:

a source of artificial illumination;

a photoresponsive element stationed to receive light from the scene to be photographed and said source of artificial illumination and to provide an output signal having an electrical characteristic which varies as a function of the intensity of light incident thereon;

means for integrating the output signal from the photoresponsive element;

shutter means for controlling the admission of scene light to the film plane to define an exposure interval and for controlling the admission of artificial light to said photoresponsive element to coincide with the commencement of said exposure interval;

circuit means for controlling the energization of said source of artificial illumination so as to illuminate said photoresponsive element prior to the commencement of said exposure interval to assure a minimum integrated output signal level from said integration means at the commencement of said exposure interval and for subsequently powering said source of artificial illumination at the commencement of said exposure interval; and

means responsive to a select change in said integrating means output signal from said minimum integrated output signal level at the commencement of said exposure interval for providing an initiation control signal in substantial correspondence with the commencement of the exposure interval so as to control an exposure influencing operation.

**4,293,209**

## MIRROR OPERATING MECHANISM IN SINGLE LENS REFLEX CAMERA

**Hiroshi Kurei, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 26, 1979, Ser. No. 14,791**

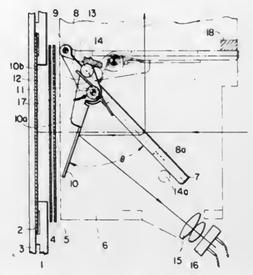
**Claims priority, application Japan, Feb. 28, 1978, 53-22316**

**Int. Cl.³ G03B** *19/12*

**U.S. Cl. 354—153** **8 Claims**

1. In a mirror operating mechanism in a single lens reflex camera having a first reflecting mirror swinging from a view finder observation position to a photographing retraction position, said first reflecting mirror having a light transmitting portion, and a second reflecting mirror for transmitting light passing through said first reflecting mirror at the view finder observation position to a light measuring element, said second reflecting mirror being swingingly mounted on said first reflecting mirror, the improvement comprising: a frame for supporting said first mirror, a rotary shaft around which said second reflecting mirror swings, both ends of said rotary shaft being rotatably mounted on both sides of said frame supporting





said first reflecting mirror, said second reflecting mirror having an operating arm with an end portion, cam means for pre-setting the position of said second mirror relative to said first mirror in both said observation and retracted positions, said cam means being secured to a stationary member but adjustable relative thereto to individually adjust either of two pre-set points of contact between said cam means and said end portion in said observation and retracted positions, respectively, without changing the other point of contact, and a spring member for urging said end portion of said operating arm into contact with said cam means at said points.

**4,293,210**

## RELEASE BUTTON DEVICE FOR CAMERA

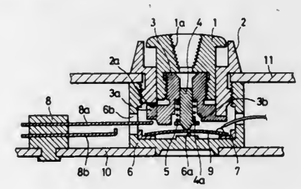
**Toru Kando, Tokyo, and Tahei Morisawa, Matsudo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 25, 1980, Ser. No. 190,768**

**Claims priority, application Japan, Oct. 23, 1979, 54/136537**

**Int. Cl.³ G03B** *17/38*

**U.S. Cl. 354—269** **3 Claims**



1. A release button device for an electromagnetic release type camera in which the operation of a shutter member is energized electrically comprising:

an electrically conductive release button adapted for receiving a cable release unit, said release button being mounted on said camera with the rotation of said release button being limited;

an electrically insulative central core frame coupled to said release button, said central core frame having an aperture formed therein aligned with an aperture in said release button, the diameter of said aperture in said core frame being sufficiently large to pass the plunger of a cable release unit connected to said release button;

an electrically conductive central core slidably disposed in said aperture in said core frame;

a protrusion positioned below a lower end of said central core, said protrusion serving as a first contact of a release switch for switchably connecting a power source to operate said shutter member, said protrusion being electrically connected to said release button; and

a contact piece disposed between said central core and said protrusion, electrically insulated from said protrusion in a normal position of said release button, and movable into contact with said protrusion upon depression of said release button or plunger, said contact piece forming a second contact of said release switch.

**4,293,211**

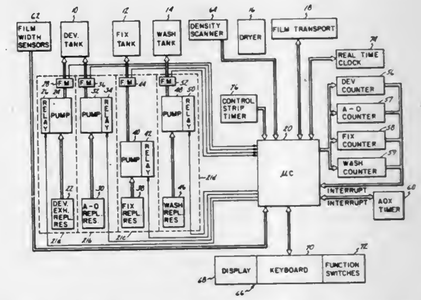
## AUTOMATIC REPLENISHER CONTROL SYSTEM

**Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.**

**Filed Jul. 14, 1980, Ser. No. 168,019**

**Int. Cl.³ G03D** *13/00, 3/06*

**U.S. Cl. 354—298** **26 Claims**




1. In a processor of photosensitive material having replenishment means for replenishment of processor chemistry, an automatic replenishment control system comprising:

means for storing a replenishment rate;

means for controlling replenishment as a function of the replenishment rate;

means for storing values indicative of desired parameter values of control strips of photosensitive material processed in the processor;

means for providing signals indicative of measured parameter values of the control strips processed in the processor;

means for automatically making a short term replenishment correction if the measured parameter value deviates from the desired parameter value; and

means for automatically adjusting the stored replenishment rate if a deviation between the measured and desired parameter values persists in a subsequent control strip processed by the processor despite a previous short term replenishment correction.

**4,293,212**

## THERMAL PROCESSOR IN AN APPARATUS FOR DEVELOPING PHOTOGRAPHIC FILM

**Bohdan W. Siryj, Cinnaminson; Richard D. Scott, Cherry Hill, and Charles R. Horton, Maple Shade, all of N.J., assignors to RCA Corporation, New York, N.Y.**

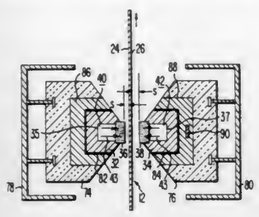
**Filed Apr. 25, 1977, Ser. No. 790,196**

**Int. Cl.² G03D** *7/00*

**U.S. Cl. 354—299** **5 Claims**

1. A thermal processor in an apparatus for heat development of a fixed photographic image on a strip of photographic film, said film including a latent image formed on an emulsion layer coated on a film base, comprising:

means for heating a supply of gas to a substantially uniform predetermined temperature;
a housing arranged to receive said gas;
means for supplying said gas to said housing;
gas distribution means responsive to said supply means for uniformly distributing said gas to said film at a predetermined pressure, said gas distribution means being supported by said housing and disposed adjacent to and on opposite surfaces of said film at a spacing such that said pressure of gas supplied to the respective surfaces of said film is sufficient to establish a gas bearing on said respective film surfaces to thereby support said film while being passed through said processor, and to transfer heat from said heating means to said respective surfaces of said film; and
a thermofoil heater disposed around said housing to provide a heat source around the housing surface in contact with said gas tending to minimize heat loss from said heated gas;
whereby said heated gas heats both surfaces of said film substantially uniformly for development of said fixed photographic image.



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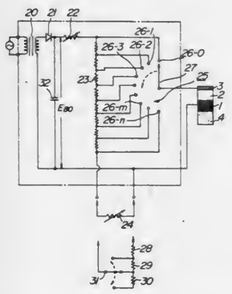
**4,293,213**

## BIAS VOLTAGE ADJUSTING MEANS FOR ELECTROPHOTOGRAPHIC APPARATUS

**Masaji Nishikawa, and Muneo Kasuga, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Continuation of Ser. No. 826,673, Aug. 22, 1977, Pat. No. 4,148,577. This application Jan. 8, 1979, Ser. No. 1,927**
**Claims priority, application Japan, Sep. 2, 1976, 51-104223**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—14 R** **2 Claims**



1. In an electrographic apparatus comprising a photosensitive screen composed of an insulating layer, two electrically conductive layers coated on opposite sides of said insulating layer and a photosensitive layer coated on one of said electrically conductive layers, a corona discharge device arranged at one side of said photosensitive screen and emitting a flow of corona ions, and a dielectric coated record sheet arranged at the other side of said photosensitive screen, whereby an electrostatic latent image produced on said photosensitive layer of said photosensitive screen causes said flow of corona ions directed from said corona discharge device through said photosensitive screen toward said dielectric coated record sheet to modulate so as to produce, on said dielectric coated record sheet, an electrostatic charge image corresponding to said electrostatic latent image on said photosensitive layer of said photosensitive screen, the improvement comprising means for adjusting a bias voltage applied between said two electrically conductive layers of said photosensitive screen, said means for adjusting said bias voltage being automatically operable in response to an electric potential built up on said electrostatic latent image produced on said photosensitive layer.

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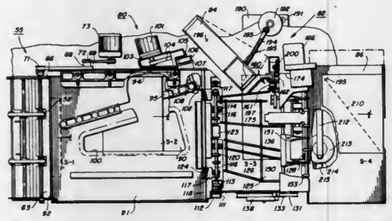
**4,293,214**

## SHEET SET SEPARATION DEVICE

**Clifford L. George, Macedon, and Jon S. Olson, Palmyra, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 30, 1979, Ser. No. 89,338**
**Int. Cl.³ G03G** *15/00*; **B65H** *39/06*
**U.S. Cl. 355—14 R** **2 Claims**



2. In an electrostatographic reproduction system having a document handling apparatus for advancing individual document sheets to an exposure station, an electrostatographic processor for processing copy sheets, and an arrangement for producing identifiable collated sets of copy sheets, the improvement comprising,
a compiler station for collecting copy sheets,
transport means for conveying processed copy sheets from the processor along a path of movement to said compiler station,
gate means adjacent said compiler station and movable from an inoperative position out of the path of movement of copy sheets to a position into said path to arrest movement of copy sheets being conveyed to said station,
means for actuating said gate means to said inoperative position and for effecting the ejection of a set of collected copy sheets,
a catch tray positioned into said path of movement for receiving sets of copy sheets ejected from the compiler station,
programming means for selectively enabling simplex or duplex modes of operation, and
drive means associated with said catch tray and said programming means for moving the same laterally in either direction alternately when the system is in the simplex mode of operation and to inhibit movement of tray when in the duplex mode of operation.

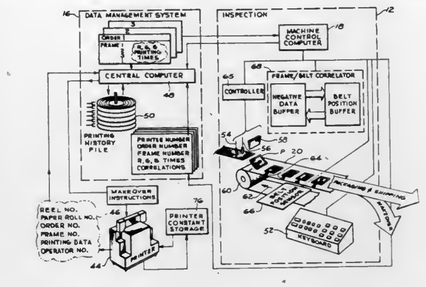


**4,293,215**

## PRINT INSPECTION AND PACKAGING METHOD AND APPARATUS

**Robert S. Rosborough, Jr., Rochester, N.Y., and Luther M. Wright, deceased, late of Brockport, N.Y. (by Edna B. Lang, nee Wright executrix), assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 15, 1979, Ser. No. 66,760**
**Int. Cl.³ G03B** *27/52*
**U.S. Cl. 355—40** **16 Claims**




1. Apparatus for processing photographic prints through an inspection operation where particular prints made from corresponding photographic negatives are selected for remaking using recorded negative-related information, said apparatus comprising:
means for storing the negative-related information corresponding to the prints being inspected;
an inspection work surface having a plurality of identifiable positions for the prints;
means for positioning a plurality of the prints in at least some of the identifiable positions;
means for correlating the negative-related information with the identifiable positions in which prints corresponding to the negatives are positioned;
means for generating a selection signal corresponding to the position on said surface of a print selected for remaking; and
means responsive to said selection signal for retrieving negative-related information corresponding to the selected print for use in remaking of the print.

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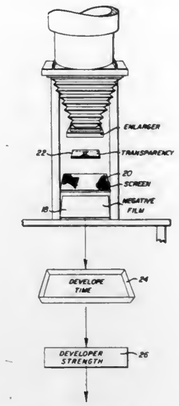
**4,293,216**

## METHOD OF PRODUCING COLOR SEPARATION NEGATIVES WITH REDUCED CONTRAST

**Joseph E. Moore, Rte. 4, Box 159, Northport, Ala. 35476**

**Filed Dec. 6, 1979, Ser. No. 101,017**
**Int. Cl.³ G03B** *27/32*
**U.S. Cl. 355—77** **4 Claims**

1. The method of preparing color separation negatives for color printing reproduction of a positive color transparency, said method including:
A. Inspection of the positive color transparency to determine the greater density detail areas to be reproduced;
B. Enlarger exposing a trial color separation negative film sheet through said positive color transparency and a half-tone screen (independent of a negative mask) with that exposure time which will properly expose those areas of the film sheet corresponding to said greater density detail areas and, due to the proper exposure of the greater density detail areas, at the same time overly expose those areas of said film sheet corresponding to the lesser density detail areas thereof;
C. Developing said trial film sheet with such less than norm developing time and greater than norm developer strength (together compensating for the less developing time) to achieve the desired "dot size" in said areas corresponding to said greater density detail areas as well as in the areas of the resultant trial color separation negative




corresponding to the lesser dense detail areas of said color transparency.

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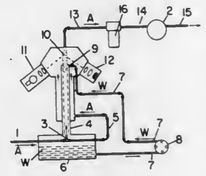
**4,293,217**

## CONTINUOUS-FLOW CONDENSATION NUCLEI COUNTER AND PROCESS

**Alvin N. Bird, Jr.; Norman L. Francis, and Albert L. Thomas, Jr., all of Birmingham, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Feb. 6, 1980, Ser. No. 118,946**
**Int. Cl.³ G01N** *1/00*
**U.S. Cl. 356—37** **6 Claims**



1. A portable continuous-flow device for detecting and counting nuclei in sampled air, said device comprising:
an upstanding tubular humidifier housing;
an upstanding and axially elongated humidifier tube centrally disposed within said humidifier housing and cooperating with said humidifier housing to define an annular passageway therebetween in which to accommodate an upward flow of a portion of a continuous flow of sampled air; said humidifier tube defining a longitudinal interior passageway therewithin in which to accommodate an upward flow of another portion of the said continuous flow of sampled air;
means for continuously delivering a forced upward flow of nuclei containing sampled air to a lower region of said annular passageway and a lower region of the interior passageway in said humidifier tube;
a wetted wick disposed within the interior passageway in said humidifier tube for saturating the portion of the continuous upward flow of sampled air therewithin;
means for heating the continuous upward flow of saturated sampled air within said humidifier tube to a temperature higher than the portion of sampled air with said annular

passageway between said humidifier tube and humidifier housing;
a plume chamber communicating with the upper regions of the interior passageway in said humidifier tube and the upper regions of annular passageway between said humidifier tube and said humidifier housing, said plume chamber thereby receiving therein both of the aforementioned upwardly flowing portions of sampled air and whereby the heated and saturated portion of the sampled air flowing upwardly from within said humidifier tube is caused to mix with and condense upon airborne nuclei by the portion of sampled air flowing upwardly from within said annular passageway;
means for illuminating said plume chamber to illuminate the condensation nuclei;
means for detecting and counting the illuminated condensation nuclei;
means for continuously exhausting the condensation nuclei from said plume chamber; and
a manually transportable enclosure means for mounting each of the foregoing in operative assembled relationship within said enclosure means.

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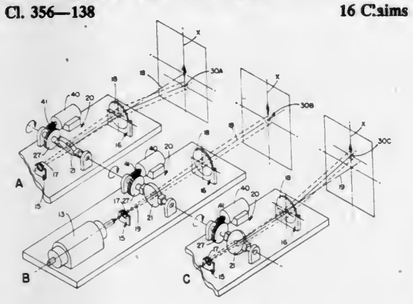
**4,293,218**

## REFERENCE LIGHT BEAM PROJECTOR

**Edward G. Nielsen; Kenneth C. Mosley, and Louis M. Chatterson, all of Grand Rapids, Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.**

**Filed Dec. 28, 1978, Ser. No. 974,019**
**Int. Cl.³ G01B *11/26;* G02B *27/17***
**U.S. Cl. 356—138** **16 Claims**



1. A reference light beam projector for producing a modulated plane of light comprising: a narrow light beam source for projecting a light beam along a predetermined path; an expanding lens located forwardly of said projector on said path, and a collimating lens located forwardly of said expanding lens from said projector on said path, the improvement comprising a variable light refracting means located between said lenses in the path of said beam for variably bending said beam along a plane; and means for actuating said light refracting means to variably bend said beam to poduce a modulated plane of light.

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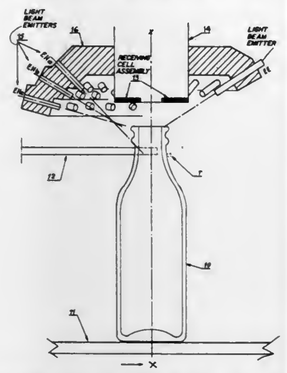
**4,293,219**

## METHOD AND APPARATUS FOR INSPECTING TRANSPARENT OBJECTS

**Marcel Ducloux, Le Pecq, France, assignor to Societe Generale Pour L'Emballage, Paris, France**

**Filed Aug. 18, 1978, Ser. No. 934,827**
**Claims priority, application France, Aug. 24, 1977, 77 25859**
**Int. Cl.³ G01N *21/90***
**U.S. Cl. 356—240** **33 Claims**

1. Apparatus for continuously inspecting transparent objects having at least a localized region with symmetry of revolution about an axis comprising:
a plurality of fixed light beam emitters for directing light beams at the position where a transparent object is located for inspection;
a plurality of light-detecting means generally oriented with respect to said light beam emitters so that at least some light-detecting means receive light from said light beam emitters when a transparent object is located at said inspection position;
electronic means for sequentially activating said light beam emitters and for interrogating said light-detecting means




in a circular scanning examination cycle, said electronic means further comprising first and second looped counters, said first counter transmitting cycles of excitation orders to said light beam emitters and said second counter transmitting cycles of interrogation orders to said light-detecting means, said counters being interconnected so that one of said counters transmits incrementing instructions to the other of said counters after transmitting a cycle of orders.

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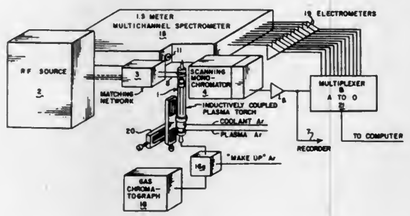
**4,293,220**

## APPLICATION OF INDUCTIVELY COUPLED PLASMA EMISSION SPECTROMETRY TO THE ELEMENTAL ANALYSIS OF ORGANIC COMPOUNDS AND TO THE DETERMINATION OF THE EMPIRICAL FORMULAS FOR THESE AND OTHER COMPOUNDS

**Medona B. Denton, Tucson, Ariz., and David L. Windsor, Cincinnati, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 2, 1979, Ser. No. 53,664**
**Int. Cl.³ G01N *21/73***
**U.S. Cl. 356—316** **3 Claims**




1. A method employing a gas chromatograph and an inductively-coupled plasma torch for evaluating the atomic elements of molecular compounds comprising;
processing said compound through said chromatograph for obtaining an effluent gas flow continuing for the period of time required for the vaporization of the compound,
energizing said torch sufficiently to produce a thermal region capable of degrading the compound into its atomic elements,
exposing said continuous effluent flow to said region to produce said atomization and to excite each of said atomic elements into radiation emission at its characteristic wavelength, said emissions each having an emission intensity responsive to the unit weight of the element independently of the physical structure of the compound,
continuously with said exposure scanning a selected plurality of said wavelengths for producing outputs proportional to the emission intensities, said selection being with regard both to their intensity and their relative freedom from spectral interference, and
utilizing the retention time in said chromatograph to determine the molecular formula of said compound according to the relationship n=k log Tr, where n is the approximate carbon number, k is an experimental constant and Tr is the elution period of the compound from the chromatograph.



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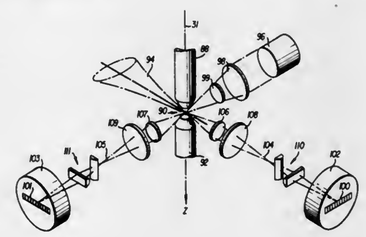
**4,293,221**

## MULTIDIMENSIONAL SLIT-SCAN FLOW SYSTEM

**David B. Kay, Rochester; Leon L. Wheeless, Jr., Webster, and James L. Cambier, Rome, all of N.Y., assignors to Research Corporation, New York, N.Y.**

**Filed Apr. 17, 1979, Ser. No. 30,880**
**Int. Cl.³ G01J *21/64***
**U.S. Cl. 356—318** **63 Claims**



1. A flow cytofluorometer for obtaining multidimensional slit-scan type fluorescence contours of a biological cell, comprising:
means for conveying the cell along a flow axis;
means for providing a substantially planar beam of electromagnetic radiation for exciting secondary fluorescence in the cell, the flow axis intersecting but not lying within the plane of the beam such that the cell passes through the beam and a plurality of first substantially planar parallel cross-sections of the cell are successively excited to secondary fluorescence;
means for measuring secondary fluorescence from the first cellular cross-sections as the cell passes through the beam so as to generate a slit-scan type contour along a first axis perpendicular to the first cellular cross-sections; and
means for measuring secondary fluorescence from each of a first plurality of substantially linear portions of the cell as the cell passes through the beam, the linear portions of the first plurality being defined by the intersections of each of a plurality of second substantially planar parallel cross-sections of the cell with each of the first cross-sections, the cell second cross-sections being parallel to the flow axis, and for generating first integrations for each individual second cross-section of the measured secondary fluorescences of all the linear portions therein, such that the resultant first integrations collectively represent a slit-scan type contour along a second axis perpendicular to the second cross-sections.

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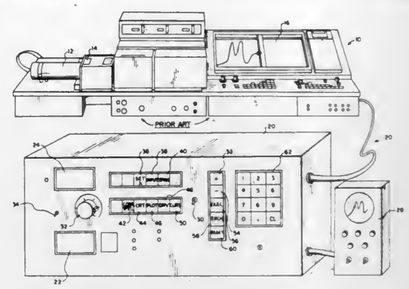
**4,293,222**

## CONTROL APPARATUS FOR SPECTROPHOTOMETER

**Stephen Caruso, Columbia, and Kamalakar D. Dighe, Laurel, both of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Continuation-in-part of Ser. No. 881,826, Feb. 27, 1978, abandoned. This application Feb. 9, 1979, Ser. No. 10,734**
**Int. Cl.³ G01J *3/42;* G06F *15/20***
**U.S. Cl. 356—319** **3 Claims**




1. A control apparatus for use with a dual beam spectrophotometer of the type in which light from a light source is split into two beams which are directed along respective first and second optical paths to a photosensitive device, the first optical path passing through a reference station and the second optical path passing through a sample station, and of the type which includes means for changing the wavelength of the light from a light source over a predetermined time period through a span of at least 75 nanometers and up to 600 nanometers or some segment thereof, starting at a wavelength of 200 nanometers or greater and proceeding up to a wavelength of 825 nanometers or less, means associated with the wavelength changing means for producing an output signal indicative of a particular wavelength of the light beams at any point in time and signal generating means coupled to the photosensitive device for subtracting the log of each signal generated by the light received by the photosensitive device from the second optical path from the log of each signal generated by light received by the photosensitive device from the first optical path and then producing a log difference signal indicative of absorbance, said control apparatus comprising electric circuit means including control, processing and memory circuits adapted to be coupled to the spectrophotometer for receiving and storing signals therefrom, said electric circuit means including first memory circuit means and second memory circuit means for receiving and storing the varying log difference signals, control and processing means for manipulating the data comprised of signal values stored in said memory circuit means, said manipulations including transferring data in one memory circuit means to the other memory circuit means, adding data from one to the data of the other, subtracting data in one from data in the other and taking the derivative of data stored in one of the memory circuit means, wavelength digital display means, absorbance digital display means, and said control and processing circuit means being coupled to a recorder in the spectrophotometer and being operable to cause movement of a pen of the recorder to plot a spectrum of wavelength v. absorbance on the recorder from a spectrum of varying log difference signals which are related to absorbance and which are stored in said one of said memory circuit means, and said control and processing means including control means coupled to said one of said memory circuit means for causing a cursor operation on the curve plotted on the recorder, said cursor being seen as a holding of the pen at a particular point on the curve and said control and processing means being operable to cause a display on said respective wavelength and absorbance digital display means of the wavelength and absorbance at the particular position of the pen on the curve plotted on the recorder and

said control means including means for moving said pen in increments along the curve plotted on the recorder.

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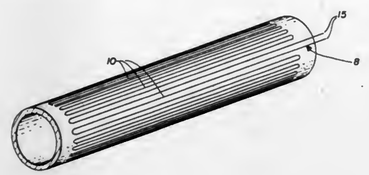
**4,293,223**

## METHOD AND APPARATUS FOR CONTROLLING RESONANT FREQUENCY OF AN OPTICAL INTERFEROMETER CAVITY

**Norman T. Seaton, 5431 College Ave., Oakland, Calif. 94618**

**Filed Sep. 27, 1979, Ser. No. 79,324**
**Int. Cl.³ H01S *3/086***
**U.S. Cl. 356—352** **11 Claims**



1. A frequency control apparatus for an optical interferometer cavity having a part having a dimension defining resonant frequency comprising:

a plurality of substantially straight electrical conductors adapted for connection to a source of electrical potential and mounted on and mechanically secured to said part and providing a conduction path substantially parallel to said dimension and having a coefficient of thermal expansion and functioning to transmit mechanical force to said part as a function of electro-thermally induced change in length of said conductors for changing said resonant frequency.

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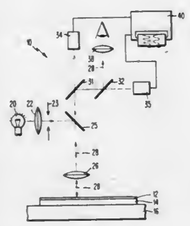
**4,293,224**

## OPTICAL SYSTEM AND TECHNIQUE FOR UNAMBIGUOUS FILM THICKNESS MONITORING

**Charles A. Gaston, Poughkeepsie; Joseph P. Kirk, Chelsea, and Chester A. Wasik, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 4, 1978, Ser. No. 966,415**
**Int. Cl.³ G01B *9/02***
**U.S. Cl. 356—357** **10 Claims**



1. An optical instrument for monitoring the increasing or decreasing thickness of a transparent film having an initial thickness within a predetermined range, and especially for eliminating ambiguity in the knowledge of the absolute thickness of said transparent film, comprising

means for illuminating said film with at least two substantially different wavelengths of light,

phototdetecting means for receiving said light and providing at least two output signals responsive to the changing intensity of optical interference in said film as said film increases or decreases in thickness, and

means for comparing the phase relationship of said output signals by recognition of coincident extrema of said output signals whereby an unambiguous indication of the absolute thickness of said film having an initial thickness within said predetermined range is provided.

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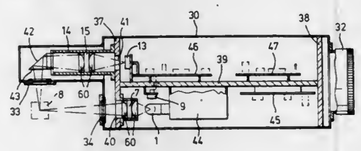
**4,293,225**

## UNDERWATER FLUOROMETER MEASURING SYSTEM

**John E. G. Wheaton, London; David Griffiths, Surrey, and Richard C. M. Learner, London, all of England, assignors to Chelsea Instruments Limited, London, England**

**Filed Jun. 29, 1979, Ser. No. 53,340**
**Claims priority, application United Kingdom, Jun. 30, 1978, 28464/78**
**Int. Cl.³ G01N *21/64***
**U.S. Cl. 356—417** **9 Claims**



1. A submersible fluorometer instrument comprising a fluid-tight pressure case containing a light transmitter adjacent to a first window in an exterior wall of the case and a light receiver adjacent to a second window in an exterior wall of the case, said windows arranged substantially orthogonally and having axes which intersect externally of said case and in a common plane, said light transmitter comprising a controllable pulsed light source for emitting flashes of fluorescent stimulating light, a first optical system which beams the flashes of light from said source through said first window into the fluid in which the instrument is immersed and a first light detecting means arranged to detect the intensity of light emitted by the said pulsed light source, and said light receiver comprising a second optical system arranged coaxially with said second window to receive light emissions from a specific volume of the fluid illuminated by said flash of light and to transmit said light emissions to a second detector, wherein said first optical system incorporates a filter which removes from the light transmitted through the first said system any light having a wavelength equal to or longer than that produced by the fluorescence and the second optical system incorporates a filter which removes from the light transmitted through the second said system any light having a wavelength shorter than that produced by the fluorescence, said fluid-tight pressure case further containing a synchronising control means for enabling the flashes of light, a first synchronised sampling means coupled to the said control means so as to be enabled thereby in synchronism with the said flashes of light, said first synchronised sampling means being connected to sample the output of the first detecting means, a second synchronised sampling means coupled to the control means so as to be enabled thereby in synchronism with the said flashes of light and the said first synchronised sampling means, said second synchronised sampling means being connected to sample the output of the second detecting means, ratioing means coupled to said first and second sampling means for determining a ratio of the synchronised samples of the said first and second sampling means, said ratioing means providing an output signal proportional to the value of the said ratio, and output means for providing a signal representative of the fluorescence detected by the second detector relative to the energy in the respective flashes of light transmitted into the said fluid.

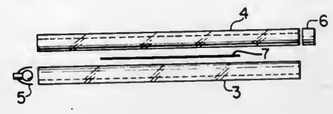


**4,293,226**

## PHOTOGRAPHIC FILM BLACKENING AREA MEASURING DEVICE

**Minoru Kinoshita, Kyoto; Kiyoshi Sugou, Yokohama, and Yukio Onoda, Kusatsu, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan**

**Filed May 19, 1980, Ser. No. 151,400**
**Claims priority, application Japan, Jun. 21, 1979, 54-85762[U]**
**Int. Cl.³ G01N *21/59*; G02B *5/14***
**U.S. Cl. 356—443** **5 Claims**



1. In an automatic photographic film development device in which a developed photographic film is moved along a transport path,

a photographic film blackening area measuring device, comprising:

(a) two rod shaped light conducting members formed of transparent material, the longitudinal surface of each of which is smooth except for a roughened portion elongated parallel to the axis of said rod shaped light conducting member, said rod shaped light conducting members being arranged parallel to one another on opposite sides of the developed photographic film transport path;

(b) a single light emitting device, disposed proximate to a first end of a first one of said rod shaped light conducting members, so as to illuminate said first rod shaped light conducting member, substantially no other light source being disposed so as to illuminate said first rod shaped light conducting member; and

(c) a single light sensitive device, disposed proximate to a first end of the other rod shaped light conducting member, said first end of said other light conducting member being the most distant end thereof from said first end of said first rod shaped light conducting member, and said light sensitive element being arranged so as to be able to receive light from said first end of said other rod shaped light conducting member, no other light sensitive element being arranged so as to receive light from said other rod shaped light conducting member.

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**4,293,227**

## SPRAYING UNIT FOR UNHARDENED CONCRETE AND THE LIKE

**Katsushi Tanaka, Takarazuka, and Taro Okamoto, Miki, both of Japan, assignors to Kyokuto Kaihatsu Kogyo Co., Ltd., Nishinomiya, Japan**

**Filed Sep. 11, 1979, Ser. No. 74,805**
**Claims priority, application Japan, Oct. 2, 1978, 53-121711**
**Int. Cl.³ B28C *5/46***
**U.S. Cl. 366—11** **6 Claims**

1. A spraying unit for spraying a mixture of unhardened concrete and a quick-set particulate concrete additive, said unit comprising:

an injection gun having a first and second inlet and an outlet for spraying a mixture of unhardened concrete and particulate additive;

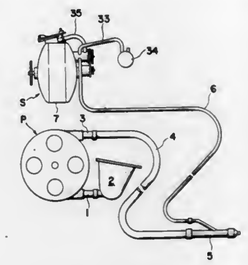
an unhardened concrete supply apparatus having a motor, and a pump, powered by said motor for pumping unhardened concrete, wherein said pump has an inlet for receiving unhardened concrete and an outlet communicating with said first injection gun inlet and for supplying unhardened concrete to said injection gun; and

an apparatus for providing a particulate additive at a substantially consistent density and under a positive pressure to said injection gun, said additive apparatus including:

a pneumatic conveying means having an air compressor and a chamber, wherein said chamber has an inlet port for receiving a particulate additive of a substantially consistent density, and air inlet port for receiving compressed air from said compressor, and an outlet port communicating with said second injection gun inlet, whereby, when said chamber receives compressed air and a particulate additive at a substantially consistent density, said means conveys a mixture of particulate additive, at a substantially consistent density, and compressed air to said injection gun;

a particulate additive container for holding a supply of particulate additive;

a second particulate transporting device in said container



and having an inlet for receiving a first maximum volume rate of particulate additive, a screw conveyer means for conveying particulate additive of a substantially consistent density and at a second maximum volume rate, which is less than said first maximum volume rate, and an outlet opening communicating with said first chamber inlet port exteriorly of said container and for discharging particulate additive from said conveyor means to said pneumatic conveying means; and

a first particulate transporting device in said container for transporting particulate additive from a lower portion of said container, and for depositing the same at said first maximum volume rate and at a substantially consistent density to said second device inlet.

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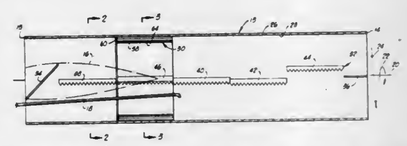
**4,293,228**

## DRUM FOR AN ASPHALT MIXING APPARATUS

**George W. Swisher, Jr., Oklahoma City; David L. Garbelman, Edmond, and Arthur G. Shaw, Mustang, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.**

**Filed Oct. 29, 1979, Ser. No. 89,212**
**Int. Cl.³ B28C *5/20***
**U.S. Cl. 366—25** **9 Claims**



7. In an apparatus for producing hot mix asphalt in a rotating drum disposed on a slant with an input end thereof higher than an opposed discharge end thereof, said apparatus including means for introducing aggregate into the input end of the drum, means for receiving asphalt from the discharge end of the drum, means for introducing a flame into the input end of the drum, means for introducing asphaltic oil into a medial portion of the drum, and flighting arranged in rows about the inner periphery of the drum for lifting and dropping aggregate and asphalt in a veil across the drum so as to transport the

aggregate and asphalt toward the discharge end of the drum, an improved drum comprising:

a cylindrical shell extending between the input end of the drum and the discharge end thereof; and

means forming an annular land on the inner periphery of said shell between the input end thereof and the medial portion of the drum where asphaltic oil is introduced into the drum, wherein at least one row of said flighting is carried by portions of the inner periphery of said shell between the means forming the annular land and the input end of the drum and at least one row of flighting is carried by the means forming the annular land.

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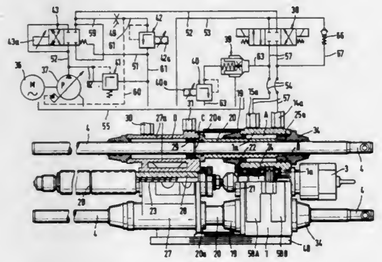
**4,293,229**

## HYDRAULIC CONTROLS FOR INJECTION UNIT OF INJECTION MOLDING MACHINE

**Karl Hehl, Arthur-Hehl-Strasse, 7298 Lossburg 1, Fed. Rep. of Germany**

**Filed Apr. 15, 1980, Ser. No. 140,615**
**Int. Cl.³ B29B *1/06***
**U.S. Cl. 366—78** **7 Claims**



1. Hydraulic controls for the injection unit of an injection molding machine processing plastic raw materials, which injection unit has a plastification cylinder defining an injection axis and a cooperating plastification screw reaching into the plastification cylinder from behind, including means for rotating the plastification screw in a plastificaton stroke and means for axially advancing it in an injection stroke, the hydraulic controls for said injection unit being associated with the means for advancing the plastification screw and comprising:

a hydraulic cylinder assembly of which the cylinder cavity is formed by a bore in a movable member which is connected to the plastification screw for axial movements therewith, and of which the piston is connected to the plastification cylinder by means of a piston rod extending forwardly from the cylinder assembly, so that pressurization of the cylinder space forward of the piston produces an injection stroke of the plastification screw; and wherein

the cylinder assembly is convertible so that, in a first assembly configuration, the piston forms the rearward extremity of the piston rod and the cylinder assembly operates in the manner of a single-acting cylinder, suitable for the connection thereto of a hydraulic supply circuit which has presettable proportional-response control valves for the adjustment of the fluid pressure and flow rate which determine the injection stroke and return movement of the plastification screw, and so that, in a second assembly configuration, the piston is adjoined by a rearwardly oriented piston rod extension of a diameter larger than the diameter of the piston rod, and the associated rear cylinder cover has a matching bore forming a seal with the piston rod extension, whereby the cylinder assembly operates in the manner of a double-acting cylinder of the differential-piston type, suitable for the connection thereto of a hydraulic supply circuit which includes an electronically controlled servo-valve receiving electronic input signals from a signal generator which receives feedback signals from pressure transducers measuring the fluid pressure on both sides of the piston.

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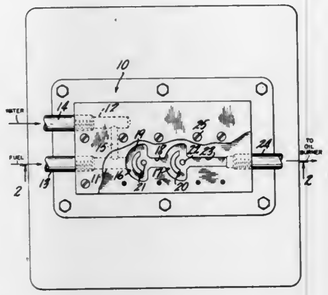
**4,293,230**

## APPARATUS FOR PROVIDING FUEL FOR AN OIL BURNER

**Lu J. Tan; David Tan, and Jeff Tan, all of 37-53 102st St., Corona, N.Y. 11368**

**Filed Apr. 12, 1978, Ser. No. 895,071**
**Int. Cl.³ B01F *3/08, 13/02***
**U.S. Cl. 366—101** **14 Claims**



1. Apparatus for preparing a fuel for an oil burner comprising an oil conduit adapted to receive fuel oil under pressure, a water conduit adapted to receive water under pressure and communicating with the oil conduit to flow the oil and water together in the oil conduit with 30 to 60% by volume of water, a first chamber formed with a first baffle, means for introducing the oil and water flow into the first chamber and for directing it against the first baffle for creating turbulence and for mixing of the oil and water, wherein said first baffle is disposed in the flow stream of said oil and water mixture for dispersing said mixture, outlet means in said first chamber on the downstream side of said baffle, a second chamber formed with a second baffle and communicating with the outlet of the first chamber to receive and direct the oil and water mixture against the second baffle to further mix the oil and water, wherein said second baffle is disposed in said second chamber in the flowstream of said oil and water mixture for dispersing said oil and water mixture, an air conduit communicating with the second chamber downstream of said baffle and adapted to receive air under pressure, the air conduit directing the compressed air into the further mixed oil and water for creating an efficient fuel, and an outlet conduit communicating with the second chamber downstream of said baffle for delivering the fuel to the oil burner.

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**4,293,231**

## BEARINGLESS VIBRATOR

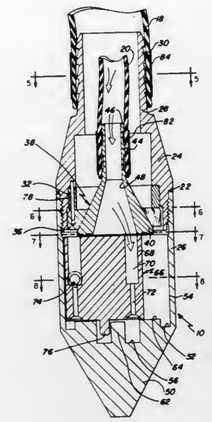
**John S. Lyle, 671 Cody St., Lakewood, Colo. 80215**

**Filed Jan. 7, 1980, Ser. No. 109,782**
**Int. Cl.³ B01F *11/00***
**U.S. Cl. 366—120** **21 Claims**

21. A bearingless vibrator devoid of chamber forming means and having a rotor acting as a turbine upon communication with a pressurized fluid, said vibrator comprising:

a housing having a center axis and an inner wall, said housing including inlet means for receiving the pressurized fluid and outlet means for discharging the fluid; and

a rotor having a center axis and contained for rolling movement within said housing, said rotor including a plurality of jets formed adjacent the periphery of said rotor, each jet having an inlet end and an an outlet end at the periphery of said rotor, an inlet end of each jet communicating in sequence with said inlet means as said rotor rolls in said housing to receive the pressurized fluid so that thrust produced by the velocity of the pressurized fluid sequentially exiting each of said outlet means of said jets drives



said rotor eccentrically relative to said center axis of said housing, said rotor impacting against said housing to produce vibrations.

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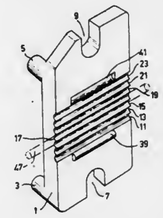
**4,293,232**

## BEARING FOR THE PRINTING HEAD OF A MATRIX PRINTER, AND PRINTING HEAD COMPRISING SUCH A BEARING

**Uno K. E. Linder, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 885,793, Mar. 13, 1978, Pat. No. 4,180,333. This application Sep. 4, 1979, Ser. No. 72,276**
**Claims priority, application Sweden, Mar. 15, 1977, 7702881**
**The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.**
**Int. Cl.³ B41J *3/12***
**U.S. Cl. 400—124** **1 Claim**



1. A bearing for use with an associated printing head of an associated matrix printer having an associated plurality of slidable printing pins which are journalled in the printing head and whose printing ends are situated in the vicinity of each other on a straight line which extends transversely of the direction of a line to be printed, and an associated means for axially displacing each of said printing pins, which comprises:

an individual substantially straight guide channel for each printing pin, each printing being guided near the printing pin end thereof, said bearing having a first portion made of a first material and a second portion made of a second material which is harder than said first material,

wherein said first portion has at least two substantially straight insert channels formed therein parallel to the guide channels and also disposed on said straight line, viewed in a cross-section of the guide channels, and

said second portion includes at least two pin-shaped inserts manufactured of said second material and two insert channels in which said two pin-shaped inserts are respectively disposed, one of the pin-shaped inserts substantially adjoining one outer printing pin, and the other pin-shaped insert substantially adjoining the other outer printing pin, each pin-shaped insert not being connected to the associated means for axially displacing each of said printing pins.

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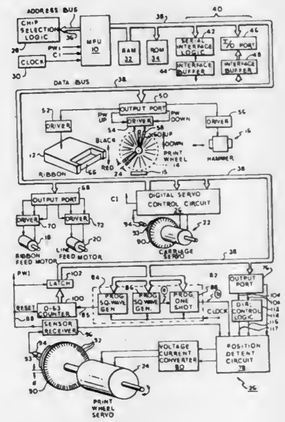
**4,293,233**

## PRINTER CONTROL SYSTEM

**Mark H. Hoffman, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.**

**Division of Ser. No. 967,090, Dec. 6, 1978, Pat. No. 4,226,546.**
**This application Jan. 23, 1980, Ser. No. 114,561**
**Int. Cl.³ B41J *1/30***
**U.S. Cl. 400—144.2** **4 Claims**



1. In a printer having an electromagnet for driving a print hammer, means for energizing said electromagnet with a pulsating electrical drive signal, the duty cycle of said drive signal being set to produce a hammer impact of a predetermined magnitude, the dwell time of said hammer being substantially greater than the period of said drive signal.

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**4,293,234**

## RIBBON CARTRIDGE FOR BAND PRINTER

**Edward H. Yonkers, Newton, and Gilbert A. LeDoux, East Taunton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.**

**Continuation of Ser. No. 897,861, Apr. 19, 1978, abandoned.**
**This application Aug. 20, 1979, Ser. No. 67,770**
**Int. Cl.³ B41J *33/10***
**U.S. Cl. 400—196.1** **7 Claims**

1. A ribbon cartridge for a high speed printer comprising:

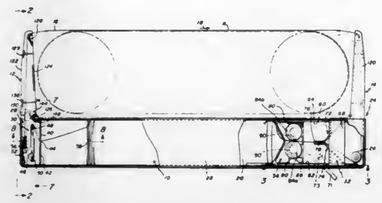
an elongated body and a pair of arms extending from opposite ends of the body and to one side thereof to form a generally U-shaped ribbon container and an endless ribbon packaged in the container with an exposed loop extending between the ends of the arms;

a ribbon passage in each arm extending from the body to the ends of the arms and a chamber in the body for storing a substantial portion of the endless ribbon and in communication with the passages in the arms;

an opening in the bottom of the body for receiving a pair of

drive rollers within the body when the cartridge is mounted on the printer;

a ribbon control assembly mounted in the body for movement between a first position which disposes the ribbon between the rollers when the cartridge is mounted on the printer, and a second position in which the ribbon portion



between the rollers is exposed to the rollers thereby to enable the rollers to grip and drive the ribbon; and

said ribbon control assembly further including means defining a ribbon dam disposed beyond the location of the rollers for preventing the ribbon from falling out of the body through said opening.

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**4,293,235**

## STRUCTURE FOR A LINEAR MOTOR FOR A PRINTER

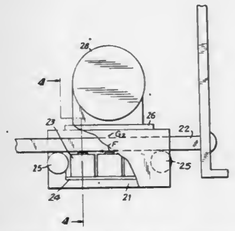
**Yoshifumi Gomi, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Filed Apr. 19, 1979, Ser. No. 31,690**

**Claims priority, application Japan, Apr. 19, 1978, 53-46195; Apr. 19, 1978, 53-46196**

**Int. Cl.³ B41J** *19/50*

**U.S. Cl. 400—322** **4 Claims**



1. A linear pulse motor for a printer comprising:

a linear stator having stator teeth on a surface thereof, said surface being perpendicular to the bottom of said printer, said stator teeth extending horizontally from said stator surface;

a translating member including a plurality of poles, said poles being spaced apart and inserted into electrical coils, each of said poles having pole teeth in a surface thereof, said pole teeth opposing said stator teeth;

a printing mechanism mounted to said translating member and moving side to side in a horizontal direction the horizontal centers of said translating member and said printing mechanism being substantially aligned with the horizontal center line of said linear stator, whereby the force of printing acts perpendicularly on said stator surface having said stator teeth thereon;

mean for aligning and spacing whereby a gap is maintained between said stator teeth and said pole teeth, and said translating member moves linearly relative to said stator when said pole coils are electrically energized,

whereby motor and printing vibrations are reduced and dust and debris do not fall upon said stator teeth.

**4,293,236**

## PRINTER

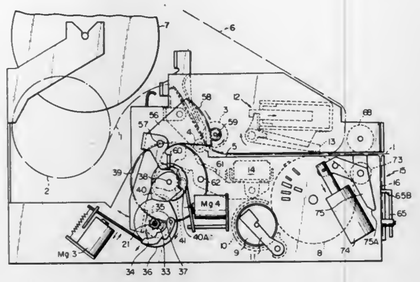
**Munetaka Shimizu, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan**

**Filed Nov. 6, 1979, Ser. No. 91,742**

**Claims priority, application Japan, Nov. 20, 1978, 53-143033; Nov. 20, 1978, 53-159795[U]; Nov. 20, 1978, 53-159796[U]; Nov. 20, 1978, 53-159797[U]**

**Int. Cl.³ B41J** *11/48*

**U.S. Cl. 400—593** **11 Claims**



1. A printer of the type in which printing is effected on a receipt paper and a journal paper disposed in parallel to each other, characterized by means for transferring said receipt and journal papers in a horizontal direction, a cutter device adapted to move vertically so as to cut said receipt paper into receipt paper sections after the transfer of the receipt paper, means for guiding said cut receipt paper sections out of said printer in a horizontal direction, a take-up roll for winding said journal paper about the roll after the journal paper has been turned upwardly, separate printing drums for said receipt and journal papers disposed below a horizontal paper transfer plane and separate printing hammers for said receipt and journal papers disposed above said horizontal transfer plane to effect printing on the undersurface of the papers in cooperation with said printing drums, respectively.

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**4,293,237**

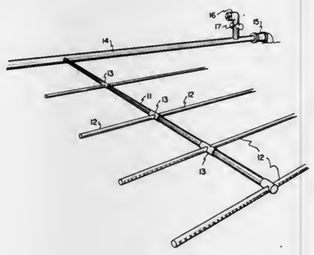
## IRRIGATION AND DRAINAGE APPARATUS

**Melvin J. Robey, 4507 Fortuna, Salt Lake City, Utah 84117; David E. Bingaman, 462 W. 3600 South, Bountiful, Utah 84010, and Arthur E. Read, 24 Hockley Pl., Don Mills, Ontario, Canada (M3A2S4)**

**Filed Jun. 29, 1979, Ser. No. 53,352**

**Int. Cl.³ E02B** *13/00*

**U.S. Cl. 405—39** **14 Claims**



1. An irrigation and drainage apparatus comprising,

a main line arranged for subsurface installation in an area to be irrigated to pass water therethrough;

a source of water connected to pass water into said main line;



a lateral line for subsurface installation connected to receive water from said main line;

weir means secured in said lateral line for partially blocking a flow of water therethrough consisting of, 'a half circular wedge shaped plate that is secured across said lateral so as to block a lower portion thereof, said plate having a profile triangular shape with upstanding sides thereof sloping towards one another from ends of a base thereof that meet in a common apex that extends across said lateral line as the weir means crest, which wedge shaped plate contains an internal passage formed therein that is arranged to be capable of being opened through an outer wall of said lateral line to receive, when appropriately connected, a liquid flow therethrough and exhausts such flow through an opening formed in an upstanding side thereof downstream to the water flow from said main line; and

means formed in said lateral line below a level of a flow of water therein for passing water therethrough into a surrounding area.

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**4,293,238**

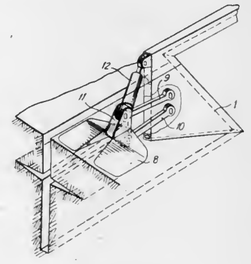
## DITCHLESS DRAINLAYER

**Eduard N. Kuzin, ulitsa III Internatsionala, 74, kv. 199; Vladimir F. Korelin, Belgradskaya ulitsa, 20, kv. 123; Mikhail L. Fainzilber, ulitsa Budapeshtskaya, 17, korpus 5, kv. 62; Jury P. Egorov, Moskovsky prospekt, 205, kv. 64; Igor V. Erofeenko, Belgradskaya ulitsa, 36, korpus 2, kv. 17; Nikolai V. Karev, Moskovsky prospekt, 138, kv. 159; Jury S. Kozlov, ulitsa Dimitrova, 10, korpus 1, kv. 160; Viktor B. Kudish, ulitsa partizana Germana, 26, kv. 44; Valery K. Kolbasov, Basseinaya ulitsa, 82, korpus 4, kv. 84, and Meri I. Bobchenok, prospekt Kosmonavtov, 13, kv. 40, all of Leningrad, U.S.S.R.**

**Filed Oct. 23, 1978, Ser. No. 953,450**

**Int. Cl.³ E02F** *5/10;* **F16L** *1/02*

**U.S. Cl. 405—175** **8 Claims**



1. A ditchless drainlayer comprising:

a frame;

a cutter-type working element for laying drains, mounted on said frame;

a hydraulic cylinder for changing the angular position of said cutter-type working element, connected to said frame;

a transmitter of the angular position of the cutter-type working element connected to said element and to said hydraulic cylinder for changing the angular position of the cutter-type working element;

an amplifier-converter for actuating said hydraulic cylinder adapted to change the angular position on signals of said angular position transmitter;

a support swivelling around a transverse horizontal axis, adapted to change the height of said cutter-type working element, and being provided with a connecting link and a pair of blades secured thereto and extending outwardly on opposite sides of said link, said connecting link being rotatably connected with said cutter-type working element by two rods arranged one above the other whose extensions converge in front as the machine goes;

a hydraulic cylinder for turning said support, articulated between said connecting link and said cutter-type working element;

a transmitter for indicating the height of said cutter-type working element connected to said element and to said support-turning hydraulic cylinder; and

another amplifier-converter for actuating said hydraulic cylinder intended to turn the support on signals from the height position transmitter.

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**4,293,239**

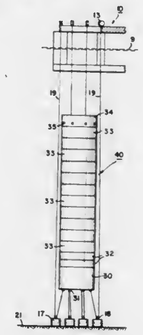
## METHOD OF ERECTING A VERY LARGE DIAMETER OFFSHORE COLUMN

**Terry D. Petty, New Orleans; Carmon R. Costello, Kenner; Gude P. Rao, New Orleans, and David Gansar, Metairie, all of La., assignors to Odeco Engineers Inc., New Orleans, La.**

**Filed Apr. 2, 1979, Ser. No. 25,961**

**Int. Cl.³ E02B** *9/00*

**U.S. Cl. 405—195** **3 Claims**



1. A method for erecting a very large submerged columnar buoyant structure and anchoring the submerged columnar structure above a selected site on the sea bed to allow the structure to draw clean cold water from the sea bottom, comprising in combination the steps of:

(1) providing a plurality of cylindrical columnar members for assembly one on top of the other, each partially assembled columnar members forming a sub-structure, said columnar members including a lowermost member having a plurality of hooks on the bottom end thereof, a second columnar member shorter than said lowermost columnar member, and an uppermost columnar member having a plurality of circumferentially spaced hooks, each columnar member having an inherent net positive buoyancy and defining therein watertight chambers;

(2) providing a platform having on a portion of its periphery a plurality of operatively positioned wireline winches;

(3) providing a transport barge adapted to become partially submerged;

(4) providing a plurality of anchor weights, each weight having a sheave thereon;

(5) transporting with said barge and deploying said weights on said selected site by suspending said weights from said wirelines;

(6) consecutively erecting said columnar members utilizing said suspended weights to pull down each assembled sub-structure;

(7) securely interconnecting said members and fluidly connecting the chambers of said columnar members utilizing said inherent positive buoyancy to lift the columnar members out of the water for the purpose of making said connections above the water surface;

(8) ballasting said columnar members with sea water, whereby said fully erected columnar structure is at a desired distance above the seabed; and
(9) anchoring the submerged columnar structure to the sea bed using said weights attached to said wirelines.

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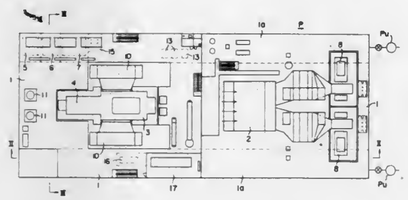
**4,293,240**
## METHOD FOR INSTALLING AN ELECTRIC POWER PLANT

**Kazuo Ogimoto, Fujisawa; Tomohiro Inoue, Yokohama; Susumu Tanaka, Ushiku, and Yoshio Kobayashi, Ooi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Sep. 27, 1979, Ser. No. 79,465**
**Claims priority, application Japan, Oct. 5, 1978, 53-122013**
**Int. Cl.³ E02D** *21/00*
**U.S. Cl. 405—195** **6 Claims**



1. A method for installing an electric power plant comprising the steps of:
preparing, at a site where the plant is to be installed, a plant yard in the form of a shallow pool having a foundation forming at least part of the bottom of said pool, said plant yard being connected to a water area whose level varies with time due to ebb and flow, the bottom of said pool being at a lower level of said water area at least when said water level is at a high water level,
mounting, in a dockyard, equipment forming the plant on a floatable base to form a floatable package,
submerging a submersible barge having ballast tanks,
moving said package over said submersible barge for support thereon, said barge including ballast tanks,
towing said barge with said package supported thereon to said water area,
unloading said package from said barge by submerging said barge whereby said package floats,
moving said package into said plant yard when the water is at a high level, and
introducing water into said ballast tank of said base of said package to cause said package to sink onto said foundation.

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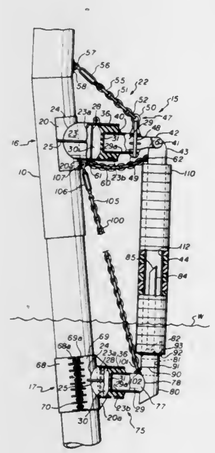
**4,293,241**
## BARGE BUMPER ASSEMBLY

**Wilton L. Helveston, and Richard J. Pecoraro, both of New Iberia, La., assignors to International Moorings & Marine, Inc., New Iberia, La.**

**Filed Feb. 26, 1979, Ser. No. 14,806**
**Int. Cl.³ E02B** *3/22*
**U.S. Cl. 405—213** **2 Claims**

1. Offshore platform structures to prevent damage to such structures by vessels and the like comprising:
(a) an upper shock cell assembly including a rigid cylinder mounted with such structure and a movable piston for moving in and out of said rigid cylinder and further including a resistant resilient material for positioning said piston inside said rigid cylinder and wherein said shock cell assembly operates such that movement of said piston relative to said rigid cylinder by vessels and the like must overcome the resistant resilient force and wherein cessation of the pressure by such vessel enables said resistant resilient material to return said piston to its original position relative to said rigid cylinder;
(b) a second lower shock cell assembly including a rigid cylinder mounted with such structure and a movable piston for moving in and out of said rigid cylinder and further including a resistant resilient material for positioning said piston inside said rigid cylinder and wherein said lower shock cell assembly operates such that movement of said piston relative to said rigid cylinder by vessels and the like must overcome the resistant resilient force and wherein cessation of the pressure by such vessel enables said resistant resilient material to return said piston to its original position relative to said rigid cylinder;
(c) a stabbing member being attached to the opposite end of said piston of said lower shock cell assembly, said stabbing member including a cylindrical stabbing base, an inwardly tapered portion above said stabbing base, and an upwardly extending stinger attached to said tapered portion;
(d) a cylindrical, hollow bumper assembly member pivotally mounted at its upper end to the opposite end of said upper



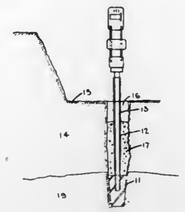
shock cell assembly to said piston of said upper shock cell assembly and depending downwardly therefrom to concentrically fit around said stabbing base for maintaining said hollow cylindrical member and stabbing member in a vertical manner relative to each other, said bumper assembly including a rigid support plate fixed thereto adjacent the lower end thereof;
(e) a bumper support plate supported by said rigid support plate, said bumper support plate having an opening therethrough to fit loosely about said bumper assembly; and
(f) a plurality of cylindrical shaped resilient bumper members supported about said bumper assembly on said bumper support plate having openings therein for fitting rotatably around said bumper assembly member wherein contact on the outer surface of said bumpers with a vessel and the like causes one or both of said upper and lower shock cell assemblies to operate such that each of said pistons is driven inwardly relative to said leg or structure and wherein cessation or elimination of pressure on said bumpers enables said resilient, resistant means to return said pistons to their original positions.



**4,293,242**
## PILES

**Stanley Merjan, 16 Beacon Dr., Port Washington, N.Y. 11050**

**Continuation-in-part of Ser. No. 792,354, Apr. 29, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,184**
**Int. Cl.³ E02D** *5/50*
**U.S. Cl. 405—239** **23 Claims**



1. Process which comprises driving a pile having a hollow stem and an enlarged preformed lower tip, which tip has a diameter of at least 19 inches, through overlying non-bearing soil into an underlying bearing layer of sand in which the driving causes said enlarged tip to penetrate into said underlying layer and the driving is continued into said underlying layer until the resistance to the driving force shows that the designed load bearing capacity of the pile has been attained, said tip having a central, upwardly open, socket and the bottom part of said stem being fitted in said socket, the driving of said enlarged tip forming an annular space around said stem above said tip and above said underlying layer, said method including the steps of supplying wet, flowable, concrete to said annular space during said driving to form an annular body of said flowable concrete in said annular space and in contact with said stem and with the soil surrounding said annular space, permitting said flowable concrete to set after said driving is completed, providing tying means for transmitting uplift forces at the top of said stem and including reinforcing rods extending through said stem from the top of said stem into said bottom part of said stem within said socket, filling said hollow stem with unhardened concrete and permitting said concrete to set in said stem and around said reinforcing rods, said stem being secured to said tip in such fashion that uplift forces are transmitted to said tip, forming a group of piles by driving at least one other pile adjacent to the first-mentioned pile and casting concrete over said group and around said tying means to form a pile-supported structure, said hardened concrete in said annular space increasing the uplift capacity of said first-mentioned pile, the relationship between said pile and the soil being such that any load bearing support contributed by the concrete surrounding the stem by frictional contact between said surrounding concrete and the soil is less than 5% of the load bearing support contributed by said tip; the dimensions or said tip and stem being such that the width of the annular space around the stem is at least about 6 inches and the length of the stem in the soil is not over about 30 feet, said tying means being constructed and arranged so as to have sufficient strengths to transmit an uplift force of 52.5 tons per pile to said stem.

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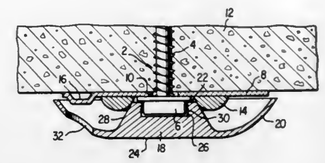
**4,293,243**
## MINE ROOF BOLT ASSEMBLY GUARD

**Carl N. Graybeal, General Delivery, Wolf Pen, W. Va. 24896; Basil E. Rogers, Beckley, W. Va.; Joseph V. Cox, Stanaford, W. Va., and Roy R. Rogers, Beckley, W. Va., assignors to Carl N. Graybeal, Wolf Pen, W. Va.**

**Filed Feb. 14, 1979, Ser. No. 12,145**
**Int. Cl.³ A47G** *3/00;* **E21D** *21/00*
**U.S. Cl. 405—259** **3 Claims**

1. In combination with a mine roof bolt assembly comprising a mine roof bolt having a head and a mine roof bolt plate adapted to fit around said bolt, a guard comprising:
a cap adapted to fit over the head of said bolt, said cap including an upper surface, a lower surface and a cavity in said upper surface into which said mine roof bolt head may be inserted;
fixing means associated with said cavity for removably fixing said cap to said bolt head; and
an annular skirt, depending from said cap and extending outward from adjacent said lower surface for a distance at least sufficient to completely cover said bolt plate, said skirt gradually curving towards said bolt plate;
wherein said mine roof bolt assembly includes hanger loops and said skirt includes cut-outs in positions corresponding to said loops;
wherein said guard presents a substantially continuous surface, having a curved periphery, to a passing miner.



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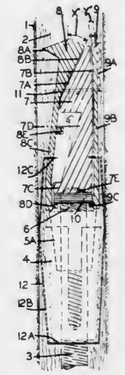
**4,293,244**
## PICK ARM ANCHOR ASSEMBLY

**David C. Donan, Jr., Manitou, Ky., assignor to Waimea Company Inc., Manitou, Ky.**

**Filed Jul. 30, 1979, Ser. No. 61,595**
**Int. Cl.³ E21D** *21/00*
**U.S. Cl. 405—259** **5 Claims**



1. A pick arm anchor assembly comprising, in combination:
(a) a bolt having a threaded stem for insertion into a bolt hole;
(b) a bolt base plate operably engaged to one end of the threaded stem of said bolt;
(c) a threaded wedge nut having an inner surface adapted for engagement upon the threaded stem of said bolt, and having an outer surface of larger diameter at the upper end thereof and tapering to a smaller diameter at the lower end thereof, said inner surface being adapted for engagement upon the threaded stem of said bolt such that as the bolt is rotated in a first direction, said threaded base nut advances upon said threaded stem;
(d) an expandable outer expansion shell unit having an inner surface for selective engagement with the wedge-shaped outer surfaces of said threaded wedge nut such that as the threaded wedge nut is selectively engaged upon the

threaded stem of the bolt as aforesaid, the threaded wedge nut advances down the threaded stem of the bolt, causing the outer surface of the lower end of said threaded wedge nut to selectively engage against the inner surface of the outer expansion shell unit such that as there is more engagement of said wedge nut and outer expansion shell unit, said outer expansion shell unit is expanded radially outward to engage the walls of the bolt hole;

(e) a threaded base nut adapted for selective engagement with the threaded stem of said bolt, such that said base nut is placed on said threaded stem above the larger diameter end of the aforesaid wedge nut;

(f) a pick arm comprising a lower end having a foot for engaging the threaded stem of the bolt between said wedge nut and said base nut and for engaging said base nut to prevent rotation of said base nut as the threaded stem of said bolt is rotated, and further having one or more attachment loops adaptable to receiving additional pick arms, a middle portion having a generally longitudinally concave inner surface, an upper portion having a biased sloped inner surface, and an upper-most portion having a protrusion for engagement with the walls of a bolt hole, as said pick arm is expanded radially outwardly;

(g) a back up wing comprising a lower end having a foot for engagement of the threaded stem of said bolt between said wedge nut and said base nut, a middle portion having a biased sloped inner surface and a generally straight outer surface adapted for positive engagement against the walls of a bolt hole;

(h) a bias thrust wedge adapted for positioning between the inner surface of said back up wing and said longitudinally concave inner surface of said pick arm and having a lower portion adaptable for engagement upon the upper end of the threaded stem of the bolt, a middle portion, and an upper end having outer surfaces with a major bias for engaging the biased sloped inner surface of the upper portion of said pick arm and a minor bias for engaging the bias sloped inner surface of said back up wing, such that as the threaded stem of said bolt is rotated in a first direction as aforesaid, said bias thrust wedge moves in a first longitudinal direction opposite to the aforesaid advancement of said threaded wedge nut causing said major and minor biased outer surfaces of said thrust wedge to engage the inner surfaces of the pick arm and the back up wing respectively as aforesaid, such that said pick arm and back up wing are expanded radially outward to engage the walls of a bolt hole contemporaneously with the advancement of said threaded wedge nut down the threaded stem of said bolt to engage said inner surfaces of said expansion sell unit as aforesaid to cause radial expansion of the outer expansion shell unit;

(i) a stabilizer having a lower end adapted for engagement with the threaded stem of said bolt and positioned below the outer expansion shell unit, one or more legs for engaging the lower portion of the bias thrust wedge and adapted to prevent rotation of the pick arm, back up wing and bias thrust wedge while the threaded stem of the bolt is being rotated; and

(j) an elastic expansion band adaptable to contain said pick arm and said back up wing around said bias thrust wedge so as to prevent said pick arm and back up wing from expanding to a greater diameter than that of the bolt hole prior to insertion of the pick arm anchor assembly therein.

**4,293,245**

## STRUCTURAL SYSTEM AND STRUCTURAL ELEMENTS FOR USE AND CONSTRUCTION OF EARTH FILLED WALLS

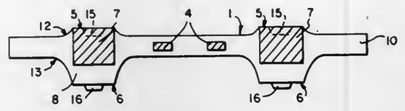
**Felix P. Jaecklin, Geissbergstrasse, 59, 5400 Ennetbaden, Switzerland**

**Filed Jun. 8, 1979, Ser. No. 46,847**

**Claims priority, application Switzerland, Jun. 13, 1978, 6411/78; Nov. 21, 1978, 8313/78**

**Int. Cl.³ E02D *5/00***

**U.S. Cl. 405—272** **27 Claims**




1. A structural system for the construction of walls comprising a framework consisting of solid frame elements and being filled with earth material, said frame elements extending in at least one plane and having at least one support area on at least one side, said frame elements further including at least one longitudinal beam having a cross-section with at least one portion thereof arranged at an acute angle against the main plane of the frame or slab, the upper surface thereof forming a substantially flat support for said earth material, at least one such longitudinal beam being located at the front side of said wall and having an upper front edge portion being positioned at a greater height compared with said flat support and forming a board for retaining a portion of said earth material resting on said flat support, the system further including holes extending at least partly vertically through said framework and distance elements between at least two of said frame or slab elements which are positioned one above the other such that the earth material at least partially filling said vertically extending openings forms at least one sloped surface extending at least partly through the scope between said frame or slab elements positioned one above the other.

**4,293,246**

## MINE ROOF SUPPORT STRUCTURE

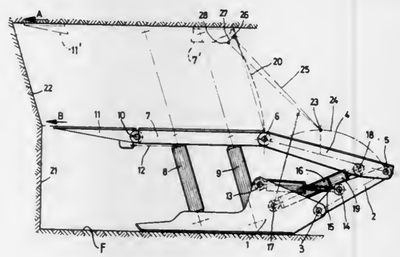
**Werner Boer, Castrop-Rauxel; Hans Lachner, Herne; Guenter Maschonat, Dortmund; Joerg Richter, Wattenscheid; Heinrich Schulte, Witten, and Hans Warnke, Herne, all of Fed. Rep. of Germany, assignors to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany**

**Filed Sep. 20, 1979, Ser. No. 77,478**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840835**

**Int. Cl.³ E21D *15/44***

**U.S. Cl. 405—291** **4 Claims**




1. In a mine roof support structure comprising a floor skid, a supporting shield, a roof cap pivotally connected at a roof cap joint to a forward end of said shield, said shield being pitovally supported on said skid at the backfilling end of the structure by a pair of rocker arms forming a lemniscate guide, hydraulic props supporting said roof cap being pivotally connected at opposite ends to said cap and to said skid, and a hydraulic actuator pivotally connected at opposite ends to said skid and to one of said arms which is inextensible, said actuator capable of being rendered rigid, the improvement wherein the other of said rocker arms is disposed nearer the coal-face end of the support structure than said one rocker arm, said other arm being longitudinally adjustable and being pivotally connected at opposite ends to said skid and to said shield, and said other arm being so constructed that said opposite ends thereof may be adjusted relative to one another to enable said cap and said roof cap joint to follow a lemniscate path during settling of the roof while said actuator is made rigid, and to follow a circular arc during a lowering of said cap toward said skid upon actuation of said hydraulic actuator.



**4,293,247**

## SEALS FOR MINE ROOF SUPPORTS

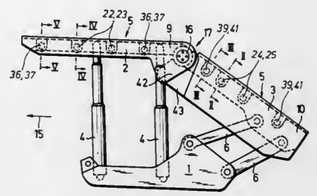
**Harry Rosenberg, Lüdinghausen, and Norbert Hölken, Lünen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany**

**Filed Nov. 28, 1979, Ser. No. 98,187**

**Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853050**

**Int. Cl.³ E21D *15/44***

**U.S. Cl. 405—296** **23 Claims**




1. A mine roof support which includes a roof-engageable frame structure, a goaf shield pivotably connected to the frame structure, gap sealing means composed of plates displaceably arranged at the sides of the frame structure and the goaf shield, the plates at the sides of the frame structure overlapping the plates at the respective associated side of the goaf shield in the zone of pivotable connection between the frame structure and the goaf shield, piston and cylinder units for effecting relative adjustable displacement between the plates at the opposite sides of the frame structure and goaf shield, spring means for urging the plates at the opposite sides of the frame structure and goaf shield apart and detachable locking elements for fixing the plates in a set position.

**4,293,248**

## WALKING ROOF SUPPORT

**Wincenty Pretor, Gliwice; Edward Rozmus, Katowice; Zbigniew Korecki, Gliwice, and Stanislaw Karmanski, Tarnowskie Gory, all of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag", Gliwice, Poland**

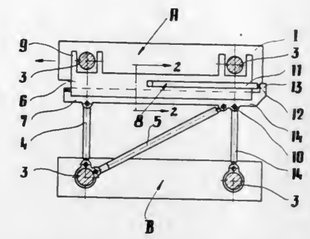
**Filed Feb. 21, 1979, Ser. No. 13,312**

**Claims priority, application Poland, Feb. 23, 1978, 204847**

**Int. Cl.³ E21D *23/08***

**U.S. Cl. 405—300** **3 Claims**

1. A walking roof support unit comprising first and second support means disposed adjacent one another for being selectively spragged and released between the floor and the roof of a structure, each support means including a base, hydraulically operated first and second props extending vertically from said base in spaced parallel relation thereon, and a roof beam supported on said props, and coupling means connecting said first and second support means for longitudinally advancing said first and second support means stepwise and in sequence parallel to one another, said coupling means comprising a guide secured to the props of the first support means, a guide shoe slidably mounted on said guide for relative movement in the longitudinal direction, said guide having a longitudinal T-shaped slot and said guide shoe including a longitudinal T-shaped end slidably engaged in said slot, two parallel, transversely extending pull rods respectively pivotably connected to the props of the second support means and to said guide shoe, an inclined pull rod pivotably connected to one of the props of said second support means and to said guide shoe and extending diagonally between said two pull rods, and a longitudinally extending hydraulic cylinder means connecting said guide and guide shoe for relatively displacing the same longitudinally.




**4,293,249**

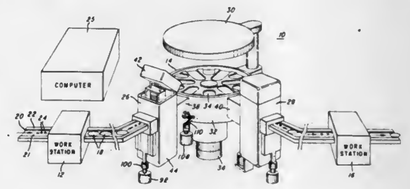
## MATERIAL HANDLING SYSTEM AND METHOD FOR MANUFACTURING LINE

**Paul L. Whelan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Mar. 3, 1980, Ser. No. 126,597**

**Int. Cl.³ B65G *51/02***

**U.S. Cl. 406—72** **29 Claims**



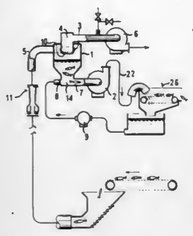

1. A line for manufacturing an article comprising:

a plurality of work stations, each of said work stations performs at least one manufacturing operation and at least one of said plurality of stations operates at subatmospheric pressures,

storage means operatively connected to said subatmospheric work station for loading and unloading articles therefrom at atmospheric and subatmospheric pressures, and

pressurized gas transport means for transporting said article at subatmospheric pressures between said storage means and said subatmospheric work station.

**4,293,250**
**APPARATUS FOR TRANSFERRING SOLIDS**
**Takeshi Hayashi, No. 85-3, Mitsuicho, Bezaiten, Muya-cho, Naruto-shi, Tokushima-ken, Japan**
**Filed Dec. 10, 1979, Ser. No. 101,793**
**Claims priority, application Japan, Dec. 8, 1978, 53-152890**
**Int. Cl.³ B65G** *53/30*
**U.S. Cl. 406—109** **10 Claims**



1. An apparatus for transferring solids while preventing damage to such solids due to the shock of transfer comprising a sealed chamber of a water-tight structure, a decompressing means for exhausting air out of the sealed chamber, a feeding means for feeding to the sealed chamber a liquid transfer medium, and a solids transfer pump for transferring the solids together with said liquid out of the sealed chamber, in which the sealed chamber is provided with an inlet opening to which an inlet pipe is connected, an outlet opening positioned above the level of the liquid in the sealed chamber and to which the suction side of the decompressing means is connected, and a delivery opening for delivering solids therethrough positioned below the level of the liquid in the sealed chamber and communicating with the suction side of the solids transfer pump, and in which air is exhausted out of the sealed chamber by means of the decompressing means, and thereby solids being introduced through the inlet pipe into the sealed chamber, dropped in and mixed with the liquid stored in the sealed chamber, and then transferred together with the liquid as a transfer medium by the solids transfer pump to a predetermined location.

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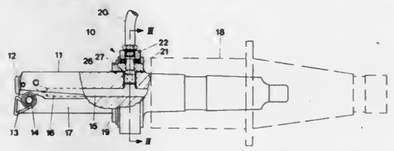
**4,293,251**
**DEVICE FOR TRANSFERRING FLUID TO A ROTATING UNIT**
**Kjell Anderson, Fagersta, Sweden, assignor to Seco Tools AB, Fagersta, Sweden**
**Filed Apr. 25, 1980, Ser. No. 143,858**
**Claims priority, application Sweden, Jun. 12, 1979, 7905152**
**Int. Cl.³ B23B** *27/10;* **F16L** *27/08*
**U.S. Cl. 408—59** **4 Claims**



1. A device for transferring fluid such as a cooling or flushing medium from a fluid source to a rotating member, said device including a housing mountable on said rotating member which comprises:
- a first member non-rotatably attachable to said rotating member,
- a second member rotatably mounted on the outside of said first member,
- said first and second members forming first passage means for fluidly connecting the fluid source with a fluid passage in the rotating member,
- connecting means for securing said first member non-rotatably to the rotating member, said connecting means disposed in said first passage means and including a through-flow passage to conduct fluid to the fluid passage in the rotating member, and
- and means retaining said second member rotatably on said first member such that said first and second members are installable as a unit onto said rotating member and securable to the latter by said connecting means.

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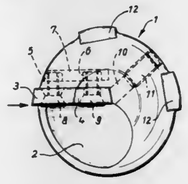
**4,293,252**
**DRILL BIT**
**Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to Mapal Fabrik für Prazisionswerkzeuge, Aalen, Fed. Rep. of Germany**
**Filed Jan. 29, 1980, Ser. No. 116,389**
**Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903814**
**Int. Cl.³ B23B** *51/00*
**U.S. Cl. 408—224** **7 Claims**



1. Drill bit having an axis of rotation with a first end extending transversely of the axis of rotation, said first end having a recess therein forming a drill bit mouth for chip removal, a plurality of turnable cutting plates located in the cutting position in a plane extending generally in the direction of the axis of rotation and also radially outwardly from the axis of rotation, each said cutting plate having a plurality of cutting edges with the active cutting edges arranged in the cutting position being disposed in a step-wise manner in the axial plane of said cutting plates, wherein the improvement comprises that in the axial plane in the cutting position said cutting plates have a parallelogram shape and said cutting edges on said cutting plates include main cutting edges with at least certain of said main cutting edges on one of said cutting plates being in parallel relation with at least certain of said main cutting edges on an adjacent one of said cutting plates, a parallel said main cutting edge on one of said cutting plates being disposed in contact with a corresponding parallel said main cutting edge on the adjacent one of said cutting plates, said recess in said first end of said drill bit having a shoulder formed therein providing a support for said cutting plates, and means for radially adjustably positioning said cutting plates in the cutting position.

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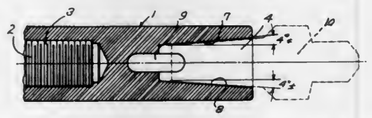
**4,293,253**
**TOOL HOLDER AND CARBIDE INSERT**
**Clyde E. Ott, c/o Pace Precision Tool & Die Co., Inc., Ohio Ave., DuBois, Pa. 15801**
**Filed Jun. 13, 1979, Ser. No. 48,096**
**Int. Cl.³ B23B** *51/12*
**U.S. Cl. 408—226** **3 Claims**



1. A tool holder and bit construction comprising a rotatable holder body, means to connect said body to rotating mecha-



nism at one end, a tool shank receiving cavity at the other end, said cavity being of flattened rectangular cross-section, diminishing uniformly in area from its widest dimension at the entrance, to the inner end on a total taper of 8 degrees with minimum tolerance therefrom, the tool bit being a preformed carbide composition member having a shank with corresponding cross-section and taper tolerance substantially identical to that of the cavity, shank being frictionally positioned in the cavity, and means to effect removal of said shank from the cavity.

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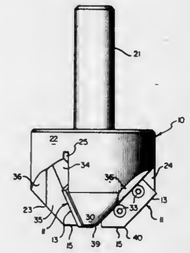
**4,293,254**
**COUNTERSINKING TOOL WITH REMOVABLE CUTTING INSERTS**
**Michael Markovics, Lindenhurst, Ill., assignor to Everede Tool Company, Chicago, Ill.**
**Filed Sep. 17, 1979, Ser. No. 76,175**
**Int. Cl.³ B23B** *51/00;* **B26D** *1/12*
**U.S. Cl. 408—229** **15 Claims**



1. In combination, a rotatable holder and a plurality of cutting inserts for use with said holder as a countersinking tool, said combination comprising:
- a frusto-conical portion on said holder;
- said frusto-conical portion tapering toward a terminal end thereof constituting the terminal end of said holder;
- a plurality of seating surfaces, one for each of said inserts;
- each of said seating surfaces being located at least partially on said frusto-conical portion;
- each of said seating surfaces lying in a plane parallel to the axis of said holder and extending inwardly from the periphery of said holder to an inner end of said seating surface;
- a locating recess at the inner end of each seating surface;
- each insert having a body, a cutting edge portion and an inner end portion opposite and spaced from said cutting edge portion;
- said locating recess comprising means for receiving said inner end portion of an insert and for cooperating with said seating surface to mount said insert on said holder;
- each locating recess comprising a locating surface disposed angularly to said seating surface and joining the latter along an interior edge;
- said inner end portion of the insert comprising means for seating on said locating surface;
- said recesses and their respective locating surfaces converging toward each other with said recesses meeting at said terminal end;
- said recesses terminating at said terminal end without intersection or overlapping of the recesses;
- said inserts and their respective inner end portions converging toward each other in the direction of said terminal end of the holder;
- each insert having a forward end portion adjacent said cutting edge portion and extending from the latter toward a projected junction with said inner end portion;
- said forward end portion of the insert being located adjacent said terminal end of the holder;
- said projected junctions overlapping at said terminal end;
- said holder having a predetermined radius at said terminal end;
- the distance from the junction of said cutting edge portion and said forward end portion to said projected junction being greater than said predetermined radius;
- the junction of said cutting edge portion and said forward end portion being radially spaced from the axis of said holder;
- each insert being cut-away from said projected junction to accommodate the inner end portions of the inserts as they converge in said holder and to prevent said inner end portions from interfering with each other at said terminal end of the holder;
- said forward end portion of the insert having a length less than said predetermined radius.

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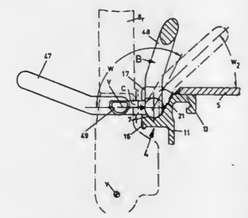
**4,293,255**
**LOAD CARRYING PLATFORM OR BACK FOR VEHICLES**
**Heinrich Hrasche, Dietikon, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland**
**Division of Ser. No. 850,155, Nov. 10, 1977, Pat. No. 4,167,273. This application Apr. 30, 1979, Ser. No. 34,766**
**Claims priority, application Switzerland, Dec. 8, 1976, 15459/76**
**Int. Cl.³ B60P** *7/00*
**U.S. Cl. 410—104** **7 Claims**



1. Load carrying platforms or backs of vehicles, in particular such platforms made out of light metal elements in a platform frame and for vehicles with at least one ring-shaped holding device which is hinged to the load carrying platform and is for attaching ropes or the like clamping facilities for securing loads in place, in which the load carrying surface is provided with at least one groove-shaped recess which has a constricted opening, into which a bearing part of the hinged holding device, pivotable about the long axis of the recess, fits and from which it can be removed, wherein said holding device comprises an arc-shaped part and at least one transverse rod or the like projecting out from said part and having at its free end the bearing part in bolt form.

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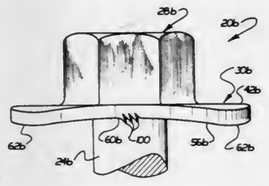
**4,293,256**
**LOAD INDICATING FASTENER**
**Walter R. Pamer, Parma, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio**
**Filed Nov. 9, 1979, Ser. No. 92,648**
**Int. Cl.³ F16B** *31/02*
**U.S. Cl. 411—11** **21 Claims**

1. A load indicating fastener for indicating when a predetermined preload has been applied to said fastener to thereby apply a force against a member and for indicating when the predetermined force against the member is reduced, said load indicating fastener comprising a thread convolution, a body section connected with said thread convolution, and a load transmitting and indicating section connected with said body section, said load transmitting and indicating section including a bearing section having a flat annular bottom surface which extends perpendicular to a central axis of said thread convolu-

tion, is adapted to abuttingly engage the member and is disposed in a coaxial relationship with said thread convolution, said body section being disposed on a first axial side of said load transmitting and indicating section and said bottom surface being disposed on a second axial side of said load transmitting and indicating section, said load transmitting and indicating section further including an undulating annular spring section circumscribing said bearing section and disposed in a coaxial relationship with said bearing section and thread convolution, said spring section having undulations which have a first amplitude when said spring section is in an unloaded condition prior to the application of the predetermined preload to said fastener and which are resiliently flattened upon the application of the predetermined preload to said fastener to indicate that the predetermined preload has been applied to said fastener, said spring section being returnable from the flattened condition toward the unloaded condition to increase the amplitude of said undulations upon a reduction in the force applied to the spring section to indicate the reduction in the preload applied to said fastener, said spring section having a circular rim portion which is disposed in a coaxial relationship




with said thread convolution and having an undulating bottom surface disposed on the second side of said load transmitting and indicating section, said bottom surface of said spring section having crest portions and trough portions which have amplitudes which increase from zero to a maximum amplitude at the rim portion of said load transmitting and indicating section as the radial distance outwardly from said bearing section increases, said crest portions of said bottom surface of said spring section extending tangentially to the plane of the bottom surface of said bearing section throughout the radial extent of said crest portions, said trough portions sloping radially and axially outwardly from said bearing section in an axial direction away from said body section, said trough portions being engageable with the member, said spring section being resiliently deflectable toward said body section to flatten the undulations in said spring section under the influence of forces applied against said trough portions upon application of the predetermined preload to said body section, said spring section being resiliently returnable to increase the amplitude of said trough portions upon a reduction in the force applied to said trough portions by the member to provide a visual indication of the reduction in force.

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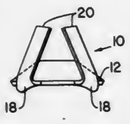
**4,293,257**

## TENSION INDICATING WASHER

**Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Mar. 17, 1980, Ser. No. 130,670**
**Int. Cl.³ F16B** *31/02, 39/24*
**U.S. Cl. 411—11** **3 Claims**




1. A tension indicating washer to indicate a predetermined loading in a joint, said washer comprising an annular disc-like body portion having first and second opposed faces with said second face defining a bearing surface, said body portion having an aperture adapted for receiving the shank of a threaded fastener; a pair of arm members projecting outwardly from the outer periphery of said body portion, each said arm having an elbow and an outer extremity extending in a direction axially away from bearing surface from said elbow to a position above said first face of said body portion; each elbow having a circumferentially inner and a circumferentially outer section, said circumferentially inner sections being adjacent each other, the circimferentially outer section of each elbow being displaced to a horizontal plane below the horizontal plane of said circumferentially inner section such that as tension is applied to the joint, the elbow will cause rotation of at least a portion of each arm so that the outer extremities thereof will approach each other and will touch when the predetermined proper loading is achieved in the joint.

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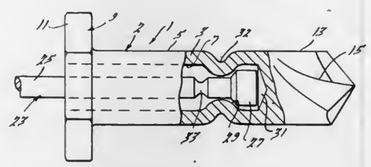
**4,293,258**

## SELF DRILLING BLIND RIVET

**Arthur J. McKewan, Rochester, Mich., assignor to Microdot Inc., Darien, Conn.**

**Continuation of Ser. No. 839,340, Oct. 4, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,209**
**Int. Cl.³ F16B** *13/06;* **E04B** *1/49*
**U.S. Cl. 411—30** **5 Claims**




1. A self drilling blind rivet comprising a hollow elongated rotatable one piece body of hardenable metal having flange means and torque receiving means formed therein at one end and having a thick second end with a hardened drill bit formed therein capable of drilling through metal parts, said torque receiving means enabling said body to be rotated whereby said drill bit may drill a hole through metal parts to be held together by the rivet, said body including a plastically deformable sleeve section extending between said flange means and torque receiving means and said drill bit and having a hardness significantly lower than said drill bit and low enough to enable it to be upset into a radial flange pleat by the application of axial compression to it whereby parts may be clamped between said flange means and said flange pleat, said body having a blind bore opening out of said one end, and a mandrel in and extending out of said bore and having a radially enlarged head located near the blind end of the bore and being slidable inside the bore, said sleeve section having a reduced diameter portion forming a radial shoulder engageable with said enlarged head for blocking removal of the mandrel from the bore and serving to transmit tension on the mandrel into axial compression on the sleeve section to enable said compression to cause it to collapse and form said flange pleat, said drill bit being a permanent part of the body and remaining integral with said body after said collapse of said sleeve section.

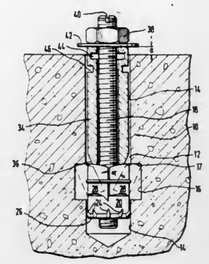


**4,293,259**

## LOCKING TOGGLE BOLT

**Heinrich Liebig, Wormserstrasse 23, D-6102 Pfungstadt, Fed. Rep. of Germany**

**Filed Dec. 1, 1978, Ser. No. 965,472**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758091; May 2, 1978, 2819289**
**Int. Cl.³ F16B** *13/08*
**U.S. Cl. 411—32** **13 Claims**



1. A form-fitting connecting arrangement comprising in combination: a workpiece having an opening therethrough, an article having a cylindrical blind bore being axially aligned with said opening and an undercut surface extending essentially radially outwardly from said blind bore and at a certain distance from the orifice of said bore, and a toggle having an elongated bolt and a toggle body having a diameter corresponding substantially to the diameter of the bore, said opening having a transverse dimension at least as great as said diameter of the bore, said toggle being introducible through the opening into the bore, locking elements mounted on said toggle body and having ends facing the bore orifice, said elements being adapted to be swung from a position lying within the diameter of the bore into a position in which they project at least partially beyond the diameter of the toggle body and engage lockingly the undercut surface of the bore, said toggle body being of relatively low height and being mounted on the bore-internal end of said bolt at the blind end of the bore, said locking elements having bore-internal ends closing together on said bottom piece to form a thick-walled cylindrical sleeve enveloping said bolt, an elongated cylindrical sleeve arranged longitudinally displaceably around said bolt and having an end tapering conically towards the interior of the bore and engaging between the ends of the locking elements facing the bore orifice, so that, upon a displacement of the bottom piece in the direction of the bore orifice, the ends of the locking elements are swung positively radially outwardly, the length of said elongated sleeve equalling substantially said certain distance of said undercut surface from the orifice of said bore plus the thickness of the workpiece at said opening plus the length of said displacement of said bottom piece necessary for swinging said locking elements radially outwardly into locking engagement with said undercut surface, said bolt having on its outer end remote from said blind end of said bore means on said bolt for effecting said displacement and including means for providing a bearing surface with said workpiece.

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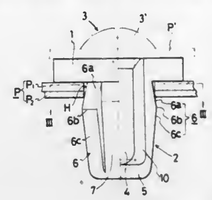
**4,293,260**

## SCREW GROMMET

**Masaharu Kojima, and Seiji Mitomi, both of Toyota, Japan, assignors to Nifco Inc., Yokohama, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,783**
**Claims priority, application Japan, Nov. 21, 1978, 53-142795**
**Int. Cl.³ F16B** *13/06*
**U.S. Cl. 411—44** **5 Claims**

1. An improvement in a screw grommet adapted to accept a screw of a predetermined diameter and to be inserted in a polygonal hole of the type including a head portion, a barrel portion extended downwardly from the head portion having an external cross-section substantially matching said polygonal hole, and a continuous axial bore through the head portion and a substantial portion of the barrel portion and possessed of an inside diameter smaller than the diameter of said screw, external means provided on the barrel portion so as to match to at least one of the corners of said polygonal fitting hole punched in a given panel for acceptance of the grommet, said external means defining a flexible portion extending angularly relative to adjacent sides of said barrel portion and further extending



outwardly beyond the margin of the said at least one corner defined by said adjacent sides of the hole, said barrel portion including relief means extending outwardly from said axial bore toward the sides of said barrel portion substantially mating with said hole but not angularly toward the said at least one corner, said angular corner engaging portion thereby being connected through the medium of a hinge formed by said relief means to the remaining part of the barrel portion and adapted to be outwardly expanded into the said at least one corner by the screw means being driven into the axial cavity enclosed with the barrel portion.

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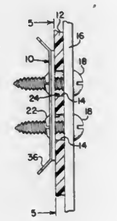
**4,293,261**

## REINFORCING SEALING SHEET METAL FASTENER ANCHOR

**Francis G. Frano, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Nov. 19, 1979, Ser. No. 95,288**
**Int. Cl.³ F16B** *37/04*
**U.S. Cl. 411—85** **9 Claims**



1. A reinforcing sealing system for use with at least two fasteners mounted in a multi-apertured thin work panel, including in combination a work panel having at least two through apertures spaced a predetermined distance, a sheet metal fastener anchor having a generally planar base, a plurality of fastener accepting apertures in said base equal in number to said work panel apertures and spaced apart said predetermined distance, gripping means extending in a first direction upwardly beyond one surface of the plane of said base, locating means comprising at least two tabs struck from within the margins of and extending generally normally to said base in a second opposite direction downwardly beyond a second surface of the plane of said base opposite said gripping means, said locating means being positioned in spaced relation to one another with only one of said tabs being positioned adjacent to each one of said spaced fastener accepting apertures and thereby adapted to engage the margins of said at least two

spaced work panel apertures and positively locate and orient said anchor fastener accepting apertures relative to said at least two work panel apertures, and continuous initially imperforate double-faced adhesive tape having one face thereof covering a substantial portion of the second surface of said base, said tape adapted to cover and seal both of said work panel and fastener accepting apertures, said spaced tabs piercing said tape and extending outwardly beyond the second face of said tape to permit blind locating and orientation of said fastener anchor apertures relative to said work panel apertures.

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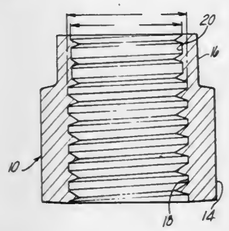
**4,293,262**

## REUSABLE PREVAILING TORQUE NUT

**Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018**

**Filed Jun. 8, 1979, Ser. No. 46,736**
**Int. Cl.³ F16B *39/30***
**U.S. Cl. 411—311** **6 Claims**




1. A prevailing torque female fastener element for use in combination with a male threaded element having a standard thread form with standard flank angles, said female element comprising a nut body having a threaded hole at least partly therethrough, the threaded hole being characterized by a thread form having a first depth along a first portion thereof and a second reduced thread depth along a second portion contiguous with the first portion, said second reduced depth being formed by a truncation of the thread flanks thereby to define a flat surface of truncation at the major diameter of said second portion, the nut body being constructed to exhibit greater radial compliance in the portion of reduced thread depth, the increased radial compliance being achieved by a reduced wall thickness in the nut body surrounding the portion of reduced thread depth, thus to permit radial and circumferential expansion of the nut body when engaged with a male fastener element or standard thread form, at least the trailing flank angle of the nut body being greater than the corresponding mating flank angle of a standard male thread form so as to provide longitudinal clearance therebetween when threadedly engaged.

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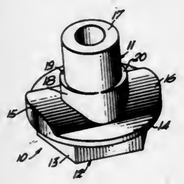
**4,293,263**

## SCREW LOCK RIVET

**Robert H. Zankl, 5410 Banyan Dr., Miami, Fla. 33156**

**Filed Nov. 26, 1979, Ser. No. 97,522**
**Int. Cl.³ F16B *19/04***
**U.S. Cl. 411—500** **4 Claims**




1. In a screw lock rivet for use in adjustably securing a riveted member to a sheet metal companion member having an adjustment slot and an opening communicating with the adjustment slot for admitting a screw lock rivet head, the combination with said sheet metal companion member of a rivet head, a rivet shank integrally formed with and extending axially outwardly of the underside of said rivet head, said underside of said head being formed with a flange comprising a flat, transversely-extending portion and an axially outwardly-projecting arcuate ramp portion, said shank comprising a shank base portion extending into a cylindrical shank outer end portion of decreased cross-sectional size to define with said shank base portion a shoulder against which a member to be riveted to seats upon the riveting deformation of said shank outer end portion, the axial distance between the outward-most projection zone of said ramp portion and said shoulder being less than the thickness of the companion member to be riveted to, and tool engaging means at the outer end of said rivet head to facilitate turning of the lock screw rivet with respect to a companion member to be riveted to, said shank base portion being ovoid in transverse cross-sectional shape, the arcuate extent of said axially outwardly-projecting arcuate ramp portion being no greater than the maximum diameter of said shank portion, the major axis of said ovoid shank portion and the radial direction of said arcuate ramp portion lying along the same transverse diameter as that of said cylindrical shank outer end portion, said major axis having a length greater than the width of the companion member adjustment slot.

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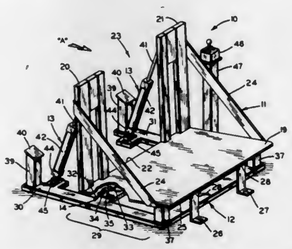
**4,293,264**

## PIVOTAL SHIPPING RACK SUPPORTING APPARATUS

**Richard G. Gilts, Walbridge; Earl A. Hille, Elmore; Albert W. Kleine, Jr., Sylvania, and Donald E. Shamp, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed Dec. 7, 1979, Ser. No. 101,124**
**Int. Cl.³ B65G *57/28***
**U.S. Cl. 414—38** **6 Claims**




1. An apparatus for tilting a sheet-carrying shipping container from an upright transporting attitude to a container packing attitude, comprising:

a. a flat pivotable member for carrying the shipping container and pivotable between a container loading/unloading attitude and a container packing attitude;

b. a pair of spaced-apart upright members with their lower ends affixed to and normal to one edge of said flat pivotable member for supporting the shipping container in said container packing attitude;

c. a base for pivotably supporting said pivotable member;

d. means for pivotably mounting said one edge of said pivotable member to said base;

e. first upstanding means affixed to said base for supporting said pivotable member in the container loading/unloading attitude;

f. second upstanding means affixed to said base for supporting said pair of spaced-apart members affixed to said pivotable member in the container packing attitude;



g. means pivotably attached between the upper ends of said spaced-apart members and said base for rotating said flat pivotable member between said container loading/unloading attitude and said container packing attitude; and

h. a platform and means affixed to said flat pivotable member for supporting said platform when said pivotable member is in said container packing attitude.

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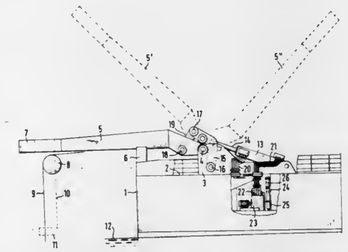
**4,293,265**

## HYDRAULICALLY OPERATED HOISTING APPARATUS FOR A SHIP FOR PICKING FLOATING OBJECTS UP OUT OF THE SEA

**Klaus Lück, Wenningsen, and Fritz-Otto Poeppel, Wunstorf, both of Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft, Hanover, Fed. Rep. of Germany**

**Filed Sep. 8, 1978, Ser. No. 940,745**
**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740608**
**Int. Cl.³ B63B *27/10***
**U.S. Cl. 414—140** **6 Claims**




1. In a hydraulically-operated hoisting apparatus on a ship for picking floating objects from the sea, including a lifting arm mounted on the ship and having means articulated at its inner end to pivot about a horizontal axis, the outer end of said arm projecting freely over the side of the ship, gripping means for firmly holding said objects, said gripping means being connected to said outer end of and suspended from said lifting arm and including a member having a first end and a second end, said first end being connected to said object to be picked up and said second end being connected to means for drawing said object into said gripping means, a hydraulic cylinder connected to said lifting arm near said inner end to raise said arm upwardly about said horizontal axis, a body of liquid in a storage container, control means connecting and controlling the flow of said liquid to said hydraulic cylinder, said control means including a valve for controlling liquid flow to the cylinder, and presence sensing means for activating said control means in response to the presence of an object within said gripping means to cause said valve to open, thereby supplying said liquid to the cylinder to raise said lifting arm, the improvement comprising, in combination:

low energy drive power means for pressurizing said body of liquid to drive said hydraulic cylinder rapidly initially and raise said lifting arm quickly thereby hoisting said object suddenly and securely from the surface of the sea at the moment said object is gripped by said gripping means, said low energy drive power means including low energy pump means for compressing air, said body of said liquid being acted upon by said compressed air to provide a source of highly pressurized liquid.

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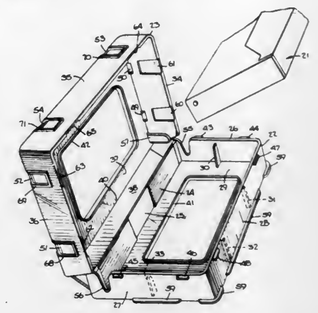
**4,293,266**

## ANTI-THEFT SECURITY ENCLOSURE AND RELEASING MECHANISM

**David S. St. Lawrence, Dania; Robert Morris, Plantation, and James G. Farrar, Coral Springs, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.**

**Filed Sep. 8, 1978, Ser. No. 940,595**
**Int. Cl.³ B65G *65/00***
**U.S. Cl. 414—411** **19 Claims**



1. Apparatus for preventing unauthorized removal of a small article from a protected area comprising in combination a device whose presence in said protected area is detectable by a surveillance unit, a wraparound enclosure having first and second interconnected sections for installation by wrapping about said article and for securing said device thereto, a plurality of independent latch means each including a latch and a mating strike for interlocking said sections in closed condition, said latch means being disposed on at least two different sides of said enclosure, and a releasing mechanism having means for simultaneously unlatching all of said latch means while grasping said second section and applying opening stress to said first section relative to said second section.

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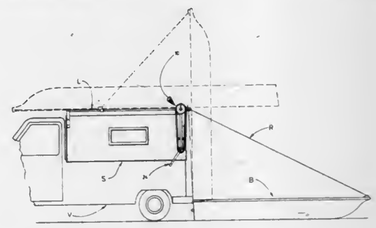
**4,293,267**

## MANUALLY OPERABLE CHAIN DRIVE FOR A BOAT LOADER

**Russell E. Grove, 5679 N. Van Ness Blvd., Fresno, Calif. 93711**

**Filed Mar. 10, 1980, Ser. No. 129,021**
**Int. Cl.³ B60R *9/04***
**U.S. Cl. 414—462** **2 Claims**




1. In combination with a boat handling apparatus particularly suited for use in stowing boats aboard overland vehicles characterized by a first means including a windlass adapted to be mounted atop an overland vehicle and a hoisting line adapted to be connected to the bow of a boat positioned in spaced relation with the vehicle and below the level of the top thereof for pivotally advancing the boat along an arcuate path into a received relationship atop said vehicle, the improvement comprising:

a pair of sprocket wheels;

a rigid bar supported in suspension by said windlass having at each end of its opposite ends one sprocket wheel of said pair supported for rotation, an endless chain arranged in coplanar relation with the pair of sprocket wheels and trained thereabout interconnecting one of the sprocket wheels of the pair in a driving relationship with the other sprocket wheel of said pair, first coupling means for releasably coupling the other sprocket wheel to said windlass in a driving relationship, a crank handle, second coupling means for releasably connecting said crank handle in a driving relationship with said one sprocket wheel, a support member for restraining said bar from pivotal motion relative to the axis of rotation for the windlass comprising a yoke adapted to be mounted on a side surface of the vehicle and supported for pivotal displacement into capturing relation with said rigid bar, and means for securing said yoke in a fixed relationship with said bar.

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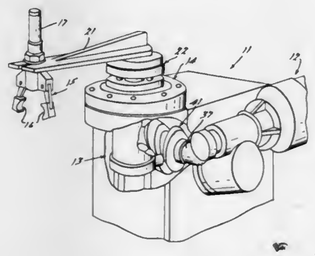
**4,293,268**

## MATERIAL HANDLING DEVICE

**George Mink, 38296 Horseshoe Dr., Mt. Clemens, Mich. 48043**

**Filed Sep. 21, 1979, Ser. No. 77,678**
**Int. Cl.³ B65G *47/90***
**U.S. Cl. 414—591** **8 Claims**



1. A material handling device for moving a workpiece comprising gripping means for selectively gripping a workpiece to be moved, first supporting means for supporting movement along a first path, second supporting means for supporting said gripping means upon said first supporting means for movement relative thereto along a second path, a cam shaft supported for rotation, a barrel cam affixed for rotation with said cam shaft, a second cam affixed for rotation with said cam shaft, a first follower supported for oscillation about an axis disposed transversely to the axis of said camshaft and continuously engaged with said barrel cam for oscillation about said follower axis upon rotation of said camshaft, a second follower continuously engaged with said second cam and movable upon rotation of said cam shaft, first motion transfer means for transferring oscillation of said first follower about its axis into movement of said gripping means along the first path, and second motion transfer means for transferring movement of said second follower into movement of said gripping means along said second path.

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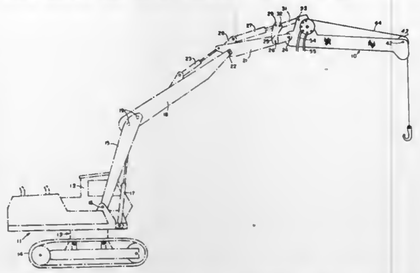
**4,293,269**

## CONVERSION OR EXTENSION BEAM

**Grant W. Zook, 436 Smokepipe Rd., Souderton, Pa. 18964**

**Filed Jul. 30, 1979, Ser. No. 62,167**
**Int. Cl.³ B66C *23/44***
**U.S. Cl. 414—686** **3 Claims**

1. An extension beam for replacement of the scoop bucket of a hydraulic excavator to convert it from a power shovel operation to a power hoist operation, comprising two spaced side plates joined along their lengths by a top plate and a bottom plate which together form an elongated beam which is box-like in cross section, the side plates having aligned sheave bearings at one end for receiving a transverse sheave supporting pin, the other ends of the side plates having aligned pivot bearings for receiving a transverse pivot pin about which the beam swings up and down, and said side plates having upward extensions above said pivot bearings through the top portions of which are aligned motive bearings for receiving a transverse pin of a driving linkage, said sheave bearings, pivot bearings and motive bearings being parallel to each other and at right angles to the length of the beam, the upper edges of said upward extensions sloping downwardly and forwardly toward said sheave bearings and having notches therein to form seats to receive a winch.



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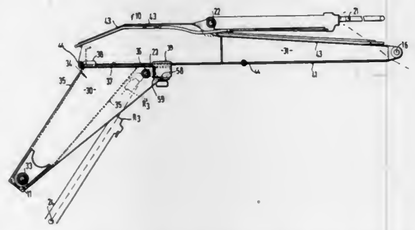
**4,293,270**

## EXCAVATORS

**Derek A. Prime, Burton on Trent, England, assignor to J. C. Bamford Excavators Limited, Great Britain**

**Filed Jan. 15, 1979, Ser. No. 3,596**
**Claims priority, application United Kingdom, Jan. 17, 1978, 1745/78**
**Int. Cl.³ E02F *3/38***
**U.S. Cl. 414—690** **12 Claims**



1. A mechanical excavator comprising a support part and a boom, said boom comprising a base part and a beam part, means pivotally to connect said base part to said support part, means to pivot said base part about a horizontal axis, a dipper arm, means to pivot said dipper arm on said beam part about a second horizontal axis, an excavating tool and means carrying said excavating tool on one end of the dipper arm, bearing means to connect together said base part and said beam part for relative movement in a first direction, said bearing means comprises a pair of parallel channel section guide means, spaced apart transversely of the direction of relative movement between the boom parts, provided on one boom part, opposed flange parts provided on the other boom part and slidably engaged in said guide means to permit relative sliding movement between said parts to vary the distance between said first and second horizontal axes and clamping means comprising at least one wedge member, and means to move said wedge member into wedging engagement with said boom parts in a direction transverse to the direction in which the resultant forces between the wedge member and boom parts act.

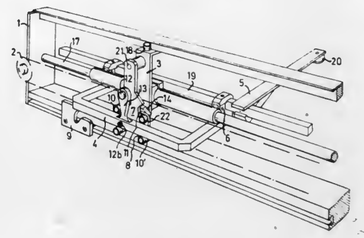


**4,293,271**

## DEVICE FOR TRANSLATING A MOVEMENT IN ONE PLANE TO A MOVEMENT IN A PLANE ESSENTIALLY PERPENDICULAR THERETO

**Arne I. Rönbeck, Olofström, Sweden, assignor to AB Volvo, Goteborg, Sweden**

**Filed Oct. 16, 1979, Ser. No. 85,288**
**Claims priority, application Sweden, Oct. 19, 1978, 7810901**
**Int. Cl.³ G05G *5/04***
**U.S. Cl. 414—737** **6 Claims**



1. Device for translating a movement in one plane to a movement in a plane essentially perpendicular thereto, the device comprising a frame with a reversible drive means for the device, a first member which is movably on the frame, said first member being provided with at least one arm with gripping means, the arm being articulated to the first member, a second movable member which is also articulated to the first member which is also articulated to the first provided with a lock mechanism for the second member, the lock mechanism being arranged to also interact with stops arranged on the frame, the drive means being connected to the second member; a releasable connection between the first member and the second member by means of the lock mechanism; and the connection of the second member to the arms being by means of a connecting means so that, when the first member and the arm have been displaced to an end position, the second member is released from the lock mechansim so that, depending on the setting of the drive means, the movement of the second member continues, so that the arm, via the connecting means, is made to carry out a movement in a plane essentially perpendicular to the plane of movement of the first and the second members.

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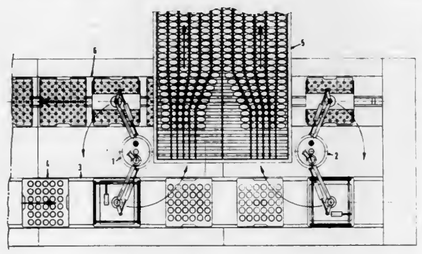
**4,293,272**

## METHOD AND APPARATUS FOR DENESTING A PLURALITY OF CONTAINERS FILLED WITH ARTICLES

**Auke Jellema, Aalten, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands**

**Filed Nov. 20, 1978, Ser. No. 963,565**
**Int. Cl.³ B65G *59/04***
**U.S. Cl. 414—744 B** **3 Claims**



1. Apparatus for denesting a plurality of stacked containers filled with articles and traveling on a conveyor, said apparatus comprising at least two denester assemblies for removing containers and articles from the conveyor and for separately discharging the containers and the articles; each denester assembly including a first arm movable upwardly and downwardly relative to a stationary frame and pivotable for swinging movement in a horizontal plane in either direction and fitted with article-gripping means and each denester assembly including a second arm likewise movable up and down and fitted with container-gripping means, said first and second arms being arranged such that during discharge of articles from the top container of a first stack by said article-gripping means on said first arm, said second arm moves toward another stack and such that during discharge of a container from said other stack, said first arm moves toward said first stack; and one of said denester assemblies being arranged to remove containers from the upper half of a stack and the other denester assembly being arranged to remove containers from the lower half of the same stack.

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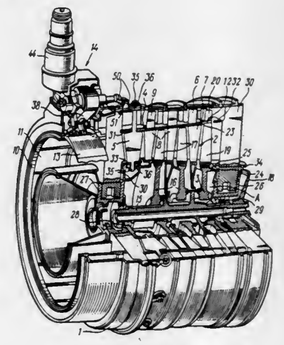
**4,293,273**

## AXIAL-FLOW REVERSIBLE TURBINE

**Viktor I. Romanov, Oktyabrsky prospekt, 38, kv. 6; Felix I. Kirzner, prospekt Lenina, 69, kv. 85, and Yakov K. Soroka, ulitsa Dekabristov, 38/2, kv. 4, all of Nikolaev, U.S.S.R.**

**Continuation of Ser. No. 746,150, Nov. 30, 1976, Pat. No. 4,124,329. This application Nov. 3, 1978, Ser. No. 958,568**
**Int. Cl.³ F01D *1/30***
**U.S. Cl. 415—78** **3 Claims**



1. An axial-flow reversible turbine according to claim 1 having a casing; a nozzle assembly accommodated in said casing provided with two-section blades for controlling the rate of flow of the working medium through said turbine; a wheel rotor with two-section blades for converting the kinetic energy of the flow of the working medium into mechanical work, mounted in the direction of the flow of the working medium after said nozzle assembly, one section of said blades of said nozzle assembly and of said wheel rotor forming the flow duct of the direct-rotating turbine and the other section of said blades of said nozzle assembly and said wheel motor forming the flow duct of the counter turbine, the inside diameter of said flow duct of counter-rotating turbine being larger than outside diameter of said flow duct of direct rotating turbine, a valve in the form of variable-incidence airfoil vanes intended to deny the access of the working medium into said flow duct of the direct-rotating turbine; located in said casing at the entrance into said flow duct; a cylindrical bushing with ports for intercommunicating said flow ducts, installed in said casing coaxially with said wheel rotor at the entrance of the flow into said flow duct before said nozzle assembly and having an inside diameter which is substantially equal to outside diameter of said flow duct of direct rotating turbine of the entrance into said flow duct; a band which is sufficiently wide for overlapping said ports and arranged along the periphery of said bush-

ing; a device for moving said band radially to at least two fixed positions, said device being installed on the external surface of said casing and connected with said band and comprising: at least one additional single-section stage located in said flow duct of the direct-rotating turbine and installed before said nozzle assembly, the maximum number of said additional stages not exceeding the number of stages obtained from the relation:

$$i_{max}=AN^3+BN^2+CN+D$$

where

A=−2000
B=2000
C=−690
D=91

$$\overline{N}=\frac{N \text{ counter-rotating turbine}}{N \text{ direct-rotating turbine}}$$

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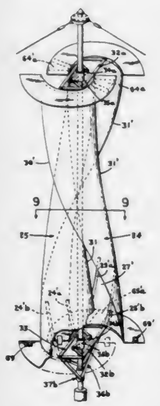
**4,293,274**

## VERTICAL AXIS WIND TURBINE FOR GENERATING USABLE ENERGY

**Frederick C. Gilman, 4th and Market, Box 395, Osceola, Mo. 64776**

**Filed Sep. 24, 1979, Ser. No. 78,643**
**Int. Cl.³ F03D** *7/06*
**U.S. Cl. 416—51** **11 Claims**



1. A vertical axis wind turbine for generating usable energy comprising:

a. driven shaft means,

b. cylindrical rotor means symmetrically disposed about said driven shaft including paired complementary vanes mounted on said driven shaft and disposed in the closed position to define a right circular cylinder,

c. support and transmission assembly means connecting said vanes and said driven shaft for self varying, essentially linear sidewise movement of said vanes with respect to each other relative the vertical axis of said driven shaft to vary the surface available for contact by the wind,

d. said vanes normally disposed in the open position, and

e. means for controlling the rate of rotation of said vertical axis wind turbine by moving the said vanes to the closed position in a predetermined range of wind velocities,

f. wherein each of said vanes is longitudinally extended and spiraled in the longitudinal direction through an arc of up to 180° from one end of said vane to the other, and said vanes are adapted to undergo axial distortion during said sidewise movement.

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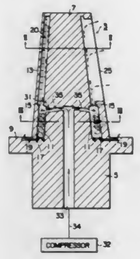
**4,293,275**

## GAS TURBINE BLADE COOLING STRUCTURE

**Nariyoshi Kobayashi, Ibaraki; Takeshi Sakamoto, Tokai; Shunichi Anzai, and Manabu Matsumoto, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 14, 1979, Ser. No. 75,584**
**Claims priority, application Japan, Sep. 14, 1978, 53-112242**
**Int. Cl.³ F01D** *5/18*
**U.S. Cl. 416—97 R** **10 Claims**



1. A turbine blade comprising:

vortex means within the blade for whirling a cooling medium to make a portion of the cooling medium lower in temperature and the other portion of the cooling medium higher in temperature;

first passage means communicating with said vortex means for introducing the cooling medium into the blade;

second passage means communicating with said vortex means for leading the lower temperature cooling medium to a higher temperature portion of the blade; and

third passage means communicating with said vortex means for leading the higher temperature cooling gas to a lower temperature portion of the blade.

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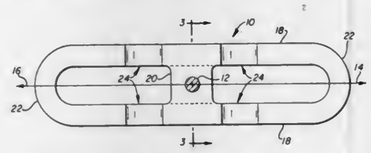
**4,293,276**

## LAMINATED COMPOSITE ROTOR YOKE

**Vas H. Brogdon, Hurst, and David L. Williams, Smithfield, both of Tex., assignors to Textron Inc., Providence, R.I.**

**Filed Oct. 27, 1978, Ser. No. 955,332**
**Int. Cl.³ B64C** *27/36*
**U.S. Cl. 416—134 A** **12 Claims**



1. A yoke for coupling helicopter blades to a mast, the longitudinal axis of the blades coupled transversely to the longitudinal axis of the mast, comprising:

a plurality of first layers formed of continuous filaments defining flat loops, each of said first layers having a width in cross section greater than the depth in cross section, and where the width of each layer lies substantially along the longitudinal axis of the blades and the depth of each layer at the mast lies substantially along the longitudinal axis of the mast; and

a plurality of second layers formed of cross-wise filaments interposed between the layers formed by continuous filaments, each of said second layers having a width in cross section greater than a depth in cross section and where the width of each of the second layers lies substantially along the longitudinal axis of the blades and the depth of each of the second layers at the mast lies substantially along the longitudinal axis of the mast;

said layers being substantially parallel and defining a flat, elongated loop with side and outboard end portions.



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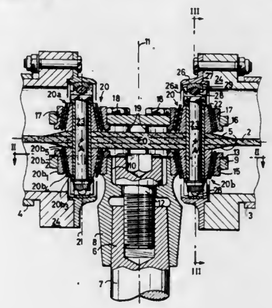
**4,293,277**

## SUPPLE MOUNTING ARRANGEMENT FOR HELICOPTER ROTOR WITH THROUGH STRIP

**Jacques A. Aubry, Cabries, France, assignor to Societe Nationale Ind. Aerospatiale, Paris, France**

**Filed Jun. 1, 1979, Ser. No. 44,365**
**Claims priority, application France, Jun. 5, 1978, 78 16730**
**Int. Cl.³ B64C** *27/38*
**U.S. Cl. 416—134 A** **11 Claims**



1. A helicopter rotor comprising a driveshaft, a hub secured to the end of said driveshaft comprising a pair of spaced plates arranged parallel to each other and perpendicular to the axis of rotation of said driveshaft, a rotor blade assembly comprising at least one pair of opposed blades formed by a common stringer having a central portion passing between the spaced plates of said hub and oppositely extending spars and a shaped blade shell surrounding each of said spars and connected thereto solely in the area of the outer end thereof and extending inwardly toward the central portion of the stringer progressively evolving in cross-section into a cylindrical sleeve proximate said hub, and means for resiliently mounting said blade assembly to said hub comprising two pair of conically laminated elastic stud means, the stud means of each pair being interposed in opposition to each other on either side of said stringer between said stringer and the corresponding one of the plates of said hub, said pair of stud means being arranged symmetrically with respect to and extending parallel to the axis of rotation of the driveshaft, and a resilient ball joint arranged between the cylindrical sleeve of each of said blade shells and the plates forming said hub.

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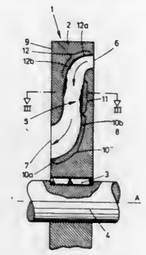
**4,293,278**

## FLUID-FLOW MACHINE

**Herbert Bachl, Munich, Fed. Rep. of Germany, assignor to Getewent Gesellschaft fur technische und Wissenschaftlichs Energieumsatzentwicklungen m.b.H., Kaufbeuren-Neugablonz, Fed. Rep. of Germany**

**Filed Feb. 21, 1979, Ser. No. 13,537**
**Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821233; European Patent Office, Jan. 26, 1979, 79.100227.2**
**Int. Cl.³ F01D** *5/14*
**U.S. Cl. 416—186 R** **8 Claims**

1. In a fluid-flow machine having at least one substantially disk-shaped rotor including flow channels for a flow medium, the intake openings of which are disposed in one axial surface of said rotor while the associated exit openings are disposed in the other axial surface, all intake openings being located at a predetermined distance from the axis of rotation, said distance being different from the distance of the respective exit openings from said axis of rotation, each flow channel having a radially outer and a radially inner deflector elbow, each said elbow having two legs forming an angle of approximately 90 degrees, one leg of the radially outer, or inner, respectively, elbow leading towards the intake opening and extending in the direction of the relative velocity of the intake flow of the flow medium prevailing thereat, and one leg of the radially inner, or outer, respectively, elbow leading towards said exit opening



and extending in the direction of the relative velocity of the exit flow, the other legs of said elbows being directed towards a substantially radial common connecting section connecting the two elbows with one another, the improvement comprising wherein the leg openings through said one axial surface and the leg openings through said other axial surface are directed such that the relative velocities (w) at said one axial surface openings have a tangential component (Wu) of magnitude greater than zero and at the other axial surface openings have a tangential component (Wu) in the same direction as said tangential component (Wu) at said one axial surface openings and of magnitude greater than or equal to zero.

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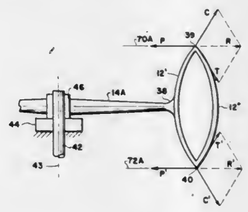
**4,293,279**

## VERTICAL AXIS WIND TURBINE

**Victor W. Bolie, 7504 American Heritage, Albuquerque, N. Mex. 87109**

**Filed Mar. 13, 1980, Ser. No. 129,833**
**Int. Cl.³ F03D** *3/06*
**U.S. Cl. 416—227 A** **30 Claims**



1. A vertical axis windmill comprising:

(a) a tower structure supported on the earth; a vertical shaft supported inside said tower structure from a bearing means at the top of said structure;

(b) a rotating structure having a central hub, rotating on said bearing means and connected to said shaft, said structure comprising at least two radial arms extending from said hub, the axes of said arms circumferentially equally spaced, in the same horizontal plane;

(c) an oval ring airfoil system or assembly, attached symmet-

rically to the outer ends of each of said arms, each of said airfoil systems oriented with its major axis in the vertical direction; and wherein

(d) the inertial center, the aerodynamic center, and the support center are all positioned at the center of rotation of said rotating structure; and in which each of said oval ring airfoil assemblies comprises two identical arched spars, the curvature of said arches designed such that there is no tendency for the curvature to change under a uniformly distributed centrifugal force being applied along the lengths of said spars, said spars are connected together at the top and bottom edges, with their concave surfaces facing each other; the center of the outer surface of one spar attached to the end of one arm.

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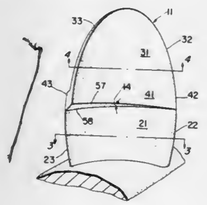
**4,293,280**

## TRANSCAVITATING PROPELLER

**Bohyun Yim, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 27, 1980, Ser. No. 181,583**
**Int. Cl.³ B63H *1/18***
**U.S. Cl. 416—237** **13 Claims**




1. A propeller blade for attachment to a central propeller hub comprises:

a radial inner blade portion, wherein said inner blade portion includes a rounded leading edge portion and a tapered trailing edge portion with arcuate pressure and suction surfaces extending therebetween;

a radial outer blade portion, wherein said outer blade portion includes a tapered leading edge portion and a blunt trailing edge portion with arcuate pressure and suction surfaces extending therebetween; and

a transition portion blade portion extending between said inner and outer blade portions, wherein said transition blade portion includes a leading edge portion and a trailing edge portion, said transition blade portion generally increases in thickness from said leading edge portion to said trailing portion, said leading edge portions of said inner, outer and transition blade portions are substantially colinear with each other, and said trailing edge portions of said inner and outer blade portions are offset from each other.

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**4,293,281**

## MOBILE AIR CHARGING SYSTEM

**Charles L. Lamoreaux, 28012 Santona Dr., Rancho Palos Verdes, Calif. 90274**

**Continuation of Ser. No. 29,740, Apr. 13, 1979, abandoned, which is a continuation of Ser. No. 766,081, Feb. 7, 1977, abandoned. This application Mar. 31, 1980, Ser. No. 135,357**
**Int. Cl.³ F04B *49/10***
**U.S. Cl. 417—9** **11 Claims**

1. A compressor system coupled to be driven by a selected one of alternative power sources comprising:

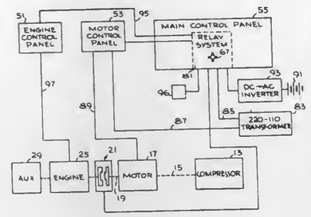
a compressor;

an electric motor having a rotor shaft extending therethrough and having coupling means at both ends thereof, the rotor shaft being coupled via a first one of the coupling means to drive the compressor;

first means for selectively energizing the motor;

an internal combustion engine mounted in driving relationship with the rotor shaft, said engine being selectively operable independently of said rotor shaft;

second means including an electromagnetic clutch for selectively coupling the engine to the rotor shaft via a second one of the coupling means at the end of the rotor shaft




remote from the first coupling means to drive the compressor via said rotor shaft, the clutch being engageable independently of the engine to couple the engine and the rotor shaft together; and

independent manually operable electrical switching means coupled respectively to the first and second means for selectively activating one and only one of the first and second means at a time and for disabling the clutch from engagement at all times except when the engine is to be operated to drive the compressor.

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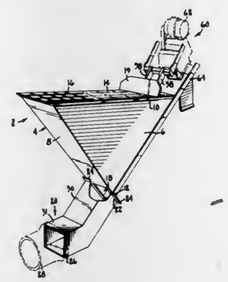
**4,293,282**

## MANURE HANDLING SYSTEM HAVING RECIRCULATING PUMP

**Clinton A. Nesseth, and Clifford B. Nesseth, both of Barron, Wis., assignors to Nesseth, Inc., Barron, Wis.**

**Filed Apr. 27, 1979, Ser. No. 34,169**
**Int. Cl.³ F04B *39/00***
**U.S. Cl. 417—53** **12 Claims**



1. An improved manure handling system of the type having a manure collection hopper; a pump cylinder connected to the collection hopper, the pump cylinder having an interior, a discharge end and a check valve for allowing one way movement of manure from the discharge end of the cylinder into a manure transfer line; and means for pumping the manure contained in the collection hopper into and through the pump cylinder; and wherein the improvement comprises: selectively operable means for simultaneously causing a flow of manure through the interior of the pump cylinder, around the discharge end of the pump cylinder, and back along the exterior of the pump cylinder in a reverse direction, said means being actuable whenever the check valve is jammed in an open position to allow the reverse manure flow to clear the jammed check valve.



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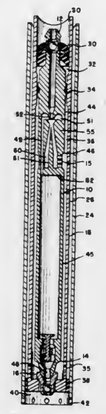
**4,293,283**

## JET WITH VARIABLE THROAT AREAS USING A DEFLECTOR

**George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760**

**Continuation-in-part of Ser. No. 803,977, Jun. 6, 1977, Pat. No. 4,183,722. This application Dec. 3, 1979, Ser. No. 99,841**
**Int. Cl.³ F04F *5/00***
**U.S. Cl. 417—172** **6 Claims**



1. A jet pump for producing a well comprising a main body having an axial bore formed therethrough; a power fluid inlet connected to said axial bore at one end of said main body, a nozzle axially aligned with said main body and having a jet end spaced from an inlet end, a suction annulus formed concentrically about the jet end of said nozzle and within said main body, said inlet end being connected to said power fluid inlet such that power fluid can flow into said inlet end, through the interior of said nozzle, and out of said jet end;

means, including a formation fluid inlet connected to the other end of said main body, which forms a flow passageway extending from the last said inlet into said suction annulus;

a venturi axially aligned with said nozzle and having an inlet end and an outlet end, said inlet end of said venturi being placed adjacent to said jet end of said nozzle, said venturi having sidewalls which describe a frustum of a cone;

a conical deflector having a large diameter end supported by said main body and a free end extending away therefrom and received within the venturi, with the apex of the deflector being positioned adjacent to the throat; with there being an annular passageway formed between the outer surface of the deflector and the inner surface of the venturi; an annular outlet chamber underlying and in communication with said annular passageway;

said annular passageway commences in proximity of the nozzle outlet and extends into communication with said annular outlet chamber; the area of said annular passageway increases in a downstream direction, a marginal length of said deflector extends through said annular outlet chamber;

an outlet port connected to said annular outlet chamber for conducting mixed fluid flow away from the pump and towards the surface of the ground.

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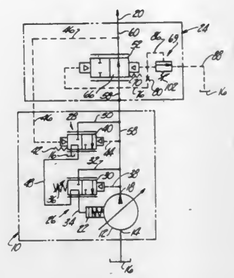
**4,293,284**

## POWER LIMITING CONTROL APPARATUS FOR PRESSURE-FLOW COMPENSATED VARIABLE DISPLACEMENT PUMP ASSEMBLIES

**Allen J. Carlson, Tecumseh, and Henry A. Vander Kaay, Ann Arbor, both of Mich., assignors to Double A Products Company, Manchester, Mich.**

**Filed Oct. 9, 1979, Ser. No. 82,975**
**Int. Cl.³ F04B *49/08***
**U.S. Cl. 417—218** **10 Claims**



1. A horsepower limiting control apparatus for a variable displacement pump assembly that has a flow compensator for sensing the load pressure of the fluid and for adjusting the displacement of the pump to whatever is required to maintain a constant pressure differential of the fluid of a selected magnitude across the horsepower limiting control apparatus, characterized in that said horsepower limiting control apparatus, comprises a pressure regulated variable orifice means through the orifice of which said pumped fluid flows to the load, said variable orifice means being responsive to changes in pressure of the pumped fluid from the pump assembly to vary inversely the effective area of the orifice means, said flow compensator functioning to hold the pressure drop across said orifice means constant so that the flow across the orifice means also varies inversely with the pressure of the pumped fluid from the pump assembly thereby to limit to a preselected value the horsepower supplied by the pump assembly to load, and an adjustable pilot means is associated with said variable orifice means for setting selectively a minimum pressure of the fluid required to actuate said variable orifice means for reducing the effective area thereof and thereby to establish the upper limit of the horsepower that can be transmitted to load.

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**4,293,285**

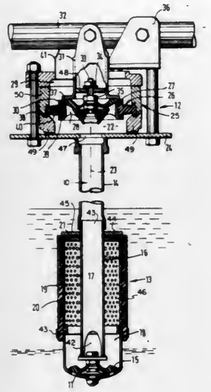
## PUMP

**John D. Burton, Andover, England, assignor to William R. Selwood Limited, Hampshire, England**

**Filed Oct. 31, 1979, Ser. No. 90,157**
**Claims priority, application United Kingdom, Oct. 31, 1978, 42685/78**
**Int. Cl.³ F04F *7/02***
**U.S. Cl. 417—240** **4 Claims**

1. In or for a pump comprising a duct having an inlet at a lower position and an outlet at a higher position, an inlet valve at the inlet, which valve opens when the pressure in the duct adjacent to the inlet is below the pressure outside the duct adjacent to the inlet, storage means for storing potential energy which can be applied to liquid in the duct as kinetic energy and pressurising means for causing cyclic changes in pressure in a liquid in the duct, improved pressurising means comprising a pumping chamber defined, at least in part, by a lateral wall, an annulus of elastomeric material having its outer periphery in non-sliding contact with the lateral wall and a centre portion in non-sliding contact with the inner periphery of the annulus, wherein the lateral wall and the centre portion are formed of

relatively rigid material and are reciprocable relative to each other to vary the volume of the pumping chamber, wherein the annulus is stressed in compression between the lateral wall and the centre portion, wherein an outlet valve is provided for controlling the flow of liquid through the outlet which outlet valve is a non-return valve adapted to open only when the pressure in the pumping chamber exceeds the pressure in the outlet at the downstream side of the outlet valve and wherein there is provided in the centre portion an aperture through which liquid can leave the pumping chamber when the outlet



valve is open, and the outlet valve is operatively associated with the centre portion for controlling the flow of liquid through the aperture therein, the pressuring means further comprising closing means for maintaining the outlet valve closed while the pressure in the pumping chamber is increasing, wherein said closing means is connected with the centre poriton for limited movement relative thereto and is adapted for transmitting to the centre portion driving forces which cause relative reciprocation of the centre portion and the lateral wall.

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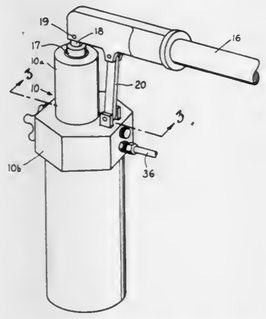
**4,293,286**

## DOUBLE ACTION PUMP

**Joel W. Hawkins, Rte. 2, Marietta, S.C. 29661**

**Filed Jan. 22, 1979, Ser. No. 5,224**
**Int. Cl.³ F04B** *3/00*
**U.S. Cl. 417—253** **3 Claims**



1. A pump having a housing carrying a cylinder with a manually operable piston having a large diameter and a small diameter delivering a large volume of fluid flow at low pressure when operated in one direction and a lesser volume of fluid flow at high pressure when operated in the other direction comprising:

an inlet duct in said housing opposite said large piston diameter;

a first check valve in said housing checking the flow of fluid outwardly through said inlet duct;

a second check valve in said housing allowing for the flow of low-pressure fluid through said inlet duct for delivery through said delivery duct while checking flow of high-pressure fluid therethrough during high-pressure fluid delivery;

a delivery duct in said housing communicating with said inlet duct;

a third check valve in said delivery duct to check the flow of fluid from said delivery duct into the inlet duct; and

a fluid pressure actuated plunger means operated responsive to the fluid pressure in the delivery duct to open said first check valve and render same ineffective.

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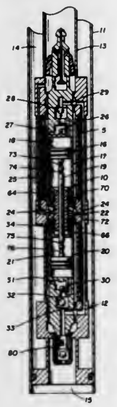
**4,293,287**

## REVERSING VALVE ASSEMBLY FOR A FLUID OPERATED WELL PUMP

**Donald E. Carrens, Tulsa, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Mar. 21, 1979, Ser. No. 22,590**
**Int. Cl.³ F04B** *47/08;* **F01L** *25/06*
**U.S. Cl. 417—393** **26 Claims**



8. A pump control means for a hydraulically powered downhole oil well pump having upper and lower piston means connected by a pump rod, a well fluid inlet, a power fluid inlet and a pumped fluid outlet, said pump control means comprising:

(a) a valve means to receive power fluid and to alternately direct it to said upper and said lower piston means in conjunction with alternately directing spent power fluid from said upper and lower piston means to said outlet and directing pumped well fluid to said outlet in order to cause reciprocating motion of said piston means and pumping of well fluid;

(b) power fluid throttling means having means with said valve means to regulate fluid flow in the flow path of the power fluid in order to operably regulate the velocity of said piston means; and

(c) means to control said power fluid throttling means having pressure-sensing means connected to both said upper and lower piston means simultaneously to sense the pressures of said power fluid and said spent power fluid as applied to said upper and lower piston means for both directions of travel of said piston means and to accordingly actuate said power fluid throttling means to in turn



control the velocity of said piston means and thereby preventing operation induced excessive shock stresses in said oil well pump which could be damaging to the structure thereof.

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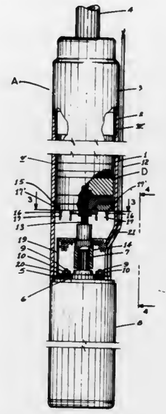
**4,293,288**

## SUBMERSIBLE PUMP HOUSING

**Walter L. Weber, St. Louis County, Mo., assignor to Weber Industries, Inc., St. Louis, Mo.**

**Filed Feb. 5, 1979, Ser. No. 9,245**
**Int. Cl.³ F04B** *21/00, 39/00*
**U.S. Cl. 417—434** **5 Claims**



1. For use with a submersible pump having a pump assembly, means defining a tubular housing integrally fabricated of a single material of construction, there being a motor mounting bracket plate fixedly provided at the normally lower end of said housing, and pump assembly support means provided internally of said housing upwardly of said bracket plate formed unitarily with said housing for supporting said pump assembly and comprising a plurality of discrete finger-like projections constituted by portions of said housing turned inwardly from conformity with the wall thereof, each providing an upper edge constituting a shoulder for supported disposition thereon of the pump assembly, each of said finger-like projections being bent inwardly along a lower circumferential line and with the resultant opening constituting a liquid outlet port for liquid escaping downwardly along the housing between same and the pump assembly.

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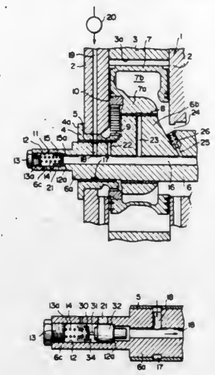
**4,293,289**

## LUBRICATING MEANS FOR ROTARY PISTON ENGINES WITH PRESSURE AND TEMPERATURE RESPONSIVE VALVE MEANS IN THE ECCENTRIC SHAFT

**Yasuyuki Morita, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan**

**Filed Jun. 5, 1979, Ser. No. 45,693**
**Claims priority, application Japan, Jun. 7, 1978, 53-69186**
**Int. Cl.³ F01C** *21/04, 21/06;* **F16K** *17/04, 17/38*
**U.S. Cl. 418—84** **5 Claims**

1. Rotary piston engine comprising a casing which includes a rotor housing having an inner wall of trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define a rotor cavity of a trochoidal configuration, and a substantially polygonal rotor disposed in said rotor cavity and carried by an eccentric shaft for rotation with apex portions in sliding contact with the inner wall of the rotor housing, a lubricating system including oil passage means extending substantially axially in said eccentric shaft, oil pump means for supplying lubricant oil under pressure to said oil passage means, and pressure regulating valve means provided in said oil passage means in the eccentric shaft means for determining oil pressure in the oil passage means, said rotor having interior cooling cavity means, oil supply passage means branched from said oil passage means in said eccentric shaft for supplying rotor cooling oil to said cooling cavity means, said



pressure regulating valve means including temperature responsive means provided in said eccentric shaft for controlling the oil pressure in accordance with a surrounding temperature so that the oil pressure in said eccentric shaft is decreased in response to a decrease in said surrounding temperature to thereby decrease the rotor cooling oil supplied to said cooling cavity.

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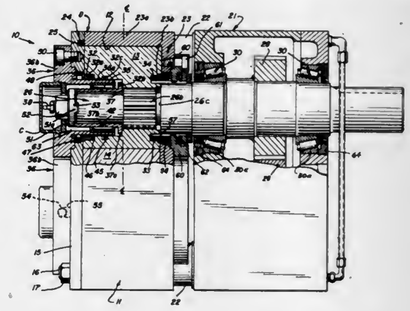
**4,293,290**

## POSITIVE DISPLACEMENT ROTARY PUMP WITH BEARINGS IN COUNTERSUNK PORTIONS OF THE ROTORS

**Victor E. Swanson, Fort Atkinson, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.**

**Filed May 4, 1979, Ser. No. 36,030**
**Int. Cl.³ F04C** *2/18, 15/00*
**U.S. Cl. 418—94** **1 Claim**



1. A positive displacement rotary pump for circulating a viscous product, comprising a housing having an interior cavity through which the product is pumped, one wall of said cavity being defined by a removable cover; a pair of spaced substantially parallel shafts extending into said cavity, each shaft having one end thereof supported by said cover and a second end extending through a wall of said cavity opposite said cover; first means for driving and supporting the second ends of said shafts; meshing rotors mounted on said shafts, each rotor having internal means in driving engagement with said

shaft on which the rotor is mounted, said internal means being located between planes defined by opposing walls forming the cavity, said rotors being disposed entirely within said cavity, the endface of each rotor adjacent said shaft one end having a substantial countersunk portion with a terminus adjacent said rotor internal means; bearing means substantially isolated from the product and disposed entirely within the countersunk portion of said rotor and supportingly engaging segments of said shaft one end, said bearing means having at least a portion thereof disposed adjacent the rotor internal means; and second means fixedly carried by said cover and extending into said countersunk portion and supporting said bearing means; each shaft being provided with an exterior shoulder adjacent the cavity-forming surface of the wall opposite said cover and against which one endface of a rotor engages and adjustable means carried on said shaft and spaced from said shoulder for engaging said rotor whereby the shoulder and adjustable means coact to restrain relative movement of said rotor on said shaft; said adjustable means including an elongated liner disposed within the countersunk portion and encompassing a segment of the shaft, one end of the liner abutting the terminus of the rotor countersunk portion, and a longitudinally adjustable element removably mounted on the shaft one end and engaging an opposite end of said liner and retaining the latter in abutting relation with said rotor terminus.

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**4,293,291**

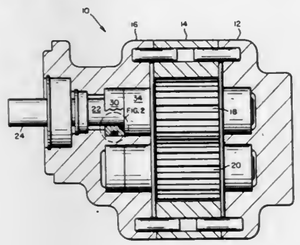
## GEAR PUMP WITH IMPROVED SHAFT SEAL

**John R. Link, Portage, Mich., assignor to General Signal Corporation, Stamford, Conn.**

**Continuation of Ser. No. 861,745, Dec. 19, 1977, abandoned. This application Aug. 1, 1979, Ser. No. 62,837**

**Int. Cl.³ F04C** *2/18, 15/00;* **F16J** *15/46;* **F16C** *33/74*

**U.S. Cl. 418—104** **5 Claims**



1. A gear pump for pumping hydraulic fluid under high pressure, comprising a housing, a pair of gears mounted for rotation within said housing, a drive shaft affixed to one of said gears for transmitting a rotational input force to said one gear, said drive shaft including a portion extending outwardly beyond said housing, and a bushing surrounding said drive shaft and secured to said housing so that said drive shaft is free to rotate within said bushing, said bushing being positioned along said drive shaft between said one gear and the portion of said drive shaft that extends beyond said housing, said bushing including an end surface facing said one gear, an annular recess in said end surface adjacent to said drive shaft for supporting and retaining a dynamic sealing member, and a unitary dynamic sealing member formed of resilient material positioned within said annular recess, and exposed to said high pressure hydraulic fluid which forces said dynamic sealing member into said annular recess thereby aiding in the creation of a dynamic seal between the drive shaft and the dynamic sealing member for minimizing the amount of leakage of said pumped high pressure fluid along said drive shaft.

**4,293,292**

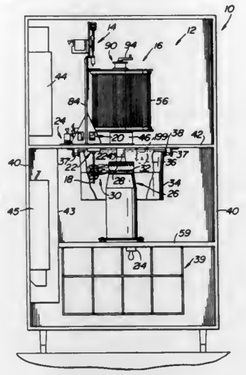
## CANDY FLOSS MACHINE

**Benjamin Israel, Bensalem Township, Bucks County, Pa., assignor to North Eastern Timber (U.S.A.) Incorporated, Camden, N.J.**

**Filed Nov. 19, 1979, Ser. No. 95,831**

**Int. Cl.³ A23G** *3/20*

**U.S. Cl. 425—9** **15 Claims**



1. In a candy floss machine for dispensing candy floss on a stick including a rotary head for producing the floss, and means for automatically dispensing stored sticks at least one stick at a time to a location spaced from the rotary head at which the floss is collected, the combination comprising:

an annular storage facility in which one or more of said sticks may be stored,

said storage facility having an opening at a preselected location through which a stick may be ejected,

means for urging said one or more sticks towards said preselected location in said storage facility to cause said one or more sticks to enter into alignment with said opening at said preselected location,

means for retaining said stick in alignment with said opening at said preselected location in said storage facility in preparation for dispensing the stick.

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**4,293,293**

## TIRE RETREADING BLADDER

**Kenneth T. MacMillan, Macon, Ga., assignor to Donald MacMillan & Son, Inc., Macon, Ga.**

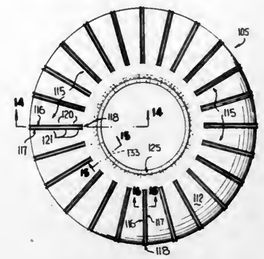
**Continuation-in-part of Ser. No. 35,207, May 2, 1979, Pat. No. 4,197,064, which is a division of Ser. No. 919,475, Jun. 27, 1978, Pat. No. 4,172,868, which is a division of Ser. No. 628,902, Nov. 5, 1975, Pat. No. 4,035.118, which is a division of Ser. No. 391,816, Aug. 27, 1973, Pat. No. 3,997,284. This application Sep. 15, 1980, Ser. No. 187,339**

**Int. Cl.³ B29H** *5/04, 5/02*

**U.S. Cl. 425—23** **10 Claims**

1. A tire retreading bladder comprising a generally annular member of a U-shaped cross-section defined by a bight portion and a pair of legs, said annular member defining an interior volume, each leg terminating in a terminal edge of a generally circular configuration, each leg having interior and exterior surfaces, means disposed along each of said exterior surfaces for venting air from between such exterior surfaces and an interior surface of an associated tire adapted to receive therewithin said bladder, each of said venting means on each of said exterior surfaces having a radially inboard portion terminating radially short of the associated terminal edge, each exterior surface defining between said radially inboard portions of each venting means and the associated terminal edge a generally smooth uninterrupted annular sealing surface, said venting means being in the form of a plurality of pairs of closely adjacent ribs with each pair of ribs setting off a venting groove





therebetween, and said venting means further including transverse venting slots being disposed lengthwise along said ribs.

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**4,293,294**

## CIRCULAR EXTRUSION APPARATUS PROVIDING FOR ROTATION AROUND THE EXTRUSION OPENING

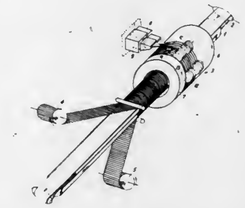
**Ole-Bendt Rasmussen, 7, Topstykket, 3460 Birkeroed, Denmark**

**Division of Ser. No. 841,481, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 657,649, Feb. 12, 1976, abandoned. This application Oct. 10, 1979, Ser. No. 83,277**

**Claims priority, application United Kingdom, Feb. 12, 1975, 5971/75**

**Int. Cl.³ B29F** *3/10;* **B29D** *23/04*

**U.S. Cl. 425—112** **16 Claims**



1. An apparatus for extruding an extrudable polymeric material in generally annular continuous or discontinuous form which apparatus comprises (a) a rotatable hollow centered extrusion die; (b) means for supplying a flow of extrudable polymeric material to said die, said die having a feed passage therein for receiving at one of its ends said polymeric material flow from said supplying means and a generally annular exit orifice at the other end of said passage for discharging said polymeric material in continuous or discontinuous generally annular extending form; (c) means for rotating at least said die exit orifice bodily about its axis; and (d) collecting means defining a zone of collection extending through the hollow center of said die for receiving thereon the polymeric material emerging from said die orifice, said collecting means comprising a fixed support and a collecting surface having at least in said collecting zone a generally cylindrical configuration and upon which said discharged material is received as a generally tubular layer form, said collecting surface being adapted to be advanced continuously in said zone in a direction generally axially of said die; (e) means for advancing at least said collecting surface generally axially of said die while said die exit orifice is rotated at a sufficient rate relative to the rate of advance of the collecting surface to subject the polymeric material emerging from said die orifice to significant attenuation in a helical direction and impart to said generally tubular layer a helical grain relative to the direction of advance; and (f) means for separating the collected attenuated material from at least the fixed support of said collecting means.

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**4,293,295**

## PELLETING PRESS

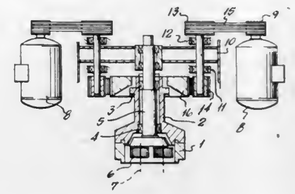
**Franciscus van Deuren, Boxtel, Netherlands, assignor to Simon-Heesen B.V., Boxtel, Netherlands**

**Division of Ser. No. 901,825, May 1, 1978, abandoned. This application Nov. 28, 1979, Ser. No. 98,361**

**Claims priority, application Netherlands, May 11, 1977, 7705231**

**Int. Cl.³ B28B** *3/20*

**U.S. Cl. 425—331** **9 Claims**



1. A pelletising press comprising a rotatably mounted annular die having material extrusion bores therethrough, at least one freely rotatable pelletising roller mounted on a fixed axis and disposed in operative association with the inner periphery of said annular die whereby to extrude material through the rotating die, and means for rotating said annular die including at least two motors each drive connected separately to a common endless flexible driving member also drive connected to said die.

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**4,293,296**

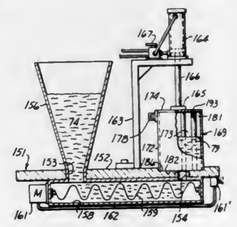
## APPARATUS AND METHODS FOR MAKING CHEESE TOPPING, AND CHEESE MOLD ASSEMBLIES

**Joseph A. Caiello, 21 W. Las Flores, Arcadia, Calif. 91006, and Ronald J. Caiello, Arcadia, Calif., assignors to Joseph A. Caiello, Arcadia, Calif.**

**Continuation-in-part of Ser. No. 847,361, Oct. 31, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,213**

**Int. Cl.³ B29F** *1/06*

**U.S. Cl. 425—547** **6 Claims**



1. In apparatus for making a piece of cheese having parallel elongate holes from a solidifiable fluid mass of cheese, the improvement comprising in combination:

a sleeve extending between an open bottom and an open top;

means for closing said bottom including a table for supporting said sleeve at said bottom and for jointly providing with said sleeve a cavity for receiving said solidifiable fluid mass of cheese, said table having an opening communicating with said cavity;

a lid covering the top of said sleeve;

a number of mutually spaced, parallel rods mounted on said lid and extending from said top to said bottom through said sleeve for providing said elongate holes;

means releasably coupled to said lid for applying said sleeve to said table; and

means connected to said table for extruding said fluid mass of cheese through said opening into said cavity and inbetween said spaced rods.

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**4,293,297**

## GAS BURNER, IN PARTICULAR FOR LIQUID GASES

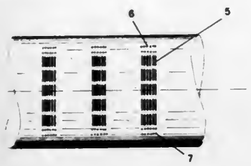
**Aldo Polidoro, Vicolo del Convento, Schio (Vicenza), Italy**

**Filed Jul. 19, 1979, Ser. No. 58,803**

**Claims priority, application Italy, Jul. 28, 1978, 85589 A/78; Nov. 6, 1978, 85622 A/78**

**Int. Cl.³ F23D *13/36***

**U.S. Cl. 431—286** **4 Claims**



1. A burner for gas particularly suitable for liquified gas comprising an extended cylindrical tube body, means for supplying the interior of said body through one end thereof with a suitable combustible mixture of gas fuel and primary air, means closing the opposite end of said body, and means forming a plurality of spaced flame fronts in a row along the length and outer surface of said body when the burner is in use, the latter said means consisting along the length of said body of a series of aligned groups of parallel slits penetrating said body to permit flow therethrough of the burning combustible mixture of primary air and gas, all of said slits extending transverse to the length of said cylindrical body, said groups of slits being arranged at a distance apart of 1.4–1.2 mm, each of said slits having a width of 0.5–0.7 mm, said slits being further arranged in sub-groups along an axis transverse to the length of said body and also parallel to each other and being all aligned among themselves, each group being separated from the adjacent groups so as to establish a series of separate flame fronts being fan-shaped to present a unified flame front whereby a substantial reduction in the vibrations produced during the combustion is achieved and substantial stabilization of the flame and improvement in the efficiency of the burner result.

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**4,293,298**

## COMBINED AIR AND FUEL NOZZLE FOR FLUIDIZED BED COMBUSTION CHAMBER

**Jörgen Bergkvist, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Sweden**

**Filed Dec. 4, 1979, Ser. No. 100,090**

**Claims priority, application Sweden, Dec. 5, 1978, 7812481**

**Int. Cl.³ F27B *15/14***

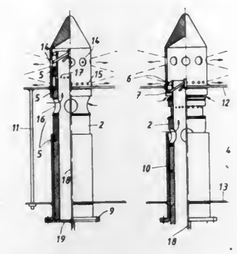
**U.S. Cl. 432—58** **6 Claims**

1. An improved fuel and air nozzle for a fluidized bed combustion chamber of the type having an air chamber at its lower end, comprising:

a nozzle unit fixed to extend upwardly from the air chamber into the fluidized bed, said nozzle unit being closed at its upper end and having openings through its side wall at two different levels within said fluidized bed;

a cylinder unit passing through said air chamber and extending upwardly into said nozzle unit, said cylinder unit having openings at three different levels to permit airflow from the air chamber into said cylinder unit and from said cylinder unit through said openings in said nozzle unit;

a fuel conduit passing through said cylinder unit; and



means for removably sealing said cylinder unit to the bottom of the air chamber.

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**4,293,299**

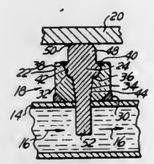
## LOAD SUPPORT DEVICE FOR HEAT FURNACES

**Robert N. Gaddes, 3222 Stuart La., Dearborn, Mich. 48120**

**Filed Apr. 4, 1980, Ser. No. 137,117**

**Int. Cl.³ F27D *3/02***

**U.S. Cl. 432—234** **2 Claims**



1. A load support device for heat furnaces having a plurality of pipe beams through which coolant is circulated, such support device comprising a saddle member mountable on the pipe beams and having therethrough a central opening, a replaceable core in the central opening of the saddle member, an upwardly disposed annular seat in the central opening through the saddle member, a lateral shoulder on the replaceable core supported on the upwardly disposed annular seat, an inwardly and downwardly disposed bevel around the lower end of the saddle member to receive a weld for mounting such member on a pipe beam in said heat furnace, an upwardly disposed bevel around the upper end of the central opening to receive a weld for detachably and sealably joining the replaceable core to the saddle member, an upwardly disposed flared section in the central opening through the saddle member below the annular seat therein, a tapered segment on the replaceable core in seating engagement with such flared section, an upwardly disposed flared section in the central opening through the saddle member above the annular seat therein, a tapered segment on the replaceable core in seating engagement with such flared section, a head on the upper end of the replaceable core for directly supporting load, and a projection on the lower end of the replaceable core extending below the saddle member so as to extend into a pipe beam in said heat furnace when the saddle member is thereon mounted.



**4,293,300**

## LIQUID SEPARATING AND EVACUATING DEVICE FOR FLUID SUCTION EQUIPMENT

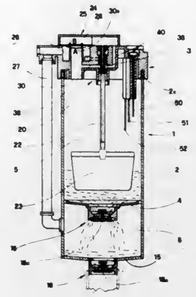
**Augusto Cattani, Parma, Italy, assignor to Officine Augusto Cattani & C. S.A.S., Parma, Italy**

**Filed Dec. 31, 1979, Ser. No. 109,200**

**Claims priority, application Italy, Jan. 15, 1979, 4005 A/79**

**Int. Cl.³ A61C *17/04***

**U.S. Cl. 433—92** **3 Claims**



1. A liquid separating and evacuating device for dental surgery fluid suction equipment comprising a first chamber connected to a vacuum source, a fluid inlet pipe connected to the first chamber for directing fluid into the first chamber which is kept at sub-atmospheric pressure during the operation of the device, a second chamber positioned beneath said first chamber, automatic means responsive to the level of liquid present in the first chamber for causing the second chamber to be vented to atmosphere so as to be at a pressure approximately identical to that of the atmosphere in response to the level of the liquid in the first chamber being lower than a pre-set value and for causing the second chamber to communicate with the first chamber so as to be at sub-atmospheric pressure approximately identical to that of the first chamber in response to the level of liquid in the first chamber being above said pre-set value, first valve means for preventing liquid from passing from the first chamber to the second chamber in response to the second chamber being at a higher pressure than the first chamber and for permitting liquid flow from the first chamber to the second chamber when the pressure in the first chamber is approximately the same as pressure in the second chamber and second valve means for allowing liquid to be discharged from the second chamber to the outside in response to pressure inside the second chamber being approximately equal to atmospheric pressure and for precluding such discharge when pressure in the second chamber is less than atmospheric pressure, wherein said automatic means includes a pneumatic distributor and a pneumatic valve including a diaphragm actuated by the said pneumatic distributor, said diaphragm being movable between a first position in which said second chamber is placed in communication with the first chamber and a second position in which said second chamber is placed in communication with the outside, a float contained in said first chamber, a rigid vertical rod having upper and lower ends and connected on its lower end to said float for vertical movement therewith and a movable valve spool connected to the upper end of said rod for movement in said pneumatic distributor in accordance with the liquid level in said first chamber.

**4,293,301**

## DENTAL ABSORPTIVE PADS AND DISPENSING MEANS THEREFOR

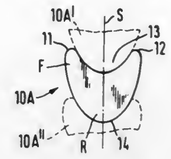
**Bengt Mattsson, Hässjövägen 4, Upsala, Sweden**

**Filed Jun. 18, 1979, Ser. No. 49,746**

**Claims priority, application Sweden, Jun. 22, 1978, 7807145**

**Int. Cl.³ A61C *5/14***

**U.S. Cl. 433—136** **11 Claims**




1. A supply tape of dental absorptive pads comprising a series of said absorptive pads connected together end to end by score lines and in a detachable manner, each said pad having an inside face and an outside face, the inside face comprising a layer formed of an absorbent material and the outside face being formed of a layer of non-absorbent material, said inside layer formed of absorbent material constituting means to place against the parotid of a patient to lower the mean rate of discharge of saliva from the parotid and to absorb saliva therefrom;

each said pad having a fore end and a rear end, said fore end having two peripheric rounded points or corners separated by a central recess, said rear end having a central rounded point or corner generally complementary to and configurative with said fore end, whereby the central point of each pad is inserted into and separably attached to the central recess of a next adjacent pad.

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**4,293,302**

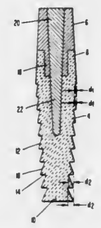
## TOOTH IMPLANTS

**Craig R. Hassler, Columbus, Ohio, and Gary L. Messing, State College, Pa., assignors to Scientific Advances, Inc., Columbus, Ohio**

**Filed Mar. 26, 1980, Ser. No. 134,082**

**Int. Cl.³ A61C *7/00***

**U.S. Cl. 433—173** **32 Claims**



1. A dental, prosthetic, endosteal implant comprising:

a base comprised of a bio-compatible material, said base having first and second ends axially spaced along the longitudinal axis of said base and sidewalls which include serrations comprising alternating oblique and substantially planar surfaces, said substantially planar surfaces being substantially perpendicular to both the longitudinal axis of said base and the direction of the intended occlusal load and said oblique surfaces being disposed at an angle to the longitudinal axis of said base, the surface area of said planar surfaces nearest said second end being greater than the surface area of said planar surfaces nearest said first end, said first end being the outermost end upon implantation and said second end being the implanted end; and

a core extending from the first end of said base and configured to permit cooperative engagement with at least one prosthetic crown.

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**4,293,303**

## JOINT FOR CONNECTING A PARTIAL DENTAL PROSTHESIS TO THE REMAINING NATURAL HUMAN TEETH

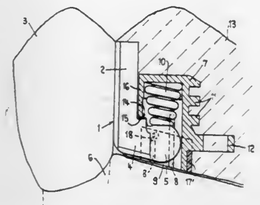
**Hans Dalla Bona, Rousseauweg 9, 2563 Ipsach, Switzerland**

**Filed Apr. 29, 1980, Ser. No. 145,193**

**Claims priority, application Switzerland, Jun. 12, 1979, 5466/79**

**Int. Cl.³ A61C *13/22***

**U.S. Cl. 433—177** **6 Claims**



1. A joint for connecting a partial dental prosthesis with remaining natural teeth, having joint members connectable to an anchor tooth and with a part of the dental prosthesis and adapted to be telescoped in each other without clearance and capable of carrying out relative movements in one plane only, and a spring located between the two joint members and adapted to act therebetween in order with the unstressed partial dental prosthesis to relieve its support, the improvement wherein said joint comprises a stop on at least one of the joint members to limit the relative movement of the joint members in the direction of the spring force.

**4,293,304**

## FLEXIBLY MOUNTED DRIVE ARRANGEMENT FOR SHIPS

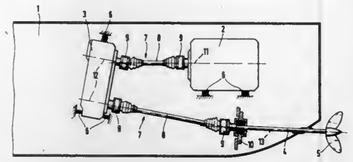
**Anders Sandström, Nynäshamn, Sweden, and Erich Aucktor, Offenbach, Fed. Rep. of Germany, assignors to Scatra Ab, Nynäshamn, Sweden**

**Filed Oct. 24, 1978, Ser. No. 954,117**

**Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748359**

**Int. Cl.³ B63H *1/14, 5/06***

**U.S. Cl. 440—83** **6 Claims**



1. Drive arrangement for a ship comprising a drive unit, said drive unit including a drive motor, and at least a first drive shaft, a propeller shaft for driving a ship's propeller, said first drive shaft arranged to receive rotational driving force from said drive motor and connected to said propeller shaft for transmitting torque thereto for driving the propeller, wherein the improvement comprises means for individually flexibly mounting said drive motor within the ship, means for connecting said drive unit to said first drive shaft and said first drive shaft to said propeller shaft for providing uniform running operation and for permitting said drive motor of said unit and said propeller shaft to be positioned out of axial alignment, said first drive shaft comprises a rigid shaft, said connecting means comprises a constant velocity universal joint at each end of said rigid shaft with one said universal joint connecting said rigid shaft to said drive unit and the other said universal joint connecting said rigid shaft to said propeller shaft, with each of said universal joints being capable of absorbing angular movement and at least one of said universal joints being cable of absorbing relative axial movement therein.



**4,293,305**

## DIESTER COMPOSITION AND TEXTILE PROCESSING COMPOSITIONS THEREFROM

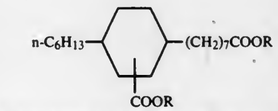
**Robert B. Wilson, Greenville, S.C., assignor to Northwestern Laboratories, Inc., Greenville, S.C.**

**Continuation-in-part of Ser. No. 90,092, Nov. 1, 1979. This application Nov. 3, 1980, Ser. No. 203,636**

**Int. Cl.³ D06M *1/00***

**U.S. Cl. 8—115.6** **5 Claims**

1. A method for lowering heat history characteristics and the degree of crystallinity of a synthetic fiber, lowering the temperature at which the fiber can be texturized and lowering the temperature at which the fiber absorbs dye comprising applying to the fiber to a pick-up of 0.4–0.75% by weight of a composition comprising a cycloaliphatic diester of the formula




wherein R is straight or branched chain alkyl of 4–20 carbon atoms, polyoxyalkylene of the formula $HO(CH_2C-H_2O)_nCH_2CH_2-$, $HO(C_3H_6O)_nC_6H_3-$ $HO(CH_2C-H_2O)_p(CH_3H_6O)_qC_3H_6-$ or $HO(C_3H_6O)_p(C_2H_4O)_qC_2H_4$ or phosphated polyoxyalkylene, wherein n is 2–22 and the sum of p+q is n; and a high boiling aromatic ester of the formula $ArCOO\text{-}R_1\text{-}OOCAr$ or $ArCOOR_2$, wherein Ar is a substituted or unsubstituted monocyclic aryl of; $R_1$ is alkylene of 2–8 carbon atoms or polyoxyalkylene of the formula $-C_rH_{2r}(O-C_rH_{2r})_s$ in which r is 2 or 3 and s is up to 15; and $R_2$ is alkyl or alkenyl of 8–30 carbon atoms;

wherein the ratio of cycloaliphatic diester to high boiling aromatic ester is 0.1:1 to 2:1 and wherein the combination of cycloaliphatic diester and high boiling aromatic ester constitutes 10–90% by weight of the composition and texturing the thus-coated fiber at 180°–230° C.

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**4,293,306**

## PROCESS FOR THE DYEING AND PRINTING OF HYDROPHOBIC SYNTHETIC ORGANIC FIBER MATERIALS WITH WATER-INSOLUBLE AZO DYESTUFFS

**Ernst Hoyer, Frankfurt am Main, Fed. Rep. of Germany; Willi Steckelberg, Coventry, R.I.; Walter Deucker, Bad Soden am Taunus, and Rudolf Schickfluss, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 6, 1980, Ser. No. 118,902**

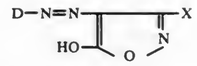
**Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904752**

**Int. Cl.³ C09B *29/36***

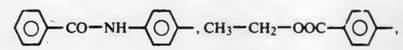
**U.S. Cl. 8—471** **1 Claim**

1. A process for the dyeing or printing of a hydrophobic organic fibrous material containing or consisting of a polyester, which comprises

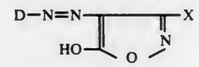
dyeing said fibrous material from an aqueous dispersion with a dyestuff of the formula



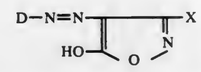

in which X is alkyl of from 1 to 4 carbon atoms, phenyl, lower alkyl-phenyl, lower alkoxy-phenyl, nitrophenyl, chlorophenyl or bromophenyl, and D is phenyl, lower alkyl-phenyl, lower alkoxy-phenyl, nitro-phenyl, chlorophenyl, benzoyl-phenyl, phenyl-phenyl, phenoxy-phenyl, lower alkylsulfonyl-phenyl, aminocarbonyl-phenyl, aminosulfonyl-phenyl,




chloro-nitro-phenyl, lower alkyl-nitro-phenyl, lower alkoxy-nitro-phenyl, (di(cyano)-phenyl, trifluoromethyl-nitro-phenyl or hydroxyalkoxy-nitro-phenyl at a pH value of from 2 to 9 and at a temperature above 100° C. under pressure, or at about 100° C. in the presence of a carrier, or by impregnating said fibrous material with an aqueous dispersion of a dyestuff of said formula




said dispersion having a pH-value of from 2 to 9, and subsequently exposing the impregnated fibrous material to a short heat treatment between about 180° and 210° C., or which comprises, in accordance with the transfer printing method, printing an inert carrier material consisting of paper, a foil of a heat resistant resin or aluminum with a printing ink containing as essential ingredients water or an organic solvent, a common binding agent and a dyestuff of said formula




in a finely divided state, bringing the printed side of the carrier material in close contact with the fibrous material, exposing said materials to a short heat treatment between 170° and 210° C. while still in contact and separating the fibrous material from the carrier material.

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**4,293,307**

## METHOD AND APPARATUS FOR ANALYZING LIQUID

**Roger J. Simpson, Sevenoaks; Janet A. Gawthorpe, Orpington, and C. Alexander Lawrence, London, all of England, assignors to Saint Peter's Research Trust Limited, England**

**Filed Mar. 15, 1979, Ser. No. 20,777**

**Claims priority, application United Kingdom, Apr. 5, 1978, 13293/78**

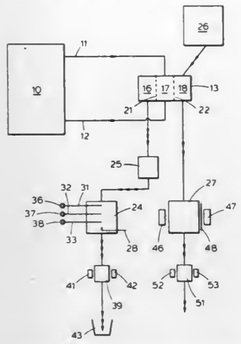
**Int. Cl.³ G01N *27/40, 33/48***

**U.S. Cl. 23—230 B** **14 Claims**

12. A method for continuously analyzing blood comprising, continuously supplying blood,

continuously separating from the blood by means of a semi-permeable membrane at least part of the ions to be analyzed with some water,

continuously analyzing the water and ions by means of at least one ion selective electrode and reference electrode



and continuously measuring the potentials of the electrodes for determining the concentrations of the ions.

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**4,293,308**

**METHOD AND APPARATUS FOR THE ANALYSIS OF SULPHUR CONTENTS IN SAMPLES**

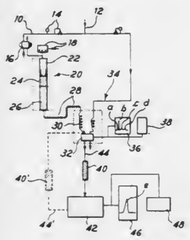
**Giorgio Sisti, Melzo, and Bruno Colombo, Cologno Monzese, both of Italy, assignors to Carlo Erba Strumentazione S.p.A., Milan, Italy**

**Filed Oct. 5, 1979, Ser. No. 82,251**

**Claims priority, application Italy, Oct. 13, 1978, 28744 A/78**

**Int. Cl.³ G01N *31/08, 21/72, 25/24***

**U.S. Cl. 23—230 PC** **10 Claims**



1. A method for determining the sulphur content of a sample comprising combusting the sample in a helium current temporarily enriched with oxygen, catalytically oxidizing and reducing the resultant combustion gases inside the same reactor thereby forming a $N_2$, $CO_2$, $H_2O$ and $SO_2$ gas mixture, separating the components of the mixture by gas chromatography, removing water from the gases emanating from the gas chromatographic separation step and passing the resulting water-free gases into a flame photometric detection system for selective detection of sulphur, whereby a single sulphur peak is formed.

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**4,293,309**

**METHOD OF OBTAINING AND RECORDING SEISMIC AND GEOCHEMICAL DATA**

**Sylvester T. Miller, Midland, Tex., assignor to STM Corporation, Midland, Tex.**

**Filed Feb. 27, 1980, Ser. No. 125,178**

**Int. Cl.³ G01N *33/24***

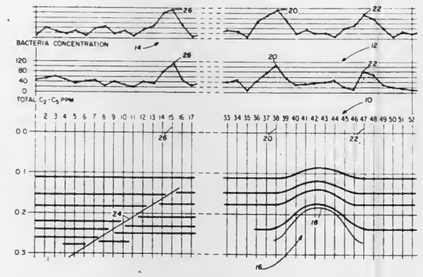
**U.S. Cl. 23—230 EP** **11 Claims**

1. A method for locating hydrocarbon deposits beneath the ground comprising the steps of:

drilling a plurality of boreholes in a test area to a predetermined depth;

collecting samples from selected ones of each of said plurality of boreholes at said predetermined depth;

generating a pressure pulse within each of said plurality of boreholes at said predetermined depth at discrete time intervals to thereby generate pressure waves through the ground at the surface of said plurality of boreholes to determine geological structure at said plurality of boreholes;



analyzing said samples from selected ones of each of said plurality of boreholes for constituents indicating the presence of hydrocarbon deposits; and

processing said pressure waves at selected ones of said plurality of boreholes and said analyses of constituents in said samples from corresponding ones of said plurality of boreholes to determine the presence and location of hydrocarbon deposits within the test area.

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**4,293,310**

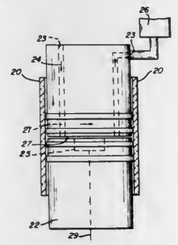
**PHOTOELECTROCHEMICAL IMMUNOASSAY**

**Stephen G. Weber, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.**

**Filed Mar. 14, 1980, Ser. No. 130,555**

**Int. Cl.³ G01N *33/54, 27/00, 27/52***

**U.S. Cl. 23—230 B** **20 Claims**



1. Immunoassay apparatus comprising:

(i) a catalytic photoelectrochemical label capable of photoexcitation such that a photocurrent is generated at an electrode of appropriate potential;

(ii) a quencher; and

(iii) an electrochemical flow cell having,

at least one wall transparent to light of a spectrum which will excite said photoelectrochemically active label, and

(iv) light means which further comprise,

a light source having a spectrum capable of exciting said photoelectrochemically active label, and means for isolating said spectrum, wherein the relative planes of orientation of the electrodes of said cell, and said spectrum are disposed such that said photoelectrochemically active label will react with said quencher to generate said photocurrent, and

means for distinguishing between said photocurrent and non-photocurrent.



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**4,293,311**

**PHOSPHORIC ACID CRYSTALLIZER UNDERFLOW RETURN**

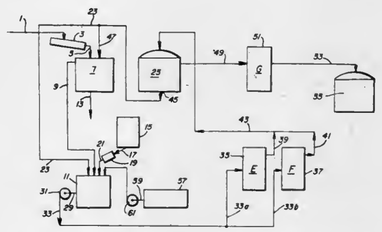
**Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Jan. 10, 1980, Ser. No. 110,805**

**The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.**

**Int. Cl.³ B01D *9/02*; C01B *25/234***

**U.S. Cl. 23—301** **2 Claims**



1. In the method of making wet process phosphoric acid analyzing about 57–63% $P_2O_5$ prepared by steps including

(a) clarifying crude feed acid in a clarifier, said feed acid analyzing about 26–36% $P_2O_5$, having an Fe (as $Fe_2O_3$): $P_2O_5$ weight ratio in the range of 0.03–0.04; and at least some of said Fe being present as $Fe^{++}$;

(b) treating the clarified acid with aluminum silicate in an aluminum silicate treatment zone in the absence of an added oxidant;

(c) concentrating the treated acid to about 46–51% $P_2O_5$;

(d) settling solids in the concentrated acid in a crystallizer-settler providing an overflow and an underflow;

(e) sending crystallizer-settler underflow to the clarifier in (a);

(f) further concentrating the overflow in (d) to about 57–63% $P_2O_5$; the improvement in which the underflow in (d) is divided into a major stream comprising 80–95% of the underflow, and a minor stream comprising the balance; and sending the major stream to the clarifier in (a) and the minor stream to the aluminum silicate treatment zone in (b), whereby the post-precipitation characteristics of the acid are improved.

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**4,293,312**

**COMBUSTIBLE COMPOSITIONS AND PROCESSES FOR THEIR PRODUCTION**

**Rodney T. Fox, North Humberside, England, assignor to Reckitt & Colman Products Limited, England**

**Filed Jul. 30, 1980, Ser. No. 173,615**

**Claims priority, application United Kingdom, Aug. 2, 1979, 26915/79**

**Int. Cl.³ C10L *7/02, 11/02***

**U.S. Cl. 44—1 R** **10 Claims**

1. An ignitable combustible composition comprising a matrix of solid resin having distributed therethrough combustible liquid, water and up to 25% by weight of a particulate non-combustible solid having a specific surface area of not greater than 8 $m^2/g$.

4. A combustible composition as claimed in claim 1, wherein the non-combustible material is selected from the group consisting of vermiculite, expanded vermiculite, sand, glass microspheres, and diatomaceous earth.

7. A combustible composition as claimed in claim 1, wherein the combustible liquid comprises kerosene.

9. A process for producing a combustible composition as claimed in claim 1 which process comprises mixing a non-combustible particulate material as defined in claim 1 with an aqueous emulsion of combustible liquid, curable resin and emulsifying agent, adding a catalyst for the curing of the resin and allowing the mixture to set.

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**4,293,313**

**COMBUSTIBLE COMPOSITIONS AND PROCESSES FOR THEIR PRODUCTION**

**Rodney T. Fox, North Humberside, England, assignor to Reckitt & Colman Products Limited, England**

**Filed Jul. 30, 1980, Ser. No. 173,625**

**Claims priority, application United Kingdom, Aug. 2, 1979, 26914/79**

**Int. Cl.³ C10L *7/02, 11/02***

**U.S. Cl. 44—1 R** **10 Claims**

1. An ignitable combustible composition comprising a matrix of solid resin having distributed therethrough combustible liquid, water and up to 25% by weight of expanded perlite.

5. A combustible composition as claimed in claim 1 wherein the combustible liquid comprises kerosene.

8. A process for producing a combustible composition as claimed in claim 1 which process comprises mixing the expanded perlite with an aqueous emulsion of combustible liquid, curable resin and emulsifying agent, adding a catalyst for the curing of the resin and allowing the mixture to set.

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**4,293,314**

**GELLED FUEL-AIR EXPLOSIVE METHOD**

**Bertram O. Stull, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 11, 1980, Ser. No. 111,453**

**Int. Cl.³ C10L *7/00***

**U.S. Cl. 44—7 A** **3 Claims**

1. In a method for producing an explosion comprising the steps of dispersing a cloud of liquid particles in the air and detonating the cloud, the improvement residing in utilizing 1,2-butylene oxide in gel form as said liquid.

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**4,293,315**

**REACTION APPARATUS FOR PRODUCING A HYDROGEN CONTAINING GAS**

**Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Division of Ser. No. 21,393, Mar. 16, 1980, Pat. No. 4,240,805.**

**This application Jul. 2, 1980, Ser. No. 165,180**

**The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.**

**Int. Cl.³ B01J *7/00, 8/06***

**U.S. Cl. 48—94** **6 Claims**

1. Reaction apparatus constructed to alternately:

(a) make a hydrogen containing gas by the cracking and catalytic steam reforming of a hydrocarbon feedstock; and

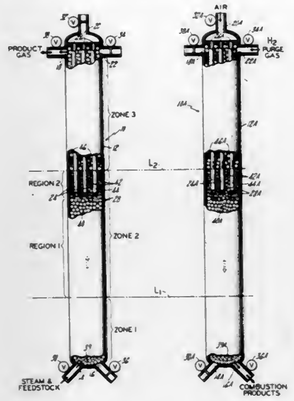
(b) be regenerated, comprising: at least one reaction vessel having an upstream end and downstream end, said vessel having disposed therein, in sequence from its upstream to downstream end, a first volume of inert packing material containing no reform catalyst, a second volume of material substantially adjacent said first volume and including a first region of reform catalyst material, and a third volume of material substantially adjacent said second volume;

said vessel including first inlet means upstream of said second volume for introducing a hydrocarbon feedstock and steam into said first volume during the making of the hydrocarbon containing gas, and first outlet means at said downstream end of said vessel for exhausting the hydrogen containing gas produced in the vessel;

said vessel including second inlet means at its downstream

end for introducing a hydrogen purge gas into said third volume during the regeneration of the apparatus, and second outlet means at said upstream end for exhausting gases produced during regeneration; and

conduit means disposed in said vessel and surrounded by at least some of said materials, said conduit means having an inlet means communicating outside said vessel for carrying an oxygen containing gas from outside said vessel into




indirect heat exchange relationship with said surrounding materials during regeneration of the apparatus, said conduit means including outlet means within said second volume of material located upstream of said first region of reform catalyst material, said conduit means constructed and arranged with respect to said first region of reform catalyst material to prevent mixing of the oxygen containing gas and hydrogen purge gas downstream of or within said first region of reform catalyst material.

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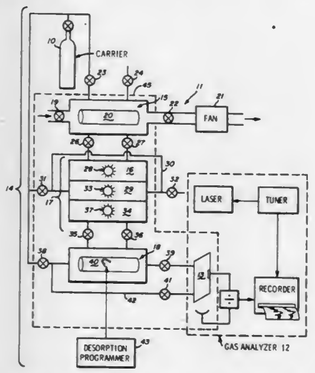
**4,293,316**

**INLET SYSTEM FOR A GAS ANALYZER**

**Barry Block, Los Altos Hills, Calif., assignor to Harry E. Aine, Los Altos, Calif., a part interest**

**Filed Sep. 30, 1977, Ser. No. 838,310**
**Int. Cl.³ B01D** *53/04, 53/22;* **G01N** *5/02*
**U.S. Cl. 55—16** **13 Claims**




1. The method for introducing gaseous material from a source of an initial gaseous mixture of first and second constituents of initial respective partial pressures into a gas analyzer, the steps of:

adsorbing onto an adsorbtive surface said first gaseous constituent of said mixture for collecting and concentrating said first gaseous constituent on said adsorbtive surface;

desorbing said adsorbed first gaseous constituent from said adsorbtive surface;

feeding the desorbed first gaseous constituent to the input of a membrane separator at a partial pressure in excess of said initial partial pressure and diffusing said first gaseous constituent through said membrane separator with a higher value of diffusion conductance than that of the second gaseous constituent of said initial mixture; and

conducting said desorbed and separated first gaseous constituent of said gas mixture into the detection region of a gas analyzer.

5. In an inlet system for introducing gaseous material from a source of an initial gaseous mixture of first and second constituents at initial respective partial pressures into a gas analyzer:

adsorber means for adsorbing onto a adsorbtive surface thereof said first gaseous constituent of said mixture;

membrane separator means having a membrane of the type which has a higher value of diffusion conductance to said first gaseous constituent than to said second gaseous constituent of said gaseous mixture to be analyzed;

means for desorbing said adsorbed first gaseous constituent from said adsorber means;

means for conducting said desorbed gaseous constituent, at a partial pressure higher than that of said initial partial pressure of said first gaseous constituent in said initial gaseous mixture, into contact with said membrane separator means so as to conduct said first gaseous constituent through said membrane of said separator means with a higher value of diffusion conductance than that of said second gaseous constituent thereby separating said first and second gaseous constituents; and

means for conducting said desorbed and separated first gaseous constituent of said gas mixture into the detection region of the gas analyzer.

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**4,293,317**

**FISSION PRODUCT ADSORBENT IMPREGNATED WITH QUINUCLIDENE**

**Julius L. Kovach, 2948 Brookdown Dr., Worthington, Ohio 43085**

**Filed Jan. 17, 1980, Ser. No. 112,934**
**Int. Cl.³ B01D** *53/02*
**U.S. Cl. 55—71** **17 Claims**

1. A method for removing an alkyl halide from a gas stream contaminated therewith comprising contacting said gas stream with a particulate adsorbent impregnated with quinuclidene.

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**4,293,318**

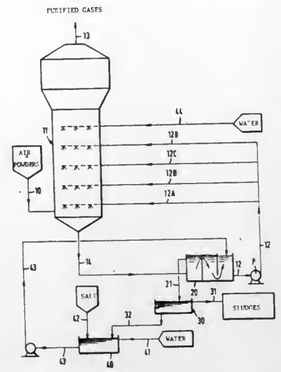
**WET PURIFICATION OF GASEOUS MIXTURES CONTAINING DETERGENT POWDERS IN SUSPENSION**

**Fausto A. Bertini, and Sergio Noe', both of Milan, Italy, assignors to Ballestra Chemica, S.p.A., Milan, Italy**

**Filed May 6, 1980, Ser. No. 147,244**
**Claims priority, application Italy, May 16, 1979, 12598 A/79**
**Int. Cl.³ B01D** *47/00*
**U.S. Cl. 55—85** **4 Claims**

1. A method for the wet purification of a gaseous mixture coming from the production of detergent insoluble in a saline solution and containing powder of said detergent in suspension in a gas, comprising washing said gaseous mixture with an aqueous sodium chloride solution containing 18 to 22 wt. % of sodium chloride to form a solid-liquid suspension of said detergent powder in said sodium chloride solution, separating detergent from said solid-liquid suspension and recycling said so-






dium chloride solution, and exhausting the washed gas from which detergent powder has been removed by said washing.

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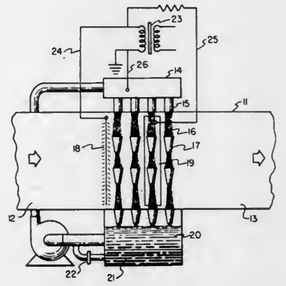
**4,293,319**

**ELECTROSTATIC PRECIPITATOR APPARATUS USING LIQUID COLLECTION ELECTRODES**

**Ben J. Claassen, Jr., New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Sep. 28, 1977, Ser. No. 837,488**
**Int. Cl.³ B03C** *3/53*
**U.S. Cl. 55—122** **5 Claims**



1. An apparatus for electrostatically imparting a charge to particles in particle-laden gas comprising:

(a) a duct for conveying said particle-laden gas;

(b) a high voltage electrode within said duct to create a corona discharge and thereby charge said particles;

(c) a grounded electrode within said duct adjacent said high voltage electrode; said grounded electrode consisting essentially of a column of free-falling liquid in laminar flow, said grounded electrode positioned within said duct in such a manner as to intercept and remove charged particles from said gas; and

(d) a field electrode within said duct adjacent said high voltage electrode and said grounded electrode to deflect charged particles into said grounded electrode.

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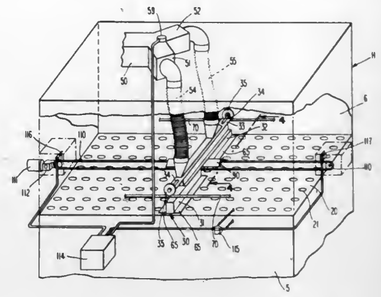
**4,293,320**

**HIGH ENERGY REVERSE AIR DUST COLLECTOR**

**James W. Robinson, Woodridge, Ill., assignor to Research-Cottrell, Somerville, N.J.**

**Filed Nov. 23, 1979, Ser. No. 96,906**
**Int. Cl.³ B01D** *46/04*
**U.S. Cl. 55—273** **13 Claims**



1. In a dust collector baghouse having upper and lower chambers, a plurality of tubular dust-collecting filter bags suspended in the lower chamber in an array of uniformly spaced rows, said filter bags having open mouths at their upper ends, and means causing a flow of process air upwardly from said lower chamber through the walls of said filter bags and through said open mouths into said upper chamber, the improvement comprising:

a. a flat support plate supporting said bags and separating said upper and lower chambers;

b. an air-distribution manifold in said upper chamber, said manifold having a length in the widthwise direction of said baghouse corresponding to the width of said upper chamber, said manifold having a width in the lengthwise direction of said baghouse sufficient to register with but a single row of bags;

c. a source of continuous pressurized air which flows in a reverse direction relative to that of said process air;

d. means directing said reverse-direction air continuously into said manifold;

e. drive means for causing said manifold to travel back and forth the length of said baghouse for injecting pressurized reverse-direction air into said filter bags, one row at a time, said pressurized air flowing through the walls of said filter bags in said row in a reverse direction relative to that of said process air, whereby dust which has been collected on the outer surface of said tubular filter bags is blown off;

f. seal means on said traveling manifold for inhibiting flow of pressurized reverse-direction air into said upper chamber;

g. said upper chamber of said baghouse having a track extending along each longitudinal side of said baghouse;

h. said traveling manifold having grooved wheels adapted to ride on said tracks;

i. said air-distribution manifold being comprised of first and second half sections connected together; and

j. guide rollers between said half sections for maintaining said manifold on said tracks.

12. In a dust collector baghouse having upper and lower chambers, a plurality of tubular dust-collecting filter bags suspended in the lower chamber in an array of uniformly spaced rows, said filter bags having open mouths at their upper ends, and means causing a flow of process air upwardly from said lower chamber through the walls of said filter bags and through said open mouths into said upper chamber, the improvement comprising:

a. a flat support plate supporting said bags and separating said upper and lower chambers;

b. an air-distribution manifold in said upper chamber, said

manifold having a length in the widthwise direction of said baghouse corresponding to the width of said upper chamber, said manifold having a width in the lengthwise direction of said baghouse sufficient to register with but a single row of bags;

c. a source of continuous pressurized air which flows in a reverse direction relative to that of said process air;

d. means directing said reverse-direction air continuously into said manifold;

e. drive means for causing said manifold to travel back and forth the length of said baghouse for injecting pressurized reverse direction air into said filter bags, one row at a time, said pressurized air flowing through the walls of said filter bags in said row in a reverse direction relative to that of said process air, whereby dust which has been collected on the outer surface of said tubular filter bags is blown off;

f. seal means on said traveling manifold for inhibiting flow of pressurized reverse-direction air into said upper chamber;

g. said air-distribution manifold being comprised of first and second half sections connected together;

h. a diverter valve fixed to said source of pressurized air;

i. a first and second duct extending from said diverter valve to said first and second half-sections of said manifold;

j. said diverter valve between said source of pressurized reverse-direction air flow and said manifold functioning to restrict said air flow in any one time period to one half the length of said manifold and to inject during any one time period pressurized reverse-direction air into the open mouths of only that half of a single row of bags located on the same one side of the axial center line of the baghouse; and

k. means, including an electrical actuator and an electric control system, for controlling said diverter valve such that at the end of the travel of said manifold in one lengthwise direction of said baghouse said diverter valve is operated so that during the return travel of said manifold pressurized reverse-direction air is injected into the open mouths of bags on the opposite side of the center line of said baghouse.

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**4,293,321**

## FASTENING DEVICE FOR FILTER BAGS IN DUST-LADEN GAS FILTERS

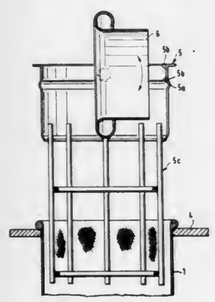
**Friedel Kordas, Recklinghausen, Fed. Rep. of Germany, assignor to Intensiv-Filter GmbH & Co. KG, Velbert, Fed. Rep. of Germany**

**Filed Jul. 7, 1980, Ser. No. 166,735**

**Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004222**

**Int. Cl.³ B01D** *46/02*

**U.S. Cl. 55—357** **11 Claims**



1. A fastening device for the dust-tight attachment of a filter bag having an open end in a separation plate between crude gas and purified gas chambers in dust-laden gas filters, comprising an elastic socket,

a clamping ring being swingably mounted in said elastic socket is adapted to be disposed at the open end of the filter bag with said elastic socket pressing the open end of the filter bag into holding engagement onto the separation plate,

said clamping ring being formed with flattened portions on two sides which are opposite each other.

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**4,293,322**

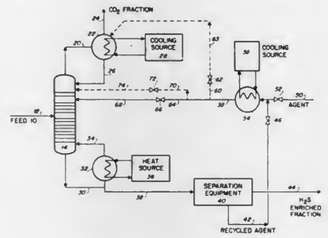
## DISTILLATIVE SEPARATION OF CARBON DIOXIDE FROM HYDROGEN SULFIDE

**James M. Ryan, Weston, and Arthur S. Holmes, Shrewsbury, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.**

**Filed Apr. 23, 1980, Ser. No. 143,099**

**Int. Cl.³ F25J** *3/00*

**U.S. Cl. 62—17** **2 Claims**




1. In a separation of carbon dioxide from hydrogen sulfide in a distillation column, the improvement of adding an agent for raising the relative volatility of carbon dioxide to hydrogen sulfide to said column at a point above the feed, said agent comprising a $C_3$–$C_6$ alkane, a mixture of $C_3$–$C_6$ alkanes, $SO_2$ or $SO_3$.

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**4,293,323**

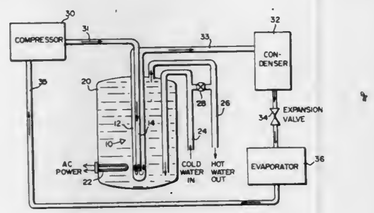
## WASTE HEAT ENERGY RECOVERY SYSTEM

**Frederick Cohen, 1500 W. Church St., Orlando, Fla. 32805**

**Filed Aug. 30, 1979, Ser. No. 71,363**

**Int. Cl.³ F25B** *27/02, 13/00*

**U.S. Cl. 62—238.6** **6 Claims**




1. A water heating system utilizing waste heat from a refrigeration system comprising:

a water storage tank having a cold water inlet line and a hot water outlet line, said water storage tank having a boss having a threaded opening therethrough;

a heat exchange unit disposed in said water storage tank and having an inlet port for connecting to the outlet of the compressor of said refrigeration system and an outlet port for connecting to the inlet of the condenser of said refrigeration system, said heat exchange unit having a threaded portion thereof adapted to match said threaded opening in said water storage tank for installation of said heat exchange unit in said water storage tank;

means for controlling the temperature of water issuing from said hot water outlet line to be below a predetermined temperature; and

said heat exchange unit comprising:

an outlet chamber attached to said threaded portion;

an elongate outer tube having a closed end and an open end thereof, said open end of said outer tube communicating with said outlet port via said outlet chamber; and

an elongate inner tube disposed within said outer tube, said inner tube having a first open end adjacent said closed end of said outer tube, and a second open end communicating with said inlet port.

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**4,293,324**

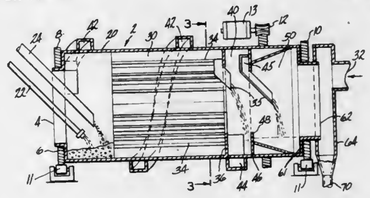
## PROCESS FOR THE PRODUCTION OF LAYERED GLASS BATCH PELLETS

**Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.**

**Filed Feb. 21, 1980, Ser. No. 123,153**

**Int. Cl.³ C03B** *1/00;* **C03C** *1/02*

**U.S. Cl. 65—27** **10 Claims**



1. A continuous process for the production of layered pellets for glass production which comprises the following steps:

(a) maintaining in a pelletizing zone of a rotary apparatus a moving bed of recycle pellets,

(b) feeding sand and particles of a calcium oxide source into said pelletizing zone,

(c) feeding a solution of sodium hydroxide into said pelletizing zone, said recycle pellets being coated with a layer comprised of said solution of sodium hydroxide, said sand and said calcium oxide source and forming layered pellets,

(d) passing said layered pellets into a heated drying zone exposed to an atmosphere containing carbon dioxide gas,

(e) lifting said layered pellets to the upper part of said drying zone and releasing said layered pellets to separately fall through the drying zone,

(f) simultaneously absorbing carbon dioxide onto said layered pellets while evaporating and removing water from said falling layered pellets to form dried layered pellets, said dried layered pellets having a residual moisture content of less than 15 percent by weight,

(g) passing said dried layered pellets from the drying zone to a recycling zone,

(h) recycling a portion of said dried layered pellets to said pelletizing zone as said recycle pellets, and

(i) recovering a portion of said dried layered pellets from said recycle zone.

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**4,293,325**

## METHOD OF FORMING HERMETIC SEALS

**Agustin M. Chirino, Elmira, and Gerald H. Yost, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 908,003, May 22, 1978, Pat. No. 4,221,604. This application Nov. 13, 1979, Ser. No. 93,064**

**Int. Cl.³ C03C** *27/00;* **C08K** *3/10*

**U.S. Cl. 65—43** **14 Claims**

1. A method of producing a mechanically strong, hermetic seal between and bonding together ceramic materials having dissimilar thermal expansions, which comprises:

preparing a mixture consisting of glass frit having a softening point of less than 750° C. and

a metal powder selected from the group consisting of 2–40 wt.% aluminum powder, 2–23 wt.% antimony powder and 2–17 wt.% zirconium powder, said wt.% based on the glass frit plus metal powder,

the frit having a sufficiently compatible coefficient of thermal expansion and the metal powder being in an effective amount when mixed with the frit such that the mixture, when reacted, will yield a seal characterized by a coefficient of thermal expansion closely matching or similar to that of the materials being sealed, and by a use temperature of up to 1000° C. when antimony or zirconium powder is chosen, and greater than 1000° C. when aluminum powder is chosen,

adding sufficient vehicle to provide a sealing mixture with viscosity to effect coating of the materials being sealed,

applying an amount of the sealing mixture to the sealing surfaces of the materials being sealed to effect a seal therebetween, and

firing the sealed materials to a temperature sufficient to complete the reaction and form the seal.

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**4,293,326**

## GLASS COATING

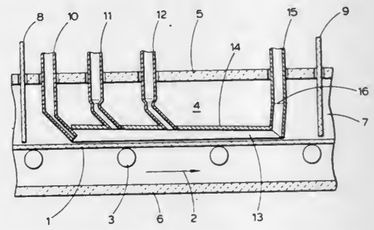
**Robert Terneu, Thiméon, and Albert Van Cauter, Charleroi, both of Belgium, assignors to BFG Glassgroup, Paris, France**

**Filed Jun. 18, 1979, Ser. No. 49,155**

**Claims priority, application United Kingdom, Jul. 20, 1978, 30589/78**

**Int. Cl.³ C03C** *17/245;* **G02B** *1/10*

**U.S. Cl. 65—60 D** **17 Claims**



1. A process for forming a tin oxide coating on a face of a glass substrate or of a previously formed coating thereon, comprising contacting said face, while said face is at elevated temperature, with a gaseous medium containing tin tetrachloride which undergoes chemical reaction and/or decomposition to form said tin oxide coating, wherein said gaseous medium contains tin tetrachloride in a concentration corresponding to a partial pressure of at least $2.5\times10^{-3}$ atm. and contains water vapour in a concentration corresponding to a partial pressure of between $50\times10^{-3}$ and $200\times10^{-3}$ atm. and is caused to contact said face while the temperature of the gaseous medium is at least 300° C. and the temperature of the glass where said contact occurs is above 550° C.

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**4,293,327**

## METHOD FOR MANUFACTURING GLASS BOTTLES

**John D. Northup, 2460 Underhill Rd., Toledo, Ohio 43615**

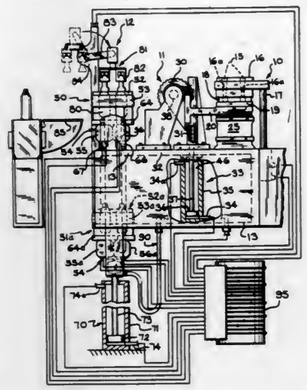
**Division of Ser. No. 964,739, Nov. 29, 1978, Pat. No. 4,244,726, which is a continuation-in-part of Ser. No. 906,048, May 15, 1978, abandoned. This application May 25, 1979, Ser. No. 42,455**

**Int. Cl.³ C03B** *9/14, 9/20*

**U.S. Cl. 65—64** **7 Claims**

1. A method of manufacturing glass containers including the steps of reciprocating first and second blow molds along a

substantially vertical path into and out of a receiving position, transferring a first parison into said first blow mold located at said receiving position, moving said first blow mold out of said receiving position and allowing said first parison to reheat, expanding said first parison into a first container, moving said second blow mold into said receiving position, transferring a second parison into said second blow mold, moving said second blow mold out of said receiving position and allowing said



second parison to reheat, expanding said second parison into a second container, moving said first blow mold back into said receiving position and removing said first container, transferring a next parison into said first blow mold, moving said first blow mold out of said receiving position, moving said second blow mold back into said receiving position and removing said second container, transferring a next parison to said second blow mold, and repeating the cycle.

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**4,293,328**

## N-(5-T-BUTYL-3-ISOXAZOLYL)ALKANAMIDE DERIVATIVES AND HERBICIDAL COMPOSITIONS CONTAINING THEM

**Hisajiro Yukinaga, Kusatsu; Shinzaburo Sumimoto; Ichiro Ishizuka, both of Osaka, and Jitsuo Sugita, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

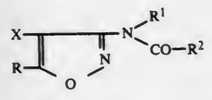
**Continuation-in-part of Ser. No. 836,238, Sep. 23, 1977, Pat. No. 4,111,680, which is a division of Ser. No. 667,033, Mar. 15, 1976, Pat. No. 4,062,861, which is a continuation of Ser. No. 491,491, Jul. 23, 1974, abandoned. This application Jun. 7, 1978, Ser. No. 914,749**

**Claims priority, application Japan, Jul. 27, 1973, 48-85339**

**Int. Cl.**[3] **A01N** *43/80;* **C07D** *261/14*

**U.S. Cl. 71—88** **11 Claims**

11. A method of killing a plant which comprises applying thereto a herbicidally effective amount of a compound represented by the formula:



wherein R is t-butyl; $R^1$ is hydrogen or methyl; $R^2$ is alkyl ($C_2$ to $C_6$), alkenyl ($C_3$ to $C_4$) or cyclopropyl; and X is hydrogen or halogen.

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**4,293,329**

## SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY

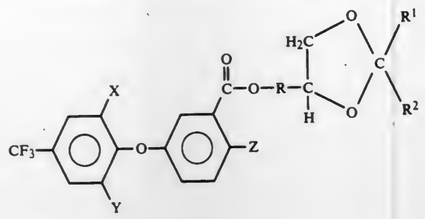
**William S. Grove, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jul. 7, 1980, Ser. No. 166,016**

**Int. Cl.**[3] **A01N** *43/00;* **C07D** *317/00*

**U.S. Cl. 71—88** **7 Claims**

1. A compound represented by the formula:



wherein:

X is hydrogen or halogen;

Y is hydrogen, halogen, cyano, trifluoromethyl, or alkyl containing up to 4 carbon atoms;

Z is nitro, halogen, or cyano;

R is alkylidene or monosubstituted alkylidene containing 1 to 3 carbon atoms wherein the substituent is alkyl containing 1 to 4 carbon atoms; and

$R^1$ and $R^2$ are the same or different and represent hydrogen or alkyl containing 1 to 4 carbon atoms.

6. A herbicidal composition containing a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

7. In a method of controlling weed growth wherein a herbicidally effective amount of herbicide is either applied to the growth medium prior to emergence of the weeds or applied to the weeds subsequent to emergence from the growth medium, wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

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**4,293,330**

## HERBICIDAL N-(PYRIDINYLAMINOCARBONYL)BENZENESULFONAMIDES

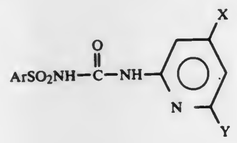
**George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 82,522, Oct. 9, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 192,034**

**Int. Cl.**[3] **A01N** *43/40;* **C07D** *213/28, 213/86*

**U.S. Cl. 71—94** **24 Claims**

1. A compound of the formula:



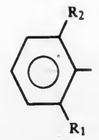
wherein

X is $CH_3$—, $CH_3CH_2$— or $CH_3O$;

Y is $CH_3$—, $CH_3CH_2$—, $CH_3O$—, $CH_3CH_2O$—, Cl, Br or F;

Ar is





$R_1$ is $CO_2R_4$;

$R_2$ is H;

$R_4$ is $C_1$–$C_4$ alkyl, $C_3$–$C_4$ alkenyl, $ClCH_2CH_2$— or $CH_3OCH_2CH_2$.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

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**4,293,331**

## NOVEL ACYLOXAMIDES AND PLANT GROWTH REGULANT COMPOSITIONS

**Gunther Beck; Helmut Heitzer, both of Leverkusen, and Klaus Lürssen, Berg.-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

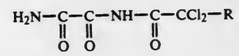
**Continuation of Ser. No. 964,223, Nov. 27, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,297**

**Claims priority, application Fed. Rep. of Germany, Dec. 3, 1977, 2753945**

**Int. Cl.**[3] **A01N** *37/18;* **C07C** *103/50*

**U.S. Cl. 71—118** **15 Claims**

9. Plant growth regulating composition containing in growth inhibiting effective amounts, an acyloxamide compound of the formula



in which R is chlorine, alkyl of from 1 to 2 carbon atoms or chloroalkyl of from 1 or 2 carbon atoms and 1 to 5 chlorine atoms in admixture with a solid or liquefied gaseous diluent or carrier or in admixture with a liquid diluent or carrier containing a surface-active agent.

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**4,293,332**

## HYDROMETALLURGICAL PROCESS FOR RECOVERING PRECIOUS METALS FROM ANODE SLIME

**Wei Ko Wang, Lung-Tan; Ying-Chu Hoh, Chia-An Village; Wen-Shou Chuang, and I-Sine Shaw, both of Taipei, all of Taiwan, assignors to Institute of Nuclear Energy Research, Taiwan**

**Continuation-in-part of Ser. No. 46,685, Jun. 8, 1977, abandoned. This application Mar. 20, 1980, Ser. No. 132,493**

**Int. Cl.**[3] **C22B** *11/04*

**U.S. Cl. 75—99** **17 Claims**

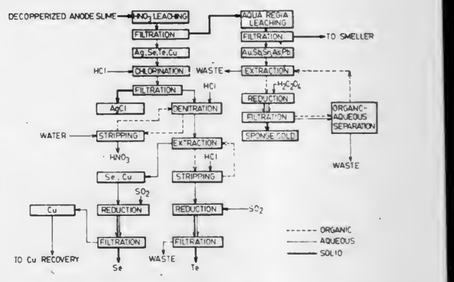
1. A process for the recovery of gold, silver, selenium and tellurium from a copper refinery anode slime containing these metals which comprises:

treating a decopperized anode slime three times with stoichiometric proportions of about 4 to 9 M nitric acid and at a temperature between about 40° to about 115° C. for a period of at least 40 minutes to obtain a nitric acid leach solution containing at least about 95% by weight of the silver content, about 96% by weight of the selenium content and about 75% by weight of the tellurium content of the decopperized anode slime and to also obtain a nitric acid leach residue containing gold, arsenic, antimony, lead, silica, tin and other impurities present in the decopperized anode slime, denitrating and chlorinating the selenium, tellurium, lead, copper and other impurities-containing solution by liquid-liquid extraction with 5% to 100% by volume of neutral or basic organic solvent balanced with a hydrocarbon diluent as the organic extractant, 8 M or higher hydrochloric acid as the acidity adjustment solution and water as the stripping solution,

separating tellurium from selenium, lead, copper and other impurities by liquid-liquid extraction using 5% to 100% by volume of a neutral or basic organic solvent balanced with a hydrocarbon diluent as the organic extractant, 4 M or higher hydrochloric acid as the scrubbing solution and 1 M or less hydrochloric acid as the stripping solution,

precipitating selenium from the selenium-containing solution with sulfur dioxide at a temperature between about 35.1° to 45° C. and at a free acid content in the selenium-containing solution between about 3.5 to 5.4 M of the hydrochloric acid;

precipitating tellurium from the tellurium-containing solution with sulfur dioxide at a temperature between about 10° to 45° C. and a free acid content in the tellurium-containing solution greater than 0.1 M of the hydrochloric acid;




treating the nitric acid leach residue with stoichiometric proportions of aqua regia at an elevated temperature of between about 40° C. to 110° C. for a period of at least 1 hour to obtain an aqua regia leach residue containing at least 99.46% by weight of the gold content of the nitric acid leach residue,

separating gold from arsenic, antimony, lead, tin, silica, platinoids and other impurities by liquid-liquid extraction at a temperature lower than 30° C. with ether having a carbon content of 10 to 12 as the organic extractant and 2 M or higher hydrochloric acid as the scrubbing solution, and

recovering gold from the gold-loaded organic extractant with stoichiometric proportions of oxalic acid at an elevated temperature of between 40° to 100° C. for a period of at least 3 hours.

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**4,293,333**

## MICROBIOLOGICAL RECOVERY OF METALS

**Walter Drobot, Montclair, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.**

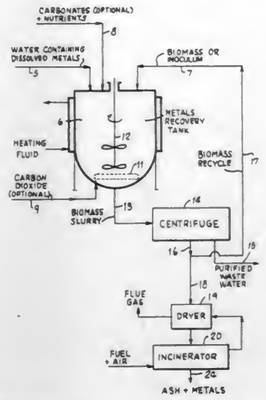
**Filed Feb. 12, 1980, Ser. No. 120,798**

**Int. Cl.**[3] **C22B** *11/04, 15/00, 19/00, 23/00*

**U.S. Cl. 75—101 BE** **27 Claims**

1. A process for removing metal from an aqueous medium containing in solution one or more metals selected from the group consisting of platinum, rhodium, palladium, ruthenium, gold, rhenium, silver, iridium, zinc, aluminum, iron, copper, nickel, cobalt, manganese, chromium, boron, and tin; which

comprises contacting said aqueous medium with at least one live fungus from the molds family for a period of time sufficient




to allow the fungus to extract metal from said solution in water insoluble form.

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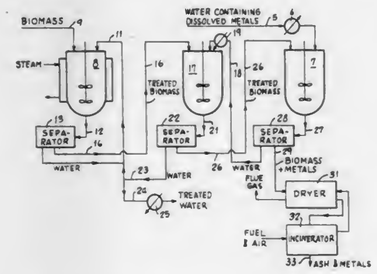
**4,293,334**

## RECOVERY OF METALS

**Walter Drobot, Montclair, and Hubert A. Lechavelier, Piscataway, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.**

**Filed Feb. 12, 1980, Ser. No. 120,800**
**Int. Cl.³ C22B** *11/04, 15/12, 21/00, 23/04*
**U.S. Cl. 75—101 BE** **13 Claims**



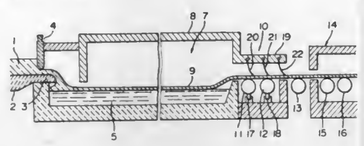

1. A process for removing metal from an aqueous medium containing in solution one or more metals selected from the group consisting of platinum, rhodium, palladium, ruthenium, gold, rhenium, silver, iridium, zinc, aluminum, iron, copper, nickel, cobalt, manganese, chromium, boron and tin; which comprises contacting said aqueous medium containing at least one of said metals with a killed fungus or a mixture of killed fungi from the family of molds for a period of time sufficient to convert said metal from soluble form to an insoluble form followed by the separation of the resulting aqueous medium from the killed fungus or killed fungi containing said removed metal.

**4,293,335**

## ROLL FOR MANUFACTURING FLOAT GLASS

**Ryo Tamamura, Yokohama, and Yukinori Kutsukake, Tokyo, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 962,713, Nov. 21, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,628**
**Claims priority, application Japan, Dec. 8, 1977, 52/146604**
**Int. Cl.³ C23F** *7/04*
**U.S. Cl. 75—124** **3 Claims**



1. A roll for conveying a float glass ribbon formed on a bath of molten metal, having excellent corrosion resistance to molten tin and high oxidation resistance, at least the surface of said roll being made of a heat-resistant cast steel consisting essentially of 0.01–2.0 wt.% of a rare earth metal mixture, and 0.1–3.0 wt.% of Al, 0.2–0.45 wt.% of C, up to 2.0 wt.% of Si, up to 2 wt.% of Mn, up to 0.04 wt.% of P, up to 0.04 wt.% of S, 19–22 wt.% of Ni, 23–27 wt.% of Cr, and the balance of Fe, said rare earth metal mixture comprising about 86.8 wt.% of Ce, about 3.0 wt.% of La, about 4.0 wt.% of Nd, about 6.2 wt.% of Sm plus Pr, and with main impurities of about 3.2 wt.% of Fe, about 0.37 wt.% of Mg, about 0.27 wt.% of Al and about 0.73 wt.% of Si.

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**4,293,336**

## COLD ROLLED NON-ORIENTED ELECTRICAL STEEL SHEET

**Ko Matsumura, Ichihara; Hiroto Nakamura, and Toshio Irie, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan**

**Filed May 27, 1980, Ser. No. 153,029**
**Claims priority, application Japan, May 30, 1979, 54-66087**
**Int. Cl.³ C22C** *38/06*
**U.S. Cl. 75—124** **1 Claim**

1. A cold rolled non-oriented electrical steel sheet having a low iron loss, which consists of not more than 0.02% by weight of C, 0.1–3.5% by weight of Si, not more than 1.0% by weight of Al, 0.1–1.0% by weight of Mn, 0.03–0.40% by weight of Sn and the remainder being essentially iron.

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**4,293,337**

## SILVER, CADMIUM OXIDE, LITHIUM CARBONATE CONTACT MATERIAL AND METHOD OF MAKING THE MATERIAL

**Frank S. Brugner, Jr., Mequon, Wis., assignor to Square D Company, Palatine, Ill.**

**Filed Aug. 20, 1979, Ser. No. 68,038**
**Int. Cl.³ B22F** *3/00;* **C22C** *29/00*
**U.S. Cl. 75—232** **12 Claims**

1. A process of forming an improved electrical contact for



electrical power applications and made with a first starting material selected from a group essentially consisting of a first metal in powder form and reducible compounds of the first metal in powder form both having a selected maximum particle size, and with a second starting material selected from a group essentially consisting of a second metal in powder form, reducible compounds of the second metal in powder form, and mixtures of the second metal in powder form all having a selected maximum particle size with said second metal selected to be more readily oxidizable than the first metal under similar environmental conditions and added in an amount from a minimum effective amount up to the maximum limit of solubility of the second metal in the first metal by mixing the first and second starting materials together to obtain a mixture having a substantially even dispersion of the first and second starting materials, heating the mixture in a reducing atmosphere at a temperature below the melting temperature of the alloy of the first and second metals in the proportions present to alloy the first and second metals in a powder form; sieving the alloyed mixture to produce a selected maximum particle size; heating the sieved mixture in an oxidizing atmosphere at a temperature and under conditions selected to substantially completely oxidize the second metal and with said temperature below the melting temperature of the alloy of the first and second metals in the proportions present to thereby maintain the mixture in a powder form; and sieving the oxidized mixture to produce a selected maximum particle size, said process comprising adding at a selected time during the process lithium metal in the form of lithium carbonate particles with the lithium carbonate particles uniformly distributed throughout material, forming a compact of the powdered material to provide an electrical contact having a desired shape, size and density, and sintering the compact for a predetermined time at a temperature less than the decomposition temperature of the lithium carbonate to provide a sintered electrical contact.

6. A sintered electrical contact for use as switching contacts in power circuits consisting essentially of silver, cadmium and lithium with silver present in a metallic form, the cadmium present as cadmium oxide and the lithium present as lithium carbonate.

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**4,293,338**

## DIFFUSION COATING COMPOSITION OF IMPROVED FLOWABILITY

**Bernard R. Rose, Ipswich, Mass., and John K. Willis, Salem, N.H., assignors to Walbar Metals, Inc., Peabody, Mass.**

**Filed Jul. 26, 1979, Ser. No. 60,891**
**Int. Cl.³ B22F** *9/00*
**U.S. Cl. 75—253** **9 Claims**

1. A particulate composition of matter forming means from which to expel aluminum and chromium at elevated temperatures, said composition comprising an inert filler, effective quantities of a halide carrier, chromium metal powder, and an aluminum-contributing powder of the compound $Co_2Al_9$.

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**4,293,339**

## UNDERWATER WAX FORMULATION AND METHOD

**Robert F. Supcoe, and Thomas Radakovich, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 28, 1980, Ser. No. 125,733**
**Int. Cl.³ C09D** *5/08, 5/14*
**U.S. Cl. 106—18.29** **4 Claims**

1. A wax coating material for application to submerged surfaces consisting essentially of a mixture, by weight percent, of from about 2% to about 18% of a fluorinatedchlorinated aliphatic polymer having a recurring unit of $—C_2F_3Cl—$ and an average molecular weight range of between about 500 to about 1200;

from about 20% to about 40% of a microcrystalline wax;

from about 40% to about 70% of a chlorinated paraffinic hydrocarbon having a chlorine content, by weight percent, of from about 40% to about 70% and

up to about 5% of a surfactant for improving the displacement of the water molecules from the surface.

4. A method of coating submerged surfaces for preventing marine growth comprises applying a wax mixture directly to the submerged surfaces, said wax mixture having a formulation substantially as follows:

from about 2% to about 18% of a fluorinated-chlorinated aliphatic polymer having a recurring structural unit $—C_2F_3Cl—$ and an average molecular weight range of between about 500 to about 1200;

from about 20% to about 40% of a microcrystalline wax;

from about 40% to about 70% of a chlorinated paraffinic hydrocarbon having a chlorine content, by weight percent, of from about 40% to about 70%; and

up to about 5% of a surfactant for improving the displacement of the molecules from the surface.

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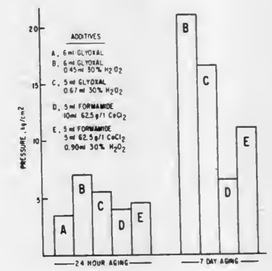
**4,293,340**

## COMPOSITION AND PROCESS FOR STABILIZING SOIL

**Fred L. Metz, Concord, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.**

**Continuation-in-part of Ser. No. 91,056, Nov. 5, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,634**
**Int. Cl.³ C09J** *1/02*
**U.S. Cl. 106—74** **15 Claims**




1. In a liquid alkali metal silicate composition curable to a solid upon standing and comprising water, an alkali metal silicate and glyoxal, the improvement which comprises incorporating from 0.02 to 0.7 mole of hydrogen peroxide per mole of glyoxal, whereby the resulting composition exhibits, upon curing, improved compressive strength.

10. In a method of stabilizing soil which comprises contacting said soil with a sole liquid composition comprising 10 to 70 percent, by volume, of an aqueous alkali metal silicate having an alkali metal oxide:silicon dioxide ratio of 1.0:3.0–4.0; about 0.25 to 1.05 moles of glyoxal per liter of composition; and water, the improvement which comprises adding to said composition about 0.025 to 0.18 mole of hydrogen peroxide per liter of composition, whereby emhanced load-bearing capacity is exhibited by soil treated with the composition.

**4,293,341**

## THIN SECTION INSULATING CONCRETE OF HIGH STRENGTH AND LOW WATER REQUIREMENT

**Hubert T. Dudley, Chelmsford, and Ralph J. Bragg, Townsend, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.**

**Filed Nov. 7, 1979, Ser. No. 92,157**
**Int. Cl.³ C04B** *7/35*
**U.S. Cl. 106—88** **14 Claims**

1. A hydratable lightweight concrete composition which when pumped and cast as a wet fluid layer hardens into a lightweight, strong porous thermal insulating mass having a density of less than 50 pounds per cubic foot comprising (a) 1 part by volume of hydratable cementitious binder; (b) about 2 to about 5 parts by volume of expanded vermiculite or expanded perlite per part by volume of said binder, said vermiculite or perlite having a density less than 10 pounds per cubic foot; (c) at least about 0.03 to about 0.08 percent by weight of said binder of air-entraining surface active agent; (d) at least about 0.005 to about 0.20 percent by weight of said binder of polyelectrolytic sulfonate dispersing agent; (e) up to about 20 percent by weight of said binder of an inert particulate having a density of from about 50 to about 100 pounds/cu. ft.; and, (f) water in an amount of from about 90 to about 110 percent by weight of the total dry weight of the said components (a) to (e).

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**4,293,342**

## LIGNOSULFONATE DERIVATIVES

**William J. Detroit, Schofield, Wis., assignor to American Can Company, Greenwich, Conn.**

**Division of Ser. No. 876,327, Feb. 9, 1978, Pat. No. 4,219,471. This application Dec. 17, 1979, Ser. No. 104,169**
**Int. Cl.³ C04B** *7/35*
**U.S. Cl. 106—90** **18 Claims**

1. A cementing composition comprising a hydraulic cement, a retarding agent therefor, in an amount of at least 0.5 percent based on the weight of the cement composition before dilution into a slurry,

said retarding agent comprising

a lignosulfonate or an alkali metal salt derivative thereof derived from sulfite waste liquor that has been subjected to alkaline oxidation, hydrolysis and partial desulfonation with subsequent resulfonation;

with subsequent reaction of said resulfonated lignosulfonate with:

(a) a halocarboxylic acid;

(b) a halocarboxylic acid and a hydroxy-substituted lactone;

(c) a hydroxy-substituted lactone as aforesaid;

(d) a halocarboxylic acid and sequentially the derivative of a sugar acid containing spent sulfite liquor derived from the reaction of a spent sulfite liquor with a cyanide followed by hydrolysis of the resulting reaction product; or

(e) said derivative of a sugar acid-containing spent sulfite liquor.

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**4,293,343**

## MORTARS AND CEMENTS HAVING IMPROVED FREEZE-THAW PROPERTIES AND METHOD OF ACHIEVING SAME

**Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Continuation of Ser. No. 874,735, Feb. 3, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,770**
**Int. Cl.³ C04B** *7/02*
**U.S. Cl. 106—99** **3 Claims**

1. Insulation materials formed from the following ingredients in parts by weight:

| | |
|---|---|
| Mineral fiber | 19–39 |
| Particulate filler | 0–60 |
| Hydraulic setting binder | 3–60 |
| Glass monofilaments | 0.01–1.0 |

said monofilaments forming a three dimensional monofilament network therein.

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**4,293,344**

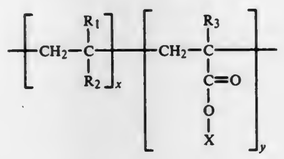
## SETTING RETARDATIVES FOR COMPOSITIONS WITH A GYPSUM PLASTER BASE OR ANHYDRITE

**Christian M. Joseph, Auzouer, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France**

**Filed Nov. 6, 1979, Ser. No. 92,055**
**Int. Cl.³ C04B** *13/00, 43/00;* **E04C** *2/00*
**U.S. Cl. 106—111** **9 Claims**

1. A plaster composition having a long setting time which comprises a gypsum-based plaster and 0.001–2 percent of a polymer having a molecular weight of less than 1000 of the formula I, as a setting retarding agent:

(I)



wherein

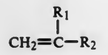
$R_1$ is hydrogen or methyl,

$R_2$ is —COOH, $COOR_4$ wherein $R_4$ is $C_1$ to $C_4$ alkyl, $—CONH_2$, or —CN,

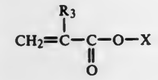
$R_3$ is hydrogen or methyl,

X is a sodium, potassium, lithium, calcium, magnesium, or ammonium ion, and

x and y designate the molar ratio of the two monomers forming the setting retarding agent of the formula I, so that x indicates that 0 to 40 moles of the monomer of the formula II



are present per 100 moles of the setting retarding agent of the formula I and so that y indicates that 60 to 100 moles of the monomer of the formula III



are present per 100 moles of the setting retarding agent of the formula I.

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**4,293,345**

## WAX COMPOSITION FOR ENTIRELY OR PARTLY REPLACING CARNAUBA WAX OR MONTAN WAX

**Jacobus J. Zeilstra, Wijnbergen; Willem J. de Klein, Dieren, and Joannes D. Bik, Eerbeek, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.**

**Filed Oct. 26, 1979, Ser. No. 88,646**
**Claims priority, application Netherlands, Oct. 26, 1978, 7810670**
**Int. Cl.³ C08L** *91/06*
**U.S. Cl. 106—270** **3 Claims**

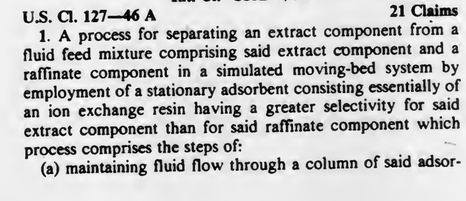
1. A wax composition for entirely or partly replacing carnauba wax or montan wax and substantially consisting of one or more acids and/or derivatives thereof selected from the group consisting of

A. ester of phenols or aromatic, aliphatic or cycloaliphatic alcohols having at least 1 to 10 primary or secondary hydroxyl groups;

B. amides of aliphatic, cycloaliphatic or aromatic mono- or diamines having 1 or 2 primary or secondary amino groups;

C. salts of alkali metals or alkaline earth metals, emphoeric metals, heavy metals, of ammonium or of a compound containing a tertiary amino group;

characterized in that at least 40% by weight of the acid present as such, or at least 40% by weight of the acid from which the derivatives are prepared has a branched-chain structure and at least 10% by weight thereof corresponds to the formula:



where

x=0, if y=2

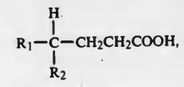
or x=2, if y=0

$R=CH_3(CH_2)_n$, where n represents an integer from 17 to 42;

b is 0 or 1, where, if b=0, Q represents a hydrogen atom, and if b=1, Q represents a $CH_2$-group, and

a=0 or 1, where if a=0, Z represents a hydrogen atom, and if a=1, Z represents a $CH_2$-group.

3. A wax composition according to the claims 1 or 2, characterized in that besides the branched-chain acids or derivatives thereof having the formulae given for these acids in claims 1 or 2 there is present an amount of 40 to 60 percent by weight of linear aliphatic monocarboxylic acids or derivatives thereof, with the acid having the formula $RCH_2CH_2CH_2COOH$, where R has the meaning given in claim 1 and about 30 to 40 percent by weight of γ-branched carboxylic acids or derivatives thereof, with the acid having the formula:



where $R_1$ and $R_2$ represent linear alkyl groups which together have the same number of carbon atoms as the group R.

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**4,293,346**

## SIMULATED COUNTERCURRENT SORPTION PROCESS EMPLOYING ION EXCHANGE RESINS WITH BACKFLUSHING

**Arthur M. Landis, Carpentersville; Donald B. Broughton, Evanston, and R. Gene Fickel, Roselle, all of Ill., assignors to UOP Inc., Des Plaines, Ill.**

**Filed Nov. 5, 1979, Ser. No. 91,303**
**Int. Cl.³ C13D** *3/14*
**U.S. Cl. 127—46 A** **21 Claims**

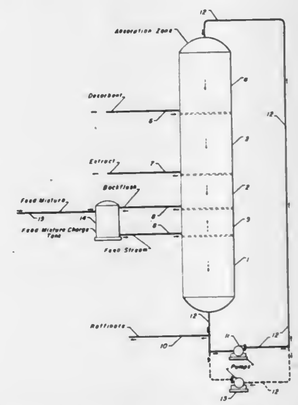
1. A process for separating an extract component from a fluid feed mixture comprising said extract component and a raffinate component in a simulated moving-bed system by employment of a stationary adsorbent consisting essentially of an ion exchange resin having a greater selectivity for said extract component than for said raffinate component which process comprises the steps of:

(a) maintaining fluid flow through a column of said adsorbent, which column contains at least an adsorption zone, a purification zone, and a desorption zone, each such zone comprising a separation zone having separate separation functions occurring therein, said column also containing a backflushing zone in which backflushing is effected, said zones being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones, said fluid flow in said separation zones being in a single direction and the fluid flow in said backflushing zone being in a direction opposite said single direction;

(b) maintaining said adsorption zone in said column defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining said purification zone as the nearest separation zone upstream, with respect to said single direction, of said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

(d) maintaining said desorption zone immediately upstream, with respect to said single direction, of said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;




(e) maintaining said backflushing zone immediately upstream, with respect to said single direction, of said feed input stream to said column, said backflushing zone defined by the adsorbent located between said feed input stream at an upstream boundary of said zone and a backflushing output stream at a downstream boundary of said zone;

(f) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said extract component by said adsorbent in said adsorption zone and withdrawing a raffinate output stream from said adsorption zone;

(g) passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of said extract component from the adsorbent in said desorption zone;

(h) withdrawing an extract output stream comprising said extract component and desorbent material from said desorption zone;

(i) withdrawing said backflushing output stream from said backflushing zone;

(j) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in

said adsorption zone the feed input steam, raffinate output stream, desorbent input stream, extract output stream, and backflushing output stream to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams.

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**4,293,347**

## PROCESS FOR DEPOLYMERIZATION OF ACRYLIC ACID POLYMERS

**Elliot M. Haschke, and Bennie J. Lewis, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jan. 21, 1980, Ser. No. 114,133**
**Int. Cl.³ B08B** *3/08, 7/00, 9/08*
**U.S. Cl. 134—11** **5 Claims**

1. A method for removing polymers of acrylic acid from distillation vessels which comprises contacting said polymer with a solvent selected from the group of dialkyl phthalates wherein each alkyl group contains from one to four carbon atoms at a temperature which will decompose or dissolve said polymer without appreciable decomposition of said solvent.

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**4,293,348**

## METHOD FOR REMOVING OIL-BASED MATERIALS FROM WATER SURFACE

**James E. Shewmaker, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Mar. 10, 1980, Ser. No. 128,726**
**Int. Cl.³ B01D** *17/02;* **B08B** *9/00*
**U.S. Cl. 134—22 R** **13 Claims**

10. A method for the direct loading and discharge of clean ballast from a crude oil depleted tank of a cargo carrier having vertical steel surfaces comprising:

(a) crude oil washing and water rinsing said tank;

(b) stripping said tank to remove residual oil heel;

(c) adding clean ballast water to said tank wherein any residual oil-based material remaining in said tank floats on the surface of said ballast water;

(d) adding to the surface of said ballast water a spreading agent having a spreading force greater than about 38 mN/M in an amount sufficient to force substantially all said material against said steel surfaces; and

(e) discharging said ballast water from said tank at a point below the surface of said water; said oil-based material being forced to deposit on said steel surfaces vacated by said discharged water.

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**4,293,349**

## PROTECTIVE COMPOSITIONS FOR STEEL SURFACES AND THE PROCESS FOR THEIR PREPARATION

**Giuseppe Pedrazzini, Milan, Italy, assignor to Parker Italiana S.a.s., Milan, Italy**

**Filed Mar. 17, 1980, Ser. No. 131,112**
**Claims priority, application Italy, Mar. 16, 1979, 21079 A/79**
**Int. Cl.³ C23F** *7/10*
**U.S. Cl. 148—6.15 R** **7 Claims**

1. A composition for protecting steel surfaces from the oxidizing action of the atmosphere, comprising as essential actial components:

an acid of molecular weight between 270 and 1200 selected from the group consisting of pyrogallyc acid glucosides, ellagic acid glucosides and combinations thereof in a quantity between about 15 and about 30%

phosphoric acid in a quantity between about 2 and about 3.2% by weight;

a phosphate selected from the group consisting of zinc phosphate, manganese phosphate and combinations thereof in a quantity between about 1.1 and about 2% by weight; and

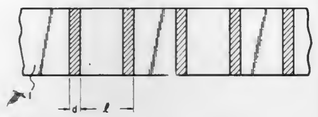
a nitrate selected from the group consisting of zinc nitrate, manganese nitrate and combinations thereof in a quantity between about 0.5 and about 1% by weight.

**4,293,350**

## GRAIN-ORIENTED ELECTROMAGNETIC STEEL SHEET WITH IMPROVED WATT LOSS

**Tadashi Ichiyama, Sagamihara; Shigehiro Yamaguchi, Fujisawa; Tohru Iuchi, Kawasaki, and Katsuro Kuroki, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Jul. 19, 1979, Ser. No. 58,757**
**Claims priority, application Japan, Jul. 26, 1978, 53-91217**
**Int. Cl.³ H01F** *1/04*
**U.S. Cl. 148—111** **15 Claims**




1. In a method of producing a grain-oriented silicon-steel electrical sheet by cold rolling a silicon-steel sheet, with intermediate annealing if necessary, to a standard electrical sheet thickness, decarbonizing the sheet if necessary, and subjecting the sheet to a final high-temperature anneal, so as to produce a grain-oriented silicon-steel electrical sheet having a plurality of magnetic domains; wherein the improvement comprises momentarily irradiating the finally annealed sheet by a laser beam so as to subdivide said domains to an extent appreciably improving the watt loss of the finally annealed sheet as compared to the watt loss it had prior to said irradiating.

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**4,293,351**

## SILICONE RUBBER EXPLOSIVE AND METHOD OF MAKING

**Gerald E. Johannes, 565 Frank Ave., SE., Huron, S. Dak. 57350**

**Filed Aug. 6, 1979, Ser. No. 63,689**
**Int. Cl.³ C06B** *45/10*
**U.S. Cl. 149—19.2** **2 Claims**

1. The method of making an explosive product wherein a particulate explosive material containing mainly a composition selected from the group consisting of PETN and RDX is mixed with a pourable silicone rubber in the ratio of 20–50 parts by weight of silicone rubber to 80–50 parts by weight of explosive material and about 1–5% by weight of glacial acetic acid or an equivalent amount of weaker acetic acid as a catalyst, to form a tacky viscous paste wherein the explosive material is uniformly distributed.

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**4,293,352**

## DEGRADABLE BINDER EXPLOSIVES

**Benjamin Y. S. Lee; Russell Reed, Jr., both of Ridgecrest, Calif., and Roger L. Miller, Brigham City, Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 23, 1979, Ser. No. 69,215**
**Int. Cl.³ C06B** *45/10*
**U.S. Cl. 149—19.4** **1 Claim**

1. An easily degradable explosive composition containing about 82 percent explosive solids and about 18 weight percent of a polyurethane binder made from the reaction of from 16.56 weight percent polyester and from 1.44 weight percent of said curative;

said binder being prepared by reaction of a hydroxyl terminated polyester having a functionality of 2.33 with a curative comprising Lysine diisocyanate methyl ester; and

said binder being degradable in aqueous ammonia or dilute acid, yielding reusable explosive solids and non-toxic binder-degradation products, and being not degradable upon contact with water.

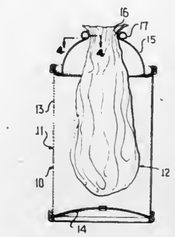


**4,293,353**

## SEALING-ATTACHING SYSTEM FOR BAG TYPE AEROSOL CONTAINERS

**Peter G. Pelton, St. Louis, Mo., and Sam C. Pulciani, Norridge, Ill., assignors to The Continental Group, Inc., New York, N.Y.**

**Filed Nov. 3, 1978, Ser. No. 957,382**
**Int. Cl.³ B29C** *27/00;* **C09J** *5/02, 5/06, 5/10*
**U.S. Cl. 156—69** **5 Claims**




1. A method of installing a product bag in an aerosol container having an upper end defining a reduced diameter opening and wherein said bag is of a cross section greater than said opening, said method comprising the steps of gathering an upper part of said bag and having the gathered bag part pass through said opening, and then heating and molding the gathered bag part against that part of said upper end defining said opening to form a unitary substantially constant thickness seal defining part aligned with and conforming to said opening, seating a valve cup in said opening and sealing said valve cup relative to said opening by said seal defining part, said valve cup being seated in said opening in advance of said heating and molding step, and said valve cup being utilized in conjunction with said upper end to effect said molding.

5. A method of installing a product bag in an aerosol container having an upper end defining a reduced diameter opening and wherein said bag is of a cross section greater than said opening, said method comprising the steps of gathering an upper part of said bag and having the gathered bag part pass through said opening, and then heating and molding the gathered bag part against that part of said upper end defining said opening to form a unitary substantially constant thickness seal defining part aligned with and conforming to said opening, the container having a body, said bag having a bag form prior to being inserted into the container, and the bag cross section generally approaching the cross section of the container body.

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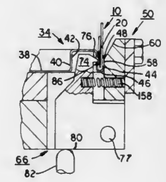
**4,293,354**

## PROCESS AND MACHINE FOR FASTENING A CLOSURE MEMBER TO A CONTAINER

**Richard G. Haas, South Haven, Mich., assignor to Brown Company, Kalamazoo, Mich.**

**Filed Aug. 30, 1979, Ser. No. 71,243**
**Int. Cl.³ B29C** *27/12;* **B30B** *15/34;* **B65B** *7/28*
**U.S. Cl. 156—69** **32 Claims**




1. A machine useful for fastening a closure member to a container with an upstanding tubular wall, an edge of which is folded over onto itself to form a folded-over, reinforced portion of double thickness at that end, said closure member having an upstanding tubular inner wall conforming to the inner surface of said folded-over, reinforced portion and a downstanding tubular outer wall connected thereto and conforming to the outer surface of said folded-over, reinforced portion, thereby forming a tubular channel in which said folded-over, reinforced portion is seated in frictional engagement, which machine comprises:

a fastening head;

anvil means;

positioning means for positioning said fastening head and said anvil means in fastening position with the downstanding tubular outer wall of said channel juxtaposed to said anvil means and with the upstanding tubular inner wall of said channel apposed to said fastening head; and,

actuating means for actuating said fastening head, while it is in fastening position, to fasten the upstanding inner tubular wall of said channel to the inner surface of said folded-over, reinforced portion, said fastening head comprising means for pressing selected portions of the upstanding tubular inner wall of said channel into the inner surface of said folded-over, reinforced portion against anvil means apposed to said selected portions; in which said fastening head comprises a plurality of punching points arranged about the periphery of said fastening head, and said actuating means comprises punching means for causing said punching points to move radially outwardly and to punch the upstanding tubular inner wall of said tubular channel into the inner surface of the folded-over, reinforced portion of the upstanding tubular wall of said container; and in which the inner surface of the folded-over, reinforced portion of the upstanding tubular wall of said container has areas of low resistance to the punching-in of the upstanding tubular inner wall of said tubular channel, which areas of low resistance are opposite said punching points and as to which said punching means is operative to punch the portions of said upstanding tubular inner wall which are are apposed to said areas of low resistance into the same.

22. A process for fastening a closure member to a container with an upstanding tubular wall, an edge of which is folded over onto itself to form a folded-over, reinforced portion of double thickness at that end, said closure member having an upstanding tubular inner wall conforming to the inner surface of said folded-over, reinforced portion and a downstanding tubular outer wall connected thereto and conforming to the outer surface of said folded-over, reinforced portion, thereby forming a tubular channel in which said folded-over, reinforced portion is seated in frictional engagement, which process comprises:

positioning the end of said container which is closed with said closure member in a position juxtaposed to a fastening head and anvil means;

effecting a relative movement of said container with respect to said fastening head and said anvil means operative to seat said fastening head on the closed end of said container with said upstanding tubular inner wall apposed to said fastening head and said downstanding tubular outer wall juxtaposed to said anvil means, and then actuating said fastening head to fasten said upstanding tubular inner wall to the inner surface of said folded over, reinforced portion by pressing selected portions of said upstanding tubular inner wall into the inner surface of said folded-over, reinforced portion against anvil means apposed to said selected portions; in which the fastening of said closure member is effected by punching-in portions of said upstanding tubular inner wall into the inner surface of said folded-over, reinforced portion; and in which the inner surface of said folded-over, reinforced portion has preformed areas of low resistance to the punching-in of said upstanding tubular inner wall into which corresponding portions of said upstanding tubular inner wall are punched.

## 4,293,355
## METHOD FOR ULTRASONICALLY WELDING PLASTICIZED THERMOPLASTIC POLYMERIC FOAM WARES

Albert R. Wacker, Zionsville, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Division of Ser. No. 900,982, Apr. 28, 1978, Pat. No. 4,193,396.
This application Sep. 10, 1979, Ser. No. 73,928
Int. Cl.³ A61F 11/02; B23K 19/04
U.S. Cl. 156—73.2 6 Claims

1. A method for thermally welding an element composed of a flexible plasticized thermoplastic material to a ware composed of a plasticized thermoplastic polymeric foam which comprises:

supporting the polymeric foam;

bringing said element into abutting relationship with said foam;

applying an ultrasonic transducer and spacing said transducer from said support so as to define a fixed gap therebetween within which said element is biased against said foam;

energizing said transducer with sufficient power and for a sufficient period of time as to flux the plasticized thermoplastic materials of said element and said foam; and

cooling the resulting weldment to below fluxing temperature, a portion of said foam forming a part of said weldment not being completely fluxed into a solid continuous state.

## 4,293,356
## METHOD FOR ADHESION OF CERAMICS

Yoshihiro Ebata, Kawanishi; Yasuo Toibana, Ikeda; Tsuneo Uetsuki, Kawanishi; Saburo Kose, and Makoto Kinoshita, both of Ikeda, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

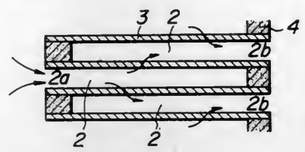
Division of Ser. No. 87,064, Oct. 22, 1979, Pat. No. 4,269,641.
This application Apr. 25, 1980, Ser. No. 143,758
Claims priority, application Japan, Nov. 10, 1978, 53-138991; Dec. 1, 1978, 53-149421
Int. Cl.³ B32B 31/12; C04B 39/12
U.S. Cl. 156—89 6 Claims

1. A method for the adhesion of two ceramic articles, which comprises interposing between the opposed surfaces of the two ceramic articles a powder mixture of $CuS$-$LaCrO_3$-$SiO_2$-$Cu$ wherein the proportion of $CuS$ to $LaCrO_3$-$SiO_2$ is in the range of from 80:20 to 90:20 by weight and the proportion of $LaCrO_3$ to $SiO_2$ is in the range of from 25:75 to 50:50 by weight, pressing the two ceramic articles into fast contact with each other across the interposed layer of powder mixture, and heating these two ceramic articles in the resultant state of fast contact in an oxidizing atmosphere at a temperature in the range of from 1000° to 1200° C. for a period of from 10 to 20 minutes.

## 4,293,357
## METHOD FOR PRODUCING CERAMIC HONEYCOMB FILTERS

Noboru Higuchi; Teruo Yano, both of Nagoya, and Masahiro Ohnishi, Kuwana, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jul. 14, 1980, Ser. No. 167,731
Claims priority, application Japan, Jun. 16, 1980, 55-80107
Int. Cl.³ C03B 29/00
U.S. Cl. 156—89 14 Claims

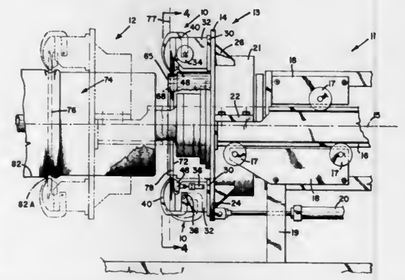


1. A method for producing a ceramic honeycomb filter comprises adhering a film on an opening end surface of a porous ceramic honeycomb sructural body having a large number of channels extending therethrough, boring holes through the film at a given portion, charging a sealing material into the channels through the bores in the film to seal an end portion of the given channels.

## 4,293,358
## METHOD AND APPARATUS FOR ACCURATELY POSITIONING A BEAD BUNDLE

Earl F. Loeffler, Uniontown, and Harley P. Weyand, Jr., Doylestown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 7, 1980, Ser. No. 147,669
Int. Cl.³ B29H 17/22
U.S. Cl. 156—131 10 Claims



2. A method for accurately positioning the axially facing surfaces of a pair of axially spaced, annular bead bundles with respect to the body ply assembly on a tire building drum, comprising the steps of:

supporting each bead bundle generally co-axially with the drum;

moving a plurality of first clamping elements into engagement with the facing surfaces of the bead bundles;

stopping the engaging movement of the first clamping elements accurately with respect to an axial reference datum;

moving a plurality of second clamping elements against the opposite axial surfaces of the bead bundles and driving the bundles fully against their respective first clamping elements; and

applying a retaining force to said first clamping elements which is greater than the force applied by said second clamping elements against the bead bundles.



## 4,293,359
## METHOD FOR FASTENING A STABILIZING ARRANGEMENT ON A CONTAINER

Kjell M. Jakobsen, Hjallese, Denmark, assignor to Aktiebolaget Platmanufaktur AB, Malmo, Sweden

Division of Ser. No. 928,539, Jul. 27, 1978, Pat. No. 4,196,039, which is a continuation-in-part of Ser. No. 793,737, May 4, 1977, abandoned. This application Jul. 11, 1979, Ser. No. 56,557
Claims priority, application Sweden, May 10, 1976, 7605265
Int. Cl.³ B32B 31/00
U.S. Cl. 156—156 6 Claims

1. A method of securing a tubular stabilizing arrangement of plastic material on a container of plastic material, said method comprising inserting the container into the tubular stabilizing arrangement into a position in which a middle portion of the bottom of the stabilizing arrangement is axially spaced from the bottom of the container while side walls of the stabilizing arrangement are in axial contact with the container, applying a force against the middle portion of the bottom of the stabilizing arrangement in order to cause it to lie against the middle portion of the bottom of the container while the walls of the tubular stabilizing arrangement axially abut against and engage the container, and simultaneously supplying energy in the region in which the middle portion of the bottom of the stabilizing arrangement lies against the middle portion of the bottom of the container, whereby the stabilizing arrangement is secured to the container in the middle portions of the arrangement and container respectively, wherein during the securing of the stabilizing arrangement to the container, the walls of said stabilizing arrangement are subjected to bending by the application of said force against the middle portion of the bottom of the stabilizing arrangement which displaces that portion axially relative to the other parts of the stabilising arrangement to cause said bottom of the stabilizing arrangement to lie against the middle portion of the bottom of the container, the middle portion of the bottom of the stabilizing arrangement remaining, after securing, in this position in which it is displaced relative to the other parts of the arrangement while said walls of said stabilizing arrangement are subjected to bending stress and tightly engage said container while being axially slidable with respect thereto.

## 4,293,360
## COATED SHEET MATERIAL FOR USE IN MAKING DECORATIVE LAMINATES

Fredrick A. Loft, South Windham, and John O. H. Peterson, Standish, both of Me., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Nov. 16, 1978, Ser. No. 961,463
Int. Cl.³ B32B 31/00
U.S. Cl. 156—230 10 Claims

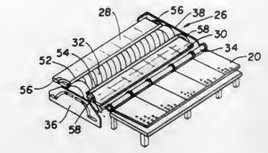
6. In a method of forming a decorative heat-and-pressure consolidated laminate by assembling between platens a plurality of superimposed plies of thermosetting resin impregnated sheets and a release medium having a transferable, gluable coating on the side of the release medium placed against an outermost ply, and applying heat and pressure through the platens to consolidate the laminate and to transfer the gluable coating from the release medium to the outermost ply,

the improvement wherein the gluable coating comprises a linear copolymer of (A) maleic acid or maleic anhydride or maleic acid salt and (B) ethylene, or a vinyl monomer having one side chain of either an aliphatic group with up to four carbon atoms or an alkoxy group with up to four carbon atoms.

## 4,293,361
## WORK SUPPORT FOR FORMING LAMINATIONS

Ferdinando Savio, Farmingdale, and William Peterson, East Nassau, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,830
Int. Cl.³ B32B 31/04
U.S. Cl. 156—242 22 Claims



1. A means to mechanize the lay-up and forming of structures, said means comprising:

a split table including movable portions operatively related to each other so as to move relatively to each other, said movable portions comprising flat surfaces adapted to move away from each other;

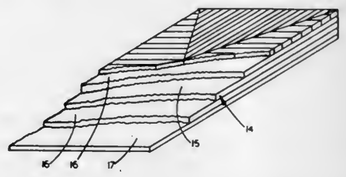
a mold located between said movable portions such that said flat surfaces are on opposite sides of said mold whereby the mold will receive structures to be formed thereby as the flat surfaces move away from the mold leaving the structures to fall over the mold; and

application rollers associated with said flat surfaces so as to be movable to expose the flat surfaces of the split table to allow deposit thereon of said structures and movable thereafter to overlay said structures at the edges of said flat surfaces adjacent said mold on opposite sides thereof to press the structures onto said mold as said flat surfaces separate and expose more and more and finally all of said mold.

## 4,293,362
## METHOD OF FORMING DECORATIVE PANELS

Dezso D. Drobina, #204 - 25 E. 12 Ave., Vancouver, British Columbia, Canada (V5T 2G6)

Filed Dec. 10, 1979, Ser. No. 102,242
Int. Cl.³ B27M 1/08; B32B 3/14
U.S. Cl. 156—264 2 Claims



1. A method of forming decorative wooden panels comprising:

(a) edge-gluing a plurality of long thin strips of wood in side-by-side relationship to form a single composite sheet,

(b) cutting the sheet into pieces of predetermined size and shape wherein each piece has a portion of said plurality of strips,

(c) gluing the pieces in edge-to-edge relationship in a predetermined pattern on a backing member, said backing member being of laminated wood construction with a central

layer of said backing member being of hard wood with the grain of said hard wood oriented at 90° to the grain of the remaining core members.

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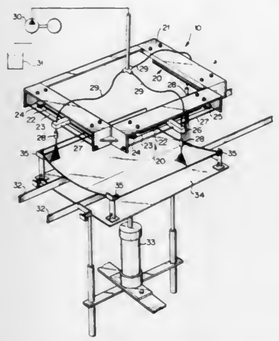
**4,293,363**

## PANEL ASSEMBLING METHOD

**Makoto Wakabayashi, Koshigaya, and Haruyoshi Takagishi, Yamato, both of Japan, assignors to Nissan Motor Company Limited, Kanagawa, Japan**

**Filed Jun. 4, 1979, Ser. No. 45,437**
**Claims priority, application Japan, Jun. 8, 1978, 53/69191; Jun. 8, 1978, 53/69192**
**Int. Cl.³ B29C** *19/02*
**U.S. Cl. 156—272** **4 Claims**



1. A method of assembling metal panels, comprising the steps of:

coating a thermosetting adhesive on a connection area of a first panel;

mating this connection area of the first panel to the connection area of a second panel; and

forming an adhesive bond between the connection areas of the first and second panels, said forming being carried out by the step of heating the adhesive by passing electricity substantially only through at least one region of one of said first and second panels to heat said region so as to provide a desired degree of setting of the adhesive in said region of said one panel.

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**4,293,364**

## METHOD AND MACHINE FOR OPENING UP A CYLINDRICAL FILM TUBE AND FITTING IT OVER AN OBJECT

**Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Osaka, Japan**

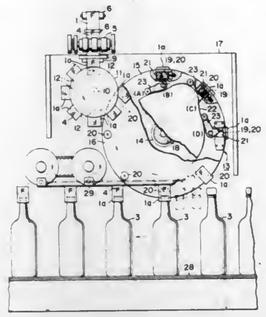
**Filed Sep. 4, 1979, Ser. No. 72,106**
**Claims priority, application Japan, Sep. 14, 1978, 53-113473**
**Int. Cl.³ B32B** *31/02*
**U.S. Cl. 156—344** **5 Claims**

1. A method for putting a cylindrical film tube over an object, the tube being initially in a collapsed state with its opposite sides flattened together so as to be in contact, comprising the steps in the specified order of:

(a) contacting two vacuum suckers to the collapsed tube, one on each of its sides, in axial opposition to one another, and supplying vacuum to these suckers so that they suck and grip the tube;

(b) moving the suckers relative to one another in a direction which is parallel to the surfaces of the tube which they are gripping and perpendicular to the axis of said suckers, and breaking the contact of the two sides of the collapsed tube by so doing;

(c) moving these suckers apart from one another in the direction perpendicular to the surfaces of the tube which



they are gripping, and opening up the tube by so doing; and

(d) putting the opened-up tube over the object.

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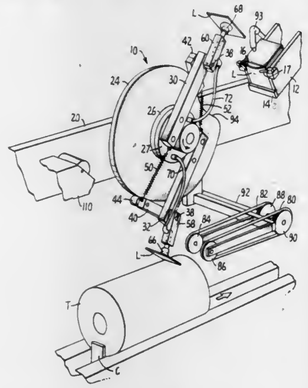
**4,293,365**

## APPARATUS FOR APPLYING LABELS OR THE LIKE

**Joseph E. Geyser, Brentwood; Henry W. Rehr, Clayton; Rudolph W. Schutz, Walnut Creek, and Rudolf R. Weis, Antioch, all of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.**

**Filed Aug. 1, 1980, Ser. No. 174,413**
**Int. Cl.³ B65C** *9/10, 9/14, 9/36*
**U.S. Cl. 156—364** **9 Claims**



1. Apparatus for applying items such as labels or the like to articles transported serially along a predetermined path of movement comprising:

storage means for said items;

delivery means including item retaining means for removing individual items from said storage means and bringing said items into contact with said articles;

applicator means including a moveable element having a contact surface forming a nip with said articles for positively engaging said items and holding them on said articles after delivery of said items to said articles by said delivery means during transport thereof; and

means for moving said delivery means past said applicator means with said item retaining means in close proximity to said nip and adjacent thereto, said article and contact surface cooperable to receive said item in said nip and



remove said item from said item retaining means as said delivery means moves past said applicator means.

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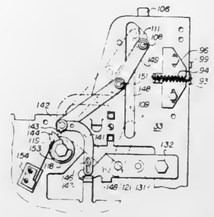
**4,293,366**

## PUNCHING AND BINDING MACHINE

**Elmer G. Szanto, Saratoga; George Wu, San Jose, and Charles J. Ulrich, Santa Barbara, all of Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.**

**Filed May 15, 1980, Ser. No. 149,997**
**Int. Cl.³ B42C** *19/00*
**U.S. Cl. 156—477 B** **2 Claims**



1. An apparatus for binding sheets together, said apparatus being of the type having a frame having a pair of spaced sides and a platen to support said sheets, a pressure bar, cooperating means on said sides and bar for guiding movement of said bar from a first position above said platen to a second position adjacent said platen and resting on top of said sheets and actuating means for moving said pressure bar, a motor, and a shaft turned by said motor, said shaft driving said actuating means, the improvement which comprises first means on said shaft, a linkage mounted on said frame, said linkage including means connected to said pressure bar and second means to engage said first means, said first means being oriented relative to said shaft to engage said second means only after said shaft has been turned through almost a full cycle of rotation of said shaft, said second means being arranged to lift said pressure bar to first position.

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**4,293,367**

## APPARATUS FOR EFFECTING SECUREMENT OF A TRANSVERSELY MOVED ELASTIC RIBBON TO A MOVING WEB

**Ladislav J. Klasek, North Riverside; Clarence F. Lamber, Country Club Hills, and Anthony Passafiume, Burbank, all of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.**

**Filed May 16, 1980, Ser. No. 150,516**
**Int. Cl.³ B32B** *31/08*
**U.S. Cl. 156—494** **5 Claims**

5. An apparatus for securing an elastic member to a flexible web of material in a non-linear configuration, said apparatus comprising:

(a) a pair of rotatable depositing rolls adapted to deposit said elastic member to the surface of a web traveling in a fixed path beneath said depositing rolls;

(b) a pair of spaced apart vertical shafts;

(c) a right angle drive at the bottom of each vertical shaft;

(d) a frame member from which the first of said vertical shafts is mounted;

(e) a gear train connecting the right angle drive of the first vertical shaft to the depositing rolls;

(f) means for driving the right angle drive at the second of said vertical shafts;

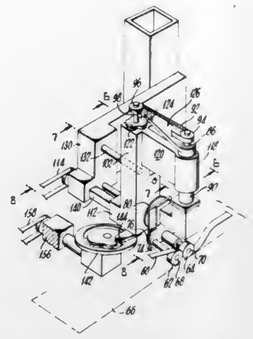
(g) a pair of timing gears mounted at the top of said vertical shafts;

(h) a timing belt connecting said timing gears for imparting drive from the second vertical shaft to the first vertical shaft;

(i) a cam mounted at the top of the second vertical shaft;

(j) a cam follower cooperating with said cam and being linked to said frame member to skew the frame member and hence the first vertical shaft and the depositing rolls with respect to said flexible web of material;

(k) slidably movable frame means from which the second vertical shaft, its right angle drive, and the frame member are mounted;



(l) a second cam follower mounted from said frame means;

(m) a rotatable cam cooperating with said cam follower; and

(n) means for rotating said cam to move the frame means and hence the first vertical shaft and the depositing rolls in a transverse direction with respect to the path of the web material.

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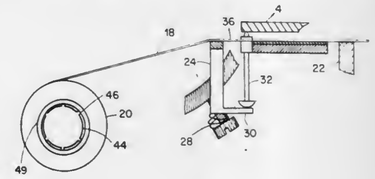
**4,293,368**

## FILM SPLICING DEVICES

**Leo Catozzo, S. Severa, Italy, assignor to Costruzione Incollatrici Rapide C.I.R. S.r.L., S. Severa, Italy**

**Filed Sep. 3, 1980, Ser. No. 183,712**
**Claims priority, application Italy, Sep. 14, 1979, 50274 A/79**
**Int. Cl.³ B31F** *5/06;* **G03D** *15/04*
**U.S. Cl. 156—506** **3 Claims**



1. An improved splicing device for connecting film, magnetic tape or the like, end to end with an adhesive tape (**18**) of the type having a base (**2**), a lower dieplate (**8**) fixed upon the base (**2**), a supporting wall (**38**) integral with said base (**2**) in order to rotatably sustain a roll (**20**) of said adhesive tape (**18**), an extractor (**6**) provided with a tape depressor (**51**) fastened upon a lid (**4**) hinged to said base (**2**), a lever (**16**) hinged in turn to said lid (**4**) and fitted with knives acting with the edges of said lower dieplate (**8**) in order to trim in coincidence with the edges of said lower dieplate (**8**) a piece of adhesive tape placed above film ends to be joined, and a movable bridge (**24**) on a fore edge of the lower dieplate (**8**) and a fixed bridge (**22**) on an opposite edge of said lower dieplate, the improvement which comprises means for moving said moveable bridge (**24**) from a retracted position removed from said fore edge of said lower dieplate (**8**) to a position close to said fore edge of said lower dieplate (**8**), said means including a pair of tonguelets (**30**) on

each end of said moveable bridge (24), each said end being pressed by a respective spring (28) against a lower end of a respective pushing rod (32), which is slidable within said base (2), an upper end of each said rod projecting beyond said base (2), whereby lowering of said lid (4) upon said base, by lowering said rods (32), causes a rotatory movement of said bridge towards said fore edge of the lower dieplate (8) and lifting of the lid (4), after the shearing of adhesive tape (18) causes, under the action of the springs (28), the rotation of the movable bridge (24) away from the edge of said lower dieplate (8), thereby permitting an operator to easily grip an end (36) of adhesive tape (18) projecting from the moveable bridge (24) in order to pull it and press it against the fixed bridge (22) for any further production of a joint between other film or tape ends.

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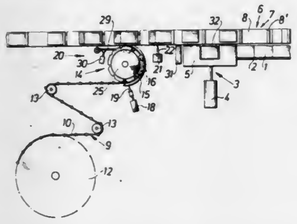
**4,293,369**

## MACHINE FOR THE APPLICATION OF SUCTION TUBES TO PACKING CONTAINERS

**Rolf M. Dilot, Lund, and Jan T. Hakansson, Eslöv, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden**

**Filed Jan. 23, 1979, Ser. No. 5,903**
**Claims priority, application Sweden, Jan. 30, 1978, 7801067**
**Int. Cl.³ B65B** *19/34*
**U.S. Cl. 156—521** **10 Claims**



**1.** An apparatus for the application of suction tubes to prefabricated packing containers wherein said tubes are wrapped in protective casings and arranged in the form of a continuous band, said apparatus comprising:

conveying means to convey packing containers along a predetermined path;

supplying means to supply a continuous band of the suction tubes to a location adjacent said path;

separating means to separate individual suction tubes from said continuous band;

advancing means to advance said separated individual suction tubes including a rotatable element having recesses along a periphery thereof for receiving individual suction tubes;

orienting means to orient and place said individual suction tubes in contact with a packing container, said means including sliding surfaces disposed along the periphery of the rotatable element which cooperate with suction tubes located in the recesses to displace said suction tubes to the desired position relative to the packing containers; and

attaching means to attach said suction tubes to said packing containers.

**4,293,370**

## METHOD FOR THE EPITAXIAL GROWTH OF BORON PHOSPHOROUS SEMICONDUCTORS

**Katsuto Nagano, Yokohama; Kazuhiko Ihaya, Tokyo; Syozo Sasa, Ichikawa, and Takeshi Nakada, Tokyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 6,220, Jan. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 806,858, Jun. 15, 1977, abandoned. This application Feb. 13, 1980, Ser. No. 120,993**
**Int. Cl.³ C30B** *25/10*
**U.S. Cl. 156—612** **4 Claims**

**1.** A process for the epitaxial growth of boron phosphorous semiconductors having improved carrier density comprising the steps of growing the boron phosphorous semiconductors on an N-type silicon substrate having a single crystal layer, at a temperature of 880° C. to 1110° C., using a reaction gas consisting mainly of diborane and phosphorous trichloride, the constituent ratio of phosphorous trichloride to diborane being 2 to 200 in mol, and the concentration of the diborane being $2\times10^{-6}$ to $5\times10^{-3}$ mol/mm, wherein said substrate is a composite substrate having an N-type silicon substrate with a boron phosphide single crystal layer on the (100) plane thereof and said boron phosphide single crystal layer being formed by a hydride system of phosphine ($PH_3$) and diborane ($B_2H_6$).

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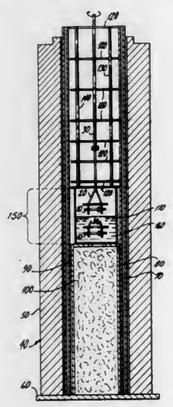
**4,293,371**

## METHOD OF MAKING MAGNETIC FILM-SUBSTRATE COMPOSITES

**Milan R. Kokta, and Roger W. Taylor, both of San Diego, Calif., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Mar. 27, 1980, Ser. No. 134,640**
**Int. Cl.³ C30B** *19/00*
**U.S. Cl. 156—624** **3 Claims**



**1.** In a method of growing a magnetic film on a garnet substrate wherein a garnet substrate of a first composition is immersed and rotated in a melt of a different composition comprising at least two different oxides which will form a film characterized by magnetic ordering in a plane substantially parallel to the surface of the melt and is withdrawn from the melt when a suitable thickness of film growth is provided on the substrate, the improvement which comprises maintaining the immersed substrate stationary in the melt after a suitable thickness of film growth is provided on the substrate for from about 0.5 seconds to 5 minutes.



**4,293,372**

## GROWTH OF SINGLE-CRYSTAL MAGNETOPLUMBITE

**Howard L. Glass, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jul. 15, 1980, Ser. No. 168,927**
**Int. Cl.³ C30B** *19/04*
**U.S. Cl. 156—624** **4 Claims**

**1.** A method of growing single-crystal magnetoplumbite, comprising the steps of:

forming a fluxed melt comprising boron oxide ($B_2O_3$), lead oxide (PbO) and iron oxide ($Fe_2O_3$), wherein the mole ratio of boron oxide to lead oxide in said melt is at least about 0.06, wherein the concentration of iron oxide in said melt is at least about 15 mole percent, and wherein the concentration of iron oxide in said melt is limited to less than that which would cause the melt to have a crystallization temperature at or over 1000° C.; and

cooling said fluxed melt to a temperature at or below 943° C., whereby said flux will be in a supersaturated state capable of supporting the growth of single crystals of magnetoplumbite by spontaneous nucleation, by growth on seed crystal, and by growth on a single-crystal substrate placed in contact with said melt.

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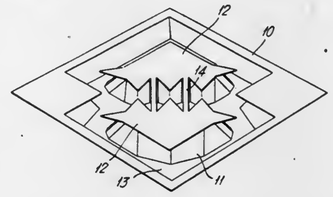
**4,293,373**

## METHOD OF MAKING TRANSDUCER

**John C. Greenwood, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Division of Ser. No. 43,466, May 29, 1979. This application Feb. 26, 1980, Ser. No. 124,781**
**Claims priority, application United Kingdom, May 30, 1978, 24186/78**
**Int. Cl.³ H01L** *21/306*
**U.S. Cl. 156—628** **2 Claims**



**1.** The method of making a silicon pressure transducer, said method comprising the steps of: selectively boron doping both faces of a silicon wafer; etching one face of said wafer to define a cavity within a frame forming a closed loop and two lands spaced from each other and from said frame, said diaphragm connecting said lands; and selectively etching the other face of said wafer opposite said groove so as to define a silicon diaphragm to which both of said lands are fixed, said etching steps leaving at least two filaments having a first pair of adjacent ends fixed to one land and a second pair of adjacent ends fixed to the other land in a plane spaced from said diaphragm.

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**4,293,374**

## HIGH ASPECT RATIO, HIGH RESOLUTION MASK FABRICATION

**Praveen Chaudhari, Briarcliff Manor; Ned J. Chou, Yorktown Heights; Ralph Feder, Hyde Park; Alan B. Fowler, Yorktown Heights, and James A. VanVechten, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

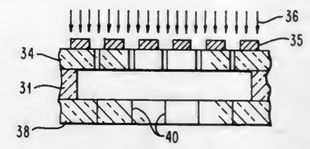
**Filed Mar. 10, 1980, Ser. No. 128,710**
**Int. Cl.³ B44C** *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/425*
**U.S. Cl. 156—628** **6 Claims**

**1.** The process of making a high aspect ratio collimating mask comprising the step of:

forming on a first thin plate of damage-trail-forming material, a preliminary mask of particle-arresting material configured to leave unmasked regions where openings are to be formed,

irradiating said first plate through said preliminary mask with particles having sufficient energy to pass through said first plate with negligible deflection and form damage trails therethrough,

etching said first plate to enlarge said damage trails,



mounting a second thin plate of damage-trail-forming material spaced from and superimposed with said first plate,

irradiating said second plate through said preliminary mask and the enlarged damage trails in said first plate, with particles energized sufficiently to pass through said second plate with negligible deflection and form damage trails therethrough, and

etching said second plate to enlarge said damage trails.

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**4,293,375**

## METHOD OF MANUFACTURING A DEVICE AND DEVICE MANUFACTURED ACCORDING TO THE METHOD

**Hans-Rudolf Neukomm, Thalwil, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 810,088, Jun. 27, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 47,979**
**Claims priority, application Netherlands, Feb. 7, 1976, 7607298**
**Int. Cl.³ H01L** *21/306;* **C03C** *15/00, 25/06*
**U.S. Cl. 156—643** **4 Claims**

**1.** A method of manufacturing a device with etch patterns of predetermined dimensions comprising

providing a body including an underlying substrate and a surface layer having a thickness D,

covering portions of said surface layer with a photolacquer mask having a thickness d, said covered portions having dimensions exceeding predetermined etch pattern dimensions by a uniform width b,

plasma etching uncovered portions of said surface layer and said photolacquer mask to obtain said predetermined pattern of dimensions at said underlying substrate by laterally etching said photolacquer mask at a faster rate than said surface layer, thereby obtaining an etch profile with an inclined side having an angle $\alpha$ with said underlying substrate,

wherein said uniform width b is at least equal to D tan $\alpha$, and said thickness d is at least equal to $2D/\sin 2\alpha$.

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**4,293,376**

## METHOD OF PRODUCING PERFORATED GLASS PLATE

**Kaspar Weingand, Dürnbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

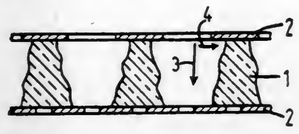
**Filed Jan. 24, 1979, Ser. No. 6,204**
**Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802976**
**Int. Cl.³ B23P** *15/00, 25/06;* **B44C** *1/22;* **C03C** *15/00*
**U.S. Cl. 156—644** **5 Claims**

**1.** A process for etching relatively fine size perforations in glass plates, comprising:

coating opposite surfaces of glass plates with a select pattern

composed of a hydrofluoric acid-resistant metal so that glass surface areas corresponding to desired locations of perforations are free of said resist metal; and

etching perforations having an average depth dimension which is greater by a factor of at least two relative to the




average lateral dimension thereof through the glass surface areas free of said resist metal by contacting said coated glass plates with a gas having hydrofluoric acid therein for a period of time sufficient to etch said perforations.

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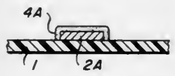
**4,293,377**

## MANUFACTURING METHOD FOR CIRCUIT BOARD

**Masanobu Miyajima, Tsuchiura, Japan, assignor to Rogers Corporation, Rogers, Conn.**

**Filed Jun. 27, 1979, Ser. No. 52,475**
**Claims priority, application Japan, Jun. 29, 1978, 53-78954**
**Int. Cl.³ C23F *1/02***
**U.S. Cl. 156—656** **7 Claims**




1. A method for the manufacture of a circuit board from an intermediate comprising a laminate of a non-conductive substrate and a layer of electrically conductive material secured to at least a first surface of the substrate, said method comprising the steps of:

defining a conductor pattern on the exposed surface of the conductive layer by screen printing a hot-melt resin onto the said conductive material surface;

curing the resin by the application of heat; and

removing the conductive layer in areas not covered by the cured resin to form discrete conductors.

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**4,293,378**

## ENHANCED WET STRENGTH FILTER MATS TO SEPARATE PARTICULATES FROM FLUIDS AND/OR COALESCE ENTRAINED DROPLETS FROM GASES

**Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724**

**Filed Jan. 10, 1980, Ser. No. 110,844**
**Int. Cl.³ D21H *5/18***
**U.S. Cl. 162—145** **12 Claims**

1. A glass fiber filter mat which is a wet laid, non-woven matrix of randomly arranged, haphazardly intersecting and overlapping at least at the intersections primarily glass fibers, which mat comprises, in percents by weight,

(a) from about 64.1% to about 83.5% of glass fibers composed of from about equal parts, to all of one, of (i) glass fibers of about one inch long and of about 12 microns in diameter and (ii) glass fibers of about three-eighths inch long and about 6 microns in diameter, and providing a network thereof in a matrix, and intermingles with said glass fibers network

(b) from about 5.5% to about 12.8% of polymer micro-bits produced from a polymer selected from the group of (i) an expanded, thermoplastic styrene-polymer, (ii) an expanded lower polyolefin from polyethylene to polymethylpentene, said polyolefin being the polymer of any of the homologs from ethylene to methylpentene, (iii) a copolymer of propylene with from about 20 to about 30 percent by weight of ethylene, (iv) a melt alloy of polyethylene with up to about 10 percent by weight of polystyrene, (v) a melt alloy composed of at least 50 percent by weight of polypropylene and the balance being a copolymer of ethylene with up to about 30 percent (of the copolymer) being vinyl acetate, and (vi) a flexible foamed polyurethane, each said polymer being non-brittle in the form used to produce said micro-bits, said polymer micro-bits of (i) to (v) being from about 40 to about 325 microns long and from about 20 to about 325 microns wide, from substantially completely to entirely completely free of intact cells of the expanded polymer from which said micro-bits were produced, substantially without any uniformity in outline of the individual micro-bit particles, and having a density from about 85 percent of, to about substantially the same as, the specific unexpanded polymer from which there was provided the aforesaid expanded thermoplastic polymer from which said micro-bits were produced, said polymer micro-bits of (vi) being in the form of tripodal particles with generally uneven length legs, said particles being broken and inter-connected strand portions from adjacent cells of said flexible foamed polyurethane, said strand portions being substantially free of intact cell windows and having hook-like projections, indentations and flutes extending therefrom, said hook-like projections, indentations and flutes having been formed by the destruction of the cell windows of said flexible foam, and the amount of said micro-bits present in said filter mat being sufficient to provide the mat with the degree of porosity and flow-rate level required for the application wherein the mat is to be used; and comprises also

(c) from about 2.8% to about 8.1% of polyvinyl alcohol participating as a binder in the matrix, and

(d) from about 6.6 to about 9.5% of a cobeat composed of (i) one part of any of said polymer micro-bits intermixed with (ii) from about one to about two parts of cellulose fibers, and (iii) non-shrinkable, non-slip polymer fibers in an amount from zero to about 7% of the sum of said (i) and (ii); and

(e) from about 3.35% to about 5.5% of a melamine-formaldehyde resin to function as a wet strength enhancing binder.

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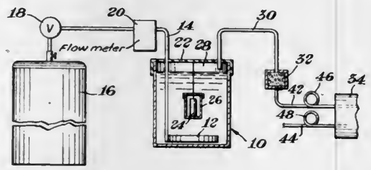
**4,293,379**

## NEUTRON ACTIVATION ANALYSIS METHOD AND APPARATUS FOR DETERMINING SODIUM AND SODIUM COMPOUNDS IN LIQUID SAMPLES

**Kerry J. Kelly, Midland, Mich., and Arthur J. Kamp, Oakley, Calif., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Mar. 26, 1980, Ser. No. 134,046**
**Int. Cl.³ G01N *23/222***
**U.S. Cl. 376—159** **20 Claims**




1. Analytical method for determining total sodium which comprises exposing sodium containing liquid sample to a neutron flux effective to produce $^{23}Ne$ radioactive gas activation product, sparging the liquid sample effective to evolve and separate from the sample a detectable concentration of $^{23}Ne$ admixed with sparging gas, flow removing said evolved gas mixture to a space remote from the neutron flux emission, monitoring said removed gas mixture for radiation emission, and quantifying based on radiation count, total sodium of the analyzed sample.

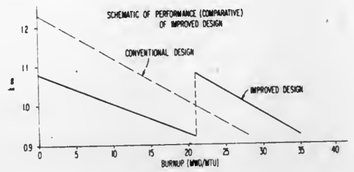


**4,293,380**

## REACTOR AND FUEL ASSEMBLY DESIGN FOR IMPROVED FUEL UTILIZATION IN LIQUID MODERATED THERMAL REACTORS

**Thomas R. Robbins, 1528 Crofton Pkwy., Crofton, Md. 21144**

**Filed Nov. 25, 1977, Ser. No. 854,970**
**Int. Cl.³ G21C *7/00***
**U.S. Cl. 376—209** **15 Claims**




1. A method for operating a liquid moderated thermal reactor which comprises:

(a) initially irradiating with all or a portion of the fuel assemblies in the core of the reactor operating in an undermoderated boiling mode, said fuel assemblies being uranium fuel assemblies enriched with fissile uranium material, and said undermoderated condition resulting in increased production of fissle plutonium with reduced uranium burn-up which increases the degree of undermoderation during said irradiation, and,

(b) after one or more fuel cycles, converting all or a portion of said undermoderated boiling fuel assemblies to operation in a near optimum moderated non-boiling mode for the fuel composition at the time of said conversion, the undermoderated boiling mode and the moderated non-boiling mode being practiced on a system which does not rely on $D_2O$ to shift the neutron spectrum but wherein undermoderated operation results from a low H/fuel ratio due to the initial boiling mode of operation and moderated operation results from an increased H/fuel ratio due to the subsequent non-boiling mode of operation.

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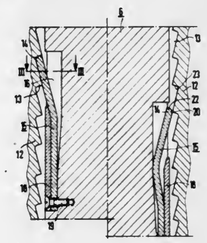
**4,293,381**

## NUCLEAR REACTOR HAVING CONTROL ROD HOLDING LATCH

**Claus Goetzmann, Erlangen, and Peter Rau, Mittelehrenbach, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Continuation of Ser. No. 549,827, Feb. 13, 1976, abandoned. This application Jul. 15, 1976, Ser. No. 705,434**
**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1974, 2409181**
**Int. Cl.³ G21C *7/08***
**U.S. Cl. 376—230** **6 Claims**



1. A reactor comprising a pressure vessel containing a core and having at least one vertically movable control rod assembly having a neutron-absorbing portion adapted for vertical insertion and removal from said core and a solid rod portion adapted to actuate the neutron-absorbing portion, said solid rod portion being surrounded by an integrally internally threaded sleeve which is vertically immovable and said solid rod portion carrying latch means engaging said screw thread with a ratchet and pawl action permitting said solid rod portion to be moved freely and rapidly towards said core so as to insert said neutron-absorbing portion into said core but positively preventing said solid rod portion from moving freely and rapidly away from said core, said sleeve and solid rod portion being relatively rotative so as to provide a screw drive for said solid portion.

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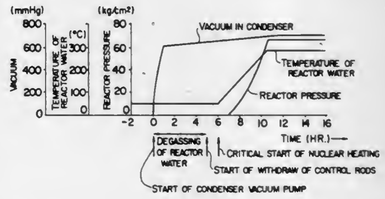
**4,293,382**

## METHOD OF STARTING UP A NUCLEAR REACTOR

**Katsumi Ohsumi, and Minoru Miki, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 29, 1978, Ser. No. 937,863**
**Claims priority, application Japan, Sep. 2, 1977, 52-106149**
**Int. Cl.³ G21C *19/32***
**U.S. Cl. 376—308** **14 Claims**




1. A method of starting-up a nuclear reactor having a reactor pressure vessel conaining cooling water therein having an oxygen content greater than 5 ppm and a fission mass in a non-critical condition comprising the steps of reducing the oxygen concentration in the cooling water of the reactor pressure vessel to a concentration less than 0.5 ppm, causing the fission mass of the nuclear reactor to become critical, and raising the water temperature to at least 150° C.

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**4,293,383**

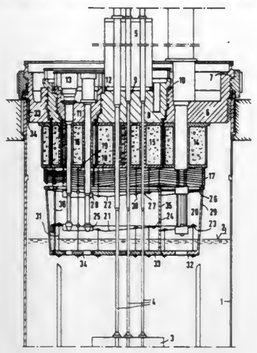
## NUCLEAR REACTOR WITH EQUIPMENT FOR PREVENTING CONVECTION OF METAL VAPORS

**Ruhama J. Lakra, Cologne; Jürgen Freund, Bonn-Bad Godesberg, and Gerd Rauschert, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bergisch Gladbach, Fed. Rep. of Germany**

**Filed Mar. 7, 1978, Ser. No. 884,115**
**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1977, 2709914**
**Int. Cl.³ G21C *13/06***
**U.S. Cl. 376—290** **3 Claims**

1. In a liquid metal-cooled nuclear reactor having a reactor vessel with a cover at the top thereof and being partly filled with liquid metal up to a given surface level, the liquid metal surface and the reactor-vessel cover defining therebetween a gas-filled space, at least one convection barrier permeable to the gas being disposed in said space and subdividing said space

into at least two parts, the parts of said space having respective thermal flow systems therein, said convection barrier being of



conical construction and extending across substantially an entire horizontal sectional area of the reactor vessel.

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**4,293,384**

## NUCLEAR REACTOR PLANT FOR GENERATING PROCESS HEAT

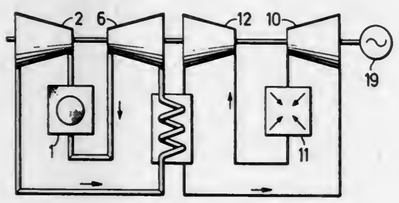
**Max Weber, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Jun. 8, 1979, Ser. No. 46,637**

**Claims priority, application Switzerland, Jun. 13, 1978, 6420/78**

**Int. Cl.**[3] **G21C** *3/56;* **F01K** *9/00*

**U.S. Cl. 376—391** **21 Claims**



1. In combination,

a nuclear reactor plant having a primary medium circuit comprising a nuclear reactor for generating a flow of heated primary working medium and a heat exchanger having a primary side to receive the flow of heated working medium and a secondary side to receive a flow of a secondary working medium in heat exchange relation with the primary working medium; and

a compressor connected to said secondary side of said heat exchanger to receive a heated flow of the secondary working medium directly therefrom for heating under compression to a given temperature.

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**4,293,385**

## SECONDARY COOLANT CIRCUIT FOR NUCLEAR-REACTORS

**Alain Brachet, Orsay, France, assignor to Electricite de France (Service National), Paris, France**

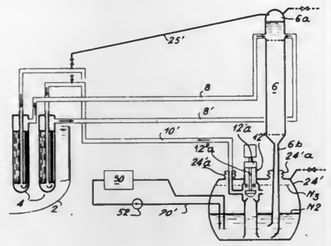
**Filed Feb. 1, 1980, Ser. No. 117,814**

**Claims priority, application France, Feb. 9, 1979, 79 03335; Mar. 15, 1979, 79 06595**

**Int. Cl.**[3] **G21C** *15/00*

**U.S. Cl. 376—283** **15 Claims**

1. A secondary coolant circuit for nuclear-reactors of the liquid-metal cooled type, said circuit comprising at least one intermediate exchanger mounted in the vessel of said reactor, outside said vessel a steam-generator for the exchange of calories between the secondary liquid-metal flowing through said secondary circuit and water-stream, at least one pump for circulating said secondary sodium and one tank for storing said secondary liquid-metal and recovering those products generated by a possible liquid-metal-water reaction in said steam-generator, said liquid-metal being likely to occupy the lowest possible level in said tank, said secondary coolant circuit being characterized in that said tank is situated at the lowest possible



level in the nuclear installation, in that the lower extremity of the liquid-metal outlet duct of said steam-generator is directly dipped into said tank, in that, in said tank above the liquid-metal, is maintained an inert gas cover at such a pressure that it balances the liquid-metal pressure in the whole secondary loop, said tank, in addition, acting as the downstream ram-effect preventing tank for said steam-generator and as an expansion tank during the temperature variations of said liquid-metal, and in that the rotor of said pump is situated above said lowest level.

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**4,293,386**

## NUCLEAR REACTOR WITH A CYLINDRICAL REACTOR PRESSURE VESSEL

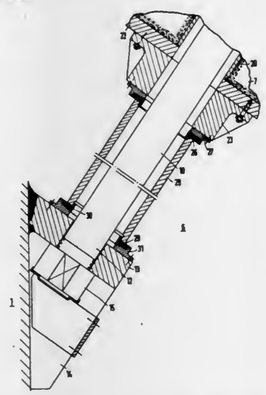
**Elmar Harand, Höchstadt, and Eberhard Michel, Nuremberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Filed Feb. 23, 1979, Ser. No. 14,366**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808104**

**Int. Cl.**[3] **G21C** *13/02*

**U.S. Cl. 376—461** **7 Claims**



1. In a nuclear reactor with a cylindrical reactor pressure vessel disposed in a reactor cavity formed in a concrete biological shield surrounding and spaced from the pressure vessel, means for suspending the reactor pressure vessel from the concrete biological shield comprising a plurality of tension bolts distributed about the periphery of the cylindrical reactor pressure vessel and secured to a corresponding plurality of brackets attached to the cylindrical reactor pressure vessel for suspending the pressure vessel from said tension bolts, said tension bolts extending from said brackets at an inclined angle through the biological shield and being anchored to the biological shield.



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**4,293,387**

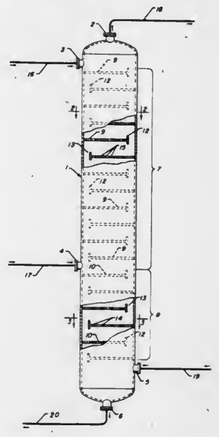
## APPARATUS FOR THE SOLVENT EXTRACTION OF AROMATIC HYDROCARBONS FROM A HYDROCARBON MIXTURE

**George R. Winter, III, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Oct. 17, 1980, Ser. No. 198,035**

**Int. Cl.**[3] **B01D** *11/04;* **C10C** *3/08*

**U.S. Cl. 196—14.52** **4 Claims**



1. A multiple stage contactor column for countercurrent contact of an upwardly moving hydrocarbon phase and a downwardly moving solvent phase which comprises:

(a) an enclosed vertically elongated shell having an overhead raffinate outlet means, an upper lean solvent inlet means, an intermediate hydrocarbon feedstock inlet means, a lower hydrocarbon reflux inlet means, and a bottom aromatic-rich solvent outlet means;

(b) a first plurality of vertically spaced apart extraction trays traversing said shell in a horizontal plane and situated above said intermediate inlet means;

(c) each of said first plurality of trays having an upcomer means associated therewith, and a number of uniform perforations of pre-selected cross-sectional area distributed across the contacting area thereof;

(d) a second plurality of vertically spaced apart extraction trays traversing said shell in a horizontal plane and situated below said intermediate inlet means;

(e) each of said second plurality of trays having an upcomer means associated therewith, and a number of uniform perforations distributed across the contacting area thereof; and,

(f) the individual perforations in said second plurality of extraction trays having a greater cross-sectional area than the individual perforations of said first plurality of extraction trays.

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**4,293,388**

## APPARATUS FOR PRODUCING ABRASION-PROOF COKE FORMS FROM BITUMINOUS COAL, BROWN COAL OR PEAT BRIQUETS

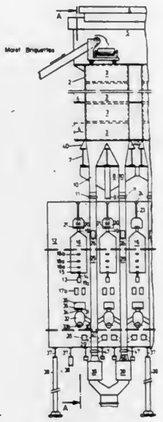
**Kurt Lorenz, Hattingen; Horst Dungs, Herne; Hans B. Koenigs, Bergheim, and Roman Kurtz, Frechen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany**

**Division of Ser. No. 30,939, Apr. 17, 1979, Pat. No. 4,259,157. This application Dec. 13, 1979, Ser. No. 103,235**

**Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818456**

**Int. Cl.**[3] **C10B** *1/04, 3/00*

**U.S. Cl. 202—126** **2 Claims**



1. An apparatus for treating coal and peat briquets so as to produce abrasion-proof coke forms, comprising, a vertically elongated drying shaft made up of a plurality of individual parallel spaced plate shaped radiators, each having spaced apart tubes through which a heating medium is directed, arranged so that the tubes of the various radiators of the stack are aligned vertically and they form vertical passages therebetween for briquets, means for directing the briquets downwardly into the shaft into the passages while circulating a heating medium through said heating elements of said radiators so as to indirectly preheat and predry the coke as it is falling downwardly, a carbonization shaft located below said drying shaft and receiving briquets therefrom, means for circulating a heating medium around the outside of said carbonization shaft to effect the carbonization of briquets which are directed downwardly therethrough, means for establishing a cooling zone in the lower end of said carbonization shaft for circulating cooling gas around the outside of said cooling zone, and discharge means for the briquets at the lower end of the carbonization shaft below the cooling means for the discharge of the briquets, one of said tubes of each radiator comprising a distributor header with a steam heating fluid inlet into said distributor header, the other tube of each radiator comprising a condenser header for receiving condensing fluid from each radiator and a discharge connected to said condenser header, and a protective plate disposed exteriorly of each of said inlet header and discharge header for preventing the coke from passing to the walls of said drying shaft.

**4,293,389**

## DOOR CLOSURE CONSTRUCTION FOR SEALING THE SEALING EDGE OF A COKE OVEN DOOR IN A FRAMED COKE OVEN OPENING

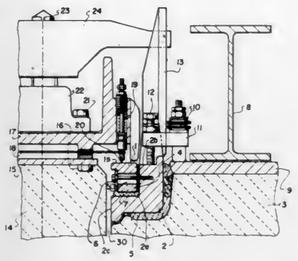
**Heinrich-Josef Clement, Oer-Erkenschwick, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany**

**Filed May 16, 1980, Ser. No. 150,361**

**Claims priority, application Fed. Rep. of Germany, May 17, 1979, 7914228**

**Int. Cl.³ C10B *25/06***

**U.S. Cl. 202—248** **2 Claims**



1. An improved sealing device for a coke oven of the type having an opening, a door and a door sealing frame for closing the opening, the door having a door body and a sealing edge extending along the periphery of the door body, the door sealing frame being of the type having a fixed outer frame and an inner frame inserted within and mounted to the outer frame, and the inner frame having a sealing surface adapted to sealingly receive the sealing edge of the door body, the improvement comprising means for adjustably mounting the inner frame to the outer frame in spaced-apart relationship therefrom to define a spacing therebetween, said adjusting means including screw means for detachably connecting the inner frame to the outer frame, and a plurality of spacers having unequal thickness exchangeably mounted within said spacing to maintain the inner and outer frame in said spaced-apart relationship.

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**4,293,390**

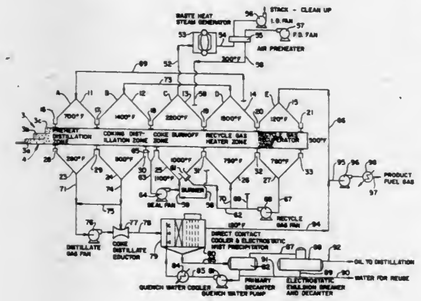
## APPARATUS FOR TREATMENT OF HYDROCARBON-CONTAINING MINERAL MATERIAL

**Franklin S. Chalmers, Bethesda, Md.; Charles A. Czako, Seven Hills, and Carl J. Nelson, Lakewood, both of Ohio, assignors to Davy McKee Corporation, Cleveland, Ohio**

**Division of Ser. No. 857,131, Dec. 5, 1977, Pat. No. 4,200,517. This application Oct. 31, 1979, Ser. No. 90,076**

**Int. Cl.³ C10B *5/02, 7/06, 35/00***

**U.S. Cl. 202—100** **9 Claims**



1. Apparatus for recovering oil and fuel gases from particulate hydrocarbon containing mineral ore in the form of discrete pieces of substantial strength, comprising a traveling gas-permeable grate, said grate having a charging location at which said pieces are deposited on the grate and a discharge location at which spent pieces are removed from the grate, means providing along said grate between said charging location and said discharging location a plurality of enclosed treating zones through which the grate travels and carries said pieces deposited thereon, said treating zones including means substantially completely preventing leakage of gas from said zones to ambient atmospheric air or leakage of atmospheric air into said zones and also preventing substantial leakage of gases between adjacent zones, said zones including a distillation zone and a coke burn-off zone, means for forming on said grate at said charging location a gas-permeable bed of substantial depth of said pieces, means for moving said grate between said charging location and said discharge location to move said pieces in said bed sequentially through said zones for sequential treatment of said pieces in said bed, means for passing heated gas through said bed and said grate in said distillation zone to heat said pieces in said bed in said zone to an oil-educting temperature and to form coke between the particles of said mineral in said pieces in said distillation zone, means for cooling the hot gases leaving said distillation zone to condense the thus-educted oil and to separate oil from said gases, means for removing and collecting hydrocarbon gas produced in said distillation zone, means for passing hot oxidizing gas in said coke burn-off zone through said grate and through said bed of oil-depleted coke-containing pieces that have passed through said distillation zone to cause combustion of said coke in said pieces and to cause substantial sintering of said pieces in said coke burn-off zone, means for cooling said spent pieces after they have left said coke burn-off zone by transferring heat from said spent pieces to said cooled gas and means for passing the thus heated gas to said distillation zone, and means for removing the spent pieces from said grate at said discharge location, said pieces having sufficient strength to form said bed and to withstand treatments in said zones without substantial breakage of said pieces.

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**4,293,391**

## CADMIUM PLATING BATHS AND METHODS FOR ELECTRODEPOSITING BRIGHT CADMIUM DEPOSITS

**Valerie M. Canaris, Parma, Ohio, assignor to Rohco, Inc., Cleveland, Ohio**

**Filed Apr. 2, 1980, Ser. No. 136,515**

**Int. Cl.³ C25D *3/26***

**U.S. Cl. 204—50 R** **26 Claims**

1. An aqueous electroplating bath for the electrodeposition of cadmium comprising

(a) cadmium ions,

(b) a free acid,

(c) at least one non-sulfur containing organic brightener compound, and

(d) at least one thiourea compound having the formula

$$[R_2N]_2CS \qquad (I)$$

wherein each R is independently hydrogen or an alkyl, alkenyl or aryl group.



**4,293,392**

## ALKYLATION OF NITRILES USING AN ELECTROGENERATED BASE AND AN ALKYLATING AGENT

**Richard C. Hallcher, Maryland Heights; Richard D. Goodin, St. Louis, both of Mo., and Manuel M. Baizer, Santa Monica, Calif., assignors to Monsanto Company, St. Louis, Mo.**

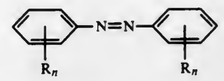
**Filed Jan. 17, 1980, Ser. No. 112,879**

**Int. Cl.³ C25B *3/04, 3/10***

**U.S. Cl. 204—59 R** **4 Claims**

1. A process for alkylating nitriles using an alkylating agent and an electrogenerated base comprising

(a) electro-reducing an azobenzene probase of the formula



where n is at least one and each R is branched-chained alkyl having from 3 to 6 carbon atoms with at least one R on each phenyl ring being in an ortho position, at a cathode in an electrolysis medium solvent containing a nitrile of the formula $R'_2CHCN$ wherein R' is H or hydrocarbyl having not more than 10 carbon atoms, comprising the probase, the nitrile and a supporting electrolyte to produce an electrogenerated base;

(b) deprotonating the nitrile with the electrogenerated base to produce a nitrile anion; and

(c) reacting the nitrile anion with an alkylating agent of the formula $R''CH_2CH_2CH_2Z$ wherein Z is a leaving group and R'' is H, Z or hydrocarbyl having not more than 10 carbon atoms, to produce an alkylated nitrile;

the aforesaid probase being more easily electro-reducible than the nitrile and producing an electro-generated base strong enough to deprotonate the nitrile which is sufficiently acidic to permit such deprotonation, and the electro-generated base not reacting readily, unless rapidly reversible, with the alkylating agent.

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**4,293,393**

## USE OF ELECTROGENERATED BASES IN CONDENSATION REACTIONS

**Richard C. Hallcher, Maryland Heights; Richard D. Goodin, St. Louis, both of Mo., and Manuel M. Baizer, Santa Monica, Calif., assignors to Monsanto Company, St. Louis, Mo.**

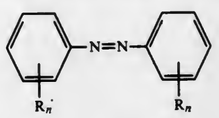
**Filed Jan. 18, 1980, Ser. No. 113,157**

**Int. Cl.³ C25B *3/02, 3/10***

**U.S. Cl. 204—59 R** **4 Claims**

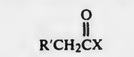
1. A process for using electrogenerated bases in condensation reactions comprising

(a) electro-reducing an azobenzene probase of the formula



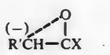
wherein n is at least one, each R is branched-chain alkyl having from 3 to 6 carbon atoms and at least one R on each phenyl ring must be in an ortho position, by electrolysis in an aprotic liquid electrolysis medium comprising said probase, an anhydrous aprotic solvent and supporting electrolyte to produce an electrogenerated base;

(b) deprotonating a compound of the formula



wherein X is OR'', $NR''_2$, Cl, Br, I or

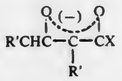
R'' is hydrocarbyl having not more than 10 carbon atoms, and R' is H or hydrocarbyl having not more than 10 carbon atoms, with said electrogenerated base to produce an anion of the formula



wherein X and R' are as defined hereinabove; and,

(c) reacting said anion with a compound of the formula

wherein X and R' are as defined hereinabove, to give a condensation product of the electrolysis of the formula



wherein R' and X are as defined hereinabove; the aforesaid probase being more easily electro-reducible than the compound to be deprotonated and producing an electrogenerated base strong enough to deprotonate the compound which is sufficiently acidic to permit deprotonation.

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**4,293,394**

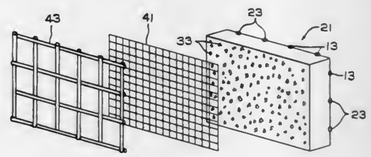
## ELECTROLYTICALLY PRODUCING CHLORINE USING A SOLID POLYMER ELECTROLYTE-CATHODE UNIT

**William B. Darlington, Portland; Donald W. DuBois, and Preston S. White, both of Corpus Christi, all of Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Mar. 31, 1980, Ser. No. 135,960**

**Int. Cl.³ C25B *1/16, 1/26, 1/46, 13/04***

**U.S. Cl. 204—98** **16 Claims**



1. In a solid polymer electrolyte electrolytic cell having an anolyte compartment separated from a catholyte compartment by a solid polymer electrolyte, said solid polymer electrolyte having a permionic membrane, anode means contacting one surface thereof, and cathode means contacting the opposite surface thereof, the improvement wherein the cathode means comprise oriented particles bonded to and embedded in the permionic membrane and having a lower hydrogen evolution overvoltage catalytic area, and a higher hydrogen overvoltage non-catalytic area, the non-catalytic area being a major portion of the particle bonded to and embedded in the permionic membrane, and the catalytic area being a major portion of the particle extending outwardly from the permionic membrane.

**4,293,395**

## PROCESS FOR ELECTROLYSIS OF AN AQUEOUS ALKALI METAL CHLORIDE SOLUTION

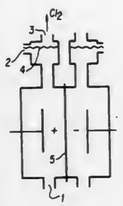
Tokuzo Iijima, Kobe; Yasushi Samejima, Kakogawa; Kazuo Kishimoto; Takamichi Komabashiri, both of Takasago, and Toshiji Kano, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 104,773, Dec. 18, 1979. This application May 9, 1980, Ser. No. 148,394

Claims priority, application Japan, Dec. 28, 1978, 53-163590; Jul. 2, 1979, 54-91757

Int. Cl.[3] C25G *1/34*

U.S. Cl. 204—98 3 Claims



1. Process for the electrolysis of an aqueous alkali metal chloride solution using an electrolytic cell which is partitioned by a cation exchange membrane into an anode chamber and a cathode chamber, the improvement which comprises connecting unit anode chambers with adjoining unit anode chambers through upper and lower contiguous connecting anode chamber portions, providing a gas-liquid interface having a surface area, at which halogen gas generated in the anode chamber is separated from the anolyte solution, larger than the sum total of the horizontal cross-section areas of unit anode chambers opposing to cathodes, supplying salt water into the lower connecting anode chamber portion containing substantially no halogen gas, and electrolysing salt water under the condition that the upper connecting anode chamber portion is filled with salt water containing bubbles of halogen gas and halogen gas generated in the anode chamber.

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**4,293,396**

## THIN CARBON-CLOTH-BASED ELECTROCATALYTIC GAS DIFFUSION ELECTRODES, AND ELECTROCHEMICAL CELLS COMPRISING THE SAME

Robert J. Allen, Saugus; Robert Lindstrom, Gloucester, and Walter Juda, Lexington, all of Mass., assignors to Prototech Company, Newton Highlands, Mass.

Filed Sep. 27, 1979, Ser. No. 79,470

Int. Cl.[3] C25C *1/12*

U.S. Cl. 204—106 17 Claims

1. A thin electrocatalytic gas diffusion electrode comprising an open pore electrically conducting carbon cloth having a coating of a uniform mixture of catalytic carbon particles and hydrophobic binder particles evenly deposited on said cloth, with said mixture of particles adhered within the cloth pores and to the yarns of the cloth.

**4,293,397**

## PHOTOCURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Yasuhiko Sato, and Hiroshi Inomata, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

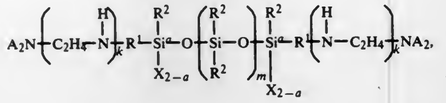
Filed Feb. 8, 1980, Ser. No. 120,084

Claims priority, application Japan, Feb. 23, 1979, 54-20472

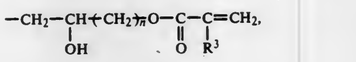
Int. Cl.[3] C08F *2/46, 30/08*

U.S. Cl. 204—159.13 3 Claims

1. A photocurable organopolysiloxane composition which comprises (a) 100 parts by weight of an acryloyloxy-containing organopolysiloxane represented by the general formula



where $R^1$ is a divalent hydrocarbon group, $R^2$ is a monovalent hydrocarbon group, X is a hydroxy group or a hydrolyzable group, k is zero or a positive integer not exceeding 4, m is a positive integer from 50 to 10,000, a is zero, 1 or 2 and at least two of the groups denoted by A in a molecule are each an acryloyloxy-containing group represented by the formula



$R^3$ being a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms and n being a positive integer from 1 to 10, the remainder of A being each a hydrogen atom, and (b) from 0.1 to 30 parts by weight of a photosensitizer.

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**4,293,398**

## PROCESS FOR CATHODICALLY ELECTRODEPOSITING POLYMERS HAVING TERTIARY AMINE OXIDE GROUPS

Paul J. Prucnal, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 8,297, Feb. 1, 1979, abandoned. This application Oct. 23, 1980, Ser. No. 199,754

Int. Cl.[3] C25D *13/06*

U.S. Cl. 204—181 C 2 Claims

1. In a method of electrocoating a conductive substrate serving as a cathode, which method comprises passing an electric current between an anode and said cathode in electrical contact with a water-dispersed composition, the improvement wherein said water-dispersed composition comprises cathodically electrodepositable polymer having tertiary amine oxide groups.

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**4,293,399**

## DEVICE FOR DETECTING AND MEASURING THE CONCENTRATION OF GASEOUS HYDROGEN DISSOLVED IN A FLUID

Guy Belanger, and Gilles Missout, both of Quebec, Canada, assignors to Hydro-Quebec, Montreal, Canada

Filed Apr. 17, 1980, Ser. No. 141,048

Claims priority, application Canada, Jun. 22, 1979, 330653

Int. Cl.[3] G01N *27/28, 27/46*

U.S. Cl. 204—195 P 10 Claims

1. A device for detecting and measuring the concentration of gaseous hydrogen dissolved in a fluid, said fluid contained in a receptacle having a wall, said wall including means defining an aperture therein, said device providing an electrical signal indicative of said concentration, said device comprising:

means for providing a base, said base including a central channel therein;

means for sealingly mounting said base on said wall, said central channel of said base in fluid communication with said aperture and said fluid in said receptacle;

a polymeric membrane in contact with said fluid and permeable to hydrogen gas, said membrane covering said central channel;

means for defining a bucket-shaped, hollow housing having a bottom, said housing including means defining an aperture in said bottom;

means for sealingly mounting said housing on said base with said polymeric membrane mounted between said housing and said base, said membrane preventing the passage of fluid and permitting the passage of hydrogen gas from said channel to and through said aperture in said hollow housing;

first and second electrodes;

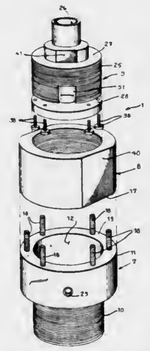
means, insertable in said hollow housing, for mounting said electrodes and defining a space therebetween, said means mounting said first electrode adjacent said aperture in said hollow housing;

means defining an electrolyte, disposed at least in said space between said electrodes, capable of producing oxidation of said hydrogen gas at said first electrode and reduction of an oxygen-containing gas at said second electrode;

said electrode mounting means comprising:

a hollow, bucket-shaped container, insertable into said hollow housing, having a bottom, said container including means defining an opening in said container bottom;

means defining a cap for removably closing said container, said cap including means defining an opening therein;



a first, bucket-shaped holding element, insertable in said container, said element having a bottom, said element including means defining an opening in said element bottom;

a second, cap-shaped holding element, insertable in said container, said second holding element including means defining an opening therein, said second holding element for tightly closing said first holding element;

a third holding element, insertable in said first holding element and held by said second holding element, said third holding element including means defining a central channel therein;

means for removably mounting said cap on said container, said first electrode removably mounted between said first and third holding elements and said second electrode removably mounted between said second and third holding elements, said openings in said cap and said first holding element, said central channel in said third holding element, and said openings in said second holding element and said container combine to define a central channel disposed in said electrode mounting means with said gap opening adjacent said aperture in said hollow housing at one end and said container opening in gaseous communication with said oxygen-containing gas, said cap, container and means for removably mounting said cap on said container combining to securely sandwich said holding elements and electrodes between said cap and container, said space between said electrodes defined by said central channel in said third holding element; and

means for removably fixing said electrode mounting means in said hollow housing.





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**4,293,400**

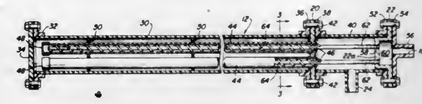
## ELECTROLYTIC TREATMENT OF WATER

James J. Liggett, 576 Crestview Dr., Twin Falls, Id. 83301

Filed Feb. 1, 1980, Ser. No. 117,490

Int. Cl.[3] C02F *1/46;* B01D *17/06*

U.S. Cl. 204—302 6 Claims



1. Precipitating apparatus, comprising in combination

an elongated, tubular housing closed at one end,

a first metallic tube having a closed end disposed within said housing,

means interposed between said tube and said housing and supporting said tube with the principal longitudinal axis of said tube lying substantially parallel to the principal longitudinal axis of said housing,

a second metallic tube disposed within said first tube and having an open end disposed in proximity with said closed end of said first tube

said first and second tubes having different electrochemical equivalents,

means for introducing a liquid into said second tube,

means for removing a liquid from the space between said first and second tubes

means for applying a D.C. voltage between said first and second tubes.

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**4,293,401**

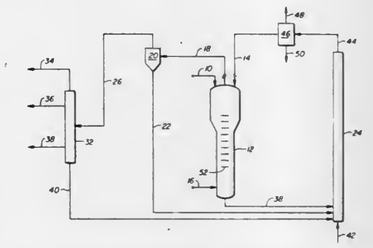
## SHALE RETORTING WITH SUPPLEMENTAL COMBUSTION FUEL

Robert P. Sieg, Walnut Creek, and Byron G. Spars, Mill Valley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 21, 1980, Ser. No. 123,149

Int. Cl.[3] C10G *1/00;* C10B *49/22*

U.S. Cl. 208—11 R 7 Claims



1. In a process for retorting lean oil shale wherein the process involves the steps of mixing raw oil shale with hot spent shale in the upper portion of a vertically elongated retorting vessel characterized by internal means to limit substantial vertical backmixing of solids passing downward therethrough; passing the mixture of raw shale and spent shale downward through the retorting vessel as a continuous moving bed of material; retorting the raw shale in the presence of a generally countercurrent flow of a stripping gas entering the bottom of the retorting vessel to carry away shale oil vapor and fines

present in the retorting vessel; and burning the residual carbonaceous material adhering to the retorted shale in a liftpipe to heat the spent shale, the improvement comprising concentrating said fines in a portion of the shale oil liquid product; and combusting said portion of the shale oil liquid product with the residual carbonaceous material adhering to the retorted shale.

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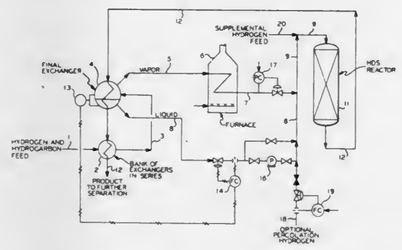
**4,293,402**

## HYDROCARBON HEATING

**John S. Olson, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 10, 1980, Ser. No. 128,991**
**Int. Cl.³ C10G *45/04, 7/00***
**U.S. Cl. 208—93** **5 Claims**




**1**. A process for generating a hydrocarbon feedstream at a given input temperature comprising

(a) heating a hydrocarbon stream to a temperature below said input temperature to evaporate lighter hydrocarbons from said hydrocarbon stream, thus generating a hydrocarbon vapor phase,

(b) separating said hydrocarbon vapor phase from the remaining liquid phase of said heated hydrocarbon stream,

(c) super heating at least a portion of said hydrocarbon vapor phase to a temperature above said input temperature,

(d) mixing at least a portion of the super heated hydrocarbon vapor phase with at least a portion of the hydrocarbon liquid phase to generate a hydrocarbon feedstream, the temperatures and quantities of the hydrocarbon vapor phase and the hydrocarbon liquid phase being such that the hydrocarbon feedstream has the given input temperature,

(e) passing said hydrocarbon feedstream through a process zone in which it is subjected to one or more process steps and from which a process effluent stream having a temperature above that of the hydrocarbon stream is withdrawn,

(f) subjecting said process effluent stream to indirect heat exchange with said hydrocarbon stream such as to effect at least a portion of said evaporation of the lighter hydrocarbons from said hydrocarbon stream.

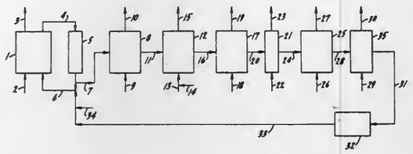
**3**. A process in accordance with claim **2** comprising passing at least a portion of said hydrodesulfurization effluent stream into indirect heat exchange relationship with said hydrocarbon comprising stream.

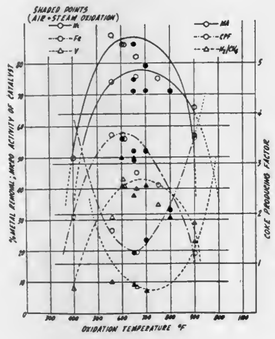
**4,293,403**

## CATALYST DEMETALLIZATION BY CONVERTING THE METAL POISONS TO A SULFUR CONTAINING METAL COMPOUND HAVING A DEFINED LOW AMOUNT OF SULFUR

**Emmett H. Burk, Jr.; Jin S. Yoo; John A. Karch, and Jui-Yuan Sun, all of 400 E. Sibley Blvd., Harvey, Ill. 60426**

**Continuation-in-part of Ser. No. 695,602, Jun. 14, 1976, Pat. No. 4,243,550, and a continuation-in-part of Ser. No. 695,662, Jun. 14, 1976, Pat. No. 4,101,444, and a continuation-in-part of Ser. No. 695,687, Jun. 14, 1976, Pat. No. 4,102,811. This application Jan. 3, 1977, Ser. No. 756,581**
**Int. Cl.³ C10G *11/05, 11/00*; B01J *29/38, 21/20***
**U.S. Cl. 208—120** **40 Claims**






**21**. In a catalytic cracking process for converting a metals contaminated hydrocarbon feedstock to more valuable, lower boiling hydrocarbon products in a cracking reaction zone wherein the cracking catalyst is poisoned and contaminated by metals including iron, nickel and vanadium present in the feedstock, the improvement which comprises

(i) withdrawing at least a portion of said metal contaminated catalyst from the cracking reaction zone;

(ii) contacting at least a portion of said metal contaminated catalyst with at least one sulfur containing compound to provide a catalyst containing sulfur containing metals compounds wherein the amount of sulfur present on the resultant catalyst is about 40 to about 90% of the total amount of iron, nickel and vanadium initially present on the catalyst;

(iii) contacting said catalyst containing sulfur containing metal compound with an oxygen-containing medium to promote subsequent metals removal by converting at least a portion of said catalyst metals to a dispersible form;

(iv) contacting said oxygen treated catalyst with an aqueous reductive wash medium and subjecting said reductively washed catalyst to an aqueous oxidative wash to remove at least a portion of the metal poisons from the oxygen treated catalyst;

(v) recovering a catalyst of reduced metal poison content and improved catalytic activity; and

(vi) returning at least a portion of said recovered catalyst to the catalytic cracking process.



**27**. A process as in claim **21** wherein the reductive aqueous wash medium is a solution of $SO_2$ in water.

**37**. A process as in claim **21** wherein said sulfur containing compound is hydrogen sulfide or a sulfur containing compound capable of being converted to hydrogen sulfide.

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**4,293,404**

## DEHYDROXYLATION AND/OR DEMERCAPTOLATION OF HEAVY PETROLEUM OILS

**Malvina Farcasiu, Princeton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Jul. 21, 1980, Ser. No. 170,406**
**Int. Cl.³ C10G *45/24, 45/28***
**U.S. Cl. 208—214** **15 Claims**

**1**. A process for removing phenolic oxygen and/or thiol sulfur from heavy petroleum oils which comprises:

(a) contacting heavy petroleum oils containing polycyclic hydroxy and/or thio aromatic compounds with effective amounts of a hydrogen donor, and a catalyst of an iron-containing porous solid, coal or coal liquefaction residue,

(b) heating the mixture of (a) at elevated temperatures to evolve $H_2O$ and/or $H_2S$ from said mixture.

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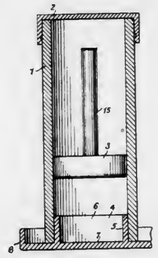
**4,293,405**

## FECAL EXAMINATION DEVICE (B)

**Robert J. Greenwald, 4771 N. Federal Hwy., Pompano Beach, Fla. 33064**

**Continuation of Ser. No. 455,016, Mar. 26, 1974, Pat. No. 4032,437, which is a continuation-in-part of Ser. No. 150,357, Jun. 7, 1971, abandoned, and Ser. No. 255,857, May 22, 1972, Pat. No. 3,819,045. This application Jun. 24, 1977, Ser. No. 809,928**
**The portion of the term of this patent subsequent to Jun. 25, 1991, has been disclaimed.**
**Int. Cl.³ B03B *7/00***
**U.S. Cl. 209—17** **2 Claims**



**1**. A knit for a fecal examining device comprising a cylindrical vessel for receiving a sample of feces introduced into the lower portion thereof and for receiving liquid flotation diluent for mixing with said sample of feces in said lower portion, said vessel being open at the top, a molded plastic strainer having open holes providing direct passage through said plastic, said strainer being constructed and arranged to be inserted through the open top of said vessel, said strainer having an integral upper portion, adapted to be held by one's hand, for manipulating said strainer to insert said strainer, through said open top, into said vessel,

the construction and arrangement being such that

(a) after said insertion a further quantity of liquid diluent can be added to form a convex meniscus,

(b) said vessel, having said inserted strainer, can stably support a microscopic slide with the lower portion of said slide being in contact with said meniscus and covering the whole area of said meniscus,

(c) said meniscus has a diameter of more than 1 cm and less than 3 cm,

(d) said unitary plastic strainer is stably positioned by contact with said vessel, and

(e) said plastic strainer serves as a barrier for passage of fecal material from the liquid below said strainer to the liquid above said strainer but permits ova to rise through said open holes to said slide,

said holes having diameters of about 1 mm.

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**4,293,406**

## SYNERGISTIC PROMOTER COMBINATION FOR ZINC SULFIDE ORES

**Michael F. Werneke, Orange, Conn., and James A. Jones, Viburnam, Mo., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Nov. 3, 1977, Ser. No. 848,162**
**Int. Cl.³ B03D *1/02***
**U.S. Cl. 209—166** **2 Claims**

**1**. A promoter combination for the froth flotation of sphalerite ores which comprises from about 25 to 75 weight percent of an iso-octyl thioglycolate and, accordingly, from about 75 to 25 weight percent of p-menthane-2,9-dithiol.

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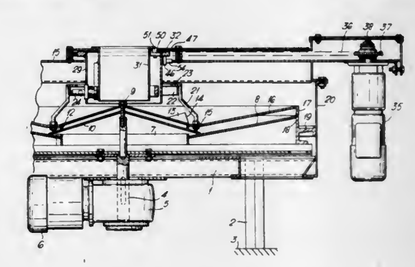
**4,293,407**

## SIEVE DEVICE FOR SEPARATING A MIXTURE OF PARTICULATE MATERIAL IN COMPONENTS OF DIFFERENT SIZES

**Jan A. K. Locker, Steenwijk, Netherlands, assignor to Machinefabriek A. Wijnveen B.V., Ede and Cooperatieve Landbouw aan- en verkoopcombinatie, B.A. "C.L.C.", Steenwijk, both of, Netherlands**

**Filed Oct. 10, 1980, Ser. No. 196,089**
**Claims priority, application Netherlands, Oct. 12, 1979, 7907587**
**Int. Cl.³ B07B *1/08***
**U.S. Cl. 209—253** **15 Claims**



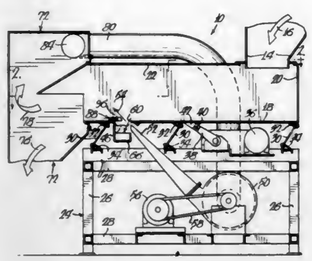
**1**. Sieve device for separating a mixture of particulate material in components of different sizes, comprising a perforated sieve surface that rotates around a central, vertical shaft, said sieve surface having the shape of a hollow, truncated cone casing with a downwardly directed apex, on which an imperforate distributor cone with an upwardly directed apex has been mounted in the middle, of which distributor cone the base connects to the sieve surface, whereas the supply of the mixture to be separated takes place via a central supply tube placed above the distributor cone, whereas the removal of the coarse component takes place near the circumference of the sieve surface, wherein at least one additional sieve surface of which the diameter of the perforations differs from that of the former sieve surface, which additional sieve surface is displacable between a non-operative position, in which it is removed from the former sieve surface and cannot receive mixture, and an operative position, in which it is placed on top of the former sieve surface and receives the supply of mixture.

**4,293,408**

## BAR END SEPARATOR

**Gary A. Herder, Kalamazoo, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.**

**Division of Ser. No. 960,921, Nov. 15, 1978, Pat. No. 4,219,410.**
**This application Jan. 14, 1980, Ser. No. 111,720**
**Int. Cl.³ B07B** *3/00*
**U.S. Cl. 209—638** **8 Claims**



1. The method of separating chips from a mixture of such chips and tramp objects heavier than said chips, said method comprising:

moving said mixture of chips and tramp objects along a generally horizontally disposed oscillating mixture feeder tray defining a conveying path and defining an aperture disposed (1) between substantially coplanar upstream and downstream regions of said path and (2) transverse to said conveying path;

conveying said mixture off of said conveying path and into a free-fall region in said aperture;

providing an abutment means at the downstream side of said aperture and along said aperture, said abutment means including a member having a contact surface for deflecting a leading portion of a tramp object to one side of said conveying path, at least a portion of said contact surface located within said aperture, one end of said contact surface being closer to said path upstream region than the other end;

deflecting a leading portion of a tramp object present in said mixture away from said downstream region of said path with said abutment member contact surface while continuing to convey the trailing portion of said object over said aperture into said free-fall region whereby the tramp object is turned at an angle with respect to said conveying path and is oriented for passage through said aperture; and

providing a blower means for producing a gas stream and directing a stream of gas from said blower means through said aperture to blow said chips away from said aperture free-fall region and into a separate chip processing path while said tramp object falls through said aperture free-fall region under the influence of gravity.

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**4,293,409**

## ARTIFICIAL KIDNEY DIALYSATE PREPARATION SYSTEM

**Gerhard Riede, Vellinge; Lars-Ake L. Larsson, Löddenköpinge; Roland J. E. Andersson, Bjärred; Sven A. Jösson, Staffanstorp, and Lars J. C. Traven, Lund, all of Sweden, assignors to Gambro AB, Sweden**

**Continuation of Ser. No. 841,899, Oct. 13, 1977, abandoned.**
**This application Nov. 28, 1978, Ser. No. 964,275**
**Claims priority, application Sweden, Oct. 14, 1976, 7611389**
**Int. Cl.³ B01D** *31/00*
**U.S. Cl. 210—96.2** **9 Claims**

1. A dialysis system for treating a first fluid with dialysis fluid, the dialysis fluid being a mixture of water and dialysis concentrate, said system comprising:

a dialyzer;

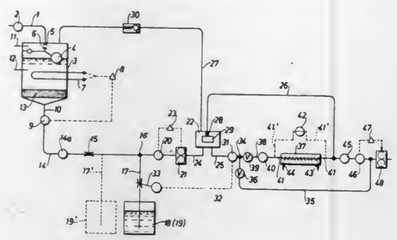
a source of water;

a source of dialysis concentrate;

first fluid conducting means communicating with said source of water;

second fluid conducting means communicating with said source of dialysis concentrate;

a single pump in fluid communication with said first and second fluid conducting means for drawing water from said source of water through said first fluid conducting means, for drawing dialysis concentrate from said source of dialysis concentrate through said second fluid conducting means, and for mixing water and said dialysis concentrate prior to its introduction into said dialyzer;



third fluid conducting means for conducting said mixture of water and dialysis concentrate from said single pump to and through said dialyzer;

gas removal means in said third fluid conducting means for removing gas bubbles from said mixture of water and dialysis concentrate; and

throttling means interposed in said first conducting means;

said throttling means, said single pump and said gas removal means cooperating with one another to deaerate said mixture of water and dialysis concentrate.

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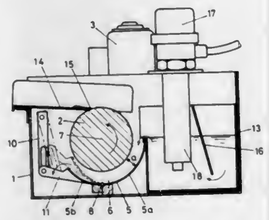
**4,293,410**

## MAGNETIC FILTER

**Hans Streuli, Baar, and Joseph Rüedi, Zurich, both of Switzerland, assignors to Hans Streuli AG, Baar, Switzerland**

**Filed Sep. 13, 1979, Ser. No. 75,031**
**Claims priority, application Switzerland, Sep. 21, 1978, 9892/78**
**Int. Cl.³ B01D** *35/06*
**U.S. Cl. 210—107** **1 Claim**



1. Apparatus for filtering both magnetic and non-magnetic particles from a liquid medium comprising:

a. a chamber for receiving the liquid medium, said chamber having one wall defining a horizontal weir over which the liquid medium flows;

b. means defining a conduit for the medium passing over the weir, including:

1. a magnetic cylinder rotatable about a horizontal axis and having a surface spaced from the weir;

2. a first conduit wall section spaced from and concentric with the surface of the cylinder, said first wall section being fixed in position and having its upper end connected to the weir, so that all the liquid medium flowing over the weir passes between the wall section and the cylinder;

3. a second conduit wall section pivotally connected to the downstream end of the first conduit wall section, said first and second sections having the same radius of curvature; and

4. means for adjusting the position of said second wall section on its pivotal connection;

5. the magnetic particles in said medium being attracted by the magnetic cylinder as they pass through the conduit and forming a beard-shaped screen effective to trap non-magnetic particles, said screen and the trapped particles cooperating to impede the flow of the medium and thereby to raise the level of the medium in the chamber; and

c. rotation control means for initiating rotation of the magnetic cylinder in a direction opposite to the direction of flow when the medium in said conduit exceeds a predetermined level, and for stopping said rotation when the medium falls below said level, said rotation control means comprising:

1. means for driving the cylinder in a direction opposite to the direction of flow of the medium; and

2. capacitive means responsive to the level of the liquid medium in the chamber and controlling the driving means to initiate rotation of the cylinder when the medium exceeds said predetermined level and to stop the rotation of said cylinder when the medium falls below said predetermined level; and

d. a stripper sheet having one end engaging the upper surface of the cylinder and slanting upwardly from said one end, for removing accumulated magnetic and non-magnetic particles from the cylinder, the upward slant of the stripper sheet being effective to allow liquid remaining in the accumulated particles to drain back into the conduit.



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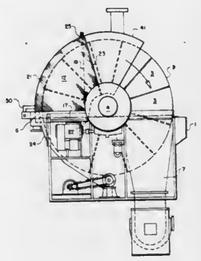
**4,293,411**

## STEAM SEAL FOR DISC FILTER

**Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.**

**Continuation of Ser. No. 984,844, Oct. 5, 1978, abandoned, which is a continuation of Ser. No. 783,099, Mar. 31, 1977, abandoned. This application Jan. 24, 1980, Ser. No. 114,855**
**Int. Cl.³ B01D** *35/18, 33/26*
**U.S. Cl. 210—178** **1 Claim**



1. An improved filter apparatus comprising a tank with upstanding sidewalls for containing slurry to be filtered, a plurality of generally circular discs, said discs being mounted spaced apart from each other on a center barrel for rotation through the slurry in the tank, each disc comprising a plurality of sectors, each sector of each disc being immersed in said slurry for a first portion of each rotation and being withdrawn from said slurry for a second portion of each rotation of said disc, means being provided to enable vacuum communication between each sector and said center barrel so as to cause formation of a cake on a surface of each sector when the sector is immersed in said slurry, said cake comprising material to be filtered from said slurry, and means being provided for removing said cake from said surface of the sector when the sector is withdrawn from said slurry;

said filter apparatus further having means for steam drying said cake on each sector of each disc after the sector is withdrawn from said slurry and before said cake is removed from the sector, said steam drying means including:

a plurality of steam hood assemblies, each steam hood assembly defining an enclosed region above the surface of said slurry over a portion of a corresponding one of said discs, said steam hood assembly being positioned so that each sector of said corresponding disc passes through said enclosed region during part of the second portion of each rotation of said disc, and

means for introducing dry steam into said enclosed region to dry said cake on the surface of the sector as the sector passes through said enclosed region;

said steam hood assembly comprising first and second sidewalls, and a spine wall; said first and second sidewalls being spaced apart from each other to accommodate passage of said corresponding disc therebetween during said rotation of said disc, said spine wall joining said first and second sidewalls, said spine wall being curved to have an inside surface that is substantially concentric with said disc, each of said first and second sidewalls and said spine wall having a bottom edge that extends below the surface of said slurry to form a steam seal for said enclosed region along the surface of said slurry, and seals attached in opposed relation to the sidewalls so as to press sealingly against the cake material on said disc as said disc rotates, said seals extending below the surface of said slurry; wherein the improvement comprises:

said seals being solely comprised of a pair of straight flexible flaps that are respectively mounted to said first and second sidewalls in opposed relationship and said flaps extending vertically from a position on said spine wall that is remote from the surface of said slurry to below the surface of said slurry on the side of said tank with respect to the center barrel from which the filter sectors rotate out of the slurry such that the center barrel is excluded from the enclosed region;

said first and second sidewalls, said spine wall and said flaps forming said enclosed region into which each sector of said corresponding disc enters immediately upon being withdrawn from said slurry, and in which each sector of said disc remains until being rotated past said flaps with said center barrel being entirely excluded from said enclosed region.

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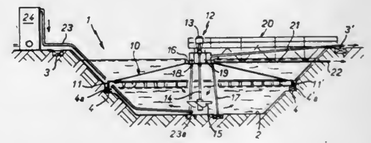
**4,293,412**

## ANAEROBIC FERMENTER-DECANTER FOR THE PURIFICATION OF RESIDUAL WATER FROM SUGAR REFINERIES, WITH RECOVERY OF COMBUSTIBLE METHANE

**Jean-Pierre Lescure, Mons-En-Baroeul, France, assignor to Syndicat National des Fabricants de Sucre de France, Paris, France**

**Filed Jan. 22, 1980, Ser. No. 114,426**
**Claims priority, application France, Jan. 24, 1979, 79 01775**
**Int. Cl.³ C02F** *3/28*
**U.S. Cl. 210—179** **4 Claims**



1. An anaerobic fermenter-decanter for digesting and clari-

fying sludge from sugar manufacturing and refining plants and for recovering fermentation gases, said anaerobic fermenter-decanter comprising an upwardly opening inverted truncated pyramid shape tank having a substantially flat bottom wall and a fluidtight skin covering the sidewalls and the bottom wall thereof, an intake pipe passing through a heater and delivering heated sludge to the bottom of said tank adjacent an impeller carried by a vertical shaft of a rotary agitator, a flexible cover anchored at its periphery midway along the height of the side walls of the tank and extending inwardly to a central opening, said cover being tensioned between the central opening and its peripheral anchoring, a metal collecting bell having free edges adapted to be immersed in the sludge and attached at the central opening of the cover, whereby fermentation gas produced during digestion is collected at the center of the cover, an evacuation tube for removing the fermentation gas from the center of the cover, the peripheral edges of the cover and the adjacent side walls of the tank defining between them a marginal peripheral space for the flow of digested sludge upwardly to a decantation area disposed in the upper part of the tank above the cover so that the cover is entirely immersed in said tank, means for removing the digested sludge from the upper part of the tank, and means for removing clarified liquid from the upper part of the tank.

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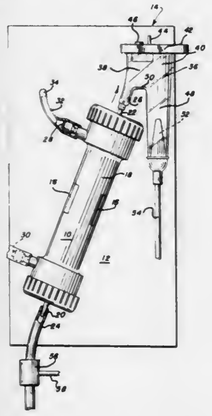
**4,293,413**

## DIALYZER BLOOD CIRCUIT AND BUBBLE TRAPS

**William J. Schnell, Wheeling, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 28, 1979, Ser. No. 108,118**
**Int. Cl.³ B01D** *31/00*
**U.S. Cl. 210—188** **7 Claims**



1. A blood dialyzer system which comprises a membrane dialyzer carried by dialysis solution delivery means, said membrane dialyzer defining a blood inlet and outlet communicating with blood flow conduits, and also defining a dialysis solution inlet and outlet communicating through solution flow conduit means with said dialysis solution delivery means, said membrane dialyzer being carried in a position whereby said blood inlet is vertically lower than said blood outlet, and said dialysis solution outlet is vertically lower than said dialysis solution inlet, and bubble trap means in direct communication with said blood outlet and blood flow conduits, said bubble trap means being attached to and carried by said membrane dialyzer, said dialysis solution delivery means being adapted to intermittently reverse the normal flow of dialysis solution through said membrane dialyzer to remove air bubbles trapped in said membrane dialyzer.

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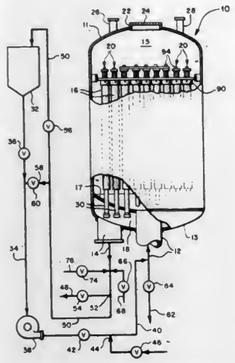
**4,293,414**

## SLOTTED SHEET FILTER ELEMENT

**Joseph F. Gianneli, Paterson, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.**

**Continuation of Ser. No. 902,988, May 4, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 92,047**
**Int. Cl.³ B01D** *37/02*
**U.S. Cl. 210—193** **15 Claims**



12. In a liquid filtering apparatus including a filter tank, a plate separating said tank into an influent compartment and a filtrate compartment, at least one filter element vertically mounted in said influent compartment and having a porous tubular ccore, and precoat means for distributing precoat particles on each filter element, the improvement to each filter element comprising:

means for supporting the filter medium precoat, said precoat support means positioned about said tubular core and terminating a distance from an end of said tubular core so that a relatively low bubble point pressure element section is defined; and

discontinuously slotted sheet means positioned over the relatively low bubble point pressure element section and sealed to said precoat support means, said discontinuously slotted sheet means having elongated slots, each slot having a width of up to about 50 microns and a length of at least about one and one-half times the width of the slot.

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**4,293,415**

## SILICA CHROMATOGRAPHIC COLUMN

**Paul F. Bente, III, Landenberg, Pa.; Ernest H. Zerenner, Newark, and Raymond D. Dandeneau, Wilmington, both of Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 27, 1979, Ser. No. 34,103**
**Int. Cl.³ B01D** *15/08*
**U.S. Cl. 210—198.2** **23 Claims**

1. A chromatographic column for separating components of sample material flowing through it, comprising

a hollow tube of drawn silica of thin wall construction with a high degree of flexibility,

the inner surface of said tube being coated with a stationary phase material and there being an unobstructed passage along the axis of the tube, and

a coating formed on the outer surface of the tube as it is drawn for protecting the said outer surface from abrasion and moisture.



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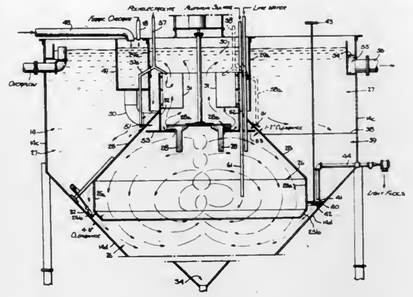
**4,293,416**

## APPARATUS FOR TREATING PLANT EFFLUENT

**Hagop Keoteklian, Islip, N.Y., assignor to Entenmann's, Inc., Bay Shore, N.Y.**

**Division of Ser. No. 801,375, May 27, 1977, Pat. No. 4,173,532, which is a continuation-in-part of Ser. No. 662,286, Feb. 27, 1976, abandoned, which is a continuation of Ser. No. 449,003, Mar. 7, 1974, abandoned. This application May 4, 1979, Ser. No. 35,809**
**Int. Cl.³ B01D** *21/01*
**U.S. Cl. 210—208** **6 Claims**



1. A clarifier in which suspended and dissolved solids are separated from liquid waste and purified effluent is produced comprising:

(a) a vertically extending tank with a generally conical lower portion with the apex thereof at the bottom of the tank,

(b) an opaque baffle extending about the vertical axis of the tank, the baffle having a cylindrical upper portion and a frusto-conical lower portion extending outwardly and downwardly from the cylindrical upper portion toward the inner surface of the conical lower portion of the tank, the periphery of the lower portion adjacent the inner surface of the tank being spaced apart therefrom to form an annular flow passage, the interior of the frusto-conical lower portion forming a primary mixing zone, the interior of the cylindrical upper portion forming a secondary mixing zone, the region between the outer surface of the opaque baffle and the inner surface of the tank forming a clarified water zone, the primary mixing zone being in communication with said clarified water zone by the annular flow passage,

(c) an impeller rotatably mounted about the vertical axis of the tank, and disposed within the primary mixing zone adjacent the junction of the cylindrical upper portion of the baffle and the lower portion thereof, the impeller when actuated causing a substantially toroidal flow within primary mixing zone and extending about the vertical axis of the tank, the impeller also causing additional flow upwardly into the secondary mixing zone, outwardly therefrom into the clarified water zone, downwardly toward the annular flow passage, and back into the primary mixing zone,

(d) a plurality of means for the addition of reactant materials into the tank,

(e) a perforated plate mounted laterally adjacent the bottom of the tank for defining a sludge zone below the primary mixing zone in the tank,

(f) means for discharging flocs from the bottom of the sludge zone,

(g) a structure forming a concentration zone for trapping lighter flocs including a pair of vertically and radially extending partitions mounted in the clarified water zone, the partitions being spaced apart and extending from the frusto-conical portion of the baffle to the inner surface of the tank, and a bottom plate in the concentration zone for isolating the concentration zone from the primary mixing zone,

(h) means for withdrawing trapped flocs from the concentration zone, and

(i) means for removing clarified water from the upper portion of the clarified water zone.

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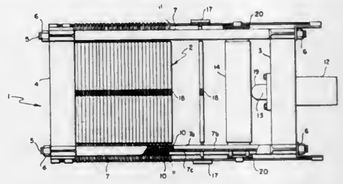
**4,293,417**

## FILTER PRESS

**Murray M. Guttman, Sandy, Utah, and William L. Fismer, Verona, N.J., assignors to Envirotech Corporation, Menlo Park, Calif.**

**Continuation of Ser. No. 35,651, May 3, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 143,991**
**Int. Cl.³ B01D** *25/12*
**U.S. Cl. 210—230** **6 Claims**



1. An improved filter press for removing solids from liquid comprising:

a. a plurality of vertically-disposed filter plates;

b. a frame inclusive of a pair of horizontal filter plate support beams, said beams having an inside flange and an outside flange; and

c. a pair of filter plate hanger assemblies attached to each of said filter plates, each of said hanger assemblies inclusive of a bracket and a roller rotatably attached to said bracket, said rollers positioned on said support beams to ride thereon such that said filter plates are moveably suspended from said beams, said rollers for adjacent filter plates alternating in transverse position on said beams between engagement with said outside flanges of said beams and engagement with said inside flanges of said beams such that the diameter of said rollers can be greater than the thickness of one of said filter plates.

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**4,293,418**

## FLUID SEPARATION APPARATUS

**Yoshishige Fujii, Ohtsu; Syozo Nagao, Shiga, and Shunji Kumazawa, Ashiya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Mar. 28, 1979, Ser. No. 24,512**
**Int. Cl.³ B01D** *31/00, 53/22*
**U.S. Cl. 210—321.1** **18 Claims**

1. A fluid separation apparatus comprising a bundle of a plurality of hollow fiber elements, each of which consists of one or two permselective hollow fibers, the fibers having an outer diameter of 50 to 600 microns and a spacer yarn composed of a textured yarn, which is spirally wound around said one or two hollow fibers wherein the apparent thickness of the

spacer yarn is 0.5 to 3 times the outer diameter of the hollow fiber, and the number of windings of spacer yarn around each hollow fiber element is 0.5 to 20 per 10 mm of the length of the hollow fiber element, said fiber element bundle being contained in the interior of a casing at a hollow fiber packing ratio of 30 to 78%.

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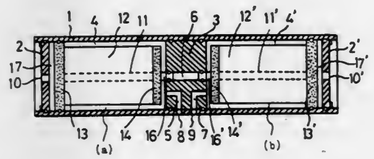
**4,293,419**

## HOLLOW FIBER MEMBRANE SEPARATION APPARATUS

**Masaaki Sekino; Kenichi Chikanari, both of Otsu, and Tsukasa Taniyama, Kyoto, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan**

**Filed Feb. 6, 1980, Ser. No. 119,235**
**Int. Cl.³ B01D** *31/00*
**U.S. Cl. 210—321.1** **4 Claims**




1. A hollow fiber membrane separation apparatus which comprises:

a pressure container composed of a cylindrical shell and end plates which seal both opening ends of the tube, respectively;

a dividing member provided at the substantial center portion in the container which divides the container into two longitudinally aligning compartments;

two columnar hollow fiber assemblies which are longitudinally aligning and placed in the compartments, respectively;

each of said columnar hollow fiber assemblies having an elongate member through which fluid to be treated can flow, hollow fiber layers formed by a plurality of hollow fibers having a selective permeability to fluid axially and radially extending at the peripheral portion of the elongate member, a conduit connected to the elongate member at the end thereof faced to the dividing member, and a resin wall radially extending at the other end faced to the end plate;

the terminals of said hollow fibers being open outward thrusting through the resin wall and said terminal openings of the follow fibers being connected to the space formed by the surrounding wall, inner surface of the cylindrical shell and end plate;

said dividing member having therein an inlet passage through which fluid to be treated is feeded and an outlet passage through which the fluid treated in the compartment is discharged;

said dividing member being set within the shell with a clearance between the dividing member and the inner surface of the shell, said clearance being sealed with a plurality of sealing members so that the compartments are fluid-sealed from outside, and external pipings being directly connected to the passages in the dividing member through openings of the shell; and

said end plate having an opening through which the fluid permeated through the hollow fiber membrane is discharged.

**4,293,420**

## TREATMENT OF REVERSE OSMOSIS MEMBRANES

**Lynn E. Applegate, Wilmington, and Charles J. Brown, Jr., Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 18, 1980, Ser. No. 141,661**
**Int. Cl.³ B01D** *13/00*
**U.S. Cl. 210—500.2** **6 Claims**

1. In the process for storing polyamide reverse osmosis membranes by immersing the membrane in an aqueous medium, the improvement which comprises adding to the aqueous medium at least one metal ion selected from the group consisting of about from $8\times10^{-4}$ to $8\times10^{-2}$ moles per liter of an alkaline earth metal ion and about from $8\times10^{-3}$ to $4\times10^{-1}$ moles per liter of an alkali metal ion.

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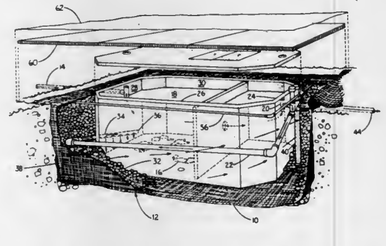
**4,293,421**

## METHOD AND EQUIPMENT FOR A WRAP-AROUND UPFLOW SUBMERGED ANAEROBIC FILTER FOR SEWAGE

**Alvin W. Green, 7310 85th St. N.W., Gig Harbor, Wash. 98335**

**Filed Apr. 30, 1980, Ser. No. 145,243**
**Int. Cl.³ C02F** *3/28*
**U.S. Cl. 210—603** **10 Claims**



1. Equipment for the treatment of sewage comprising:

a septic tank having an inlet for raw sewage and an outlet for effluent, an anaerobic filter composed of a bed of surface contact material including void spaces for filamentous zoogloea growth laterally surrounding said septic tank, the inner boundary of said anaerobic filter being defined by said septic tank and the outer boundary being defined by a means for retaining the surrounding earth which prevents fine aggregates in the earth from entering said anaerobic filter, an effluent discharge line connecting said outlet to a perforated distribution line outlet for distributing said effluent into said anaerobic filter at approximately the lowest elevation in said anaerobic filter, a perforated discharge riser positioned diametrically opposite said distribution line outlet for collecting effluent which has passed through the filter, overlow weirs positioned on said effluent discharge line and said discharge riser for bypassing the filter and directing said effluent from said outlet to said discharge riser, said overflow weirs being connected to a vent system for venting the gaseous products produced in said anaerobic filter, and means for connecting said discharge riser to a final treatment system.

8. A method for treatment of effluent discharged from a septic tank prior to delivery of the effluent to the final treatment phase comprising the steps of:

directing said effluent from said septic tank through an effluent discharge line into a perforated distribution line outlet at approximately the lowest elevation in an upflow anaerobic filter laterally surrounding said septic tank, said anaerobic filter composed of a bed of surface contact material including void spaces for filamentous zoogloea growth, the inner boundary of said anaerobic filter being defined by said septic tank, and the outer boundary being defined by a means for retaining the surrounding earth which prevents fine aggregates in the earth from entering the filter, passing said effluent upwardly and horizontally through said void spaces to contact said filamentous zoogloea growth, collecting said effluent which has passed through the filter in a perforated discharge riser positioned diametrically opposite said distribution line outlet to maximize the detension time of said effluent in the filter, directing the collected effluent to a final treatment phase, continuously venting gaseous products produced in said anaerobic filter through overflow weirs positioned on said effluent discharge line and said discharge riser into a vent system, bypassing said anaerobic filter by directing said effluent from said septic tank through said overflow weirs into said discharge riser when the filter becomes clogged, and washing the filter to restore the flow of said effluent through the filter.



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**4,293,422**

## FLASH CHROMATOGRAPHY

**W. Clark Still, 560 Riverside Dr., New York, N.Y. 10027**

**Filed Jul. 5, 1979, Ser. No. 54,982**
**Int. Cl.³ B01B** *15/08*
**U.S. Cl. 210—656** **3 Claims**




1. A method of adsorption chromatography for separation of organic compounds in liquid solvent therefor, which includes:

a. establishing an horizontally confined, vertically defined bed of adsorbent particles having a horizontally confined zone thereabove,

b. placing said liquid solvent in said zone above said bed,

c. applying positive gas pressure to said solvent above said bed to wet said bed whereby and until gases entrapped in said bed are driven out of said bed,

d. lowering the level of solvent to the upper level of said bed,

e. placing said solvent containing said compounds in said zone above said bed,

f. applying positive gas pressure to said solvent containing said compounds above said bed to drive said solvent and compounds into said bed while withdrawing solvent displaced from said bed from beneath said bed,

g. placing solvent (eluant) in said zone above said bed,

h. applying positive gas pressure to said eluant above said bed to drive said eluant into said bed at a rate in excess of 1.0 inches per minute, and

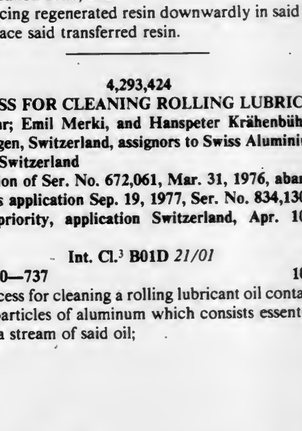
i. withdrawing from beneath said bed and separating into fractions eluant containing said compounds displaced from said bed.

**4,293,423**

## PROCESS AND APPARATUS FOR ION EXCHANGE BY USE OF THERMALLY REGENERABLE RESIN

**Kenji Kosaka, Mitaka; Takeshi Iwatsuka, Funabashi; Ikuo Shindo, Mitaka, and Akira Hotogi, Ichikawa, all of Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Oct. 18, 1977, Ser. No. 843,197**
**Int. Cl.³ B01D** *15/04*
**U.S. Cl. 210—676** **16 Claims**



1. A process for continuous ion exchange treatment utilizing a column packed with a single bed of heterogeneous thermally regenerable ion exchange resin, said bed having a regeneration zone in the upper portion of the bed, a loading zone in the lower portion of the bed, and a heat displacement zone between said regeneration and loading zones for minimizing heat dispersion, said process comprising the steps of:

(a) flowing an aqueous feed liquid having an undesirably high concentration of ions upwardly through said loading zone to substantially reduce the concentration of ions, and withdrawing resultant treated liquid as product liquid from the vicinity of the top of the loading zone with the remainder of product liquid flowing upwardly into the heat displacement zone;

(b) flowing an aqueous liquid regenerant at a higher temperature than the temperature of the feed liquid, through the resin in the regeneration zone to regenerate the resin;

(c) controlling the flow of aqueous liquid in the heat displacement zone to the extent necessary to maintain a temperature differential between the loading zone and the regeneration zone;

(d) transferring loaded resin from the loading zone to the regeneration zone; and

(e) displacing regenerated resin downwardly in said column to replace said transferred resin.

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**4,293,424**

## PROCESS FOR CLEANING ROLLING LUBRICANT

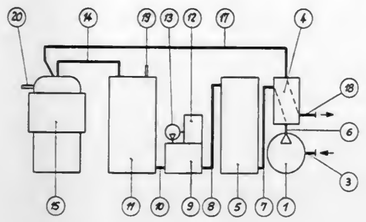
**Rudolf Baur; Emil Merki, and Hanspeter Krähenbühl, all of Kreuzlingen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Continuation of Ser. No. 672,061, Mar. 31, 1976, abandoned.**
**This application Sep. 19, 1977, Ser. No. 834,130**
**Claims priority, application Switzerland, Apr. 10, 1975, 4554/75**
**Int. Cl.³ B01D** *21/01*
**U.S. Cl. 210—737** **10 Claims**

1. A process for cleaning a rolling lubricant oil contaminated with fine particles of aluminum which consists essentially in:

heating a stream of said oil;

mixing into said stream a stream of aqueous alkali metal carbonate solution having a pH above 9 and having a concentration of about 150 to about 250 grams of $Na_2CO_3$ per liter, wherein the ratio of said contaminated oil to said



solution is about 400 to 1200 liters of said oil to about 0.5 to about 1.5 liters of said solution, thereby coagulating said particles in said stream; and

removing said coagulated particles from said oil to provide cleaned rolling lubricant.

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**4,293,425**

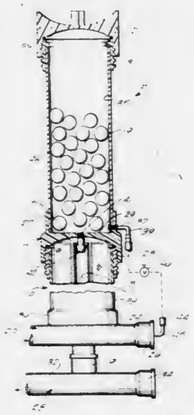
## METHOD OF CHLORINATING SWIMMING POOLS AND THE LIKE

**Kenneth E. Price, 1534 Channelwood Dr., Whittier, Calif. 90601, assignor to Kenneth E. Price, Whittier, Calif.**

**Division of Ser. No. 906,673, May 15, 1978, Pat. No. 4,210,624, which is a continuation of Ser. No. 735,964, Oct. 27, 1976, abandoned. This application Jan. 14, 1980, Ser. No. 112,097**

**Int. Cl.³ E04H** *3/20*

**U.S. Cl. 210—754** **1 Claim**



1. A method of chlorinating water in a swimming pool and the like comprising the steps of

(a) providing an openable airtight chamber having a water inlet to and a water outlet from the chamber at the bottom therein, the outlet being equipped with a check valve operable to prevent flow of water into the chamber through the outlet, the inlet being equipped with a closable water flow regulating valve,

(b) connecting the chamber into a water circulation system for a swimming pool and the like, which system includes a pump, so that the inlet and the outlet are connected to separate points in the system and the inlet is connected to a point at which water in the system, during operation of the pump, is at a higher pressure than the point to which the outlet is connected,

(c) initially loading a quantity of dry water-soluble chlorinating material into the chamber at a time when the pump is not operating, the regulating valve is closed, and the chamber is dry, and then sealing the chamber in an airtight manner to entrap air in the chamber with said material,

(d) operating the pump and opening the regulating valve to establish a desired water flowrate into and through the chamber and to cause the air entrapped in the chamber to be compressed in the upper portion of the chamber by an amount related to the pressure of water applied to the chamber through the inlet,

(e) the air in the chamber expanding therein to force water from the chamber during periods when the pump is not operating, and

(f) periodically, as needed, recharging chlorinating material into the chamber by a procedure which includes the steps of

(1) interrupting operation of the pump, and closing the regulating valve to enable air entrapped in the chamber to force water from the chamber through the outlet,

(2) opening the chamber and introducing a desired quantity of chlorinating material into the chamber,

(3) closing the chamber in an airtight manner to entrap air therein as aforesaid,

(4) opening the regulating valve to re-establish the desired water flowrate into and through the chamber, and

(5) re-establishing operation of the pump.

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**4,293,426**

## COATED CALCIUM PEROXIDE PARTICLES USEFUL IN THE TREATMENT OF WATER

**Ignace Gago, Braine-l'Alleud, Belgium, assignor to Interox, Brussels, Belgium**

**Filed Nov. 17, 1978, Ser. No. 961,699**

**Claims priority, application Luxembourg, Nov. 18, 1977, 78545**

**Int. Cl.³ C02F** *1/72;* **B32B** *19/04;* **B05D** *7/00*

**U.S. Cl. 210—759** **30 Claims**

1. Solid particles comprising calcium peroxide, and a coating agent coating the calcium peroxide, said coating agent being predominantly a water-insoluble solid compound which is an organic polymer or an inorganic compound, said water-insoluble solid compound having a solubility in water of less than 1% by weight and a melting point of at least 50° C.

13. Process for the production of solid particles in a medium containing, the solid particles comprising calcium peroxide and a coating agent coating the calcium peroxide, said coating agent being predominantly a water insoluble solid compound having a solubility in water of less than 1% by weight and a melting point of at least 50° C., comprising spraying a solution, emulsion or suspension of a composition forming the coating agent in a liquid medium onto moving calcium peroxide granules, and evaporating the liquid medium.

14. Process for the oxygenation of water, comprising treating each $m^3$ of water with 0.05 to 1,000 g of solid particles comprising calcium peroxide and a coating agent coating the calcium peroxide, said coating agent being predominantly a water insoluble solid compound having a solubility in water of less than 1% by weight and a melting point of at least 50° C.

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**4,293,427**

## DRILLING FLUID CONTAINING A COPOLYMER FILTRATION CONTROL AGENT

**James M. Lucas; Dorothy P. Enright, and Alphonse C. Perricone, all of Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.**

**Continuation-in-part of Ser. No. 19,219, Mar. 9, 1979, abandoned. This application Mar. 18, 1980, Ser. No. 131,329**

**Int. Cl.³ C09K** *7/02*

**U.S. Cl. 252—8.5 C** **25 Claims**

13. An aqueous drilling fluid comprising water, a clayey substance suspended in said water, and at least about 0.25 pounds per 42 gallon barrel of a copolymer of: (a) from between about 8 mole percent and about 70 mole percent of a (meth)- acrylamido alkyl sulfonic acid or alkali metal salt thereof; and (b) from between about 30 mole percent and about 91 mole percent of a (meth) acrylamide or N-alkyl (meth) acrylamide, a 0.5% by weight aqueous solution of said copolymer having a viscosity of about 25° C. of from between about 18 centipoises and about 44 centipoises, as determined at a shear rate of 511 reciprocal seconds, the number of carbon atoms in the alkyl portion of the acrylamidoalkyl sulfonic acid or alkali metal salt thereof being about four, and the number of carbon atoms in the alkyl portion of the N-alkyl (meth) acrylamide being from between about 1 and about 3.



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**4,293,428**

## PROPOXYLATED ETHOXYLATED SURFACTANTS AND METHOD OF RECOVERING OIL THEREWITH

**Walter W. Gale; Maura C. Puerto, both of Houston; Thomas L. Ashcraft, Baytown; Rhoderick K. Saunders, Sinton, and Ronald L. Reed, Houston, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.**

**Filed Jan. 18, 1978, Ser. No. 870,313**

**Int. Cl.³ C09K** *3/00*

**U.S. Cl. 252—8.55 D** **26 Claims**

1. A method for recovering oil from an oil-bearing formation which comprises injecting into said formation a fluid containing an effective amount of surface-active agent having the general formula:

$$R_1O(C_3H_6O)_m(C_2H_4O)_nYX$$

wherein

$R_1$ is a linear or branched alkyl radical, an alkenyl radical, or an alkyl or alkenyl substituted benzene radical, the non-aromatic portion of the radical containing from 6 to 24 carbon atoms;

m has an average value of from about 1 to about 10;

n has an average value of from about 1 to about 10;

Y is a sulfate, sulfonate, phosphate, or carboxylate group; and

X is a cation; and

driving said fluid through said formation to displace oil from said formation and recovering the displaced oil.

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**4,293,429**

## MGO DISPENSIONS

**William J. Cheng; David B. Guthrie, and Donald M. Leiendecker, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.**

**Filed Jan. 16, 1980, Ser. No. 112,495**

**Int. Cl.³ C10M** *1/24, 3/18, 1/10;* **C10L** *1/18*

**U.S. Cl. 252—18** **12 Claims**

1. A process of preparing a stable, fluid magnesium oxide containing dispersion which comprises heating MgO powder at a temperature greater than 230° C. in a relatively stable, relatively non-volatile process fluid capable of being heated to a temperature greater than about 230° C. in the presence of less than a stoichiometric amount of carboxylic acid, based on MgO. whereby the carboxylate is formed in situ and decomposes to form said MgO.

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**4,293,430**

## SULFURIZED METALLIC DITHIOPHOSPHATES AND THEIR USE AS ADDITIVES FOR LUBRICATING OILS

**Georges Rivier, Bron, France, assignor to Orogil, Courbevoie, France**

**Filed Feb. 29, 1980, Ser. No. 126,161**

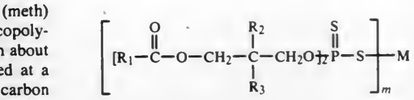
**Claims priority, application France, Mar. 9, 1979, 79/06059**

**Int. Cl.³ C10M** *1/48, 1/38, 3/42, 3/32*

**U.S. Cl. 252—32.7 E** **12 Claims**

1. A sulfurized metallic dithiophosphate comprising the product obtained by sulfurization of a composition containing:

(A) from about 100 to 20 percent of a metallic dithiophosphate of formula (I):



(I)

in which formula:

$R_1$ represents:

(a) a linear or branched alkenyl radical containing from about 2 to 24 carbon atoms;

(b) an unsaturated cycloaliphatic or polycycloaliphatic radical containing from about 3 to 20 carbon atoms;

$R_2$ and $R_3$ are similar or different and represent an alkyl radical containing from about 1 to 12 carbon atoms;

m represents the valence of the metal M;

M represents a metal of group IIB, IIIB, IVB, or VIII of the Periodic System of the Elements; and

(B) from about zero to 80 percent of an alkyl ester of formula (II):

(II) $R_4—COOR_5$

in which:

$R_4$ represents a linear or branched alkenyl radical containing from about 2 to 24 carbon atoms, and $R_5$ represents an alkyl radical containing from about 1 to 12 carbon atoms, by means of a sulfurization agent in an amount corresponding to a weight of sulfur of between about 0.5 and 10 percent, referred to the weight of composition to be sulfurized.

11. A novel lubricating composition comprising a major proportion of at least one lubricating oil and between about 0.3 and 15 percent by weight of a sulfurized metallic dithiophosphate according to claim 1.

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**4,293,431**

## PROCESS OF PREPARING METALLIC DETERGENT-DISPERSANT ADDITIVES OF HIGH ALKALINITY IN PARTICULAR FOR LUBRICATING OILS, AND PRODUCT OBTAINED THEREBY

**Bernard Demoures, Puteaux, and Jean-Louis Le Coent, Le Havre, both of France, assignors to Orogil, Courbevoie, France**

**Filed Jun. 19, 1979, Ser. No. 49,959**

**Claims priority, application France, Jun. 26, 1978, 78 18946**

**Int. Cl.³ C10M** *1/40*

**U.S. Cl. 252—33.2** **18 Claims**

1. A process of preparing metallic detergent-dispersant compositions from alkylbenzene sulfonates of alkaline earth metals, alkylphenols, and alkaline earth compound, an alkylene glycol and carbon dioxide, which process comprises:

(1) reacting sulfur with an alkylphenol bearing at least one $C_6$–$C_{60}$ alkyl substituent in the presence of a dilution oil, an alkaline earth metal alkylbenzene sulfonate of a molecular weight greater than about 300 and TBN less than or equal to about 150, an alkaline earth metal compound, optionally an alkali metal hydroxide, a base component of a metallic detergent-dispersant of a TBN greater than or equal to about 200 selected from among superalkalinized and sulfurized alkaline earth metal alkylphenates, alkylbenzene sulfonates of alkaline earth metals and mixtures of superalkalinized sulfurized alkylphenates of alkaline earth mixtures and alkylbenzene sulfonates of alkaline earth metals, and an alkylene glycol, at a temperature of between about 100 and 190° C., employing the following quantities of reagents:

(a) at least about 5 parts by weight of alkylphenol for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate;

(b) up to about 95 parts by weight of alkylbenzene sulfonate

for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate;
(c) from about 1 to 18 parts by weight of sulfur for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate;
(d) from about 4 to 45 parts by weight of alkaline earth compound for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate;
(e) up to about 10 parts by weight of alkali metal hydroxide for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate;
(f) from about 2 to 35 parts by weight of said base component for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate; and
(g) from about 8 to 200 parts by weight of alkylene glycol for 100 parts by weight of mixture of alkylphenol plus alkylbenzene sulfonate.
(2) carbonating the resultant mixture by means of carbon dioxide at a temperature of between about 100 and 200° C., the amount of $CO_2$ being between that which can be completely absorbed and an excess of 30% of said amount;
(3) removing the alkylene glycol; and
(4) separating the metallic detergent-dispersant of high alkalinity thus obtained.

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**4,293,432**

## LUBRICATING OIL COMPOSITION

**Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Ethyl Corporation, Richmond, Va.**

**Filed Oct. 18, 1979, Ser. No. 85,968**
**Int. Cl.³ C10M** *1/46, 1/36, 3/40, 3/20*
**U.S. Cl. 252—49.9** **8 Claims**

1. A lubricating oil composition formulated for use in the crankcase of an internal combustion engine, said composition containing an ashless dispersant and a friction-reducing amount of about 0.1–1.5 weight percent of a product consisting mainly of N-(2-hydroxyethyl)fatty acid amide wherein said fatty acid contains about 12–22 carbon atoms.

4. A lubricating oil composition of claim 1 also containing about 0.005–0.75 weight percent of a di-$C_{1-4}$ alkyl $C_{12-36}$ aliphatic hydrocarbylphosphonate.

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**4,293,433**

## PERCHLOROETHYLENE DIELECTRIC FLUID CONTAINING PYRROLE AND PHENOL

**Jack A. Borror, Chesterland, and Edward A. Rowe, Jr., North Perry, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Filed Jun. 2, 1980, Ser. No. 155,070**
**Int. Cl.³ H01B** *3/18, 3/24*
**U.S. Cl. 336—94** **14 Claims**

8. A dielectric fluid composition which is resistant to decomposition at elevated temperatures in the presence of oxygen, comprising perchlorethylene containing less than about 0.005 percent chlorinated ethanes, and a synergistic mixture of N-methyl pyrrole and p-tertiary amyl phenol.

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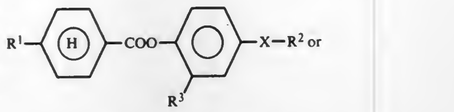
**4,293,434**

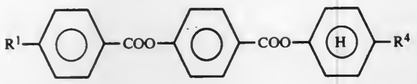
## LIQUID CRYSTAL COMPOUNDS

**Hans-Joachim Deutscher, Halle; Herrmann Schubert, Nehlitz; Christina Seidel, Halle; Dietrich Demus, Halle, and Horst Kresse, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik, Berlin-Oberschöneweide, German Democratic Rep.**

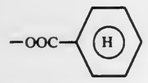
**Continuation-in-part of Ser. No. 877,557, Aug. 8, 1978, abandoned. This application Feb. 13, 1979, Ser. No. 11,952**
**Int. Cl.³ C09K** *3/34;* **G02F** *1/13*
**U.S. Cl. 252—299.63** **2 Claims**

1. Nematic composition for electro-optical devices for the modulation of transmitted or incident light and the rendition of numbers, symbols and images, or as orientation medium in spectroscopy and gas chromatography comprising liquid crystalline compounds, non-liquid crystalline dyestuffs and at least one compound having the following general formula:

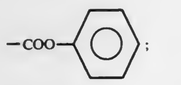




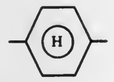
wherein
$R^1$ equals $C_nH_{2n+1}$ with n being 1 to 9;
$R^2$ equals $C_nH_{2n+1}-$ or $C_nH_{2n+1}O-$ when X is



and $R^2$ equals $C_nH_{2n+1}O-$ or —CN when X is

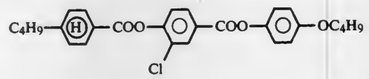


$R^3$ equals $-CH_3$, $-C_2H_5$, —Cl or —Br; and
R and $R^4$ each equals $C_nH_{2n+1}$ or $C_nH_{2n+1}O-$, with n being 1 to 9 and



represents cyclohexyl.

2. The compound having the formula:



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**4,293,435**

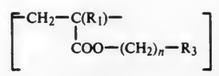
## LIQUID-CRYSTALLINE POLYMER PHASE HAVING A CHOLESTERIC STRUCTURE, PROCESSES FOR ITS PREPARATION AND ITS USE

**Michael Portugall, Eltville; Heino Finkelmann, Clausthal-Zellerfeld, and Helmut Ringsdorf, Mainz-Gonsenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jul. 19, 1979, Ser. No. 58,943**
**Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831909**
**Int. Cl.³ C09K** *3/34;* **G02F** *1/13*
**U.S. Cl. 252—299.01** **9 Claims**

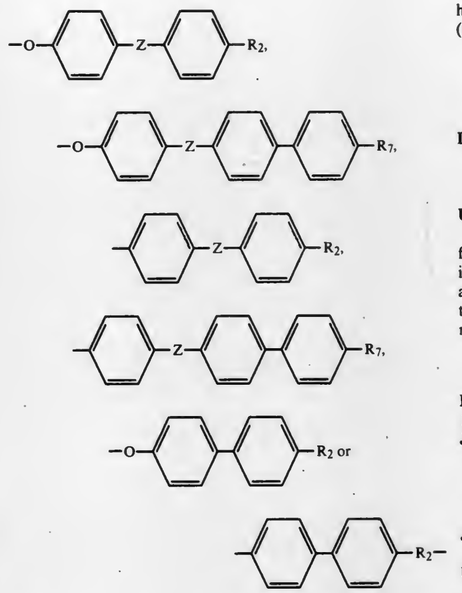
1. A composition of matter exhibiting a liquid-crystalline cholesteric polymer phase consisting essentially of (1) at least one copolymer which contains (a) nematogenic units of the formula (I)



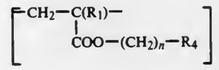


(I)

where $R_1$ is hydrogen or methyl, n is an integer from 1 to 6 and $R_3$ is

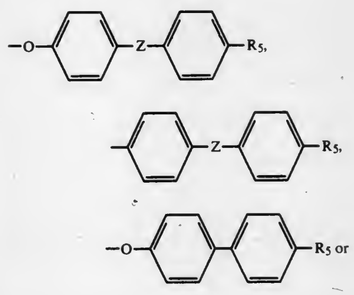


where Z is COO— or OCO—, $R_2$ is $-O(CH_2)_mH$, $-(CH_2)_mH$ or $-COO-(CH_2)_mH$, m being an integer from 1 to 6, and $R_7$ is hydrogen or $R_2$, and (b) chiral units of the formula (II)



(II)

in which $R_1$ is hydrogen or methyl, n is an integer from 1 to 10 and $R_4$ is



-continued

where Z is COO— or OCO— and $R_5$ is $-CH{=}N-R_6$, $-OR_6$, $-COOR_6$, $-CH{=}CH-COOR_6$ or $-R_6$, $R_6$ being alkyl or alkylaryl of 4 to 10 carbon atoms and having at least one asymmetric carbon atom or (2) a mixture of (a) a polymer having a nematic structure and containing units of the formula (I) and (b) a compound having a chiral structure.

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**4,293,436**

## AUTOFLUOROGRAM AND COMPOSITION AND METHOD FOR MAKING THE SAME

**Dennis L. Fost, Franklin, Mass., assignor to New England Nuclear Corporation, Boston, Mass.**

**Filed Mar. 30, 1979, Ser. No. 25,653**
**Int. Cl.³ C09K** *11/06*
**U.S. Cl. 252—301.1 R** **38 Claims**

1. A method of impregnating an autofluorographic medium for use in an autofluorographic method comprising impregnating an absorbent or adsorbent autofluorographic medium with at least 0.01% by weight of a fluor in a solution having between 47.5 and 95% by weight of a water-soluble or water-miscible carboxylic acid carrier.

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**4,293,437**

## PROCESS FOR THE TREATMENT AND PACKAGING OF LOW OR AVERAGE ACTIVITY RADIO-ACTIVE WASTE

**Jean Taponier, Asnieres sur Seine, and Rene Pierlas, Antony, both of France, assignors to Societe Generale pour les Techniques Nouvelles S.G.N., Montigny le Bretonneux, France**

**Filed Apr. 9, 1979, Ser. No. 28,453**
**Claims priority, application France, Apr. 13, 1978, 78 10963; Jul. 13, 1978, 78 20988**
**Int. Cl.³ G21F** *9/16*
**U.S. Cl. 252—301.1 W** **7 Claims**

1. A process for the treatment of low- and average-activity radioactive waste comprising:
(a) obtaining a homogeneous mixture of effluents containing said waste,
(b) forming from said mixture a stable suspension of precipitated solid matter by precipitation of radioactive compounds,
(c) adjusting the quantity of said solid matter to between about 40 to 400 grams per liter of precipitated suspension and adding from about 0.2 to 6 grams per liter of alkaline silicate, and a quantity of asbestos fibers such that the final mixture obtained in step (d) below comprises from about 0.5 to 5% by weight of asbestos fibers with respect to cement,
(d) adding to said suspension from about 0.6 to 2 parts by weight of cement for each part by weight of said suspension, so as to obtain a homogeneous mixture, and
(e) casting said homogeneous mixture into a container.

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**4,293,438**

## METHOD OF PROCESSING RADIOACTIVE WASTES

**Friedrich-Wilhelm Ledebrink, Maintal; Wolfgang Stoll, Hanau, and Dieter Schäfer, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany**

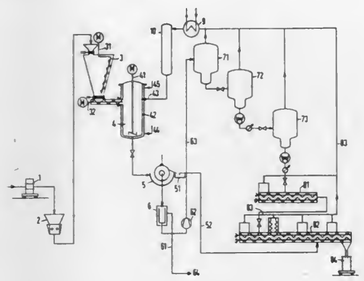
**Filed Jan. 30, 1980, Ser. No. 116,933**
**Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904627**
**Int. Cl.³ G21F** *9/30*
**U.S. Cl. 252—301.1 W** **6 Claims**

1. Method for treating solid raw wastes containing as a major component plastic soluble in a liquid organic solvent, a minor component of a solid material insoluble in the liquid

organic solvent and a minor component of fission material selected from the group consisting of uranium fission material and plutonium fission material to separate and recover the fission material and convert the wastes freed of the fission material into a space-saving product which can be committed to ultimate storage, comprising the following steps:

(a) comminution of the raw wastes to a grain size in which the solid material component is not reduced to the same size as the fission material to facilitate later separation of larger solid material from the smaller fission material

(b) admixing a liquid organic solvent in which the plastic is soluble, with the comminuted raw wastes to effect dissolution of the plastic at elevated temperature in the organic solvent



(c) separation of undissolved larger waste chips from the polymer solution

(d) separation of the undissolved fission material content from the polymer solution by means of a centrifuge

(e) evaporation and condensation of the solvent for return into the dissolving process according to (b)

(f) embedding the waste component from (c) into the remaining plastic melt

(g) drawing-off the melt and solidification thereof in storage containers.

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**4,293,439**

## GELLED SOLDER GLASS SUSPENSIONS FOR SEALING GLASS OR CERAMIC PARTS

**Daniel W. Corbett, Beaver Dams, and Donald L. Guile, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 934,348, Aug. 17, 1978, Pat. No. 4,260,406. This application Oct. 3, 1980, Ser. No. 193,627**

**Int. Cl.³ B01J** *13/00*

**U.S. Cl. 252—316** **22 Claims**

1. A solder glass suspension having the characteristics of a reversible gel, suitable for the application of fritted solder glass to the surface of a glass or ceramic part to be sealed, which comprises:

an organic vehicle consisting essentially of a cellulose binder and an organic solvent for the binder;

a fritted solder glass; and

a gelling agent in a proportion at least sufficient to render the solder glass suspension essentially non-settling and non-sagging under the influence of gravity, while permitting said suspension after it is sheared by remixing or dispensing to become relatively flowable and readily extrudable onto a sealing surface, yet while permitting said suspension after extrusion to rapidly regel to retain its extruded shape and to be essentially non-flowable, non-settling and non-sagging under the influence of gravity, the gelling agent being one which does not adversely affect the sealing process or the mechanical integrity of the final seal.

**4,293,440**

## TEMPERATURE GELATION ACTIVATED AQUEOUS SILICATE MIXTURES AND PROCESS OF FORMING IMPERMEABLE GELS

**Eugene A. Elphingstone; Homer C. McLaughlin, and Charles W. Smith, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Continuation-in-part of Ser. No. 613,726, Sep. 15, 1975, abandoned. This application Apr. 16, 1979, Ser. No. 30,205**

**Int. Cl.³ B01J** *13/00*

**U.S. Cl. 252—317** **23 Claims**

1. An aqueous silicate mixture which does not gel for a period of time below a given temperature but which rapidly gels at temperatures above said given temperature comprising water, a water soluble silicate and an activator which reacts above said given temperature to gel said mixture, said aqueous silicate mixture having a pH in the range of about 9 to 13 at a temperature below said given temperature and said activator being at least one compound of the following formula:

$$X_nR\text{-}W$$

wherein:

n is an integer in the range of from 1 to 6;

X is a halide substituent on an alpha chain, a terminal carbon or both;

R is an alkyl radical, an aryl radical or an alkyl aryl radical with the alkyl radicals having in the range of from 1 to 6 carbon atoms and the aryl radicals having in the range of from 6 to 10 carbon atoms and

W-is an aldehyde group.

13. A process of selectively forming an impermeable gel comprising the steps of: mixing water, a water soluble metal silicate and an activator to form a mixture which does not gel for a period of time below a given temperature but which rapidly gels at temperatures above said given temperature, said aqueous silicate mixture having a pH in the range of from about 9 to 13 at a temperature below said given temperature and said activator being at least one compound of the following formula present in said mixture at a concentration to produce a total acid or acid equivalent concentration in said mixture of less than about 20 milliequivalents per 16 milliliters of concentrated aqueous silicate mixed with water below said given temperature and above about 20 milliequivalents per 16 milliliters of concentrated aqueous silicate per 100 ml total aqueous mixture above said given temperature:

$$X_nR\text{-}W$$

wherein:

n is an integer in the range of from 1 to 6;

X is a halide substituent on an alpha chain, a terminal carbon or both;

R is an alkyl radical, an aryl radical or an alkyl aryl radical with the alkyl radicals having in the range of from 1 to 6 carbon atoms and the aryl radicals having in the range of from 6 to 10 carbon atoms; and

W is an aldehyde group; and

gelling said mixture by increasing the temperature of said mixture to said given temperature.

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**4,293,441**

## CORROSION INHIBITING HEAT TRANSFER LIQUID

**Richard G. Newell, Woodbury, and Dale C. Perry, Welch, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

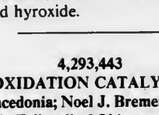
**Continuation-in-part of Ser. No. 19,732, Mar. 12, 1979, Pat. No. 4,202,706. This application Apr. 11, 1979, Ser. No. 29,703**

**The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.**

**Int. Cl.³ C09K** *3/00*

**U.S. Cl. 252—389 A** **6 Claims**

2. A liquid composition comprising ethylene glycol or propylene glycol and an amount, sufficient to inhibit corrosion of a metal in contact with said composition, of fluoroaliphatic compound of the formula:



in which $R_f$ is a fluoroaliphatic radical, Q is a linkage through which $R_f$ and the phosphorus atom, P, are covalently bonded together, the skeletal chain of such linkage being free of moieties which are more readily hydrolyzable than an amido moiety, and $M^1$ and $M^2$ are indepdendently hydrogen or salt-forming cations.

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**4,293,442**

## CATALYTIC COMPOSITE, METHOD OF MANUFACTURE, AND PROCESS FOR USE

**Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Aug. 10, 1979, Ser. No. 65,673**

**The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.**

**Int. Cl.³ B01J** *31/22*

**U.S. Cl. 252—428** **19 Claims**

1. A method of preparing a supported metal chelate catalyst which comprises contacting a solid adsorptive support with a solution of a metal chelate, and thereafter contacting the resulting composite at a temperature between about 50°-200° C. with a substituted ammonium compound represented by the structural formula



where R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R' is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hyroxide.

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**4,293,443**

## OXIDATION CATALYSTS

**Dev D. Suresh, Macedonia; Noel J. Bremer, Stow, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to Standard Oil Company, Ohio**

**Continuation of Ser. No. 891,786, Mar. 30, 1978, Pat. No. 4,234,461, which is a continuation-in-part of Ser. No. 778,658, Mar. 17, 1977, abandoned, which is a division of Ser. No. 602,343, Aug. 6, 1975, Pat. No. 4,052,418. This application Dec. 31, 1979, Ser. No. 108,764**

**Int. Cl.³ B01J** *21/02, 21/00, 23/10, 23/16*

**U.S. Cl. 252—432** **10 Claims**

1. A catalyst composition having the empirical formula:

$$A_aV_bD_cO_x$$

wherein

A is at least one element selected from the group consisting of potassium and arsenic; and

D is at least one element selected from the group consisting of niobium, tantalum and tungsten;

and wherein

a is a positive number less than or equal to 5;

b and c are 0.1 to 10; and

x is the number as determined by the combined valence requirements of elements other than oxygen present in the catalyst.

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**4,293,444**

## SOLID CATALYSTS FOR OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

**R. Parthasarathy, and Eugene V. Hort, both of Wayne, N.J., assignors to GAF Corporation, New York, N.Y.**

**Filed Sep. 4, 1980, Ser. No. 183,911**

**Int. Cl.³ B01J** *21/04, 21/08, 23/28, 23/50*

**U.S. Cl. 252—432** **3 Claims**

1. A composition consisting essentially of silver, molybdenum and oxygen, with the silver-to-molybdenum atom ratio being about 3:1.

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**4,293,445**

## METHOD FOR PRODUCTION OF MOLDED PRODUCT CONTAINING TITANIUM OXIDE

**Shinkichi Shimizu; Tadao Nishizaki, both of Niihama, and Masabumi Tsuda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,322**

**Int. Cl.³ B01J** *27/24, 27/06, 21/00, 21/10*

**U.S. Cl. 252—438** **4 Claims**

1. In a method for the production of a molded product containing titanium oxide by molding a titanium oxide composition the improvement which comprises molding said titanium oxide composition containing a barium compound in the atomic ratio of titanium:barium = 100:0.1 to 20, followed by calcining at a temperature of about 300° to 600° C.

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**4,293,446**

## CONVERSION OF SYNTHESIS GAS WITH IRON-CONTAINING CATALYST

**Stephen A. Butter, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Division of Ser. No. 970,307, Dec. 18, 1978. This application Mar. 12, 1980, Ser. No. 129,551**

**Int. Cl.³ B01J** *29/34*

**U.S. Cl. 252—455 Z** **15 Claims**

1. A catalyst composition prepared by forming a homogenous, aqueous mixture of a water insoluble, decomposable iron derivative of an organic compound, a matrix and an acidic crystalline aluminosilicate zeolite having a silica-to-alumina ratio of at least 12, a pore size greater than about 5 Angstrom units and a constraint index of about 1 to 12, drying and heating said mixture to decompose the organic iron compounds, and treating it with carbon monoxide or mixtures containing the same at elevated temperatures.

2. The composition of claim 1 which has been spray-dried to produce fluid size particles.

3. The composition of claim 1 wherein said iron compound is ferrous oxalate.

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**4,293,447**

## PROCESS FOR REPAIRING PLATE-SHAPED DENITRATING CATALYSTS

**Hideya Inaba; Kenichi Nagai; Masayoshi Ichiki; Yasumi Kamino, and Kazuo Maeda, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co. Ltd., Osaka, Japan**

**Continuation of Ser. No. 927,097, Jul. 24, 1978, abandoned. This application Mar. 11, 1980, Ser. No. 129,204**

**Claims priority, application Japan, Jul. 6, 1978, 53-82563**

**Int. Cl.³ B01J** *21/06, 35/04*

**U.S. Cl. 252—461** **3 Claims**

1. A process for producing a catalyst for reducing nitrogen oxides in exhaust gases comprising the steps of applying a slurry composed of finely divided titania and a binder to a metal net, drying the resulting coating to cause the titania and the binder to be retained on and cover the metal net, immersing

the coated net in a solution of a salt of an active component, and drying and baking the immersed body.

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**4,293,448**

## PREPARATION OF A CATALYST CARRIER FROM ALUMINA MIXTURES

**Peter R. Laurer, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Nov. 27, 1979, Ser. No. 97,836**

**Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852947**

**Int. Cl.³ B01J** *21/04*

**U.S. Cl. 252—463** **4 Claims**

1. A process for the preparation of a very hard catalyst carrier from a mixture of aluminum oxides which comprises pretreating $\alpha$-$Al_2O_3$ with an acid, base and/or metal salt solution, mixing the pretreated $\alpha$-$Al_2O_3$ with at least one member selected from the group consisting of $\gamma$-$Al_2O_3$, $\chi$-$Al_2O_3$, transition oxides of aluminum or hydrated aluminum oxides, kneading the mixture with the addition of water, extruding the resulting mass and drying and heating the extrudate to form the desired catalyst carrier.

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**4,293,449**

## HIGH-SURFACE AREA COATED SUPPORT FOR CATALYSTS AND PROCESS FOR THEIR PREPARATION

**Daniel R. Herrington, Bainbridge, and Albert P. Schwerko, Solon, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Aug. 7, 1980, Ser. No. 176,215**

**Int. Cl.³ B01J** *21/04, 23/88*

**U.S. Cl. 252—465** **7 Claims**

1. A process for preparing a high-surface area catalyst support, the process comprising:

(i) partially wetting an inert core with a wetting agent,

(ii) applying a powdered high-surface area coating to the inert core,

(iii) drying and calcining the coated core to form a support, and

(iv) adding catalytic elements to the support.

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**4,293,450**

## PROCESS FOR CONDUCTING ELECTRICITY UTILIZING A SPECIFICALLY DEFINED GRAPHITE INTERCALATION COMPOUND

**F. Lincoln Vogel, R.D. 3, Voorhees Rd., Whitehouse Station, N.J. 08889**

**Filed Apr. 18, 1978, Ser. No. 897,443**

**Int. Cl.³ H01B** *1/04*

**U.S. Cl. 252—503** **30 Claims**

1. A process for conducting electricity comprising providing an electrically conductive composition which comprises a graphite intercalation compound formed under anhydrous conditions of:

(a) graphite,

(b) a sulfur-containing reactant selected from the group consisting of fluorosulfonic acid, chlorosulfonic acid, and mixtures thereof, and

(c) a halide reactant selected from the group consisting of a boron trihalide, a tetrahalide of a Group IV element, a pentahalide of a Group V element, and mixtures thereof,

wherein the molar ratio of said sulfur-containing reactant to said halide reactant is within the range of approximately 0.01:1 to 200:1, and connecting an electrical source to said electrically conductive composition.

**4,293,451**

## SCREENABLE CONTACT STRUCTURE AND METHOD FOR SEMICONDUCTOR DEVICES

**Bernd Ross, 2154 Blackmore Ct., San Diego, Calif. 92109**

**Continuation-in-part of Ser. No. 913,872, Jun. 8, 1978, Pat. No. 4,219,448. This application Dec. 27, 1979, Ser. No. 107,657**

**Int. Cl.³ H01B** *1/02, 5/14*

**U.S. Cl. 252—512** **25 Claims**

1. A method of fabricating an electrical contact upon a substrate, comprising the steps of

screening a metal frit ink comprising a metal powder and a metal frit in a predetermined pattern upon said substrate, said ink containing a fluxing agent capable of dissolving insulating substances on said substrate,

dissolving any insulating substances present on said substrate by activating said fluxing agent, and

sintering said ink by firing to a temperature above the melting point of the metal frit and below the melting point of the metal powder to create a coherent metal contact.

3. A metal powder composition for deposition and firing upon a substrate, comprising

a screenable metal powder,

a binder,

a vehicle,

a metal frit for use as a liquid medium to transport the metal powder in a liquid sintering process and thereby create a coherent metal structure, and

a fluxing agent comprising silver fluoride for dissolving insulating substances from said substrate.

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**4,293,452**

## ELECTRICALLY CONDUCTIVE POLYMERIC COMPOSITIONS

**Robert B. Fox, Washington, D.C., and Oh-Kil Kim, Burke, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 31, 1980, Ser. No. 117,162**

**Int. Cl.³ H01B** *1/06*

**U.S. Cl. 252—518** **7 Claims**

1. An electrically conductive polymeric composition consisting essentially of a polymer selected from the class consisting of polycarbonates and poly(alkyl alkacrylates) wherein the alkyl radicals have from one to 10 carbons and, dispersed therein, an effective amount of a crown ether complex represented by the formula:

$$[(OA)_x.M]^{+m}[TCNQ]^{-}_{m}[TCNQ]_n^{\circ}$$

wherein m is 1 or 2, n is 0 or 1, TCNQ is 7,7,8,8,-tetracyano-p-quinodimethane, M is selected from the group consisting of lithium, sodium, potassium, rubidium, lesium calcium, strontium, and barium, and $(OA)_x$ is a macrocycle wherein x is an integer from 4 to 10, 0 represents oxygen and A is a bivalent hydrocarbon radical having from 2 to 8 carbon atoms in which the free valences are separated by two carbon atoms.

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**4,293,453**

## PROCESS FOR USING BRIDGED KETONES IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF CONSUMABLE MATERIALS

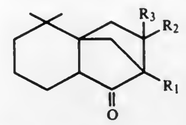
**Mark A. Sprecker, Sea Bright; James M. Sanders, Eatontown; William L. Schreiber, Jackson; Hugh Watkins, Lincroft; Joaquin F. Vinals, Red Bank, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Thomas J. O'Rourke, Red Bank, N.J.; Myrna L. Hagedorn, Highland Park, N.J., and Philip Klemarczyk, Old Bridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Division of Ser. No. 95,149, Nov. 16, 1979, Pat. No. 4,250,338. This application Oct. 23, 1980, Ser. No. 200,060**

**Int. Cl.³ C07C** *13/30*

**U.S. Cl. 252—522 R** **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a perfume composition or cologne comprising the step of adding to a perfume composition, a perfume base or a cologne base, an aroma augmenting or enhancing quantity of at least one substantially pure tricyclic ketone having the structure:



wherein $R_1$, $R_2$ and $R_3$ are the same or different and each represents hydrogen or $C_1$-$C_3$ lower alkyl.



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**4,293,454**

## PROCESS FOR REACTING CHLORAL WITH NITROGEN COMPOSITIONS

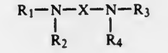
**Harold G. Monsimer, East Norriton, and Stanley R. Sandler, Springfield, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.**

**Filed Feb. 4, 1980, Ser. No. 118,297**

**Int. Cl.³ C09K** *3/28;* **C07C** *127/15, 127/22, 143/72, 157/05, 157/12;* **C08J** *9/00*

**U.S. Cl. 252—609** **6 Claims**

1. A process for preparing an anhydrous flame retardant composition comprising reacting 0.5 to 4 moles of chloral with 0.5 to 2.0 moles of a nitrogen compound having the formula:



(I)

wherein:

(a) X=

or, $-SO_2-$;

(b) Z is selected from O or S;

(c) $R_1$, $R_2$, $R_3$ and $R_4$ are independently selected from the group consisting of H, alkyl of 1 to 6 carbons, and substituted or unsubstituted hydroxyalkyl of 2 to 4 carbons and mixtures thereof in a temperature range of 25° to 100° C. with efficient mixing in the absence of a catalyst and of a solvent.

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**4,293,455**

## $N^{\alpha}$-DESACETYLTHYMOSIN$\alpha_1$ AND PROCESS

**Robert B. Merrifield, Cresskill, N.J., and Tai W. Wong, New York, N.Y., assignors to Rockefeller University, New York, N.Y.**

**Filed Apr. 7, 1980, Ser. No. 137,939**

**Int. Cl.³ C08L** *37/00;* **C07C** *103/52*

**U.S. Cl. 260—8** **6 Claims**

1. [Lys(Tfa)$^{14,17,19,20}$]desacetylthymosin$\alpha_1$.

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**4,293,456**

## PROCESS FOR THE PRODUCTION OF POLYURETHANE PLASTICS

**Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 89,322, Oct. 29, 1979, Pat. No. 4,251,638. This application Sep. 9, 1980, Ser. No. 185,635**

**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846809**

**Int. Cl.³ C08J** *5/00*

**U.S. Cl. 260—9** **4 Claims**

1. A process for the production of boards and moldings by hot-pressing starting materials containing ligno-cellulose with liquid polyisocyanates as binders, wherein, the improvement comprises a substantially monomerfree, crosslinked distillation residue which is insoluble in inert organic solvents and which cannot be melted without decomposing, of the type accumulating as slag in the distillation of monomeric tolylene diisocyanates from the cruede phosgenation products of tolylene diamines and which has been size reduced to a mean particle size of less than 800 m$\mu$ being used as an additional binder in a quantity of from 2% to 60% by weight.

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**4,293,457**

## SEALERLESS PRIMERS

**Martin J. Simon, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 34,514, Apr. 30, 1979, Pat. No. 4,232,090, which is a division of Ser. No. 348,771, Apr. 6, 1973, Pat. No. 4,187,258, which is a continuation-in-part of Ser. No. 156,923, Jun. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 887,333, Dec. 22, 1969, abandoned. This application Nov. 14, 1979, Ser. No. 94,394**

**Int. Cl.³ C08L** *1/14*

**U.S. Cl. 260—15** **5 Claims**

1. A primer composition comprising:

a. an aminoplast curing agent produced from the condensation products of amines or amides with aldehydes;

b. an oil-free saturated polyester having hydroxyl functionality which is curable with said curing agent to form a thermoset polymer; and

c. a thermoplastic acrylic polymer which

(1) is selected from the group consisting of addition polymers of esters of alpha-beta ethylenically unsaturated acids and interpolymers of esters of alpha-beta ethylenically unsaturated acids with other ethylenically unsaturated compounds;

(2) is essentially non-curable with said aminoplast curing agent;

(3) after curing of the primer composition, is soluble in solvents in which it was soluble before said curing; and

d. cellulose acetate butyrate.

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**4,293,458**

## THERMOPLASTIC POLYMER COMPOSITION MATERIALS FOR PRETREATING PAPER

**Eberhard Gruenberger, Hilden, and Roswitha Müller, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany**

**Filed Jan. 17, 1980, Ser. No. 112,829**

**Claims priority, application Fed. Rep. of Germany, Jan. 22, 1979, 2902293**

**Int. Cl.³ C08L** *3/02*

**U.S. Cl. 260—17.4 GC** **10 Claims**

1. A composition for pretreating the back of paper to be glued to a surface, which comprises a mixture of:

(a) a fine-grained dispersion of film-forming, non-blocking thermoplastic polymer;

(b) a paraffin dispersion;

(c) natural or synthetic zeolite;

(d) optionally, additional conventional additives; and

(e) water.

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**4,293,459**

## ASPHALT EMULSION-CONDITIONER

**William J. Detroit, Schofield, Wis., assignor to American Can Company, Greenwich, Conn.**

**Filed Jun. 7, 1979, Ser. No. 46,377**

**Int. Cl.³ C08L** *1/26, 89/00, 95/00, 97/00*

**U.S. Cl. 260—17.5** **21 Claims**

1. An anionic asphalt emulsion-conditioner composition consisting essentially of an admixture of (a) from about 80 to 90 percent by weight of a partially desulfonated lignosulfonate,

derived from spent sulfite liquor and that has been subjected to alkaline hydrolysis and partial desulfonation, or mixture of such lignosulfonates, said lignosulfonates containing combined organic sulfonic sulfur after partial desulfonation of less than about 3 weight percent; (b) from about 5 to 15 weight percent of a nonionic or anionic emulsifying agent; and (c) from 0 to about 5 weight percent of a thickener.

**9**. An anionic asphalt emulsion comprising at least 57 weight percent of an asphaltic material having a penetration between about 40 and 250 and from about 0.5 to 1.5 weight percent of an emulsion-conditioner composition as claimed in claim **1**.

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**4,293,460**

## POLYAMIDE YARN SPIN FINISH CONTAINING A REARRANGED GLYCERIDE AND OXIDIZED POLYETHYLENE

**Robert M. Marshall, Chester, and Kimon C. Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed May 5, 1980, Ser. No. 146,588**
**Int. Cl.**[3] **D06M** *13/10, 16/00*
**U.S. Cl. 260—18 PF** **49 Claims**

**1**. A spin finish for application to polyamide yarn, the spin finish having a pH of about 7 to 12 and being an oil in water emulsion, the oil portion of which comprises:

about 24.7 to 65 weight percent of a rearranged glyceride, about 5 to 30 weight percent of ethoxylated oleyl alcohol, about 1 to 10 weight percent of ethoxylated nonyl phenol, about 5 to 30 weight percent of ethoxylated castor oil, about 1 to 7.4 weight percent of an oxidized polyethylene, about 0.2 to 2.0 weight percent of a non-nitrogen nonionic emulsifier for the oxidized polyethylene, and about 0.04 to 0.3 weight percent of an alkali hydroxide; wherein said rearranged glyceride is a triglyceride rich in $C_{18}$ unsaturated oleic acid chain, formed by alcoholysis using oleyl alcohol in the presence of an acid catalyst or transesterification of coconut oil with glycerol trioleate.

**38**. In a process for the production of polyamide yarn the improvement which comprises treating the yarn during spinning with a spin finish, the spin finish having a pH of about 7 to 12 and being an oil in water emulsion, the oil portion of which comprises:

about 24.7 to 65 weight percent of a rearranged glyceride, about 5 to 30 weight percent of ethoxylated oleyl alcohol, about 1 to 10 weight percent of ethoxylated nonyl phenol, about 5 to 30 weight percent of ethoxylated castor oil, about 1 to 7.4 weight percent of an oxidized polyethylene, about 0.2 to 2.0 weight percent of a non-nitrogen nonionic emulsifier for the oxidized polyethylene, and about 0.04 to 0.3 weight percent of an alkali hydroxide; wherein said rearranged glyceride is a triglyceride rich in $C_{18}$ unsaturated oleic acid chain, formed by alcoholysis using oleyl alcohol in the presence of an acid catalyst or transesterification of coconut oil with glycerol trioleate.

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**4,293,461**

## UNSATURATED MELAMINE CONDENSATES

**William F. Strazik; John R. LeBlanc, both of Wilbraham, and J. Owen Santer, East Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mich.**

**Filed Jun. 9, 1980, Ser. No. 157,720**
**Int. Cl.**[3] **C08L** *91/00*
**U.S. Cl. 260—18 N** **22 Claims**

**1**. An unsaturated condensate of a methylolmelamine, an acrylamide, an ethylenically unsaturated fatty acid amide and a $C_1$ to $C_{10}$ alcohol wherein the methylolmelamine has at least about 5 methylol groups per melamine ring, wherein substantially all the methylol groups are condensed with the acrylamide, the unsaturated fatty acid amide or the alcohol, wherein the number of the acrylamide moieties of the condensate is in the range of about 1 to about 4 per melamine ring and the number of unsaturated fatty acid amide moieties is in the range of about 0.5 to about 2 per melamine ring, wherein the ratio of the acrylamide moieties to unsaturated fatty acid amide moieties is in the range of about 1:1 to about 3:1 and wherein the unsaturated fatty acid amide is an amide of ammonia or methylamine and an ethylenically unsaturated fatty acid containing from 4 to 32 carbon atoms and at least one allylic hydrogen atom per fatty acid moiety.

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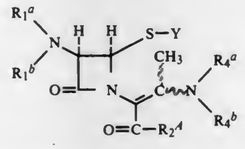
**4,293,462**

## PROCESS FOR THE MANUFACTURE OF ENOL DERIVATIVES, AND INTERMEDIATES

**Robert B. Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 913,429, Jun. 7, 1978, abandoned, which is a division of Ser. No. 671,193, Feb. 10, 1976, Pat. No. 4,110,533. This application Dec. 10, 1979, Ser. No. 102,461**
**Claims priority, application Switzerland, Feb. 20, 1975, 2157/75; Aug. 25, 1975, 10962/75**
**Int. Cl.**[3] **C07D** *205/08, 403/14, 403/04, 403/12*
**U.S. Cl. 260—239 A** **15 Claims**

**1**. A compound of the formula



(II)

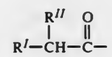
wherein $R_1{}^a$ represents an acyl group of the formula

($A_1$),

wherein $R^I$ represents hydrogen, cyclopentyl, cyclohexyl or cycloheptyl, or such cycloalkyl which is mono- substituted in the 1-position by amino, lower alkoxycarbonylamino, 2-halogeno-lower alkoxycarbonylamino or phenyl-lower alkoxycarbonylamino, sulphoamino or sulphoamino in the form of an alkali metal salt, or $R^I$ represents phenyl, naphthyl or tetrahydronaphthyl, group or phenyl, naphthyl or tetrahydronaphthyl mono- substituted by hydroxyl, lower alkoxycarbonyloxy, 2-halogeno-lower alkoxycarbonyloxy or phenyl-lower alkoxycarbonyloxy, and/or by halogen or $R^I$ represents 4-isoxazolyl, or $R^I$ represents an amino group which is N-mono-substituted by lower alkyl or halogen substituted lower alkyl, or $R_1{}^a$ represents an acyl group of the formula

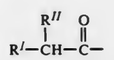
($A_2$),

wherein $R^I$ represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxy-phenyloxy-lower alkyl protected by lower alkoxy carbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, halogeno-phenyloxy-lower alkyl, or lower alkyl mono-substituted by amino and/or carboxyl, wherein amino is free or protected by tri-lower alkylsilyl, lower alkanoyl, halogenolower alkanoyl or phthaloyl and carboxyl is free or protected by tri-lower alkylsilyl, lower alkyl, 2-halogeno-lower alkyl or phenyl-lower alkyl or $R^I$ represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl protected by lower alkoxycarbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, halogeno-phenyl, hydroxyhalogeno-phenyl, protected hydroxy-halogeno-phenyl protected by lower alkoxycarbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl protected by lower alkanoyl, halogeno-lower alkanoyl or phthaloyl, phenyloxy-phenyl, or $R^I$ represents pyridyl, pyridinium, thienyl, furyl, imidazolyl or tetrazolyl, or said heterocyclic groups mono-substituted by lower alkyl, amino, protected amino protected by tri-lower alkylsilyl, lower alkanoyl, halogeno-lower alkanoyl or phthaloyl, aminomethyl or protected aminomethyl protected by lower alkanoyl, halogenolower alkanoyl or phthaloyl or $R^I$ represents lower alkoxy, phenyloxy, hydroxy-phenyloxy, protected hydroxy-phenyloxy protected by lower alkoxycarbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, halogeno-phenyloxy, lower alkylthio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio and said heterocyclylthio groups, mono-substituted by lower alkyl, or $R^I$ represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkyl-carbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl or azido, or $R_1{}^a$ represents an acyl group of the formula



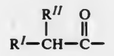
($A_3$),

wherein $R^I$ represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl protected by lower alkoxycarbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, halogeno-phenyl, hydroxy-halogenophenyl, protected hydroxy-halogeno-phenyl protected by lower alkoxycarbonyl, 2-halogenolower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, furyl, thienyl, or isothiazolyl, and also represents 1,4-cyclohexadienyl, and $R^{II}$ represents amino, lower alkoxycarbonylamino, 2-halogeno-lower alkoxycarbonylamino, phenyl-lower alkoxycarbonylamino, wherein phenyl is optionally substituted by lower alkoxy or nitro, tritylamino, nitrophenylthioamino, tritylthioamino or 2-propylideneamino, wherein the propylidene group is optionally substituted by lower alkoxycarbonyl or lower alkanoyl, carbamoylamino or guanidinocarbamoylamino, guanidinocarbonyl-amino, sulphoamino, sulphoamino in alkali-metal saltform, azido, carboxyl, carboxyl in alkali-metal salt-form, lower alkoxycarbonyl, or diphenylmethoxycarbonyl, cyano, sulpho, hydroxyl, protected hydroxyl protected by lower alkoxycarbonyl, 2-halogeno lower alkoxycarbonyl, or phenyl-lower alkoxycarbonyl, wherein phenyl is optionally substituted by lower alkoxy or nitro, 0-lower alkylphosphono, 0,0'-di-lower alkyl-phosphono or halogeno or $R_1{}^a$ represents a group of the formula



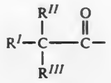
($A_4$),

wherein $R^I$ and $R^{II}$ each represent halogeno, or lower alkoxycarbonyl, or $R_1{}^a$ represents a group of the formula



($A_5$)

wherein $R^I$ represents phenyl, hydroxyphenyl, protected hydroxyphenyl protected by lower alkoxy carbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl protected by lower alkoxy-carbonyl, 2-halogeno-lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, furyl, thienyl, isothiazolyl or 1,4-cyclohexadienyl, and $R^{II}$ represents aminomethyl or protected aminomethyl protected by lower alkanoyl, halogeno-lower alkanoyl or phthaloyl, or $R_1{}^a$ represents a group of the formula



($A_6$),

wherein each of the groups $R^I$, $R^{II}$ and $R^{III}$ represents lower alkyl, and $R_1{}^b$ represents hydrogen, or $R_1{}^a$ and $R_1{}^b$ together represent 1-oxo-3-aza-1,4-butylene, such group monosubstituted in the 2-position by a group $R^I$ as defined under formula ($A_3$) and such group mono- or disubstituted in the 4-position by lower alkyl, the group $—N(R_4{}^a)(R_4{}^b)$ denotes a secondary amino group, wherein one of the substituents $R_4{}^a$ and $R_4{}^b$ represents hydrogen and the other represents lower alkyl, lower alkoxy-lower alkyl, lower alkyl thio-lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein $—N(R_4{}^a)(R_4{}^b)$ denotes a tertiary amino group, wherein each of the substituents $R_4{}^a$ and $R_4{}^b$, independent of each other is lower alkyl, lower alkoxy-lower alkyl, lower alkylthio-lower alkyl, cyclohexyl-lower alkyl, phenyl-lower alkyl, thienyl-lower alkyl, cycloalkyl with 3 to 7 carbon atoms, or such cycloalkyl monosubstituted by lower alkyl, lower alkoxy, lower alkylthio, cyclohexyl, phenyl, or furyl, or wherein N-$(R_4{}^a)(R_4{}^b)$ is 1-aziridinyl, 1-pyrrolidinyl, 1-piperidyl, 1H-2,3,4,5,6,7-hexahydroazepinyl, 4-morpholinyl, 4-thio-morpholinyl, 1-piperazinyl, or 4-methyl-1-piperazinyl, Y represents a leaving group of the formula $—S-R_4$, wherein $R_4$ is a monocyclic five membered diazacyclic, oxazacyclic, thiazacyclic, thiadiazacyclic, thiatriazacyclic, oxadiazacyclic or oxatriazacyclic or a corresponding dicycic benzdiazacyclic, benzoxazacyclic or benzthiazacyclic radical of aromatic character which radical is bonded to the thio group —S— by one of its ring carbon atoms, which is bonded to a ring nitrogen atom by a double bond, or such group mono- substituted by lower alkyl, lower alkoxy, halogen or phenyl, or wherein $R_4$ denotes lower alkanoyl, lower thioalkanoyl, cycloalkane carbonyl, cycloalkanethio-carbonyl, benzoyl, thiobenzoyl, naphthylcarbonyl, naphthylthio-carbonyl, pyridylcarbonyl, thenoyl, furoyl, pyridylthiocarbonyl, thiothenoyl or thiofuroyl, or represents such an acyl or thioacyl group which is mono- substituted by lower alkyl, halogen, lower alkoxy, phenyl or phenyloxy, which groups $R_4$ have up to 18 carbon atoms, or Y represents a leaving group of the formula $—SO_2—R_5$, wherein $R_5$ represents unsubstituted or lower alkoxy-, halogeno, phenyl-, or phenyloxy-monosubstituted by lower alkyl, lower alkenyl, cyclopentyl or cyclohexyl or $R_5$ represents naphthyl, or phenyl, or naphthyl or phenyl monosubstituted by lower alkyl, lower alkoxy, halogen, phenyl, phenyloxy, or nitro, which groups $R_5$ have up to 18 carbon atoms, and $R_2{}^A$ represents lower alkoxy, 2-halogeno-lower alkoxy, phenylcarbonyl-methoxy, mono- or diphenyl-lower alkoxy, wherein phenyl is optionally substituted by lower alkoxy and/or nitro, 1-adamantyloxy, 2-tetrahydrofuryloxy, 2-tetrahydropyranyloxy, 2,3-dihydro-2-pyranyloxy, nitrophenoxy, 2,4,6-trichlorophenoxy, pentachlorophenoxy, cyanomethoxy, phthaliminomethoxy, succinyliminomethoxy, lower alkanoyloxymethoxy, aminolower alkanoyloxymethoxy, phthalidyloxy, tri-lower alkylsilyloxy, halogeno-lower alkoxy-lower alkylsilyloxy, tri-lower alkylstannyloxy, or halogen.

**4,293,463**

## SULPHUR CEMENTS, PROCESS FOR MAKING SAME AND SULPHUR CONCRETES MADE THEREFROM

**Alan H. Vroom, 10728 Willowfern Dr. SE., Calgary, Alberta, Canada**

**Division of Ser. No. 659,659, Feb. 20, 1976, Pat. No. 4,058,500, which is a continuation of Ser. No. 581,735, May 29, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,413**

**Int. Cl.³ C08K *3/06***

**U.S. Cl. 260—42.24** **28 Claims**

1. A composition for use in the preparation of a sulphur concrete comprising:

(A) a sulphur cement composition comprising

(a) sulphur, and

(b) a bonding agent which is adapted to stabilize said sulphur cement against progressive embrittlement and subsequent crumbling under thermal stress, said bonding agent comprising from about 10 to about 150% by weight of said sulphur of a fly ash of a size of minus 100 mesh; and

(B) natural or manufactured aggregates.

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**4,293,464**

## PHOSPHINE OXIDE FLAME RETARDED, RUBBER-MODIFIED, POLYPHENYLENE ETHER RESIN COMPOSITIONS

**Albrecht H. Granzow, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Sep. 24, 1979, Ser. No. 78,531**

**Int. Cl.³ C08K *5/51***

**U.S. Cl. 260—45.7 P** **6 Claims**

1. A flame retardant composition comprising a homogeneous blend of polymers containing about 50 to 80 parts by weight of polyphenylene ether resin, about 50 to 20 parts by weight of a polystyrene, and 6% by weight down to a flame retarding effective amount of a compound represented by the formula:

wherein R is selected the group consisting of from alkyl (1 to 4 carbon atoms), cycloalkyl (5 to 8 carbon atoms), carboxyalkyl (1 to 4 carbon atoms), phenyl, halophenyl (1 to 3 halogen atoms), alkoxyphenyl (1 to 4 carbon alkoxy); R′ is selected the group consisting of from hydrogen, alkyl (1 to 12 carbon atoms), omega-cyano alkyl (1 to 4 carbon alkyl), benzyl, alkylbenzyl (1 to 5 alkyl substituents each containing 1 to 4 carbon atoms), and hydroxyalkyl (1 to 4 carbon alkyl), with the proviso that when R is carboxyalkyl, R′ is not hydrogen or benzyl.

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**4,293,465**

## BIS PHOSPHINE OXIDE FLAME RETARDED, RUBBER-MODIFIED, POLYPHENYLENE ETHER RESIN COMPOSITIONS

**Albrecht H. Granzow, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

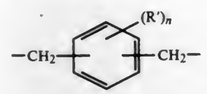
**Filed Sep. 24, 1979, Ser. No. 78,534**

**Int. Cl.³ C08K *5/51***

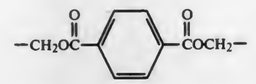
**U.S. Cl. 260—45.7 P** **8 Claims**

1. A flame retardant composition comprising a homogeneous blend of polymers containing about 50 to 80 parts by weight of polyphenylene ether resin, about 50 to 20 parts by weight of a polystyrene, and 6% by weight down to a flame retarding, effective amount of a compound represented by the formula:

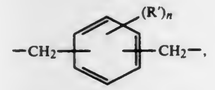
wherein R is selected from the group consisting of cycloalkyl of 5 to 8 carbon atoms, phenyl, carbamoylethyl and carboalkoxyethyl wherein the alkoxy group contains 1 to 4 carbon atoms; and wherein Y is selected from the group consisting of alkylene of 1 to 6 carbon atoms, the group,



wherein R′ is alkyl of 1 to 4 carbon atoms and n is an integer from 1 to 4, or the group,



with the proviso that when R is carboalkoxyethyl and Y is



then n is 4.

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**4,293,466**

## PIPERIDINE PHOSPHITE STABILIZERS FOR POLYMERS AND POLYMERS STABILIZED THEREBY

**Piero Di Battista, San Donato Milanese; Renzo Fontanelli, Milan; Francesco Gratani, Sesto San Giovanni, and Giuseppe Nelli, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy**

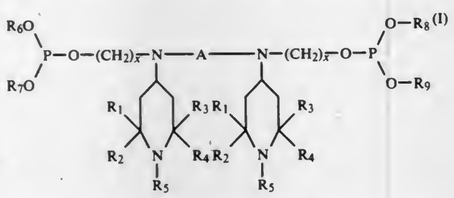
**Filed Dec. 5, 1978, Ser. No. 966,562**

**Claims priority, application Italy, Dec. 2, 1977, 30331 A/77**

**Int. Cl.³ C07D *401/12*; C08K *5/34***

**U.S. Cl. 260—45.8 N** **11 Claims**

1. Compositions comprising synthetic thermoplastic polymers stabilized to sunlight, to heat and to ageing, and having incorporated therein, in an amount sufficient to prevent degradation of the polymer, a compound having general formula:



wherein: each of $R_1$, $R_2$, $R_3$ and $R_4$, which may be the same or different, may be an alkyl having 1 to 4 carbon atoms; $R_5$ may be a hydrogen atom or an alkyl having 1 to 4 carbon atoms; A is an alkylene group having 2 to 12 carbon atoms or a cycloalkylene group containing 3 to 12 carbon atoms; x is an integer from 1 to 10, and $R_6$, $R_7$, $R_8$ and $R_9$, which may be the same or different, are each a linear or branched alkyl group having 1 to 20 carbon atoms or a simple or substituted aryl group having 6 to 20 carbon atoms or $R_6$ and $R_7$ together and $R_8$ and $R_9$ together may form a linear or branched alkylene group having 2 to 20 carbon atoms, or a simple or substituted arylene group having 6 to 20 carbon atoms or a simple or substituted cycloalkylene group having 3 to 20 carbon atoms.



**4,293,467**

## ISOPROPYLIDENEDICYCLOHEXYLENE ESTERS AND THEIR USE AS LIGHT STABILIZERS

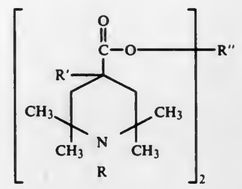
**William B. Hardy, Bound Brook, and Frank F. Loffelman, Bridgewater, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Jan. 16, 1980, Ser. No. 112,390**

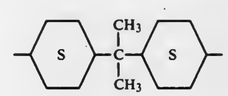
**Int. Cl.³ C07D *401/12*; C08K *5/34***

**U.S. Cl. 260—45.8 N** **16 Claims**

5. A composition comprising a synthetic polymer subject to oxidative degradation and an effective stabilizing amount of a compound represented by the formula



wherein R is hydrogen or alkyl ($C_1$–$C_8$); R′ is hydrogen, hydroxyl or alkoxy ($C_1$–$C_8$); and R″ is the group:



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**4,293,468**

## MALONATE DERIVATIVES AS STABILIZERS FOR ORGANIC MATERIALS

**Jean Rody, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

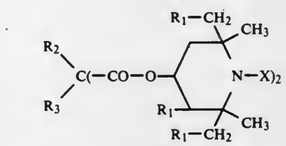
**Continuation of Ser. No. 958,447, Nov. 7, 1978, abandoned, which is a continuation of Ser. No. 792,179, Apr. 29, 1977, abandoned. This application Feb. 4, 1980, Ser. No. 118,219**

**Claims priority, application Switzerland, May 4, 1976, 5558/76**

**Int. Cl.³ C08K *5/34*; C07D *401/12***

**U.S. Cl. 260—45.8 N** **16 Claims**

1. A malonate of the formula I



(I)

in which $R_1$ is hydrogen or $C_1$–$C_4$-alkyl, $R_2$ is $C_3$–$C_4$-alkenyl, benzyl or phenyl, cyano or phenyl substituted by $C_1$–$C_8$-alkyl or $C_1$–$C_8$-alkoxy, $R_3$ is $C_3$–$C_4$-alkenyl or benzyl and X denotes hydrogen, oxyl, $C_1$–$C_{12}$-alkyl, $C_3$–$C_6$-alkenyl, $C_3$–$C_4$-alkinyl, $C_2$–$C_{21}$-alkoxyalkyl, $C_7$–$C_{11}$-aralkyl, 2,3-epoxypropyl, an aliphatic acyl group selected from formyl, acetyl, acryloyl or crotonyl, or one of the groups $—CH_2COOR_4$, $—CH_2—CH(R_5)—OR_6$, $—COOR_7$ or $—CONHR_7$, in which $R_4$ is $C_1$–$C_8$-alkyl, $C_3$–$C_6$-alkenyl, phenyl, $C_7$–$C_8$-aralkyl or cyclohexyl and $R_5$ is hydrogen, methyl or phenyl and $R_6$ denotes hydrogen or acetyl, propionyl, butyryl, octanoyl, dodecanoyl, stearoyl, acryloyl, benzoyl, chlorobenzoyl, toluoyl, isopropylbenzoyl, 2,4-dichlorobenzoyl, 4-methoxybenzoyl, 3-butoxybenzoyl, 2-hydroxybenzoyl, 3,5-di-t-butyl-4-hydroxybenzoyl, β-(3,5-di-t-butyl-4-hydroxyphenyl)propionyl, phenylacetyl, cinnamoyl or hexahydrobenzoyl and $R_7$ is $C_1$–$C_{12}$-alkyl, cyclohexyl, phenyl or benzyl.

13. A method of stabilizing an organic material ordinarily subject to light- and thermal-induced degradation which comprises adding to the organic material a stabilizing amount of a malonate of claim 1 to prevent said degradation.

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**4,293,469**

## PRODUCTION OF AN IMPROVED NON-REINFORCED POLYOXYMETHYLENE MOLDING COMPOSITION WHICH FORMS REDUCED MOLD DEPOSITS UPON MOLDING

**Robert Edelman, Staten Island, N.Y., assignor to Celanese Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 752,212, Dec. 17, 1976, abandoned. This application Oct. 28, 1977, Ser. No. 846,661**

**Int. Cl.³ C08K *5/16*; C08L *59/02***

**U.S. Cl. 260—45.9 P** **16 Claims**

1. A process for improving the thermal stability at molding temperatures of from about 150° to about 240° C. of a polyoxymethylene molding composition which is free of fibrous reinforcement comprising heating a mixture of:

(1) a polyoxymethylene polymer which exhibits a propensity to form mold deposits upon molding, and

(2) about 0.25 to about 3 percent by weight based on the weight of the polyoxymethylene polymer of a polycarbodiimide which is (a) derived from an aromatic diisocyanate which is unsubstituted or substituted with up to one methyl group per aromatic ring and (b) contains at least three carbodiimide units per polycarbodiimide molecule,

for at least about two minutes at a temperature at which the polyoxymethylene polymer is molten to yield a molding composition which forms a reduced quantity of mold deposits upon molding.

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**4,293,470**

## STABILIZING POLYUREA POLYMER POLYOLS BY TREATING WITH A SECONDARY AMINE

**Michael Cuscurida, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Jul. 11, 1980, Ser. No. 168,898**

**Int. Cl.³ C08G *18/32***

**U.S. Cl. 260—45.9 R** **17 Claims**

1. A polyurea polymer polyol made by reacting a hydroxyl-containing amine, a polyether polyol of about 3000 to 8000 molecular weight and an organic polyisocyanate wherein the amount of polyisocyanate reacted is less than the stoichiometric amount needed to satisfy the hydroxyl group of the hydroxyl-containing amine and the polyether polyol and adding to the reaction product an amount of secondary amine effective to improve the storage stability of said polyurea polymer polyol.

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**4,293,471**

## FAST-DRYING ALKYD LATEX

**Philip Heiberger, Broomall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 20,985, Mar. 16, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,793**

**Int. Cl.³ C09D *3/64*, *3/66*, *5/02***

**U.S. Cl. 260—22 CB** **10 Claims**

1. An aqueous dispersion of a preformed unsaturated fatty acid alkyd resin having an emulsion polymer formed therein by means of a water-soluble emulsion catalyst, said dispersion containing 0.005–2% by weight of an oil-soluble catalyst for oxidative crosslinking.

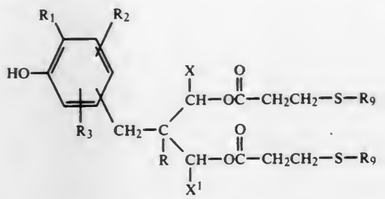
**4,293,472**

## STABILIZED SYNTHETIC RESIN COMPOSITION

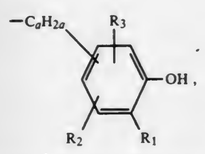
**Motonobu Minagawa, 1-207-3 Shichizacho, Koshigaya; Yutaka Nakahara, 406-71 Minimishimoarai, Iwatsuki, and Tohru Haruna, 969-4 Shimohideya, Okegawa, all of Japan**

**Filed Apr. 24, 1979, Ser. No. 33,024**
**Claims priority, application Japan, Apr. 24, 1978, 53-48599**
**Int. Cl.³ C08K** *5/36;* **C07C** *65/04*
**U.S. Cl. 260—23 XA** **18 Claims**

1. An ortho-alkylhydroxybenzylpropane-1,3-diol compound having the formula



in which $R_1$ is an alkyl group having 1 to 8 carbon atoms, $R_2$ and $R_3$ are hydrogen or alkyl groups having 1 to 8 carbon atoms, R is hydrogen, an alkyl group having 1 to 8 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, or an ortho-alkylhydroxybenzyl group



X and X' are each independently hydrogen, alkyl groups, aryl groups, aralkyl groups, or alkaryl groups having 1 to 18 carbon atoms, provided that X and X' are not simultaneously hydrogen; and $R_9$ is an alkyl group having 1 to 30 carbon atoms.

**14**. A stabilizer synthetic resin composition comprising a synthetic resin and 0.01 to 5% by weight of an ortho-alkylhydroxybenzylpropanediol compound according to claim **1**.

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**4,293,473**

## POLYVINYL ALCOHOL - CRYSTALLINE SOLVENT SYSTEM BASED COMPOSITIONS MODIFIED WITH ETHYLENE POLYMER

**Ernest F. Eastman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jul. 25, 1980, Ser. No. 172,243**
**Int. Cl.³ C08L** *93/00, 93/04*
**U.S. Cl. 260—27 R** **15 Claims**

1. Solid adhesive composition consisting essentially of (1) from about 2 to about 35 percent by weight of a vinyl alcohol polymer selected from the group consisting of polyvinyl alcohol and ethylene/vinyl alcohol copolymers containing at least 50 mol percent vinyl alcohol; (2) from about 10 to about 80 percent by weight of an at least two component crystalline solvent system wherein component (a) is selected from the group consisting of urea, solid alkyl substituted ureas containing a total of up to 9 carbon atoms, thiourea, biuret, and solid aliphatic amides containing up to 6 carbon atoms, and component (b) is ϵ-caprolactam, the ratio of component (a) to component (b) being from about 80/20 to about 20/80; (3) from about 1 to about 15 percent by weight of at least one ethylene polymer selected from the group consisting of ethylene homopolymer and ethylene copolymers with vinyl esters, acrylates, methacrylates and their terpolymers with carbon monoxide, and their terpolymers with acids selected from the group consisting of acrylic acid and methacrylic acid, provided that when said ethylene polymer is ethylene homopolymer it is present in an amount of up to about 5 percent by weight; (4) from 0 to about 15 percent by weight of thermoplastic tackifier; and (5) from 0 to about 5 percent by weight of normally solid, saturated aliphatic carboxylic acid.

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**4,293,474**

## POLYURETHANE IONOMER DISPERSIONS CONTAINING ELECTROLYTES

**Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, and Peter Markusch, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 862,455, Dec. 20, 1977, abandoned. This application Jan. 21, 1980, Ser. No. 113,920**
**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659617**
**Int. Cl.³ C08G** *18/12, 18/32;* **C08L** *75/08, 75/12*
**U.S. Cl. 260—29.2 TN** **3 Claims**

1. Aqueous dispersions or solutions of polyurethane ionomers which are stable at room temperature, characterized by
(a) hydrophilic polyalkylene oxide-polyether chains in the polyurethane, having an ethylene oxide unit content of from 1.2 to 50% by weight, based on the polyurethane solid content;
(b) containing 5 to 250 milliequivalents, per 100 g of polyurethane solid content, of ionic groups built into the polyurethane; and
(c) containing from 0.5 to 100% by weight, based on the polyurethane solid content, of water-soluble electrolytes dissolved in the water, wherein said water-soluble electrolytes are salts of
(i) inorganic or organic acids having a pKa-value of from 0 to 3 with
(ii) inorganic or organic bases having a pKb-value of from 0 to 3
with the proviso that where organic compounds are used as said organic acids or said organic bases, they should not form mycellae in their salt form, should not have surface active properties and should not contain hydrocarbon groups with more than eight carbon atoms.

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**4,293,475**

## PIGMENT DISPERSIONS FOR SURFACE-COATING COMPOSITIONS AND SURFACE-COATING COMPOSITIONS CONTAINING SAME

**Henri Sidi, Paramus, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.**

**Filed Sep. 12, 1980, Ser. No. 186,890**
**Int. Cl.³ C08F** *220/20*
**U.S. Cl. 260—29.6 TA** **19 Claims**

1. A pigment dispersion that comprises
(a) 10% to 75% by weight of a pigment component;
(b) 5% to 35% by weight of a dispersant that is a water-soluble salt of a polymer derived from
(1) 30% to 75% by weight of at least one hydroxyalkyl methacrylate wherein the hydroxyalkyl group has from 2 to 4 carbon atoms;
(2) 20% to 65% by weight of methacrylic acid; and
(3) 2% to 20% by weight of at least one ethylenically-unsaturated monomer selected from the group consisting of styrene, vinyltoluene, glycidyl acrylate, and glycidyl methacrylate,
said polymer having an acid value in the range of 160 to 400 and a hydroxyl value in the range of 150 to 320; and
(c) 15% to 70% by weight of a solvent selected from the group consisting of water, water-miscible organic solvents, and mixtures thereof.



**4,293,476**

## INTERFACIAL CROSS-LINKING OF LATEX FILMS

**Carl Moore, and Robert A. Kirchoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 2, 1979, Ser. No. 63,279**
**Int. Cl.³ C08L** *51/04*
**U.S. Cl. 260—29.7 W** **17 Claims**

1. A cross-linkable, synthetic polymer composition comprising an aqueous polymer dispersion of (1) heterogeneous polymer particles which comprise a water-insoluble polymeric core of a polymer of a conjugated diene or a copolymer of a conjugated diene with a monovinylidene aromatic and having on its surface a reactive polymer domain, said reactive polymer domain having an average thickness of up to about 100 Å and being derived from an amount of a reactive monomer bearing a non- or weakly ionic reactive halo, amino or substituted amino, or epoxy group such that the reactive groups are more concentrated in the reactive polymer domain than in the polymeric core of the heterogeneous polymer particle and (2) a water-soluble coreactive component bearing a plurality of a second non- or weakly ionic reactive group coreactive with the reactive groups of the reactive polymer domain of the heterogeneous polymer particles.

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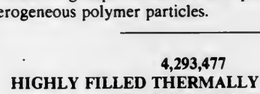
**4,293,477**

## HIGHLY FILLED THERMALLY CONDUCTIVE ELASTOMERS III

**Ares N. Theodore, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

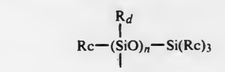
**Filed Jan. 4, 1980, Ser. No. 109,446**
**Int. Cl.³ C08K** *3/08, 3/10, 3/20;* **C08L** *83/14*
**U.S. Cl. 260—29.1 SB** **7 Claims**

1. A thick, highly filled, shaped elastomeric body made by filling a cavity with a dispensable elastomer precursor consisting essentially of:
I. 100 parts by weight of an olefinically unsaturated cross-linkable polysiloxane having the formula:



I

wherein at least most of the Ra's and Rb's are selected from (A) saturated hydrocarbyl and hydrocarbyloxy groups having 1 to about 10 carbon atoms that are alkyl or aryl or alkyl and aryl and (B) allyl or vinyl groups, but wherein up to about 25% of the Rb's may be



I(a)

wherein at least most of the Rc's and Rd's are selected from (A) and (B) above but up to about 10% of the Rd's may contain additional siloxane units with substituents selected from (A) and (B) or still additional siloxane units; and still further wherein (1) the average number of siloxane units per polymer is between 150 and 250 and (2) there is an average of above about 1.5 but lower than 2.5 crosslinking sites selected from the vinyl, allyl or vinyl and allyl groups per polymer molecule;
II. about 60–500 parts by weight of finely divided particulate comprising:
(A) silica 60–500 parts by weight ratio to the polysiloxane of I. of between about 0.3 and 2.5:1 wherein the silica particulate comprises:
1. ground silica having an average particule diameter between about 0.5 and 10 microns; and
2. fumed silica having an average particule diameter between about 0.010 and 0.014 microns;
(B) thermally conductive alloy powder at a weight ratio to the polysiloxane of I. of between 0.3 to 2.5:1 wherein the alloy is an alloy of a first row transition metal;
III. a viscosity modifier comprising a silicone oil having a viscosity between about 1000–1,000,000 centistokes at 25° C. at a weight ratio to the particulate of II of between about 1:20–1:4 oil to particulate; and
IV. a silyl hydride functional polysiloxane oligomer containing between about 5 and about 50 siloxane groups at a weight ratio with respect to the polysiloxane of I. of between about 1:3 to 1:20, the silyl hydride functional polysiloxane oligomer having an average of more than 1 and less than 20 silyl hydride groups per polymer chain.

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**4,293,478**

## PROCESS FOR PRODUCING POLYPHENYLENE ETHER COMPOSITION CONTAINING INORGANIC PIGMENT

**Akitoshi Sugio, Ohmiya; Masanobu Masu, Kanamachi; Hiroshi Nakai, Matsudo, and Yukio Sasaki, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan**

**Filed Oct. 3, 1979, Ser. No. 81,620**
**Claims priority, application Japan, Oct. 4, 1978, 53-122436**
**Int. Cl.³ C08L** *71/04*
**U.S. Cl. 260—37 R** **3 Claims**

1. In a method for preparing a resin composition composed of a polyphenylene ether alone or a polyphenylene ether and a styrene polymer, and an inorganic pigment, the improvement which comprises intimately mixing the polyphenylene ether and the inorganic pigment in a weight ratio of from 0.5:1 to 2:1 by a high-speed mixer wherein the linear speed of the tips of the stirring impellers is maintained at 5 to 50 m/sec to form a pre-blend, and admixing in an extruder the pre-blend intimately with the polyphenylene ether alone or the polyphenylene ether and the styrene polymer.

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**4,293,479**

## HEAT CURABLE MOLDING COMPOSITION

**Tsuneo Hanada; Taro Koshii, and Hideo Shinmi, all of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 867,067, Jan. 5, 1978. This application Dec. 6, 1979, Ser. No. 101,324**
**Claims priority, application Japan, Feb. 18, 1977, 52-16072**
**Int. Cl.³ C08L** *63/00*
**U.S. Cl. 260—37 EP** **4 Claims**

1. An improved heat curable molding composition which consists of
(A) 100 parts of a heat curable molding resin;
(B) up to 400 parts of a filler;
the improvement comprising replacing 5–80 weight percent of (B) with a spherical non-crystalline silica filler having an average particle size of 1–800 millimicrons which has been prepared by vaporization of high purity sand or quartz in the absence of hydrogen or natural gas and subsequently condensed.

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**4,293,480**

## URETHANE BINDER COMPOSITIONS FOR NO-BAKE AND COLD BOX FOUNDRY APPLICATION UTILIZING ISOCYANATO-URETHANE POLYMERS

**Ralph D. Martin; William R. Dunnavant, both of Columbus; Gregory P. Sturtz, Worthington, and Heimo J. Langer, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.**

**Filed May 11, 1979, Ser. No. 38,158**
**Int. Cl.³ C08L** *61/10, 75/08*
**U.S. Cl. 260—38** **24 Claims**

1. A binder composition useful for making shaped foundry articles for use in casting lightweight metals, which articles collapse after casting of said lightweight metals, comprising in admixture a polyol component, an isocyanate component com-

prising an isocyanato urethane polymer wherein all hydroxy groups of said polymer are capped and a curing agent.

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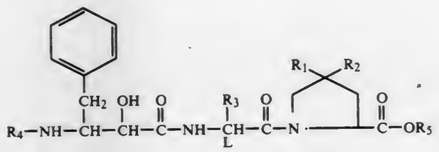
**4,293,481**

## TRIPEPTIDE INHIBITORS OF ANGIOTENSIN-CONVERTING ENZYME

**Michael E. Condon, Lawrenceville, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Jul. 24, 1980, Ser. No. 171,772**
**Int. Cl.³ C07C *103/52***
**U.S. Cl. 260—112.5 R** **7 Claims**

1. A tripeptide having the formula



or a salt thereof, wherein $R_1$ is hydrogen and $R_2$ is hydroxyl, alkyl, aryl, arylalkyl, alkoxy, alkylthio, aryloxy, arylthio, halogen, or azido, or $R_1$ and $R_2$ are the same and each is hydrogen, halogen, alkoxy or alkylthio, or $R_1$ and $R_2$ together are oxo, $-O-(CH_2)_n-O-$, or $-S-(CH_2)_n-S-$, wherein n is 1 or 2;

$R_3$ is hydrogen, alkyl or trifluoromethyl;

$R_4$ is hydrogen or an acyl protecting group; and

$R_5$ is hydrogen or alkyl.

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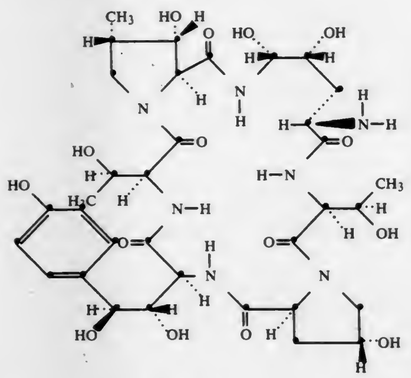
**4,293,482**

## A-30912A NUCLEUS

**Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,017, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,029**
**Int. Cl.³ C07C *103/52*; H61K *37/00*; C12P *21/04***
**U.S. Cl. 260—112.5 R** **22 Claims**

1. A-30912A nucleus of the formula



and the acid addition salts thereof.

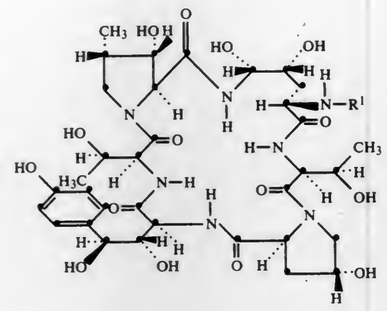
**4,293,483**

## DERIVATIVES OF A-30912A NUCLEUS

**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

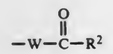
**Continuation-in-part of Ser. No. 103,149, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,030**
**Int. Cl.³ C07C *103/52***
**U.S. Cl. 260—112.5 R** **25 Claims**

1. A compound of the formula:



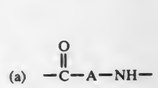
wherein

$R^1$ is an N-alkanoyl amino acyl group of the formula

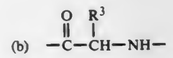


wherein:

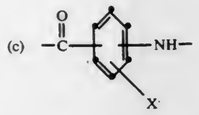
W is a divalent aminoacyl radical of the formula:



wherein A is $C_1$–$C_{10}$ alkylene or $C_5$–$C_6$ cycloalkylene;

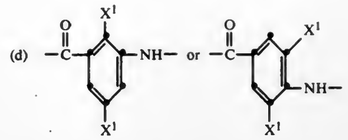


wherein $R^3$ is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indole-methyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;

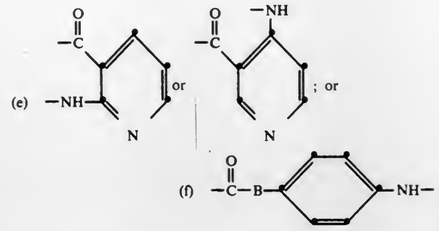


wherein X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamoyl, or $C_1$–$C_3$ alkylcarbamyl;

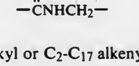




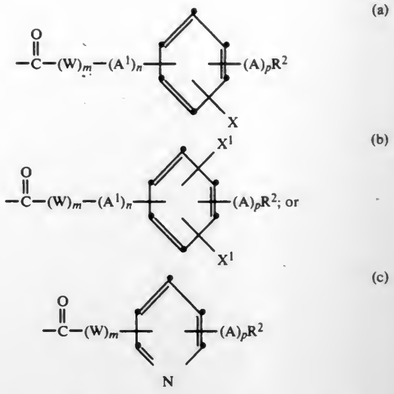
wherein $X^1$ is chloro, bromo, or iodo;



wherein B is a divalent radical of the formula; $-(CH_2)_n-$, wherein n is an integer from 1 to 3; $-CH=CH-$; $-CH=CH-CH_2-$; or



and $R^2$ is $C_1$-$C_{17}$ alkyl or $C_2$-$C_{17}$ alkenyl.



wherein A is divalent oxygen, sulfur, sulfinyl, or sulfonyl; $A^1$ is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl or $C_1$–$C_3$ alkylcarbamyl; $X^1$ is chloro, bromo or iodo; $R^2$ is hydrogen $C_1$–$C_{18}$ alkyl or $C_2$–$C_{18}$ alkenyl; W is $C_1$–$C_{10}$ alkylene or $C_2$–$C_{10}$ alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the $R^2$ and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and $A^1$ cannot be sulfinyl or sulfonyl and that when A and $A^1$ are sulfinyl or sulfonyl, they must be in equal oxidation states.

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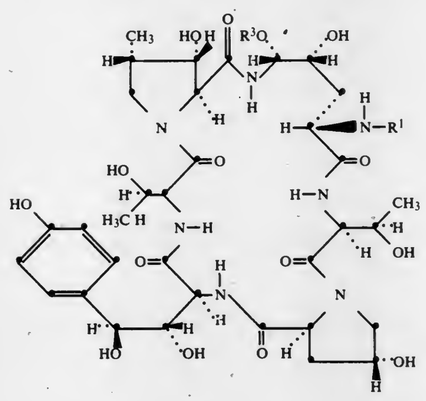
**4,293,484**

## DERIVATIVES OF A-30912H NUCLEUS

**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,146, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,034**
**Int. Cl.³ C07C *103/52***
**U.S. Cl. 260—112.5 R** **40 Claims**

1. A compound of the formula:



wherein $R^3$ is $C_1$–$C_6$ alkyl and $R^1$ is a group of the formula:

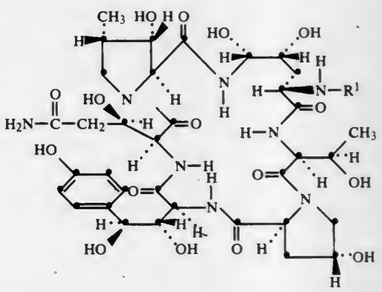
**4,293,485**

## DERIVATIVES OF S31794/F-1 NUCLEUS

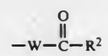
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,148, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,436**
**Int. Cl.³ C07C *103/52*; A61K *37/00*; C12P *21/04***
**U.S. Cl. 260—112.5 R** **25 Claims**

1. A compound of the formula:



wherein $R^1$ is an N-alkanoyl amino acyl group of the formula



wherein:

W is a divalent aminoacyl radical of the formula:

**4,293,486**

## DERIVATIVES OF S31794/F-1 NUCLEUS

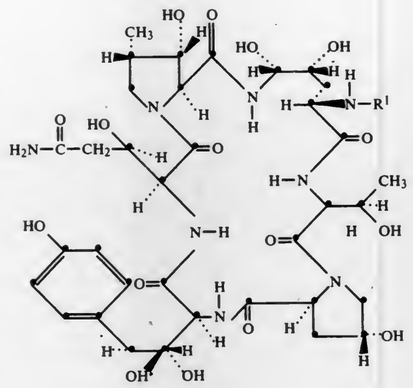
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,150, Dec. 13, 1979. This application Aug. 25, 1980, Ser. No. 181,037**

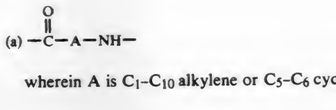
**Int. Cl.**[3] **C07C** *103/52*

**U.S. Cl. 260—112.5 R** **40 Claims**

**1.** A compound of the formula:

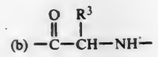


wherein $R^1$ is a group of the formula:



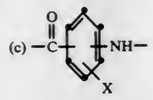
(a)

wherein A is $C_1$–$C_{10}$ alkylene or $C_5$–$C_6$ cycloalkylene:



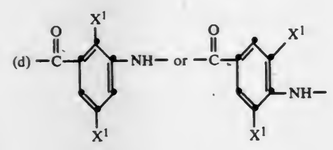
(b)

wherein $R^3$ is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indolemethyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;



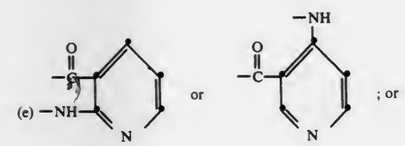
(c)

wherein **X** is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;



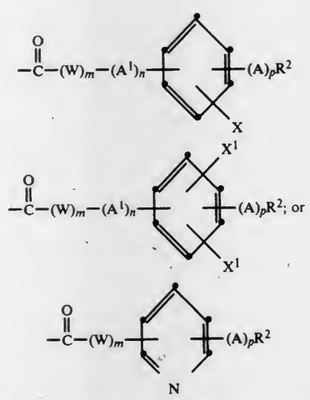
(d)

wherein $X^1$ is chloro, bromo, or iodo;



(e)

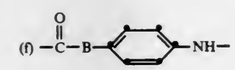
wherein A is divalent oxygen, sulfur, sulfinyl, or sulfonyl; $A^1$ is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl or $C_1$–$C_3$ alkylcarbamyl; $X^1$ is chloro, bromo or iodo; $R^2$ is hydrogen $C_1$–$C_{18}$ alkyl or $C_2$–$C_{18}$ alkenyl; W is $C_1$–$C_{10}$ alkylene or $C_2$–$C_{10}$ alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the $R^2$ and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and $A^1$ cannot be sulfinyl or sulfonyl and that when A and $A^1$ are sulfinyl or sulfonyl, they must be in equal oxidation states.



(a)

(b)

(c)



(f)

wherein B is a divalent radical of the formula: —$(CH_2)_n$—, wherein n is an integer from 1 to 3; —CH=CH—; —CH=CH—$CH_2$—; or



and

$R^2$ is $C_1$–$C_{17}$ alkyl or $C_2$–$C_{17}$ alkenyl.



**4,293,487**

## DERIVATIVES OF A-30912D NUCLEUS

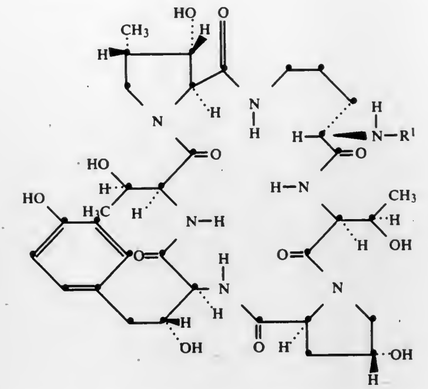
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,015, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,040**

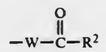
**Int. Cl.**[3] **C07C** *103/52;* **A61K** *37/00;* **C12P**-*21/04*

**U.S. Cl. 260—112.5 R** **25 Claims**

**1.** A compound of the formula:



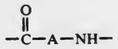
wherein $R^1$ is an N-alkanoyl amino acyl group of the formula



wherein:

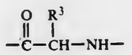
W is a divalent aminoacyl radical of the formula:

(a)



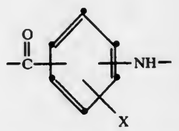
wherein A is $C_1$–$C_{10}$ alkylene or $C_5$–$C_6$ cycloalkylene;

(b)



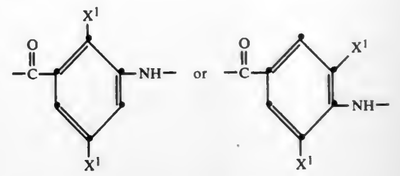
wherein $R^3$ is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indolemethyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;

(c)



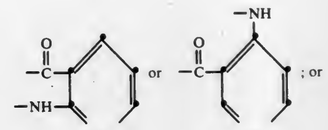
wherein X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;

(d)



wherein $X^1$ is chloro, bromo, or iodo;

(e)



(f)

wherein B is a divalent radical of the formula: —$(CH_2)_n$—, wherein n is an integer from 1 to 3; —CH=CH—; —CH=CH—$CH_2$—; or



and $R^2$ is $C_1$–$C_{17}$ alkyl or $C_2$–$C_{17}$ alkenyl.

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**4,293,488**

## DERIVATIVES OF A-30912B NUCLEUS

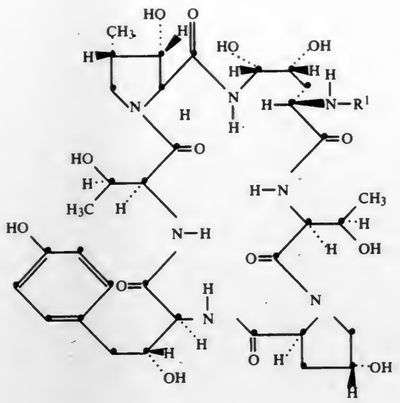
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,131, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,435**

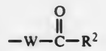
**Int. Cl.**[3] **C07C** *103/52;* **A61K** *37/00;* **C12P** *21/04*

**U.S. Cl. 260—112.5 R** **25 Claims**

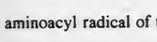
**1.** A compound of the formula:



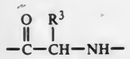
wherein $R^1$ is an N-alkanoyl amino acyl group of the formula



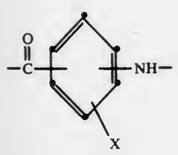
wherein:
W is a divalent aminoacyl radical of the formula:

(a) 

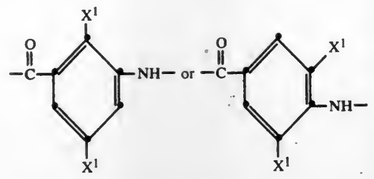
wherein A is $C_1$–$C_{10}$ alkylene or $C_5$–$C_6$ cycloalkylene;

(b) 

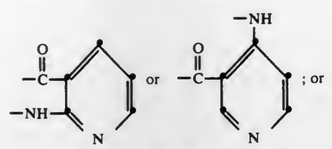
wherein $R^3$ is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indolemethyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;

(c) 

wherein X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;

(d) 

wherein $X^1$ is chloro, bromo, or iodo;

(e) 

wherein B is a divalent radical of the formula: $-(CH_2)_n-$, wherein n is an integer from 1 to 3;



and $R^2$ is $C_1$–$C_{17}$ alkyl or $C_2$–$C_{17}$ alkenyl.

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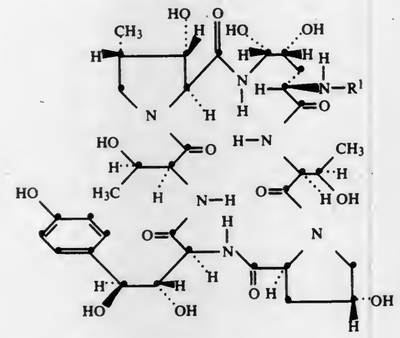
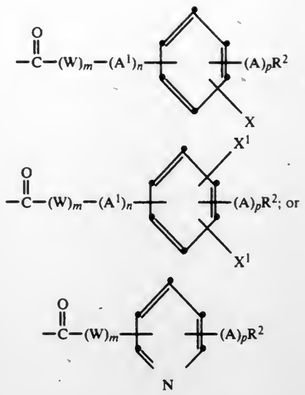
**4,293,489**
**DERIVATIVES OF A-30912A NUCLEUS**
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**
**Continuation-in-part of Ser. No. 103,012, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,442**
**Int. Cl.³ C07C *103/52***
**U.S. Cl. 260—112.5 R** **40 Claims**

1. A compound of the formula:



wherein $R^1$ is a group of the formula:





wherein A is divalent oxygen, sulfur, sulfinyl, or sulfonyl; $A^1$ is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl or $C_1$–$C_3$ alkylcarbamyl; $X^1$ is chloro, bromo or iodo; $R^2$ is hydrogen $C_1$–$C_{18}$ alkyl or $C_2$–$C_{18}$ alkenyl; W is $C_1$–$C_{10}$ alkylene or $C_2$–$C_{10}$ alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the $R^2$ and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and $A^1$ cannot be sulfinyl or sulfonyl and that when A and $A^1$ are sulfinyl or sulfonyl, they must be in equal oxidation states.

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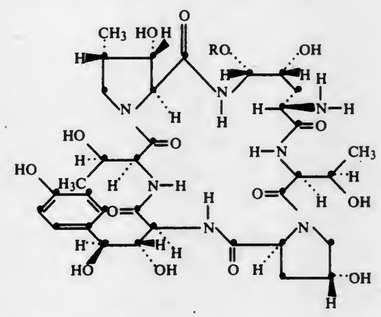
**4,293,490**
**A-30912H NUCLEI**
**Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**
**Continuation-in-part of Ser. No. 103,016, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,443**
**Int. Cl.³ C07C *103/52*; C12P *21/04*; H61K *37/00***
**U.S. Cl. 260—112.5 K** **33 Claims**

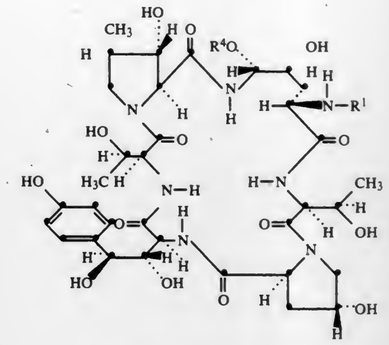
1. A-30912H-type compounds of the formula



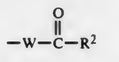
wherein R is $C_1$–$C_6$ alkyl and the acid addition salts thereof.

(a) **Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**
**Continuation-in-part of Ser. No. 103,147, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 182,248**
**Int. Cl.³ C07C *103/52***
**U.S. Cl. 260—112.5 R** **25 Claims**

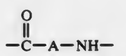
(b) 1. A compound of the formula:

(c) 

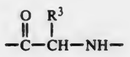
wherein $R^4$ is $C_1$–$C_6$ alkyl and $R^1$ is an N-alkanoyl amino acyl group of the formula



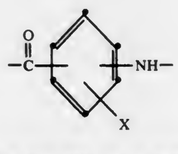
wherein:
W is a divalent aminoacyl radical of the formula:

(a) 

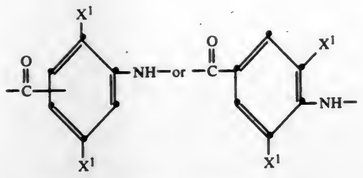
wherein A is $C_1$–$C_{10}$ alkylene or $C_5$–$C_6$ cycloalkylene;

(b) 

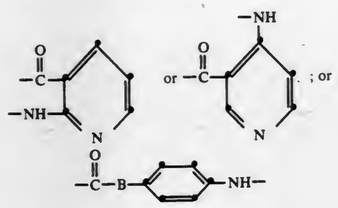
wherein $R^3$ is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indolemethyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$alkylcarbamyl;

(c) 

wherein X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl, or $C_1$–$C_3$ alkylcarbamyl;



wherein $X^1$ is chloro, bromo, or iodo;



wherein B is a divalent radical of the formula: $-(CH_2)_n-$, wherein n is an integer from 1 to 3; $-CH=CH-$;



and $R^2$ is $C_1$–$C_{17}$ alkyl or $C_2$–$C_{17}$ alkenyl.

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**4,293,492**

## DISAZO COMPOUNDS DERIVED FROM 3,6-BIS(STYRYL)-9-ETHYLCARBAZOLE

**Masaomi Sasaki, Kawasaki; Kiyoshi Sakai, Tokyo; Mitsuru Hashimoto, Hino; Masafumi Ohta, Yokohama, and Kyoji Tsutsui, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

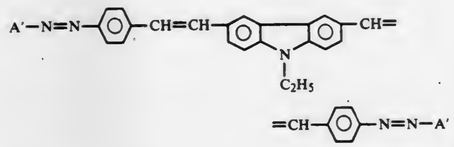
**Division of Ser. No. 921,086, Jun. 30, 1978, Pat. No. 4,251,614. This application May 20, 1980, Ser. No. 152,061**

**Claims priority, application Japan, Jul. 5, 1977, 52-80116; Jul. 8, 1977, 52-81791**

**Int. Cl.³ C09B** *35/24, 35/34*

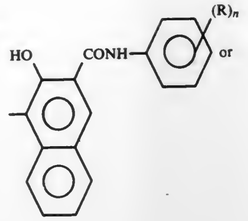
**U.S. Cl. 260—160** **26 Claims**

1. A disazo compound having the formula

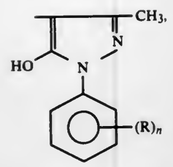


in which A′ is

(d)



(e)



(f)

wherein R is alkyl, alkoxy, nitro, dialkylamino or halogen, n is zero or the integer **1**, **2** or **3**, and R is either the same or different when n is the integer **2** or **3**.

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**4,293,493**

## AZETIDINONE ALCOHOL DISULFIDES AND PROCESS FOR CYCLIZATION

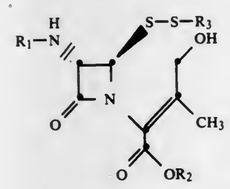
**Stjepan Kukolja, Carmel, and Janice L. Pfeil, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Apr. 7, 1980, Ser. No. 137,862**

**Int. Cl.³ C07D** *205/08, 403/12, 403/14, 405/14*

**U.S. Cl. 260—239 A** **25 Claims**

1. A compound of the formula;



wherein $R_1$ is an acyl group of the formula

wherein R′ is

(a) $C_1$–$C_7$ alkyl, cyanomethyl, $C_1$–$C_6$ haloalkyl,4-protected amino-4-protected carboxybutyl; or

(b) $C_1$–$C_6$ alkoxy, phenoxy, benzyloxy or 4-methoxybenzyloxy; or

(c) the group —R″ wherein R″ is phenyl or substituted phenyl wherein the substituents are 1 or 2 halogens, protected hydroxy, cyano, trifluoromethyl, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, protected carboxy, protected carboxymethyl, protected hydroxmethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

$$R''-(O)_m-CH_2-$$

wherein R″ is as defined above, and m is 0 or 1; or

(e) a substituted arylalkyl group of the formula

wherein

R‴ is R″ as defined above, 2-thienyl, 3-thienyl, 2-furyl or 3-furyl; W is protected hydroxy, protected carboxy, protected amino, or

(f) a heteroarylmethyl groups of the formula

$$R''''-CH_2-$$

wherein

R‴′ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl;

$R_2$ is a carboxy protecting group and $R_3$ is another identically substituted azetidinone alcohol moiety bonded to the opposite end of the disulfide group or is phenyl or a monosubstituted phenyl group, where the substituents are chloro, methoxy, methyl or acetoxy.

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**4,293,494**

## METHOD FOR THE PURIFICATION OF RAW CAPROLACTAM WHICH CONTAINS AMIDES AND OTHER BY-PRODUCTS

**Paolo Senni, Colleferro, and Domenico Astarita, Segni, both of Italy, assignors to Snia Viscosa S.p.A., Milan, Italy**

**Filed Apr. 24, 1980, Ser. No. 143,418**

**Claims priority, application Italy, May 4, 1979, 22355 A/79**

**Int. Cl.³ C07D** *201/16*

**U.S. Cl. 260—239.3 A** **9 Claims**

1. A method for the purification of raw caprolactam, which contains as impurities one or more primary amides according to formula I:

(I)

wherein R is a hydrocarbon radical having from 1 to 14 carbon atoms, and other by-products, comprising performing the following operations in the order indicated hereinbelow:

(a) treating a solution of said raw caprolactam in which the solvent is a substantially water insoluble organic solvent with water in such a way as to extract the greater part of the caprolactam in purified form;

(b) separating the aqueous caprolactam solution from the water insoluble organic solvent and isolating the caprolactam from the aqueous solution;

(c) treating the remaining solution containing the organic solvent with a mineral acid in a concentration as to be inert with respect to the organic solvent and to cause the formation of two separate phases;

(d) separating the two phases into a heavy phase, containing the mineral acid, its respective dilution water and the greater part or all the amides according to formula I and said by-products; and a light phase containing said organic solvent; and

(e) recycling said light phase to (a).

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**4,293,495**

## SYMMETRICAL AZETIDINONE ALDEHYDE DISULFIDES AND PROCESS

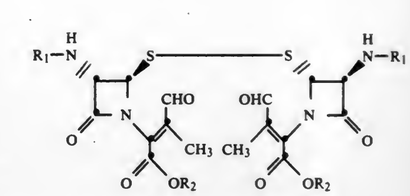
**Stjepan Kukolja, Carmel, and Janice L. Pfeil, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Apr. 7, 1980, Ser. No. 138,023**

**Int. Cl.³ C07D** *205/08, 403/12, 403/14, 405/14*

**U.S. Cl. 260—245.4** **9 Claims**

1. A compound of the formula;



wherein $R_1$ is an acyl group of the formula

wherein R′ is

(a) $C_1$–$C_7$ alkyl, cyanomethyl, $C_1$–$C_6$ haloalkyl, 4-protected amino-4-protected carboxybutyl; or

(b) $C_1$–$C_6$ alkoxy, phenoxy, benzyloxy or 4-methoxybenzyloxy; or

(c) the group —R″ wherein R″ is phenyl or substituted phenyl wherein the substituents are 1 or 2 halogens, protected hydroxy, cyano, trifluoromethyl, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, protected carboxy, protected carboxymethyl, protected hydroxymethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

$$R''-(O)_m-CH_2-$$

wherein R″ is as defined above, and m is 0 or 1; or

(e) a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl, 3-thienyl, 2-furyl or 3-furyl; W is protected hydroxy, protected carboxy, protected amino or

(f) a heteroarylmethyl group of the formula

$$R''''-CH_2-$$

wherein R‴′ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl;

and $R_2$ is a carboxy protecting group.

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**4,293,496**

## 6(R)-[2-(8-HYDROXY-2,6-DIMETHYLPOLYHYDRONAPHTHYL-1)-ETHYL]-4(R)-HYDROXY-3,4,5,6-TETRAHYDRO-2H-PYRAN-2-ONES

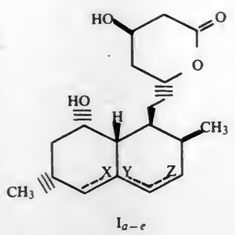
**Alvin K. Willard, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 118,049, Feb. 4, 1980, abandoned. This application Aug. 5, 1980, Ser. No. 175,232**

**Int. Cl.³ C07D** *309/30;* **C07C** *59/11*

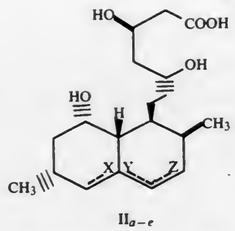
**U.S. Cl. 260—343.5** **6 Claims**

1. A compound of the formula



$I_{a-e}$

or



$II_{a-e}$

in which the dotted lines X, Y and Z represent possible double bonds, said double bonds, when any are present, being either X and Z in combination or one of X, Y or Z alone.

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**4,293,497**

## COUPLING REACTION INVOLVING A GRIGNARD AND ALLYLIC HALIDE

**Carlos G. Cardenas, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.**

**Division of Ser. No. 865,668, Dec. 29, 1977, Pat. No. 4,228,313, which is a division of Ser. No. 786,983, Apr. 13, 1977, which is a continuation-in-part of Ser. No. 596,273, Jul. 16, 1975, abandoned, and a continuation-in-part of Ser. No. 596,426, Jul. 16, 1975, abandoned, and a continuation-in-part of Ser. No. 596,274, Jul. 16, 1975, abandoned, and a continuation-in-part of Ser. No. 596,361, Jul. 16, 1975, abandoned. This application Mar. 18, 1980, Ser. No. 131,421**

**Int. Cl.³ C07D *311/72*; C07C *27/02***

**U.S. Cl. 260—345.5** **3 Claims**

1. A process for the synthesis of dehydrophytol or a polydehydro-phytol from a $C_{10}$ acyclic terpene hydrocarbon compound of the 2,6-dimethyloctane series, having a terminal isopropenyl or isopropylidene group, and a $C_{10}$ aliphatic compound comprising the steps of;

(a) halogenating said $C_{10}$ acyclic terpene hydrocarbon to produce an allylic halide having a halogen allylic to a terminal olefinic site;

(b) forming the Grignard reagent RMgX of said $C_{10}$ aliphatic compound, RMgX being 3,7-dimethyloctyl-magnesium halide or a compound having the same arrangement of carbon atoms and one or more points of unsaturation;

(c) preparing a reaction mixture comprising adding said Grignard reagent to said allylic halide said reaction mixture including a transition metal catalyst and a dipolar aprotic solvent;

(d) removing from said reaction mixture a $C_{20}$ compound in which coupling of the Grignard reagent and allylic halide occurs by displacement by R of the Grignard reagent at the terminal olefinic site of the allylic halide accompanied by double bond migration and loss of halide; and

(e) converting the coupling product to a polydehydrophytol or dehydrophytol.

**4,293,498**

## PREPARATION OF MALEIC ANHYDRIDE

**Michael F. Lemanski, Cleveland; Noel J. Bremer, Stow, and Ernest C. Milberger, Solon, all of Ohio, assignors to Standard Oil Co., Cleveland, Ohio**

**Filed Oct. 22, 1980, Ser. No. 199,148**

**Int. Cl.³ C07D *307/60***

**U.S. Cl. 260—346.75** **10 Claims**

1. A process for the production of maleic anhydride by the oxidation of n-butane, n-butene, 1,3-butadiene or a mixture thereof with molecular oxygen or oxygen-containing gas in the vapor phase at a reaction temperature of 250° C.–600° C. in the presence of a catalyst containing the mixed oxides of vanadium and phosphorus, wherein said catalyst is prepared by

(a) introducing a pentavalent vanadium-containing compound into an olefinic, halogenated organic liquid-containing liquid medium,

(b) effecting reduction of at least a portion of said vanadium to a valence state of about +4;

(c) adding a phosphorus-containing compound to said medium before or after effecting said reduction to form a catalyst precursor;

(d) recovering the catalyst precursor;

(e) drying the catalyst precursor;

(f) calcining the catalyst precursor.

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**4,293,499**

## PROCESS FOR PRODUCING A CARBOXYLATE ESTER USING A SUPPORTED ACIDIC CATALYST

**O. Richard Hughes, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Filed Feb. 8, 1980, Ser. No. 119,682**

**Int. Cl.³ C07C *67/05***

**U.S. Cl. 260—410.9 R** **19 Claims**

1. A process for producing a carboxylate ester which comprises contacting a mixture of a monoolefin containing between about 2–12 carbon atoms and a carboxylic acid containing between about 1–20 carbon atoms with a strongly acidic solid catalyst at a temperature in the range between about 100°–400° C., wherein said solid catalyst comprises a composite of between about 0.5–40 weight percent, based on catalyst weight, of 5-sulfoisophthalic acid in combination with a carrier substrate having a surface area between about 1–1000 $m^2$/gram.

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**4,293,500**

## UNSATURATED ESTERS AND METHOD OF PREPARING THEM

**Didier Morel, Lyon, France, assignor to Rhone-Poulenc Industries, Saint-Fons, France**

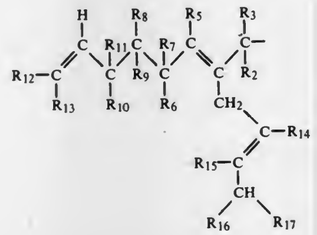
**Filed Mar. 4, 1980, Ser. No. 127,047**

**Claims priority, application France, Mar. 12, 1979, 79 06214**

**Int. Cl.³ C07C *67/28***

**U.S. Cl. 260—410.9 R** **15 Claims**

1. A mixture of unsaturated esters of the formula $ACOOR_1$, in which $R_1$ represents an alkyl group having from about 1 to 6 carbon atoms and "A" is selected from the group consisting of hydrocarbon radicals of the formulae:





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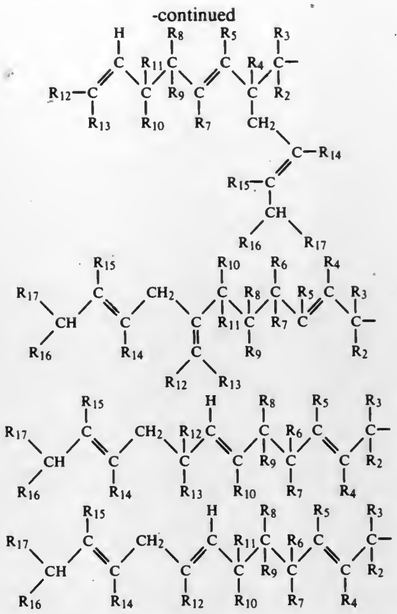
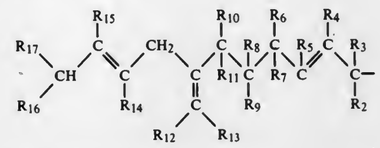


in which $R_2$ to $R_{17}$, inclusive, being identical or different, represent a member selected from the class consisting of a hydrogen atom and an alkyl radical having from about 1 to 3 carbon atoms, wherein said unsaturated ester in which hydrocarbon radical "A" has the formula:



is the major component of said mixture.

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**4,293,501**

## β-LACTAM ANTIBIOTICS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

**Roger J. Ponsford, Horsham; Andrew J. G. Baxter, Hull, and Robert Southgate, Warnham, all of England, assignors to Beecham Group Limited, England**

**Division of Ser. No. 4,896, Jan. 19, 1979, Pat. No. 4,255,441. This application Dec. 14, 1979, Ser. No. 103,562**

**Claims priority, application United Kingdom, Mar. 14, 1978, 0998578**

**Int. Cl.³ C07F *1/10, 1/02, 1/04***

**U.S. Cl. 260—430** **6 Claims**

1. The sodium, thallium, silver or lithium salt of a compound of the formula:

$$HS—CH=CHNHC(O)_nR_6$$

wherein

n is 1 or 2, and

$R_6$ is lower alkyl, phenyl or phenyl substituted by one or two members selected from the group consisting of halo, lower alkyl or lower alkoxy.



**4,293,502**

## NICKEL YLIDES

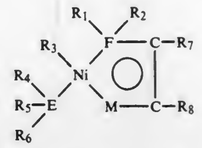
**David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Aug. 18, 1980, Ser. No. 179,079**

**Int. Cl.³ C07F *15/04***

**U.S. Cl. 260—439 R** **19 Claims**

1. A nickel ylide defined by the following formula:



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$ and $R_8$ are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbons atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy, provided that at least one of each of $R_1$ to $R_8$ radicals is a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl carrying a sulfonato group, M is sulfur or oxygen, E is phosphorus, arsenic, antimony or nitrogen and F is phosphorus, arsenic or antimony.

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**4,293,503**

## SYNTHESIS OF POLYOL BIS(ALLYL CARBONATE) UTILIZING REAGENT RECOVERY AND RECYCLE

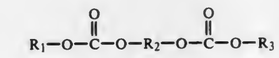
**Elgin E. Young, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jan. 10, 1980, Ser. No. 111,146**

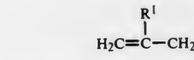
**Int. Cl.³ C07C *69/96***

**U.S. Cl. 260—463** **13 Claims**

1. In a method of forming bis(allyl carbonate) monomer represented by the formula:



where $R_1$ and $R_3$ are allyl groups represented by the formula:



where R' is chosen from the group consisting of H, a halogen, and a 1 to 4 carbon alkyl group, and $R_2$ is chosen from the group consisting of alkylene groups, alkylene ether groups, and alkylene polyether groups, comprising:

(a) forming a first reaction solution of bis(chloroformate) and allyl alcohol;

(b) adding aqueous alkali metal hydroxide to the reaction solution whereby to form bis(allyl carbonate); and

(c) recovering (1) an organic phase containing bis(allyl carbonate) monomer, and (2) an aqueous phase containing water soluble organics and unreacted allyl alcohol reagent: the improvement comprising:

(a) distilling said aqueous phase into a high-boiling residue and a low-boiling distillate, wherein said distillate contains a water-allyl alcohol azeotrope; and

(b) feeding said distillate to a second reaction solution containing bis(chloroformate).

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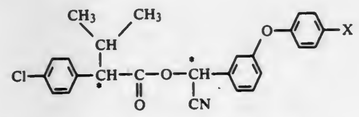
**4,293,504**

## PROCESS FOR PREPARING OPTICALLY ACTIVE α-CYANO-3-(4-HALOGENOPHENOXY)-BENZYL 2-(4-CHLOROPHENYL)ISOVALERATE

**Yukio Suzuki, Toyonaka; Kiyoshi Kasamatsu, Takarazuka, and Kohichi Aketa, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,716**
**Claims priority, application Japan, Feb. 5, 1979, 54-12500**
**Int. Cl.³ C07C *121/75***
**U.S. Cl. 260—465 D** **9 Claims**

1. A process for preparing the compound (S)-α-cyano-3-(4-halogenophenoxy)benzyl (S)-2-(4-chlorophenyl)isovalerate, substantially free of other isomers, which comprises crystallizing said compound from a solution of the compound of the formula



wherein X is a fluorine atom, a chlorine atom or a bromine atom, and * indicates an asymmetric carbon atom, having an (S)-configuration on the acid moiety with or without being seeded with crystals in the presence or absence of a basic catalyst, and separating the crystal of said compound from the mother liquor.

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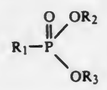
**4,293,505**

## PREPARATION OF β-HALOETHYLPHOSPHONIC ACIDS AND HALF ESTERS THEREOF

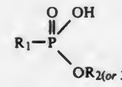
**David I. Randall, 417 Dogwood Ter., Easton, Pa. 18042**

**Division of Ser. No. 872,766, Oct. 30, 1969, which is a continuation-in-part of Ser. No. 628,839, Apr. 6, 1967. This application Jan. 31, 1980, Ser. No. 117,334**
**Int. Cl.³ C07F *9/40***
**U.S. Cl. 260—983** **10 Claims**

1. A process for producing β-haloethylphosphonic acid which comprises introducing anhydrous HCl or HBr from an outside source into a diester stable at a temperature above 140° C. and having the formula



wherein $R_1$ is haloethyl and $R_2$ and $R_3$ represent alkyl or haloalkyl containing no more than 6 carbon atoms, at a temperature of about 140° C. to 165° C. until a product is obtained containing about 3 to 40% of the corresponding monoester of the formula



no more than 5% of dehydrohalogenated impurities, no more than about 5% of other impurities, and the balance β-haloethylphosphonic acid or anhydride.

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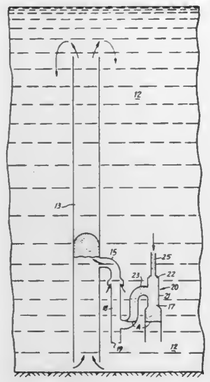
**4,293,506**

## LIQUID CIRCULATING DEVICE

**Peter Lipert, Dollard des Ormeaux, Canada, assignor to Atara Corporation, Dorval, Canada**

**Continuation-in-part of Ser. No. 3,707, Jan. 15, 1979, Pat. No. 4,187,263. This application Jul. 5, 1979, Ser. No. 54,826**
**The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.**
**Int. Cl.³ B01F *3/04***
**U.S. Cl. 261—77** **18 Claims**



1. A device for creating circulation within a body of liquid, the device comprising a substantially vertically extending stackpipe means designed to be wholly submerged within the liquid, the stackpipe having an upper discharge opening and a lower inlet opening; a large-bubble generator means located adjacent the stackpipe and comprising a gas-accumulator chamber having a peripheral wall, a top wall, and an opening at the chamber bottom; a substantially vertically extending standpipe adjacent the accumulator chamber and the stackpipe; an inverted siphon defining fluid flow connecting means between the upper portion of the accumulator chamber and the standpipe; means for delivering gas under pressure into the accumulator chamber; transverse gas flow conduit means between the upper end of the standpipe and the stackpipe, the transverse conduit connecting through the peripheral wall of the stackpipe; and secondary liquid inlet means into the transverse conduit between the standpipe and the stackpipe.

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**4,293,507**

## PREPARATION OF SHAPED BODIES

**Peter W. Sutcliffe, Abingdon; Jim W. Isaacs, Harwell; Robert L. Nelson, Kingston; Colin E. Lyon, Charlton Heights, and Brian Stringer, East Hendred, all of England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Filed May 17, 1979, Ser. No. 39,964**
**Claims priority, application United Kingdom, May 26, 1978, 23671/78**
**Int. Cl.³ G21C *21/02***
**U.S. Cl. 264—0.5** **14 Claims**

1. A method for the preparation of a shaped body comprising cold pressing a material consisting essentially of gel particles produced by the gel precipitation process to give the shaped body, wherein the material has not been substantially comminuted prior to cold pressing.

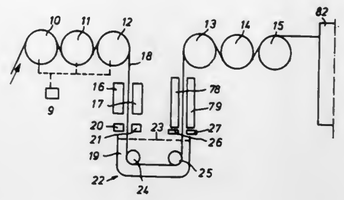


**4,293,508**

## METHOD AND APPARATUS FOR LONGITUDINALLY STRETCHING A SUBSTANTIALLY AMORPHOUS POLYETHYLENE TEREPHTHALATE FILM

**Wilfried A. Heirbaut, Haasdonk, and Walter J. Rens, Kontich, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium**

**Filed Apr. 11, 1980, Ser. No. 139,558**
**Claims priority, application United Kingdom, Apr. 11, 1979, 12859/79**
**Int. Cl.³ B29C *17/02*; B29D *9/00*; B32B *27/06***
**U.S. Cl. 264—25** **24 Claims**



1. A process of longitudinally stretching a substantially amorphous polyethylene terephthalate film during its longitudinal conveyance in which longitudinal stretching forces are applied to the film by first and second traction means located at spaced positions along the path of conveyance of the film, while heating the film between said first and second traction means by means of infrared radiation to a temperature such that the film undergoes plastic elongation under said stretching forces, and then cooling the stretched film, characterised by the steps of maintaining the temperature of the first traction means not higher than 65° C., carrying out said heating by directly and symmetrically exposing both sides of the film first to diffused IR-radiation to increase the film temperature but not sufficient for plastic elongation to occur, thereby preheating the film, and then to concentrated infrared radiation to heat the film to a temperature between 100° and 120° C. whereby rapid plastic elongation of the film occurs under said stretching forces, and then rapidly cooling the film to below its second order transition temperature, before it reaches the second traction means, by bringing the two sides of the film symmetrically into contact with a cooling liquid.

13. Apparatus for longitudinally stretching a substantially amorphous polyethylene terephthalate film comprising:

first driven roller means for feeding said film at a first speed in a zone where the film is freely supported,

means for maintaining the temperature of said first roller means lower than 65° C.,

second driven roller means for removing the cooled film from said zone at a second speed that is higher than said first speed to cause the film to be stretched in said zone,

first IR-heaters disposed symmetrically at both sides of the film path through said zone for producing IR-radiation thereby to heat the film to a temperature at which it does not yet become stretched,

second IR-heaters disposed transversely and symmetrically at both sides of the film path, for heating the film to a temperature between 100° and 120° C. to effect stretching thereof,

a bath of cooling liquid into which the stretched film is immersed,

means in said bath for keeping the free surface of said cooling liquid at the entry region of the film quiescent, and

roller means disposed below the level of the cooling liquid in said bath for terminating the zone where the film is free supported.

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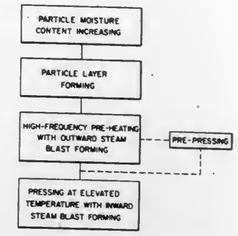
**4,293,509**

## PROCESS FOR THE PRODUCTION OF CHIPBOARDS, FIBERBOARDS, OR LIKE BOARDS

**Günter Bücking, Spring, Fed. Rep. of Germany, assignor to Bison-werke Bähre & Greten GmbH & Co. KG, Spring, Fed. Rep. of Germany**

**Filed Dec. 17, 1979, Ser. No. 104,703**
**Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854336**
**Int. Cl.³ B29J *5/02***
**U.S. Cl. 264—26** **15 Claims**




1. Process for the production of chipboards, fiberboards, and like boards from particles which are electrically nonconductive and have a poor thermal conductivity, comprising the steps of combining the particles with at least one binder and with water, forming a chip or like layer on a moving support, preheating said layer by high-frequency and thereafter pressing the layer into boards with the use of contact heat that produces a steam blast that is effective from the outside of the layer toward the inside, characterized in that the layer is provided initially with the same amount of moisture throughout, which amount is sufficient to produce, by means of and during the high-frequency preheating step, a steam blast which proceeds from the inside of the layer into the surface zone thereof.

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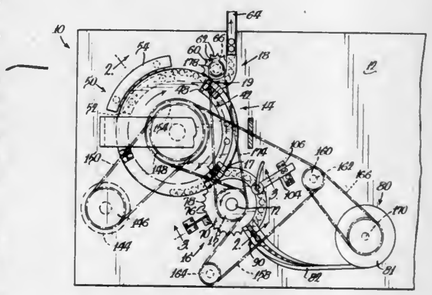
**4,293,510**

## METHOD OF LINING CLOSURES

**Robert W. George, Naperville; Casper W. Miller, Mundelein, and Kenneth Rapey, Chicago, all of Ill., assignors to National Can Corporation, Chicago, Ill.**

**Division of Ser. No. 906,770, May 18, 1978, abandoned. This application May 18, 1980, Ser. No. 133,261**
**Int. Cl.³ B29C *13/02***
**U.S. Cl. 264—40.7** **3 Claims**



1. A method of producing lined cap closures at a rate of more than one-thousand per minute with a continuously rotating feed wheel having a plurality of pockets, a molding and curing head having a plurality of stations and a take-off wheel having a plurality of pockets all rotating at said rate, aligning a dispensing unit above the path of movement of the pockets for

said feed wheel with the dispensing unit having an elongated generally circular chamber having an upper inlet and a lower outlet with a polygonal plunger reciprocated in said chamber to open and close said outlet and a solenoid surrounding said chamber, a surface of said chamber and said polygonal plunger defining flow paths between said upper inlet and said lower outlet, delivering unlined closures to the respective pockets of said feed wheel, delivering a continuous supply of pressurized liquid lining compound at substantially room temperature under pressure to said upper inlet of said dispensing unit, sensing the position of the pockets of the feed wheel with respect to the path for said pockets, actuating said solenoid each time a pocket is aligned therewith to raise said plunger and open said outlet to cause said compound to flow through said flow paths along said surface of said chamber and said lower outlet toward said closures while maintaining said dispensing unit at substantially room temperature, and heating each of said stations sufficiently to cure said compound between the inlet and outlet for said closures from the head to cure said compound.

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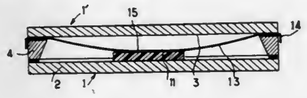
## 4,293,511
## PROCESSES AND PRODUCTION APPARATUS FOR RIGID CELLULAR MATERIALS COMPRISING POLYVINYL CHLORIDE

**Michel Vernon, Trilport, France, assignor to K.R.P. Plastiques, Trilport, France**

**Continuation-in-part of Ser. No. 958,026, Nov. 6, 1978, abandoned. This application Oct. 10, 1980, Ser. No. 195,760**
**Claims priority, application France, Nov. 9, 1977, 77 33693**
**Int. Cl.³ B29D *27/00***
**U.S. Cl. 264—55** **28 Claims**




1. In a process for producing rigid cellular plastic by treatment of an embryonic block of PVC containing a polyisocyanate, with a hot fluid comprising water selected from the group consisting of liquid water and water vapor, the improvement comprising:

introducing said embryonic block into a closable expansion box into which the hot fluid can pass and having side walls, a bottom wall and a top wall, and further containing a centering and holding means for the embryonic block, said expansion box being of predetermined, fixed internal maximum dimensions, closing said expansion box and centering and holding said embryonic block in place with said centering and holding means;

introducing said closed box containing said embryonic block into a first bath of said hot fluid at a temperature of about 80°–85° C. for a sufficiently long period to pre-heat said embryonic block to a uniform temperature;

removing said closed expansion box from said first bath and immersing it into a second bath of said hot fluid at a temperature of about 90°–95° C. for a period sufficient to cause pre-expansion of said block;

removing said expansion box from said second bath and immersing it into a third bath of said hot fluid held at a temperature of about 95°–100° C. for a period sufficiently long to bring about expansion of said block to the internal dimensions of said expansion box and also to bring about hardening of said expanded block by reaction between said water and said polyisocyanate, the expansion of said block being performed in said closed expansion box and being controlled by means of said centering and holding means and without transferring of said block from one expansion box to another; and

cooling said expansion box containing said expanded block for a period sufficiently long to dimensionally stabilize said expanded block.

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## 4,293,512
## MAKING TEMPERATURE-STABLE PROTECTIVELY COATED GRAPHITE MOLDED BODY

**Hartmut Luhleich, Düren; Peter Pflaum; Francisco J. Dias, both of Jülich; Aristides Nauomidis, Jülich-Koslar; Arno Schirbach, Stolberg, and Hubertus Nickel, Jülich-Koslar, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany**

**Filed Nov. 14, 1979, Ser. No. 94,120**
**Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718142; Apr. 23, 1977, 2718143**
**Int. Cl.³ F27B *9/14*; C01B *31/36***
**U.S. Cl. 264—58** **3 Claims**

1. A method of making a temperature-stable protectively coated graphite molded body, comprising the steps of:

making a molded body by conglomerating in a mold particles of at least one carbonaceous material of at least partly graphitic composition, said particles being coated with a synthetic resin binder;

applying to said body, before any heating thereof to a coking temperature, successive layers of one or more materials of the kind or kinds used in the conglomerating step mixed with an admixture of between nearly zero atomic % and about 50 atomic % of a substance selected from the group consisting of silicon and zirconium, said substance being in the form of particles coated with said synthetic resin binder, said layers being applied in such a way that the layer nearest said molded body contains the smallest proportion of said substance and the outermost layer the highest proportional content thereof, with the other layers providing intermediate gradations of such proportional content, to produce a coated body;

heating the body after each layer application to a heat treatment sufficient to harden the binder; and

after the application of the last layer, further heating the body, first to coke the body including the layers and then, by a rapid rise of temperature to a temperature in the range of from 1500° C. to 1800° C., to convert said substance at least partially into its carbide.

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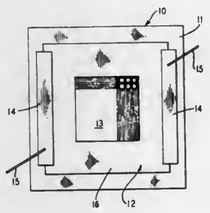
## 4,293,513
## METHOD OF MAKING HONEYCOMB STRUCTURES

**Robert C. Langley, Millington; Herbert Myers, Newark, and Muriel Abrash, Paterson, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.**

**Continuation of Ser. No. 344,510, Mar. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,127, Nov. 2, 1970, abandoned. This application May 12, 1975, Ser. No. 576,640**
**Int. Cl.³ C04B *35/64***
**U.S. Cl. 264—60** **10 Claims**




1. A process for making a monolithic structure having a plurality of channels comprising:

(a) admixing an inorganic powder and a temporary vehicle to provide an admixture which is solid and self-supporting at room temperature and is fluid at an elevated temperature, said inorganic powder being capable of being sintered;

(b) depositing the admixture on a stencil having a plurality of masking islands;

(c) providing the admixture deposited on said stencil in a heated fluid condition;

(d) forcing the resulting heated, fluidized admixture through said stencil, thereby forming a thin lamina beneath and in contact with the bottom of said stencil, and immediately cooling said lamina by loss of heat to the ambient surroundings to form a reproduction of said stencil such that said masking islands define openings in said lamina;

(e) repeating step (d) at least about 20 times in a manner such that each lamina is formed on the top surface of the lamina previously formed so as to produce successive, overlying, cohesive laminae forming a substantially monolithic structure having a plurality of channels formed therethrough, said channels having a cross-sectional area defined by said openings provided by said masking islands, said successive, overlying, cohesive laminae being formed as a continuous structure of at least about ¼ inch in length;

(f) heating gradually the monolithic structure to remove said vehicle and to prevent distortion of the monolithic structure; and

(g) thereafter heating said monolithic structure to a sintering temperature, and then permitting the monolithic structure to cool, said structure exhibiting a condition of mechanical strength sufficient to be self-supporting.



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## 4,293,514
## METHOD OF PRODUCING HONEYCOMB STRUCTURAL BODIES CONSISTING OF BARIUM TITANATE SERIES CERAMICS HAVING A POSITIVE TEMPERATURE COEFFICIENT OF ELECTRIC RESISTANCE

**Shigetaka Wada, Kuwana, Japan, assignor to NGK Insulators, Ltd., Nagaya, Japan**

**Continuation of Ser. No. 851,705, Nov. 15, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 16,832**
**Claims priority, application Japan, Nov. 26, 1976, 51-141093**
**Int. Cl.³ C04B *35/46***
**U.S. Cl. 264—61** **6 Claims**

1. A method of producing a honeycomb structural body consisting of barium titanate series ceramics having a positive temperature coefficient of electric resistance, comprising kneading raw material powders, which contain at least 50% by weight of powders having perovskite type crystal structure and have a particle size distribution that 5–50% by weight of the raw material powders has a particle size of not smaller than 10 μm and 10–60% by weight thereof has a particle size of not larger than 2 μm, together with water and at least two kinds of organic binders to prepare a green mass, extruding the green mass into a honeycomb shaped article, drying the extruded article by blowing air through the channels of the honeycomb article at a rate of at least 50 cm/sec until the water content of the article becomes less than 5% by weight wherein the temperature of the air employed is less than 40° C., and firing the dried article, wherein said at least two kinds of organic binder are different by at least 50° C. in the decomposition temperature or weight decreasing temperature between a binder having the highest decomposition temperature or weight decreasing temperature and another binder having the lowest decomposition temperature of weight decreasing temperature.

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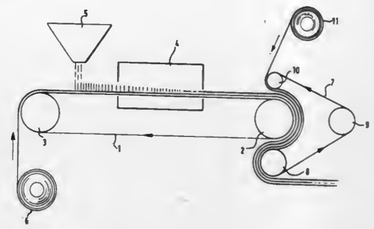
## 4,293,515
## MANUFACTURE OF PLASTICS PRODUCTS

**William J. Mair, Merrow, near Guildford, England, assignor to Plastic Recycling Limited, England**

**Filed Sep. 10, 1979, Ser. No. 73,615**
**Claims priority, application United Kingdom, May 11, 1979, 16510/79**
**Int. Cl.³ B27J *5/00***
**U.S. Cl. 264—120** **5 Claims**




1. A method of manufacturing a plastics product from a raw material containing at least 50% by weight reclaimed synthetic thermoplastics material, comprising the steps of:

forming a mat of the raw material in particulate form on a conveyor belt;

heating the mat of material by conveying the mat through an oven on the conveyor belt to cause the thermoplastics material in the mat to soften; and

compressing the softened mat downstream of the oven between said conveyor belt and a further belt passing around three rollers arranged generally one above the other to define a first passage between the upper and middle rollers and a second passage between the middle and lower rollers, the mat passing from the oven through said first passage, around the middle roller to said second passage, and then around the lower roller to continue in the direction away from the oven, the middle and lower rollers being of substantially greater diameter than the upper roller, while cooling the mat at least as it passes around said middle roller, whereby the softened thermoplastics material binds the pieces of other material in the mat to thus produce a unitary, continuous, indefinite length sheet.

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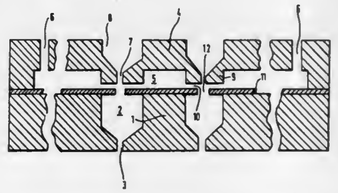
## 4,293,516
## PROCESS FOR SPINNING BICOMPONENT FILAMENTS

**Paul C. Parkin, Harrogate, England, assignor to Imperial Chemical Industries, Limited, London, England**

**Division of Ser. No. 97,067, Nov. 23, 1979, Pat. No. 4,251,200. This application Jun. 24, 1980, Ser. No. 162,354**
**Claims priority, application United Kingdom, Nov. 30, 1978, 46637/78**
**Int. Cl.³ D01D *5/22***
**U.S. Cl. 264—168** **4 Claims**




1. A process for the production of sheath/core bicomponent fibers using a spinning assembly comprising a spinneret plate

having at least one counter-bore terminating in an extrusion orifice, a distributor plate spaced apart from but facing the spinneret plate to provide a liquid channel therebetween, the distributor plate being provided with an aperture opposite each orifice in the spinneret plate, and a plateau like protrusion extending about the axis common to the aperture of the distributor plate and the extrusion orifice of the spinneret plate to constrict the liquid channel in a region surrounding the entrance to the counter-bore of the extrusion orifice, in which core forming material flows into the apertures provided in the distributor plate and sheath forming material flows into the liquid channel between the distributor plate and the spinneret plate, the improvement being that the flow of the sheath forming material into the entrance to the counter-bore of the extrusion orifice is restricted by an orifice plate provided in the spinning assembly.

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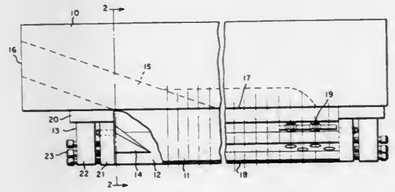
**4,293,517**

## DIE WITH INSERT AND ITS USE

**Kenneth L. Knox, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 14, 1980, Ser. No. 139,796**
**Int. Cl.³ B29F *3/04***
**U.S. Cl. 264—176 R** **9 Claims**



1. An extrusion die comprising:

(a) a die structure having an internal chamber with at least one inlet and an outlet of parallel, spaced-apart, die lands extending along the length of the die structure to form an outlet slit;

the internal chamber having two opposing inner walls of substantially flat surfaces, each with one edge parallel with the die lands and diverging away from the die lands at an acute angle with respect to the plane of the die land surfaces; and

(b) an insert for at least one end of the die, located in, and extending into, the internal chamber, between the inner walls from the end of the die to the end of the insert;

the insert, (i) having a downstream edge directed toward the outlet slit and formed as a result of the intersection of two downstream surfaces, (ii) having diminishing downstream surfaces from the end of the die to a point at the end of the insert, and (iii) having a spaced-apart relationship with the inner walls such that the downstream surfaces are spaced apart from the neighboring inner walls substantially the same distance.

9. A process for making a film of thermoplastic material having indefinite length, large lateral extension, substantially constant center thickness, and edges with thickened beads by forming a molten stream of thermoplastic material in laminar flow and conducting it to a chilled surface

wherein the improvement comprises, in forming the molten thermoplastic material before conducting it to the chilled surface;

separating the stream of molten thermoplastic material, at the edges, by means of a streamlined insert having diminished surface area from the edge of a point at the end of the insert to divert a portion of the material toward the center and pass the remainder of the material in separated streams;

conducting the separated streams toward each other at substantially equal acute angles with the direction of flow; and

rejoining the separated streams immediately beyond the insert in a line perpendicular to the direction of flow.

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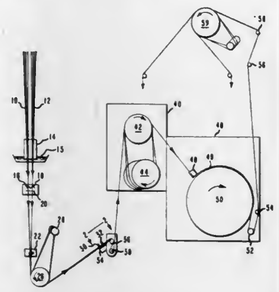
**4,293,518**

## CONTROL OF SYNTHETIC YARNS DURING DRAWING WITH HEATED ROLLS

**Willis D. Bethay, Jr., Camden, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jul. 31, 1980, Ser. No. 174,254**
**Int. Cl.³ D01D *5/12***
**U.S. Cl. 264—210.2** **3 Claims**



1. An improved coupled spin-draw-bulking process for making a synthetic bulked continuous multifilament yarn in which process the yarn is melt-spun, and then drawn in frictional contact with one or more draw pins which are located between and are substantially parallel to a feed roll and a pair of heated draw rolls on which the drawn yarn is preheated in preparation for bulking, wherein the improvement comprises stabilizing the path of the yarn on the one or more draw pins and on the heated draw rolls by passing the yarn just before it contacts the one or more draw pins, between two fixed substantially parallel guide pins in tandem in a zig-zag path such that each pin creates a change of direction break angle in the yarn path of from about 0° to 14° while maintaining the yarn in substantially ribbon form, with the axes of the pins being oriented with respect to the yarn path between the feed roll and the one or more draw pins so as to cause the plane of the yarn ribbon to rotate about the yarn axis by an angle of from about 50° to 90° with respect to the plane of the ribbon as it leaves the feed roll surface and as it first contacts a draw pin, and then forwarding the yarn to the heated draw rolls from the last draw pin without further contact with any guiding surface.

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**4,293,519**

## METHOD FOR POTTING AND ENCAPSULATING ELECTRONIC CIRCUITS

**Thomas A. Knappenberger, Phoenix, and James F. Landers, Jr., Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Division of Ser. No. 890,434, Mar. 27, 1978, abandoned. This application Oct. 4, 1979, Ser. No. 81,703**
**Int. Cl.³ B29D *6/02***
**U.S. Cl. 264—272.13** **2 Claims**

1. A method of potting an electronic circuit utilized in high acceleration and high thermal cycling environments comprising the steps of:

(a) selecting an uncured compound consisting essentially of thermosetting resin and curing agent in a flowable powder form with a particle size in the range of approximately 60 mesh to 200 mesh, curable in a temperature range of approximately 125° F. to 212° F. at approximately ambient pressure and which produces, in a vacuum of less than $10^{-5}$ Torr, outgassing of a maximum of 0.1 percent volatile condensible materials and a maximum of 1.0 percent weight loss;

(b) selecting a quantity of hollow microspheres having a diameter in the range of approximately 5 microns to 300 microns;

(c) mixing said compound and said microspheres into a substantially homogeneous mixture consisting essentially of said compound and said microspheres in a predetermined ratio in the range of approximately 35 percent to 45 percent resin-curing agent to microspheres by weight;

(d) partially enclosing the electronic circuit with a form to limit the flow of potting material;

(e) pouring the homogeneous mixture in the form to surround the electronic circuit with mixture; and

(f) heating the mixture to the required temperature for curing in a temperature range of approximately 125° to 212° F. at approximately ambient pressure.



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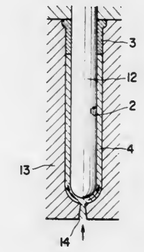
**4,293,520**

## PROCESS FOR MOLDING PARISON FOR MAKING STRETCH MOLDED BOTTLE

**Masao Akutsu, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan**

**Filed Sep. 18, 1979, Ser. No. 76,750**
**Int. Cl.³ B29C *17/04, 17/07, 17/10;* B29D *23/02***
**U.S. Cl. 264—513** **2 Claims**



1. A process for molding a parison for making a stretch molded bottle, comprising heating a material of a saturated polyester resin, particularly polyethylene terephthalate, in the form of a relatively thick flat plate to a temperature at which said material may be biaxially stretched, stretching said material biaxially in four directions to form a stretched material, heating said stretched material again to a temperature at which said material may be biaxially stretched, impact or vacuum molding said stretched material into a short cylindrically shaped, closed bottomed article having a neck portion and a bottom portion, removing said bottom of said article, inserting said neck portion over the base portion of a core, placing about said core and neck portion a mold to define a mold cavity, and molding within said cavity a cylindrically shaped body portion having a closed bottom from the same resinous material as that of which said neck portion is made, said body portion having an inside diameter equal to the inside diameter of said neck portion and being integrally united with said neck portion to form a parison.

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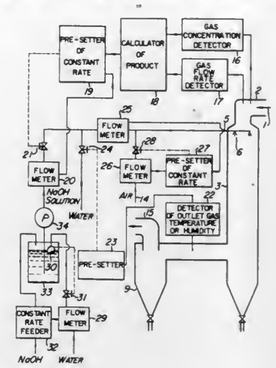
**4,293,521**

## APPARATUS FOR CLEANING WASTE FLUE GASES

**Fumio Isahaya, Hitachi, and Tugihiro Yukitake, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 801,328, May 27, 1977, Pat. No. 4,208,381, which is a continuation of Ser. No. 197,356, Nov. 10, 1971, abandoned. This application Dec. 14, 1979, Ser. No. 103,572**
**Claims priority, application Japan, Dec. 4, 1970, 45/107811**
**Int. Cl.³ G01N *25/56, 25/66;* B01D *53/54***
**U.S. Cl. 422—62** **13 Claims**

1. A waste flue gas cleaning apparatus comprising a vaporizing tower having an inlet and an outlet for a waste flue gas and equipped with spray means for spraying a reactant solution in an atomized state into the waste flue gas introduced into said tower, detectors for detecting the flow rate of the inlet gas and the concentration of a toxic component contained in the waste flue gas at the inlet of the tower, respectively, and means for supplying the reactant solution to said spray means after adjusting the ratio between an amount of water, to be admixed



with the reactant solution, and the reactant solution, said reactant solution supplying means being operative in response to signals from said detectors and to a signal from a gas temperature or humidity detector provided at the outlet of said tower whereby the reaction products produced within said tower are formed into solid particles at a temperature above the dew point of the waste flue gas.

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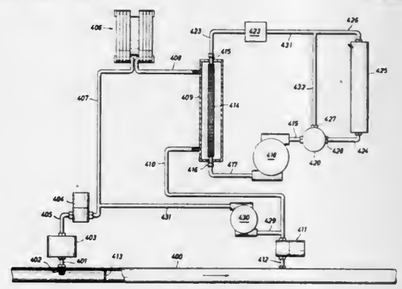
**4,293,522**

## ELECTROPHOTOLYSIS OXIDATION SYSTEM FOR MEASUREMENT OF ORGANIC CONCENTRATION IN WATER

**H. Eugene Winkler, Friendswood, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 21, 1979, Ser. No. 41,145**
**Int. Cl.³ G01N *31/12***
**U.S. Cl. 422—80** **7 Claims**



1. An oxidation cell for oxidizing organic carbon contained in aqueous solution comprising, in combination:

(a) an ultraviolet radiation source in radioactive communication with said aqueous solution;

(b) means for forming a chamber to contain said aqueous solution;

(c) electrolytic cell means adjacent said chamber forming means for electrolyzing water and for forming a barrier to maintain said aqueous solution within said chamber, said

electrolytic cell means comprising an anode adjacent said aqueous solution chamber, a solid, water impermeable electrolyte member in electrical contact with said anode and a cathode in electrical contact with said electrolyte member;
(d) hydrogen cavity forming means adjacent said cathode;
(e) means for admitting aqueous solution to said chamber;
(f) means for removing aqueous solution from said chamber; and
(g) means for removing hydrogen from the hydrogen cavity.

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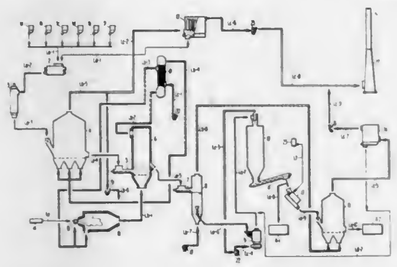
**4,293,523**

## APPARATUS FOR PRODUCING POTASSIUM SILICATE FERTILIZER

**Hiroshi Segawa, Tokyo, and Katsufumi Akizuki, Yokohama, both of Japan, assignors to Denpatsu Fly Ash, Tokyo, Japan**

**Division of Ser. No. 48,121, Jun. 13, 1979. This application Aug. 12, 1980, Ser. No. 177,698**
**Claims priority, application Japan, Jun. 13, 1978, 53-70380**
**Int. Cl.³ B01J** *6/00, 8/26, 8/24;* **F27B** *15/08*
**U.S. Cl. 422—139** **11 Claims**



1. An apparatus for producing a citric acid soluble potassium silicate fertilizer comprising:
(a) a plurality of continuous quantitative feeders for supplying a binder, a potassium source, fly ash and pulverized coal for forming a mixture;
(b) a continuous kneader for continuously kneading said mixture;
(c) an extruder for forming the resulting kneaded mixture into granules;
(d) a fluidized dryer for drying the granules to a state of substantially absolute dryness;
(e) a fluidized calcining furnace for calcining dried granules in order to chemically react potassium with silicon present in the fly ash and thereby form a citric acid soluble potassium silicate; and
(f) a cooling device for cooling the resulting calcined product.

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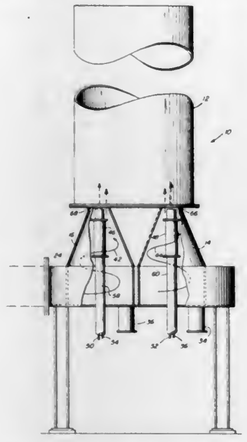
**4,293,524**

## METHOD AND APPARATUS FOR COOLING AND NEUTRALIZING ACID GASES

**Aaron J. Teller, Westboro; Denis R. J. Roy, and Shih K. Lin, both of Shrewsbury, all of Mass., assignors to Teller Environmental Systems, Inc., Worcester, Mass.**

**Continuation of Ser. No. 944,076, Sep. 20, 1978, abandoned. This application Jun. 18, 1980, Ser. No. 160,443**
**Int. Cl.³ B01J** *10/00;* **B01D** *53/34*
**U.S. Cl. 422—169** **4 Claims**

1. An apparatus for treating an effluent gas which gas contains acidic components of varying particle size which comprises:
(a) a first chamber having an inlet and an outlet, the outlet being positioned above the inlet, the chamber being configured as a truncated cone, the inlet in communication with the base of the chamber and substantially perpendicular to the longitudinal axis of the chamber, the inside walls of the chamber sloping upwardly and inwardly whereby the effluent gas introduced into the first chamber moves upwardly in a spiral path within said chamber effecting removal of the larger particles from the gas;
(b) a particle collection means disposed below the base of the first chamber to receive the particles removed in the first chamber;
(c) a second cylindrical-shaped chamber downstream of the first chamber and in communication therewith, the chamber configured to cause the gas to flow in an upward direction; and being free of structural interference from one end to the other;
(d) adjustable spray nozzle means
to introduce a spray of a basic material in a direction



cocurrent with the upwardly moving effluent gas, said means including a discharge end, said end positioned at the apex of the first chamber such that the stream contacts the effluent gas after it has followed its spiral path and flowed into the second chamber; and
to control the residence time and to cause reaction of the basic spray and acidic components while the spray and the acidic components move upwardly in the second chamber to evaporate substantially all of the spray; and to form a dry stream with entrained acid salts, the dry stream exiting from the chamber being substantially free of acid gases;
(e) means for removing products of said reaction from the effluent stream after the stream has left the chamber.

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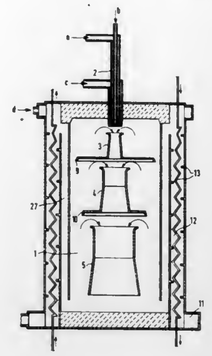
**4,293,525**

## APPARATUS FOR RECOVERING SULFUR FROM GASES CONTAINING HYDROGEN SULFIDE

**Hermann Reitzenstein, No. 9, Amselweg, 8213 Aschau, Fed. Rep. of Germany**

**Filed Jun. 4, 1980, Ser. No. 156,453**
**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851802**
**Int. Cl.³ B01J** *8/02, 10/00, 12/02*
**U.S. Cl. 422—176** **12 Claims**

1. An apparatus for recovering sulfur from gases containing hydrogen sulfide, said apparatus comprising:
(a) a first reaction chamber for the reaction of liquid sulfur with oxygen;
(b) a plurality of nozzles installed one on top of another loosely in said first reaction chamber in the direction of flow of the materials flowing into said chamber to give as complete mixing and circulation of the constituents of a mixture as possible, slit-shaped orifices being provided between said nozzles in order to mix and circulate the reactants, and
(c) a second reaction chamber for the subsequent mixing and reaction of the sulfur dioxide formed in said first reaction chamber with the hydrogen sulfide content of the gas mixture to be treated, containing hydrogen sulfide,



(d) said two reaction chambers being connected to one another by means of orifices in such a way that the reactions of sulfur with oxygen and of sulfur dioxide with hydrogen sulfide take place at separate locations and successively.

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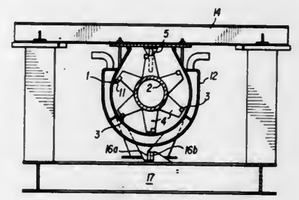
**4,293,526**

## PROCESS AND APPARATUS FOR THE CONDENSATION OF SOLIDS

**Klaus Sommer, Heidelberg; Walter Klemm, Weinheim Ortsteil Rippenweier; Hermann Weber, Hemsbach; Frederich Meinhardt, Birkenheide; Gerhard Schönmann, Ludwigshafen, and Wilhelm Spatz, Ober-Kainsbach, all of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Fed. Rep. of Germany**

**Filed Feb. 22, 1980, Ser. No. 123,754**
**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907453**
**Int. Cl.³ F28D** *21/00*
**U.S. Cl. 422—205** **6 Claims**



1. Apparatus for condensing solid materials which tend to sinter and adhere during condensation in a heated reactor, said apparatus comprising: a reactor housing having an exterior wall, means for heating the exterior wall of said reactor housing; at least one set of rotatable paddles disposed in the interior of said reactor housing for agitating solid material in said reactor housing, at least one paddle of each set being provided with blade means which passes closely adjacent the wall of said reactor housing when said set of paddles is rotated for stripping sintered material from said reactor wall; duct means communicating with the interior of said reactor housing for withdrawing waste gases from said reactor housing; means for drawing waste gases through said duct means; and means for introducing atmospheric air into said waste gases to dilute said waste gases.

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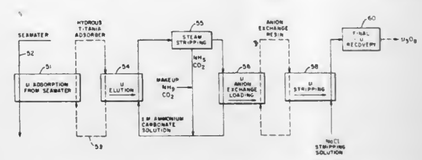
**4,293,527**

## METALS EXTRACTION FROM SEA WATER

**Dean T. Morgan, Sudbury; Chryssostomos Chryssostomidis, Cambridge, and George J. LaRue, Wayland, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.**

**Filed May 14, 1980, Ser. No. 149,866**
**Int. Cl.³ C02F** *1/28*
**U.S. Cl. 423—6** **14 Claims**



1. A method of extracting uranium from sea water which utilizes adsorber sheets comprising the steps of deploying said sheets in a current of sea water, moving said deployed sheets through said sea water to adsorb uranium, winding said sheets on perforated hollow bobbins to form rolls, and eluting uranium from said wound sheets by passing elutant from inside said bobbins through said rolls.

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**4,293,528**

## YELLOWCAKE PROCESSING IN URANIUM RECOVERY

**James M. Paul, DeSoto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Nov. 19, 1979, Ser. No. 95,709**
**Int. Cl.³ C01G** *43/01*
**U.S. Cl. 423—7** **8 Claims**

1. In a method for the recovery of uranium wherein uranium yellowcake produced by precipitation with hydrogen peroxide and containing sodium cloride as an impurity is calcined at an elevated temperature to effect decomposition of the yellowcake to uranium oxide with the evolution of free oxygen, the improvement comprising carrying out said calcination procedure in the presence of a reducing agent which reacts with said free oxygen to retard the evolution of chlorine gas.

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**4,293,529**

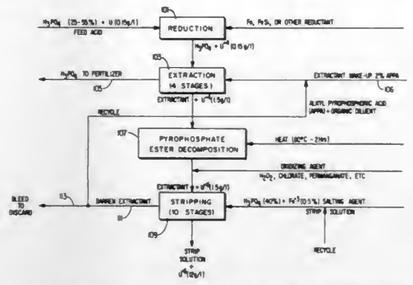
## PROCESS FOR RECOVERING URANIUM FROM WET-PROCESS PHOSPHORIC ACID USING ALKYL PYROPHOSPHORIC ACID EXTRACTANTS

**Stanton L. Reese, and William E. Schroeder, both of Lakeland, Fla., assignors to Uranium Recovery Corporation, Mulberry, Fla.**

**Filed Oct. 27, 1978, Ser. No. 955,340**
**Int. Cl.³ C01G** *43/00*
**U.S. Cl. 423—10** **22 Claims**

1. Process for obtaining uranium values from an extractant consisting essentially of an alkyl pyrophosphoric acid dissolved in a water immiscible organic solvent and containing said uranium values, which comprises (1) heating said extractant to lower the distribution coefficient for uranium from phosphoric acid; and (2) stripping said extractant with a phos-

phoric acid strip solution comprising from about 25 to 80% by weight $H_3PO_4$ and having dissolved therein, prior to stripping,




ferric ions in a concentration sufficient to salt uranium out of the extractant into the phosphoric acid solution.

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**4,293,530**

## RECOVERY OF GOLD AND URANIUM FROM CALCINES

**Eric Livesey-Goldblatt, 7 MacKenzie St., Florida Park, Roodepoort, Transvaal Province, South Africa, assignor to Eric Livesey-Goldblatt, Florida Park, South Africa**

**Filed Oct. 17, 1978, Ser. No. 952,175**

**Claims priority, application South Africa, Oct. 24, 1977, 77/6320**

**Int. Cl.³ C01G** *43/00*

**U.S. Cl. 423—18** **1 Claim**

1. A process for the recovery of gold and uranium from calcines which contain gold and uranium encapsulated within and/or in solid solution within iron oxide, said process comprising the steps of

(i) reacting the calcine with strong sulfuric acid in the liquid phase while agitating the reaction mixture for sufficient time for substantially all of the iron present to form a water soluble iron sulphate,

(ii) roasting the reacted calcine at a temperature of from 150° to 720° C.,

(iii) admixing water with the roasted product,

(iv) separating the liquid and solid phases from each other,

(v) recovering gold from the solid phase by treatment of the said solid phase with an alkali metal cyanide, and

(vi) recovering uranium from the liquid phase.

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**4,293,531**

## SELECTIVE REMOVAL OF $H_2S$ FROM GAS MIXTURES CONTAINING $CO_2$ AND $H_2S$

**Joseph H. Field, and Donald H. McCrea, both of Pittsburgh, Pa., assignors to Benfield Corporation, Pittsburgh, Pa.**

**Filed Aug. 7, 1980, Ser. No. 176,203**

**Int. Cl.³ B01D** *53/34*

**U.S. Cl. 423—232** **10 Claims**

1. A method for selectively removing $H_2S$ from a gas mixture containing $H_2S$ and $CO_2$ in a molar ratio in excess of $4CO_2$:$1H_2S$ wherein said gas mixture undergoes substantial variation in flow rate comprising the steps of:

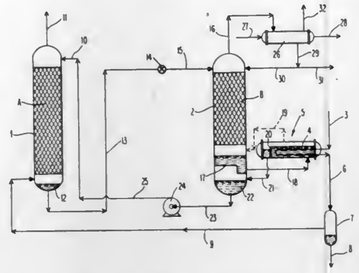
(a) Countercurrently contacting said gas mixture in an absorption zone with an aqueous scrubbing solution of alkali metal carbonate at an absorption temperature of at least 60° C. and under super-atmospheric pressure thereby absorbing $CO_2$ and $H_2S$ in said solution,

(b) Regenerating said solution in a regeneration zone at approximately atmospheric pressure by countercurrently steam stripping said solution,

(c) Supplying stripping steam to said regeneration zone at a steam/gas ratio selected to reduce the equilibrium partial pressure of $H_2S$ above said solution at the bottom of the regenerator to a value which will provide the desired partial pressure of $H_2S$ in the purified gas leaving said absorption zone,

(d) Controlling the partial pressure of $H_2S$ in the purified gas at a substantially constant value by maintaining said selected steam/gas ratio substantially constant as said gas flow varies,

(e) Adjusting the solution/gas ratio in said absorption zone to a selected ratio in the vicinity of that at which the partial pressure of $H_2S$ in the purified gas remains at said desired



value and at which the difference between the partial pressure of $CO_2$ and $H_2S$ in the purified gas reaches a maximum level,

(f) Maintaining said selected solution/gas ratio at a substantially constant value as said gas flow varies,

whereby the purified gas is selectively reduced in $H_2S$ content and whereby the ratio of $H_2S$ to $CO_2$ absorbed is rendered substantially independent of variations in gas flow.

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**4,293,532**

## PROCESS FOR PRODUCING HYDROGEN CHLORIDE AND AMMONIA

**Hiromi Sasaki, and Yoshiyuki Takahara, both of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan**

**Filed May 29, 1980, Ser. No. 154,469**

**Claims priority, application Japan, Jun. 5, 1979, 54/69424**

**Int. Cl.³ C01B** *7/08;* **C01C** *1/02*

**U.S. Cl. 423—356** **16 Claims**

1. A process for producing hydrogen chloride and ammonia, comprising the following steps of:

reacting ammonium chloride with molten ammonium hydrogen sulfate to produce hydrogen chloride gas;

heating the resulting reaction mixture at a temperature of 280° C. or higher to produce ammonia gas; and adding at least one alkali metal sulfate during said reacting or heating step.

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**4,293,533**

## METHOD FOR PRODUCING SOLID CARBON MATERIAL HAVING HIGH FLEXURAL STRENGTH

**Kiro Asano, Tokyo; Humio Tamura, Koganei; Yushi Nezu, Yokohama; Tsuyoshi Saito, and Yoshio Kawai, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 544,902, Jan. 28, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,838**

**Claims priority, application Japan, Jan. 31, 1974, 49-12258**

**Int. Cl.³ C01B** *31/02*

**U.S. Cl. 423—449** **1 Claim**

1. In a method for producing solid carbon material having a high bending strength and a low porosity which comprises preparing a precursory carbon material having a hydrogen-to-carbon ratio of from 0.4 to 0.6 by the sequential steps: introducing functional groups containing oxygen into a pitch used as a raw material having a maximum hydrogen-to-carbon atomic ratio of 0.8; shaping said precursory carbon material into a desired article without using any binding material; and carbonizing and graphitizing said article after said shaping in an inert atmosphere; the improvement comprising so introducing said functional groups into the pitch so as to satisfy the following equation,

$$0.54 = \frac{H}{C} - \frac{f}{100} = R$$

where H/C is the hydrogen-to-carbon atomic ratio of the said pitch, R is a value ranging from 0.2 to 0.3, and f is the percent by weight oxygen introduced into the precursory carbon material on the basis of the weight thereof, whereby the said solid carbon material has a maximum effective porosity of 7 percent and a bending strength of at least 900 kg/cm².

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**4,293,534**

## MOLTEN SALT SYNTHESIS OF ALKALINE EARTH TITANATES, ZIRCONATES AND THEIR SOLID SOLUTIONS

**Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 22, 1980, Ser. No. 180,294**

**The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.**

**Int. Cl.³ C01G** *23/00, 25/00*

**U.S. Cl. 423—593** **10 Claims**

1. A process for producing a product selected from the group consisting of an alkaline earth titanate, an alkaline earth zirconate, and an alkaline earth titanate zirconate wherein the alkaline earth component is selected from the group consisting of barium, strontium and mixtures thereof, which consists essentially of providing a particulate first reactant selected from the group consisting of $TiO_2$, $ZrO_2$ and mixtures thereof in at least stoichiometric amount or particulate precursor therefor, providing a particulate second reactant which is an alkaline earth oxide selected from the group consisting of BaO, SrO, and mixtures thereof in at least stoichiometric amount or particulate precursor therefor, providing an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide and mixtures thereof, forming a mixture of said reactants or precursors therefor and said hydroxide solvent, said hydroxide solvent being used in an amount of at least about 20% by weight of the total amount of said reactants and said hydroxide solvent, heating said mixture to a reaction temperature at least sufficient to melt said hydroxide solvent and form said product, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said hydroxide solvent in molten form being a solvent for said reactants, maintaining said reaction temperature dissolving and reacting said reactants in said molten solvent and precipitating said product, recovering said precipitated product by dissolving said hydroxide solvent and separating said precipitated product from the resulting solution.

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**4,293,535**

## MOLTEN SALT SYNTHESIS OF ALKALINE ZIRCONATE POWDER

**Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 22, 1980, Ser. No. 180,343**

**The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.**

**Int. Cl.³ C01G** *25/00*

**U.S. Cl. 423—593** **7 Claims**

1. A process for producing an alkaline earth zirconate powder which consists essentially of providing particulate $ZrO_2$ in at least stoichiometric amount or particulate precursor therefor, providing particulate alkaline earth oxide in at least stoichiometric amount of particulate precursor therefor, said alkaline earth oxide being selected from the group consisting of BaO, SrO, and mixtures thereof, providing an alkali chloride salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, forming a mixture of said $ZrO_2$ or precursor therefor, said alkaline earth oxide or precursor therefor and said chloride salt solvent, said chloride salt being used in an amount of at least about 20% by weight of the total amount of said $ZrO_2$, alkaline earth oxide and said chloride salt, heating said mixture to a reaction temperature at least sufficient to melt said chloride salt, each said precursor decomposing completely at or below said reaction temperature to form said oxide and by-product gas, said chloride salt in molten form being a solvent for said $ZrO_2$ and alkaline earth oxide, maintaining said reaction temperature dissolving and reacting said $ZrO_2$ and alkaline earth oxide in said molten salt and precipitating said alkaline earth zirconate, and recovering said precipitated alkaline earth zirconate by dissolving said chloride salt and separating said precipitated alkaline earth zirconate from the resulting salt solution.

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**4,293,536**

## ESTROPHILIN DETECTION

**Elwood V. Jensen, and Verne D. Hospelhorn, both of Chicago, Ill., assignors to University Patents, Inc., Norwalk, Conn.**

**Filed May 10, 1979, Ser. No. 37,631**

**Int. Cl.³ G01N** *33/48;* **G01T** *1/00;* **A61K** *43/00;* **G01N** *23/06*

**U.S. Cl. 424—1** **14 Claims**

1. A method for determining the quantity of estrophilin in a tissue sample, said method comprising:

(1) contacting said sample with a plurality of porous glass beads having a pore diameter of from about 400 to about 1200 Å to selectively adhere said estrophilin to the pore surfaces of said beads;

(2) contacting estrophilin in said sample with radioactively labelled estradiol to form a stable complex association of estrophilin bound to estradiol; and

(3) selectively removing laballed estradiol from complex association with estrophilin and measuring the quantity of labelled estradiol so removed.

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**4,293,537**

## NOVEL CHEMICAL METHOD OF LABELING PROTEINS WITH $^{99m}$TC-TECHNETIUM AT PHYSIOLOGICAL CONDITION

**Dennis W. Wong, 2853 Sunnyglen Rd., Torrance, Calif. 90505**

**Filed Sep. 5, 1978, Ser. No. 939,820**

**Int. Cl.³ A61K** *49/00, 43/00;* **C07G** *7/00*

**U.S. Cl. 424—1** **9 Claims**

1. A method of labeling human or animal plasma proteins, compounds or substances containing proteins with $^{99m}$Tc-pertechnetate at physiological pH 6–8 condition comprising the sequential steps of:

a. treating 2–3 ml(60–100 mCi) $^{99m}$Tc-pertechnetate in normal saline with 0.5 ml of a solution of 0.1-5 mg stannous chloride or stannous tartrate in 0.05 N hydrochloric acid solution at room temperature for about 10 minutes;

b. raising the pH of the acidic mixture of step (a) to 7.4 with a sufficient amount of pH 12.4 trisodium citrate/NaOH solution;

c. adding from 0.1–50 mg of the desired protein to be labeled in less than 1 ml diluent to the admixture of step (b) and incubating at 37° C. or at room temperature for 30 minutes.

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**4,293,538**

## ASSAY FOR HEPATITIS A ANTIGEN

**William J. McAleer, Ambler; William M. Hurni, and William J. Miller, both of North Wales, all of Pa., assignors to Merck & Co. Inc., Rahway, N.J.**

**Filed Apr. 20, 1979, Ser. No. 31,712**

**Int. Cl.³ G01N** *33/48;* **A61K** *43/00;* **G01T** *1/00*

**U.S. Cl. 424—1** **4 Claims**

1. An assay for detection of hepatitis A antigen in a sample which comprises the steps of:

contacting a surface having hepatitis A antibody adsorbed

thereto as the first layer with a proteinaceous material capable of being adsorbed to the surface;
contacting the surface having adsorbed thereto the hepatitis A antibody and proteinaceous material with a sample containing hepatitis A antigen;
incubating the surface under conditions effective to form a complex of hepatitis A antigen and hepatitis A antibody;
incubating the surface in the presence of an excess amount of radioactively labelled hepatitis A antibody, and
measuring the resulting radionuclide on the surface.

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**4,293,539**

## CONTROLLED RELEASE FORMULATIONS AND METHOD OF TREATMENT

**Nelson H. Ludwig, and Earl E. Ose, both of Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Sep. 12, 1979, Ser. No. 74,684**
**Int. Cl.[3] A61K *9/22***
**U.S. Cl. 424—19** **48 Claims**

1. A controlled release formulation capable of delivering an effective dose of active ingredient over a prolonged period of time and biodegradable into readily metabolized substances and normal active ingredient metabolic products comprising about 5 to about 85 percent by weight of active ingredient intimately dispersed throughout a copolymer derived from about 60 to about 95 weight percent lactic acid and about 40 to about 5 weight percent glycolic acid, said copolymer having an inherent viscosity of about 0.08 to about 0.30 when measured in chloroform, a molecular weight of about 6000 to about 35000, and said copolymer being substantially free of polymerization catalyst.

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**4,293,540**

## GRANULAR CERAMIC CARRIER FOR ADMINISTRATION OF MEDICINES AND MEDICINE SUPPORTED THEREIN

**Takuji Shikita, Matsubara, and Masaya Hirabayashi, Yokaichi, both of Japan, assignors to Kyoto Ceramic Co., Ltd., Kyoto, Japan**

**Filed Feb. 12, 1980, Ser. No. 120,916**
**Claims priority, application Japan, Feb. 13, 1979, 54-15917**
**Int. Cl.[3] A61K *9/22, 33/08;* A61J *3/00, 3/10***
**U.S. Cl. 424—26** **3 Claims**

3. A medicine-administering agent for the remedy of osteomyelitis to be embedded in an effected bone texture or in the vicinity thereof, comprising:
a porous ceramic carrier comprising a fired granular body of α-alumina or apatite having a particle size of from about 0.1 to 20 mm;
wherein said body has communicating pores disposed therein wherein said pores have an average size of about 1 to 200 microns and said body has a porosity of from about 5 to 50 percent; and
from about 0.1 to 30 percent by weight, based on the weight of said carrier, of an antibiotic supported on said carrier.

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**4,293,541**

## COMPOUNDS

**Hugh Cairns, and Thomas B. Lee, both of Loughborough, England, assignors to Fisons Limited, London, England**

**Continuation of Ser. No. 963,812, Nov. 27, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,627**
**Claims priority, application United Kingdom, Nov. 30, 1977, 49761/77**
**Int. Cl.[3] A61K *31/35;* C07D *311/24;* A61L *9/04***
**U.S. Cl. 424—45** **10 Claims**

1. A salt of 2,8-dicarboxy-4,6-dioxo-10-propyl-4H,6H-benzo-(1,2-b:5,4-b')dipyran with a pharmaceutically acceptable organic cation, the salt having a solubility of less than 3% w/w in water at 20.5° C.

10. A method of treatment of asthma or hay fever, which comprises administration of a salt according to claim 1 to a patient suffering from such a condition.

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**4,293,542**

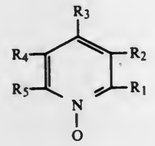
## COSMETIC COMPOSITION FOR IMPARTING TO HUMAN SKIN A COLORATION RESEMBLING A NATURAL TAN

**Gerard Lang, Epinay-sur-Seine, and Serge Forestier, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France**

**Filed May 3, 1977, Ser. No. 793,316**
**Claims priority, application France, May 3, 1976, 76 13164**
**Int. Cl.[3] A61K *7/00, 7/021, 7/44, 31/44***
**U.S. Cl. 424—47** **35 Claims**

1. A cosmetic composition for imparting to human skin after exposure to sunlight a coloration resembling a natural tan comprising a cosmetic vehicle, suitable for topical application to the skin, selected from the group consisting of (i) a hydroalcoholic solution, (ii) a glycerin-alcoholic solution and (iii) a glycerine hydroalcoholic solution of at least one compound selected from the group consisting of

(a) a compound of the formula



wherein
$R_1$ represents hydrogen or amino,
$R_2$ represents hydrogen, lower alkyl or amino,
$R_3$ represents hydrogen, lower alkyl or amino,
$R_4$ represents hydrogen, lower alkyl or chlorine,
$R_5$ represents hydrogen, lower alkyl or hydroxy, or when $R_1$ is amino, $R_5$ can also represent amino, with the proviso that $R_1$, $R_2$ and $R_3$ are not simultaneously amino, and at least one of $R_1$, $R_2$ and $R_3$ is amino, and

(b) an acid addition salt of the compound in (a), said alcohol being ethanol or isopropanol and being present in said cosmetic vehicles (i), (ii) and (iii) in an amount between 10 and 90 weight percent thereof and said glycerine being present in said cosmetic vehicles (ii) and (iii) in an amount between 0.5 and 5 weight percent thereof, and said compound being present in an amount of 0.5–10 weight percent of said composition.

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**4,293,543**

## PROCESS AND COMPOSITION FOR THE COLORATION OF KERATIN-CONTAINING SUBSTANCES

**Jean-Marie Cotte, Saint-Cyr-Au-Mont, and Philippe Potin, Billere, both of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France**

**Filed Oct. 2, 1980, Ser. No. 193,397**
**Claims priority, application France, Oct. 3, 1979, 79 24627; Sep. 26, 1980, 80 20720**
**Int. Cl.[2] A61K *7/42, 7/12, 7/13***
**U.S. Cl. 424—59** **14 Claims**

1. A process for the colouration of a keratin-containing substance or tissue by means of a colouration agent having a ketone or aldehyde function favouring the development of colouration in the substance or tissue, in which an amino-acid is applied to the latter before, during or after treatment with the colouration agent, wherein the amino-acid contains a sulphoxy group.



**4,293,544**

## FLUID AND SEMI-FLUID COMPOSITIONS INCLUDING BENZOATE ESTERS

**Steele J. Elmi, Midland Park, N.J., assignor to Finetex Incorporated, Elmwood Park, N.J.**

**Continuation-in-part of Ser. No. 18,250, Mar. 7, 1979. This application Dec. 6, 1979, Ser. No. 100,917**
**Int. Cl.[3] A61K *7/44, 7/42, 7/15***
**U.S. Cl. 424—60** **6 Claims**

1. In a sunscreening composition for application to the skin comprising a liquid vehicle together with an effective sunscreening amount of a sunscreening agent dissolved in the vehicle or emulsified along with the vehicle in the composition, the improvement comprising wherein the vehicle comprises the benzoic acid esters of a mixture of $C_{12}$, $C_{13}$, $C_{14}$ and $C_{15}$ linear primary alcohols, the alcohol mixture comprising by weight from about 23% to 31% of the $C_{12}$ alcohol, 32% to 44% of the $C_{13}$ alcohol, 17% to 23% of the $C_{14}$ alcohol, and 12% to 18% of the $C_{15}$ alcohol.

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**4,293,545**

## MODIFIED *PASTEURELLA MULTOCIDA* BACTERIA VACCINES

**Carrell J. Kucera, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.**

**Filed Mar. 31, 1980, Ser. No. 135,828**
**Int. Cl.[3] A61K *39/02***
**U.S. Cl. 424—92** **12 Claims**

1. A modified live *Pasteurella multocida* vaccine capable of inducing immunity in bovine, porcine and ovine animal species without serious side effects comprising a vaccinal amount of modified live *Pasteurella multocida* bacteria prepared by chemical modification of virulent *Pasteurella multocida* strain ATCC No. 31609 with an acridinium salt, and a carrier therefor.

9. A method of vaccinating bovine, porcine and ovine animal species comprising administering to said animals the modified live *Pasteurella multocida* vaccine of claim 1.

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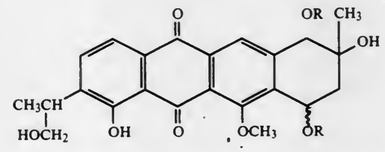
**4,293,546**

## ANTHRACYCLINE ANTIBIOTICS PRODUCED BY *STREPTOSPORANGIUM FRAGILIS* SHEARER SP. NOV. ATCC 31519

**Claude H. Nash, III, Audubon; Marcia C. Shearer, Conshohocken; Kenneth M. Snader, Hatboro; Joseph R. Valenta, Strafford, and David Cooper, Phoenixville, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.**

**Filed Jul. 24, 1980, Ser. No. 171,852**
**Int. Cl.[3] A61K *35/00***
**U.S. Cl. 424—119** **9 Claims**

1. An antibiotic, fragilomycin A of the formula



in which R represents sugars of unknown structure and wherein fragilomycin A is characterized as follows:
(a) red-orange solid having a melting point of 197°–199° C. (dec.);
(b) approximate elemental composition of 55.07 percent carbon, 6.92 percent hydrogen and 2.37 percent nitrogen;
(c) proposed empirical formula of $C_{54}H_{82}N_2O_{26}$;
(d) specific optical rotation: $[\alpha]_D = +29.5°$ (C=0.1 methanol);
(e) solubility: soluble in methanol, methylene chloride and dimethyl sulfoxide; sparingly soluble in water at a pH of 6.0 or lower;
(f) ultraviolet absorption spectrum in methanol exhibits absorption maxima at 438 nm, 296 (sh) nm, 264 nm, 231 nm, and 208 nm, as shown in FIG. 1;
(g) infrared absorption spectrum in KBr exhibits peaks at the following wavelengths in $cm^{-1}$: 3430, 2970, 2930, 2820, 1671, 1613, 1547, 1455, 1430, 1385, 1300, 1105 and 1045 as shown in FIG. 2;
(h) proton magnetic resonance spectrum in $CDCl_3$—$CD_3OD$ (80 $MH_z$) shows the following chemical shifts (ppm) 7.4–8.2 (multiplet), 4.0 (singlet), 3.8 (doublet), 3.5 (multiplet) 3.2 (singlet) and 1.2 (doublet) as shown in FIG. 3;
(i) field desorption mass spectrum at 20 ma exhibits the following fragmentation pattern (m/e) 892, 872-871, 824 and 392.

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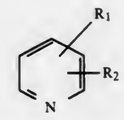
**4,293,547**

## METHOD OF TREATING MALARIA

**Charles Lewis, Kalamazoo Township, Kalamazoo County, and Robert D. Birkenmeyer, Comstock Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Aug. 25, 1980, Ser. No. 180,986**
**Int. Cl.[3] C07H *15/16;* A61K *31/71***
**U.S. Cl. 424—180** **34 Claims**

1. A method of treating malaria comprising the systemic administration of an effective amount of a compound having the formula



wherein $R_1$, which can be singly or multiply substituted in any position of the pyridine ring not already substituted by $R_2$, is selected from the group consisting of hydrogen, alkyl and substituted alkyl wherein the alkyl portion is from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof, cycloalkyl and substituted cycloalkyl, substituted oxygen, substituted nitrogen, halogen, phenyl, and substituted phenyl, $-(CH_2)_n-OH$, $-(CH_2)_n-NR_4R_5$, and isomeric forms thereof, wherein n is an integer of from 1 to 8, inclusive, $R_4$ and $R_5$ are H or alkyl of from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof; wherein $R_2$, which can be singly substituted in any position of the pyridine ring not already substituted by $R_1$, is

and X is the amino function of a compound selected from the group consisting of 7(S)-halo-methyl 1-thio-α-lincosaminide and 7(R)-halo-methyl 1-thio-α-lincosaminide; the 2-phosphate; the 2-palmitate; and the pharmaceutically acceptable acid-addition salts thereof, to a mammal hosting a malarial parasite.

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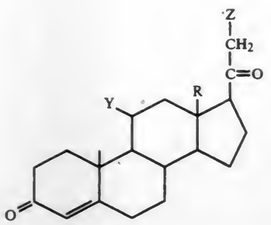
**4,293,548**

## 18-SUBSTITUTED PREGN-4-ENE-3,20-DIONES

**Brian W. Metcalf, Mason, and J. O'Neal Johnston, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Filed Sep. 2, 1980, Ser. No. 183,534**
**Int. Cl.[3] C07J *5/00;* A61K *31/56***
**U.S. Cl. 424—242** **16 Claims**

1. A compound of the formula:



wherein Y is hydrogen or hydroxy; Z is hydrogen or hydroxy; and R is 1,2-propadienyl, 2-alkynyl containing up to 6 carbon atoms, or 1-hydroxy-2-propynyl.

16. A method for producing a diuretic effect which comprises administering to a patient in need of such treatment an effective amount of a compound of claim 1.

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**4,293,549**

## QUINOLINYL GUANIDINES HAVING ANTIINFLAMMATORY, ANALGESIC OR ANTIPYRETIC ACTIVITY

**Schneur Rachlin, Vaerlose, and Edoardo Arrigoni-Martelli, Farum, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktion-saktieselskab), Ballerup, Denmark**

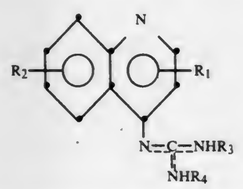
**Filed Oct. 27, 1978, Ser. No. 955,228**

**Claims priority, application United Kingdom, Nov. 7, 1977, 46166/77**

**Int. Cl.³ A61K** *31/47, 31/555;* **C07D** *215/42*

**U.S. Cl. 424—245** **25 Claims**

1. A compound of the formula I having anti-inflammatory, analgesic or antipyretic activity and characterized by its low acute toxicity and low gastro ulcerogenic activity



I

in which $R_1$ represents hydrogen, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, hydroxy, halogen, trifluoromethyl, or phenyl; $R_2$ represents hydrogen, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, halogen, trifluoromethyl, or hydroxy; $R_3$ represents $C_1$–$C_{18}$-alkyl, $C_3$–$C_8$-cycloalkyl which is unsubstituted or mono- or di-substituted with methyl or ethyl, or phenyl or phenyl-$C_1$–$C_3$-alkyl in which the phenyl is unsubstituted or substituted with a methyl, methoxy, halo or trifluoromethyl group; and $R_4$ represents a heterocyclic ring system selected from thiazolinyl, thienyl, pyrryl, thiazolyl, isothiazolyl, pyrazolyl, imidazolyl, oxaxolyl, isoxazolyl, triazolyl, thiadiazolyl, tetrazolyl, pyridyl, pyridazinyl, pyrimidyl, pyrazinyl, triazinyl, oxazinyl, benzoxazolyl, benzothiazolyl and benzoimidazolyl, said ring system being unsubstituted or substituted with from 1 to 2 members of the group consisting of $C_1$–$C_3$-alkyl, $C_1$–$C_3$-alkoxy, carboxy, carbalkoxy, halogen, trifluoromethyl, hydroxy and mercapto; and pharmaceutically acceptable, non-toxic salts thereof, pharmaceutically-acceptable non-toxic metal complexes thereof or the products wherein the H of —$NHR_4$ is replaced by the acyl group of a carboxylic acid.

16. A pharmaceutical composition in dosage unit form for enteral, parenteral or topical treatment of humans or domestic animals suffering from arthritic diseases, which comprises as an active ingredient 0.01 g to 1 g of a compound as claimed in claim 1 calculated as the free base together with a pharmaceutically acceptable, non-toxic carrier.

25. In the treatment of humans or domestic animals suffering from arthritic diseases, the administration of a compound as claimed in claim 1, alone or in combination with another active ingredient, in daily doses from 1 mg/kg body weight/day to 30 mg/kg body weight/day of the active ingredient(s).

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**4,293,550**

## CEPHALOSPORIN DERIVATIVES

**Jürgen Blumbach, Frankfurt am Main; Walter Dürckheimer, Hattersheim am Main, and Elmar Schrinner, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

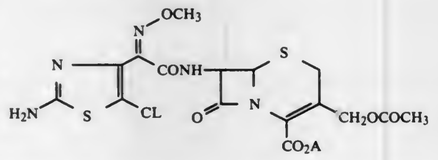
**Filed Dec. 20, 1978, Ser. No. 971,558**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758001**

**Int. Cl.³ A61K** *31/545;* **C07D** *501/34*

**U.S. Cl. 424—246** **4 Claims**

1. A compound of the formula



wherein A is hydrogen, a cleavable ester group, or a physiologically acceptable cation, and wherein, in the formula, =N—$OCH_3$ is present in the syn form.

3. An antibacterial composition comprising an effective amount of a compound as in claim 1 in dosage form or in dosage form with a pharmaceutical carrier therefor.

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**4,293,551**

## N-AMINO-3,4,5-TRIHYDROXYPIPERIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

**Günther Kinast; Lutz Müller; Walter Puls, and Rüdiger Sitt, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

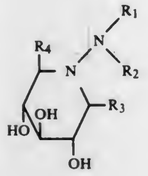
**Filed Jul. 17, 1979, Ser. No. 58,348**

**Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835069**

**Int. Cl.³ C07C** *211/98;* **A61K** *31/445*

**U.S. Cl. 424—249** **15 Claims**

1. A compound which is an N-amino-3,4,5-trihydroxypiperidine of the formula



(I)

or a salt thereof,

in which

$R_1$ is a hydrogen atom, a formyl or carboxamido group, or a $R_5$, $COR_5$, $CO_2R_5$, $CONHR_5$, $CONR_5R_6$, $CSR_5$, $CSNH_2$, $CSNHR_5$, $CSNR_5R_6$, $SO_3H$ or $SO_2R_5$ group,

$R_2$ is a hydrogen atom or an $R_5$ group, or

$R_1$ and $R_2$ together represent the grouping

$R_3$ denotes a hydrogen atom, a hydroxyl, mercapto, amine, cyano, carboxyl, carboxamido, aminomethyl, sulpho hydroxymethyl group or an $OR_5$, $SR_5$, $NHR_5$, $NR_5R_6$, $CO_2R_5$, $CONHR_5$, $CONR_5R_6$, $CH_2NHR_5$, $CH_2NR_5R_6$, $CH_2NHR_5$, $CH_2NR_5COR_6$, $CH_2NHSO_2R_5$, $CH_2NR_5SO_2R_6$, $CH_2OR_5$ or $CH_2OCOR_5$ group,

$R_4$ denotes a hydrogen atom, a hydroxymethyl, formyl, carboxyl or carboxamido group or a $R_5$, $CH_2OR_5$, $CHR_5OH$, $CHR_5OR_6$, $CR_5R_6OH$, $CR_5R_6OR_7$, $CR_5O$, $CO_2R_5$, $CONHR_5$, $CONR_5R_6$ or $CH_2X$ group wherein X is fluoro chloro, bromo,

$R_5$, $R_6$ and $R_7$ independently of one another denote a straight-chain, branched or cyclic saturated or unsaturated aliphatic hydrocarbon group or an aromatic or a heterocyclic group derived from furane, pyrane, pyrrolidine, piperidine, pyrazole, imidazole, pyrimidine, pyridazine, pyrazine, triazine, pyrrole, pyridine, benzimidazole, quinoline, isoquinoline or purine, and

$R_8$ and $R_9$ independently of each other denote a hydrogen atom or an $R_5$ group.

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**4,293,552**

## NOVEL 1-(MONO-O-SUBSTITUTED BENZOYL)-3-(SUBSTITUTED PYRAZINYL) UREAS

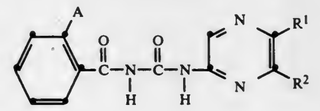
**John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 881,300, Feb. 27, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,393**

**Int. Cl.³ C07D** *241/20, 241/26;* **A01N** *43/60*

**U.S. Cl. 424—250** **22 Claims**

1. A compound of the formula

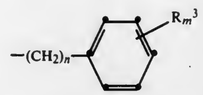


(I)

wherein

A is bromo or chloro;

$R^1$ is hydrogen, trifluoromethyl, or



$R^2$ is hydrogen, chloro, methyl, or trifluoromethyl;

$R^3$ is hydrogen, halo, methoxy, trifluoromethyl, or phenyl;

m is 1; and

n is 0;

and 1-(2-chlorobenzoyl)-3-(5-cyclohexyl-6-methyl-2-pyrazinyl) urea.

7. A method for the control of ova of insects of an order selected from the group consisting of Coleoptera, Diptera, Lepidoptera, and Orthoptera, which comprises applying to the loci of the insects an insecticidally effective amount of a 1-(mono-o-substituted benzoyl)-3-(substituted pyrazinyl)urea compound of claim 1, except for 1-(2-chlorobenzoyl)-3-(5-cyclohexyl-6-methyl-2-pyrazinyl)urea.

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**4,293,553**

## 1-PHTHALAZONE DERIVATIVES, AND USE THEREOF

**Masayuki Ishikawa, 14-13, Akazutsumi 3-chome, Setagaya-ku, Tokyo 156, Japan; Hiromichi Tanaka, Yokohama, Japan; Yukuo Eguchi, Chiba, Japan; Shigeru Ito, Nagareyama, Japan; Yoshimi Takashima, Akishima, Japan, and Masahiko Kobayashi, Kokubunji, Japan, assignors to Masayuki Ishikawa, Tokyo, Japan**

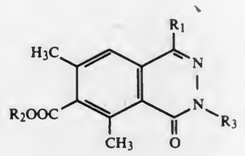
**Filed Aug. 7, 1979, Ser. No. 64,368**

**Claims priority, application Japan, Aug. 11, 1978, 53-97186; Sep. 22, 1978, 53-116006; Sep. 22, 1978, 53-116007; Sep. 22, 1978, 53-116009; Oct. 2, 1978, 53-120387; Oct. 2, 1978, 53-120388**

**Int. Cl.³ C07D** *237/32*

**U.S. Cl. 424—250** **28 Claims**

1. 1-Phthalazone derivatives of the following formula:



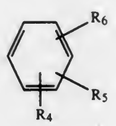
(I)

wherein

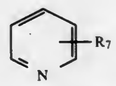
$R_1$ is a member selected from the group consisting of a hydrogen atom, alkyl groups having 1 to 4 carbon atoms and a hydroxymethyl group,

$R_2$ is an alkyl group having 1 to 4 carbon atoms, and

$R_3$ is a group having the formula



in which $R_4$ and $R_5$ are identical or different and each represents a member selected from the group consisting of a hydrogen atom, halogen atoms, alkyl groups having 1 to 4 carbon atoms and alkoxy groups having 1 to 4 carbon atoms, and $R_6$ represents a member selected from the group consisting of a hydrogen atom, halogen atoms, alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, a hydroxyl group, a carboxyl group, alkoxycarbonyl groups having 2 to 5 carbon atoms, a nitro group and an amino group; or a group having the formula



in which $R_7$ represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

and pharmaceutically acceptable inorganic acid addition salts thereof.

**4,293,554**

## METHOD OF TREATING ASTHMA

**George R. Allen, Jr., Old Tappan, N.J.; John W. Hanifin, Jr.; Daniel B. Moran, both of Suffern, N.Y., and Jay D. Albright, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Feb. 21, 1980, Ser. No. 122,958**

**Int. Cl.³ A61K *31/495***

**U.S. Cl. 424—250** **1 Claim**

**1**. A method of preventing the development of asthmatic conditions in a warm-blooded animal, which comprises administering to said animal a prophylactically effective amount of 6-phenyl-1,2,4-triazolo-[4,3-b]pyridazin-3(2H)-one.

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**4,293,555**

## 6- AND 6,6-DISUBSTITUTED-2-SUBSTITUTED-OXAPEN-2-EM-3-CARBOXYLIC ACIDS

**Burton G. Christensen, Scotch Plains, and Frank P. DiNinno, Old Bridge, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

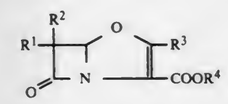
**Continuation-in-part of Ser. No. 30,970, Apr. 17, 1979, abandoned, and Ser. No. 30,788, Apr. 17, 1979, abandoned, which is a continuation of Ser. No. 865,277, Dec. 28, 1977, abandoned, and Ser. No. 865,109, Dec. 28, 1977, abandoned. This application Oct. 10, 1979, Ser. No. 83,721**

**The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.**

**Int. Cl.³ C07D *498/04, 205/08;* A61K *31/42;* C07D *409/06***

**U.S. Cl. 424—263** **5 Claims**

**1**. A compound having the structural formula:



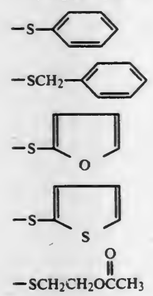
wherein:

$R^4$ is hydrogen, pharmaceutically acceptable salts, or benzyl, p-nitrobenzyl, o-nitrobenzyl, t-butyl, bromo-t-butyl, t-butyl-dimethylsilyl, trimethylsilyl, trichloroethyl, pivaloyloxymethyl, allyl, methallyl, (2-methylthio)ethyl, or 3-buten-1-yl;

$R^1$ and $R^2$ are independently selected from: hydrogen, hydroxymethyl, 1-hydroxyethyl, 1-hydroxy-3-phenylpropyl, 1-hydroxy-3-phenyl-3-carboxypropyl, 1-hydroxy-2,2,2-trifluoroethyl, methoxyl, phenyl, methyl, 2-thienyl, 2-pyridyl, benzyl, p-methoxyphenyl; and

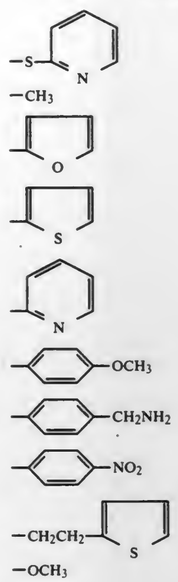
$R^3$ is

$-SCH_2CH_3$
$-SCH_3$
$-S(CH_2)_nNH_2$ (n=1−5)



$-SCH_2CH_2OCCH_3$

-continued



$-NHCH_2CH_3$; except that when both $R^1$ and $R^2$ are hydrogen, $R^3$ cannot be methyl; and, except that $R^3$ cannot be $-SCH_2CH_2NH_2$ when $R^2$ is hydrogen and $R^1$ is 1-hydroxyethyl.

**5**. An antibiotic pharmaceutical composition comprising in unitary dosage form, an antibacterially effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier therefor.

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**4,293,556**

## ANALGESIC 2-(2-ALKOXY-ETHYL)-2'-HYDROXY-6,7-BENZOMORPHANS AND SALTS THEREOF

**Herbert Merz, Ingelheim am Rhein, and Klaus Stockhaus, Bingen, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim, Fed. Rep. of Germany**

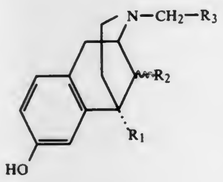
**Continuation of Ser. No. 52,433, Jun. 26, 1979, abandoned. This application May 28, 1980, Ser. No. 154,067**

**Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2828039**

**Int. Cl.³ A61K *31/445;* C07D *221/26***

**U.S. Cl. 424—267** **4 Claims**

**1**. A racemic or optically active compound of the formula



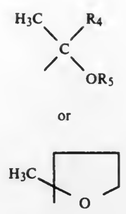
wherein

$R_1$ is methyl, ethyl or propyl;

$R_2$ is hydrogen, methyl or ethyl; and

$R_3$ is





where

$R_4$ is hydrogen or methyl,

$R_5$ is methyl, ethyl or propyl, and

n is 1 or 2,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

**4**. The method of relieving pain in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic amount of a compound of claim **1**.

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**4,293,557**

## ANTIULCER PHENOXYPROPYLAMINE DERIVATIVES

**Kenyu Shibata, Inagi; Toshihisa Itaya; Nobuaki Yamakoshi, both of Kawasaki; Shigeru Kurata, Tokyo; Naoyuki Koizumi, Kawasaki; Masaaki Tarutani; Hideki Sakuma, both of Yokohama, and Kunihiro Konishi, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan**

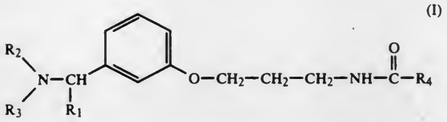
**Filed Jun. 30, 1980, Ser. No. 164,017**

**Claims priority, application Japan, Jul. 3, 1979, 54-83426; Feb. 20, 1980, 55-19088**

**Int. Cl.³ A61K *31/445;* C07D *295/14***

**U.S. Cl. 424—267** **12 Claims**

**1**. A phenoxypropylamine derivative of the following formula



(I)

wherein $R_1$ represents a hydrogen atom or a methyl or ethyl group, $R_2$ and $R_3$, independently from each other, represent a lower alkyl group, or together form a linear alkylene group having 4 to 7 carbon atoms which may be optionally substituted by a hydroxyl or hydroxymethyl group, and $R_4$ represents a hydrogen atom or a group of the formula $—R_5—Z$ in which $R_5$ represents a lower alkylene group, and Z represents a hydrogen atom or an amino, mono- or di-(lower alkyl)amino, hydroxy lower alkylamino, lower alkanoylamino, hydroxyl, lower alkoxy, lower alkanoyloxy, phenoxy, halophenoxy, benzoyloxy or halobenzoyloxy group, or a pharmaceutically acceptable salt thereof.

**12**. Method for the treatment of ulcers of the stomach or duodenum, which comprises administering to a patient suffering therefrom an antiulcer effective amount of a compound according to any one of claims **1** to **10** or a pharmaceutically acceptable salt thereof.

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**4,293,558**

## ANTIVIRAL THIAZOLINYL BENZIMIDAZOLES AND DERIVATIVES

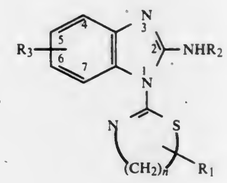
**Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James W. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Division of Ser. No. 2,836, Jan. 12, 1979, Pat. No. 4,216,313, which is a division of Ser. No. 769,358, Feb. 16, 1977, Pat. No. 4,150,028, which is a continuation-in-part of Ser. No. 626,014, Oct. 28, 1975, abandoned. This application Nov. 14, 1979, Ser. No. 94,129**

**Int. Cl.³ A61K *31/425;* A01N *43/52, 43/78***

**U.S. Cl. 424—270** **33 Claims**

**1**. A method of suppressing the growth of a virus which comprises adding an antivirally effective amount of an active agent to a medium in which the virus is growing, said active agent being a compound of the formula



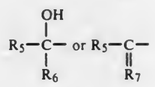
I

wherein

$R_1$ is hydrogen, $C_1$–$C_3$ alkyl, phenyl, or benzyl;

$R_2$ is hydrogen, or $C_1$–$C_4$ alkanoyl;

$R_3$ is at the 5 or 6 position and is 1-($C_1$–$C_3$ alkyl)tetrazol-5-yl, 1,3-dithiolan-2-yl,

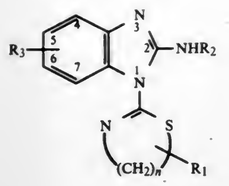


wherein $R_5$ is $C_1$–$C_3$ alkyl, $C_3$–$C_7$ cycloalkyl, ($C_3$–$C_7$ cycloalkyl)methyl, 1-($C_3$–$C_7$ cycloalkyl)ethyl, thienyl, or phenyl; $R_6$ is $C_1$–$C_7$ alkyl; $R_7$ is $C_1$–$C_7$ alkylidene; or

wherein $R_4$ is hydrogen, $C_1$–$C_7$ alkyl, $C_3$–$C_7$ cycloalkyl, ($C_3$–$C_7$ cycloalkyl)methyl, 1-($C_3$–$C_7$ cycloalkyl)ethyl, thienyl, benzyl, phenyl or mono substituted phenyl wherein said substituents are selected from the group consisting of $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl and Z is hydroxyimino, $C_1$–$C_4$ alkoxyimino, $C_1$–$C_4$ alkanoyloxyimino, hydrazono, α-methoxycarbonylhydrazono, α-hydroxycarbonylmethoxyhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono or thiocarbamylhydrazono; and

n is 2.

**23**. A method of suppressing the growth of a virus which comprises administering an antivirally effective amount of an active agent intranasally to a warmblooded animal, said active agent being a compound of the formula



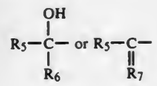
I

wherein

$R_1$ is hydrogen, $C_1$–$C_3$ alkyl, phenyl, or benzyl;

$R_2$ is hydrogen, or $C_1$–$C_4$ alkanoyl;

$R_3$ is at the 5 or 6 position and is 1-($C_1$–$C_3$ alkyl)-tetrazol-5-yl, 1,3-dithiolan-2-yl,



wherein $R_5$ is $C_1$–$C_3$ alkyl, $C_3$–$C_7$ cycloalkyl, ($C_3$–$C_7$ cycloalkyl)methyl, 1-($C_3$–$C_7$ cycloalkyl)ethyl, thienyl, or phenyl; $R_6$ is $C_1$–$C_7$ alkyl; $R_7$ is $C_1$–$C_7$ alkylidene; or

wherein $R_4$ is hydrogen, $C_1$–$C_7$ alkyl, $C_3$–$C_7$ cycloalkyl, ($C_3$–$C_7$ cycloalkyl)methyl, 1-($C_3$–$C_7$ cycloalkyl)ethyl, thienyl, benzyl, phenyl or mono substituted phenyl wherein said substituents are selected from the group consisting of $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl and Z is hydroxyimino, $C_1$–$C_4$ alkoxyimino, $C_1$–$C_4$ alkanoyloxyimino, hydrazono, α-methoxycarbonylhydrazono, α-hydroxycarbonylmethoxyhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono or thiocarbamylhydrazono; and

n is 2.

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**4,293,559**

## SLIME CONTROL COMPOSITIONS AND METHODS OF USING THE SAME

**John D. Buckman; Stanley J. Buckman; Betty S. Johnson, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.**

**Filed Mar. 29, 1978, Ser. No. 891,435**

**Int. Cl.³ A01N** *43/78*

**U.S. Cl. 424—270** **8 Claims**

1. A bactericidal and fungicidal synergistic composition consisting essentially of about 15 to about 85 parts by weight of 2-(thiocyanomethylthio)benzothiazole and about 85 to about 15 parts by weight of a compound selected from 2'-hydroxyethyl 2,3-dibromopropionate and 2'-hydroxyethyl 2-bromoacrylate.

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**4,293,560**

## TALAMPICILLIN 2-METHOXYPHENOXYACETATE AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

**Andrea Pedrazzoli, Milan, and Sergio Boveri, Monza, both of Italy, assignors to C M Industries, France**

**Filed Jun. 23, 1980, Ser. No. 161,687**

**Int. Cl.³ A61K** *31/34;* **C07D** *499/68*

**U.S. Cl. 424—271** **7 Claims**

2. A pharmaceutical composition in unit dosage form, for use in the treatment of infections sensitive to ampicillin, comprising about 20–1000 mg per dosage unit of the 2-methoxyphenoxyacetate of the phthalidyl ester of 6-[D(−)-α-amino-phenylacetamido]penicillanic acid in admixture with a pharmaceutical carrier.

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**4,293,561**

## 1-(NAPHTHYL-N-PROPYL)IMIDAZOLE DERIVATIVES

**Keith A. M. Walker, Los Altos Hills, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

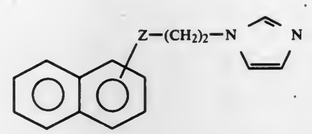
**Filed Mar. 9, 1979, Ser. No. 19,201**

**The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.**

**Int. Cl.³ A61K** *31/415;* **C07D** *233/60, 405/06*

**U.S. Cl. 424—273 R** **7 Claims**

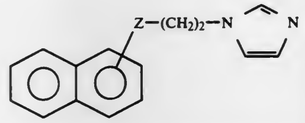
1. A compound of the formula



(I)

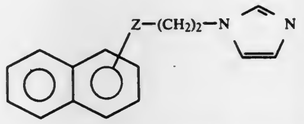
wherein Z is a carbonyl group protected as an acyclic ketal derived from a monohydric straight chain alkanol having from one to four carbon atoms, or a carbonyl group protected as a cyclic ketal wherein the cyclic ketal is selected from the group consisting of ethylenedioxy, 1,3-propylenedioxy, 1,2-propylenedioxy, 2,2-dimethyl-1,3-propylenedioxy, 1-methyl-1,3-propylenedioxy, 1,3-dimethyl-1,3-propylenedioxy, and 2,3-butylenedioxy and the pharmaceutically acceptable acid addition salts thereof.

6. A method for treating and preventing convulsions in a mammalian subject comprising administering to said subject in need thereof a therapeutically effective amount of a compound of the formula



wherein Z is carbonyl, a carbonyl group protected as an acyclic ketal derived from a monhydric straight chain alkanol having from one to four carbon atoms, or a carbonyl group protected as a cyclic ketal derived from a dihydric alcohol having two or three carbon atoms which may be optionally substituted by one or more methyl groups or a pharmaceutically acceptable acid addition salt thereof.

7. A method for inhibiting gastric secretion in a mammalian subject comprising administering to said subject in need thereof a therapeutically effective amount of a compound of the formula



wherein Z is carbonyl, a carbonyl group protected as an acyclic ketal derived from a monhydric straight chain alkanol having from one to four carbon atoms, or a carbonyl group protected as a cyclic ketal derived from a dihydric alcohol having two or three carbon atoms which may be optionally substituted by one or more methyl groups or a pharmaceutically acceptable acid addition said thereof.



**4,293,562**

## METHODS OF OBTAINING ANOREXIC EFFECTS USING A COMBINATION OF AMPHETAMINES AND CIMETIDINE

**Arnold Ritter, 18402 N. 19th Ave., Phoenix, Ariz. 85023**

**Filed Jul. 2, 1979, Ser. No. 53,766**

**Int. Cl.³ A61K** *31/415, 31/135*

**U.S. Cl. 424—273 R** **5 Claims**

1. A method of suppressing the appetite of a mammalian host as an adjunct to a weight control program comprising administering orally to said host once daily (a) up to 5 mg of an anorexant which is substantially less than the normal daily dosage of said anorexant concurrently with (b) from 150 mg to 300 mg of cimetidine, said anorexant being selected from the group consisting of amphetamines, biphetamines and the non-toxic biologically acceptable salts thereof.

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**4,293,563**

## THENYL HYDANTOINS AND ANTI-ASTHMATIC COMPOSITIONS THEREOF

**William B. Jamieson, Woking; William J. Ross, Lightwater; Robin G. Simmonds, Wokingham, and John P. Verge, Henley-on-Thames, all of England, assignors to Lilly Industries Limited, London, England**

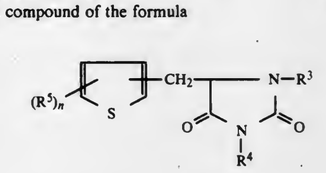
**Division of Ser. No. 39,075, May 14, 1979, Pat. No. 4,241,073. This application May 12, 1980, Ser. No. 148,633**

**Claims priority, application United Kingdom, May 23, 1978, 21352/78**

**Int. Cl.³ A61K** *31/415;* **C07D** *409/06*

**U.S. Cl. 424—273 R** **4 Claims**

1. A compound of the formula



wherein

$R^3$ is H, $C_1$–$C_6$ alkyl or $C_2$–$C_4$ alkenyl;

$R^4$ is $C_1$–$C_6$ alkyl, $C_2$–$C_4$ alkenyl, benzyl or phenyl;

$R^5$ is phenyl or $C_1$–$C_4$ alkyl; and n is 0, 1 and 2 but

n is 1 when $R^5$ is phenyl and 1 or 2 when $R^5$ is $C_1$–$C_4$ alkyl.

3. A solid or aerosol pharmaceutical formulation in unit dosage form adapted for administration to treat asthma or other immediate hypersensitivity condition which comprise per dosage unit an amount of a compound of claim 1 effective to treat asthma associated with a pharmaceutically-acceptable carrier therefor.

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**4,293,564**

## 2-(3,5-DIBROMO-4-AMINO-PHENYLIMINO)-IMIDAZOLIDINE, SALTS AND COMPOSITIONS THEREOF

**Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim; Wolfram Gaida, Ingelheim am Rhein, all of Fed. Rep. of Germany, and Ludwig Pichler, Vienna, Austria, assignors to Boehringer Ingelheim GmbH, Ingelheim, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 12,650, Feb. 16, 1979, Pat. No. 4,250,186. This application Aug. 20, 1980, Ser. No. 179,839**

**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806775**

**Int. Cl.³ A61K** *31/415;* **C07D** *233/50*

**U.S. Cl. 424—273 R** **2 Claims**

1. 2-(3,5-Dibromo-4-amino-phenylimino)imidazolidine or a non-toxic, pharmacologically acceptable acid addition salt thereof.

2. A bradycardiac pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective bradycardiac amount of a compound of claim 1.

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**4,293,565**

## TRANSDERMAL MEDICATION SYSTEM FOR ISOSORBIDE DINITRATE

**Günter Cordes, Leichlingen; Ewald Giesselmann, and Ulrich Münch, both of Monheim, all of Fed. Rep. of Germany, assignors to Sanol Schwarz-Monheim GmbH, Monheim, Fed. Rep. of Germany**

**Filed Oct. 9, 1979, Ser. No. 82,490**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2924005**

**Int. Cl.³ A61K** *31/34*

**U.S. Cl. 424—285** **10 Claims**

1. A pharmaceutical preparation consisting essentially of

(a) isosorbide dinitrate as active ingredient,

(b) a non-aqueous solvent for isosorbide dinitrate which dissolves at least 5% by weight of isosorbide dinitrate, based on the solvent, has an ointment-like consistency and is miscible with water, where said solvent is an ester of a $C_{8-18}$ fatty acid with glycerin ethoxylated with from 3 to 10 mols of ethylene oxide,

(c) an ointment consistency agent selected from the group consisting of glycerin monostearate, hardened castor oil, cetyl alcohol, stearyl alcohol, stearic acid, and mixtures thereof, and

(d) water,

where the weight ratio of water to consistency agent to solvent is 30 to 80:3 to 35:3 to 35 and the amount of isosorbide dinitrate in the preparation is from 2% to 20% by weight.

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**4,293,566**

## PESTICIDALLY ACTIVE 1-ARYLAMINO-2,4-DINITRONAPHTHALENES

**Rainer Hamprecht, Cologne; Alfons Hartmann, Beckingen; Erich Klauke, Odenthal-Hahnenberg; Ingeborg Hammann, Cologne; Peter Roessler, Bergisch-Gladbach, and Wilhelm Brandes, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 876,456, Feb. 1, 1978, Pat. No. 4,183,949. This application Jul. 12, 1979, Ser. No. 57,056**

**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708440**

**The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.**

**Int. Cl.³ A01N** *33/18, 37/34;* **C07C** *87/00, 121/78*

**U.S. Cl. 424—304** **25 Claims**

1. A compound selected from the group consisting of

1-(2-cyano-4-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(4-chloro-2-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(4-nitro-2-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(2,6-dichloro-4-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(4,6-dinitro-2-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(2,4,6-trichlorophenylamino)-2,4-dinitronaphthalene,

1-(2,4-dicyanophenylamino)-2,4-dinitronaphthalene,

1-(2-bromo-4-nitro-6-trifluoromethylphenylamino)-2,4-dinitronaphthalene,

1-(2,6-dichloro-4-nitrophenylamino)-2,4-dinitronaphthalene,

1-(4-nitro-2-bromophenylamino)-2,4-dinitronaphthalene,

1-(3-chloro-4-nitrophenylamino)-2,4-dinitronaphthalene,

1-(2-nitro-4-chlorophenylamino)-2,4-dinitronaphthalene,

1-(3-nitro-4-chlorophenylamino)-2,4-dinitronaphthalene,

1-(2,4-dinitro-6-bromophenylamino)-2,4-dinitronaphthalene,

1-(2-methyl-4-nitro-5-chlorophenylamino)-2,4-dinitronaphthalene,

1-(2-methoxy-4-nitro-5-chlorophenylamino)-2,4-dinitronaphthalene,
1-(2-nitro-4-methylphenylamino)-2,4-dinitronaphthalene,
1-(2,6-dinitrophenylamino)-2,4-dinitronaphthalene,
1-(3-chloro-4-methoxycarbonylphenylamino)-2,4-dinitronaphthalene,
1-(2-chloro-4-nitrophenylamino)-2,4-dinitronaphthalene,
1-(3-chloro-4-fluorophenylamino)-2,4-dinitronaphthalene and
1-(2,4-difluorophenylamino)-2,4-dinitronaphthalene.

**25**. A method of combating arthropods, fungi or bacteria which comprises applying to the arthropods, fungi or bacteria, or to a habitat thereof, an arthopodically, fungicidally or bactericidally effective amount of a compound according to claim **1**.

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**4,293,567**

## ANTI-FEEDANT FOR BOLL WEEVILS

**Martin Jacobson, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Apr. 16, 1980, Ser. No. 140,911**
**Int. Cl.³ A01N** *37/06*
**U.S. Cl. 424—312** **3 Claims**

**1**. A method of deterring boll weevils from feeding on growing cotton plants comprising applying methyl α-eleostearate to growing cotton plants in an amount sufficient to deter boll weevils from feeding thereon.

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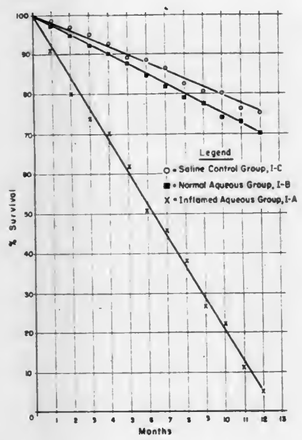
**4,293,568**

## METHOD FOR TREATMENT OF HUMAN EYE DISEASE

**Emil Wirostko, E. 208 Midland Ave., Paramus, N.J. 07652, and Lewis A. Johnson, 1050 Park Ave., New York, N.Y. 10028**

**Division of Ser. No. 932,904, Aug. 11, 1978, Pat. No. 4,220,657, which is a division of Ser. No. 453,463, Aug. 23, 1974, abandoned. This application Apr. 1, 1980, Ser. No. 136,297**
**Int. Cl.³ A61K** *31/135, 31/10*
**U.S. Cl. 424—330** **20 Claims**




**1**. A method of treating active endogenous uveitis caused by MICROMYCES intracellularis comprising administering to a patient having endogenous uveitis an effective amount therefor of a therapeutic agent comprising 4,4'-sulfonyldianiline.

**6**. A method of treating chronic conjunctivitis caused by MICROMYCES intracellularis comprising administering to a patient having chronic conjunctivitis an effective amount therefor of a therapeutic agent comprising 4,4'-sulfonyldianiline.

**11**. A method of treating kerato-conjunctivitis caused by MICROMYCES intracellularis comprising administering to a patient having kerato-conjunctivitis an effective amount therefor of a therapeutic agent comprising 4,4'-sulfonyldianiline.

**16**. A method of treating keratitis caused by MICROMYCES intracellularis comprising administering to a patient having keratitis an effective amount therefor of a therapeutic agent comprising 4,4'-sulfonyldianiline.

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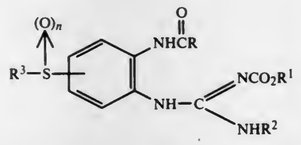
**4,293,569**

## SUBSTITUTED PHENYLGUANINDINES AND METHOD

**Rudiger D. Haugwitz, Titusville; Peter C. Wade, Pennington, and Barbara V. Maurer, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed May 12, 1978, Ser. No. 905,265**
**Int. Cl.³ C07C** *155/02, 149/437, 147/14;* **A61K** *31/325*
**U.S. Cl. 424—300** **9 Claims**

**1**. A compound of the structure



wherein R is hydrogen, lower alkyl, cycloalkyl, lower alkoxy, phenyl, phenylalkyl, lower alkoxyalkyl, phenoxy, phenylalkoxy, phenoxyalkyl, dialkylaminoalkyl, alkylthio, phenylthio, phenylthioalkyl, alkylthioalkyl or cycloalkyl substituted with 1, 2, 3 or 4 halogen groups and/or 1, 2, 3 or 4 lower alkyl groups; $R^1$ is lower alkyl or benzyl, $R^2$ is hydrogen lower alkoxy carbonyl, or lower alkanoyl; $R^3$ is cycloalkylalkyl, benzyl or cycloalkylalkyl wherein the cycloalkyl portion is substituted with 1, 2, 3 or 4 halogen groups and/or 1, 2, 3 or 4 lower alkyl groups; and n is 0 or 1, or a physiologically acceptable salt thereof.

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**4,293,570**

## PROCESS FOR THE PREPARATION OF SWEETENER CONTAINING PRODUCT

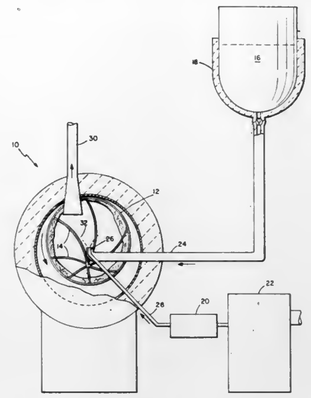
**Kalman Vadasz, South Wharton, N.J., assignor to Chimicasa GmbH, Chur, Switzerland**

**Filed Apr. 2, 1979, Ser. No. 26,357**
**Int. Cl.³ A23G** *3/30, 3/00*
**U.S. Cl. 426—3** **6 Claims**

**1**. A process of preparing a cryptocrystalline sweetener containing product, which process comprises:

spraying in a fine liquid spray within a vessel and into the cooler atmosphere within the vessel, through heated spray nozzles, a heated, aqueous, low-viscosity, high-solids, sweetener solution selected from the group consisting of an aqueous solution of sorbitol, sucrose fructose, mannitol, glucose, and combinations thereof, having a temperature of from about 180° F. to 315° F., and containing about 70% to 99.5% by weight of sweetener, and employing in the spraying operation cool, compressed, dry, air, which cool, compressed air is introduced into the heated spray nozzles, and wherein the heated solution is maintained in a heated condition up to the point of spraying, and wherein the compressed air has a temperature of from about 40° F. to 120° F. and is employed at a pressure of from about 40 to 125 psi, and wherein the change in phase from a liquid to a solid of the sweetener solution occurs without the substantial loss of moisture during the spraying operation, to provide for the formation in the atmosphere within the vessel of a fine particle-size, cryptocrystalline, sweetener product having a particle size of less






than about 5 microns, and admixing the fine-particle-size product with a food or confectionary product.

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**4,293,571**

## PROCESS FOR THE PREPARATION OF A PURIFIED PROTEIN HYDROLYSATE

**Mats Olofsson, Astorp, Sweden; Marcel Buhler, Tolochenaz, and Robert Wood, Le Mont-s/Lausanne, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland**

**Filed Feb. 28, 1980, Ser. No. 125,480**
**Claims priority, application Switzerland, Mar. 9, 1979, 2278/79**
**Int. Cl.³ A23J** *3/00*
**U.S. Cl. 426—7** **10 Claims**

**1**. A process for the preparation of a purified protein hydrolysate comprising:

(a) subjecting an aqueous solution of proteins to a hydrolysis treatment to yield at least hydrolysate products free of original protein and protein fragments capable of acting as allergens;
(b) subjecting the treated aqueous solution to a heat treatment to denature the proteins not hydrolysed in step (a); and
(c) eliminating the denatured proteins from the heat treated hydrolysate by ultrafiltration and obtaining an ultrafiltration permeate constituting the purified protein hydrolysate free of said original protein and protein fragments.

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**4,293,572**

## PROCESS FOR APPLYING A MOISTURE BARRIER COATING TO BAKED AND FRIED FOOD PRODUCTS

**Roy Silva; David J. Asb, both of Norwalk, Conn., and Clement E. Scheible, Rye, N.Y., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 881,935, Feb. 28, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,615**
**Int. Cl.³ A21D** *13/00*
**U.S. Cl. 426—19** **4 Claims**

**1**. A method of providing a multicomponent baked or fried bakery food product with an edible effective moisture barrier which comprises:

(a) preparing a substantially salt-free coating material of a water in oil emulsion comprising a uniform dispersion of droplets of a solution of 6% to 40% material selected from the group consisting of saccharide, polysaccharide or dextrin in 12% to 43% water in 25% to 75% oily substance selected from the group consisting of acetylated monoglycerides, or a triglyceride combined with an emulsifying agent and holding said emulsion at a first temperature at which it remains a stable liquid;
(b) cooking said bakery food product and reducing the temperature of the surface thereof to a temperature which is less than the first temperature of said coating material;
(c) applying said emulsion to the cooler surfaces of said product to provide a thin uniform coating on said surface whereby moisture migration is inhibited;
(d) setting said uniform coating prior to any further processing of said product; and
(e) icing said food product with said uniform coating being present between said product and said icing.

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**4,293,573**

## PREPARATION OF FROZEN YOGURT

**Robert L. Bradley, Jr., Madison, Wis., and Majid Hekmati, Karay Iran, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Mar. 30, 1979, Ser. No. 25,615**
**Int. Cl.³ A23C** *9/12*
**U.S. Cl. 426—43** **1 Claim**

**1**. A method for preparing a frozen yogurt containing in admixture cream, condensed skim milk, sucrose, corn sweetener, stabilizers and 30–50% fluid acid whey based on the total weight of the admixture obtained from the manufacture of cottage cheese, said method comprising preparing a first mixture consisting essentially of a major amount of said condensed skim milk and a minor amount of said cream, pasteurizing the mixture, cooling the mixture to incubation temperature, inoculating the cooled mixture with a yogurt culture, incubating the inoculated mixture to acidify the mixture, preparing a second mixture consisting essentially of said sucrose, corn sweetener, stabilizers and 30–50% fluid acid whey, pasteurizing the second mixture, cooling the pasteurized second mixture, mixing the cooled second mixture with the first acidified mixture to produce a third mixture containing a total solid content of 22–35% by weight, homogenizing the third mixture and freezing the third mixture to produce said frozen yogurt.

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**4,293,574**

## PROCESS FOR PREPARING MAYONNAISE-LIKE FOODS

**Yasuo Mikami, Yokohama; Hiroshi Kanda, Zushi, and Akio Uno, Yokohama, all of Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan**

**Filed Feb. 21, 1980, Ser. No. 123,250**
**Claims priority, application Japan, Aug. 10, 1979, 54-101306**
**Int. Cl.³ A23L** *1/24*
**U.S. Cl. 426—46** **3 Claims**

**1**. A process for preparing a mayonnaise food which comprises solubilizing an alcohol-denatured soybean protein with protease until the solubility of the protein in a 10% aqueous solution of trichloroacetic acid has reached about 15–35% by weight, separating water-insoluble materials to obtain refined soybean proteins and emulsifying the refined soybean proteins together with edible oils, vinegars, seasonings.

**4,293,575**

## METHOD AND APPARATUS FOR TEXTURIZING A PROTEINACEOUS SUBSTANCE

**Geoffrey N. Cockram, Henley on Thamas, and Jeffrey E. Munden, High Wycombe, both of England, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 889,041, Mar. 22, 1978, abandoned, which is a continuation of Ser. No. 694,989, Jun. 11, 1976, abandoned. This application Dec. 31, 1979, Ser. No. 108,841**

**Claims priority, application United Kingdom, Jun. 13, 1975, 25387/75**

**Int. Cl.**[3] **A23J** *3/00;* **A23L** *1/28*

**U.S. Cl. 426—104** **8 Claims**

1. A method of texturizing a mass consisting essentially of fungal mycelia having reduced turgor and a solids content of between 20% and 35% by weight, consisting solely of the steps of passing the mass under pressure through at least one member containing a plurality of apertures whereby the mass is filamented and compacting the resulting filaments to form a textured structure.

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**4,293,576**

## FOOD PRODUCT AND PROCESS OF MANUFACTURE

**Christopher B. Sentance, Wodonga, Australia, assignor to Effem Foods Pty. Ltd., Wodonga, Australia**

**Filed Aug. 10, 1978, Ser. No. 932,650**

**Claims priority, application Australia, Aug. 15, 1977, PD1233**

**Int. Cl.**[3] **A23K** *1/04*

**U.S. Cl. 426—104** **9 Claims**

1. A process for producing a food product simulating meat from an anticoagulant-treated, coagulable blood fluid by the controlled, chemically-stimulated coagulation of said blood fluid under controlled temperature conditions, said process comprising the steps of:

(a) coagulating an anticoagulant-treated, coagulable blood fluid selected from the group consisting of

(i) whole animal blood,

(ii) a plasma phase of animal blood,

(iii) a mixture of up to about 40% of a haemoglobin phase of animal blood and a plasma phase of animal blood,

(iv) a mixture of whole animal blood and a plasma phase of animal blood,

(v) a mixture of whole animal blood and up to about 20% of a haemoglobin phase of animal blood and

(vi) a mixture of whole animal blood, a plasma phase of animal blood and up to about 40% of a haemoglobin phase of animal blood,

in the presence of an exudation-inhibiting agent and a coagulation stimulant, both present in effective amounts, while maintaining said blood fluid at a temperature within about 10° C. either above or below the physiological temperature of the animal from which the blood has been derived to chemically induce coagulation and

(b) then recovering the resultant coagulate.

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**4,293,577**

## PRESERVABLE BAKED PASTRY PRODUCT, SUBSTANTIALLY FREE FROM SUCROSE AND SWEETENED WITH FRUCTOSE

**Renzo Cillario, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy**

**Filed Jun. 27, 1980, Ser. No. 163,893**

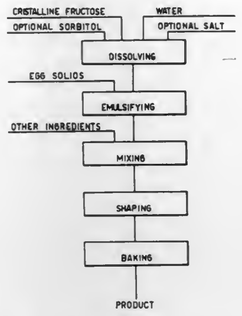
**Claims priority, application Italy, Nov. 22, 1979, 69262 A/79**

**Int. Cl.**[3] **A23G** *3/00*

**U.S. Cl. 426—244** **34 Claims**

1. Baked pastry product substantially free from sucrose and formed by a wheat flour-based cellular matrix, the said matrix being sweetened with fructose, either alone or in association with sorbitol, wherein the said cellular matrix is soft, is not crisp, is artificially leavened and is formed essentially, in addition to the wheat flour, from 50 to 80 parts by weight of starch, 15 to 25 parts by weight of gluten, 40 to 60 parts by weight of powdered skimmed milk and 50 to 100 parts by weight of egg solids for every 100 parts by weight of wheat flour, the said product being obtainable by the steps of:

(a) dissolving crystalline fructose in water and emulsifying in the obtained solution the said egg solids, in the form of powder or fresh eggs, thereby to obtain an emulsion containing from 150 to 200 parts by weight of water and at least 55 parts by weight of fructose for every 100 parts by weight of flour;




(b) introducing all the remaining ingredients in the proportions specified above, and a synthetic leavening agent, into the said emulsion under mixing conditions, to obtain a homogeneous, unleavened dough which is substantially unkneaded; and

(c) baking the said dough in an oven to obtain a final product having a moisture content of 17 to 22% by weight.

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**4,293,578**

## METHOD OF TREATING FRESH SHRIMP TO REDUCE MOISTURE AND NUTRIENT LOSS

**Everett W. Stone, P.O. Box 2168, Kodiak, Ak. 99615**

**Filed Mar. 31, 1980, Ser. No. 135,474**

**Int. Cl.**[3] **A22C** *25/00*

**U.S. Cl. 426—332** **16 Claims**

8. A method of treating shrimp while in the shell to reduce moisture and nutrient loss, comprising:

delivering water to a flake ice machine, admixing an amount effective to reduce moisture and nutrient loss of a moisture binding phosphate compound with the water while delivering the water to the flake ice machine, so that such compound will be incorporated into the ice, resulting in colder ice with a greater cooling capacity than plain water ice, and

collecting flakes of ice from such machine;

mixing such flake ice with shrimp within a storage region aboard a fishing vessel, as such shrimp is caught, said mixed ice and shrimp resulting in shrimp being wetted by water containing moisture binding phosphate compound, as the ice melts.

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**4,293,579**

## FLAVORING WITH 3,5-DI-(2-METHYLPROPYL)-1,2,4-TRITHIOLANE

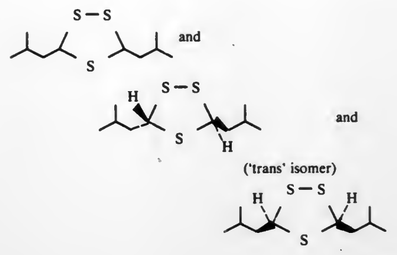
**Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Continuation of Ser. No. 63,377, Aug. 3, 1979, Pat. No. 4,259,507, which is a division of Ser. No. 963,176, Nov. 24, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,252**

**Int. Cl.**[3] **A23L** *1/226, 1/231, 1/234*

**U.S. Cl. 426—535** **3 Claims**

1. A process for augmenting or enhancing the flavor of a foodstuff comprising the step of adding to said foodstuff from about 0.0005 ppm up to about 250 ppm of the compound 3,5-di-(2-methylpropyl)-1,2,4-trithiolane or its "cis" or "trans" isomers having a structure selected from the group consisting of:

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**4,293,580**

## FROZEN FRUIT AND VEGETABLE JUICES

**Irving H. Rubenstein, Owings Mills, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.**

**Filed Nov. 23, 1979, Ser. No. 96,889**

**Int. Cl.**[3] **A23L** *2/02, 2/16;* **A23G** *9/00*

**U.S. Cl. 426—565** **17 Claims**

1. A method for the preparation of a soft-frozen whipped fruit or vegetable juice concentrate which comprises the steps of:

adding one or more whipping proteins or emulsifiers to single strength juice in an amount effective to whip the resulting juice concentrate mixture;

blending the single strength juice containing the whipping proteins or emulsifiers in an amount ranging from greater than 0% to 90% by weight of the total with a fruit or vegetable juice concentrate; and

subjecting the resulting mixture to simultaneous whipping and freezing at a temperature of about 18° to 30° F. to provide said soft-frozen whipped concentrate.

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**4,293,581**

## SAPONIFICATION TREATMENT OF SPENT COFFEE GROUNDS

**Pierre Hirsbrunner, Corseaux, and Raymond Bertholet, La Tour-de-Peilz, both of Switzerland, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland**

**Continuation-in-part of Ser. No. 90,148, Nov. 1, 1979, abandoned. This application Dec. 16, 1980, Ser. No. 216,960**

**Claims priority, application Switzerland, Nov. 3, 1978, 11332/78**

**Int. Cl.**[3] **A23K** *1/14*

**U.S. Cl. 426—630** **9 Claims**

1. Process for producing an animal feed component which comprises subjecting spent coffee grounds to a saponification treatment in an aqueous reaction medium which effectively saponifies cafestol and kahweol esters contained therein, acidifying the medium to a pH below 5 and recovering an animal feed component by drying the acidified medium.

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**4,293,582**

## POTATO DOUGH WITH PROCESS OIL FOR FORMED AND EXTRUDED POTATO PRODUCTS

**Michael L. Hamann, and Richard K. Pinegar, both of Caldwell, Id., assignors to J. R. Simplot Company, Boise, Id.**

**Filed Jun. 9, 1980, Ser. No. 157,257**

**Int. Cl.**[3] **A23L** *1/216*

**U.S. Cl. 426—637** **17 Claims**

1. A potato dough for formed and extruded potato products, the dough composed of a mixture consisting essentially of:

i. from about 45 to about 75 weight percent cooked mashed potatoes;

ii. from about 9 to about 20 weight percent dehydrated potato flakes;

iii. from about 0.12 to less than about 2.0 weight percent of liquid process oil selected from the group consisting of vegetable oils, animal fats and blends thereof; and

iv. from about 17 to about 27 weight percent of an aqueous slurry of an effective amount of binding agent.

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**4,293,583**

## PROCESS FOR DEBITTERING A PROTEIN HYDROLYSATE AND THE DEBITTERED HYDROLYSATE OBTAINED BY THIS PROCESS

**David R. Farr, Brent, and Daniele Magnolato, Chardonne, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland**

**Filed Jan. 23, 1980, Ser. No. 114,680**

**Claims priority, application Switzerland, Jan. 26, 1979, 788/79**

**Int. Cl.**[3] **A23J** *3/00*

**U.S. Cl. 426—657** **7 Claims**

1. A process for debittering an enzymatic hydrolysate of whey protein which comprises contacting the hydrolysate with an adsorbent consisting of desugared carob particles at a temperature of from 10° to 60° C.

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**4,293,584**

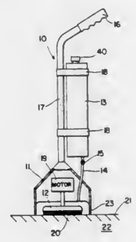
## METHOD OF PLATING WITH A PORTABLE MECHANICAL PLATER

**Erith T. Clayton, 3100 Elm Ave., Baltimore, Md. 21211**

**Filed Apr. 14, 1980, Ser. No. 112,108**

**Int. Cl.**[3] **C23C** *17/00*

**U.S. Cl. 427—11** **22 Claims**




1. A method of mechanically applying a metal coating onto the surface of an object comprising:

providing a portable plating device comprising: a housing; a mechanical plating member moveable relative to said housing and having a plating surface adapted to be urged against and moved relative to said object surface; means for moving said plating member relative to said housing with said plating surface urged against said object surface; and means for holding and guiding said device for movement by an operator over said surface, said device being portable and capable of being moved to said object for plating thereof;

moving said device into operative position with said plating surface of said plating member urged against said object surface;

supplying an admixture of mechanical plating promoter and particles of plating metal to said plating surface; and

moving said plating member relative to said housing and relative to said object surface to provide a solid metallurgically integrated metallic coating derived from said plating metal particles onto said surface.

**4,293,585**

## METHOD FOR THE PREPARATION OF POLARIZING FILMS OR SHEETS

**Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Jul. 10, 1980, Ser. No. 168,082**
**Claims priority, application Japan, Jul. 16, 1979, 54-90221**
**Int. Cl.³ B05D** *3/06*
**U.S. Cl. 427—40** **6 Claims**

1. A method for the preparation of a polarizing film or sheet which comprises the steps of

(a) subjecting a substrate film or sheet of a vinyl chloride-based resin to exposure to an atmosphere of low temperature plasma of a gas having no polymerizability in a plasma condition,

(b) coating the plasma-treated substrate film or sheet with an aqueous solution of a polyvinyl alcohol,

(c) drying the thus coated film or sheet to form a coating layer of the polyvinyl alcohol firmly bonded to the surface of the substrate film or sheet,

(d) stretching unidirectionally the polyvinyl alcohol-clad film or sheet, and

(e) subjecting the thus stretched film or sheet to an iodine treatment.

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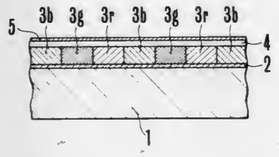
**4,293,586**

## METHOD FOR FORMING A FLUORESCENT SCREEN

**Takaaki Unnai; Akiya Izumi, and Misturu Hinosugi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 16, 1980, Ser. No. 112,613**
**Claims priority, application Japan, Jan. 19, 1979, 54-3954**
**Int. Cl.³ H01J** *29/22;* **B05D** *1/36, 7/22*
**U.S. Cl. 427—68** **5 Claims**




1. A method for forming a fluorescent screen on a panel of a cathode ray tube comprising the steps of coating on the inner face of the panel an undercoat layer containing at least polystyrene particles and having a film weight of 0.002 to 0.04 mg/cm², wherein the undercoat layer is made from an aqueous emulsion containing polystyrene particles of an average grain size of about 0.1 to 0.4 μm whose solid content is from about 0.3 to 4 weight %, and coating phosphor slurry on the undercoat layer.

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**4,293,587**

## LOW RESISTANCE BACKSIDE PREPARATION FOR SEMICONDUCTOR INTEGRATED CIRCUIT CHIPS

**Richard K. Trueblood, San Jose, Calif., assignor to Zilog, Inc., Cupertino, Calif.**

**Filed Nov. 9, 1978, Ser. No. 959,344**
**Int. Cl.³ H01L** *21/285*
**U.S. Cl. 427—90** **5 Claims**

1. A process for preparing the surface of a semiconductor integrated circuit chip for conductive attachment to a receiving surface comprising

removing substantially all surface contaminants and silicon dioxide from a surface of said chip,

applying a layer of aluminum to said surface,

applying a layer of gold to said aluminum layer, having a thickness in the range of twenty to forty times thicker than said aluminum layer, and

alloying said aluminum and gold layers at a temperature range between 380° and 440° C. for a time of four to six minutes in a nitrogen atmosphere, whereby gold is driven through said aluminum layer to penetrate said silicon surface, pulling traces of aluminum therewith.

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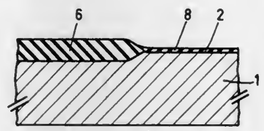
**4,293,588**

## METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE USING DIFFERENT ETCH RATES

**Hans-Rudolf Neukomm, Thalwil, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 914,750, Jun. 12, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,226**
**Claims priority, application Netherlands, Jun. 21, 1977, 7706802**
**Int. Cl.³ B05D** *5/12;* **B44C** *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/95*
**U.S. Cl. 427—93** **6 Claims**




1. A method of manufacturing a semiconductor device having a sunken oxide pattern, which comprises:

providing a silicon body having a major surface;

providing a silicon oxide layer on said surface;

providing a silicon nitride layer on said oxide layer;

removing like portions of said oxide and nitride layers to form a patterned oxidation mask which exposes selected areas of the surface;

oxidizing said exposed areas of the surface to obtain a sunken oxide pattern in an oxidation step in which a small silicon nitride strip is formed beneath said nitride layer adjacent the edges of said patterned oxidation mask defining said sunken oxide pattern and at the interface between said oxide layer and the surface of said silicon body; and

then removing said patterned oxidation mask to expose further areas of the surface adjacent the sunken oxide pattern by an etching treatment in which the silicon nitride layer is etched more rapidly than the silicon oxide layer and the silicon body material, the silicon oxide layer and the silicon body material are etched at approximately the same rate, and the small silicon nitride strip is removed, the exposed further areas of the surface being substantially flat at the edges of the oxide pattern.

3. A method as claimed in claim 1, further comprising the step of providing a layer of insulating material on said further areas of the major surface and adjoining said sunken oxide pattern to form a field effect transistor gate insulation layer.

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**4,293,589**

## PROCESS FOR HIGH PRESSURE OXIDATION OF SILICON

**Mikio Takagi; Mamoru Maeda, both of Kawasaki, and Hajime Kamioka, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 955,755, Oct. 30, 1978. This application Oct. 1, 1980, Ser. No. 192,812**
**Claims priority, application Japan, Oct. 31, 1977, 52-130651; Oct. 31, 1977, 52-130652; Oct. 31, 1977, 52-130653**
**Int. Cl.³ H01L** *2/316*
**U.S. Cl. 427—93** **16 Claims**

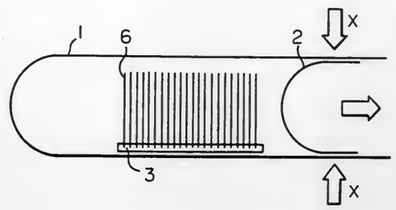
1. A process for high pressure oxidation of silicon with high uniformity in the thickness of the oxide film, said process comprising the steps of:

spacing silicon wafers apart from each other in a quartz capsule in the form of a tube with one end closed;



feeding a predetermined pressure of an oxidizing gas into said quartz capsule;

sealing said quartz capsule gas-tightly by fusing; and




heating said quartz capsule to an elevated temperature to generate a high pressure oxidizing atmosphere therein and to form said high uniformity oxide film on said silicon wafers.

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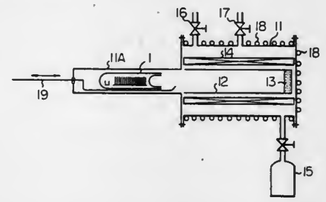
**4,293,590**

## PROCESS FOR HIGH PRESSURE OXIDATION OF SILICON

**Mikio Takagi, Kawasaki; Mamoru Maeda, Tama, and Hajime Kamioka, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Division of Ser. No. 955,755, Oct. 30, 1978. This application Oct. 1, 1980, Ser. No. 192,813**
**Claims priority, application Japan, Oct. 31, 1977, 52-130651; Oct. 31, 1977, 52-130652; Oct. 31, 1977, 52-130653**
**Int. Cl.³ H01L** *21/316*
**U.S. Cl. 427—93** **7 Claims**




1. A process for high pressure oxidation of silicon with high uniformity in the oxide thickness, said process comprising the steps of:

introducing silicon wafers and a predetermined amount of an oxidizing substance into a quartz capsule in the form of a tube with one end closed;

sealing said quartz capsule gas-tightly by fusing;

introducing said sealed quartz capsule into a furnace placed in a pressure chamber; and

heating said quartz capsule to an elevated temperature to simultaneously generate a high pressure oxidizing atmosphere therein to form an oxide film on said silicon wafers with said high uniformity; and

simultaneously with said heating operation, increasing the pressure in said pressure chamber.

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**4,293,591**

## PROCESS USING ACTIVATED ELECTROLESS PLATING CATALYSTS

**Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540**

**Continuation-in-part of Ser. No. 105,865, Feb. 21, 1979, which is a division of Ser. No. 941,044, Sep. 11, 1978, Pat. No. 4,180,600, which is a continuation-in-part of Ser. No. 820,904, Aug. 1, 1977, Pat. No. 4,131,699, which is a continuation of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Mar. 31, 1980, Ser. No. 135,237**
**The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.**
**Int. Cl.³ C23C** *3/02*
**U.S. Cl. 427—97** **10 Claims**

1. A process for electroless or chemical plating onto a non-conductor substrate comprising the step of contacting said substrate with an activated colloidal dispersion wherein said colloidal dispersion comprises a metal which in one of its oxidation states is capable of electroless or chemical plating initiation and wherein said metal may be in an elemental state or alloy or compound and mixtures thereof and further wherein said activated colloidal dispersion comprises at least one primary stabilizer which alone renders the dispersion weakly active and at least one reactivity modifier and wherein said primary stabilizer and said reactivity modifier are inherently colloid stabilizers however they are different materials and further wherein said reactivity modifier is a non-ionic surfactant.

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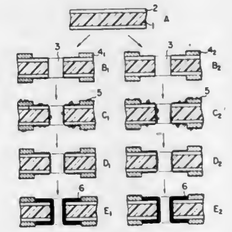
**4,293,592**

## METHOD FOR PRODUCTION OF PRINTED CIRCUITS BY ELECTROLESS METAL PLATING

**Hirosada Morishita; Mineo Kawamoto, and Kanzi Murakami, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 549,673, Feb. 13, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,723**
**Claims priority, application Japan, Feb. 15, 1974, 49-17567**
**Int. Cl.³ C23C** *3/02*
**U.S. Cl. 427—98** **11 Claims**




1. A method for producing a printed circuit by electroless metal plating wherein an insulating substrate having initiator for electroless metal plating on a negative pattern area of a thermo-setting resin, said thermosetting resin comprising a thermo-setting resin composition containing at least one of epoxy resin, polyester resin and phenol resin and at least one of silicone resin and wax, activity of said resin for deposition of the initiator for electroless metal plating being substantially reduced, and a positive pattern area on which electroless plated film of the circuit is to be formed is allowed to contact with an initiator washing liquid of an aqueous solution consisting essentially of 5 to 100 grams of at least one organic acid selected from the group consisting of tartaric acid, citric acid, oxalic acid and maleic acid, and 1 to 4 N hydrochloric acid or 0.1 to 0.5 N nitric acid per one liter of said aqueous solution to dissolve and remove said initiator deposited on the negative pattern area before said insulating substrate is immersed in an electroless metal plating solution to form a circuit conductor by electroless plating on said positive pattern area.

**4,293,593**

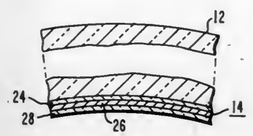
## METHOD OF FABRICATING HEAT MIRROR FOR INCANDESCENT LAMP ENVELOPE

**Bulent E. Yoldas, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 931,346, Aug. 8, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,217**

**Int. Cl.**[3] **C03C** *17/36;* **G02B** *1/10;* **H01K** *1/32*

**U.S. Cl. 427—106** **9 Claims**




1. The method of applying a heat mirror which is transmissive for visible radiations and reflective for infrared radiations to the interior surface of a regularly conformed hollow thin-walled vitreous light-transmitting member intended for use as an envelope for an incandescent light source, which method comprises:

a. applying to the interior surface of said envelope, to a substantially uniform predetermined thickness, a clear solution having contained therein partially hydrolyzed metallic alkoxide which in the metallic alkoxide form prior to hydrolyzation is expressed as $M(OR)_n$, wherein M at least substantially comprises titanium, R is alkyl with from 1 to 6 carbon atoms, and n is the valence of M; total reacted and unreacted water in said solution being present in amount of from 0.6 mole to 8 moles per mole of said metallic alkoxide; the solution solvent being liquid aliphatic alcohol present in amount to provide a solution solids content, expressed as equivalent metallic oxide, of from about 0.1% to about 3% by weight; and as an optional constituent, said solution is acidified with at least one of hydrochloric, nitric and perchloric acid in amount of up to about 0.3 mole per mole of said metallic alkoxide;

b. heating said envelope and first applied solution to a temperature of from about 300° C. to about 600° C. but not exceeding the strain point of said envelope for a sufficient period of time to convert said applied clear solution to an adherent thin continuous metallic oxide layer;

c. applying over said first applied metallic oxide layer a thin continuous silver layer of predetermined thickness sufficient to be substantially transmissive for visible radiations and substantially reflective for infrared radiations;

d. applying over the applied silver layer to a thin substantially uniform predetermined thickness a second clear solution as used to apply said first-applied metallic oxide layer; and

e. heating said envelope and applied second clear solution to a temperature of from about 300° C. to about 425° C. under conditions which are non-reactive for silver for a sufficient period of time to convert said second applied clear solution to an adherent clear metallic oxide layer.

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**4,293,594**

## METHOD FOR FORMING CONDUCTIVE, TRANSPARENT COATING ON A SUBSTRATE

**Bulent E. Yoldas, Churchill, and Douglas M. Mattox, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Aug. 22, 1980, Ser. No. 180,768**

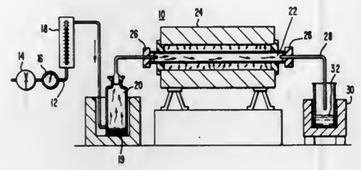
**Int. Cl.**[3] **B05D** *7/22, 5/12;* **C03C** *17/245*

**U.S. Cl. 427—107** **12 Claims**

1. The method of forming a conductive, transparent coating on the interior surface of a vitreous tubular member of predetermined dimensions, which method comprises:

(a) in a carrier gas comprising oxygen and exterior to said member to be coated, forming a vapor from a material substantially comprising organic tin halide compound having a predetermined condensation temperature and a predetermined decomposition temperature, with the temperature of said carrier gas and said formed vapor maintained between the condensation temperature and the decomposition temperature of said organic tin halide compound;

(b) heating said member to be coated to a temperature greater than the decomposition temperature of said organic tin halide compound, flowing said heated carrier gas and said formed vapor at a predetermined rate into one




end portion of said heated member and longitudinally through said heated member to cause a predetermined amount of said formed vapor to contact the interior surface of said heated member where the contacting vapor decomposes and forms said transparent conductive coating;

and

(c) flowing said carrier gas and residual heated vapor out of the other end portion of said heated member, and cooling said carrier gas and said residual vapor to less than the condensation temperature of said organic tin halide compound to recover same.

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**4,293,595**

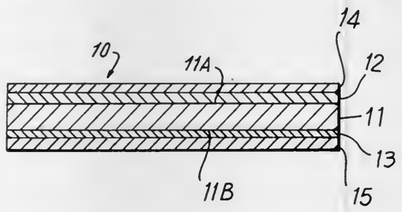
## AQUEOUS PROCESS FOR MAKING A CONDUCTIVE MEDIUM FOR ELECTROSTATIC PRINTING

**William H. Kreiling, Longmeadow, Mass., and Edward S. Jones, Bellvale, N.Y., assignors to International Paper Company, New York, N.Y.**

**Filed Mar. 28, 1979, Ser. No. 24,584**

**Int. Cl.**[3] **B05D** *5/12*

**U.S. Cl. 427—121** **14 Claims**




1. An improved process for making a conductive medium for electrostatic printing comprising applying to a first side of a high density basestock a partially insolubilizable aqueous conductive latex precoat comprising an interpolymer of a butadienebased polymer latex and a $\alpha\beta$-olefinically unsaturated carboxylic acid monomer, the insolubilization of the conductive latex resulting from partial insolubilization of the major conductive component of the latex; applying to the other side of the basestock a first aqueous low-resistance coating; partially insolubilzing the conductive latex precoat, the extent of said partial insolubilization being controlled so as to provide to said first side of the basestock a surface resistivity of about $1 \times 10^{10}$ ohm/square at 50% relative humidity; applying to the partially insolubilized conductive latex precoat an aqueous dielectric coating; and applying to the first aqueous low-resistance coating a second aqueous low-resistance coating.



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**4,293,596**

## SURFACE COATING METHOD EMPLOYING A TEMPORARY BONDING

**Allan R. B. Furendal; Bernt Larsson, and Erik R. Nilsson, all of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden**

**Filed Apr. 5, 1976, Ser. No. 673,843**

**Claims priority, application Sweden, Apr. 11, 1975, 7504193**

**Int. Cl.**[3] **B05B** *5/00;* **B05D** *3/04*

**U.S. Cl. 427—160** **30 Claims**

1. A method of coating a surface with a coherent coating containing a polymeric material as the main bonding agent wherein said main bonding agent is not film forming at room temperature, but forms the coherent phase of the finished coating which comprises:

A. applying to said surface a dispersion containing said main bonding agent dispersed in an inert liquid forming the continuous phase in relation to the dispersed main bonding agent, said dispersion also containing a second and temporary bonding agent in an amount of 0.5–25% by volume based upon the total quantity of solids in the dispersion;

B. then allowing the continuous phase of the dispersion to evaporate or be driven off;

C. causing said main bonding agent to precipitate in the form of polymer particles having a diameter of 0.1–30 $\mu$m wherein the minimum film forming temperature (MFT) of said bonding agent is at least 20° C. above the temperature prevailing in the coating during step B above;

D. causing said temporary bonding agent to precipitate at the same time as said main bonding agent to form a porous powder layer on said surface, and wherein the minimum film forming temperature (MFT) of said temporary bonding agent is at least 20° C. below the MFT for said main bonding agent and is below the temperature prevailing in the coating during step B above, and wherein said temporary bonding agent is present in an amount sufficient to bond the particles of said main bonding agent to said surface with sufficiently strong adhesion forces to permit a certain handling of the porous powder layer thus obtained;

E. then exposing said porous powder layer to a solvent capable of dissolving said main bonding agent and causing the bonding agent particles to flow together to form a coherent coating;

F. then driving off any excess solvent and drying said coherent coating.

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**4,293,597**

## METHOD OF FORMING A ROOFING COMPOSITE USING SILICONE RUBBER COMPOSITION

**Stanley J. Bessmer, Cohoes, and Warren R. Lampe, Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Continuation of Ser. No. 537,085, Dec. 30, 1974, abandoned, which is a division of Ser. No. 478,824, Jun. 12, 1974, Pat. No. 3,888,815, which is a continuation of Ser. No. 389,733, Aug. 20, 1973, abandoned, which is a continuation of Ser. No. 180,068, Sep. 13, 1971, abandoned. This application Sep. 28, 1979, Ser. No. 80,143**

**Int. Cl.**[3] **B05D** *7/14, 3/00*

**U.S. Cl. 427—186** **8 Claims**

1. A process for forming a composite of a silicone rubber composition and a substrate wherein the bond between said silicone rubber composition and said substrate is hydrolytically stable, said process comprising:

(A) applying to a substrate a self-bonding room temperature vulcanizable silicone rubber composition consisting essentially of (a) a linear, fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 500 to 10,000,000 centipoise when measured at 25° C., the organic groups of the aforesaid organopolysiloxane representing monovalent hydrocarbon radicals; (b) 5 to 300% by weight of said linear organopolysiloxane of a filler; (c) from 0.1–10% by weight based on the linear organopolysiloxane of an alkyl silicate selected from the group consisting of (1) a monomeric organosilicate corresponding to the general formula,

$$(R^{40}O)_3Si{-}R^{41}$$

where $R^{40}$ is a radical selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and $R^{41}$ is selected from the group consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and acyloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds; (d) from 0.1 to 5% by weight of the linear organopolysiloxane of a catalyst which is a metallic salt of an organic monocarboxylic or dicarboxylic acid in which the metal ion is selected from the group consisting of lead, tin, zirconium, antimony, iron, cadmium, barium, calcium, titanium, bismuth and manganese with the exception of manganese napthenate and calcium stearate and (e) an amount in the range of from 0.5 to 4% by weight based on the linear organopolysiloxane, that is sufficient to form a hydrolytically stable bond with a substrate, of a nitrogen-functional silane of the formula,

$$\Sigma_{(3-a)}\overset{R_a}{\overset{|}{Si}}\theta$$

where R is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, $\Sigma$ is a hydrolyzable group selected from the group consisting of alkoxy, phenoxy, amino and dialkylamino and $\theta$ is a nitrogen-functional radical which is a saturated, unsaturated or aromatic hydrocarbon residue which in addition to nitrogen-functionality may be functionalized by a radical selected from the group consisting of amino, cyano, thio, oxo, and ester, and multiples and combinations thereof and a is a whole number that varies from 0 to 2, and where there is present 5 to 50% by weight of the total composition of a hydrocarbon solvent and an amount of an oxygenated solvent selected from the group consisting of alcohols, ethers, ketones and esters that will prolong the work life of the composition without retarding the final cure; and

(B) permitting said composition to cure.

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**4,293,598**

## METHOD FOR INCREASING BORON[10] CONTENTS OF NEUTRON ABSORBING ARTICLES

**Michael T. Hortman, Tonawanda, and Robert G. Naum, Lewiston, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.**

**Filed Nov. 13, 1978, Ser. No. 960,150**

**Int. Cl.**[3] **G21F** *1/10*

**U.S. Cl. 427—203** **9 Claims**

1. A method for increasing the $B^{10}$ content of a neutron absorbing article which includes neutron absorbing boron carbide particles in a matrix of cured solid polymeric material which comprises coating a surface of such article with a curable liquid synthetic organic polymeric material, applying boron carbide particles to the curable polymeric material so

that portions of such particles project beyond the surface of the curable polymeric material, and curing and solidifying the polymer to solid form so that it holds the boron carbide particles in place on the neutron absorbing article, with portions of said particles projecting beyond the surface of the cured polymeric material.

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**4,293,599**

## METHOD OF FORMING DECORATIVE RELIEF PATTERN AND PATTERN-FORMING DEVICE THEREFOR

**Kiyoshi Hori, Osaka, and Nobuyoshi Nagata, Nara, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Oct. 28, 1975, Ser. No. 626,446**

**Claims priority, application Japan, Oct. 29, 1974, 49-125247; Nov. 5, 1974, 49-127764**

**Int. Cl.³ B05D** *3/12, 5/02*

**U.S. Cl. 427—274** **19 Claims**

1. In the method of forming a relief pattern on the surface of an article or substrate which comprises coating the surface thereof with a coating composition and applying thereto, during the course of the drying of the coating, a pattern-forming device with a design to be patterned thereon once or a plurality of times, the improvement according to which the pattern-forming device is composed of a rigid or semi-rigid material having air-permeable pores therein and having a percent water or liquid absorption of from about 15 to 99 percent and the pattern-forming device contains a releasing agent therein, the said releasing agent being the same material as the solvent employed in the coating composition, and the said coating composition having a viscosity in the range of from about 20 to 1000 poises.

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**4,293,600**

## METHOD OF FINISHING FIBERS OR FABRICS WITH DISPERSIONS OF HYDROPHILIC ACRYLIC RESINS

**Herbert Fink, Bickenbach; Klaus Huebner, Ober-Ramstadt-Eiche; Horst Dinklage, Darmstadt-Arheilgen, and Hans Ottofrickenstein, Darmstadt-Eberstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany**

**Division of Ser. No. 20,037, Mar. 13, 1979, Pat. No. 4,239,671, which is a continuation-in-part of Ser. No. 955,796, Oct. 30, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,177**

**Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749386**

**Int. Cl.³ B05D** *3/02*

**U.S. Cl. 427—385.5** **9 Claims**

1. The method of finishing fibers or fabrics which comprises applying thereto an aqueous dispersion of a hydrophilic copolymer prepared by polymerizing, in an aqueous medium, a monomer mixture comprising: (1) from 65 to 94.5 percent, by weight of said copolymer, of a member selected from the group consisting of lower alkyl acrylates and methacrylates; (2) a compound of the formula

$$CH_2=\underset{\displaystyle R}{\overset{\displaystyle |}{C}}-\overset{\displaystyle O}{\overset{\displaystyle \|}{C}}-(Y-CH_2CH_2)_n-OR^1$$

wherein

R is hydrogen or methyl,

$R^1$ is hydrogen or alkyl having 1 to 4 carbon atoms,

Y is oxygen or $-NR^2-$,

$R^2$ is hydrogen or alkyl having 1 to 4 carbon atoms, and

n is an integer from 1 to 25; (3) up to 8 percent, by weight of the copolymer, of a member selected from the group consisting of copolymerizable carboxylic acids and salts of such acids; and (4) at least one monomer capable of cross-linking said copolymer, and cross-linking said copolymer by drying said dispersion and heating the dried treated fiber or fabric.

**4,293,601**

## FLOWER-LIKE DECORATIVE ORNAMENT

**Bernard M. Cole, 7 Park Dr. East, Old Westbury, N.Y. 11568**

**Filed Sep. 5, 1980, Ser. No. 184,417**

**Int. Cl.³ A41G** *1/00*

**U.S. Cl. 428—24** **8 Claims**

1. A flower-like decorative ornament for use in gift-wrapping a package comprising:

(A) an artificial flower comprising a base, a pattern of petals extending at least partially upwardly from said base, and a passage extending longitudinally through said base; and

(B) an elasticized cord having its end portions knotted together to define a section of enlarged diameter incapable of passing through said passage, a pair of free ends to one side of said enlarged section and a loop to the other side thereof; said loop passing longitudinally through said passage with said enlarged section being at least partially disposed above said passage to slidably mount said flower on said loop, said cord being configured and dimensioned such that when said loop is stretched about a package so that said enlarged section is disposed immediately atop said passage, said free ends extend at least partially upwardly from said enlarged section and terminate closely adjacent the uppermost portions of said petals, whereby said free ends have the appearance of stamens.

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**4,293,602**

## NATURAL BOTANICAL ORNAMENT

**James P. Coffey, and Bettie L. Coffey, both of 137 South St., Ext., Warwick, N.Y. 10990**

**Filed Dec. 17, 1979, Ser. No. 104,010**

**Int. Cl.³ A01N** *3/00;* **A44C** *25/00*

**U.S. Cl. 428—28** **8 Claims**

1. A fragrant ornament molded in a compression molding process from a mixture comprising, in combination:

(a) a naturally fragrant botanical material comminuted into a particulate form,

(b) an essential oil, which is capable of complementing the fragrance of said botanical material, and which is absorbed on the botanical material or an optional absorbtive fixative, and

(c) a fiber reinforced fluorocarbon resin binder, which binds the botanical material together without masking or sealing the botanical material, allowing the release of the fragrance from said botanical material and said absorbed essential oil, said resin binder being dispersed through the botanical material from an aqueous suspension of the fluorocarbon resin.



**4,293,603**

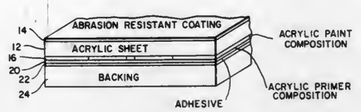
## ACRYLIC SHEET-LACQUER LAMINATES AND ARTICLES OF FURNITURE MADE THEREFROM

**Charles R. Hayman-Chaffey, and Frederick W. Hayman-Chaffey, both of New York, N.Y.**

**Filed Jan. 9, 1980, Ser. No. 110,559**

**Int. Cl.³ B32B** *3/00, 27/00, 27/08;* **B05B** *5/00*

**U.S. Cl. 428—86** **23 Claims**




1. A method of making a decoarative laminate comprising the steps of:

(a) providing as a starting material an acrylic composition sheet which includes a pair of opposed spaced surfaces;

(b) applying an acrylic paint coating composition in a selected color to at least a portion of one surface of the acrylic composition sheet;

(c) applying an acrylic primer coating composition over at least that portion of the surface of the sheet to which the acrylic paint coating has been applied; and

(d) adhesively bonding the surface of said sheet to which the acrylic paint coating composition and the primer acrylic coating have been applied to a backing member,

whereby the uncoated surface of the acrylic sheet layer forms the outer layer of the laminated article.

19. An article of furniture comprising at least one member thereof which includes:

an acrylic composition sheet which includes a pair of opposed spaced surfaces;

a thin layer of acrylic paint coating composition in a selected color on at least a portion of one surface of the acrylic composition sheet;

a thin layer of acrylic primer coating composition over at least that portion of the one surface of the acrylic composition sheet to which the acrylic paint coating has been applied; and

a backing member adhesively secured to said acrylic composition sheet on the same side thereof to which the acrylic paint coating composition and the acrylic primer coating composition has been applied.

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**4,293,604**

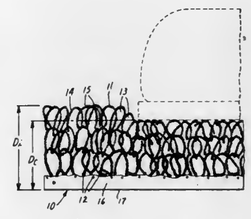
## FLOCKED THREE-DIMENSIONAL NETWORK MAT

**Douglas D. Campbell, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Filed Jul. 11, 1980, Ser. No. 168,683**

**Int. Cl.³ B32B** *5/28*

**U.S. Cl. 428—90** **11 Claims**



1. A flocked mat especially suited for pedestrain traffic particularly to wipe wet and/or dirty feet, said mat comprising:

(1) a web formed of a three-dimensional, lofty, open, porous, network comprising strands of water-resistant, organic polymer material generally defining connecting open spaces capable of receiving dirt, said web being at least 0.5 cm in thickness, having a void volume of at least about 75% and being resiliently compressible underfoot by about at least 10% of its thickness;

(2) a continuous backing layer of organic polymeric material having a thickness on the order of 0.2 to 2.5 mm attached to one major surface of said web and forming one major surface of said mat;

(3) a resinous water-resistant bonding adhesive substantially entirely coating the surfaces of said strands of said network without filling said open spaces substantially throughout said web; and

(4) water-resistant, wear-resistant organic textile flocking material having a denier in the range of about 0.5 to 25 and a length in the range of about 0.25 to 2.5 mm and being uniformly distributed substantially throughout said web and adhesively bonded to said web by said resinous bonding adhesive substantially entirely covering the surfaces of each of said strands of said network substantially without filling said open spaces to provide a flocked web capable of providing a wiping surface for dirt and water, receiving, obscuring and holding dirt therein and facilitating the evaporation of water.

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**4,293,605**

## TIE FOR WOOD PILES

**Alf Persson, Badhusgatan 10, 686 00, Sunne, and Nils O. Söderberg, Skogsberg 680 15, Backalund, both of Sweden**

**Filed Jul. 12, 1979, Ser. No. 56,941**

**Int. Cl.³ B32B** *3/04;* **B65D** *85/62*

**U.S. Cl. 428—126** **6 Claims**

1. A device for inserting between layers of wooden boards or like rigid structures, comprising:

a longitudinally elongated strip of stiff cellulosic material having a bottom layer of predetermined constant width and formed with a pair of top layers over the majority of the width thereof, and defining a plane;

means for maintaining the layers together;

means for imparting bending resistance to said strip so that when held at one end with that end horizontal the free end does not deflect significantly from the horizontal, said means consisting of a pair of longitudinally extending single layer deformable projections formed from said stiff cellulosic material, one provided at each of the lateral edges of said strip, and each standing upright from said plane substantially the entire length of said strip; each said projection being defined by a longitudinally extending channel that is substantially triangular in cross-section with two legs of the triangle formed from one of said top layers joining at an obtuse angle and defining an apex upstanding from said one layer, and the third leg of the triangle formed from the bottom layer with said third leg coplanar with said bottom layer; and

means for preventing buckling of said channels, comprising a fibrous material bundle disposed in each of said channels.

**4,293,606**

## LOW FRICTION, ABRASION RESISTANT COATING FOR TRANSPARENT FILM

**J. Lamar Zollinger, Maplewood, and Larry A. Lien, Forest Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

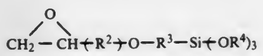
**Filed Mar. 13, 1978, Ser. No. 885,762**
**Int. Cl.³ B32B** *3/00, 7/14, 27/38, 9/04*
**U.S. Cl. 428—203** **3 Claims**

1. A transparent, imaged motion picture film having on at least one face thereof a mottle free abrasion resistance coating of from 0.5 to 15.0μ on at least one face of said film, said coating resulting from the cure of a composition comprising at least 30% by weight of an epoxy-terminated silane, said coating:

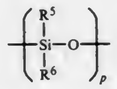
(1) having a coefficient of friction against tin-plated steel of from 0.05 to 0.30, as measured by ANSI PH 1.47–1972,

(2) having a dynamic coefficient of friction against said coating of less than 0.41, and

(3) allowing at least 75% transmission of all radiation between 400 and 780 nm which is transmitted by said imaged film without said coating, wherein said epoxy-terminated silane is represented by the formula:



wherein $R^2$ and $R^3$ are independently alkylene groups of 1 to 4 carbon atoms, and $R^4$ is alkyl of 1 to 4 carbon atoms, and wherein said coating contains from 0.05 to 15.0% by weight of the coating of an oligomeric or polymeric material having at least 5% by weight of said material comprised of siloxane units of the formula:



wherein $R^5$ and $R^6$ are independently selected from alkyl groups of 1 to 4 carbon atoms and phenyl groups having no more than 10 carbon atoms, and p is a positive whole integer of at least 1.

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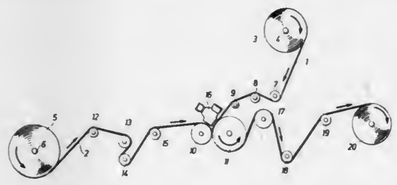
**4,293,607**

## FLEXIBLE SHEET COVERING MATERIAL FOR WRAPPING HEAT, COLD AND SOUND INSULATION

**Ulf J. Millgardh, Stora Mellösa; Ulf W. Lindberg, Örebro; Weimar A. Anneflod, Örebro; Nils H. Werner, Örebro, and Bjorn Wimelius, Örebro, all of Sweden, assignors to Örebro Pappersbruks AB, Orebro, Sweden**

**Division of Ser. No. 884,299, Mar. 7, 1978, Pat. No. 4,188,248.**
**This application Aug. 29, 1979, Ser. No. 70,577**
**Claims priority, application Sweden, Mar. 14, 1977, 7702865**
**The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.**
**Int. Cl.³ B32B** *7/02*
**U.S. Cl. 428—212** **6 Claims**



1. A continuous flexible self curling sheet material intended as a semifinished product for wrapping around heat, cold or sound insulation on piping, said sheet material comprising a multilayer laminate containing at least two layer groups, the first group forming the outer part of the sheet material when rolled up, and containing a supporting layer consisting of a kraft paper with minor extensibility, covered on its outwardly facing surface with a polyethylene layer and similarly on its inner surface with a polyethylene or glue layer, while the second group; forming the inner part of the material when rolled up, containing a layer consisting of a highly extensible kraft paper, which is given a contracting tendency due to its striving to retain its original shape, by being given a high tensional load during manufacture, the highly extensible kraft paper having a polyethylene or glue layer on its surface facing towards the first layer group, said glue layer being bonded to the corresponding layer in the first layer group or constituting said corresponding layer, and on its surface facing the opposite direction being protected by a polyethylene layer, both layer groups being bonded to each other such that the sheet material has an enduring precurvature characteristic for the sheet material.

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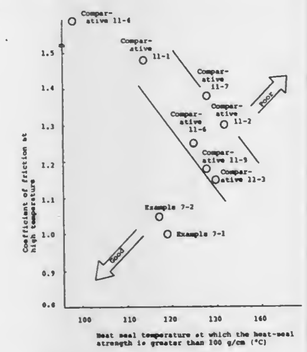
**4,293,608**

## OLEFIN PACKAGING LAMINATE

**Tsutomu Isaka, Inuyama, and Saburoh Kumada, Kawanishi, both of Japan, assignors to Toyo Baseki Kabushiki Kaisha, Japan**

**Filed Oct. 15, 1979, Ser. No. 84,498**
**Int. Cl.³ B32B** *27/08*
**U.S. Cl. 428—220** **19 Claims**




1. A heat sealable material comprising (A) a stretched base layer comprising a propylene polymer and (B) on at least one surface of said base layer a stretched surface layer comprising a blend of a propylene-ethylene copolymer and a $C_4$–$C_{10}$α-olefin-propylene copolymer comprising units of $C_4$–$C_{10}$α-olefin and units of propylene in a weight proportion of 30:70 to 5:95, said blend being present in a weight proportion of 20:80 to 94:6 by weight.

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**4,293,609**

## FLEXIBLE ABSORBENT LAMINATES

**Robert E. Erickson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 55,586, Jul. 9, 1979, abandoned.**
**This application Jun. 30, 1980, Ser. No. 164,644**
**Int. Cl.³ B32B** *7/00*
**U.S. Cl. 428—246** **28 Claims**

1. A flexible hydrophilic absorbent laminate which has a rapid absorption rate and is soft and flexible at low and high relative humidities which comprises



(a) a central, substantially discontinuous and crushed film consisting of a water-swellable hydrophilic polymer, and

(b) a layer of wicking substrates bonded to both sides of said film.

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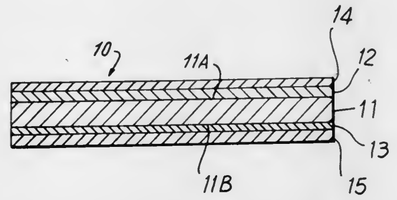
**4,293,610**

## ELECTROSTATIC PRINTING MEDIUM

**William H. Kreiling, Longmeadow, Mass., and Edward S. Jones, Bellvale, N.Y., assignors to International Paper Company, New York, N.Y.**

**Division of Ser. No. 24,584, Mar. 28, 1979. This application Nov. 30, 1979, Ser. No. 99,006**
**Int. Cl.³ B32B** *7/00*
**U.S. Cl. 428—246** **16 Claims**




1. An improved conductive medium for electrostatic printing comprising on a first side of a high density basestock a partially insolubilized aqueous conductive latex precoat comprising an interpolymer of a butadiene-based polymer latex and a αβ-olefinically unsaturated carboxylic acid monomer, the insolubilization of the conductive latex resulting from partial insolubilization of the major conductive component of the latex, the extent of said partial insolubilization being controlled so as to provide to said first side of the basestock a surface resistivity of about $1 \times 10^{10}$ ohm/square at 50% relative humidity, and on top thereof a dielectric coating and comprising on the other side of the high density basestock at least two low-resistance coatings.

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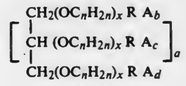
**4,293,611**

## SILICONE POLYETHER COPOLYMERS

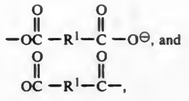
**Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.**

**Division of Ser. No. 86,906, Oct. 22, 1979, Pat. No. 4,246,423.**
**This application May 20, 1980, Ser. No. 152,054**
**Int. Cl.³ B32B** *7/00, 25/00*
**U.S. Cl. 428—266** **14 Claims**

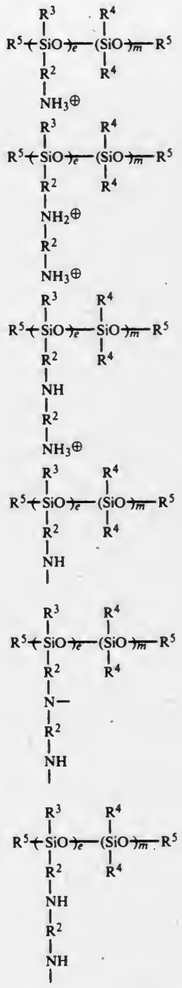
1. A process for treating a textile material which comprises coating a textile material with a composition containing a silicone polyether copolymer having the general formula



where R is a radical selected from the group consisting of



in which the radical R is linked to the polyether through an ester linkage, $R^1$ is a divalent hydrocarbon radical selected from the group consisting of $(-CH_2)_y$, —CH=CH— and a cyclic radical selected from the group consisting of $C_6H_4$, $C_6H_8$ and $C_{10}H_6$; A is a silicone containing monovalent or divalent radical selected from the group consisting of



$R^2$ is selected from the group consisting of saturated divalent hydrocarbon radicals, hydrocarbonoxy radicals in which the hydrocarbon group is linked to the silicon by a carbon bond and the oxygen is in the form of an ether linkage, and unsaturated divalent hydrocarbon radicals, $R^3$ is selected from the

group consisting of monovalent hydrocarbon radicals having from 1 to 18 carbon atoms, alkoxy radicals having from 1 to 18 carbon atoms and $OSi(R^4)_3$ radicals, $R^4$ is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, $R^5$ is a monovalent radical selected from the group consisting of $O_{0.5}Si(R^4)_3$ and $O_{0.5}R^4$, where $R^4$ is the same as above, and when R is cationic, then A must be anionic and when R is nonionic then A must be nonionic, a is a number of from 0 to 4, b, c and d are each numbers of from 0 to 1, the sum of b, c and d must be at least 1 when A is a monovalent radical and when A is a divalent radical b, c and d must be at least 0.5 and up to 3, with the proviso that when c is greater than 0, then a must be at least 1, e is a number of from 1 to 200, m is a number of from 1 to 20,000, n is 2, 3 or 4, x is a number of from 1 to 400, and y is a number of from 0 to 8, and thereafter drying the coated material at a temperature of from 50° to 200° C. in the presence of atmospheric moisture.

5. The process of claim 1, wherein the textile material is polyester.

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**4,293,612**

## NEEDLE-PUNCH CARPET WITH BINDER CONTAINING ALKALI-STABILIZED SILICIC ACID

**Kjell R. Andersson, Surte, and Hans E. Johansson, Kungälv, both of Sweden, assignors to Elektrokemiska Aktiebolaget, Surte, Sweden**

**Filed Jan. 16, 1980, Ser. No. 112,443**
**Claims priority, application Sweden, Jan. 18, 1979, 7900451**
**Int. Cl.³ D04H 1/08**
**U.S. Cl. 428—281** **8 Claims**

7. A needle punch carpet comprising synthetic fibers which are mechanically bound together by needling and which are further chemically bound together by the dried residue of an aqueous mixture of an organic binder latex and an alkali-stabilized silicic acid sol having particles of a size between 1 and 100 nm, the particles being present in an amount comprising between 0.1 to 12 percent by weight, calculated as dry $SiO_2$, based upon the weight of the synthetic fibers, and the amount of dry $SiO_2$ being between 1 and 30 weight percent of the organic binder solids, said residue being dispersed throughout the body of the carpet whereby said carpet exhibits an improved abrasion resistance and chalking is minimized.

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**4,293,613**

## ACRYLIC FIBER HAVING IMPROVED BASIC DYEABILITY

**Hartwig C. Bach, and Helmuth E. Hinderer, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Jun. 6, 1980, Ser. No. 157,129**
**Int. Cl.³ D02G 3/00**
**U.S. Cl. 428—364** **5 Claims**

1. An acrylic fiber having improved basic dyeability, said fiber being formed from a blend of

a. an acrylic polymer containing at least about 35 weight percent acylonitrile and 1 to 20 weight percent of a sulfonated vinyl monomer, said sulfonated vinyl monomer being polymerized with said acrylonitrile, and

b. 1-20 weight percent of polystyrene, said polystyrene being present in the form of a separate phase dispersed throughout the fiber.

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**4,293,614**

## CRIMPED POLYESTER FILAMENT

**LeMoyne W. Plischke; Harold M. Familant, both of Pensacola, and Darrell A. Kelly, Milton, all of Fla., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Nov. 2, 1979, Ser. No. 90,823**
**Int. Cl.³ D02G 3/00**
**U.S. Cl. 428—370** **4 Claims**

1. A melt spun filament having a crimp level of at least 5 crimps per inch and being composed of two polyester components arranged in a side-by-side relation, wherein the polyester of one component contains $CaF_2$ uniformly dispersed therein at a concentration of at least 200 parts per million based on the weight of the polyester of said component and the polyester of the other component contains no $CaF_2$ and wherein the weight ratio of the $CaF_2$-containing component to the other component is 5:95 to 70:30, said filament being characterized in that the polyester of both components is of the same chemical structure and thermal history.

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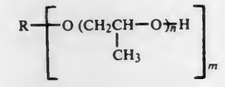
**4,293,615**

## POLYVINYL BUTYRAL LAMINATES

**Griffith Bowen, Wilmington, Del., and Peter A. Fowell, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 30, 1980, Ser. No. 154,853**
**Int. Cl.³ B32B 27/36, 27/42**
**U.S. Cl. 428—412** **5 Claims**

1. A laminar structure comprising at least one layer of glazing material and a sheet of plasticized polyvinyl butyral having a hydroxyl content of about from 15 to 30% by weight, calculated as vinyl alcohol, and, in compatible admixture therewith, about from 10 to 70 parts per hundred parts by weight of at least one propylene oxide oligomer of the general formula



wherein R is a linear or a branched aliphatic, cycloaliphatic, aralkyl, aromatic, alkoxy alkyl or heterocyclic radical of 1 to 14 carbon atoms, n is an integer of 1 to 30 and has an average value of about from 1 to 20, and m is an integer of from 1 to 3 wherein the average molecular weight of the propylene oxide oligomers is about from 300 to 2500.

3. A laminar structure of claim 1 wherein the glazing material is polycarbonate sheeting.

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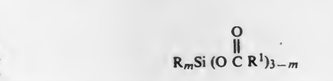
**4,293,616**

## PAINTABLE ONE-COMPONENT RTV SYSTEMS

**Alfred H. Smith, Jr., Ballston Lake, and M. Dale Beers, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.**

**Division of Ser. No. 16,255, Feb. 28, 1979, Pat. No. 4,247,445.**
**This application May 21, 1980, Ser. No. 152,077**
**Int. Cl.³ B32B 15/08**
**U.S. Cl. 428—447** **22 Claims**

1. A painted laminate structure comprising (i) a substrate selected from the class consisting of masonry surfaces, cellulosic substrates, metal surfaces and plastic surfaces; (ii) cured silicone elastomer over the substrate surface which is formed by exposing to atmospheric moisture a mixture of ingredients, comprising (A) 100 parts by weight of a silanol end-stopped diorganopolysiloxane polymer where the organo groups are monovalent hydrocarbon radicals and the polymer has a viscosity that varies from 50 to 1,000,000 centipoise at 25° C.; (B) from 200 to 500 parts by weight of calcium carbonate; (C) from 1 to 10 parts by weight of a cross-linking agent of the formula,



where R is a monovalent hydrocarbon radical of 1 to 8 carbon atoms and $R^1$ is a monovalent hydrocarbon radical of 2 to 30 carbon atoms and m is 0 or 1; and (D) from 0.01 to 5 parts by weight of a curing catalyst comprising an organic tin salt of an organic acid or a tin salt of an organic acid; and (iii) over the cured silicone elastomer there being present a coating of an



organic paint selected from the class consisting of organic latex paints and organic oil base paints.

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**4,293,617**

## PROCESS FOR PRODUCING STRIPPABLE COPPER ON AN ALUMINUM CARRIER AND THE ARTICLE SO OBTAINED

**Albert E. Nagy, Mentor-on-the-Lake, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed Dec. 26, 1979, Ser. No. 106,477**
**Int. Cl.³ C25D 5/44**
**U.S. Cl. 428—469** **10 Claims**

1. A process for producing a composite structure suitable for use in connection with the manufacture of printed circuits which includes a carrier layer of aluminum and a covering layer of copper which structure is characterized by the fact that the copper layer is tenaciously bonded to said carrier layer of aluminum but readily separable therefrom by mechanical means without destroying the integrity of the copper layer which process comprises the steps of: (a) providing a layer of aluminum foil, (b) cleaning at least one major surface of said aluminum foil to remove surface contaminants therefrom, (c) positioning said aluminum foil in a suitable electrolyte and passing electrical current therethrough in such a manner that said foil is rendered cathodic to activate the surface of said aluminum foil, (d) positioning said activated foil in a suitable electrolyte comprising, in volume percent, from about 53 to 73% phosphoric acid, from about 5 to about 25% sulfuric acid, and from about 12 to about 32% water, and passing electrical current therethrough in such a manner that said foil is rendered anodic so as to form a thin layer of aluminum oxide on the surface thereof, and (e) electrodepositing a thin layer of copper on the anodized surface of aluminum foil.

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**4,293,618**

## SINTERED BODY FOR USE IN A CUTTING TOOL AND THE METHOD FOR PRODUCING THE SAME

**Akio Hara, and Shuji Yazu, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed May 7, 1979, Ser. No. 36,989**
**Claims priority, application Japan, May 17, 1978, 53/58546**
**Int. Cl.³ C22C 29/00; B22F 7/06**
**U.S. Cl. 428—551** **4 Claims**

1. In a diamond sintered body or high pressure from boron nitride sintered body for use in a cutting tool, the improvement wherein said sintered body is supported by cermet in which carbide crystals in the form of (Mo, W)C chiefly consisting of molybdenum are bonded by iron group metals.

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**4,293,619**

## SILICON-NITRIDE AND METAL COMPOSITE

**Richard L. Landingham, Livermore, Calif., and Sarah A. Huffsmith, Urbana, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jun. 11, 1979, Ser. No. 47,597**
**Int. Cl.³ B32B 15/04**
**U.S. Cl. 428—623** **6 Claims**

1. A composite formed in part from a ceramic substrate of silicon nitride and from a refractory metal substrate, said composite comprising:

(i) the ceramic substrate of silicon nitride;

(ii) the refractory metal substrate which comprises Mo, Ti and Zr; and

(iii) a layer greater than 0.1 mm in thickness consisting essentially of $MoSi_2$ between the ceramic substrate and refractory metal substrate,

said layer bonded to the ceramic substrate by a first reacted sublayer on the order of 0.01 mm in thickness and bonded to the metal substrate by a second reacted sublayer on the order of 0.01 mm in thickness;

whereby the composite will remain intact as a composite during thermal cycling up to pressures of 240 MPa and temperatures of 1000° C.

4. A composite comprising:

a ceramic substrate of silicon nitride;

a refractory metal substrate selected from Mo, W, Ta and their associated alloys; and

a layer greater than 0.1 mm in thickness consisting essentially of $MoSi_2$ between the ceramic substrate and refractory metal substrate;

with said layer bonded to the ceramic substrate by a first reacted sublayer on the order of 0.01 mm in thickness and bonded to the metal substrate by a second reacted sublayer on the order of 0.01 mm in thickness, wherein said composite is prepared by:

(a) contacting as a bonding agent, the layer of $MoSi_2$ with a portion of the silicon nitride substrate and with a portion of the refractory metal substrate;

(b) heating the layer of $MoSi_2$ to a temperature of between about 1000° C. to about 1300° C.; and

(c) compressing the layer with said portions of said substrates, simultaneously with said heating, such that said compression of the layer is with a pressure of at least 30 MPa.

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**4,293,620**

## PROCESS FOR THE DEPOSITION OF THICK CHROMIUM FILMS FROM TRIVALENT CHROMIUM PLATING SOLUTIONS AND ARTICLE SO PRODUCED

**James M. L. Vigar, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 9, 1980, Ser. No. 157,714**
**Claims priority, application United Kingdom, Jun. 29, 1979, 22791/79**
**Int. Cl.³ C25D 3/06, 5/12, 5/14**
**U.S. Cl. 428—667** **10 Claims**

1. A process of electroplating an article with a layer of chromium exceeding five microns in thickness comprising the step of electroplating the article with an initial relatively thin layer of chromium from a first equilibrated aqueous solution of chromium (III)—thiocyanate complexes of relatively low chromium concentration of about 0.003 M, and plating the major proportion of the remaining thickness in one or more steps from a second equilibrated aqueous solution of chromium (III)—thiocyanate complexes of relatively higher concentration of about 0.1 M.

9. An article plated by a process as claimed in claim 1.

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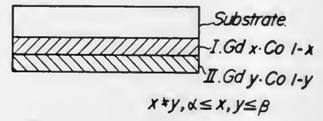
**4,293,621**

## RECORDING MEDIUM

**Yuji Togami, Isehara, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan**

**Filed Oct. 5, 1979, Ser. No. 82,238**
**Claims priority, application Japan, Oct. 12, 1978, 53-125298; May 4, 1979, 54-54153**
**Int. Cl.³ B32B 15/00**
**U.S. Cl. 428—678** **4 Claims**




1. A recording medium comprising a recording carrier for magnetically recording a binary code signal, said carrier being formed of an amorphous magnetic layer consisting of at least a rare earth metal and an iron family metal, said amorphous magnetic layer comprising a plurality of thin amorphous magnetic layers stacked on each other, the composition ratio between the rare earth metal and the iron family metal in each of said thin layers being different from the composition ratio in an

adjacent one of said thin layers, the thickness of a first one of said plurality of amorphous magnetic thin layers, which has a larger perpendicular magnetic anisotropy, being larger than a thickness of an adjacent second one of said plurality of amorphous magnetic thin layers, which has a smaller perpendicular magnetic anisotropy, said amorphous magnetic layer enabling said recording carrier to magnetically and thermally stably record a binary code signal even if the diameter of a recorded information bit is on the order of one micrometer.

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**4,293,622**

## STEP CELL

**Nikola Marincic, Winchester, and James Epstein, Sharon, both of Mass., assignors to Battery Engineering, Inc., Newton, Mass.**

**Continuation-in-part of Ser. No. 104,157, Dec. 17, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,568**

**Int. Cl.³ H01M *10/44***

**U.S. Cl. 429—50** **12 Claims**

1. An electrochemical cell which exhibits a general step change in output voltage at a predetermined discharge level from a first substantially constant voltage to a second substantially constant voltage, and comprising:

an alkali metal anode;

an electrolyte including an oxyhalide cathode depolarizer together with a Lewis acid and a Lewis base and;

a cathode structure of catalytic material suitable for providing oxyhalide-reducing sites,

the quantity of electrolyte being proportioned relative to the remaining electrochemically active cell components so as to be the first exhausted.

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**4,293,623**

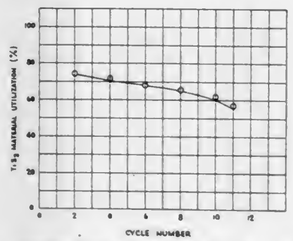
## ELECTROLYTES FOR ALKALI-METAL ELECTROCHEMICAL DEVICES

**Lawrence P. Klemann, Somerville; Gerald H. Newman, Westfield; Eugene L. Stogryn, Edison; Thomas A. Whitney, Roselle, and Dan Farcasiu, Princeton, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Jul. 3, 1980, Ser. No. 165,412**

**Int. Cl.³ H01M *6/16***

**U.S. Cl. 429—194** **20 Claims**




(MATERIAL UTILIZATION ($TiS_2$, %) vs. DISCHARGE CYCLE NUMBER FOR A Li-$TiS_2$ CELL OPERATING WITH A 1.4 mA/L. SOLVENT, Li[$B(C_2O_4)_2$]1M Dios/DME : 54/46)

1. An electrolyte for an alkali-metal electrochemical device, comprising:

(a) an organic solvent selected from a group consisting of ethers, esters, sulfones, organic sulfites, organic sulfates, organic nitrites and organic nitro compounds; and

(b) at least one electrolytically active alkali-metal complex anion salt having the formula:

$$ZMR_xQ_y$$

wherein Z is an alkali metal;

wherein M is an element selected from a group consisting of B, Al, Ga, In, Tl, P, As, Zn, Cd and Sn (stannous);

wherein Q represents at least one heteroatom grouping bonded to M, the core element, through a carbon-M bond;

wherein R is selected from the group consisting of: heteroatom-containing groups bonded to M, the core element, through the heteroatom site, alkyls, aryls, alkaryls, aralkyls, halogens, halogen substituted aryls, halogen substituted alkaryls, and pseudohalides; and

wherein x and y are positive integers, a sum of x plus y being equal to one plus the valence of the core element M, and further,

wherein x can be zero.

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**4,293,624**

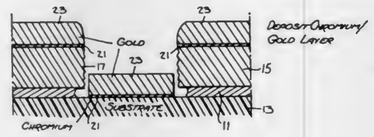
## METHOD FOR MAKING A MASK USEFUL IN X-RAY LITHOGRAPHY

**William D. Buckley, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Jun. 26, 1979, Ser. No. 52,292**

**Int. Cl.³ H05G *1/00*; G21F *1/12***

**U.S. Cl. 430—5** **12 Claims**




1. A method of making a lithography mask comprising:

(a) depositing on a substrate which is transparent to the radiation to be used in the lithography process a thin layer of a material which is reflective to ultraviolet radiation;

(b) covering said reflective layer with a layer of photoresist;

(c) exposing the photoresist with UV radiation through a master mask to thereby expose areas at which radiation absorbers are to be located;

(d) developing the photoresist to expose the reflective layer in said areas;

(e) etching the reflective layer away to expose the substrate and to provide an undercut;

(f) depositing a layer of a material which is opaque to the radiation with which the mask is to be used on the substrate; and

(g) lifting off the resist and unwanted portions of said opaque material.

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**4,293,625**

## ANCHOR LAYER IN PHOTOLITHOGRAPHIC RECEPTOR BASE CONTAINS OXIDE SURFACE TREATED TITANIUM DIOXIDE

**Joseph F. Myers, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Continuation of Ser. No. 782,174, Mar. 28, 1977, abandoned. This application Oct. 15, 1980, Ser. No. 197,198**

**Int. Cl.³ G03C *1/04***

**U.S. Cl. 430—9** **15 Claims**

1. A hydrophilic-surfaced photolithographic receptor sheet comprising a support having an anchor layer thereon, said anchor layer comprising a dispersion of rutile crystalline titanium dioxide in a binder resin, said titanium dioxide having an oxide surface treatment of at least about 10 percent by weight, said oxide surface treatment comprising the oxides of silica and alumina, the major proportion thereof being the oxide of silica, and overlying said anchor layer a hydrophilic layer comprising hydrophilic colloidal silica, said hydrophilic layer having a coating weight of from about 200 to about 500 milligrams per square foot.

6. A light-sensitive photolithographic printing plate capable of being imaged by the silver salt diffusion transfer process comprising a support having an anchor layer thereon, said anchor layer comprising a dispersion of rutile crystalline titanium dioxide in a binder resin, said titanium dioxide having an oxide surface treatment of at least about 10 percent by weight, said oxide surface treatment comprising the oxides of silica and alumina, the major proportion thereof being the oxide of silica, and overlying said anchor layer a hydrophilic layer comprising hydrophilic colloidal silica, and overlying said hydrophilic layer a light-sensitive layer, comprising a silver halide emulsion.

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**4,293,626**

## ELECTROPHOTOSENSITIVE MATERIALS FOR MIGRATION IMAGING PROCESSES

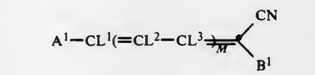
**Frank G. Webster, Rochester; Michael T. Regan, Fairport, and Louis J. Rossi, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 12,172, Dec. 14, 1979, Pat. No. 4,272,595, which is a continuation-in-part of Ser. No. 899,186, Apr. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 818,697, Jul. 25, 1977, abandoned. This application Oct. 31, 1980, Ser. No. 202,406**

**Int. Cl.³ G03G *5/06, 17/04***

**U.S. Cl. 430—17** **5 Claims**

1. An electrophoretic migration image comprising a material having the structure:

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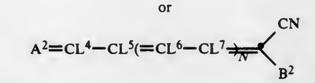
or




II

wherein:

M and N may be zero, one or two;

$L^1$, $L^2$, $L^3$, $L^4$, $L^5$, $L^6$ and $L^7$ may be cyano, hydrogen, substituted or unsubstituted alkyl, alkoxy, aralkyl, aryl or heterocycyl and in addition any two of $L^1$, $L^2$ and $L^3$ and any two of $L^4$, $L^5$, $L^6$ and $L^7$ may together represent the elements needed to complete a carbocyclic or heterocyclic ring having from 5-12 carbon atoms;

$A^1$ may be the same as $A^2$ and in addition may represent an aryl or diarylamino aryl substituted, or unsubstituted aryl group or a substituted or unsubstituted heterocyclic nucleus such as thiophene, benzo[b]thiophene, naphtho[2,3-b]thiophene, furan, isobenzofuran, chromeme, pyran, xanthene, pyrrole, 2H-pyrrole, pyrazole, indolizine, indoline, indole, indazole, carbozole, pyrimidine, isothiazole, isoxazole, furazan, chroman, isochroman, 1,2,3,4-tetrahydroquinoline, 1,2-dihydro-4H-pyrrolo[3,2,1-ij]quinoline; 4H-pyrrolo[3,2,1-ij]-quinoline; 1,2,5,6-tetrahydro-4H-pyrrolo[3,2,1-ij]quinoline; 1H,5H-benzo[ij]quinolizine; 2,3-dihydro-1H,5H-benzo[ij]quinolizine; 2,3-dihydro-1H,5H-benzo[ij]-quinolizine and 2,3,6,7-tetrahydro-1H,5H-benzo[ij]quinolizine; 10,11-dihydro-9H-benzo[a]xanthen-8-yl; 6,7-dihydro-5H-benzo[b]pyran-7-yl and pyrrolo[2,1-b]-benzothiazole;

$A^2$ represents a basic substituted or unsubstituted heterocyclic nucleus selected from the group consisting of substituted or unsubstituted imidazole, thiazole, benzothiazole, naphthothiazole, thianaphtheno-7',6',4,5-thiazole, oxazole, benzoxazole, naphthoxazole, benzoselenazole, naphthoselenazole, thiazoline, 2-quinoline, 4-quinoline, 1-isoquinoline, benzimidazole, 2-pyridine, 4-pyridine, pyrrolo[1,2-a]pyridine, 3H-indole, tetrazole, and acenaphthothiazole; and

$B^1$ and $B^2$ represent cyano, cyanoaryl, carboxy, alkoxycarbonyl, aryloxycarbonyl, alkylsulfonyl, acyl, arylcarbonyl, benzofuroyl, nitro, nitro-substituted aryl, sulfonyl, fluorosulfonyl, trifluoromethylsulfonyl, carbamoyl, arylcarbamoyl, and alkylcarbamoyl, or

$B^2$ may be combined with $\{CL^4-CL^5\}$ or $\{CL^6-CL^7\}$ to provide sufficient atoms to form a substituted pyrindine nucleus.

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**4,293,627**

## PROCESS OF DEVELOPING MAGNETIC IMAGES AND DRY MAGNETIC TONER COMPOSITIONS

**Cornelius B. Murphy, and Donald S. Sypula, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 30, 1980, Ser. No. 145,171**

**Int. Cl.³ G03G *9/08***

**U.S. Cl. 430—39** **3 Claims**

1. A process for causing the development of magnetic images which comprises forming a magnetic image on an imaging member, contacting the image with a dry magnetic toner composition consisting of from about 25 percent to about 50 percent by weight of a resin of a polymeric esterification product of 1,4-benzene dicarboxylic acid polymerized with 1,2,4-benzene tricarboxylic acid-cyclic, 1,2-anhydride and 2,2-dimethyl-1,3-propane diol, and from about 50 percent to about 75 percent by weight of a magnetic material selected from magnetites, metals, metal oxides, ferrites, and alloy materials, followed by transferring the developed image to a suitable substrate and permanently affixing the image thereon at a fusing temperature which ranges from about 300° F. to about 390° F., and at a fusing speed of from about 20 inches per second to about 50 inches per second.

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**4,293,628**

## ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING DISAZO COMPOUNDS

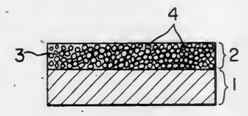
**Mitsuru Hashimoto, Hino; Masafumi Ohta; Akio Kozima, both of Yokohama; Kiyoshi Sakai, Tokyo, and Masaomi Sasaki, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Jan. 26, 1978, Ser. No. 872,679**

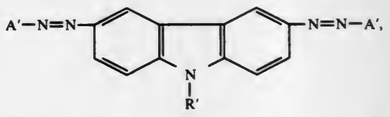
**Claims priority, application Japan, Jan. 31, 1977, 52/8740; Jan. 31, 1977, 52/8471**

**Int. Cl.³ G03G *5/06***

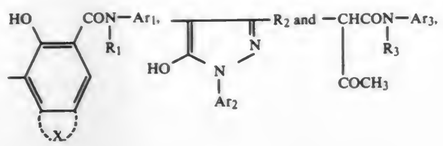
**U.S. Cl. 430—58** **24 Claims**




1. An electrophotographic material which comprises an electrically conductive support and a photosensitive layer formed thereon, said photosensitive layer consisting of fine particles of a disazo pigment having the formula




wherein R' is a member selected from the group consisting of hydrogen, ethyl, chloroethyl and hydroxyethyl, A' is a member selected from the group consisting of



wherein

is a fused ring selected from the group consisting of benzene ring, bromobenzene ring, naphthalene ring, indole ring, carbazole ring and benzofuran ring; $Ar_1$ is a member selected from the group consisting of phenyl, methylphenyl, methoxyphenyl, chlorophenyl, nitrophenyl, ethoxyphenyl, methylchlorophenyl, dimethylphenyl, methoxychlorophenyl, methoxybromophenyl, methoxymethylphenyl, dimethoxyphenyl, dimethoxychlorophenyl, dimethylaminophenyl, cyanophenyl, carboxyphenyl, benzenesulfonic acid sodium salt, tert-butoxyphenyl, naphthyl, methoxydibenzofuryl and carbazolyl; each of $Ar_2$ and $Ar_3$ is a member selected from the group consisting of phenyl, naphthyl, methoxyphenyl, methylphenyl, acetylaminophenyl, dimethylaminophenyl, cyanophenyl, nitrophenyl, dinitrophenyl, chlorophenyl, trichlorobenzenesulfonic acid, benzenesulfonic acid and benzenesulfonamide; each of $R_1$ and $R_3$ is a member selected from the group consisting of hydrogen, methyl, ethyl, phenyl and chlorophenyl; and $R_2$ is a member selected from the group consisting of methyl, carboxyl and $—COOC_2H_5$; and a resinous binder.

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**4,293,629**

## ELECTROSTATIC MASTER AND METHOD FOR MAKING THE SAME

**Michael J. Shaw, Paw Paw, and Robert J. Thiessen, Richland, both of Mich., assignors to Allied Paper Incorporated, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 930,329, Aug. 2, 1978, abandoned, which is a division of Ser. No. 827,127, Aug. 24, 1977, abandoned. This application Oct. 12, 1979, Ser. No. 84,409**

**Int. Cl.³ G03F *7/02*; B41M *5/00*; B41N *1/00***

**U.S. Cl. 430—64** **21 Claims**

1. An electrostatic master having improved water resistance for lighographic printing comprising

a base;

a barrier coat; and

a photoconductive layer containing a photoconductive material and a binder;

said barrier coat comprising a binding amount of a natural or synthetic binder and a filler at least a portion of which is an amount of plastic polymeric particles sensitive to the solvent used in the application of the photoconductive layer, said plastic polymeric particles being in an at least partially coalesced state in said barrier coat.

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**4,293,630**

## ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

**Kozo Oka, Ebina, Japan, assignor to Rank Xerox Limited, London, England**

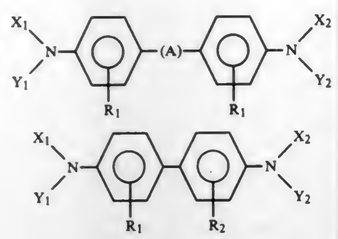
**Filed Apr. 21, 1980, Ser. No. 142,199**

**Claims priority, application Japan, May 29, 1979, 54-65672**

**Int. Cl.³ G03G *5/14***

**U.S. Cl. 430—59** **2 Claims**

1. An electrophotographic photosensitive body comprising a conductive support having provided thereon, in sequence, a photoconductive layer and a protective layer, said protective layer containing in a binder resin an aromatic amine compound wherein said compound is of the following general formula (I) or (II) an an organic halogen compound capable of producing a free halogen atom:

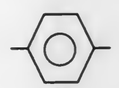


(I)

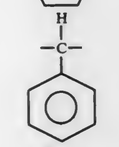


(II)

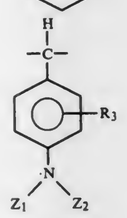
wherein $X_1$, $X_2$, $Y_1$, and $Y_2$ each is an alkyl group or a substituted or unsubstituted aryl group, $R_1$ and $R_2$ each is a hydrogen atom, an alkyl group containing 1–6 carbon atoms, or a halogen atom, and —(A)— represents a member selected from the group consisting of Members (III)–(IX) wherein



is (III)

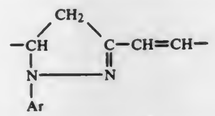


is (IV)



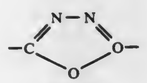
is (V)

wherein $Z_1$ and $Z_2$ each is an alkyl group containing 1–6 atoms, or a substituted or unsubstituted aryl group, and $R_3$ is a hydrogen atom or an alkyl group containing 1–6 carbon atoms,

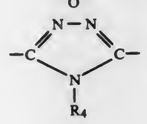


is (VI)

wherein Ar represents a substituted or unsubstituted aryl group,

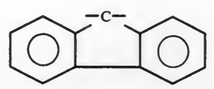


is (VII)



is (VIII)

wherein $R_4$ represents an alkyl group containing 1–6 carbon atoms and



is (IX)

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**4,293,631**

## ELECTROGRAPHIC TONER COMPOSITIONS

**Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 12, 1979, Ser. No. 19,694**

**Int. Cl.³ G03G *9/10***

**U.S. Cl. 430—106** **1 Claim**

1. A developer composition comprised of a resin component, a carrier component, a colorant, and a charge inducing material wherein the resin is selected from the group consisting of a styrene/n-butyl methacrylate copolymer, and polystyrene, the carrier is selected from polyvinylidene fluoride coated Hoeganaes steel carrier, and vinyl fluoride resin coated steel carrier materials, the colorant is carbon black and the charge inducing material is stearamidopropyl dimethyl beta-hydroxyethyl ammonium dihydrogen phosphate, or stearamidorpropyl dimethyl beta-hydroxyethyl ammonium nitrate, said charge including material being present in an amount of from 0.1 percent to 10 percent based on the weight of toner, wherein the toner is charged positively and the carrier is charged negatively.

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**4,293,632**

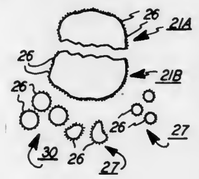
## ATTRITION PROCESS FOR ALTERATION OF TONER PARTICLES CONTAINING CONDUCTIVE MATERIALS

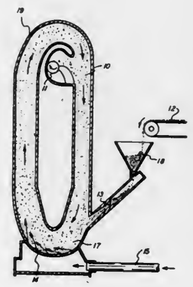
**Charles G. Dickerson, Farmington, and Peter F. Erhardt, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 3, 1978, Ser. No. 892,717**

**Int. Cl.³ G03G *9/08***

**U.S. Cl. 430—137** **5 Claims**





1. A process for lowering the minimum fuse temperature of a toner material containing a resin and a conductive coating by subjecting the toner material to a minor amount of attrition, thereby causing the removal of small amounts of the toner conductive coating material, thus exposing the inner portions of the toner particles and rendering such particles less conductive whereby the altered particles have a minimum fuse temperature greater than 10° F. below the fuse temperature of unaltered particles.

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**4,293,633**

## REFLEX COPYING PROCESS ONTO LIGHT-SENSITIVE RECORDING MATERIALS

**Roy F. Huffey, Manningtree, and John A. Pope, Colchester, both of England, assignors to Bexford Limited, London, England**

**Filed Nov. 23, 1979, Ser. No. 96,648**

**Claims priority, application United Kingdom, Dec. 11, 1978, 47952/78**

**Int. Cl.³ G03C *5/10, 5/20***

**U.S. Cl. 430—152** **7 Claims**

1. A copying process for recording an image of an original material upon a light-sensitive vesicular imaging material by reflex exposure to imaging light, the light-sensitive vesicular imaging material having an imaging layer comprising a polymeric vehicle which is softenable upon heating above ambient temperature to permit the formation of a recorded image in the form of light-scattering or reflecting gas vesicles in those areas struck by imaging light, said process comprising the steps of:

selecting a screen;

interposing the screen between the source of imaging light and the light-sensitive vesicular imaging material, the screen transmitting the light incident from the source of imaging light in separate bundles of light rays;

reflex imaging the light-sensitive vesicular imaging material by means of the bundles of light rays transmitted through the light-sensitive vesicular imaging material and reflected from the original material and;

softening the polymeric vehicle of the light-sensitive vesicular imaging material by heating said vesicular imaging material to record an image of the original material in the form of gas vesicles in the imaging layer.

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**4,293,634**

## METHOD OF RECORDING IMAGES ON A RADIATION SENSITIVE MATERIAL

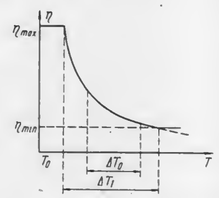
**Yakov A. Monosov, prospekt Vernadskogo, 99, korpus 1, kv. 204, Moscow, U.S.S.R.**

**Continuation of Ser. No. 916,363, Jun. 16, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 139,139**

**Claims priority, application U.S.S.R., Nov. 25, 1977, 2543210; Dec. 21, 1977, 2555201; Dec. 22, 1977, 2553262**

**Int. Cl.³ G03C *5/24***

**U.S. Cl. 430—269** **17 Claims**



1. A method of recording images of a radiation sensitive material comprising the steps of:

forming a layer of radiation sensitive material comprised of a heterogeneous mixture of substances, at least one of said substances being used as a binder and being capable of converting its states of aggregation in the mixture of the type of crystal-liquid or crystal-gas under the action of intrinsic or reflected radiation obtainable from the object

being recorded and at least one said substances which is used as a filler present in the heterogeneous mixture in the form of particles that are randomly arranged in the layer to assure its uniform optical density, said binder being in a solid state when free of exposure to radiation and holding said particles against migration and being capable of absorbing thermal radiation for converting into a liquid or gaseous substance, said particles being responsive to a force field and capable of absorbing radiation to melt that portion of the binder surrounding the particle which absorbs radiation for permitting the irradiated particles to migrate and to form chains that are extended along force field lines as a result of the interaction between the heated particles in a force field;

introducing said layer of said heterogeneous mixture of substances into an electric or a magnetic force field at right angles to the layer surface;

projecting onto said layer of said heterogeneous mixture of substances an image of an object being recorded with the help of the intrinsic or reflected radiation obtainable from the object being recorded to cause the heating of said particles on the illuminated sections of the layer, which heated particles then in turn melt the portion of the binder adjacent to the heated particles to permit the particles to migrate in response to the force field;

said projecting step also causing the converting of the state of aggregation of the binder surrounding the heated particles to either crystal-liquid or crystal-gas, thus enabling said heated particles to orient their position in the binder to aggregate in chains perpendicularly to the surface as a result of the interaction with said magnetic or said electric field; and

fixing the projected image by converting the state of aggregation of the binder by switching off the recorded object radiation to cause the binder to cool and re-crystallize.

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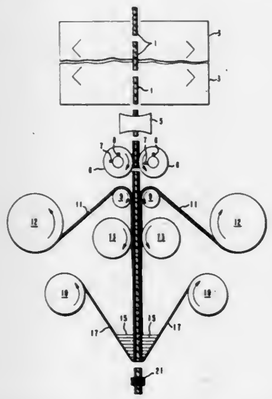
**4,293,635**

## PHOTOPOLYMERIZABLE COMPOSITION WITH POLYMERIC BINDER

**William L. Flint, Somerset, and Yvan P. Pilette, Lawrenceville, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 27, 1980, Ser. No. 153,639**
**Int. Cl.³ G03C *1/78, 1/68***
**U.S. Cl. 430—271** **13 Claims**



1. A photosensitive composition having reduced cold flow comprising (a) addition polymerizable ethylenically unsaturated monomer; (b) an initiating system activatable by actinic radiation; and (c) an organic polymeric binder containing at least two percent by weight of an amphoteric polymer which, is an interpolymer of (1) 30–60 percent by weight of a comonomer selected from the group consisting of $C_{2-12}$ N-alkyl acrylamide and $C_{2-12}$ N-alkyl methacrylamide, $C_{1-4}$ alkyl ($C_{2-4}$) aminoalkyl acrylates and $C_{1-4}$ alkyl ($C_{2-4}$) aminoalkyl methacrylates, and mixtures thereof; (2) 10–25 percent by weight of an acidic comonomer selected from the group consisting of acrylic, methacrylic, crotonic, itaconic, maleic and fumaric acids and $C_{1-4}$ alkyl half esters of maleic and fumaric acid, and mixtures thereof; and (3) 20–55 percent of a copolymerizable comonomer selected from the group consisting of $C_1$–$C_{12}$ alkyl acrylates, $C_1$–$C_{12}$ alkyl methacrylates, $C_{2-4}$ hydroxyalkyl acrylates, hydroxystearyl acrylate, hydroxyalkyl methacrylates, hydroxystearyl methacrylates and mixtures thereof.

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**4,293,636**

## PHOTOPOLYMERIZABLE POLYESTER CONTAINING COMPOSITIONS

**Ken Okuya, Tokorozawa, Japan, assignor to Tamura Kaken Co., Ltd., Iruma, Japan**

**Filed Aug. 14, 1980, Ser. No. 178,233**
**Claims priority, application Japan, Jun. 27, 1980, 55-88408**
**Int. Cl.³ G03C *1/68***
**U.S. Cl. 430—281** **4 Claims**

1. A photosensitive composition, which comprises:

(a) polyester reaction product of the reaction between a polybasic acid component selected from the group consisting of polybasic acids and anhydrides thereof, and a polyhydric alcohol component,

(b) half-ester reaction product of the reaction between equimolar amounts of a polybasic acid component selected from the group consisting of polybasic acids and anhydrides thereof, and monohydroxyalkyl acrylate or monohydroxyalkyl methacrylate,

(c) vinyl monomer selected from the group consisting of methoxyethyl acrylate, methoxyethyl methacrylate, ethoxyethyl acrylate, ethoxyethyl methacrylate, butoxyethyl acrylate, butoxyethyl methacrylate, stearyl acrylate, stearyl methacrylate, lauryl acrylate, lauryl methacrylate, tetrahydrofurfuryl acrylate, tetrahydrofurfuryl methacrylate, benzyl acrylate, benzyl methacrylate, phenoxyethyl acrylate, phenoxyethyl methacrylate, 2-hydroxyethyl acryloyl phosphate, 2-hydroxyethyl methacryloyl phosphate, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl acrylate, 2-hydroxypropyl methacrylate, ethylene glycol diacrylate, ethylene glycol dimethacrylate, diethylene glycol diacrylate, diethylene glycol dimethacrylate, triethylene glycol diacrylate, triethylene glycol dimethacrylate, polyethylene glycol diacrylate, polyethylene glycol dimethacrylate, propylene glycol diacrylate, propylene glycol dimethacrylate, polypropylene glycol diacrylate, polypropylene glycol dimethacrylate, 1,6-hexanediol diacrylate, 1,6-hexanediol dimethacrylate, trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, 2-ethylhexyl acrylate, 2-ethylhexyl methacrylate, 1,3-butylene glycol diacrylate, 1,3-butylene glycol dimethacrylate, 1,4-butylene glycol diacrylate, 1,4-butylene glycol dimethacrylate, neopentyl glycol diacrylate, neopentyl glycol dimethacrylate, dipropylene glycol diacrylate, dipropylene glycol dimethacrylate, tetramethylolmethane triacrylate, tetramethylolmethane trimethacrylate, tetramethylolmethane tetraacrylate, tetramethylolmethane tetramethacrylate, hydroxypivalic acid neopentyl glycol diacrylate, hydroxypivalic acid neopentyl glycol dimethacrylate, dipentaerythritol hexaacrylate and dipentaerythritol hexamethacrylate, and

(d) a photopolymerization initiator,

wherein the weight ratio of a:b is from 25:75 to 85:15, the weight ratio of (a+b):c is from 30:70 to 90:10 and the weight ratio of (a+b+c):d is from 90:10 to 99.5:0.5.

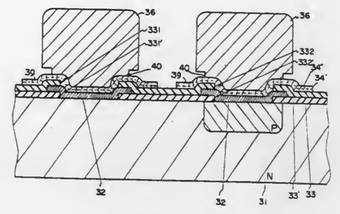


**4,293,637**

## METHOD OF MAKING METAL ELECTRODE OF SEMICONDUCTOR DEVICE

**Kenzo Hatada, Katano, and Takao Kajiwara, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 909,445, May 25, 1978, abandoned. This application Oct. 5, 1979, Ser. No. 82,426**
**Claims priority, application Japan, May 31, 1977, 52-64409; May 31, 1977, 52-64410**
**Int. Cl.³ H01L *21/283, 21/288***
**U.S. Cl. 430—314** **16 Claims**



1. A method of making metal bumps on a semiconductor device including the successive steps of:

forming electrode pads on predetermined parts of a principal face of a semiconductor substrate,

forming a multiple layer of metal on said principal face,

photolithographically forming a first photoresist film on said multiple layer providing openings on areas substantially above said electrode pads thereby exposing predetermined parts of the surface of said multiple layer above said electrode pads,

forming metal bumps on said predetermined parts of the surface of said multiple layer exposed through said openings using said first photoresist film as a plating mask,

removing said first photoresist film,

applying a second photoresist film of negative type over the entire surface of said principal face,

exposing selected portions of said second photoresist film using a photomask having a transparent mask pattern size encircling and larger than the projection pattern size of said metal bumps on said semiconductor substrate,

developing and etching said second photoresist film to retain a photoresist film pattern around said metal bumps, and thereafter,

selectively etching said multiple layer using said retained photoresist film pattern as an etching mask to retain predetermined portions of said multiple layer having a size encircling and larger than the projection pattern size of said metal bumps and removing the parts of said multiple layer which are not covered by said etching mask.

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**4,293,638**

## METHOD FOR ALLEVIATING PARTIAL INACTIVATION OF COLOR COUPLERS

**John R. Fyson, London, and Gerald I. P. Levenson, Harrow, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 27, 1980, Ser. No. 153,504**
**Claims priority, application United Kingdom, May 30, 1979, 18821/79**
**Int. Cl.³ G03C *7/00***
**U.S. Cl. 430—373** **17 Claims**

1. A method for alleviating partial inactivation of a color coupler, said partial inactivation having been caused by reaction of the color coupler with formaldehyde or a vinyl monomer, said method comprising contacting the color coupler with an aqueous solution comprising hydrogen peroxide or deuterium peroxide as an oxidizing agent and an oxidation accelerator capable of acting as a potential mediator for transferring electrons between the oxidizing agent and the color coupler.

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**4,293,639**

## BLEACHING COMPOSITIONS FOR PHOTOGRAPHIC PROCESSING

**Isamu Itoh; Taiji Hashimura, and Takatoshi Ishikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed May 9, 1980, Ser. No. 148,356**
**Claims priority, application Japan, May 9, 1979, 54-57434**
**Int. Cl.³ G03C *5/32, 7/16***
**U.S. Cl. 430—393** **18 Claims**

1. A bleaching composition for silver halide photographic materials comprising (1) a persulfate or an inorganic ferric salt, (2) a water-soluble halide, and (3) a compound represented by the formula [I-a] or [I-b]

$$R^1—CO—NH—CO—R^2 \quad \text{[I-a]}$$

$$R^1—SO_2—NH—CO—R^2 \quad \text{[I-b]}$$

$R^1$ represents an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, a phenyl group, an alkoxy group having 1 to 4 carbon atoms, an amino group, an acylamino group having 1 to 4 carbon atoms, or a heterocyclic ring; and $R^2$ represents hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, a phenyl group, an acyl group having 1 to 4 carbon atoms, a carbamoyl group, or a heterocyclic ring; or or $R^1$ and $R^2$ together form a 5- or 6-membered heterocyclic ring, which may be condensed with another ring.

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**4,293,640**

## RADIOGRAPHIC IMAGE ENHANCEMENT

**Norman L. Weinberg, East Amherst, N.Y., assignor to Minrad Corporation, East Amherst, N.Y.**

**Continuation-in-part of Ser. No. 971,922, Dec. 21, 1978, Pat. No. 4,238,563, which is a continuation-in-part of Ser. No. 848,993, Nov. 11, 1977, abandoned. This application Jul. 21, 1980, Ser. No. 170,885**
**Int. Cl.³ G03C *7/00, 1/92***
**U.S. Cl. 430—421** **16 Claims**

1. A method for enhancing and darkening the silver image density of a radiograph, which comprises contacting an underexposed, developed and fixed radiographic silver halide film with a composition to initially intensify the image density profile of the radiograph, said composition comprising an aqueous mixture of at least one water soluble organic or inorganic salt of copper, a water soluble ferricyanide salt and a sequestering agent having a stability constant of sufficient value to prevent substantial precipitation of cupric ferricyanide in said composition and to enable formation of a cupric ferrocyanide-containing composition in said radiographic film and subsequently darkening said enhanced silver image by contacting said treated radiograph with an aqueous solution of an iron salt.

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**4,293,641**

## PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

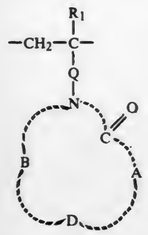
**Osamu Takahashi, and Shinji Sakaguchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 24, 1980, Ser. No. 143,232**
**Claims priority, application Japan, Apr. 27, 1979, 54-52113**
**Int. Cl.³ G03C *1/76***
**U.S. Cl. 430—502** **25 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least two silver halide photographic emulsion layers capable of forming a silver image upon treatment with an alkaline processing solution in the presence of a

developing agent for silver halide after exposure, said material containing an interlayer to prevent color mixing positioned between said emulsion layers, wherein the improvement comprises

an interlayer containing gelatin and a complex which is formed by dissolving a mixture of hydroquinone derivatives having a solidifying point of 100° C. or less in a low boiling point solvent, which are different from the developing agent for silver halide used in the treatment of the material and which do not substantially develop silver halide and a homopolymer or copolymer containing a recurring unit represented by formula (I):



(I)

wherein $R_1$ represents a hydrogen atom or a methyl group; Q represents a chemical bond, $-COOR_2-$ or $-CONHR_2-$; A represents a chemical bond or an oxygen atom; B represents a chemical bond or



D represents $-(CH{=}CH)_n-$ or $-(CH_2)_n-$, wherein n represents an integer of 3 to 5 when A and B are both chemical bonds, an integer of 2 or 3 when A is an oxygen atom and B is a chemical bond, or an integer of 2 to 4 when A is a chemical bond and B is

or D represents

when A is a chemical bond and B is

and $R_2$ represents a substituted or unsubstituted divalent hydrocarbon group having 2 to 8 carbon atoms.

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**4,293,642**
**IN PHOTOGRAPHIC EMULSION ADHESION TO A POLYESTER FILM BASE**

**Elton L. Beavan, Binghamton, N.Y., and E. Bradley Moynahan, Saratoga, Calif., assignors to GAF Corporation, New York, N.Y.**

**Filed May 13, 1980, Ser. No. 149,355**
**Int. Cl.³ G03C *1/78***
**U.S. Cl. 430—534** **8 Claims**

1. A photographic film element comprising a gelatin-containing silver halide emulsion chemically cross-linked to a hydrophobic film base substrate having active functional group sites which are cross-linked with the amino groups of the gelatin by a carbodiimide cross-linking agent.

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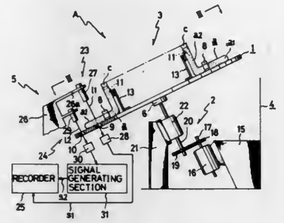
**4,293,643**
**ROTARY SHAKING CULTURE MEASURING METHOD AND APPARATUS**

**Yukio Ohtake, and Masahiro Nakamura, both of Tokyo, Japan, assignors to Ohtake Works Company, Ltd., Tokyo, Japan**

**Filed Jan. 28, 1980, Ser. No. 116,184**
**Claims priority, application Japan, Jan. 31, 1979, 54-9174**
**Int. Cl.³ C12Q *1/06***
**U.S. Cl. 435—39** **12 Claims**




1. A rotary shaking culture measuring apparatus comprising a rotatable turntable means rotatable about an axis which is disposed at an acute angle relative to vertical, said turntable means comprising a turntable element rotatable in a plane generally perpendicular to said axis, a plurality of radially spaced culture means carried on said turntable means, said culture means each being generally L-shaped and each having an upright portion joined to a lateral portion, said upright portion being disposed generally parallel to said axis and said lateral portion being generally parallel to said turntable element such that upon rotation of said turntable means, said culture means is stirred by the resultant force of gravity and centrifugal force, retaining means retaining said culture means on said turntable means, said turntable element having a plurality of concentration detection openings, a concentration measuring device disposed adjacent to said turntable means comprising a light source and a light detector device operable in association with said concentration detection openings to provide a concentration signal indicative of the concentration in said culture means, and a synchronizing device disposed adjacent to said turntable means operable to detect passage of said culture means past a predetermined position and thereby provide a synchronization signal for synchronizing the measuring of said concentration by said concentration measuring device as said culture means pass successively by said concentration measuring device.

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**4,293,644**
**PROCESS FOR PREPARING ANDROST-4-ENE-3,17-DIONE**

**Merle G. Wovcha, and Candice B. Biggs, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 735,075, Oct. 22, 1976, abandoned. This application Oct. 9, 1977, Ser. No. 849,525**
**Int. Cl.³ C12P *33/16***
**U.S. Cl. 435—55** **8 Claims**

8. A process for preparing androst-4-ene-3,17-dione which comprises cultivating a mutant microorganism of *Mycobacterium fortuitum,* said mutant being characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 2 to 10 carbon atoms, inclusive, and accumulate androst-4-ene-3,17-dione in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain, and recovering the produced androst-4-ene-3,17-dione.



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**4,293,645**
**PROCESS FOR PREPARING ANDROSTA-1,4-DIENE-3,17-DIONE AND ANDROST-4-ENE-3,17-DIONE**

**Merle G. Wovcha; Candice B. Biggs, both of Kalamazoo, and Thomas R. Pyke, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 662,563, Mar. 1, 1976. This application Nov. 9, 1977, Ser. No. 849,526**
**Int. Cl.³ C12P *33/16***
**U.S. Cl. 435—55** **8 Claims**

8. A process for preparing a mixture of androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione which comprises cultivating a mutant microorgansim of *Mycobacterium fortuitum,* said mutant being characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 2 to 10 carbon atoms, inclusive, and accumulate androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione in the fermenation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain, and recovering the produced androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione.

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**4,293,646**
**COMPOSITION OF MATTER AND PROCESS**

**Merle G. Wovcha, and Kevin E. Brooks, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Aug. 7, 1978, Ser. No. 931,741**
**Int. Cl.³ C12P *33/16***
**U.S. Cl. 435—55** **7 Claims**

1. A process for preparing androst-4-ene-3,17-dione which comprises cultivating *Mycobacterium fortuitum* NRRL B-11359 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain, and recovering the produced androst-4-ene-3,17-dione.

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**4,293,647**
**METHOD OF DISSOLVING COLLAGEN-CONTAINING TISSUES**

**Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany**

**Filed Feb. 28, 1978, Ser. No. 882,616**
**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709035**
**Int. Cl.³ C12P *21/06***
**U.S. Cl. 435—69** **11 Claims**

1. A method for dissolving collagen-containing tissue to form soluble decomposed products of low viscosity, which method consists essentially of enzymatically hydrolyzing said tissue by treatment with at least one acid protease at a pH within the acid region and in the presence of urea at a concentration between 0.01 mol/liter and 0.3 mol/liter.

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**4,293,648**
**PROCESS FOR ESTERIFICATION OF α-L-ASPARTYL-L-PHENYLALANINE**

**Arthur A. Davino, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.**

**Continuation-in-part of Ser. No. 102,807, Dec. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 27,196, Apr. 5, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,556**
**Int. Cl.³ C12P *21/02***
**U.S. Cl. 435—70** **12 Claims**

1. A process for esterifying α-L-aspartyl-L-phenylalanine which comprises contacting α-L-aspartyl-L-phenylalanine with an alcohol in the presence of an effective amount of a proteolytic enzyme with specific esterase activity in an aqueous alcohol medium at a pH of 4 to 7 in which the alcohol concentration is sufficient to reverse the hydrolytic activity of the protease.

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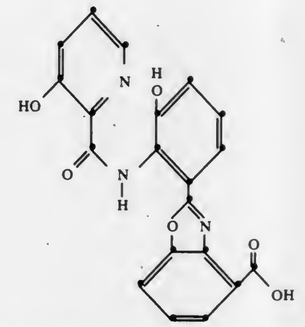
**4,293,649**
**PROCESS FOR PRODUCTION OF ANTIBIOTIC A-33853**

**Marvin M. Hoehn, and Karl H. Michel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**Filed Feb. 21, 1980, Ser. No. 123,330**
**Int. Cl.³ C12P *17/16***
**U.S. Cl. 435—118** **2 Claims**

1. The method of producing the A-33853 antibiotic having the structure



which comprises cultivating Streptomyces sp. NRRL 12068, or an A-33853-producing variant or mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until said antibiotic in the culture medium is produced.

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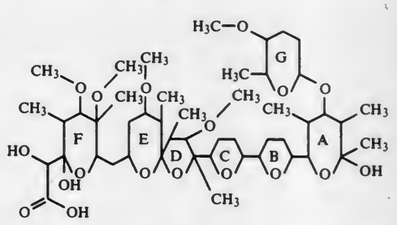
**4,293,650**
**ANTI-COCCIDIAL SUBSTANCE AND ITS PREPARATION**

**Jean Florent, Hauts de Seine; Jean Lunel, Paris, and Denise Mancy, Charenton, all of France, assignors to Rhone-Poulenc Industries, France**

**Filed Oct. 5, 1978, Ser. No. 948,786**
**Claims priority, application France, Oct. 7, 1977, 77 30236**
**Int. Cl.³ C12P *17/18;* C12N *1/20;* C12R *1/465***
**U.S. Cl. 435—119** **10 Claims**

1. A process for the preparation of the anticoccidial substance hereinbefore designated 37,454 RP of the formula:



which, in the form of its sodium salt, has the following properties:

it is a white crystalline powder which is soluble in methylene

chloride and chloroform, methanol, dimethyl formamide, acetone and ethyl acetate, sparingly soluble in hexane and virtually insoluble in water;

it has the following approximate elementary composition; C% 59.27, H% 8.45, O% 28.32 and Na% 2.36; which is compatible with the empirical formula $C_{48}H_{81}O_{18}Na$;

its melting point (determined in a capillary tube) is 198°–199.5° C.;

its optical rotation (determined in methanolic solution at a concentration of 0.974%) is approximately: $[\alpha]_D^{20} = +2.3 \pm 0.6°$; $[\alpha]_{436}^{20} = +1.3 \pm 0.6°$;

it does not exhibit a characteristic absorption in its ultraviolet spectrum;

it exhibits the following characteristic absorption bands in its infra-red spectrum (determined on tablets of a mixture with potassium bromide): 3,560 (shoulder), 3,420 (strong) ($H_2O$), 3,300 (medium), 3,260 (shoulder), 3,000 (shoulder), 2,980 (strong), 2,955 (shoulder), 2,940 (medium), 2,915 (medium), 2,898 (shoulder), 2,865 (shoulder), 2,860 (shoulder), 2,838 (medium), 2,660 (very weak), 2,360 (very weak) ($CO_2$), 2,080 (very weak), 1,718 (very weak), 1,620 (strong), 1,460 (strong), 1,450 (shoulder), 1,438 (shoulder), 1,428 (shoulder), 1,410 (shoulder), 1,405 (medium), 1,375 (medium), 1,362 (strong), 1,345 (shoulder), 1,335 (shoulder), 1,320 (shoulder), 1,310 (medium), 1,300 (shoulder), 1,288 (medium), 1,262 (very weak), 1,245 (medium), 1,230 (medium), 1,215 (shoulder), 1,200 (shoulder), 1,188 (strong), 1,162 (strong), 1,140 (shoulder), 1,130 (shoulder), 1,120 (strong), 1,105 (very strong), 1,098 (shoulder), 1,082 (strong), 1,070 (very strong), 1,060 (shoulder), 1,052 (strong), 1,045 (shoulder), 1,040 (shoulder), 1,035 (shoulder), 1,020 (strong), 1,010 (shoulder), 995 (medium), 985 (strong), 970 (shoulder), 955 (strong), 950 (medium), 945 (shoulder), 915 (medium), 900 (medium), 895 (shoulder), 880 (weak), 860 (weak), 858 (shoulder), 830 (very weak), 808 (weak), 780 (weak), 720 (shoulder), 710 (medium), 690 (shoulder), 665 (weak), 660 (shoulder), 630 (medium), 615 (weak), 580 (weak), 550 (shoulder), 540 (medium), 525 (very weak), 518 (very weak), 500 (medium), 470 (shoulder), 452 (weak), 412 (weak), 400 (shoulder), and 340 (medium) $cm^{-1}$;

it has a proton nuclear magnetic resonance spectrum which shows that it contains 5 methoxy groups;

it has a $^{13}C$ nuclear magnetic resonance spectrum which shows that it contains 48 carbon atoms;

it has a field desorption mass spectrum which shows a molecular peak corresponding to a mass of 968; and

it has an Rf of 0.75 in ascending thin layer chromatography on silica gel, using as eluent a mixture of methylene chloride and methanol (94:6 by volume); or a non-toxic salt of 37,454 RP with a metal or a nitrogen-containing base which process comprises cultivating *Streptomyces gypseus* DS 27,461 (NRRL 11,168) or a productive mutant thereof, aerobically in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic substances, and isolating the 37,354 RP formed during the culture as such or as a non-toxic salt thereof.

10. A biologically pure culture of the microorganism *Streptomyces gypseus* DS 27,461 having the identifying characteristics of NRRL 11,168, said culture being capable of producing the antibiotic 37,454 RP in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

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**4,293,651**

**PROCESS FOR PRODUCING ANTIBIOTIC USING SACCHAROPOLYSPORA**

**Howard A. Whaley, Portage, and John H. Coats, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Oct. 2, 1979, Ser. No. 81,211**

**Int. Cl.³ C12P *1/06***

**U.S. Cl. 435—169** **2 Claims**

1. A process for preparing antibiotic U-59,760, which comprises cultivating *Saccharopolyspora hirsuta* strain 367, having the identifying characteristic of NRRL 12045, in an aqueous nutrient medium under aerobic conditions until substantial antibiotic U-59,760 activity is imparted to said medium and separating antibiotic U-59,760 from said medium.

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**4,293,652**

**METHOD FOR SYNTHESIZING DNA SEQUENTIALLY**

**Stanley N. Cohen, Portola Valley, Calif., assignor to Cetus Corporation, Berkeley, Calif.**

**Filed May 25, 1979, Ser. No. 42,403**

**Int. Cl.³ C12N *15/00***

**U.S. Cl. 435—172** **4 Claims**

1. A method for producing a cloning vector containing a synthesized gene of a predetermined composition and length, comprising, preparing or selecting a cloning vector having a single restriction enzyme recognition sequence for a restriction enzyme of the type which cuts at a site outside said recognition sequence, chemically synthesizing a fragment of double-stranded DNA corresponding to a preselected portion of said gene, inserting said fragment in said cloning vector, respectively, at the site cut by the restriction enzyme recognized by said restriction enzyme recognition sequence, placing said cloning vector in an appropriate host and providing growth conditions for said host to amplify and purify said inserted fragment, and repeating the foregoing said synthesis, insertion, and amplification steps for preselected portions of said gene immediately adjacent the previously cloned fragment until a gene is complete.

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**4,293,653**

**METHOD FOR PROPAGATING FELINE INFECTIOUS PERITONITIS VIRUS**

**Marian C. Horzinek, Kramsvogellaan 128, Bilthoven, and Albertus D. M. E. Osterhaus, Dr. Breveestraat 16, Bunnik, both of Netherlands**

**Filed Apr. 12, 1979, Ser. No. 29,591**

**Int. Cl.³ C12N *7/08***

**U.S. Cl. 435—237** **5 Claims**

1. A process for propagating feline infectious peritonitis virus which comprises the steps of:

(a) inoculating suckling rodents intracerebrally with infectious cat material;

(b) replicating the virus in the brain of said inoculated rodents;

(c) harvesting FIP virus containing brain material from said inoculated rodents; and

(d) optionally inoculating rodents, with the so obtained virus containing brain material for further passages.

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**4,293,654**

**CELL CULTURE MICROCARRIERS**

**David W. Levine, Somerville; William G. Thilly, Cambridge; Daniel I. C. Wang, Belmont, all of Mass., and Jason S. Wong, Toledo, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Division of Ser. No. 842,696, Oct. 17, 1977, Pat. No. 4,189,534, which is a continuation-in-part of Ser. No. 740,993, Nov. 11, 1976, abandoned. This application Jul. 2, 1979, Ser. No. 54,319**

**Int. Cl.³ C12N *5/02*; C08B *37/00***

**U.S. Cl. 435—241** **9 Claims**

1. Cell culture microcarriers having a degree of substitution thereon with positively-charged chemical moieties sufficient to provide a charge capacity of from about 0.1 to about 4.5 meq/gram of dry, untreated microcarriers.

7. A method of producing cell culture microcarriers comprising soaking crosslinked dextran beads in an aqueous solution of a tertiary or quaternary amine and a base until said beads are substituted with a sufficient amount of amine moieties to produce an exchange capacity thereon of from about 0.1 to about 4.5 meq/gram of dry dextran.



**4,293,655**

**APPARATUS FOR ENSILAGING AND FERMENTING**

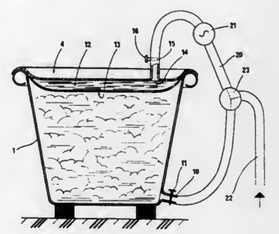
**Charles Christ, 65 rue de Paris, 72160 Connerre, France; Jean-Michel LeBeault, Villiers/Coudun, and Claude Noël, Compriegne, both of France, assignors to Charles Christ, Connerre, France**

**Division of Ser. No. 825,487, Aug. 17, 1977, Pat. No. 4,242,361. This application Jul. 2, 1979, Ser. No. 53,801**

**Claims priority, application France, Oct. 14, 1976, 76 30874**

**Int. Cl.³ C12M *1/02***

**U.S. Cl. 435—316** **10 Claims**



1. In a device for manufacturing and ensilaging sauerkraut, comprising a closable container adapted to be stored on a pallet and to receive through an upper open end of the container cabbage material to be fermented, and a flexible cover member of tightly sealing said open end of the container, the improvement comprising rehydration means for adding rehydration liquid to said cabbage material in the container, said rehydration means comprising recycling means connected to the bottom and to the upper section of said container for removing juice from the bottom of the container and recirculating said juice by introducing the removed juice into said upper section of said container, said rehydration means further comprising feeding means adapted to admix a controlled amount of a fresh rehydrating liquid with the recirculated juice prior to introducing said juice into said upper container section.

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**4,293,656**

**FLAME RETARDANT POLYSTYRENE**

**Klaus Hahn, Lampertheim; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Nov. 28, 1980, Ser. No. 211,378**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950098**

**Int. Cl.³ C08J *9/18*; C08K *5/06***

**U.S. Cl. 521—88** **3 Claims**

1. A thermoplastic molding material comprising polystyrene containing a halogen-containing organic flame retardant other than 2,2-bis(4allyloxy-3,5-dibromophenyl)-propane and 2,2-bis(4-allyloxy-3,5-dibromophenyl)-propane, which is a synergist, present in the molding material in an amount between 0.01 percent by weight and 1.0 percent by weight based on the weight of the polystyrene.

**4,293,657**

**STABLE MELAMINE POLYOL DISPERSIONS, A PROCESS FOR THEIR MANUFACTURE AND FOR THE PREPARATION OF FOAMED POLYURETHANE PLASTICS**

**Dietmar Nissen, Heidelberg; Matthias Marx, Bad Duerkheim; Wolfgang Jarre, Ludwigshafen; Ernst Schoen, Neustadt, and Walter Decker, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 7, 1980, Ser. No. 166,636**

**Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932304**

**Int. Cl.³ C08G *18/14***

**U.S. Cl. 521—121** **12 Claims**

1. A stable melamine-polyol dispersion consisting of

(A) 5 to 70 percent by weight of melamine based on the total weight of melamine and polyoxyalkylene polyether polyol with 90 percent of the melamine particles having a particle size of less than 10 microns,

(B) 95 to 30 percent by weight of a polyoxyalkylene polyether polyol based on the weight of melamine and polyol, said polyoxyalkylene polyether polyol having a molecular weight of 200 to 16,000, and

(C) an effective amount of a stabilizer selected from the group consisting of (a) silicic acids and silicates, (b) salts of perfluorinated alkyl carboxylic acids having 4 to 20 carbon atoms; salts of alkyl sulfonic acids and perfluorinated alkylsulfonic acids having 4 to 20 carbon atoms and polyperfluoroether polyols having molecular weights of 300 to 6000, and (c) salts of fatty alcohol sulfates having 6 to 30 carbon atoms.

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**4,293,658**

**PROCESS FOR RIGID FOAMS OF IMPROVED FRIABILITY**

**Daniel S. Raden, Hawthorn Woods, and Francis W. Arbir, Itasca, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed May 12, 1980, Ser. No. 148,634**

**Int. Cl.³ C08G *18/14, 18/18, 18/24, 18/32***

**U.S. Cl. 521—129** **21 Claims**

1. The process of making a rigid, cellular polyurethane with improved friability, comprising reacting a polyisocyanate with a polyol in the presence of a fully neutralized salt of a tertiary amine, a surfactant, a blowing agent, and at least a minor proportion of butyl benzyl phthalate, said polyol being prepared by reacting a phenol and formaldehyde under substantially anhydrous conditions with continuous removal of water, said polyol having a water content of no more than about 5% and having at least four phenyl groups per mole.

11. The process of making a rigid cellular polyurethane from one molar equivalent of a polyol which is prepared by reacting a phenol and formaldehyde under substantially anhydrous conditions with continuous removal of water and said polyol having a water content of no more than about 5% and having at least four phenyl groups per mole, and 0.95 to 1.25 molar equivalents of a polyisocyanate, in the presence of 0.001–0.05 molar equivalents of a fully neutralized tertiary amine salt, 0.5–5.0% of benzyl butyl phthalate, 0.5–4.0% of a surfactant and 0.4–40% of a blowing agent, said percentage figures being taken as a weight-by-weight amount based on said polyol.

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**4,293,659**

**COMPOSITION FOR COATING MOLDED ARTICLES**

**Glenn R. Svoboda, Grafton, Wis., assignor to Freeman Chemical Corporation, Port Washington, Wis.**

**Filed May 1, 1980, Ser. No. 145,799**

**Int. Cl.³ C08G *18/04, 18/42, 18/80***

**U.S. Cl. 525—28** **1 Claim**

1. A storage stable composition for the in-mold coating of a molded, fiber-reinforced thermoset plastic article comprising a resin system including

(A) a blocked polyisocyanate which is the reaction product, essentially free of unreacted -NCO radicals, of e-caprolactam and organic polyisocyanate;
(B) a polyepoxide-polyacrylate which is the reaction product, essentially free of unreacted epoxy radicals of a polyepoxide and acrylic or methacrylic acid;
(C) ethylenically unsaturated polyester resin;
(D) copolymerizable alpha-beta ethylenically unsaturated monomer;
wherein the said ethylenically unsaturated polyester resin and the said copolymerizable alpha-beta ethylenically unsaturated monomer comprise more than 50 weight percent of the said resin system and the said blocked isocyanate is present in sufficient quantity that the ratio of NCO/OH radicals in the resin system after unblocking of the said blocked polyisocyanate is from 0.2 to 0.8;
said composition also including an initiator for addition polymerization; a catalyst for the reaction of —NCO radicals and —OH radicals; and fillers.

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**4,293,660**

## POLYPHENYLENE ETHER RESIN COMPOSITION

**Akitoshi Sugio, Ohmiya; Masanobu Masu, Tokyo, and Masatugu Matunaga, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan**

**Filed Apr. 16, 1980, Ser. No. 140,865**
**Claims priority, application Japan, Apr. 18, 1979, 54-47411**
**Int. Cl.³ C08L** *53/00;* **C09L** *61/04*
**U.S. Cl. 525—68** **7 Claims**

1. A resin composition comprising
(a) a polyphenylene ether resin, and
(b) a grafted block copolymer of an unsaturated polyolefin and butyl rubber obtained by graft copolymerization in the presence of a bifunctional phenolic compound as a grafting vehicle.

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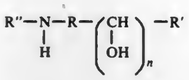
**4,293,661**

## LOW MOLECULAR WEIGHT ACRYLATE RESINS CONTAINING HYDROXYL AND TERTIARY AMINO GROUPS

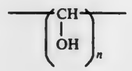
**Joachim Probst, Cologne; Michael Sonntag, Odenthal, and Günter Kolb, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 31, 1979, Ser. No. 108,349**
**Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900592**
**Int. Cl.³ C08F** *8/08, 8/32;* **C08G** *18/62*
**U.S. Cl. 525—127** **1 Claim**

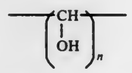
1. A composition comprising a compound which contains or is capable of forming more than one isocyanate group and; as a crosslinking component a reaction product of an acrylate resin containing glycidyl groups and a secondary mono-amine containing hydroxyl groups, obtained by reaction of said acrylate resin of copolymerised, statistically distributed units of
(A) 3 to 30% by weight of the glycidyl ester of acrylic acid or methacrylic acid or of vinyl glycidyl ether, or any mixture thereof;
(B) 0 to 20% by weight of a hydroxyalkyl ester of acrylic acid or methacrylic acid containing from 2 to 4 carbon atoms in the hydroxyalkyl radical, or any mixture thereof;
(C) 5 to 80% by weight of styrene, α-methyl styrene, o-chlorostyrene, p-chlorostyrene o-, m- or p-methyl styrene, p-tert.-butyl styrene, methyl methacrylate, acrylonitrile or methacrylonitrile, or any mixture thereof;
(D) 5 to 70% by weight of an acrylic acid ester containing from 1 to 12 carbon atoms in the alcohol radical or of a methacrylic acid ester containing from 2 to 12 carbon atoms in the alcohol radical, or any mixture thereof; and
(E) 0 to 10% by weight of an α,β-mono-olefinically unsaturated monocarboxylic or dicarboxylic acid containing from 3 to 5 carbon atoms or of a maleic acid mono-ester containing from 2 to 14 carbon atoms in the alcohol radical, or any mixture thereof,
with at least one amine containing hydroxyl groups corresponding to the formula:



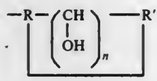
in which
n=1 to 4,
R=a single bond or an alkylene group containing from 1 to 4 carbon atoms,
R′=alkyl containing from 1 to 4 carbon atoms,
R″=alkyl containing from 1 to 4 carbon atoms or



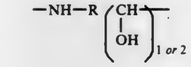
or in which
R and R′ together with



represent an alicyclic 5- or 6-membered ring



or R′ and R″ together with



represent a pyrrolidine or piperidine ring, at a temperature of from 50° to 200° C. in such a ratio that one epoxide equivalent of the acrylate resin has been reacted with from 0.7 to 1 NH equivalent of the amine containing hydroxyl groups with the OH function remaining largely intact.

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**4,293,662**

## POLYAMIDES CONTAINING OXIDIZED POLYETHYLENE

**Frieder Heydenreich, Ratingen; Helmut Korber, Odenthal; Peter Tacke, Krefeld; Friedrich Fahnler, Krefeld, and Dieter Neuray, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 971,386, Dec. 20, 1978, abandoned. This application Dec. 3, 1979, Ser. No. 99,844**
**Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805892**
**Int. Cl.³ C08L** *77/00*
**U.S. Cl. 525—184** **6 Claims**

1. A high-impact resistant polyamide moulding composition consisting of a mixture of
(1) 70 to 99% by weight, based on the mixture as a whole, of at least one polyamide and
(2) 1 to 30% by weight, based on the mixture as a whole, of oxidized polyethylene, the oxidised polyethylene having a number average molecular weight of from 15,000 to 25,000 and having been obtained by oxidising polyethylene in the melt with oxygen or an oxygen-containing gas, under intensive mixing and kneading under a pressure of from 1 to 150 bars, at a temperature in the range of from 100° to 300° C. and over a reaction time of at most 20 minutes.

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**4,293,663**

## FLUOROELASTOMER/POLYEPICHLOROHYDRIN ELASTOMER ARTICLES

**David A. Stivers, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Oct. 23, 1979, Ser. No. 87,501**
**Int. Cl.³ C08L** *63/00, 27/16, 27/12*
**U.S. Cl. 525—187** **31 Claims**

1. A gum stock composition, comprising a blend of:
(a) fluoropolymer gum comprising a copolymer of (1) terminally ethylenically unsaturated olefin which has 2 to 4 carbon atoms and can be homopolymerized by emulsion polymerization in the presence of a water soluble free radical catalyst such as $K_2S_2O_8$, and (2) at least one terminally unsaturated fluoromonoolefin, each of the doubly bonded chain carbon atoms of said fluoromonoolefin being bonded to at least one fluorine atom substituent and any remaining valence of any chain carbon atom of said fluoromonoolefin being satisfied by hydrogen, fluorine, chlorine, bromine, or a fluoroalkyl or fluoroalkoxy radical of 1 to 4 carbon atoms, with at least 10 percent of the chain carbon atoms of said copolymer being —$CH_2$— units, at least 10 percent of the chain carbon atoms of said copolymer being bonded to alkyl or alkoxy radicals with the proviso that only one such radical is bonded to a given carbon atom, and with at least 50 percent of the total number of carbon-bonded moieties in said copolymer being fluorine, but with no chain carbon atom of said copolymer being bonded to more than one chlorine or bromine atom;
(b) polyepichlorohydrin gum;
(c) polyphenol curing agent; and
(d) organo-onium cocuring agent selected from compounds of the formulas

$$(R^1)_4Q^{+1}(X^{-m})_{1/m}$$

$$(R^1)_3QR^2Q(R^1)_3^{+2}(X^{-m})_{2/m}$$

wherein Q is a nitrogen, arsenic or phosphorus atom; X is an anion of valence m; each $R^1$ is a monovalent organic radical containing 1 to 20 carbon atoms, is the same as or different from any other $R^1$, and can combine with another $R^1$ to form a cyclic structure containing a Q atom; and $R^2$ is a divalent organic radical containing 2 to 12 carbon atoms;

$$(R^3)_3S^{+1}(X^{-m})_{1/m}$$

or

$$(R^3)_2SR^4S(R^3)_2^{+2}(X^{-m})_{2/m}$$

wherein S is sulfur; X is an anion of valence m; each $R^3$ is a monovalent organic radical containing 1 to 20 carbon atoms, is the same as or different from any other $R^3$, and can combine with another $R^3$ to form a cyclic structure containing an S atom; $R^4$ is a divalent organic radical containing 2 to 12 carbon atoms; and at least one $R^3$ or $R^4$ group is aromatic;
which composition in reactive association with an acid acceptor will, upon exposure to heat, cure into an elastomer.

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**4,293,664**

## COOK-IN FILM CONTAINING A BLEND OF IONOMER AND ELASTOMER

**Stanley Lustig, Park Forest, and Stephen J. Vicik, Darien, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Dec. 27, 1979, Ser. No. 107,568**
**Int. Cl.³ C08L** *23/16, 33/02*
**U.S. Cl. 525—196** **10 Claims**

1. A stretchable monolayer film adapted for packaging and cooking pountry; consisting essentially of a blend of (1) ionomer(s) of α-olefin(s) having a carbon number of 2 to 4 and α,β-ethylinically unsaturated carboxylic acid(s) having a carbon number of 3 to 6 containing one or more metallic ions connected to the side chains of the copolymer, and (2) an elastomer selected from the group consisting of a saturated ethylene-propylene copolymer elastomer having a Mooney viscosity greater than about 45 at 125° C. or an unsaturated ethylene-propylene non-conjugated diene terpolymer elastomer having a Mooney viscosity greater than about 65 at 125° C., said film having a thickness of from about 1.0 to about 3.0 mils.

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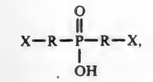
**4,293,665**

## STRUCTURAL ADHESIVE FORMULATIONS

**Denis J. Zalucha, Waterford; Frederick H. Sexsmith, Erie; Ernest C. Hornaman, Girard, and Terrance H. Dawdy, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.**

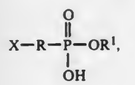
**Continuation-in-part of Ser. No. 899,621, Apr. 24, 1978, Pat. No. 4,223,115. This application Jan. 11, 1980, Ser. No. 111,504**
**Int. Cl.³ C08K** *5/52*
**U.S. Cl. 525—255** **4 Claims**

1. A room temperature-curable adhesive system comprising
1. as a polymerizable adhesive composition, a mixture of
(1) a polymer-in-monomer syrup consisting essentially of
(i) from about 2 to about 60 percent by weight of at least one addition polymer;
(ii) from about 10 to about 98 percent by weight of at least one polymerizable olefinically unsaturated compound having at least one >C=C< group; and
(iii) from zero to about 30 percent by weight of a polymer containing the group $-(CH_2CCl{=}CH{-}CH_2)_n-$, wherein n is an integer;
wherein (i) and (ii) are present as a partial polymerization product of (ii) or of (ii) in the presence of (iii), the mixture of (i) and (ii) or of (i), (ii) and (iii) being a syrup of polymeric materials dissolved or dispersed in monomer, in which syrup the amount of (i) derived from (ii) is in the range from about 2 to about 90 percent by weight, based on the total weight of (i), (ii) and (iii);
(2) from zero to about 5 percent by weight of polymerizable adhesive composition of at least one unsaturated dicarboxylic acid ester;
(3) from zero to about 10 percent by weight of polymerizable adhesive composition of at least one usaturated polyester resin;
(4) from zero to about 20 percent by weight of polymerizable adhesive composition of at least one unsaturated carboxylic acid;
(5) from zero to about 40 percent by weight of polymerizable adhesive composition of at least one monomeric acrylic or methacrylic acid ester, said ester (5) being in addition to any such ester employed in (1) (ii);
(6) from zero to about 50 percent by weight of polymerizable adhesive composition of at least one polyvinyl alkyl ether;
(7) from zero to about 1 percent by weight of polymerizable adhesive composition of at least one waxy substance selected from the group consisting of paraffin wax, montan wax, beeswax, ceresine wax and spermaceti wax;
(8) an effective amount of at least one phosphorus-containing compound having the formulae



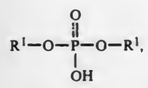
I.

wherein each R is the same or different, and each R is independently a divalent organic radical directly bonded to the phosphorus atom through a carbon-phosphorus bond, said divalent radical being selected from the group consisting of divalent unsubstituted organic radical and divalent organic radical having at least one substitutent group selected from the class consisting of halogen, hydroxyl amino, alkyl radical containing from 1 to 8 carbon atoms and aryl radical having at least one moiety containing at least one aromatic nucleus; and wherein each X is the same or different, and each X is independently a functional group selected from the class concisting of hydrogen, hydroxyl, amino, mercapto, halogen and $CH_2{=}C\cong$;



II.

wherein R and X are as previously defined; and $R^1$ is hydrogen or $-R^2-X$, wherein $R^2$ is a divalent organic radical directly bonded to the oxygen radical through a carbon-oxygen bond, said divalent radical $R^2$ being selected from the group consisting of divalent unsubstituted organic radical and divalent organic radical having at least one substituent group selected from the class consisting of halogen, hydroxyl, amino, alkyl radical containing from 1 to 8 carbon atoms and aryl radical having at least one moiety containing at least one aromatic nucleus and X is as previously defined; and

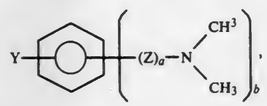


III.

wherein $R^1$ is as previously described;

(9) an effective amount of at least one reducing agent;

(10) from 0.01 to about 10 percent by weight of polymerizable adhesive composition of at least one tertiary amine having the formula



V.

wherein Z is methylene; Y is selected from the group consisting of hydrogen, hydroxy, amino, halogen, alkyl radical having from one to 8 carbon atoms, and alkoxy radicals wherein the alkyl moiety has from one to 8 carbon atoms; and a is zero or 1; and b is one or two;

(11) from zero to about 15 percent by weight of polymerizable adhesive composition of a mixture of a metal molybdate selected from the group consisting of zinc molybdate, calcium molybdate, barium molybdate, strontium molybdate and mixtures thereof and a metal phosphate selected from the group consisting of zinc phosphate, calcium phosphate, magnesium phosphate and mixtures thereof; said metal molybdate being present on a volume concentration basis of from about 2 to about 3 parts per part of said metal phosphate; and

(12) from zero to about 15 percent by weight of polymerizable adhesive composition of at least one compound selected from the group consisting of polybasic lead salts of phosphorus acid, polybasic lead salts of unsaturated organic dicarboxylic acids and acid anhydrides, polybasic lead salts of unsaturated organic dicarboxylic acids and acid anhydrides, zinc oxide, and mixtures thereof;

the amount (1), in weight percent, being 100 minus the combined weight percent of (2) through (12); and

II. as a bonding accelerator, an effective amount of at least one oxidizing agent, said oxidizing agent being reactive at room temperature with said reducing agent to generate free radicals effective to initiate addition polymerization of said polymerizable adhesive composition.

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**4,293,666**

## ORGANIC PIGMENTS

**William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.**

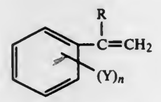
**Division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Jun. 23, 1980, Ser. No. 161,803**

**Int. Cl.³ C08F *267/10***

**U.S. Cl. 525—284** **24 Claims**

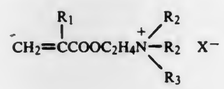
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (a) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexanediol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylnaphthalene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



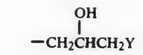
wherein

$R_1$ is hydrogen or methyl,

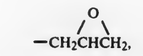
$R_2$ is hydrogen, or a $C_1$–$C_4$ alkyl,

$R_3$ is hydrogen, a $C_1$–$C_4$ alkyl,





where Y is hydroxyl or halogen,



or $-(CH_2CH_2O)_nH$ where n is an integer 1 or more and $X^-$ is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomers (1) employed, said prepolymer moiety of the particles having chemically bonded thereto a cellulose reactive group.

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**4,293,667**

## ORGANIC PIGMENTS

**William W. Maslanka, London-Britain Township, Chester County, and Gavin G. Spence, New Castle County, both of Pa., assignors to Hercules Incorporated, Wilmington, Del.**

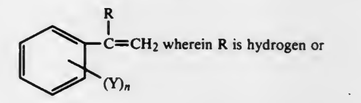
**Division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Jun. 23, 1980, Ser. No. 161,804**

**Int. Cl.³ C08F *267/10***

**U.S. Cl. 525—284** **28 Claims**

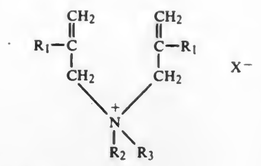
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (a) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexanediol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylnaphthalene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula

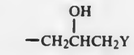


wherein

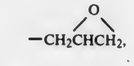
$R_1$ is hydrogen or a $C_1$–$C_4$ alkyl,

$R_2$ is hydrogen, alkyl or substituted alkyl,

$R_3$ is hydrogen, a $C_1$–$C_4$ alkyl,



where Y is hydroxyl or halogen,



or $-(CH_2CH_2O)_nH$ where n is an integer 1 or more and $X^-$ is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomers (1) employed.

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**4,293,668**

## REFINING OLEFIN/MALEIC ACID COPOLYMERS BY EXTRACTION WITH ALKANES

**Robert A. Heimsch, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Dec. 26, 1979, Ser. No. 94,417**

**Int. Cl.³ C08F *8/42, 6/10, 6/00***

**U.S. Cl. 525—369** **8 Claims**

1. A method of refining octadecene-1/maleic acid copolymer which comprises extracting monomeric and low molecular weight polymer material from such copolymer in a procedure involving contacting the copolymer in the form of particles in the range of about 20 to about 100 mesh with liquid alkane having 5 to 8 carbon atoms for an extended period of time sufficient for the alkane to permeate through copolymer particles and extract such material, and separating the alkane from the copolymer, with the resulting copolymer having less than 0.1% of its molecules of less than 2000 molecular weight and no more than 400 parts per million of monomeric olefin.

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**4,293,669**

## HEAT-RESISTANT CROSS-LINKED POLYMERS AND THE USE THEREOF AS BINDERS

**Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen; Jürgen Lewalter, Odenthal; Wilfried Zecher, and Willi Dünwald, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,950**

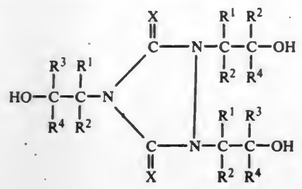
**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908626**

**Int. Cl.³ C08G *18/32, 18/38, 18/16***

**U.S. Cl. 525—452** **5 Claims**

1. Cross-linked polymers which are linked by ester and/or urethane groups and which optionally contain amide and/or imide groups and/or isocyanurate and/or hydantoin rings in co-condensed form or are mixed with the corresponding poly-

mers, wherein said cross-linking component is derived from N,N',N''-tris-hydroxyalkyl triazolidine-3,5-diones corresponding to the following general formula:



wherein

$R^1$, $R^2$, $R^3$ and $R^4$ each independently represents hydrogen, an optionally substituted aliphatic, cycloaliphatic or atomatic radical and X represents O or S.

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**4,293,670**

## BLENDS OF POLY(ARYL ETHER) RESINS AND POLYETHERIMIDE RESINS

**Lloyd M. Robeson, Whitehouse Station; Markus Matzner, Edison, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

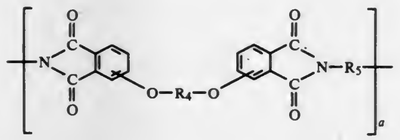
**Filed Dec. 26, 1979, Ser. No. 106,505**

**Int. Cl.³ C08L** *81/06, 79/08*

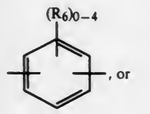
**U.S. Cl. 525—436** **9 Claims**

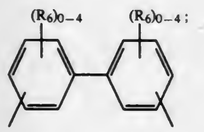
**1.** A molding composition comprising a blend of from about 95 to about 5 weight percent of a poly(aryl ether) and from about 5 to about 95 weight percent of a polyetherimide of the following formulae:

(I)

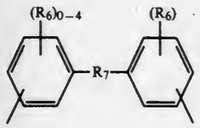


wherein a is an integer greater than 1, to about 10,000 or more, —O—$R_4$—O— is attached to the 3 or 4 and 3' and 4' positions and $R_4$ is selected from (a) a substituted or unsubstituted aromatic radical such as



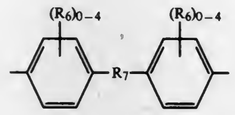


(b) a divalent radical of the formula:



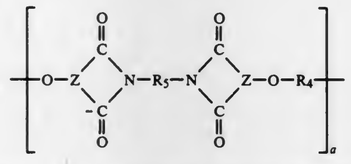
wherein $R_6$ is independently $C_1$ to $C_6$ alkyl, or halogen and $R_7$ is selected from —O—,

alkylene of 1 to 6 carbon atoms, cycloalkylene of 4 to 8 carbon atoms, alkylidene of 1 to 6 carbon atoms or cycloalkylidene of 4 to 8 carbon atoms, $R_5$ is selected from an aromatic hydrocarbon radical having from 6–20 carbon atoms and halogenated derivatives thereof, or alkyl substituted derivatives thereof, wherein the alkyl group contains 1 to 6 carbon atoms, alkylene and cycloalkylene radicals having from 2 to 20 carbon atoms, $C_2$–$C_8$ alkylene terminated polydiorganosiloxane and a divalent radical of the formula



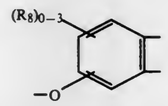
wherein $R_6$ and $R_7$ are as previously defined and $R_7$ may be a direct bond;

(II)



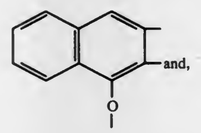
wherein —O—Z< is a member selected from

(a)

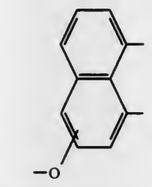


wherein $R_8$ is independently hydrogen, lower alkyl or lower alkoxy

(b)



(c)



wherein the oxygen may be attached to either ring and located ortho or para to one of the bonds to the anhydride carbonyl group wherein a, $R_4$ and $R_5$ are as previously defined.



**4,293,671**

## ORGANOPOLYSILOXANE COMPOSITION FOR PREPARING PEELABLE FILM

**Shosaku Sasaki, and Nobuo Kaiya, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Ichihara, Japan**

**Filed Jan. 17, 1980, Ser. No. 112,871**

**Claims priority, application Japan, Feb. 16, 1979, 54-15988**

**Int. Cl.³ C08L** *83/06;* **C08G** *77/12*

**U.S. Cl. 525—478** **2 Claims**

**1.** An organopolysiloxane composition, curable to a peelable film, said composition being obtained by mixing components consisting essentially of

(a) 100 parts by weight of an organopolysiloxane having the formula $R'_aSiO_{(4-a)/2}$ and a viscosity at 25° C. of from 40 to 3000 centipoise, wherein each R' denotes a monovalent hydrocarbon or fluorinated hydrocarbon group and a is a number from 1.9 to 2.05, at least two R' groups being vinyl and at least 70 percent of all R' groups being methyl,

(b) 0.5 to 20 parts by weight of an organohydrogenpolysiloxane having at least 3 silicon-bonded hydrogen atoms per molecule and a viscosity at 25° C. of from 1 to 1000 centipoise,

(c) 2 to 200 parts by weight of a copolymer composed of $RSiO_{3/2}$ siloxane units in addition to $R_3SiO_{1/2}$ siloxane units and $SiO_{4/2}$ siloxane units wherein each R denotes a monovalent hydrocarbon group, at least two R groups per molecule being vinyl, the molar ratio of $(R_3SiO_{1/2})/(RSiO_{3/2})/(SiO_{4/2})$ being (0.1 to 1.5)/(0.1 to 1.0)/(1.0), and

(d) a catalytic amount of a hydrosilylation catalyst, the viscosity of said organopolysiloxane composition, curable to a peelable film, having a value of from 50 to 6000 centipoise at 25° C.

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**4,293,672**

## PROCESS FOR STABILIZING POLYESTER COMPOSITIONS

**Roy J. Jackson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Jun. 27, 1980, Ser. No. 163,464**

**Int. Cl.³ C08G** *59/16*

**U.S. Cl. 525—507** **13 Claims**

**1.** A process for reducing the premature gelation of unsaturated polyester prepared by esterifying an epoxy compound containing tertiary, allylic or benzylic hydrogens with an ethylenically unsaturated monocarboxylic acid which comprises prereacting the epoxy compound with a hydroxylamine prior to the esterification step.

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**4,293,673**

## SPHEROIDAL POLYMERIZATION CATALYST, PROCESS FOR PREPARING, AND USE FOR ETHYLENE POLYMERIZATION

**Anthony D. Hamer, and Frederick J. Karol, both of Belle Mead, N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 974,013, Dec. 28, 1978, abandoned. This application Nov. 28, 1979, Ser. No. 95,010**

**Int. Cl.³ C08F** *2/34, 4/02, 10/02*

**U.S. Cl. 526—88** **8 Claims**

**1.** A catalytic process for producing ethylene polymers selected from the group consisting of ethylene homopolymers and copolymers with a Ti containing catalyst at a productivity of ≧50,000 pounds of polymer per pound of Ti under a pressure of ≦ 1000 psi in the gas phase

said polymer being produced in granular spherical form having a particle size of from about 250 to about 2550 microns and having a density of ≧0.91 to ≦0.97 and melt flow ratio of ≧22 to ≦32

which comprises homopolymerizing or copolymerizing ethylene at a temperature of about 30° to 115° C. by contacting the monomer charge with spherical particles of an activated catalyst composition produced by

(A) forming a spherical precursor composition of the formula:

$$Mg_mTi_1(OR)_nX_p[ED]_q[Filler]_r$$

wherein

R is a $C_1$ to $C_{14}$ aliphatic or aromatic hydrocarbon radical, or COR' wherein R' is a $C_1$ to $C_{14}$ aliphatic or aromatic hydrocarbon radical, X is Cl, Br, I, or mixtures thereof, ED is an electron donor compound, Filler is an inert filler compound, and, based on the total weight of said composition,

m is ≧0.5 to ≦56,

n is 0 or 1,

p is ≧2 to ≦116,

q is ≧2 to ≦85, and

r has a value such that the percent filler is from about 10 to about 95 weight percent based on the total weight of said composition, by forming a slurry or solution of at least one magnesium compound and at least one titanium compound and at least one filler compound in at least one electron donor compound so as to thereby form a slurry or solution of said precursor composition in said electron donor compound and spray drying said slurry or solution by atomization to form spherical particles of said precursor composition which have a particle size of from about 10 to about 200 microns,

said magnesium compound having the structure $MgX_2$,

said titanium compound having the structure $Ti(OR)_aX_b$

wherein a is 0, 1 or 2, b is 1 to 4 inclusive and a+b=3 or 4,

said electron donor compound being a liquid organic compound in which said magnesium compound and said titanium compound are soluble and which is selected from the group consisting of alkyl esters of aliphtic and aromatic carboxylic acids, aliphatic ethers, cyclic ethers and aliphatic ketones and,

(B) completely activating said precursor composition with 10 to 500 mols of activator compound per mol of Ti in said precursor composition,

said activator compound having the formula

$$Al(R'')_cX'_dH_e$$

wherein X' is Cl or OR''', R'' and R''' are the same or different, and are $C_1$ to $C_{14}$ saturated hydrocarbon radicals, d is 0 to 1.5, e is 1 or 0 and c+d+e=3,

said activating being conducted after the recovery of said particles of said precursor composition.

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**4,293,674**

## DIENYL METHACRYLATES

**Gerald D. Andrews, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jun. 3, 1980, Ser. No. 155,978**

**Int. Cl.³ C08F** *20/40;* **C07C** *67/03;* **C08F** *118/12*

**U.S. Cl. 526—327** **16 Claims**

**10.** Copolymer, prepared by direct polymerization, of the compound of the formula $CH_2{=}C(CH_3)CO_2R$ wherein R is an alkadienyl or cycloalkadienyl group which contains the 1,3- or 1,4-diene carbon skeleton and at least one anionically polymerizable methacrylic acid ester.

**11.** Copolymer of claim **10** wherein the ester is methyl methacrylate.

**12.** Copolymer of claim **10** wherein the ester is butyl methacrylate.

**4,293,675**

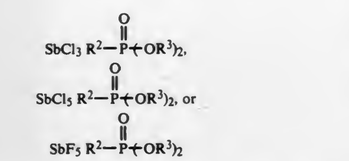
## ANTIMONY HALIDE-ORGANIC PHOSPHONATE ESTER CATIONIC POLYMERIZATION CATALYSTS

**Robert J. Blachunis, St. Paul, and Stephen W. Bany, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 26, 1980, Ser. No. 124,836**
**Int. Cl.³ C08G *77/06***
**U.S. Cl. 528—14** **8 Claims**

1. A method for polymerizing at least one cationically polymerizable organic monomer the method comprising:

(a) admixing with said organic monomer a catalytically effective amount of a trivalent or pentavalent antimony halide-organic phosphorus ester complex catalyst of the formula:



$SbCl_3\ R^2-P(=O)(OR^3)_2$,

$SbCl_5\ R^2-P(=O)(OR^3)_2$, or

$SbF_5\ R^2-P(=O)(OR^3)_2$

wherein $R^2$ and $R^3$ are independently selected from phenyl, alkenyl, halogenated alkyl, or alkyl of one to 18 carbon atoms, and

(b) effecting polymerization of said organic monomer.

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**4,293,676**

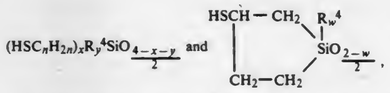
## OXYGEN-CURABLE MERCAPTOORGANOSILOXANE COMPOSITIONS CONTAINING BOTH REDOX AND IRON CARBONYL COMPOUNDS AND METHOD OF FORMING HIGHER MOLECULAR WEIGHT PRODUCTS THEREFROM

**Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Dec. 3, 1979, Ser. No. 99,253**
**Int. Cl.³ C08G *77/06***
**U.S. Cl. 528—15** **24 Claims**

1. A composition of matter, stable in the absence of oxygen, which consists essentially of a product obtained by mixing the following substantially in the absence of oxygen

(A) 100 parts by weight of at least one mercapto-functional organosiloxane, said mercapto-functional organosiloxane having an average of at least two mercapto-functional siloxane units per molecule selected from the group consisting of mercapto-functional siloxane units of the average unit formula



$(HSC_nH_{2n})_xR_y^4SiO_{\frac{4-x-y}{2}}$ and



any other siloxane units present having the average unit formula

$R^2_zSiO_{(4-z)/2}$,

wherein

each $R^2$ is a hydroxyl radical or an organic radical selected from the group consisting of $R^4$ and 3,3,3-trifluoropropyl radicals,

each $R^4$ is $R^3$ or $OR^1$,

each $R^3$ is an alkyl radical of 1 to 4 inclusive carbon atoms or phenyl radical,

each $R^1$ is an alkyl radical of 1 to 4 inclusive carbon atoms,

n has a value of from 2 to 4 inclusive,

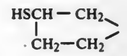
w has a value of from 0 to 1 inclusive,

x has a value of from 1 to 2 inclusive,

y has a value of from 0 to 2 inclusive,

z has a value of from 0 to 3 inclusive and the sum of x+y has a value of from 1 to 3 inclusive,

and the ratio of the total $R^3$, $HSC_nH_{2n}$—,



and 3,3,3-trifluoropropyl radicals to silicon atoms in the mercapto-functional organosiloxane is in the range of 0.98/1 to 3.00/1;

(B) a catalytic amount of an iron carbonyl catalyst selected from the group consisting of $Fe(CO)_5$, $Fe_2(CO)_9$, $Fe_3(CO)_{12}$, dicyclopentadienyldiiron tetracarbonyl, butadieneiron tricarbonyl, and cyclohexadieneiron tricarbonyl;

(C) 0 to 200 parts by weight of at least one filler; and

(D) 0.1 to 6 parts by weight of a redox compound selected from the group consisting of copper (II) sulfate and iron (III) oxide.

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**4,293,677**

## CURABLE ORGANOPOLYSILOXANE COMPOSITION CONTAINING MICROCAPSULES

**Takeshi Imai, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan**

**Filed Jun. 9, 1980, Ser. No. 157,928**
**Claims priority, application Japan, Jun. 4, 1979, 54-68841**
**Int. Cl.³ C08G *77/08, 77/20***
**U.S. Cl. 528—15** **6 Claims**

1. An organopolysiloxane composition comprising

(A) an organopolysiloxane having an average unit formula

$R_aSiO_{4-a/2}$

wherein R represents a substituted or unsubstituted monovalent hydrocarbon radical and a has a value in the range of from 0.5 to 3, and said organopolysiloxane having at least two silicon-bonded alkenyl radicals per molecule,

(B) an organohydrogenpolysiloxane having at least two silicon-bonded hydrogen atoms per molecule and the organic radicals bonded to silicon atoms are substituted or unsubstituted monovalent hydrocarbon radicals, said organohydrogenpolysiloxane being contained in microcapsules with a nonpermeable film, and

(C) a catalyst for the addition reaction between (A) and (B).

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**4,293,678**

## RADIATION-CURABLE ACRYLATED EPOXY SILICONE COMPOSITIONS

**Richard G. Carter, Charleston; Stuart L. Watson, Jr., South Charleston, both of W. Va., and Arthur N. Pines, Katonah, N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Nov. 26, 1979, Ser. No. 97,446**
**Int. Cl.³ C08G *77/20***
**U.S. Cl. 528—32** **5 Claims**

1. Acrylated epoxy silicones of the general formula:

$M-D_x-D_y'''-D_z''-M$

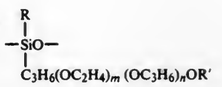
wherein

M is an $R_3SiO_{0.5}$ group;

D is an

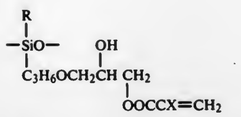
group;

D'' is an

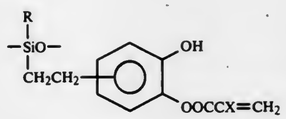


group;

D''' is an



or an



group;

X is hydrogen;

R is an alkyl group having from 1 to 5 carbon atoms, a cycloalkyl group having from 5 to 7 carbon atoms, an aryl group having 6 ring carbon atoms, or an alkoxy group having from 1 to 3 carbon atoms;

R' is an alkyl group having from 1 to 5 carbon atoms;

m is an integer having a value of from about 0 to 25;

n is an integer having a value of from 0 to 25;

x is an integer having a value of from 0 to about 100;

y is an integer having a value of from 1 to about 5; and

z is an integer having a value of from 0 to about 10; and wherein the silicone backbone may be linear, branched or cyclic and may be continuous or discontinuous being a random arrangement of the D, D'' and D''' groups.

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**4,293,679**

## COMPOSITION AND METHOD OF CONTROLLING SOLID POLYURETHANE PARTICLE SIZE WITH WATER REACTANT

**Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co., New York, N.Y.**

**Continuation-in-part of Ser. No. 47,973, Jun. 13, 1979, abandoned. This application May 27, 1980, Ser. No. 153,307**
**Int. Cl.³ C08G *18/08***
**U.S. Cl. 528—48** **12 Claims**

1. A process for forming solid, discrete, hydrophilic, crosslinked, polyurethane particles of reduced size which comprises adding

(a) a hydrophilic prepolymer comprising an isocyanate-capped polyol or mixture of isocyanate-capped polyols wherein said isocyanate-capped polyol or mixture of polyols has a reaction functionality greater than 2, the total of said polyol present having an ethylene oxide content of at least 40 weight percent before capping;

(b) said prepolymer (a) being dissolved in a water soluble solvent, to

(c) an agitated water reactant,

the volume ratio of (c):(a) being at least 2:1.

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**4,293,680**

## PROCESS FOR THE PRODUCTION OF DIISOCYANATO TOLUENE MIXTURES HAVING AN INCREASED CONTENT OF 2,6-DIISOCYANATO TOLUENE, AND THE USE THEREOF AS SYNTHESIS COMPONENTS IN THE PRODUCTION OF POLYURETHANE ELASTOMERS

**Jan Mazanek, Munich, and Hanns P. Nüller, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Aug. 6, 1980, Ser. No. 175,601**
**Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932095**
**Int. Cl.³ C08G *18/76***
**U.S. Cl. 528—67** **5 Claims**

1. A process for the production of diisocyanate mixtures of 2,4-diisocyanato toluene and 2,6-diisocyanato toluene, having from 36 to 90% by weight, based on the total mixture, of 2,6-diisocyanato toluene, comprising: trimerizing some of the isocyanate groups of a diisocyanate mixture of 2,4-diisocyanato toluene and 2,6-diisocyanato toluene, having a maximum content of 2,6-diisocyanato toluene of 35% by weight based on the total mixture and isolating from the reaction mixture which is thus obtained, a diisocyanate mixture having an increased content of 2,6-diisocyanato toluene.

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**4,293,681**

## LIQUID ANHYDRIDE BLENDS

**Edward P. Malik, Tonawanda, N.Y., assignor to Buffalo Color Corporation, West Paterson, N.J.**

**Filed Feb. 21, 1980, Ser. No. 123,269**
**Int. Cl.³ C08G *59/42***
**U.S. Cl. 528—115** **6 Claims**

1. A liquid blend of from 7 to 25 weight percent methyl endomethylenetetrahydrophthalic anhydride with from 75 to 93 weight percent hexahydrophthalic anhydride.

5. An epoxy resin hardened with from about 0.8 to about 1 mole of a liquid blend of anhydrides per epoxide equivalent in the uncured resin, said blend comprising from 7 to 25 weight percent methyl endomethylenetetrahydrophthalic anhydride with from 75 to 93 weight percent hexahydrophthalic anhydride.

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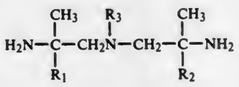
**4,293,682**

## NITROGEN CONTAINING COMPOUNDS AND COMPOSITIONS

**Edward W. Kluger, Pauline, and Tien-Kuei Su, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.**

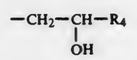
**Filed May 12, 1980, Ser. No. 148,084**
**Int. Cl.³ C08G *59/50***
**U.S. Cl. 528—123** **14 Claims**

1. A nitrogen-containing compound selected from the group consisting of:



$H_2N-C(R_1)(R_2)-CH_2N-CH_2-C(R_2)(CH_3)-NH_2$

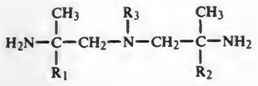
wherein $R_1$ and $R_2$ are lower alkyl and $R_3$ is selected from hydrogen, lower alkyl, aryl and



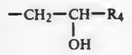
$-CH_2-CH(OH)-R_4$

wherein $R_4$ is selected from H and lower alkyl.

8. A curable epoxy resin composition comprising an epoxy resin and an epoxy resin curing agent, wherein the epoxy resin curing agent is represented by the formula:



wherein $R_1$ and $R_2$ are each independently selected from hydrogen and lower alkyl and $R_3$ is selected from hydrogen, lower alkyl, aryl and



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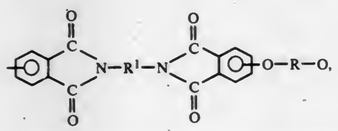
**4,293,683**

**METHOD FOR MAKING POLYETHERIMIDES USING CARBOXYLIC ACID SALTS OF ALKALI METALS OR ZINC AS CATALYSTS**

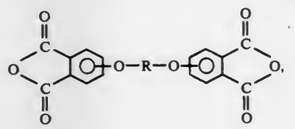
**Tohru Takekoshi, Scotia, and Howard J. Klopfer, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 11, 1980, Ser. No. 168,660**
**Int. Cl.³ C08G** *69/04, 73/10*
**U.S. Cl. 528—180** **10 Claims**

1. A method for making polyetherimide consisting essentially of chemically combined units of the formula,



which comprises effecting the reaction under melt polymerization conditions or solution polymerization conditions, between an aromatic bis(ether anhydride) of the formula,



and an organic diamine of the formula,

$H_2NR^1NH_2$,

in the presence of a metal catalyst selected from the class consisting of Group IA metal carboxylic acid salts and Group IIB metal carboxylic acid salts, where R is a divalent aromatic organic radical having from 6–30 carbon atoms, $R^1$ is a divalent organic radical selected from R radicals, alkylene radicals having from 2–20 carbon atoms, cycloalkylene radicals, and $C_{(2-8)}$ alkylene terminated polydiorganosiloxane radicals.

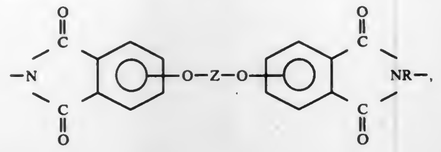
**4,293,684**

**POLYETHERIMIDE HAVING LONG CHAIN ALIPHATIC END GROUPS AND METHOD FOR MAKING**

**Tohru Takekoshi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**This application Mar. 26, 1980, Ser. No. 134,071**
**Int. Cl.³ C08G** *73/10*
**U.S. Cl. 528—185** **10 Claims**

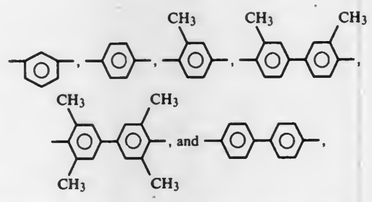
1. Polyetherimides consisting essentially of chemically combined units of the formula,



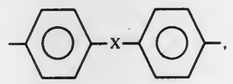
and terminal radicals of the formula,

$-R^1$,

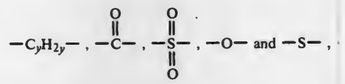
where Z is a member selected from



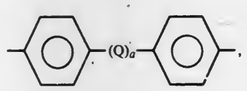
and divalent organic radicals of the general formula,



where X is a member selected from the class consisting of divalent radicals of the formula,



where y is an integer from 1 to 5, and R is a divalent organic radical selected from the class consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from $C_2$ to about $C_8$ alkylene terminated polydiorganosiloxane and divalent radicals of the formula,



where Q is a member selected from —O—, —S—, —$SO_2$—, —CO— and —$C_xH_{2x}$—, x is an integer from 1 to 5, a is 0 or 1 and $R^1$ is an aliphatic radical having from 12–20 carbon atoms.



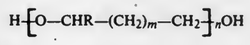
**4,293,685**

**METHOD FOR MANUFACTURING CROSSLINKED POLYETHERESTER RESINS**

**Zbigniew Jedlinski, Gliwice; Bogdan Thomalla; Antoni Kotas, both of Zabrze; Stanislaw Jedlinski, Debica; Wladyslaw Pilat, and Jan Jach, both of Nowa Sarzyna, all of Poland, assignors to Polska Akademia Nauk Zaklad Polimerow, Zabrze, Poland**

**Filed Oct. 25, 1979, Ser. No. 88,278**
**Claims priority, application Poland, Oct. 20, 1978, 210406**
**Int. Cl.³ G08G** *63/02, 63/18*
**U.S. Cl. 528—190** **8 Claims**

1. A method for the production of cross-linked polyether polyester resins comprising polycondensing of saturated dicarboxylic acids or their anhydrides and unsaturated dicarboxylic acids or their anhydrides with glycols and then copolymerizing with a cross-linking monomer wherein as a saturated carboxylic acid, the Diels-Alder adduct of 2-napthol with maleic anhydride is used, and wherein as a glycol is used a mixture of low molecular weight glycol and a high molecular weight glycol-hydroxyoligoether of the formula



wherein
R=H, $CH_3$, $C_2H_5$,
n=2–15,
and m=0–4.

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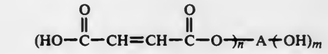
**4,293,686**

**THERMOSETTING POLYESTER RESIN COMPOSITION**

**Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Apr. 18, 1980, Ser. No. 141,311**
**Int. Cl.³ C08G** *63/02, 63/54*
**U.S. Cl. 528—192** **33 Claims**

1. A polymerizable composition comprising a mixture of: (a) an unsaturated polyester, (b) a half ester characterized by the following empirical formula:



(I)

wherein n is a number having an average value of about 1.5 to less than about 4, m is equal to the free valence of A less the average value of n, A is the hydroxyl-free residue of an organic polyol which contained from 2 to 4, inclusive, hydroxyl groups, OH, in formula (I), (c) maleic anhydride and (d) an ethylenically unsaturated monomer.

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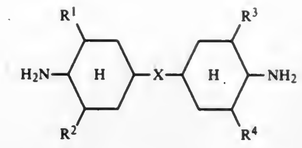
**4,293,687**

**TETRAALKYLATED BISCYCLOHEXYLAMINE DERIVATIVES**

**Oskar Weissel; Volker Serini, and Hans-Josef Buysch, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

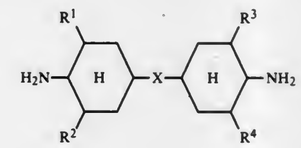
**Continuation of Ser. No. 818,261, Jul. 22, 1977, abandoned. This application May 5, 1980, Ser. No. 146,842**
**Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632956; Aug. 17, 1976, 2637009**
**Int. Cl.³ C08F** *12/02;* **C07C** *83/00*
**U.S. Cl. 528—346** **22 Claims**

1. A biscyclohexylamine having the formula



wherein:
$R^1$ to $R^4$ each represents identical or different alkyl groups having 1 to 6 carbon atoms;
X represents a single bond,
a divalent straight-chain or branched-chain aliphatic group having from 2 to 10 carbon atoms,
a methylene group, when at least one of said substituents $R^1$ to $R^4$ has more than 1 carbon atom,
a divalent cycloaliphatic group having from 6 to 12 carbon atoms,
a divalent aliphatic straight or branched chain group with cycloaliphatic substituents having from 6 to 8 carbon atoms,
a divalent straight-chain or branched-chain dialkyl cyclohexane group having from 8 to 12 carbon atoms and a divalent straight-chain or branched-chain dialkyl benzene group having from 8 to 12 carbon atoms.

13. A polyamide obtained by reacting a biscyclohexylamine of the Formula



wherein:
$R^1$ to $R^4$ each represent identical or different alkyl groups having 1 to 6 carbon atoms;
X represents a single bond,
a divalent straight-chain or branched-chain aliphatic group having from 2 to 10 carbon atoms,
a methylene group, when at least one of said substituents $R^1$ to $R^4$ has more than 1 carbon atom,
a divalent cycloaliphatic group having from 6 to 12 carbon atoms,
a divalent aliphatic straight or branched-chain group with cycloaliphatic substituents having from 6 to 8 carbon atoms, a divalent straight-chain or branched-chain dialkyl cyclohexane group having from 8 to 12 carbon atoms and a divalent straight-chain or branched-chain dialkyl benzene group having from 8 to 12 carbon atoms with an aliphatic and/or aromatic dicarboxylic acid with up to 16 C-atoms.

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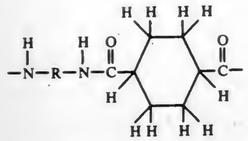
**4,293,688**

**POLYAMIDES OF 1,4-CYCLOHEXANE DICARBOXYLIC ACID AND 5-METHYL-1,9-NONANEDIAMINE AND FIBERS THEREOF**

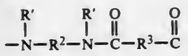
**Robert W. Campbell, and H. Wayne Hill, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Aug. 31, 1973, Ser. No. 393,493**
**Int. Cl.² C08G** *69/26*
**U.S. Cl. 528—346** **18 Claims**

1. A normally soild, resinous polyamide with at least 80 weight percent thereof being composed of primary recurring structural units of the formula



wherein the R in each of at least 50 percent of said primary recurring structural units is 5-methylnonamethylene, and the R in each of the balance, if any, of said primary recurring structural units is individually selected from the group consisting of 2,4-dimethyloctamethylene and 2,4,6-trimethylheptamethylene; the balance, if any, of the recurring structural units of said polyamide having the formula



wherein each R′ is individually selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms per radical, each $R^2$ is a divalent hydrocarbon radical having from 6 to 16 carbon atoms, and each $R^3$ is a divalent hydrocarbon radical having from 4 to 14 carbon atoms; said polyamide containing less than 5 olefinic double bonds per 100 R groups.

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**4,293,689**

## METHOD OF PRODUCING 3-O-DEMETHYLFORTIMICIN B FROM FORTIMICIN AN

**John H. Seely, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Division of Ser. No. 25,250, Mar. 29, 1979, Pat. No. 4,219,643. This application Mar. 24, 1980, Ser. No. 133,177**

**Int. Cl.³ C07H** *15/22*

**U.S. Cl. 536—17 R** **1 Claim**

1. A method of producing 3-O-demethylfortimicin B from fortimicin AN comprising the steps of subjecting fortimicin AN to hydrolysis in the presence of base and recovering 3-O-demthylfortimicin B from the reaction.

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**4,293,690**

## PRODUCTION OF 2,6-DIAMINONEBULARINES

**Yoichi Sawa, Sengokuhigashimachi; Yoshiyuki Kawakami, Tsurumaihigashi, and Ryuji Marumoto, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

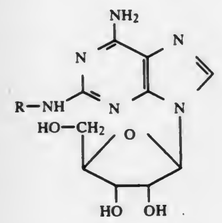
**Filed Mar. 28, 1980, Ser. No. 136,072**

**Claims priority, application Japan, Apr. 2, 1979, 54-39562**

**Int. Cl.³ C07H** *19/16, 19/18*

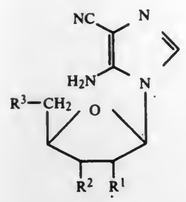
**U.S. Cl. 536—24** **16 Claims**

1. A method for producing a compound of the formula



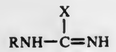
wherein

R is phenyl or phenyl substituted on the ring by halogen, $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, carbamoyl, lower alkyl carbamoyl, phenylcarbamoyl, morpholinocarbamoyl, piperidinocarbamoyl or $C_{2-5}$ alkanoyl; or an acid addition salt thereof, which consists of reacting a compound of the formula



wherein

$R^1$, $R^2$ and $R^3$, independently of one another, are hydroxyl or protected hydroxyl, with a compound of the formula,



wherein

R has the same meaning as defined above;

X is amino, amino substituted by R as defined above or $C_{1-4}$ alkylthio;

and removing the hydroxyl protecting groups of the resulting compound when such protective groups remain.

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**4,293,691**

## METHOD FOR PREPARING MAGENTA COUPLERS HAVING THIOETHER GROUPS

**Nobuo Furutachi, and Nobuo Seto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Aug. 10, 1979, Ser. No. 65,407**

**Claims priority, application Japan, Aug. 10, 1978, 53-97574**

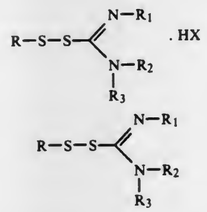
**Int. Cl.³ C07D** *413/12, 401/12, 403/12, 231/48*

**U.S. Cl. 544—140** **11 Claims**

1. A method for preparing a coupler represented by the formula (I):

(I)

which comprises reacting a disulfide compound represented by the formulae (IIa) or (IIb) with a compound of the formula A—H

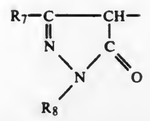


(IIa)

(IIb)

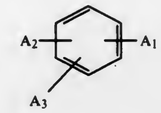
wherein A is a magenta coupler in which a hydrogen atom at the coupling active position is removed, wherein A is represented by the formula (IV):





(IV)

wherein $R_7$ represents an anilino group, an acylamino group or a ureido group; and $R_8$ represents a group of the formula



wherein $A_1$, $A_2$ and $A_3$, which may be the same or different, each represents a hydrogen atom, an alkyl group, a halogen atom, an alkoxy group, an aryloxy group, an acylamino group, a carbamoyl group, a sulfamoyl group, a sulfonyl group or a cyano group and wherein any $R_7$ or $R_8$ group of an aliphatic nature has 1–22 carbon atoms and any $R_7$ or $R_8$ group of an aromatic nature has 6–32 carbon atoms, R is a straight chain or branched chain alkyl group having 1 to 22 carbon atoms or a cyclic alkyl group having 5 to 22 carbon atoms, a cyclic alkenyl group having 6 to 22 carbon atoms, or an aralkyl group having up to

group, where B is —Y, —D—Y or

and D is an oxygen atom or

$R_4$ is a hydrogen atom, an alkyl group having 1 to 22 carbon atoms or an aryl group having 6 to 32 carbon atoms, Y is a straight chain or branched chain alkyl group having 1 to 22 carbon atoms or a cyclic alkyl group having 5 to 22 carbon atoms, a straight chain or branched chain alkenyl group having up to 22 carbon atoms or a cyclic alkenyl group having 5 to 22 carbon atoms, as aralkyl group having up to 32 carbon atoms, an aryl group having 6 to 32 carbon atoms, or a non-metallic heterocyclic group containing at least one carbon atom and comprising a 5 to 7-membered heterocyclic ring, Q is a non-metallic atom group necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring containing at least one carbon atom, Z is an oxygen atom or a sulfur atom, $R_1$, $R_2$ and $R_3$ each is a hydrogen atom, an alkyl group having 1 to 22 carbon atoms, a cycloalkyl group having 5 to 22 carbon atoms or a substituted or unsubstituted phenyl group and $R_1$ and $R_3$ or $R_2$ and $R_3$ can combine to form a 5-, 6- or 7-membered nitrogen-containing heterocyclic ring containing at least one carbon atom and X is a halogen atom, said disulfide being reacted with said compound in the presence of a base and a solvent.

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**4,293,692**

## CONTINUOUS PROCESS FOR MANUFACTURING SUBSTANTIALLY FULLY METHYLATED SUBSTANTIALLY FULLY METHYLOLATED MELAMINE COMPOSITIONS

**Venkatrao K. Pai, and Joseph F. Skrivan, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Nov. 17, 1977, Ser. No. 852,380**

**Int. Cl.³ C07D** *251/70*

**U.S. Cl. 544—196** **11 Claims**

1. A continuous process for making a substantially fully methylated, substantially fully methylolated melamine composition comprising the steps of:

(1) conducting the methylolation of melamine in two stages as follows: (a) in a first stage, continuously charging melamine and aqueous formaldehyde to a first reaction zone in a ratio of from about 9 to about 18 moles of formaldehyde per mole of melamine while controlling the pH of the reaction mixture thus formed in the reaction zone at from about 4 to 6 and also controlling the temperature of the reaction mixture at from about 45° C. to about 75° C. and the residence time of the mixture in said zone for a period sufficiently long to allow the melamine to become methylolated to an average of about 4.5 to 5.5, said methylolated product being from about 40% to about 70% in the oligomeric state and from about 30% to about 60% in the monomeric state, then (b), in a second stage, passing the reaction mixture from the first reaction zone to a second reaction zone and adjusting the pH of the mixture in the second zone to from above 7 to about 10 and holding the temperature at about 45° C. to about 75° C. for a residence time sufficient for the melamine monomers and oligomers to become substantially fully methylolated;

(2) withdrawing the methylolated reaction mixture from the second reactor and removing about 70–95% of the water content thereof;

(3) passing the concentrated reaction mixture to a third reaction zone along with from about 20 to about 30 moles of methanol per mole of melamine utilized in step 1(a) while controlling the pH of the mixture at from about 1.2 to about 2.5, the temperature of the reaction mixture at from about 30° C. to about 55° C. and the residence time of the mixture in the reaction zone for a period sufficient to effect an average degree of methylation of the methylolmelamine of at least 4.5;

(4) withdrawing the reaction mixture from the third reaction zone into a neutralization zone and adjusting the pH thereof to from about 9 to 12;

(5) withdrawing the mixture from the neutralization zone to a distillation column and distilling off unreacted methanol therefrom;

(6) passing the bottoms from the distillation column to a stripping zone and stripping off substantially all of the water and unreacted formaldehyde therefrom; and

(7) treating the bottoms from step 6 in a solids separation unit to remove precipitated salts therefrom and provide the substantially fully methylated, substantially fully methylolated melamine composition product.

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**4,293,693**

## HEMIACETALS OF ADDUCTS OF ACROLEIN AND ISOCYANURIC ACID

**Saul M. Cohen, Springfield, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Dec. 22, 1980, Ser. No. 219,018**

**Int. Cl.³ C07D** *251/34*

**U.S. Cl. 544—221** **21 Claims**

1. A process for the preparation of a hemiacetal which comprises reacting isocyanuric acid with at least one mole of acrolein per mole of isocyanuric acid under mildly acid condition to form an aldehyde and reacting the aldehyde with a

monohydric primary or secondary alcohol to form the hemiacetal.

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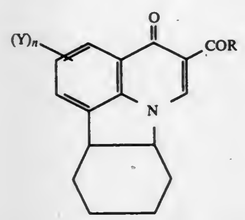
**4,293,694**

## PYRIDO[3,2,1-JK]CARBAZOLS

**Hiroshi Ishikawa, and Kazuyuki Nakagawa, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**

**Filed Apr. 10, 1979, Ser. No. 28,771**
**Int. Cl.³ C07D *221/04***
**U.S. Cl. 546—72** **14 Claims**

1. A pyrido[3,2,1-jk]carbazol having the formula (I)



(I)

wherein R represents a hydroxy group, an alkoxy group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and substituted with a halogen atom, an alkoxy group having 1 to 4 carbon atoms and substituted with a 4-methyl-1 piperidinyl group, a hydrazino group or a

wherein Y represents a hydroxy group, an alkoxy group having 1 to 4 carbon atoms, a halogen atom, a nitro group, an amino group, an alkanoylamino group having 1 to 4 carbon atoms or non-sterically hindering alkyl group having 1 to 4 carbon atoms, and n is 0, 1 or 2; and the pharmaceutically acceptable salts thereof.

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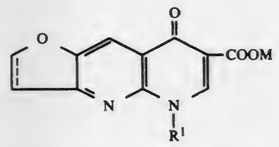
**4,293,695**

## FURONAPHTHYRIDINE COMPOUNDS

**Yoshiaki Tanaka, and Isao Hayakawa, both of Minamifunabori, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 8,205, Jan. 31, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,620**
**Claims priority, application Japan, Jun. 9, 1978, 53-69685**
**Int. Cl.³ C07D *491/147***
**U.S. Cl. 546—83** **6 Claims**

1. A compound of the formula (I)



(I)

wherein $R^1$ represents an alkyl group having 1 to 6 carbon atoms, and M represents a hydrogen atom, an alkali metal or an alkaline earth metal.

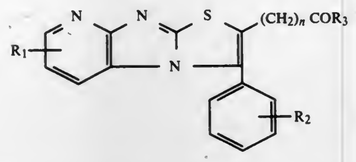
**4,293,696**

## 3-SUBSTITUTED PHENYLTHIAZOLO[3'2':1,2]IMIDAZO[4,5-B]PYRIDINE-2-ALKANOIC ACIDS

**Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.**

**Filed Dec. 22, 1980, Ser. No. 218,903**
**Int. Cl.³ C07D *513/14***
**U.S. Cl. 546—83** **2 Claims**

1. A compound of the formula:



wherein

$R_1$ is hydrogen, lower alkyl of 1–4 carbon atoms, $CF_3$, $NO_2$ or halo;

$R_2$ is hydrogen, lower alkyl of 1–4 carbon atoms, lower alkoxy of 1–4 carbon atoms, hydroxy, $CF_3$, halo, cyclalkyl of 5–7 carbon atoms or phenyl;

$R_3$ is lower alkoxy of 1–4 carbon atoms, hydroxy or amino; and

n is 1–3.

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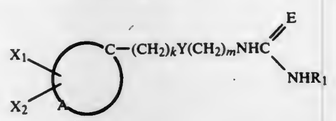
**4,293,697**

## PHARMACOLOGICALLY ACTIVE THIOUREA AND UREA COMPOUNDS

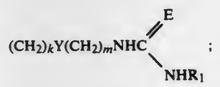
**Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith, Kline & French Laboratories Limited, Welwyn Garden City, England**

**Division of Ser. No. 940,547, Sep. 8, 1978, Pat. No. 4,230,865, which is a division of Ser. No. 805,491, Jun. 10, 1977, Pat. No. 4,137,234, which is a division of Ser. No. 638,005, Dec. 5, 1975, Pat. No. 4,053,473, which is a division of Ser. No. 451,333, Mar. 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Apr. 9, 1980, Ser. No. 138,637**
**Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71; Jul. 22, 1971, 34334/71; Feb. 3, 1972, 136/72; Aug. 8, 1972, 37015/72**
**Int. Cl.³ C07C *471/02***
**U.S. Cl. 546—121** **6 Claims**

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a 3-(5,6,7,8-tetrahydroimidazo[1,5-a]pyridine) ring; $X_1$ is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or





$X_2$ is hydrogen or when $X_1$ is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or sulphur; and $R_1$ is hydrogen, lower alkyl, benzoyl or di-lower alkylamino-lower alkyl or a pharmaceutically acceptable addition salt thereof.

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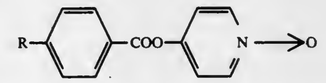
**4,293,698**

## COMPOUND FOR CONTROLLING DIELECTRIC CONSTANT OF LIQUID CRYSTAL

**Kazuhisa Toriyama, Mobara; Tsujiaki Hata, Yokohama; Shinji Hasegawa, and Ken Sasaki, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 10, 1980, Ser. No. 111,104**
**Claims priority, application Japan, Jan. 12, 1979, 54-1351**
**Int. Cl.³ C09K *3/34*; G02F *1/13*; C07D *213/02***
**U.S. Cl. 546—301** **10 Claims**

1. A compound for controlling the dielectric constant of liquid crystals consisting of a 4-p-Alkylbenzoyloxypyridine oxide represented by the general formula



wherein R is a normal alkyl group having 1 to 9 carbon atoms.

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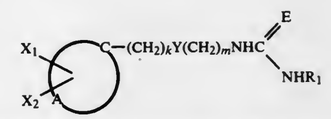
**4,293,699**

## PHARMACOLOGICALLY ACTIVE GUANIDINE COMPOUNDS

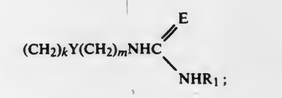
**Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England**

**Division of Ser. No. 948,358, Oct. 4, 1978, Pat. No. 4,228,291, which is a division of Ser. No. 764,921, Feb. 2, 1977, Pat. No. 4,137,237, which is a division of Ser. No. 637,496, Dec. 4, 1975, Pat. No. 4,022,797, which is a division of Ser. No. 450,957, Mar. 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 21, 1980, Ser. No. 132,605**
**Claims priority, application Ireland, Feb. 3, 1972, 136/72**
**Int. Cl.³ C07C *235/04, 235/06, 471/02***
**U.S. Cl. 546—121** **7 Claims**

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a benzimidazole or 3-(5,6,7,8-tetrahydroimidazo[1,5-a]pyridine) ring; $X_1$is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



$X_2$ is hydrogen or when $X_1$ is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is $NR_2$; $R_1$ is hydrogen, lower alkyl or di-lower alkylamino-lower alkyl; and $R_2$ is hydrogen, nitro or cyano, or a pharmaceutically acceptable addition salt thereof.

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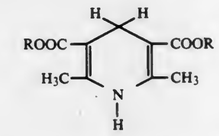
**4,293,700**

## 2,6-DIMETHYL-1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTERS AND METHOD FOR PREPARING SAME

**Yan R. Uldrikis, ulitsa Darza, 2, kv. 2, Elgava; Ieva E. Preisa, ulitsa Lachplesha, 44/46, kv. 14, Riga; Gunar Y. Dubur, ulitsa Ierikju, 43, kv. 2, Riga; Aina A. Zidermane, ulitsa F. Engelsa, 11-a, kv. 9, Riga; Egils A. Biseniex, Talavas Gatve, 11, kv. 15, Riga, and Gunar D. Tirzit, ulitsa Zhagatu, 22, kv. 33, Riga, all of U.S.S.R.**

**Filed Apr. 3, 1980, Ser. No. 137,012**
**Claims priority, application U.S.S.R., Aug. 8, 1978, 2655083[I]**
**Int. Cl.³ C07D *213/80, 211/90***
**U.S. Cl. 546—321** **2 Claims**

1. 2,6-dimethyl-1,4-dihydropyridine-3,5-dicarboxylic acid esters of the general formula:



wherein R is cycloterpenyl, or branched or linear $C_1$–$C_5$ alkyl substituted by COOX wherein X is hydrogen or a salt forming cation, or methyl substituted by phenyl or carboxylate.

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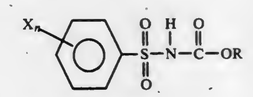
**4,293,701**

## N-(BENZENESULFONYL) CARBAMATES - HERBICIDAL ANTIDOTES

**Ferenc M. Pallos, Walnut Creek, and Edmund J. Gaughan, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.**

**Division of Ser. No. 721,721, Sep. 13, 1976, Pat. No. 4,230,874, which is a continuation-in-part of Ser. No. 619,114, Oct. 2, 1975, abandoned. This application Dec. 31, 1979, Ser. No. 108,889**
**Int. Cl.³ C07D *213/55*; C07C *143/67***
**U.S. Cl. 546—335** **6 Claims**

1. Compounds according to the formula



in which X is chloro, and methyl;

n is an integer from 1 to 3 inclusive, provided that when X is bromo, trifluoromethyl, or methoxy, n is 1;

and R is selected from 4-chlorophenylthiomethyl, 4-chlorobenzyl, 4-methoxybenzyl, 3-pyridylmethyl, and phenoxyethyl.

**4,293,702**

## METHOD FOR PREPARING 4-SUBSTITUTED-N-METHYLBENZOTHIAZOLONE DERIVATIVES

**Takeaki Umemura; Haruki Morino, both of Takarazuka; Tetsuhiko Watanabe, Minoo, and Tamon Uematsu, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

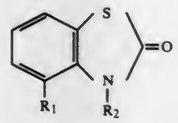
**Filed Jun. 18, 1979, Ser. No. 49,634**

**Claims priority, application Japan, Jun. 19, 1978, 53-74614; Jun. 20, 1978, 53-75111; Jun. 20, 1978, 53-75112; Jul. 10, 1978, 53-84161; Jul. 11, 1978, 53-84859**

**Int. Cl.³ C07D** *277/68;* **A61K** *31/425*

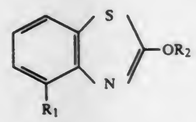
**U.S. Cl. 548—165** **9 Claims**

1. A process for producing N-alkylbenzothiazolone derivatives having the formula:



(I)

wherein $R_1$ is a hydrogen atom, chlorine atom, bromine atom, fluorine atom or methyl group, and $R_2$ is a $C_1$–$C_5$ alkyl group by heating a 2-alkoxybenzothiazole derivative at temperatures of 100°–150° C. without a solvent or by heating said derivative in a solvent at about the refluxing temperature of the solvent, said derivative having the formula:



(III)

wherein $R_1$ and $R_2$ are defined above, in the presence of a catalytic amount of a catalyst selected from (1) teritary amines and salts thereof, which amines are selected from the group consisting of saturated hydrocarbyl aliphatic amines and diamines, dimethylaniline, N, N-diethylaniline, pyridine, 1,5-diazabicyclo[3.4.0], and 1,5-diazabicyclo[5.4.0]undecene-5 and the HCl and HBr and $H_2SO_4$ salts thereof; (2) a quaternary ammonium compound selected from the groups consisting of tetra-n-butylammonium bromide, tetra-n-butylammonium chloride, tetra-n-butylammonium iodide, tetra-n-butylammonium hydroxide, triethylbenzylammonium chloride, triethylbenzylammonium bromide, triethylbenzylammonium iodide, trimethylbenzylammonium chloride, n-cetylpyridinium bromide, tetra-n-butylammonium hydrogen sulfate and tetra-n-butylammonium perchlorate; and (3) a dialkyl sulfate selected from the group consisting of dimethyl sulfate and diethyl sulfate.

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**4,293,703**

## IMIDAZOLE OR IMIDAZOLINE SUBSTITUTED UREAS

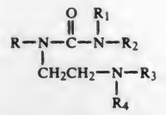
**William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 4,252, Jan. 18, 1979, Pat. No. 4,241,072. This application Jul. 7, 1980, Ser. No. 166,670**

**Int. Cl.³ C07D** *471/04, 235/30, 233/48, 233/88*

**U.S. Cl. 548—337** **4 Claims**

1. A compound having the formula:



wherein R is imidazole or imidazoline, and wherein said heterocyclic rings may be fused to a benzo or pyridyl moiety and also wherein said groups may be substituted with one, two or three loweralkyl groups; and $R_1$, $R_2$, $R_3$ and $R_4$ are independently loweralkyl, and the pharmaceutically acceptable acid addition salts thereof.

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**4,293,704**

## NOVEL 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-ONES, 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-OLS, AND VARIOUS 2-SUBSTITUTED-CYCLOPENTENONES

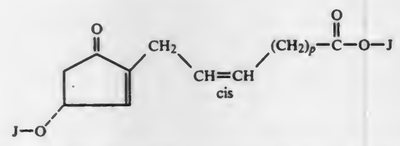
**Karel F. Bernady, Somerville, N.J.; Middleton B. Floyd, Jr., Suffern; John F. Poletto, Nanuet, both of N.Y.; Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Continuation of Ser. No. 616,790, Sep. 25, 1975, which is a continuation-in-part of Ser. No. 355,101, Apr. 27, 1973, abandoned. This application Jan. 28, 1980, Ser. No. 115,833**

**Int. Cl.³ C07F** *7/18*

**U.S. Cl. 556—442** **7 Claims**

1. A compound of the formula:



wherein p is an integer from 2 to 6, inclusive, and J is tri(lower alkyl)silyl.

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**4,293,705**

## 13,14-DEHYDRO-11-DEOXY-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

**Carmelo Gandolfi; Renato Pellegata; Franco Faustini, and Angelo Fumagalli, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy**

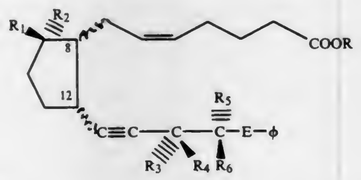
**Division of Ser. No. 825,783, Aug. 18, 1977, which is a division of Ser. No. 664,472, Mar. 8, 1976. This application Feb. 19, 1980, Ser. No. 122,276**

**Claims priority, application Italy, Mar. 14, 1975, 21264 A/75**

**Int. Cl.³ C07C** *177/00*

**U.S. Cl. 560—53** **16 Claims**

1. Optically active compounds of the formula:



wherein

R is a member selected from the group consisting of hydrogen, a $C_1$–$C_{12}$ alkyl group, and a cation of a pharmaceutically acceptable base;



one of $R_1$ and $R_2$ is hydrogen and the other is hydroxy or acyloxy or $R_1$ and $R_2$ together form an oxo group;
one of $R_3$ and $R_4$ is hydrogen and the other is hydroxy;
$R_5$ and $R_6$ are independently selected from the group consisting of hydrogen, fluorine and $C_1$–$C_4$ alkyl, provided that when one of them is $C_1$–$C_4$ alkyl, the other is hydrogen or fluorine and when one of them is fluorine, the other is $C_1$–$C_4$ alkyl;
E is selected from the group consisting of $-(CH_2)_n-$, wherein n is an integer of 1 to 6, and $-(CH_2)_{n1}-O-(CH_2)_{n2}-$ where $n_1$ and $n_2$ are independently selected from the group consisting of zero, 1, 2 and 3 provided that at least one of $n_1$ and $n_2$ is at least 1;
$\phi$ is a member selected from the group consisting of phenyl and phenyl substituted by at least one substituent selected from the group consisting of halogen, $C_1$–$C_4$ alkoxy, phenyl, and trihalomethyl;
and wherein the chains bound to the carbon atoms in the 8- and 12-positions have a trans-configuration.

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**4,293,706**

## PREPARATION OF N-BENZYLOXYCARBONYL ASPARTIC ACID

**Susan B. Gorman, Barrington; Ralph B. Thompson, Oakbrook, and Edward E. Yonan, Carol Stream, all of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 19, 1980, Ser. No. 161,175**

**Int. Cl.³ C07C** *125/06*

**U.S. Cl. 560—163** **15 Claims**

1. A method for preparing N-benzyloxycarbonyl aspartic acid substantially free of N-benzyloxycarbonyl aspartyl aspartic acid, which comprises:
(a) introducing a stoichiometric amount of benzyl chloroformate gradually into an aqueous solution of alkali metal salt of aspartic acid at temperatures of between about 10° C. and about 45° C. while maintaining the pH of the aqueous solution at between 10.75 and 11.75, and
(b) acidifying the resulting reaction mixture, thereby to produce N-benzyloxycarbonyl aspartic acid substantially free of N-benzyloxycarbonyl aspartyl aspartic acid.

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**4,293,707**

## PROCESS FOR PREPARING TRICHLOROPHENOXY ALKANOIC ACID AND HYDROLYZABLE DERIVATIVES THEREOF FREE OF CHLORINATED DIBENZO-P-DIOXINS

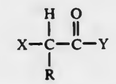
**Sidney B. Richter, Akron, and William S. Grove, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 4, 1979, Ser. No. 45,549**

**Int. Cl.³ C07C** *59/56*

**U.S. Cl. 562—472** **5 Claims**

1. In a process for preparing 2,4,5-trichlorophenoxy alkanoic acid, selected from 2,4,5-trichlorophenoxy acetic acid and 2-(2,4,5-trichlorophenoxy) propionic acid including hydrolyzable aliphatic esters and amides of said acids, by reacting in a liquid alkaline reaction medium containing an inorganic or organic base, a chlorinated phenol with at least an equimolar amount of alpha halo compound represented by the formula:



wherein X represents bromine, chlorine or iodine; R represents hydrogen or methyl; and Y represents hydroxy or a hydrolyzable substituent selected from an aliphatic radical containing up to 20 carbon atoms, amide or mono- or disubstituted amide the substituent of which contains up to 20 carbon atoms, and chlorinating the reaction product in the liquid phase, the improvement wherein the alpha halo compound is reacted with a chlorophenol selected from 3-chlorophenol and 3,4-dichlorophenol so as to obtain a pure product that is free of analytically detectable amounts of chlorinated dibenzo-p-dioxins.

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**4,293,708**

## 13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_1$ COMPOUNDS

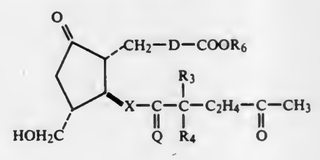
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,969**

**Int. Cl.³ C07C** *177/00*

**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3-(CH_2)_g-CH_2-$, or
(2) $(CH_2)_3-(CH_2)_g-CF_2-$;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) $-(p-Ph)-CO-CH_3$,
(h) $-(p-Ph)-NH-CO-(p-Ph)-NH-CO-CH_3$,
(i) $-(p-Ph)-NH-CO-(p-Ph)$,
(j) $-(p-Ph)-NH-CO-CH_3$,
(k) $-(p-Ph)-NH-CO-NH_2$,
(l) $-(p-Ph)-CH=N-NH-CO-NH_2$,
(m) $\beta$-naphthyl,
(n) $-CH_2-CO-R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is $-C\equiv C-$.

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**4,293,709**

## 13,14-DIHYDRO-9-DEOXY-9-METHYLENE-19-OXO-PGF$_2$ COMPOUNDS

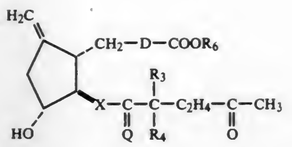
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,986**

**Int. Cl.³ C07C** *177/00*

**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—$CH_2$—$(CH_2)_g$—$CH_2$—,
(2) cis—CH=CH—$CH_2$—$(CH_2)_g$—$CF_2$—,
(3) cis—$CH_2$—CH=CH—$CH_2$—$CH_2$—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α—OH:β—$R_5$ or α—$R_5$:β—OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —$CH_2CH_2$—.

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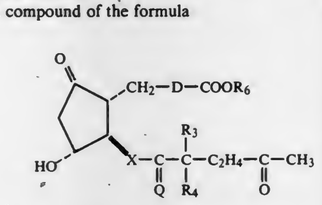
**4,293,711**
**INTER-OXA-19-OXO-PGE$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,209**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

**1.** A compound of the formula



wherein D is
(1) $(CH_2)_3$—O—$CH_2$—,
(2) $(CH_2)_3$—O—$CF_2$—, or
(3) —$CH_2$—O—$(CH_2)_3$—;
wherein Q is α-OH:β-$R_5$ or α-$R_5$:β-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —$CH_2CH_2$—.

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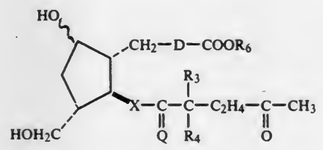
**4,293,710**
**13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_2$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,987**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

**1.** A compound of the formula



wherein D is
(1) cis—CH=CH—$CH_2$—$(CH_2)_g$—$CH_2$—,
(2) cis—CH=CH—$CH_2$—$(CH_2)_g$—$CF_2$—,
(3) cis—$CH_2$—CH=CH—$CH_2$—$CH_2$—, or
(4) trans-$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-$R_5$ or α-$R_5$:β-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and



wherein X is cis- or trans-CH=CH—.

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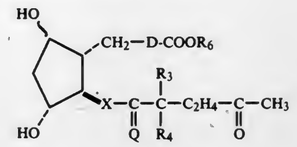
**4,293,712**
**INTER-OXA-19-OXO-PGF$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,210**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

**1.** A compound of the formula



wherein D is
(1)—$(CH_2)_3$—O—$CH_2$—,
(2) —$(CH_2)_3$—O—$CF_2$—, or
(3) —$CH_2$—O—$(CH_2)_3$—;
wherein Q is α—OH:β—$R_5$ or α—$R_5$:β—OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is cis- or trans-CH=CH—.

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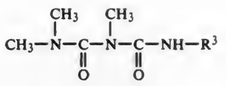
**4,293,713**
**NOVEL 1,1,3,5-SUBSTITUTED BIURET COMPOUND AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME**
**Hajime Fujimura, Kyoto; Yasuzo Hiramatsu, Otsu; Takahiro Yabuuchi, Takarazuka; Masakatu Hisaki, Hikone; Katsuo Takikawa, Naruto; Takaji Honna, Tokushima; Hidekazu Miyake, Tokushima, and Makoto Kajitani, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan**
**Filed Mar. 27, 1980, Ser. No. 134,556**
**Claims priority, application Japan, Mar. 31, 1979, 54-38790**
**Int. Cl.$^3$ A61K *31/17*; C07C *127/24***
**U.S. Cl. 564—38** **33 Claims**

**1.** A 1,1,3-trimethyl-5-substituted biuret compound of the formula:



wherein
$R^3$ is a cyclohexyl group or a phenyl group which may be unsubstituted or may have at least one substituent selected from the group consisting of chlorine, bromine, fluorine, methyl, trifluoromethyl, dimethylamino, methoxy, methylthio, nitro and acetyl.

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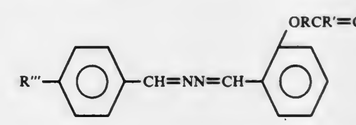
**4,293,714**
**COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER 4-ALKOXY-2'-ALLYLOXYBENZAZINES**
**Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.**
**Filed Mar. 20, 1980, Ser. No. 132,194**
**Int. Cl.$^3$ C07C *109/04***
**U.S. Cl. 564—249** **10 Claims**

**1.** A copolymerizable ultraviolet light absorber compound having the formula:



where R is alkylene, oxyalkylene, alkyleneoxyalkylene, said alkylene group being attached to the oxygen of the phenolic, or phenylene, which R groups are of up to 10 carbon atoms and are unsubstituted or substituted with hydroxy;
R' and R'' are independently hydrogen or alkyl $C_1$-$C_6$; and,
R''' is alkyl $C_1$-$C_6$, or alkoxy $C_1$-$C_6$.

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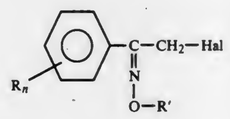
**4,293,715**
**PREPARATION OF ω-AZOLYL-ACETOPHENONE OXIDE ETHERS EMPLOYING ω-HALOGENO-ACETOPHENONE OXIDE ETHERS**
**Wolfgang Krämer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Filed Feb. 11, 1980, Ser. No. 120,168**
**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907972**
**Int. Cl.$^3$ C07C *131/00*; C07D *233/61, 249/08***
**U.S. Cl. 564—256** **6 Claims**

**1.** An ω-halogeno-acetophenone oxime ether of the formula



in which
R is fluorine, chlorine, bromine, nitro, cyano, alkyl or alkylsulphonyl with 1 to 4 carbon atoms, alkoxy or alkylthio with 1 to 2 carbon atoms, halogenoalkyl with up to 4 carbon atoms and up to 5 halogen atoms,
R' is alkyl, alkenyl or alkynyl with up to 4 carbon atoms, cycloalkylalkyl with 5 to 7 carbon atoms in the cycloalkyl moiety and 1 to 2 carbon atoms in the alkyl moiety, the cycloalkyl moiety being optionally substituted by alkyl

with 1 to 4 carbon atoms, benzyl, styryl, or benzyl or styryl substituted by halogen, cyano, nitro, amino, alkyl with 1 to 4 carbon atoms, phenyl, phenoxy and/or halogenoalkyl with up to 2 carbon atoms and up to 3 identical or different halogen atoms,
n is 1, 2 or 3, and
Hal is halogen.

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**4,293,716**
**PROCESS FOR PREPARING ALKYLDIMETHYLAMINES**
**Harold E. Swift, Gibsonia; Robert A. Innes, Monroeville, both of Pa., and Phillip Adams, Murray Hill, N.J., assignors to Gulf Research & Development Company, Pittsburgh, Pa. and Kewanee Industries, New York, N.Y.**
**Filed Dec. 31, 1979, Ser. No. 108,479**
**Int. Cl.³ C07C *85/06***
**U.S. Cl. 564—480** **22 Claims**

1. In a process wherein an alcohol or mixture of alcohols is reacted with dimethylamine in the presence of copper catalyst to obtain alkyldimethylamine or alkenyldimethylamine by passing said reactants in the vapor phase through a fixed bed of such catalyst, the improvement which comprises substantially decreasing the formation of byproduct alkylmonomethylamine by introducing into the reaction zone the dimethylamine and alcohol in a molar ratio of about 3:1 to about 1:1 and carrying out the reaction in the additional presence of about 0.5 to about 1.5 weight percent of an oxide of a Group I metal.

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**4,293,717**
**PROCESS FOR PREPARING ALDEHYDES AND DIOLS**
**Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Glöbusch, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Continuation of Ser. No. 743,546, Nov. 22, 1976, abandoned, which is a continuation of Ser. No. 563,263, Mar. 28, 1975, abandoned, which is a continuation of Ser. No. 322,321, Jan. 10, 1973, abandoned. This application Feb. 5, 1979, Ser. No. 9,019**
**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1972, 2201456**
**Int. Cl.³ C07C *47/21, 47/20, 29/03***
**U.S. Cl. 568—485** **19 Claims**

1. Process for preparing a diol and an aldehyde which comprises reacting an olefin having the formula

wherein $R_1$ and $R_2$, which may be the same or different, are:
hydrogen;
phenyl which can be substituted by $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy;
a straight-chain or branched alkyl, which can be substituted by $C_1$–$C_6$ alkoxy or phenyl;
or wherein the radicals $R_1$ and $R_2$ together with the C—C double bond represent a carbocyclic ring with up to 24 carbon atoms; with a non-aqueous solution of between 3 and 30% by weight hydrogen peroxide in an alcohol, ester, acid alkylamide or an ester of alkylamide or phosphoric, phosphonic or phosphinic acid solvent, in the presence of an acetate, benzoate, carbonyl, acetylacetonate or a naphthenate of a metal selected from the group of vanadium and molybdenum, at a temperature in the range of from −80° to +100° C., said metal compound being added in quantity of from 0.01 to 10 mol percent relative to the quantity of hydrogen peroxide.

**4,293,718**
**PREPARATION OF ACETALDEHYDE**
**Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Paris, France**
**Filed Oct. 23, 1979, Ser. No. 87,631**
**Claims priority, application France, Oct. 31, 1978, 78 31634**
**Int. Cl.³ C07C *45/49***
**U.S. Cl. 568—487** **22 Claims**

1. In a process for the preparation of acetaldehyde by carbonylation of methanol, the improvement which comprises (i) carbonylating methanol with a gaseous admixture of hydrogen and carbon monoxide, (ii) with the hydrogen comprising at least 25 mol percent of said admixture, and in the presence of (iii) a catalytic amount of a catalyst system comprising (iiia) cobalt, (iiib) an iodide selected from the group consisting of alkali metal iodides, alkaline earth metal iodides, ammonium iodides, quaternary ammonium iodides, phosphonium iodides and quaternary phosphonium iodides, and (iiic) a halogen-containing promoter differing from said iodide (iiib), said halogen-containing promoter being a compound formed by replacing at least one hydrogen atom of an organic molecule which only contains carbon and hydrogen with a halogen or being a compound which, under the reaction conditions, is capable of leading to the production of a methyl halide in the reaction medium and which is selected from the group consisting of $Cl_2$, $Br_2$, $I_2$, HCl, HBr, HI, $CoBr_2$ and $CoI_2$.

22. A process for the preparation of acetaldehyde which comprises carbonylating methanol in the liquid phase with a gaseous admixture of hydrogen and carbon monoxide with the hydrogen comprising at least 25 mol percent of the admixture,
at a temperature in the range of about 180°–230° C. and under a total pressure in the range of about 75–350 bars, and
in the presence of a catalyst system comprising (i) cobalt, which is employed in an amount in the range of about 0.01 to about 1 milligram-atom of cobalt per mol of methanol, (ii) an alkali metal iodide and (iii) methyl iodide, wherein the ratio of gram-ions of $I^-$ originating from the alkali metal iodide (ii) to gram-atoms of cobalt (i) is in the range of about 20 to 200 and the ratio of gram-molecules of $CH_3I$ (iii) to gram-ions of $I^-$ originating from the alkali metal iodide (ii) is in the range of about 0.01 to 0.08.

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**4,293,719**
**MANUFACTURE OF HYDROPEROXIDES**
**Louis J. Velenyi, Lyndhurst; Serge R. Dolhyj, Parma, and Marcia H. Sundeen, Cleveland Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**
**Filed Mar. 31, 1980, Ser. No. 135,306**
**Int. Cl.³ C07C *179/035***
**U.S. Cl. 568—573** **12 Claims**

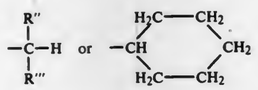
1. A process for manufacturing an aryl hydroperoxide of the formula

$$Ar—(R'—OOH)_n \quad (I)$$

from a corresponding aryl compound of the formula

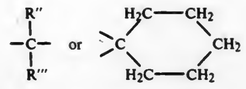
$$Ar—(R)_m \quad (II)$$

where
Ar is an aryl radical, each R is independently hydrogen or a radical of the formula



each R′ is a radical of the formula





R″ and R‴ are independently hydrogen or alkyl radicals of 1 to 3 carbon atoms with the proviso that both cannot be simultaneously hydrogen,
m is 1 or 2 with the provisoes that when m is 1, R is not hydrogen, and when m is 2, at least one R is not hydrogen, and
n is 1 or 2,
the process comprising contacting (II) with molecular oxygen at hydroperoxidative conditions in the presence of an initiator and a catalyst selected from the group consisting of $C_{14}$–$C_{16}$ straight-chain, primary alkyl amines amine and poly(vinyl)pyrrolidone having a weight average molecular weight of at least about 1,000.

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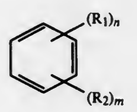
**4,293,720**
**PROCESS FOR PREPARATION OF HYDROPEROXIDES**
**Tetsuo Iwaki; Yukio Takahashi, both of Ohtake; Shuji Moriuchi, and Hisamitsu Kaneko, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**
**Filed May 2, 1980, Ser. No. 146,080**
**Claims priority, application Japan, May 9, 1979, 54-55664**
**Int. Cl.³ C07C *179/035***
**U.S. Cl. 568—575** **8 Claims**

1. A process for the preparation of aromatic hydroperoxides which comprises reacting an aromatic compound represented by the following formula:



wherein $R_1$ stands for a secondary alkyl group having 3 to 4 carbon atoms, $R_2$ stands for a primary alkyl group having up to 4 carbon atoms, and n and m are numbers of 1 or 2 with the proviso that the sum of n and m does not exceed 3,
with a molecular oxygen-containing gas in the presence of a basic aqueous solution and a copper compound catalyst at a temperature of 50° to 150° C., wherein an aqueous solution containing (A) cupric carbonate and (B) at least one member of the group consisting of alkali metal carbonate and an alkali metal bicarbonate is prepared outside the oxidation system and said aqueous solution is supplied to the oxidation system, and the concentration of cupric carbonate in the aqueous phase in the oxidation system is maintained at 0.01 to 5 ppm as the copper atom.

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**4,293,721**
**PROCESS FOR THE PURIFICATION OF ALKALINE SOLUTION OF LOWER ALKYL ALCOHOLS CONTAINING ALKALI METAL ALKOXIDES**
**Sudhir K. Mendiratta, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.**
**Filed Aug. 4, 1980, Ser. No. 175,175**
**Int. Cl.³ C07C *29/76, 29/88***
**U.S. Cl. 568—916** **14 Claims**

1. A process for purifying an alkaline solution of a lower alkyl alcohol containing as impurities an alkali metal alkoxide and an alkali metal hydroxide which comprises:
(a) treating said alkaline solution of a lower alkyl alcohol with an anhydrous hydrogen halide to react with said alkali metal alkoxide and said alkali metal hydroxide to provide a neutral solution comprised of said lower alkyl alcohol, an alkali metal halide and water;
(b) removing said alkali metal halide from said neutral solution to obtain a substantially salt-free solution comprised of said lower alkyl alcohol and water; and
(c) contacting said substantially salt-free solution with a zeolite molecular sieve to remove said water and to recover a substantially anhydrous solution of said lower alkyl alcohol.

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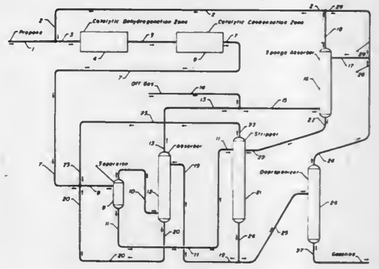
**4,293,722**
**PROCESS FOR CONVERSION OF PROPANE TO GASOLINE**
**Dennis J. Ward, South Barrington, and Bipin V. Vora, Elk Grove Village, both of Ill., assignors to UOP Inc., Des Plaines, Ill.**
**Filed Feb. 14, 1980, Ser. No. 121,353**
**Int. Cl.³ C07C *2/08, 5/32***
**U.S. Cl. 585—330** **4 Claims**



1. A hydrocarbon conversion process which comprises the steps of:
(a) passing a feed stream comprising propane and a hereinafter characterized recycle stream into a dehydrogenation zone operated at propane dehydrogenation conditions and thereby forming a dehydrogenation zone effluent stream comprising hydrogen, propane and propylene;
(b) passing the entire dehydrogenation zone effluent stream into a catalytic condensation zone operated at conditions which effect the conversion of propylene into $C_9$ hydrocarbons and thereby forming a catalytic condensation zone effluent stream which comprises hydrogen, propane, $C_6$ hydrocarbons and $C_9$ hydrocarbons;
(c) passing the catalytic condensation zone effluent stream, a first absorber bottoms stream and a stripping column overhead stream into a vapor-liquid separation zone;
(d) passing a vapor stream comprising hydrogen and propane and which is withdrawn from the vapor-liquid separation zone into a first absorber and contacting the vapor stream at absorption-promoting conditions with a first lean liquid hydrocarbon stream comprising $C_6$ and $C_9$ hydrocarbons and thereby producing the first absorber bottoms stream, which comprises propane and $C_9$ hydrocarbons, and a first absorber vapor stream comprising hydrogen, propane and $C_6$ hydrocarbons;
(e) passing a liquid stream comprising $C_6$ and $C_9$ hydrocarbons and which is withdrawn from the vapor-liquid separation zone into a stripping column operated at conditions which effect the separation of the liquid stream into a stripping column overhead stream comprising hydrogen and propane and a stripping column bottoms stream which comprises propane, $C_6$ hydrocarbons and $C_9$ hydrocarbons;
(f) passing a first portion of the stripping column bottoms stream into the first absorber as the previously specified first lean liquid hydrocarbon stream, and passing a second portion of the stripping column bottoms stream into a depropanizer column operated at conditions which effect the separation of the entering hydrocarbons into a depro-

panizer overhead stream comprising propane and a net depropanizer bottoms stream removed from the process as a product stream which comprises $C_6$ and $C_9$ hydrocarbons and is substantially free of propane;

(g) removing a first portion of the first absorber vapor stream from the process as an off gas stream, and passing a second portion of the first absorber vapor stream into a second absorber and contacting the second portion of the first absorber vapor stream with a second lean liquid hydrocarbon stream at absorption-promoting conditions and thereby producing a second absorber bottoms stream, which comprises propane and a second adsorber vapor stream;

(h) passing the second absorber bottoms stream into the stripping column; and,

(i) passing a first portion of the depropanizer overhead stream into the second absorber as the previously specified second lean liquid hydrocarbon stream, and combining a second portion of the depropanizer overhead stream and the second absorber vapor stream with the feed stream as the previously referred to recycle stream of step (a).

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**4,293,723**

## CONVERSION OF ISOBUTENE TO AROMATICS OR POLYISOBUTYLENE WITH MODIFIED GAMMA ALUMINA COMPOSITION

**Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Division of Ser. No. 61,221, Jul. 27, 1979, Pat. No. 4,235,756.**
**This application Apr. 21, 1980, Ser. No. 142,591**
**Int. Cl.³ C07C *2/04*; B01J *21/04***
**U.S. Cl. 585—407** **2 Claims**

1. A process for dehydrocoupling isobutene to aromatics which comprises contacting the isobutene at about 450° C.–650° C. with an aluminous composition prepared by a process which comprises impregnating a substantially dehydrated gamma alumina with aluminum hydride dissolved in an anhydrous, non-hydroxyl containing organic solvent, drying the impregnated alumina to remove the solvent and subsequently heating the impregnated alumina at a temperature of about 300° to about 900° C. in a nonoxidizing atmosphere wherein the aluminum hydride added ranges from about 3 to about 7 percent by weight measured as aluminum metal.

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**4,293,724**

## ALKYLATION OF AROMATICS WITH PROPYLENE AND HIGHER OLEFINS

**David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed May 21, 1980, Ser. No. 151,953**
**Int. Cl.³ C07C *2/66***
**U.S. Cl. 585—457** **61 Claims**

1. A process for alkylating an aromatic hydrocarbon with an alpha olefin which comprises contacting an alpha olefin having at least three carbon atoms and an aromatic hydrocarbon with a catalyst composition obtained by contacting (a) a refractory metal oxide/silica support wherein the silica content of said support is from about 2 to about 95 weight percent and the metal oxide content of said support is from about 5 to about 98 weight percent with (b) a tris(cyclopentadienyl)trinickel dicarbonyl.

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**4,293,725**

## USE OF METAL MODIFIED REFRACTORY METAL OXIDE/SILICA SUPPORTED NICKEL CLUSTER CATALYST TO OLIGOMERIZE ETHYLENE

**David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed May 21, 1980, Ser. No. 151,952**
**Int. Cl.³ C07C *2/02, 2/26***
**U.S. Cl. 585—523** **85 Claims**

1. A process for oligomerizing ethylene which comprises contacting ethylene with a catalyst composition obtained by contacting (1) a refractory metal oxide/silica support wherein the silica content of said support is from about 2 to about 95 weight percent and the metal oxide content of said support is from about 5 to about 98 weight percent with (2) a solution of a soluble salt whose cationic portion is selected from the group consisting of an alkali metal, an alkaline earth metal and a lanthanide and whose anionic portion is selected from the group consisting of a halide, a nitrate, an acetate and an acetylacetonate and (3) then contacting the metal modified support with a tris(cyclopentadienyl)trinickel dicarbonyl.

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**4,293,726**

## PROCESS FOR THE OLIGOMERIZATION OF PROPYLENE AND HIGHER OLEFINS

**David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed May 21, 1980, Ser. No. 151,950**
**Int. Cl.³ C07C *2/02, 2/26***
**U.S. Cl. 585—523** **70 Claims**

1. A process for oligomerizing an alpha olefin which comprises contacting an alpha olefin having at least three carbon atoms with a catalyst composition obtained by contacting (a) a refractory metal oxide/silica support wherein the silica content of said support is from about 2 to about 95 weight percent and the metal oxide content of said support is from about 5 to about 98 weight percent with (b) a tris(cyclopentadienyl)trinickel dicarbonyl.

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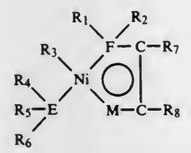
**4,293,727**

## PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE

**David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Aug. 18, 1980, Ser. No. 179,076**
**Int. Cl.³ C07C *2/02***
**U.S. Cl. 585—526** **59 Claims**

1. A process for oligomerizing ethylene which comprises contacting ethylene under oligomerization conditions with a nickel ylide defined by the following formula:




wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$ and $R_8$ are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbons atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy groups, provided that at least one of each of $R_1$ to $R_8$ radicals is a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl carrying a sulfonato group, M is sulfur or oxygen, E is phosphorus, arsenic, antimony or nitrogen and F is phosphorus, arsenic or antimony.



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**4,293,728**

## PRETREATMENT OF BUTENE-1 IN ISOMERIZATION OF IT TO BUTENE-2

**Dean P. Montgomery, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Mar. 31, 1980, Ser. No. 135,606**
**Int. Cl.³ C07C *5/23***
**U.S. Cl. 585—670** **4 Claims**

1. In the isomerization of isomerizable olefins in the presence of a catalyst the activity of which is adversely affected by an impurity such as sulfur or arsenic, the step of pretreating the feedstream by contacting the same at a temperature of the order of about 190° F. in a guard chamber or pretreatment bed containing an activated alumina contact mass adapted to remove from the feedstream the objectionable impurity.

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**4,293,729**

## ALKYLATION WITH DIB VAPOR ACID WASH

**Norman P. Kolb, Overland Park, Kans., and Orlando Webb, Lee's Summit, Mo., assignors to Stratford/Graham Engineering Corp., Kansas City, Mo.**

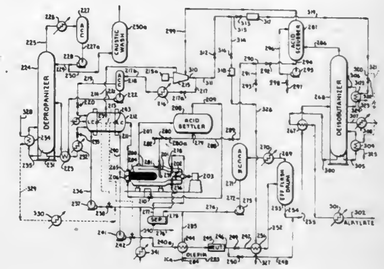
**Filed Jul. 8, 1980, Ser. No. 166,768**
**Int. Cl.³ C07C *3/54***
**U.S. Cl. 585—715** **8 Claims**

1. In a sulfuric alkylation process, wherein an olefin is reacted with isobutane in the presence of sulfuric acid catalyst in the reaction zone to produce a liquid hydrocarbon effluent containing the alkylate product and a vaporous hydrocarbon effluent,

the liquid hydrocarbon effluent is first neutralized and then passed to a distillation zone wherein low boiling material are removed as a vaporous fraction from the liquid alkylate product and the liquid alkylate product is removed from the distillation zone,

the vaporous hydrocarbon effluent having sulfur dioxide vapors therein and the vaporous fraction from the distillation zone having some water therein,

the improvement which comprises:




first removing the water from the said vaporous fraction,

passing the vaporous hydrocarbon effluent and water free vaporous fraction to a common compressor,

compressing the said vaporous hydrocarbon effluent and vaporous fraction in the said common compressor in admixture with one another and

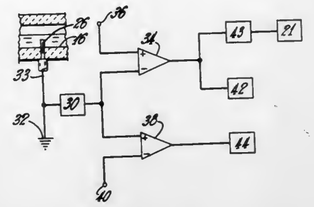
thereafter passing the compressed mixture in heat exchanging relationship with the liquid hydrocarbon phase effluent whereby to heat same in order to drive off light hydrocarbons therefrom.

**4,293,730**

## METHOD AND APPARATUS FOR DETECTING A GROUND ON ELECTRIC FURNACES

**Robert W. Myers, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Nov. 13, 1979, Ser. No. 93,772**
**Int. Cl.³ C03B *5/02***
**U.S. Cl. 13—6** **8 Claims**




1. A method of detecting a ground on an electric furnace, said method comprising the steps of: connecting an electrode, which is located in said furnace, to ground potential; sensing the current flowing from said electrode to ground; comparing the sensed current with a first reference signal indicative of the maximum desired current flowing to ground through said grounded electrode; and providing a first alarm signal when said sensed current is greater than said first reference signal.

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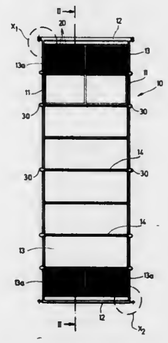
**4,293,731**

## SOLAR GENERATOR, ESPECIALLY FOR SPACE CRAFT

**Helmut Schweig, Hoehenkirchen, and Henning von Bassewitz, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany**

**Filed Jun. 2, 1980, Ser. No. 155,649**
**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923535**
**Int. Cl.³ H01L *31/04***
**U.S. Cl. 136—245** **16 Claims**




1. A solar generator, comprising flexible panel means, solar cells secured to said flexible panel means, frame means for holding said panel means, said frame means (**10**) comprising longitudinal bars (**11**) made of fiber compound materials and crossbars (**12**) also made of fiber compound materials, each frame means enclosing one of said flexible panel means, first adjustable tensioning means operatively interposed between said crossbars and said flexible panel means for coupling said flexible panel means to said frame means at the ends of said panel, and second adjustable tensioning means comprising stay wires means coupled to the sides of said flexible panel means and adjustable biasing means (**26**) operatively connecting said wire means to said crossbars (**12**).

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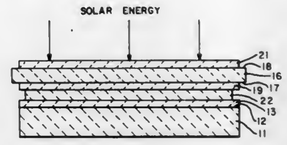
**4,293,732**

## SILICON SOLAR CELL AND 350 NANOMETER CUT-ON FILTER FOR USE THEREIN

**James D. Rancourt, and Richard I. Seddon, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.**

**Continuation of Ser. No. 945,433, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 823,843, Aug. 11, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,379**
**Int. Cl.³ H01L *31/06***
**U.S. Cl. 136—257** **18 Claims**




1. In a solar cell construction, a body formed essentially of silicon having a surface with a photovoltaic junction applied thereon, an anti-reflection coating formed on said surface, a transparent protective cover, a reflective cut-on filter carried by the cover and a layer of substantially transparent cement securing said protective cover to said body so that it overlies the junction and the anti-reflection coating, the reflective cut-on filter comprising a stack of layers formed alternately of higher and lower refractive index materials for reflecting a substantial portion of the light energy in the ultraviolet region below a predetermined cut-on wavelength, the cut-on filter also comprising a layer formed of an absorbing material which has an absorption band commencing at approximately the cut-on wavelength for blocking the passage of solar energy in the ultraviolet region below approximately the cut-on wavelength, said cut-on filter having a transmission cut-on which is angle insensitive to the angle of incidence of solar energy at the cut-on wavelength, said cut-on filter providing angle insensitivity without substantial sacrifice of the capability of reflecting solar energy below the cut-on wavelength at normal incidence.

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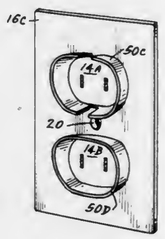
**4,293,733**

## SAFETY COVER FOR ELECTRICAL OUTLETS

**George R. Royer, Toledo, Ohio, assignor to John A. Weithman, Genoa, Ohio, a part interest**

**Filed Nov. 13, 1979, Ser. No. 93,608**
**Int. Cl.³ H01R *13/44***
**U.S. Cl. 174—67** **4 Claims**




1. A protective covering device for electrical plugs with two prongs for insertion in a wall affixed electrical outlet, said protective device comprising:

(a) a plate member, said plate member having one or more

openings, extending therethrough to receive a male electrical appliance plug for insertion into the outlet;
(b) hollow and open ended tunnel members affixed over each of said openings in said plate member, said hollow tunnel members being axially aligned to receive an appliance plug therethrough for insertion of the respective plug through said corresponding plate openings into the electrical outlet, at least one of said tunnel members having gaps in its upper and lower periphery to allow access to a portion of a plug when inserted in the outlet, and wherein the width of said gaps is less than the distance between the two prong members;
(c) means to affix said plate member to the electrical outlet.

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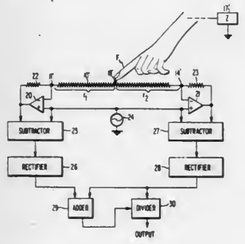
**4,293,734**
**TOUCH PANEL SYSTEM AND METHOD**
**William Pepper, Jr., Bethesda, Md., assignor to Peptek, Incorporated, Bethesda, Md.**
**Filed Feb. 23, 1979, Ser. No. 14,450**
**Int. Cl.³ G08C *21/00*; G01N *27/00***
**U.S. Cl. 178—18** **28 Claims**




1. In an apparatus for locating a selected touch point on a current-conducting impedance surface having at least a pair of boundaries, the improvement comprising
means for linearizing current flow to said boundaries,
means for causing a linearized electrical current to flow through said selected touch point as the sum of separate currents passing through each of said boundaries, and
means for translating said separate currents to at least one signal corresponding to the location of said selected touch point relative to said boundaries.

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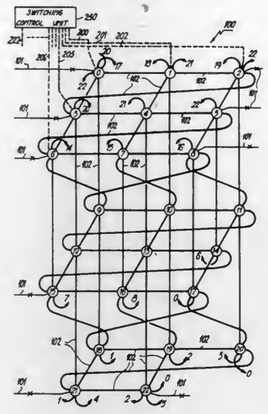
**4,293,735**
**NODAL STRUCTURE SWITCHING NETWORK**
**Christian H. Duret, 6, rue de l'Epargne, Chatillon, France (92320)**
**Filed Jun. 28, 1979, Ser. No. 52,764**
**Claims priority, application France, Jun. 29, 1978, 78 19506**
**Int. Cl.³ H04Q *3/42***
**U.S. Cl. 179—18 GE** **3 Claims**

1. A switching network unit for establishing interconnections amongst any of a plurality of termination circuits, said switching network unit comprising:
a plurality of N identical elementary node switching networks having consecutive addresses comprised between 0 inclusive and (N−1) inclusive, N being an integer smaller than or equal to $f^p$, f and p being predetermined integers, said termination circuits being connected to respective ones of said elementary node switching networks;
internode links connecting each of said elementary node switching networks to 2p other elementary node switching networks, the elementary node switching networks having addresses i smaller than or equal to $N-f^k-1$ being connected through said internode links to elementary node switching networks of addresses $i+f^k$ and the elementary node switching networks having addresses i greater than or equal to $N-f^k$ being connected through said internode links to elementary node switching networks of addresses i+1 (modulo $f^k$) where k is any integer including 0 and at most equal to p.

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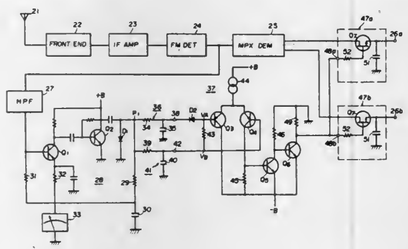
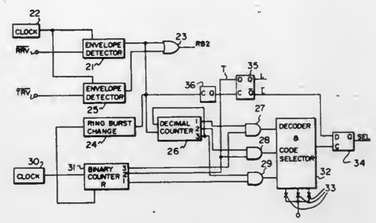
**4,293,736**
**NOISE ELIMINATOR FOR RADIO RECEIVER**
**Minoru Ogita, c/o Nippon Gakki Seizo Kabushiki Kaisha, No. 10-1, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken, Japan**
**Filed Oct. 15, 1979, Ser. No. 84,752**
**Claims priority, application Japan, Oct. 20, 1978, 53-144171[U]**
**Int. Cl.³ H04H *5/00***
**U.S. Cl. 179—1 GD** **12 Claims**




1. A noise eliminator for a radio receiver, comprising:
first circuit means coupled to a signal path leading from a front end circuit to a demodulator circuit in the receiver and including a filter circuit for deriving a noise signal contained in a signal on said signal path;
second circuit means receiving said noise signal for averaging the same to produce an average signal;
third circuit means for producing a differential signal corresponding to a difference between said noise signal and said average signal;
gating means inserted between said demodulator circuit and an output terminal of the receiver for interrupting a transmission of a demodulated output signal to said output terminal when said gating means is nonconductive; and
fourth circuit means responsive to said differential signal for rendering said gating means nonconductive.



**4,293,737**
**RINGING DECODER CIRCUIT**
**Jacob Cepelinski, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada**
**Filed Dec. 6, 1979, Ser. No. 100,949**
**Claims priority, application Canada, Oct. 18, 1979, 337959**
**Int. Cl.³ H04M *13/00, 3/02***
**U.S. Cl. 179—17 E** **14 Claims**




1. A ringing decoder circuit for decoding coded ringing signals comprising at least one sequence of long and/or shot bursts of ringing signals, comprising:
(a) means for counting the total number of bursts in a sequence,
(b) means for detecting the length of the final burst in the sequence relative to a first predetermined interval, and
(c) means for indicating the reception of a predetermined code in the event the number of bursts and the relative length of the final burst in the sequence match a predetermined indicated number and relative length respectively.

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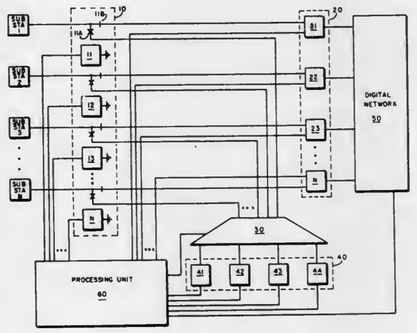
**4,293,738**
**ANALOG ACCESS ARRANGEMENT FOR A DIGITAL TELEPHONE OFFICE**
**David J. Stelte, Lombard, and Alex W. Kobylar, Chicago, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.**
**Filed Nov. 9, 1979, Ser. No. 92,877**
**Int. Cl.³ H04M *3/42*; H04Q *3/60***
**U.S. Cl. 179—18 FC** **9 Claims**




1. An arrangement for concentrating specialized analog line circuitry in a digital switching system, including a plurality of subscriber stations each operated to generate an off-hook signal, said arrangement comprising:
a plurality of line circuits, each connected to an associated one of said subscriber stations, each operated in response to a said off-hook signal to generate a supervisory signal;
a processing unit connected to said plurality of line circuits, operated in response to predetermined ones of said supervisory signals to generate an associated line access signal and an associated analog circuit enable signal;
connection means connected to said plurality of line circuits;
a plurality of specialized analog circuits connected to said processing unit, each operated in response to an associated one of said analog circuit enable signals to connect to said connection means;
each of said plurality of line circuits further operated in response to an associated one of said line access signals to connect to said connection means; and
said connection means operated in response to connection of said line circuit and said specialized analog circuit to connect said line circuit to said specialized analog circuit.

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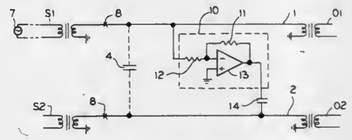
**4,293,739**
**CIRCUIT WITH CROSSTALK ELIMINATION CAPABILITY**
**Yasuo Iijima, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**
**Filed Jan. 29, 1980, Ser. No. 116,497**
**Claims priority, application Japan, Jan. 30, 1979, 54-9456**
**Int. Cl.³ H04Q *3/50, 1/36***
**U.S. Cl. 179—18 GF** **9 Claims**



1. A circuit for eliminating crosstalk between lines in a switching network, said network having a group of incoming lines respectively connected to input terminals thereof and a group of outgoing lines respectively intersecting these incoming lines, a plurality of switching crosspoint means arranged between the incoming and outgoing groups of lines for selectively interconnecting predetermined ones of the incoming and outgoing lines, crosstalk elimination means comprising a serial circuit having a phase inverter circuit means and an impedance circuit means which together has an impedance value sufficiently close to the impedance value of a leakage impedance between two of these incoming and outgoing lines, and means for connecting said serial circuit between said two lines.

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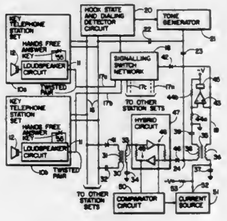
**4,293,740**
**HANDS FREE ANSWER INTERCOM**
**William D. Gibb, and Donald E. Clement, both of Belleville, Canada, assignors to Northern Telecom Limited, Montreal, Canada**
**Filed Aug. 25, 1980, Ser. No. 180,882**
**Int. Cl.³ H04M *1/60, 9/10***
**U.S. Cl. 179—99 A** **10 Claims**




3. A hands free answer intercom circuit in combination with a station set which includes a receive signal path for coupling voice band signals received at a signal terminal to a loudspeaker for producing corresponding audible tones, the hands free answer intercom circuit comprising:

a transmit signal path for coupling voice band signals at the loudspeaker to the signalling terminal; and

switch means for alternately connecting one and the other of the transmit and receive signal paths in series between the loudspeaker and the signal terminal, in response to one and the other of first and second d.c. signal states received at the signal terminal;

whereby the station set is remotely controllable to operate in a hands free receiving mode and in a hands free transmitting mode, providing a hands free answer intercom function.

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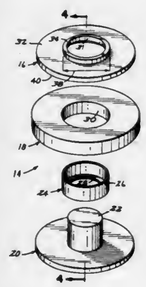
**4,293,741**

## MAGNET ASSEMBLY

**Clifford B. Digre, 4745 Vincent Ave. South, Minneapolis, Minn. 55410**

**Filed Jun. 21, 1979, Ser. No. 50,873**
**Int. Cl.³ H04R** *9/02*
**U.S. Cl. 179—115.5 PC** **16 Claims**



7. A magnetic assembly for attachment to a loudspeaker basket of predetermined thickness comprising:

(a) a back plate having a solid cylindrical pole projecting from one face thereof;

(b) an annular magnet having a face and an axial bore therethrough, said projecting pole being disposed centrally within said axial bore;

(c) means affixing said face of said magnet to said face of said back plate; and

(d) a front plate having a face disposed against said magnet, said front plate having a circular aperture of a diameter less than said axial bore in said magnet but greater than the diameter of said projecting pole, said second plate further having a lip having generally vertical walls projecting outwardly and substantially perpendicularly from the other face of said front plate whereby a concentric ring is formed around said projecting pole to be received within said basket opening and wherein said lip extends outwardly beyond said basket.

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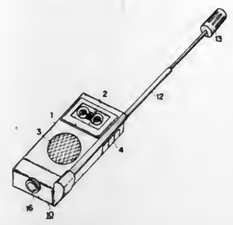
**4,293,742**

## MICROPHONE DEVICE

**Masanobu Sato, Hachioji, and Ken Satoh, Akigawa, both of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Sep. 21, 1979, Ser. No. 77,721**
**Claims priority, application Japan, Sep. 25, 1978, 53-131512[U]**
**Int. Cl.³ G11B** *31/00;* **H04B** *1/06*
**U.S. Cl. 179—178** **6 Claims**

1. A microphone device for use with acoustic equipment, comprising a body detachably mountable on the acoustic equipment, an extensible and contractable elongated arm on the body, a microphone fitted to the free end of the arm, and extensible and contractable elongated conductor means disposed in the arm for electrically connecting the microphone with the body.



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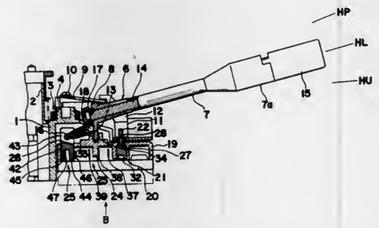
**4,293,743**

## COMBINATION SWITCHING MEANS OF LEVER TYPE FOR MOTOR VEHICLES

**Masayosi Iwata, Hashima, and Harumi Douke, Komaki, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Oct. 5, 1979, Ser. No. 82,404**
**Claims priority, application Japan, Oct. 6, 1978, 53-138472**
**Int. Cl.³ H01H** *3/16, 9/00*
**U.S. Cl. 200—4** **9 Claims**



1. A combination switching assembly of the lever type for use in a motor vehicle, said assembly comprising:

a support frame adapted to be mounted on a steering column of a motor vehicle, said support frame having projecting therefrom a pivot shaft;

a lever support member mounted to pivot about said pivot shaft;

a hollow operating lever;

supporting shaft member means for connecting said operating lever to said lever support member such that upon application to said operating lever of a first tilting pivotal movement in a first direction said operating lever and said lever support member together pivot about said pivot shaft, and such that upon application to said operating lever of a second tilting pivotal movement in a second direction substantially perpendicular to said first direction said operating lever pivots with respect to said lever support member about an axis of said supporting shaft member means;

first, second and third switching means, fixed with respect to said support frame, for achieving first, second and third switching operations, respectively;

first operating member means, connected to said lever support member, for, upon movement of said operating lever and said lever support member about said pivot shaft in said first direction, actuating said first switching means;

first sliding member means, mounted for sliding movement with respect to said support frame, for actuating said second switching means;



second operating member means, connected to said operating lever, for, upon movement of said operating lever in said second direction, causing said first sliding member means to actuate said second switching means, and for, upon movement of said operating lever in said first direction, preventing sliding movement of said first sliding member means and thus preventing actuation of said second switching means;

an operating shaft extending coaxially through the interior of said operating lever and being mounted therein for twisting rotational movement with respect thereto;

second sliding member means, mounted for sliding movement with respect to said support frame, for actuating said third switching means; and

third operating member means, connected to said operating shaft for, upon twisting rotational movement of said operating shaft with respect to said operating lever, causing said second sliding member means to actuate said third switching means, and for, upon movement of said operating lever in said first or second directions, preventing sliding movement of said second sliding member means and thus preventing actuation of said third switching means.

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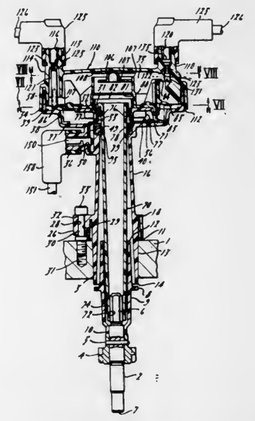
**4,293,744**

## ALIGNMENT DEVICES FOR REMOVABLE SPARK PLUG TERMINALS IN AN IGNITION COMMUTATION DISTRIBUTOR

**Robert L. Kuhn, Dearborn, and Charles C. Kostan, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 14, 1979, Ser. No. 103,634**
**Int. Cl.³ H01H** *19/00*
**U.S. Cl. 200—19 R** **11 Claims**



1. An ignition commutation distributor for an internal combustion engine comprising:

a distributor base, for mounting on said internal combustion engine, defining a portion of a commutation cavity;

a distributor cap for mounting on said distributor base and defining the remaining portion of said commutation cavity;

a rotor mounted within said commutation cavity, in rotational driving communication with said engine, said rotor containing at least one commutation conductor which rotates with said rotor about a central axis of said commutation cavity;

a common high voltage supply electrode fixedly mounted to said base in said commutation cavity to be in arc-gap communication with said at least one commutation conductor over several distinct portions of said electrode, when said rotor is rotationally driven;

a plurality of open ended hollow spark plug wire terminal connectors permanently attached to spark plug wires and removably mounted on said distributor cap to extend therethrough into said commutation cavity; and

means within said commutation cavity for entering said open end and aligning said removably mounted spark plug wire terminal connectors about said central axis to be in predetermined locations so that each is in arc-gap registration with said at least one commutation conductor during a portion of each rotation of said rotor.

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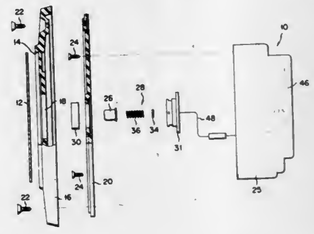
**4,293,745**

## CAPACITANCE TYPE CONTACT SWITCH

**Takehiko Matsuda, Matsudo, and Kyoichi Izawa, Tokyo, both of Japan, assignors to Toyostar Corporation, Tokyo, Japan**

**Filed Jun. 5, 1979, Ser. No. 45,755**
**Claims priority, application Japan, Jun. 23, 1978, 53/86265[U]**
**Int. Cl.³ H01H** *35/00*
**U.S. Cl. 200—52 R** **7 Claims**



1. A capacitance type contact switch comprising:

a conductive front contact plate mounted to a front panel,

a support plate attached to said front panel,

fitting means attached to said support plate and containing a conductive push button in the form of a conductive bottomed cylinder, a conductive seat member, and a conductive spring member interposed between said bottomed cylinder of said push button and said seat member and biasing said push button toward the back of said front contact plate,

a switch case coupled to said support plate and containing an electrical circuit substrate, and

lead wire means electrically connecting said electrical circuit substrate with said seat member, thereby providing electrical conduction between said substrate and said conductive contact plate through said seat member, spring member and push button.

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**4,293,746**

## FOOT OPERATED CONTROL UNIT

**Ronald J. Braaten, P.O. Box 161, Woodstock, Conn. 06281**

**Continuation of Ser. No. 765,896, Feb. 7, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,453**
**Int. Cl.³ H01H** *3/14;* **G05G** *1/14*
**U.S. Cl. 200—86.5** **6 Claims**

1. A self-contained foot operated unit for controlling a power circuit of an associated power driven device comprising:

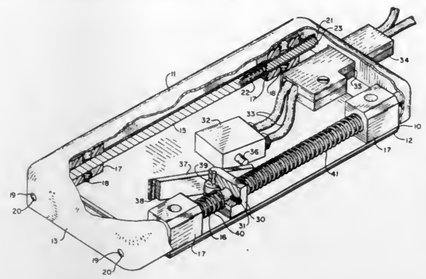
(a) a substantially flat base adapted to be placed on a horizontal supporting surface and having means to retain the base in a fixed position thereon,

(b) an elongate foot operated actuating member having an upper surface for receiving and supporting the entire bottom surface of the foot of an operator,

(c) bearing means mounting the foot operated actuating member on the base for limited reciprocating forward and

backward movement relative thereto only in a linear direction longitudinally of the actuating member responsive to movement of an operator's foot resting on the actuating member, said member together with the base providing an enclosed space therebetween,

(d) a control mechanism of the switch or valve type



mounted on the base within said enclosed space for connection to the power circuit of an associated power driven device for controlling the operation thereof, and

(e) actuating means within said enclosed space and arranged to cooperate with the actuating member for actuating the control mechanism responsive to longitudinal movement of the actuating member relative to the base.

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**4,293,747**

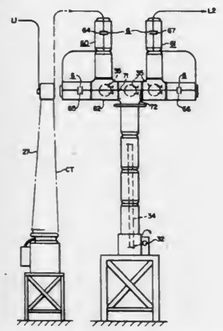
## HIGH-VOLTAGE PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER ASSEMBLAGE

**John R. Perulfi, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 713,559, Aug. 11, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,052**

**Int. Cl.³ H01N** *33/14, 9/40*

**U.S. Cl. 200—145** **1 Claim**



1. A high-voltage circuit-interrupting assemblage comprising an upstanding supporting columnar structure; a first horizontally-extending supporting structure secured to, and supported by, said upstanding supporting columnar structure, said first horizontally-extending supporting structure having disposed therein a first common operating mechanism; a pair of second horizontally-extending supporting structures one each of which is secured to each end of said first horizontally-extending supporting structure, each of said second supporting structures having disposed therein a second common operating mechanism operatively connected to said first common operating mechanism such that said first and second operating mechanism operate simultaneously; a first hollow leg secured to each second supporting structure disposed generally parallel to said upstanding supporting columnar structure and a second hollow leg secured to each second supporting structure disposed along the axis of said first horizontally-extending supporting structure; an interrupting unit disposed in each of said first and second hollow legs, said interrupting units being operatively connected to said second common operating mechanisms and effecting simultaneous opening and closing of all of said interrupting units; and means for connecting said interrupting units in electrical series.

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**4,293,748**

## VACUUM CIRCUIT INTERRUPTER ELECTRODES

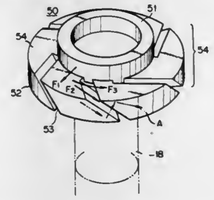
**Shinzo Sakuma, Yokohama, and Hifumi Yanagisawa, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Meidensha and Kabushiki Kaisha GEMVAC, both of Tokyo, Japan**

**Filed Dec. 19, 1978, Ser. No. 970,912**

**Claims priority, application Japan, Dec. 28, 1977, 52-160560**

**Int. Cl.³ H01H** *33/66*

**U.S. Cl. 200—144 B** **9 Claims**



1. In a circuit interrupter having a pair of electrodes, one of said electrodes being relatively movable with respect to the other between a closed position in engagement with the other and an open position separated from the other to form a circuit-interrupting arc column between said electrodes, wherein the improvement comprises:

at least one of said electrodes comprises an annual contact section and a disc-shaped arc driving section surrounding said annular contact section,

said arc driving section being formed with a plurality of slots extending inwardly from its outer periphery to divide it into arc driving segments,

said slots being inclined at an angle with respect to the radius of said arc driving section and also being inclined at an angle with respect to the axis of said arc driving section such that said arc driving segments can overlap the adjacent arc driving segments across said inclined slots,

said arc driving segments together with said slots between adjacent ones of said arc driving segments being interrelated such that an arc column generated during circuit interruption moves in the direction which makes an acute angle with respect to said slots in the plane facing the other electrode.

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**4,293,749**

## PUFFER TYPE GAS CIRCUIT BREAKER

**Tuneo Kishi, and Koji Sasaki, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 25, 1979, Ser. No. 60,480**

**Claims priority, application Japan, Jul. 26, 1978, 53/90439**

**Int. Cl.³ H01H** *33/16*

**U.S. Cl. 200—144 AP** **5 Claims**

1. A puffer type gas circuit breaker including;

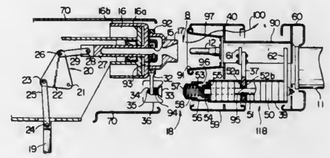
an interrupting unit having a main fixed contact, a main movable contact movably disposed in opposed relation with said main fixed contact between a position where it is in contact with and a position where it is separated from said main fixed contact, and a puffer device for compressing and flowing arc-affecting gases across the arc established between the main fixed and movable contacts when the same are separated from each other;

a preinsertion resistor contact unit electrically connected in parallel with the main fixed and movable contacts of the interrupting unit, said preinsertion resistor contact unit having a fixed resistor contact a dash-pot cylinder slidably mounted on the outer surface of said fixed resistor contact for normally biasing said fixed resistor contact toward its closing position, said dash-pot cylinder being of electrically conductive material including a duct for creating the dash-pot effect, a preinsertion resistor assembly electrically connected in series with a dash-pot cylinder and a fixed resistor contact, and a movable resistor contact fixed to said puffer cylinder and adapted to be selectably contacted with said fixed resistor contact;

operating means for actuating said main movable contact and said puffer device; and

a sealed container including a grounded tank filled with





arc-affecting gas and provided with an opening for maintenance for accommodating said interrupting unit, said preinsertion resistor unit and said operating means; said sealed container, said interrupting unit, said preinsertion resistor contact unit and said operating means being isolated from each other by insulator means; said puffer type gas circuit breaker comprising;

a support arm extending from the outer surface of said puffer cylinder in a direction substantially perpendicular to the axis of said puffer cylinder, and

a plurality of adjustment plates disposed along the axis of said main movable contact between said support arm and said movable resistor contact, wherein the number of said adjustment plates are selectively increased or decreased to adjust the time interval between the close of said main fixed and movable contacts and the close of said fixed and movable resistor contacts or the time interval between the open of said main fixed and movable contacts and the open of said fixed and movable resistor contacts.

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**4,293,750**

## ELECTRIC GAS BLAST CIRCUIT BREAKER

**Heiner Marin, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Feb. 22, 1980, Ser. No. 123,553**

**Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907691**

**Int. Cl.³ H01H** *33/88*

**U.S. Cl. 200—148 A** **8 Claims**

1. In an electric gas blast circuit breaker comprising:

(a) an electric contact system having a movable cylindrical contact member; and

(b) a gas arc quenching system surrounding the electric contact system, having:

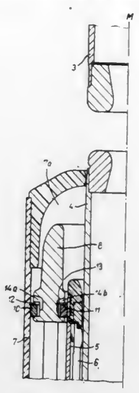
(1) an annular piston;

(2) a movable cylinder;

(3) two sealing rings arranged, respectively between said piston and said movable cylinder on one side, and between said piston and said cylindrical contact member on the other side; and

(4) a one-way valve for the control of quenching gas, which valve is closed during the compression phase and open during the intake phase of the circuit breaker;

the improvement wherein said sealing rings are disposed on a common plane in annular grooves of said piston; wherein means are arranged between said two sealing rings for constraining said rings to be displaced jointly in the direction of



said plane; wherein said sealing rings are dimensioned to provide axial play within said grooves; and wherein said piston includes flow paths to and from said grooves for the quenching gas such that said sealing rings form said one-way valve.

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**4,293,751**

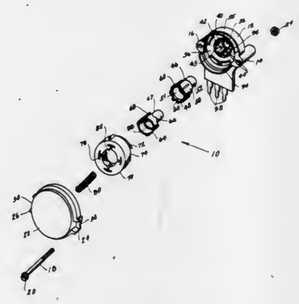
## PROCESS FOR PRODUCING AN ON-OFF PUSH SWITCH AND RESULTING ARTICLE

**John D. Van Benthuysen, and Carlton M. Osburn, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.**

**Filed Feb. 8, 1980, Ser. No. 119,643**

**Int. Cl.³ H01H** *19/14*

**U.S. Cl. 200—156** **4 Claims**



1. A control switch comprising a switch housing having a base plate, an internal socket opening with a plurality of circumferentially spaced internal ribs each having a beveled surface and formed integrally with the inner surface of said socket opening, means forming a plunger disposed in said socket opening and having a stem fitting through a central opening of said housing at one end of said socket opening and including a plurality of crowned teeth and external ribbing means in coacting slidable and abutting relation with the internal ribs of said housing to preclude relative rotation therebetween, a rotor having complementary crowned teeth engageable with correspondingly opposed teeth of said plunger and external ribs slidably engageable and disengageable with respective internal ribs, a spring means for yieldably opposing axial movement of said plunger and rotor in one direction and for providing an opposite restoring axial movement to said

rotor and plunger, a contactor plate circumposing the other end of said socket opening, and an annular drive arm including a plurality of resilient contactor paddles secured to said annular drive arm retained in said housing by said base plate and key means to rotate said drive arm with said rotor to effect one of a plurality of electrical circuits with said contactor plate, whereby upon axial movement of the plunger and rotor in the one direction there is effected an angular stepping movement of the rotor in a switch-operating direction, the external ribs of said rotor engaging beveled surfaces of respective internal ribs whereby upon the opposite restoring axial movement of said plunger and rotor the rotor is indexed a further angular incremental movement thereby completing a positioning of the rotor to its initial axial position.

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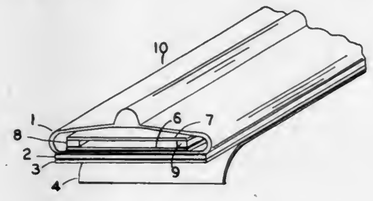
**4,293,752**
**SELF ADHERING TAPE SWITCH**
**Robert H. Koenig, Huntington Hills, N.Y., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.**
**Filed Jan. 11, 1980, Ser. No. 111,279**
**Int. Cl.³ H01H** *13/16, 3/14*
**U.S. Cl. 200—295** **4 Claims**




1. Self adhering tape switch assembly comprising: a tape switch having a pair of switch contacts,
a layer of deformable material bonded to the underside of said tape switch,
a layer of pressure sensitive adhesive connected to the underside of said deformable material layer,
a strip of paper adhering to the underside of the pressure sensitive adhesive, said paper strip being removable,
a plurality of spaced notches cut through the paper and pressure sensitive adhesive layer so that the tape switch assembly can be easily coiled.

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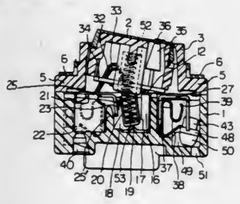
**4,293,753**
**SWITCH**
**Hiroshi Kanada, Tsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan**
**Filed Sep. 13, 1979, Ser. No. 75,261**
**Claims priority, application Japan, Sep. 13, 1978, 53-113428**
**Int. Cl.³ H01H** *9/18*
**U.S. Cl. 200—315** **4 Claims**




1. A switch for indicating an activated condition of a load circuit, said switch comprising:
a body including first, second, third, and fourth chambers, said first and second chambers disposed adjacent one another in a widthwise direction of said body, and said third and fourth chambers disposed at opposite lengthwise ends of said first and second chambers,
said second and third chambers being separated by a partition,
a transformer disposed in said first chamber and including primary and secondary windings,
a conductive fulcrum member connected to one lead of said primary winding and forming a fulcrum disposed in said second chamber,
a movable contact member carrying a movable contact and rockably supported on said fulcrum for rocking movement to either side thereof,
a first spring for yieldably retaining said movable contact member in position,
a fixed contact member disposed in said third chamber and carrying a fixed contact, said fixed contact member extending over said partition to locate said fixed contact in said second chamber for being contacted by said movable contact,
a contacting element connected to another lead of said primary winding and disposed in said fourth chamber,
second springs disposed in said third and fourth chambers, respectively, on opposite sides of said fulcrum and in opposing relation to said fixed contact member and contacting element, said second springs each including a wedge portion and arranged to urge an exterior load connecting wire against said fixed contact member and contacting element, respectively,
a switch button rockably mounted on said body and resiliently abutting said first spring, and
a light emitting diode connected to said secondary winding and being housed visibly within said button to provide a visual indication when the load circuit is activated.

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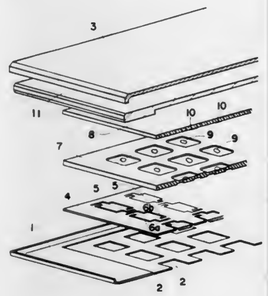
**4,293,754**
**THIN AND FLAT KEYBOARD INTEGRAL WITH A METALLIC HOUSING**
**Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed Dec. 28, 1979, Ser. No. 107,888**
**Claims priority, application Japan, Dec. 28, 1978, 53-179785[U]**
**Int. Cl.³ H01H** *3/12*
**U.S. Cl. 200—340** **3 Claims**




1. A thin keyboard construction for a handheld calculator which comprises
a housing member and a key actuator sheet containing a plurality of key actuators which are integral with said key actuator sheet,
said housing member being made of a sheetlike flat material having a portion of its area with a reduced thickness, said key actuator sheet being disposed in said area of reduced thickness, said area of reduced thickness having apertures disposed therein in positions corresponding to said plurality of key actuators,
said key actuator sheet being made of a sheet like flat material having cutout portions defining said plurality of key actuators, said cutout portions enabling said key actuator to move in a vertical direction, and said cutout portions being concealed behind said housing member.



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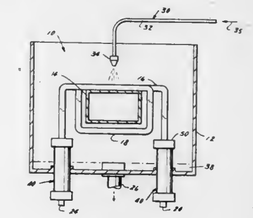
**4,293,755**
**METHOD OF COOLING INDUCTION-HEATED VAPOR DEPOSITION APPARATUS AND COOLING APPARATUS THEREFOR**
**Lawrence Hill, Short Hills; Dennis Garbis, Dix Hills, and Robert Heller, Levittown, all of N.Y., assignors to General Instrument Corporation, Clifton, N.J.**
**Continuation of Ser. No. 953,575, Oct. 23, 1978, abandoned.**
**This application Apr. 14, 1980, Ser. No. 140,293**
**Int. Cl.³ H05B** *6/42;* **C23C** *13/08*
**U.S. Cl. 219—10.41** **2 Claims**




1. A method of cooling induction-heated horizontal epitaxy tube vapor deposition apparatus including an electrically grounded deposition enclosure and an RF induction heating coil having essentially electrically uninsulated turns thereof disposed about said deposition enclosure, comprising the step of spraying deionized liquid having a resistivity of at least 14 megohms-centimeter directly onto said deposition enclosure and said coil turns of said apparatus in a pattern such that hotter parts of said deposition enclosure receive greater volumes of said deionized liquid than cooler parts thereof.

2. In apparatus for cooling induction-heated horizontal epitaxy tube vapor deposition apparatus including an electrically grounded deposition enclosure and an RF induction heating coil having essentially electrically uninsulated turns thereof disposed about said deposition enclosure, the improvement comprising
(a) means positioned in a location having access to said enclosure for spraying deionized liquid having a resistivity of at least 14 megohms-centimeter directly onto said enclosure and said coil turns of said apparatus, said spray means being so arranged as to spray said deionized liquid in a pattern such that hotter parts of said deposition enclosure receive greater volumes of said deionized liquid than cooler parts thereof;
(b) means for collecting the sprayed liquid, said collecting means comprising a receptacle adapted to receive liquid, and said deposition apparatus being disposed above the bottom of said receptacle with end portions of said coil passing through the bottom of said receptacle, said end portions being grounded and encapsulated in polytetrafluoroethylene to electrically isolate said coil end portions from said receptacle and the liquid contents thereof;
(c) means for maintaining within said receptacle a liquid level below the top of said encapsulated coil end portions but above the bottom of said receptacle; and
(d) means for independently grounding said spray means and said collecting means.

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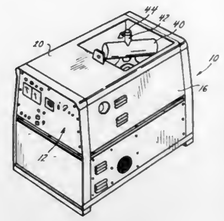
**4,293,756**
**ELECTRIC WELDER**
**Harold C. Hoyt, Jr., St. Louis, Mo., and William J. Greene, Warren, N.J., assignors to Teledyne Walterboro, Walterboro, S.C.**
**Filed Sep. 22, 1978, Ser. No. 944,962**
**Int. Cl.³ B23K** *9/10*
**U.S. Cl. 219—133** **12 Claims**




1. An electric welder which comprises output terminals, a D.C. generator that can selectively develop a positive voltage or a negative voltage at one of said output terminals, an energizing circuit for the field winding of said D.C. generator, a polarity-controlling switch that can be set in one position to enable said energizing circuit to cause current to flow through said field winding in a direction which will enable said D.C. generator to develop said positive voltage at said one output terminal, said polarity-controlling switch being adapted to be set in a second position to enable said energizing circuit to cause current to flow through said field winding in the opposite direction and thereby enable said D.C. generator to develop said negative voltage at said one output terminal, a sensing circuit which senses a condition that is representative of the operating level of the D.C. generator and which can develop a first signal when the D.C. generator is operating below a predetermined level and which can develop a second and different signal when said generator is operating above said predetermined level, means to establish and maintain different selected levels of current flow through said field winding, and a control circuit which automatically responds to the development of said first signal by said sensing circuit to force all current flow through said field winding to be in the first said direction irrespective of the position in which said polarity-controlling switch is set, said control circuit subsequently and automatically responding to the development of said second signal by said sensing circuit to permit the current flow through said field winding to be in the direction called for by the setting of said polarity-controlling switch, whereby said D.C. generator will automatically develop said positive voltage at said one output terminal whenever said D.C. generator is operating below said predetermined level but will subsequently and automatically permit said D.C. generator to respond to the setting of said polarity-controlling switch to develop either said positive voltage or said negative voltage at said one output terminal whenever said D.C. generator is operating above said level.

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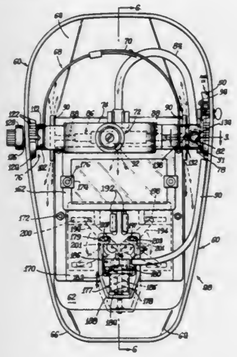
**4,293,757**
**AUTOMATIC WELDER'S HELMET HAVING VENTILATION MEANS**
**Francis J. Niemi, 3933 W. Ellis Ave., Chicago, Ill. 60653**
**Filed Sep. 17, 1979, Ser. No. 76,409**
**Int. Cl.³ B23K** *9/32;* **A61F** *9/06;* **F16P** *1/06*
**U.S. Cl. 219—147** **5 Claims**

1. In an automatic welder's helmet for use with a welding machine, the combination comprising: an open back headshield, head harness means pivotally connected to said headshield for supporting the same on the head of an operator, a movable dark eye lens slidably mounted in a frame secured about an opening in said headshield and operable to slide over

said opening between open and closed positions, pneumatic operating means protectively mounted within said headshield for opening said dark eye lens, spring means associated with said pneumatic means and operable to effect closing of said dark eye lens; electrical control means for controlling operation of the welding machine and said pneumatic means, said electrical control means including a first time delay means for delaying energization of the welding machine for a period of time until after said dark eye lens has moved to its closed position, and a second time delay means for delaying the movement of said dark lens to its open position for a period of time at least until after the welding cycle has been completed; and helmet ventilation means communicating with the interior of said headshield and operably controlled by said control means to supply fresh air to the interior thereof whenever said lens is in its closed position.



5. A welding helmet for use with an electric arc welding system, comprising: an open back headshield member, a head harness, pivotal means joining said harness to said headshield member whereby to support the latter on the head of an operator and provide for its pivotal movements between raised and lowered positions; helmet ventilation means communicating directly with the interior walls of said headshield member and comprising air distribution means protectively mounted within said headshield member and air supply means located exteriorly thereof; said pivotal means comprising rotary valve means in communication with said air distribution means and said air supply means and operable in response to pivotal movements of said headshield member, whereby when said headshield member is in its lowered position, the air supply means is in direct commuication with said air distribution means and when said headshield member is in its said raised position, said air supply means is isolated from said air distribution means.

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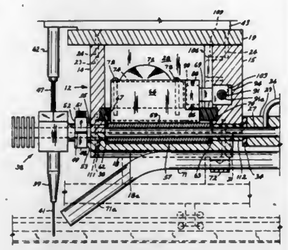
**4,293,758**

## WELDING APPARATUS INCLUDING MEANS FOR DEPOSITING THE WELD METAL ALONG PARALLEL PATHS

**Clyde M. Slavens; Edward A. Clavin, and James E. Alleman, all of Houston, Tex., assignors to Midcon Pipeline Equipment Co., Houston, Tex.**

**Filed Aug. 1, 1979, Ser. No. 62,686**
**Int. Cl.³ B23K *9/09***
**U.S. Cl. 219—125.12** **34 Claims**

1. Welding apparatus, comprising a welding torch having a consummable welding electrode, a pivotal support for said welding torch, electromagnetic means for oscillating said pivotal support and said welding torch supported thereby in back and forth movements, means for supplying DC welding current of pulsating amplitude to said welding electrode, said pulsating amplitude of said welding current having a frequency equal to the frequency of emissions of weld metal droplets from said welding electrode, electrical circuit means for energizing said electromagnetic means in correlation with the welding current amplitude pulse frequency so that a selected number of weld metal droplets are emitted at each of the ends of said back and forth movements of said welding torch,



whereby a selected number of weld metal droplets are emitted along a pair of parallel paths along opposite sides of a welding joint, and whereby no weld metal droplets are emitted between said parallel paths.

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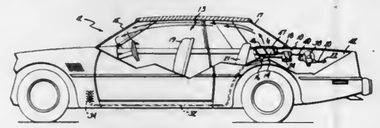
**4,293,759**

## ELECTRIC HEATING SYSTEM FOR HEATING THE INTERIOR OF A MOTOR VEHICLE PRIOR TO STARTING

**Pink M. Higgins, 136 Moore La. 5, Billings, Mont. 59101**

**Filed Dec. 19, 1979, Ser. No. 105,133**
**Int. Cl.³ H05B *1/02*; F02N *17/02*; F24H *3/04***
**U.S. Cl. 219—202** **2 Claims**



1. In a motor vehicle having a passenger compartment with at least one seat, a windshield, a rear window, a trunk, a battery and a horizontal shelf behind the rearmost seat over the trunk, the improvement comprising a heating system for heating the passenger compartment and defrosting the rear window and windshield of the vehicle prior to starting, said heating system including:

an electric air heater means fixedly mounted under and to the horizontal shelf for heating air, said air heater having an air outlet in the shelf and an air inlet communicating with the interior of the trunk;

a blower means also positioned underneath the shelf for conveying air through the electric heater means from the trunk and upwardly through the air outlet into the interior of the motor vehicle over the rear window;

a conductive power cord conductively connected to the electric heater means and blower means at one end and having a terminal at another end compatible with a conventional electrical receptacle external of the vehicle for energizing said heater means and said blower from ordinary commercial power of approximately 110 volts, said power cord being retractable into a storage reel in the trunk beneath the horizontal shelf when not in use;

a manually settable timer switch mounted in the trunk beneath said shelf, and including a switch for interrupting the connection between the conductive cord and the electric heater means and blower means, said timer switch having an electric motor for driving the same, and

permanent electrical connections between the battery of the vehicle and the timer motor to cause the timer motor to run continuously regardless of whether the vehicle is in use or not whereby the operation of the timer motor is independent of whether the power cord is connected to a commercial power source or not.



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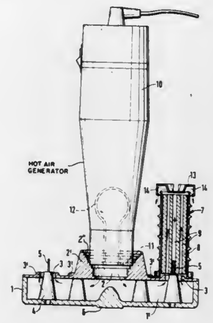
**4,293,760**

## APPARATUS FOR ELECTRICALLY HEATING HAIR CURLERS

**Henri Smal, Oupeye, Belgium, assignor to Societe Anonyme FACO, Herstal, Belgium**

**Filed Jul. 31, 1978, Ser. No. 929,532**
**Claims priority, application Luxembourg, Apr. 7, 1978, 79402**
**Int. Cl.³ A45D *4/12*; H05B *1/00***
**U.S. Cl. 219—222** **10 Claims**




1. Apparatus, comprising

a hair curler support having a hollow interior and a support surface formed with a central hot air inlet opening and a plurality of hot air discharge ports arranged radially about in spaced relationship from and centered around said inlet opening, said opening and said discharge ports communicating with the interior of said support,

means for holding a hair curler on said support surface at each of said ports in the path of air discharged from the port,

a hot air generating means for supplying hot air into said support through said opening for discharge from each of said ports.

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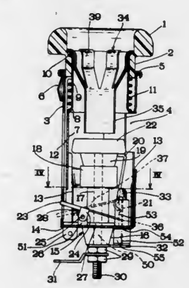
**4,293,761**

## CIGARETTE LIGHTERS, PARTICULARLY FOR MOTOR VEHICLES

**Luigi Pramaggiore, Strada Statale 26, 11010 Sarre (Aosta), Italy**

**Filed Dec. 4, 1979, Ser. No. 100,261**
**Claims priority, application Italy, Dec. 19, 1978, 6989 A/78**
**Int. Cl.³ F23Q *7/22***
**U.S. Cl. 219—269** **5 Claims**



1. A cigarette lighter, particularly for motor vehicles, having a control knob mounted for sliding movement within a cylindrical casing and acting through a control rod upon a pivotally mounted contact plate for opening and closing an electric circuit including an electrical heating resistance incorporated in a hot plate adapted to light a cigarette when it is held against;

a bimetal tongue positioned adjacent said hot plate so as to be heated thereby and having a resilient shaped end projecting toward and in engagement with an edge of said pivotally mounted contact plate to release the latter when the cigarette is lighted and said bimetal tongue has been heated;

a light emitting diode mounted in said cylindrical casing for emission of light to indicate the position of the lighter on an instrument panel;

said electric circuit comprising an input connection plate connectable to a source of current secured to a lower end of an upright stem extending through a lower portion of said lighter and supporting at its upper end said hot plate, said electric circuit further comprising said bimetal tongue, said pivotally mounted contact plate, mounting lugs for said contact plate, a bottom disc supporting said mounting lugs and a connection lug extending downwardly from said bottom disc and connectable to a ground side of said source of current;

said electric circuit, for energization of said light emitting diode, further comprising a support plate secured to and extending perpendicularly from said upright stem, a central stem extending perpendicularly upwardly from a free end of said support plate and through a diode body of said light emitting diode to a cathode thereof, a conductor extending parallel to said central stem from an anode of said diode located opposite said cathode to a single coil spring peripherally surrounding said diode body in a position intermediate the ends thereof, said coil spring engaging the under side and being electrically connected to said bottom disc which through said connection lug extending downwardly therefrom is connected to the ground side of said source of current; and

resilient means peripherally surrounding the end of said cylindrical casing adjacent said control knob for detachably mounting the lighter on the instrument panel.

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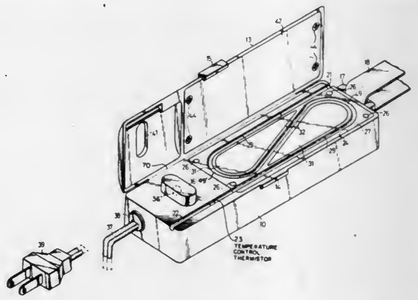
**4,293,762**

## TEMPERATURE-CONTROLLED ELECTRIC HEATING DEVICE FOR HEATING INSTILLATION OR TRANSFUSION LIQUIDS

**Genshirou Ogawa, 13-3, Inuyama Nishikoken, Inuyama, Aichiken, Japan**

**Filed Nov. 30, 1978, Ser. No. 964,861**
**Claims priority, application Japan, Feb. 16, 1978, 53-16909**
**Int. Cl.³ H05B *1/02*; A61M *5/14*; F24H *1/14***
**U.S. Cl. 219—302** **3 Claims**



1. A heating device for instillation comprising a casing having means at one end thereof for vertically supporting the

casing during use of the device, said casing including a circuit element receiving chamber and a heater receiving chamber having a front opening, a lid for at least covering said front opening of the heater receiving chamber, a heater situated in said heater receiving chamber, said heater including a heater segment coextensive with, disposed in and filling said front opening and an electric heating element attached to a back side of the heater segment for heating the segment, said heater segment having a tortous groove on a front side thereof for receiving therein a liquid feed pipe through which an instillation liquid to be heated flows, said lid being arranged to cover said groove and feed pipe received therein when in closed position, said groove having upper and lower curves and extending from an upper portion of the heater segment to a lower portion thereof to keep the instillation liquid in the liquid feed pipe between the upper and lower curves for a period sufficient to heat the liquid, and electric circuit means situated in said circuit element receiving chamber, said electric circuit means including first and second temperature control thermistors, the first thermistor sensing temperature of the instillation liquid after passing through the length of the heater segment groove for operating said circuit means to intermittently energize the heating element to heat the instillation liquid flowing through the feed pipe to a predetermined temperature, the second thermistor being provided at the electric heating element for operating said circuit means to turn off the electric circuit means when the electrical heating element is heated beyond a predetermined temperature due to excess flow of the instillation liquid to thereby override the control of the heating element by the first thermistor.

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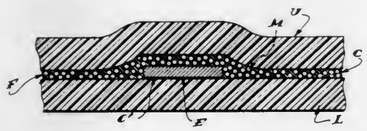
**4,293,763**

## ELECTRICALLY INSULATED RESISTANCE HEATER

**James P. McMullan, 12300 Monarch St., Garden Grove, Calif. 92641**

**Filed Jun. 2, 1980, Ser. No. 155,475**
**Int. Cl.³ H05B** *3/34*
**U.S. Cl. 219—528** **6 Claims**



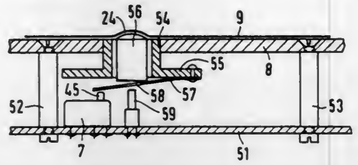

1. An electrically insulated resistance heater comprising an elongate metallic resistance element, terminals at the ends of the element to connect said element in a power supply circuit for the heater, an electric insulating envelope structure comprising a pair of laminates of dielectric material having a low dielectric constant with inside portions between which said element is arranged and outside portions defining outer work-engaging surfaces in predetermined spaced relationship from said element and a multiplicity of particulate components of material having a high dielectric constant between the laminates in substantial bridging engagement with each other and with said element and enhancing the electric insulating capacity of the envelope structure and supporting the outside portions and work-engaging surfaces thereof spaced from the element, said laminates are joined together with the element and particulate components held secure therebetween.

**4,293,764**

## CONTROL CONSOLE

**Herbert Amrhein, Moehrendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 20, 1979, Ser. No. 68,091**
**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842622**
**Int. Cl.³ H01H** *9/04, 9/16, 3/12*
**U.S. Cl. 200—302** **13 Claims**




1. A control console with installed microswitches having respective actuating elements, particularly for the control of apparatus in the operating room, characterized in that a cover plate (8) has a continuous stiff plastic sheet (9) in covering relation thereto which sheet is arched so as to be raised to form depressible bubble-like portions in the region of said individual actuating elements of the installed microswitches, plastic cylinders being disposed in an intermediate space between the individual bubble-like portions of the plastic sheet (9) and the respectively allocated actuating elements of the microswitch for transmitting depression of each respective bubble-like portion to the associated actuating element, said plastic cylinders being matched to the diameter of the bubble-like portions and having convexly protrudingly curved end portions thereof facing the plastic sheet (9), a light source (42, 59) being allocated to each plastic cylinder (48, 56), and a separate plate (41, 51) connected with said cover plate (8) and mounted at a defined distance therefrom, the microswitches (7) being mounted on said separate plate (41, 51) the cover plate (8) having guide means (46, 55) in alignment with the respective bubble-like portions (20, 24) and said plastic cylinders (48, 56) being guided by said guide means (46, 55), said guide means comprising a sleeve (55) for each plastic cylinder (56) mounted by said cover plate (8), each sleeve (55) having at the end thereof remote from said cover plate (8) a spring plate (57) which is secured to said end of said sleeve (55) at its one end and acts, at its other end, against the associated actuating element (45) of the associated microswitch (7), each plastic cylinder (56) being reciprocally movable in its associated sleeve (55) and engaging with the associated spring plate (57), and said spring plate (57) having means (58) for transmitting light from said light source to the interior of said sleeve (55) for passage axially thereof via the associated plastic cylinder (56).

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**4,293,765**

## COUNTER

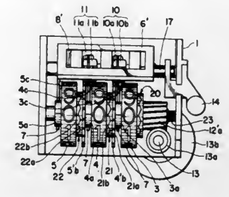
**Tutomu Kashiwagi, Tokyo, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan**

**Filed Feb. 4, 1980, Ser. No. 118,635**
**Claims priority, application Japan, Feb. 15, 1979, 54-16428; Oct. 4, 1979, 54-136693**
**Int. Cl.³ G06C** *15/42*
**U.S. Cl. 235—144 R** **12 Claims**

1. A counter comprising a worm wheel and a plural number of digit wheels which are supported on a shaft attached to a frame, driven gears supported on said shaft and arranged between individual pairs of said digit wheels, intermittent mechanisms arranged between said worm wheels and the lowermost digit wheel adjacent thereto and between each digit wheel and the next lower digit wheel and pinions which are supported on another shaft attached to said frame and so positioned as to engage with two teeth formed on each digit wheel and each



driven gear at the same time, said counter being so adapted in such a manner that when each of said intermittent transmission mechanisms and each of said driven gears are rotated, their rotation is transmitted to said digit wheels to rotate them integrally with said members, whereas when the digit wheels are rotated for resetting them at the zero positiond, said driven gear are made immovable by said pinions and only said digit wheels are rotated.



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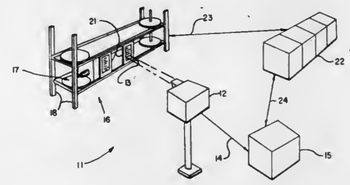
**4,293,766**

## RAIL CAR IDENTIFICATION APPARATUS

**Lennart E. Long, Waltham, and Robert L. Wiseman, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.**

**Filed Oct. 30, 1979, Ser. No. 89,431**
**Int. Cl.³ G06K** *7/10, 13/00*
**U.S. Cl. 235—462** **8 Claims**



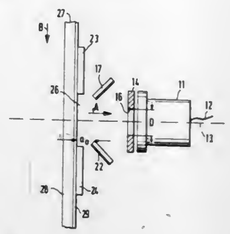

1. Apparatus for simulating a rail car identification system comprising:
- a plurality of coded labels;
- transport means for sequentially moving each of said coded labels through a viewing zone;
- optical scanning means for scanning said coded labels in said viewing zone;
- control circuit means for controlling said transport means comprising endless conveyor means and wherein said coded labels are mounted at spaced apart locations on said endless conveyor means;
- processor means for processing the output of said optical scanning means;
- label sensor means for detecting the entry of each of said labels into said viewing zone and supplying label position signals to said control circuit means in response thereto;
- conveyor position sensor means for detecting the entry into said viewing zone of a particular portion of said endless conveyor means and supplying conveyor position signals to said contol circuit means in response thereto; and
- wherein said control circuit means comprises speed control means for selectively controlling the speed of said endless conveyor means.

**4,293,767**

## APPARATUS FOR MEASURING THE THICKNESS OF THIN LAYERS

**Helmut Fischer, Bergwaldstrasse 28, 7261 Gechingen; Albert Ott, Am Weinberg 22, 6200 Wiesbaden, Auringen, and Willi Steegmüller, Tulpenstrasse 18, 7407 Rottenburg 15, all of Fed. Rep. of Germany**

**Filed Aug. 24, 1979, Ser. No. 69,610**
**Int. Cl.³ G01N** *23/00*
**U.S. Cl. 250—308** **14 Claims**



1. In an apparatus for measuring the thickness of a thin layer on strip-shaped, wire-shaped or like material, which can be moved from a first point past the apparatus to a second point, comprising a beta emitter directed towards said thin layer and a windowed beta radiation detector arranged to the rear of the beta emitter for counting the backscattered beta radiation, the counting taking place while the material is being moved, the improvement wherein:
- (a) the apparatus is stationary;
- (b) the apparatus is provided with a guide for guiding the material at a specified distance from the beta emitter;
- (c) the ratio of the characteristic cross-sectional dimension (D) of the window of the beta radiation detector, to the intersecting surface diameter (d) of the intersecting surface layer/intensity distribution curve of the beta emitter, being expressed as D/d coming within the range 15 . . . 2;
- (d) the distance between the layer and the beta emitter is in the plateau region of the counting rate/distance characteristic which is obtained by (c) above.

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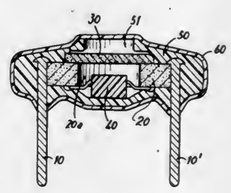
**4,293,768**

## INFRARED RADIATION DETECTING APPARATUS AND METHOD OF MANUFACTURING

**Hideo Adachi, Kyoto; Kiichi Minai, Shiga; Kozo Moriyasu, and Shunjiro Imagawa, both of Muko, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Apr. 18, 1979, Ser. No. 31,048**
**Claims priority, application Japan, Apr. 26, 1978, 53-50373**
**Int. Cl.³ G01J** *1/00;* **H04N** *9/27*
**U.S. Cl. 250—338** **27 Claims**




1. An infrared radiation detecting apparatus, comprising:
- a substrate made of an insulating material;
- a thermal type infrared radiation sensing device having first and second opposing main surfaces; said first main surface

constituting a radiation receiving surface; said thermal type sensing device being thermally responsive to heat caused by infrared radiation incident upon said radiation receiving surface, and generating an electrical signal responsive to infrared radiation incident upon said radiation receiving surface;

external connection lead means secured to said insulating substrate and electrically connected to said thermal type infrared radiation sensing device;

a first resin layer covering said thermal type infrared radiation sensing device except for said radiation receiving surface thereof, and covering said insulating substrate and a portion of said external connection lead means; and

a second resin layer covering said first resin layer and said radiation receiving surface, and being transparent to infrared radiation of frequencies it is desired to detect.

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**4,293,769**

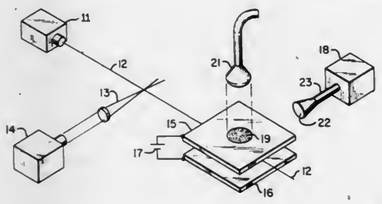
## DETECTING IR AND MM RADIATION

**Daniel Kleppner, Belmont, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation of Ser. No. 869,345, Jan. 13, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 94,959**

**Int. Cl.³ G01J *1/00***

**U.S. Cl. 250—338** **5 Claims**




1. IR and mm energy detecting apparatus comprising,

a source of a beam of atoms,

means for establishing an electric field,

means for causing said beam of atoms to enter said electric field,

a source of essentially monochromatic energy for exciting atoms in said beam that enter said electric field into a predetermined energy level,

means for illuminating said excited atoms in said electric field with IR or mm electromagnetic radiation and establishing the intensity of said electric field to step the energy level of said excited atoms in said electric field from said predetermined energy level to a higher level when the wavelength of said electromagnetic radiation is a predetermined value related to the contemporary intensity of said electric field to thereby produce particles stripped from those atoms at said higher level and emitted from said electric field representative of said radiation,

and means for detecting the emitted particles to provide an indication of said radiation.

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**4,293,770**

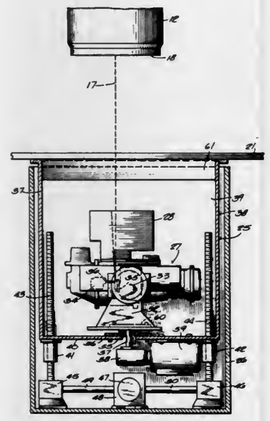
## X-RAY TABLE FOR OBTAINING LONGITUDINAL AND LATERAL OBLIQUE CARDIOVASCULAR VIEWS

**Robert M. Vavrek, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Nov. 29, 1979, Ser. No. 99,132**

**Int. Cl.³ G01N *21/00***

**U.S. Cl. 250—445 R** **3 Claims**




1. Apparatus for making x-ray cardiovascular examinations comprising:

an overhead carriage movable horizontally in opposite longitudinal directions,

an x-ray image receiver and means for mounting said receiver to move vertically and to tilt in a single vertical plane through opposite angles from vertical about a first laterally extending axis that is transverse to the longitudinal direction,

a longitudinally extending x-ray transmissive table top located below said receiver to support a body for examination and housing means below said table top, said housing means being adapted for mounting fixedly on a floor and comprising opposed pairs of side walls defining a top opening,

enclosure means mounted for moving vertically within said housing, and comprising a bottom member and opposed pairs of side walls joined to said bottom member, said walls defining a top opening across which said x-ray transmissive table top extends for being supported from said side walls,

an x-ray tube casing in said enclosure means and a base supporting said tube casing for tilting in said single vertical plane through opposite angles from vertical about a second laterally extending axis in opposite angular correspondence with said image receiver,

a rotary anode x-ray tube in said casing having an x-ray target disk rotatable about a generally longitudinally directed axis, said disk having a beveled annular focal spot track surface on one of its faces and said disk being offset generally longitudinally from said second laterally extending axis to thereby offset the focal spot to one side of said second axis, the central ray of the x-ray beam emanating from said focal spot being moved in said single plane for all corresponding tilting angles of said x-ray tube and said image receiver, and

the improvement for enabling said x-ray beam to be directed obliquely to said plane comprising,

bearing means interposed between said base and said bottom member of the vertically movable enclosure, said bearing means supporting said base and x-ray tube casing thereon for rotation about a vertical axis, motor means mounted to said enclosure and means for coupling said motor means in driving relation to said base to effect rotation of the base about said vertical axis and thereby enable said tube casing to tilt in a vertical plane which is at an angle relative to the aforementioned vertical plane and to simultaneously offset said focal spot in a lateral direction so the central ray of said x-ray beam will be directed obliquely to said aforementioned plane.



**4,293,771**

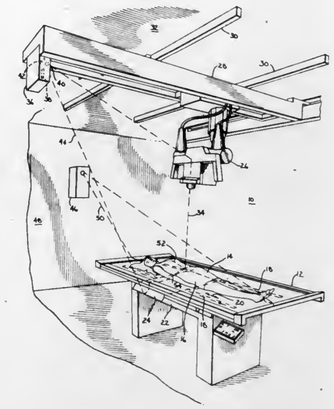
## INDICATOR FOR USE WITH PROJECTED BEAM OF RADIATION

**Charles Lescrenier, 660 Crescent Ct., Wauwatosa, Wis. 53213**

**Filed Jun. 7, 1979, Ser. No. 46,435**

**Int. Cl.³ G01N *21/00, 23/00***

**U.S. Cl. 250—491** **13 Claims**



1. Apparatus for defining the relationship of a projected beam with respect to an object comprising:

a first light source means (**36, 82**) for establishing a first plane of light (**44, 84**) containing the projected beam (**34, 76**) and applicable to the object (**14, 16, 24, 90**); and

a second light source means (**46, 86**) for establishing a second plane of light (**50, 88**) containing at least one of the projected beam and object and appliable to the latter,

said first light source means (**36, 82**) being movable with respect to said second light plane (**50, 88**) and object (**14, 16, 24, 90**) while maintaining the projected beam (**34, 76**) therein, said first and second light planes intersecting, the intersection of said light planes defining the projected beam-object relationship.

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**4,293,772**

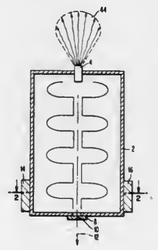
## WOBBLING DEVICE FOR A CHARGED PARTICLE ACCELERATOR

**Volker A. W. Stieber, Erlangen, Fed. Rep. of Germany, assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.**

**Filed Mar. 31, 1980, Ser. No. 135,300**

**Int. Cl.³ G01J *1/42***

**U.S. Cl. 250—492.2** **9 Claims**



1. A linear accelerator for medical treatment comprising, in combination:

(a) an accelerator chamber including wall means made of a non-ferromagnetic material;

(b) means arranged in said chamber for accelerating a narrow beam of electrons in a forward direction therethrough, said electrons forming beam pulses having a predetermined pulse frequency;

(c) a discharge window disposed on said chamber for receiving said beam of electrons at a striking location and for discharging said electrons therethrough; and

(d) means for wobbling said beam of electrons before the electrons strike said discharge window, wherein said wobbling means comprises three magnetic coils which are arranged 120° apart from each other around said beam of electrons on the outside of said wall means near said discharge window, said three magnetic coils being adapted for connection to a three-phase current supply having a predetermined supply frequency, said supply frequency being lower than said pulse frequency of said electron beam pulses, said coils thereby being provided for generating a magnetic field in the vicinity of said striking location near said discharge window, which magnetic field causes said electrons to impinge on said discharge window in a circular path, thereby enlarging said striking location and reducing the number of secondary electrons being accelerated in a backward direction through said accelerator chamber.

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**4,293,773**

## METHOD FOR CONTAINING SPENT NUCLEAR FUEL RODS IN A PROTECTIVE CONTAINER TO FACILITATE DISPOSAL

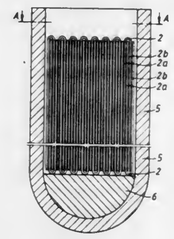
**Jan Lundren, Robertsfors, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden**

**Filed May 8, 1978, Ser. No. 903,946**

**Claims priority, application Sweden, May 10, 1977, 7705417**

**Int. Cl.³ G21F *5/00***

**U.S. Cl. 250—506** **3 Claims**



1. A method for preventing the scattering of radioactive material in spent nuclear fuel rods in the environment comprising (a) placing one or more of the fuel rods within a casing of ductile metal, (b) sealing the casing so as to be gastight, (c) bending the casing into a U-shape such that the distance between the legs of the U-shape is equal to or somewhat greater than the thickness of the casing, and (d) placing a number of the bent U-shaped casings within a protective container such that a leg of each casing extends between the legs of another casing.

**4,293,774**

## METHOD AND DEVICES FOR REGULATION OF THE FORWARD TRAVEL OF A STRIP BEARING MARKS AT REGULAR INTERVALS, AND A WRAPPING-MACHINE EMPLOYING SUCH A DEVICE

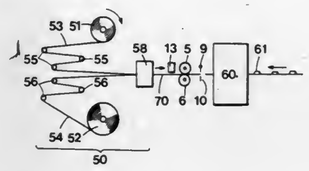
**Endre Pongracz, Vaud, Switzerland, assignor to SAPAL Societe Anonyme des Plieuses Automatiques, Switzerland**

**Filed Oct. 16, 1979, Ser. No. 85,207**

**Claims priority, application Switzerland, Nov. 20, 1978, 11868/78**

**Int. Cl.³ G01N *21/86***

**U.S. Cl. 250—548** **14 Claims**




1. A method for regulating the forward travel of a strip (70) which at regular intervals bears section marks (71) and which is cut into sections (73) and used to individually wrap a succession of articles (61) comprising the steps of:

cyclically cutting said strip (70) into sections and using a cut section (73) to wrap one of said succession of articles (61);

detecting the passing of each mark (71) of said strip and providing a signal (LECTREP) indicating said detection;

generating from each cutting and wrapping cycle a phase reference signal (SYNCHR) indicating at what time said mark (71) should be detected;

measuring the phase error between the signal indicating detected passing of the mark (LECTREP) and the phase reference signal (SYNCHR);

temporarily modifying the driving speed of the strip (70) so that it adopts either a lead or lag correction for compensating the measured phase error; and,

limiting the lead or lag correction to a maximum amplitude of correction such that a cut-off section (73) has a length sufficient to wrap an article.

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**4,293,775**

## OZONE PIPE FOR OZONE PRODUCTION PLANT

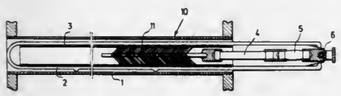
**Ewald Feuerstake, Dorsten, and Klaus Schwarz, Neukirchen-Vluyn, both of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany**

**Filed Nov. 13, 1979, Ser. No. 93,384**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853749**

**Int. Cl.³ C01B *13/11*; B01J *19/12***

**U.S. Cl. 250—535** **5 Claims**




1. In an ozone production pipe for use with a plurality of such pipes in parallel in a large ozone production plant employing several hundred pipes, said production pipe comprising

(a) a tubular body comprised of a dielectric material;

(b) a metal jacket electrode encasing said body;

(c) a counter-electrode in the form of a metal coating on the inside of said tubular body;

(d) an electrical current supply connection mounted in one end of said tubular body;

(e) means in said body providing electrical flow communication between said electrical current supply connection and said counter-electrode;

(f) a high voltage fuse mounted in said flow communication means; the improvement characterized by

(g) said high voltage fuse having a capacity within the range of between about 0.15 to 0.63 amperes; and

(h) a resistance is mounted in said flow communication means in series with said fuse.

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**4,293,776**

## BANKNOTE CONDITION MONITORING APPARATUS

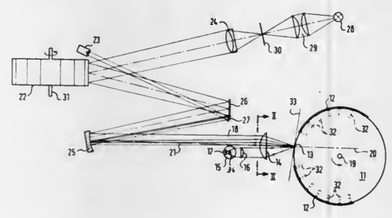
**Erwin Sick, Icking, and Siegfried Mankel, Geretsried, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH-Optik-Elektronik, Waldkirch, Fed. Rep. of Germany**

**Filed Apr. 8, 1980, Ser. No. 138,337**

**Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917875**

**Int. Cl.³ G01N *21/88***

**U.S. Cl. 250—572** **8 Claims**




1. Banknote condition monitoring apparatus comprising a rotating drum on the peripheral surface of which the banknotes to be examined are held, for example by means of air suction, an optical scanning device which generates a scanning light beam which forms a scanning light bead on the banknote which cyclically scans the banknote transversly to its direction of movement substantially without gaps, a cylindrical lens extending in the scanning direction in front of the banknote and which concentrates with a portion of its width the transmitted light beam onto the banknote and directs light remitted from the banknote via another part of its width to a light receiving device and wherein the transmitted light beam is narrow and passes through the cylindrical lens at a portion of its periphery, the rotational axis of the drum is so displaced relative to the optical axis of the cylindrical lens that specularly reflected light enters the same half of the cylindrical lens as the transmitted light beam, but however separated from the same, and the specularly reflected beam is deflected in a distance substantially the same as the distance of the scanning device from the point of incidence of the light bead on the banknote directly onto a photodetection device without contacting the scanning member of the optical scanning device.

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**4,293,777**

## TURBO-ELECTRIC POWER PLANT AND PROCESS

**Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Inc., Kalamazoo, Mich.**

**Filed Jul. 30, 1979, Ser. No. 62,322**

**Int. Cl.³ H02K *7/18*; F01D *5/30***

**U.S. Cl. 290—52** **18 Claims**

1. A turbo-electric power plant which comprises

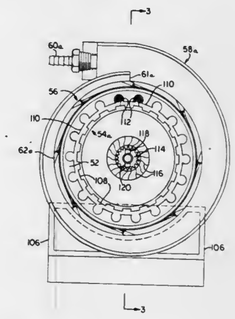
(1) a stationary housing supported by a base member and having an annular member provided with depending sides which form with said annular member an annular channel, said annular channel having a smooth cylindrical inner surface;



(2) a hollow rotor mounted for rotation in said housing about the axis thereof, with the outer portion thereof disposed in said annular channel and having a roughened outer cylindrical surface and sides conforming essentially to the shape of said annular channel, said hollow rotor having an inner cylindrical surface in said outer portion thereof which is concentric with the other said cylindrical surfaces;

(3) electric generator elements disposed in said hollow rotor in electricity-generating relation to each other, one said element being affixed to the inner cylindrical surface of said hollow rotor and functioning as the rotor element of said electric generator, and the other said element being anchored to said base member and functioning as the stator element of said electric generator;

(4) a plurality of jet orifices disposed in and around said




annular member and oriented to jet propellant fluid into the space between the smooth inner cylindrical surface of said annular channel and the apposed roughened outer cylindrical surface of said hollow rotor and onto the said roughened outer cylindrical surface;

(5) outlet means at spaced intervals around and in the side walls of said housing below the said annular channel, whereby the propellant fluid jetted onto the outer cylindrical surface of said hollow rotor, fans out to the edges thereof and moves down between the sides of said annular channel and the sides of the outer portion of said hollow rotor and out said outlet means, thereby functioning as a coolant fluid for cooling said electric generator elements; and,

(6) collecting means for collecting the electricity generated by said electric generator elements and leading it to the exterior of said housing.

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**4,293,778**

## ANTI-THEFT SCREEN CONSTRUCTION

**William H. Williams, Palos Verdes Penninsula, Calif., assignor to Sandstone, Inc., La Mirada, Calif.**

**Continuation-in-part of Ser. No. 883,488, Mar. 6, 1978, abandoned. This application Feb. 12, 1979, Ser. No. 11,099**

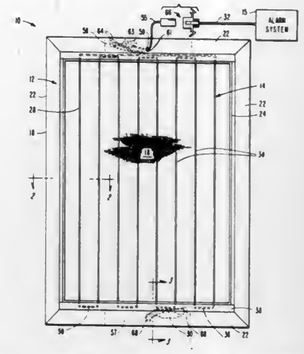
**Int. Cl.³ G08B *13/12***

**U.S. Cl. 307—147** **28 Claims**

1. A partially conductive security screen arrangement for use with an intrusion alarm system designed to operate in a normally closed sensing circuit condition and to produce a warning signal when the sensing circuit is broken, said arrangement comprising:

screen apparatus including a frame defining a central aperture, screening material comprising a mesh of interwoven strands covering said aperture and having a plastic coating, and means for securing the periphery of said screening material to said frame to close said aperture, said screen apparatus positionable to cover an opening in a building;

electrically conductive means continuous between two ends thereof, including wire means having a plastic coating and at least partially overlying said screen apparatus, said wire means being bonded to the screening material by thermal fusing of the respective plastic coatings to prevent passage of a human being through said aperture unless said conductive means is severed,




means for connecting said conductive means at the two ends thereof into the sensing circuit as a series element thereof; whereby passage of a human being through the opening for said screen apparatus in position to cover said opening breaks the sensing circuit.

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**4,293,779**

## CONTROL OF POWER SEMICONDUCTORS THROUGH CENTER-TAPPED TRANSFORMER WITH SELF-DEMAGNETIZING CIRCUITRY

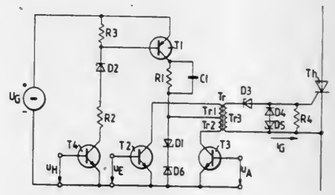
**Johannes Nestler, and Hans Wrede, both of Berlin, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 22, 1979, Ser. No. 14,281**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2808000**

**Int. Cl.³ H03K *17/60***

**U.S. Cl. 307—252 C** **5 Claims**




1. In a method for controlling a power semiconductor which can be triggered into conduction by pulses of one polarity and quenched again by pulses of the opposite polarity, by transmitting such pulses via a transformer to the power semiconductor connected at the secondary side of the transformer, the improvement comprising forming such a pulse by turning on a first transistor connected between one pole of a voltage source and a tap which divides the primary winding of the transformer into two partial windings, and by selectively turning on either one of second and third transistors each connected to the end of a respective partial winding, and terminating such a pulse by switching off the first transistor, while maintaining on the selected second or third transistor in order to cause the demagnetization current of the transformer to flow through the selected transistor and a first Zener diode connected between the tap of the primary winding and the other pole of the

voltage source, the anode side of the first Zener diode being connected to the tap of the primary winding.

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**4,293,780**

## DIGITAL INTEGRATED SEMICONDUCTOR CIRCUIT

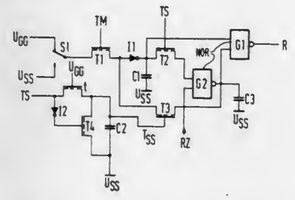
**Helmut Roesler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Sep. 6, 1979, Ser. No. 72,975**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845379**

**Int. Cl.³ H03K** *3/02*

**U.S. Cl. 307—262** **12 Claims**




1. In a digital integrated semiconductor circuit arrangement of the type having a clock pulse generator for supplying a first sequence of first clock pulses, a second sequence of second clock pulses and a third sequence of third pulses in phase with said second pulses, the sequences having the same frequency with the leading edge of each second pulse time-spaced from the trailing edge of the previous first pulse, and a circuit to be operated into a predetermined digital condition, the improvement therein comprising:

a control pulse generator connected to the circuit to be operated for producing a control pulse to operate that circuit into the predetermined condition, said control pulse generator including

an input transistor circuit including a first transistor having a controlled conduction path with input and output electrodes and a control electrode, a first logic circuit including first and second inputs and an output,

an inverting second logic circuit including a first input a second input and an output which serves to provide said control pulse,

said first inputs of said logic circuits connected to said output electrode of said first transistor circuit,

a switch connected to apply a first potential to said input electrode,

said control electrode connected to receive a first pulse to clock said input transistor circuit to apply a first logic signal pulse to said first inputs of said logic circuits,

said output of said first logic circuit connected to said second input of said second logic circuit, said second input of said second logic circuit connected to receive the second pulse which follows the mentioned first pulse to clock said first logic circuit to provide a second logic signal pulse to said second logic circuit, said second logic circuit responsive to produce said control pulse defined by the leading edges of said first and second logic signal pulses, and

a second transistor circuit including a second transistor having a controlled conduction path connected between said output electrode of said first transistor and a second potential and a control electrode connected to receive and operable in response to a third pulse to connect said first transistor to said second potential.

**4,293,781**

## MONOSTABLE MULTIVIBRATOR

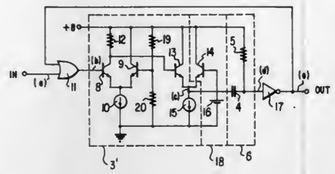
**Tsuneo Yamada, and Yukihiko Miyamoto, both of c/o Trio Kabushiki Kaisha, 6-17, 3-Chome, Aobadai, Meguro-ku, Tokyo 153, Japan**

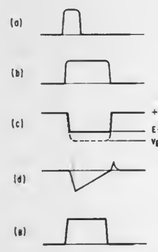
**Filed Dec. 8, 1978, Ser. No. 967,636**

**Claims priority, application Japan, Mar. 15, 1978, 53-29654; Mar. 15, 1978, 53-29655; Mar. 15, 1978, 53-29656**

**Int. Cl.³ H03K** *3/284, 5/08, 17/16*

**U.S. Cl. 307—273** **20 Claims**




1. In a monostable multivibrator including a gate circuit having first and second inputs, a driver circuit responsive to the output of said gate circuit, a differentiating circuit responsive to the output of said driver circuit and a voltage comparison circuit responsive to the output of the said differentiating circuit where said gate circuit is adapted to have a trigger pulse applied to said first input thereof and the output of said voltage comparison circuit fed back to said second input thereof,

the improvement in said monostable multivibrator where said driver circuit includes (a) at least one transistor of a differential transistor pair responsive to said output of the gate circuit for producing said output of the driver circuit, (b) a constant current source in circuit with said one transistor and (c) means for preventing saturation of said one transistor and where a clipping circuit clips the output of said driver circuit to lessen the effect of noise produced by said constant current source on the output of said multivibrator.

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**4,293,782**

## VOLTAGE DETECTING CIRCUIT

**Kojiro Tanaka; Shozo Ochiai, and Hideki Noda, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan**

**Filed Jan. 28, 1977, Ser. No. 763,598**

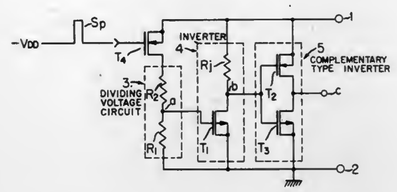
**Claims priority, application Japan, Jan. 28, 1976, 51/8237**

**Int. Cl.³ H03K** *5/153*

**U.S. Cl. 307—350** **3 Claims**

1. A voltage detecting circuit comprising first and second lines connected respectively to terminals of a voltage source of which a predetermined drop in voltage is to be detected, a voltage divider and a first MOS transistor having a gate connected in series with one another between said lines, said voltage divider comprising first and second resistance means connected in series with one another with an intermediate tap between them, first inverter means comprising a second MOS transistor having a gate and third resistance means connected in series with one another between said first and second lines with an output between said second MOS transistor and said third resistance means, means connecting the gate of said second MOS transistor with said tap, second inverter means comprising an N-MOS transistor and a P-MOS transistor each having a gate connected in series with one another between said first and second lines with an output providing a voltage






indicating signal between said N-MOS transistor and said P-MOS transistor, means connecting the output of said first inverter means with the gates of said N-MOS transistor and said P-MOS transistor and means for periodically applying a signal pulse to the gate of said first MOS transistor, the ratio of current to the conductive constant of said MOS transistor being above 0.1 whereby said predetermined drop in voltage is determined by the dividing ratio of said voltage divider with compensation for temperature variation.

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**4,293,783**

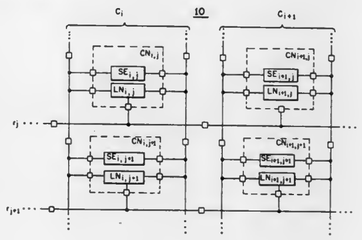
## STORAGE/LOGIC ARRAY

**Suhas S. Patil, Salt Lake City, Utah, assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Nov. 1, 1978, Ser. No. 956,794**

**Int. Cl.³ H03K** *19/177, 19/091;* **H04Q** *3/00*

**U.S. Cl. 307—465** **37 Claims**




1. A programmable storage/logic array comprising

A. a set of substantially parallel column conductors including a plurality of non-intersecting subsets,

B. a set of substantially parallel row conductors including a plurality of non-intersecting subsets, said row conductors being orthognal to said column conductors,

C. a plurality of cell networks, each of said cell networks being associated with one of said subsets of column conductors, and one of said subsets of row conductors,

wherein at least one of said cell networks includes a storage element, and

wherein at least one of said cell networks includes programmable cell contact means for selectively coupling said cell network to its associated row and column conductors, and

wherein said storage element includes means for storing a signal representative of the binary state of one of the conductors of said coupled subsets of column and row conductors, and means for coupling said stored signal to one of the conductors of said coupled subsets of column and row conductors.

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**4,293,784**

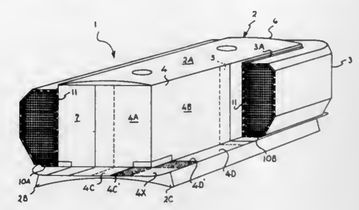
## INSULATED POLE AND COIL ASSEMBLY AND METHOD OF MAKING SAME

**Joseph J. Zdaniewski; William B. Penn, and Roy L. Balke, all of Erie, Pa., assignors to General Electric Co., Schenectady, N.Y.**

**Filed May 21, 1979, Ser. No. 41,170**

**Int. Cl.³ H02K** *15/12*

**U.S. Cl. 310—45** **9 Claims**




1. An insulated pole and coil assembly for a dynamoelectric machine, said assembly comprising a pole member having a base portion and two tip portions that protrude respectively from opposite sides of said base portion, a coil of insulated magnet wire having a central opening formed therein and fitted closely around said pole base portion, a plurality of formed sheets of insulating material each including a back part and a lip part, each of said sheets being positioned with its back part extending around and a predetermined distance beyond a respective corner of said pole base portion with the lip parts of the respective sheets facing and conforming closely to the adjacent coil surface and the respective surfaces of the pole tip portions that are juxtaposed with said coil, thereby to insulate the coil from the pole member by positioning the ends of each of said sheets in overlapping relationship with the ends of adjacent sheets and to cover all of the sides and corners of said pole base portion that are surrounded by said coil and to cover the surfaces of said pole tip portions closest to said coil.

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**4,293,785**

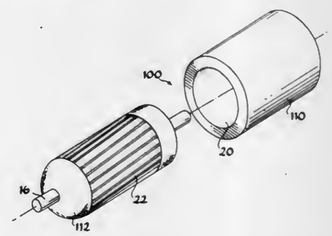
## ROTATING ELECTRIC MACHINES WITH ENHANCED RADIATION COOLING

**John T. Jackson, Jr., St. Paul, Oreg., assignor to Jackson Research, Inc., St. Paul, Oreg.**

**Continuation-in-part of Ser. No. 939,804, Sep. 5, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,452**

**Int. Cl.³ H02K** *9/00;* **F28F** *27/00;* **B05D** *5/12*

**U.S. Cl. 310—64** **6 Claims**




1. A rotary electrical machine having a cylindrical rotor and a stator encompassing said rotor, said rotor having an outer

surface and said stator having an inner surface opposing said outer surface of said rotor, each of said surfaces having a respective coating thereon having a higher emissivity for thermal radiation than the emissivity of the respective surface of said rotor or stator which underlies the respective coating, the respective emissivities for thermal radiation of said coatings being such that the effective emissivity for thermal radiation between said coatings is at least about 0.65 in a temperature range for said coatings of about 75° C.–150° C., the absorptivity for thermal radiation of the coating on the inner surface of said stator being greater than the absorptivity of said inner surface of said stator and being at least about 0.65 in said temperature range.

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**4,293,786**

## CARRYING AND GUIDING SPIDER FOR THE SUPPORT OF A ROTOR OF A VERTICAL ELECTRICAL MACHINE

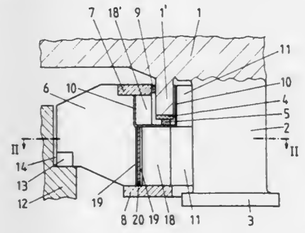
**Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

**Filed Nov. 14, 1979, Ser. No. 93,973**

**Claims priority, application Switzerland, Nov. 15, 1978, 11728/78**

**Int. Cl.³ H02K** *5/00*

**U.S. Cl. 310—157** **7 Claims**




1. A carrying and guiding spider for supporting a rotor of a vertical electrical machine, said machine including an annular foundation surrounding a central body supporting said rotor, said spider comprising:

at least one first arm having one end clamped to said central body at a first clamping point and having another end extending to said foundation and horizontally slidingly resting on said foundation;

at least one second arm having one arm clamped to said central body at a second clamping point and having another end extending to said foundation and fixed to said foundation;

wherein said at least one first arm forms a first acute circumferential angle with a radial line passing through said first clamping point and wherein said at least one second arm forms a second circumferential angle with a radial line passing through said second clamping point, said first and second angles being of equal magnitude but of opposite sense.

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**4,293,787**

## STATOR WINDING HOLDING STRUCTURE FOR ROTARY ELECTRIC MACHINE

**Motoya Ito; Masaki Sato; Masatoshi Watanabe, and Hironori Okuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

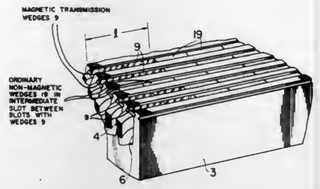
**Filed Jan. 12, 1979, Ser. No. 3,012**

**Claims priority, application Japan, Feb. 24, 1978, 53/19697**

**Int. Cl.³ H02K** *1/00*

**U.S. Cl. 310—181** **9 Claims**

1. In a rotary electric machine comprising an annular stator core having a plurality of axially extended core teeth to form coil slots therebetween at regular intervals in the circumferential direction in the inner surface of said annular stator core, a stator winding mounted in said coil slots of said stator core through a predetermined insulating material, a plurality of non-magnetic wedges fitted into said coil slots for securely holding said stator winding in said coil slots, a rotor core mounted in the annular hollow portion of said stator core and formed axially shorter than said stator core, a rotor winding wound on said rotor core and having an end portion protruded axially from said core, a coil retaining ring of an electrically




conductive material for securely holding the end portion of said rotor winding and a rotary shaft for holding said rotor core; the improvement further comprising magnetic transmission means for magnetically connecting adjacent teeth of said stator core, said magnetic transmission means being provided in said stator slots only at portions opposed to said coil retaining ring for facilitating transmission of magnetic flux from said stator to said rotor through said portions of said stator slots having said magnetic transmission means.

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**4,293,788**

## THREE-PHASE VEHICULAR GENERATOR CONSTRUCTION

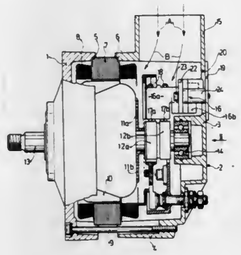
**Georg Binder, Bechhofen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed May 25, 1979, Ser. No. 42,361**

**Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2826930**

**Int. Cl.³ H02K** *9/28*

**U.S. Cl. 310—227** **5 Claims**



1. Generator structure for use in mobile or vehicular application to supply on-board power for a self-contained network, in combination with a voltage regulator,

wherein the generator has end bells (**1, 2**) defining a housing, a stator (**7**) located in the housing;

a shaft (**13**) rotatable in the housing;

a rotor (**10**) secured to the shaft and rotatable within the stator;

slip rings (**12***a*, **12***b*) secured to the shaft;

a brush holder (**16***a*) located within the housing;

brushes (**17***a*, **17***b*) located in the brush holder and engaging the slip rings;

wherein a holder plate (**19**) is provided said brush holder (**16***a*) and the brushes therein, and said voltage regulator (**16***b*) being secured to said plate and forming a brush holder—voltage regulator assembly (**16**);



the end bell (**2**) adjacent the slip rings is formed with an opening (**20**) therein of such size that the brush holder—regulator assembly can pass therethrough from the outside for positioning of the brushes in the brush holder against the slip rings, and the entire assembly within the housing,

said plate being larger than said opening (**20**) in the end bell and being fitted against and closing off said opening;

and means (**15**) supplying cooling air to the interior of the housing and positioned to direct cooling air to said brush holder—regulator assembly within the housing to place the brush holder and the regulator in the stream of cooling air being supplied into the housing comprising

a duct element extending radially outwardly from the end bell (**2**) adjacent the slip rings and at least approximately aligned with said brush holder—voltage regulator assembly (**16**).

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**4,293,789**

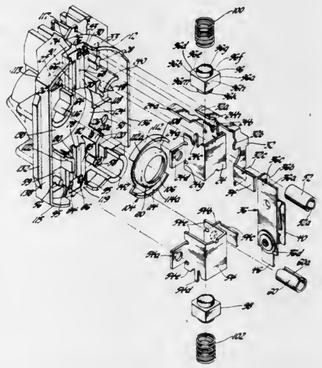
## DYNAMOELECTRIC MACHINE BRUSH RIGGING

**Dallas E. King, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 10, 1979, Ser. No. 74,387**

**Int. Cl.³ H02K** *13/00*

**U.S. Cl. 310—239** **4 Claims**



1. An end cap assembly for a dynamoelectric machine comprising, an end cap having bearing means adapted to receive the shaft of a dynamoelectric machine rotor, at least one brush holder extending radially of said end cap, a brush slidably supported by said brush holder, resilient means for urging said brush radially of said end cap, and an annular brush retainer having outer wall means engaging and slidably supported by internal wall means of said end cap for movement axially of said end cap, said retainer having a central opening, said internal wall means of said end cap extending axially of said bearing means, a portion of the outer wall means of said brush retainer engaging an end of said brush to hold said brush in a retracted position against the force of said resilient means, said brush retainer being axially movable toward said bearing means along said internal wall means by engagement with a dynamoelectric machine rotor when the shaft of the rotor is inserted through said central opening in said retainer and into said bearing means to thereby move said brush retainer to an assembled position in contact with said internal wall means and out of engagement with the end of said brush to permit said brush to contact a rotary current conducting means of said dynamoelectric machine rotor.

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**4,293,790**

## IMAGE CONVERTER HAVING CYLINDRICAL HOUSING AND PHOTOCATHODE SEPARATED BY SPACING ELEMENT FROM LUMINESCENT SCREEN ON FRUSTRUM

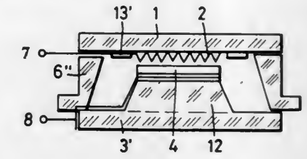
**Hans-Wolfgang Funk, Hirschberg; Kurt Frank, and Günter Flasche, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 748,502, Dec. 18, 1976, abandoned. This application Dec. 6, 1978, Ser. No. 967,620**

**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555438; Nov. 15, 1976, 2652070**

**Int. Cl.³ H01J** *40/02, 40/18*

**U.S. Cl. 313—101** **8 Claims**




1. An image converter which is designed to prevent arcing caused by avalanche discharge from taking place during operation, comprising:

a flat and circular entrance window with an inner surface and an outer surface;

a flat and circular photocathode centered on and attached to the inner surface of the entrance window;

a flat and circular exit window with an inner surface and an outer surface and having a central frustum-shaped platform extending towards the entrance window;

a flat and circular luminescent screen centered on top of the platform and parallel to the windows and being sized substantially equally to the photocathode; and

a hollow, unitary and generally cylindrical housing connected to the entrance window and the exit window in a manner that the windows are aligned and parallel to each other, the housing having an interior surface which is circular in cross-section and further having a minimum internal diameter adjacent the entrance window and the photocathode, a maximum internal diameter adjacent the exit window and an intermediate internal diameter which increases linearly between said minimum internal diameter and said maximum internal diameter, the diameters of the housing being such that avalanche discharge around the interior surface of the housing is minimized.

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**4,293,791**

## COLOR PICTURE TUBE HAVING IMPROVED CORRUGATED APERTURED MASK

**Ralph J. D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.**

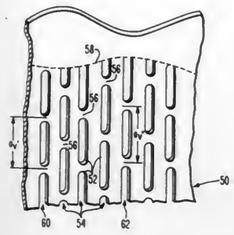
**Filed Nov. 15, 1979, Ser. No. 94,464**

**Int. Cl.³ H01J** *29/07*

**U.S. Cl. 313—403** **4 Claims**

1. In a color picture tube having a corrugated mask wherein the mask corrugations are substantially parallel, said mask having slit shaped apertures aligned in columns parallel to the mask corrugations, the slits in each column being separated by web portions of the mask, said tube including an electron gun for generating a plurality of electron beams and means for

scanning said beams in lines across the mask the improvement comprising




the web repeat distance within a slit column being proportional to the distance from the major axis of the mask to the mask intercept of any particular scan line.

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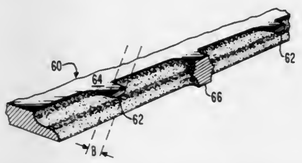
**4,293,792**

## COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK

**Donald L. Roberts, Conestoga, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Dec. 18, 1979, Ser. No. 104,828**
**Int. Cl.³ H01J** *29/07, 29/18*
**U.S. Cl. 313—403** **4 Claims**




1. In a color picture tube having a cathodoluminescent screen, an electron gun, and a slit type apertured mask located between the screen and gun, wherein the slits in said mask are arranged in vertical columns and the slits in each column are vertically separated by webs, the improvement comprising

alternate webs within a column being of lesser thickness than the general mask thickness with the geometric center of the alternate webs being offset toward the screen side of the mask.

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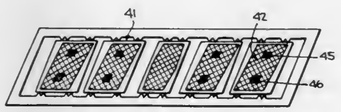
**4,293,793**

## FLUORESCENT DISPLAY TUBE

**Masayuki Kojima; Masaki Kobayakawa, and Kozo Tanaka, all of Izumi, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed May 7, 1979, Ser. No. 36,510**
**Claims priority, application Japan, May 10, 1978, 53-63100[U]**
**Int. Cl.³ H01J** *19/38, 63/06*
**U.S. Cl. 313—497** **8 Claims**




1. In a fluorescent display tube, an anode substrate having at least one display pattern of anode segments mounted thereon, said anode segments being excitable to emit light by electron bombardment, said anode substrate having insulating regions within the pattern of anode segments, a cathode member extending over said anode substrate and said anode segments, and a grid member disposed between said anode substrate and said cathode member, said grid member having electron passage regions of relatively open mesh structure lying over said anode segments for permitting electrons to pass through to said anode segments, said grid member having shielding regions of relatively fine mesh structure lying over said anode substrate insulating regions within said pattern of anode segments, said shielding regions being characterized in that they inhibit passage of electrons to said anode substrate while permitting light to pass therethrough.

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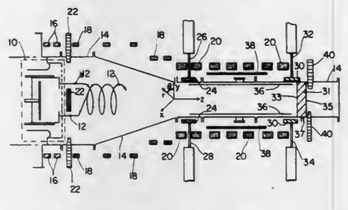
**4,293,794**

## GENERATION OF INTENSE, HIGH-ENERGY ION PULSES BY MAGNETIC COMPRESSION OF ION RINGS

**Christos A. Kapetanakos, 6101 Overlea Rd., Bethesda, Md. 20016**

**Filed Apr. 1, 1980, Ser. No. 136,227**
**Int. Cl.³ H01J** *3/04*
**U.S. Cl. 315—111.81** **13 Claims**




1. A system for generating intense (high-current), high-energy ion pulses, and propagating the pulses independent from a requirement for an applied external magnetic field, guide tube, or other applied guiding means, comprising:

means for forming a magnetic field, said field having axial and radial components, and said field including a magnetic mirror having near and far mirror peaks;

means for forming a hollow beam of ions, the axis of said beam coinciding with the axis of said magnetic field, said ions having translational energy and translational velocity, $v_z$;

means for providing rotational energy and a rotational velocity, $v_\theta$, to said ions and causing the ions to rotate;

means for forming a ring of ions, inside the magnetic mirror, said ions having rotational and translational energy;

means for increasing the rotational energy of said ions;

means for extracting said ring of ions;

means for separating the ions from any electrons which may be intermixed with the ions; and

means for increasing said translational energy of the ions, said extracted ions having rotational and translational energy, said ions forming rotational and translational current densities, $J_\theta$ and $J_z$, respectively, said $J_\theta$ producing a self-magnetic field, $B_z$, and said $J_z$ producing a self-magnetic field, $B_\theta$, said $J_z$ and $B_\theta$ producing an inward force, $J_z B_\theta$, for inhibiting radial expansion of the beam and maintaining equilibrium of the beam during propagation.

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**4,293,795**

## SOLID STATE FLASHER RELAY

**Carlo Fields, Woodland, Calif., assignor to Southern Pacific Transportation Company, San Francisco, Calif.**

**Filed Jan. 11, 1980, Ser. No. 111,320**
**Int. Cl.³ H05B** *39/06*
**U.S. Cl. 315—200 A** **21 Claims**

1. A flasher relay of the type wherein an AC or DC input voltage provided across first and second loads interconnected



in series at a common junction can be selectively applied across said first load or said second load,

said input voltage is applied to said first and second loads via first and second input, lines, said relay comprising:

first solid state shunting means for shunting said first load so that said input voltage is applied across said second load;

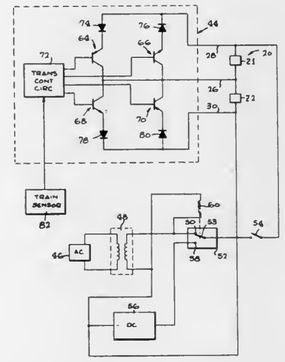
second solid state shunting means for shunting said second load so that said input voltage is applied across said first load;

means for selectively controlling said first and second means so as to alternately shunt said first and second loads;

said first solid state shunting means comprising,

a first shunting transistor connected between said first input line and said common junction, said first transistor being chosen to conduct when a voltage potential across said first and second loads is of one polarity and said first transistor is biased on and a second shunting transistor connected between said first input line and said common junction, said second transistor being chosen to conduct when a voltage potential across said first and second loads is of the other polarity and said second transistor is biased on;

said means for selectively controlling comprises means for biasing said first and second transistors so that said first input




line is continually shunted to said common junction by either said first or second transistor regardless of the polarity of the input voltage across said first and second loads; and

said second solid state shunting means comprises,

a third shunting transistor connected between said second input line and said common junction, said third transistor being chosen to conduct when a voltage potential across said first and second loads is of one polarity and said third transistor is biased on;

a fourth shunting transistor connected between said second input line and said common junction, said fourth transistor being chosen to conduct when a voltage potential across said first and second loads is of the other polarity and said fourth transistor is biased on; and

said means for selectively controlling further comprises means for preventing said third or fourth transistor from conducting when either said first or second transistor is conducting, means for biasing said third and fourth transistors so that said second input line is continuously shunted to said common junction by either said third or fourth transistor regardless of the polarity of the input voltage across said first and second loads, and means for preventing said first or second transistor from conducting when either said third or fourth transistor is conducting.

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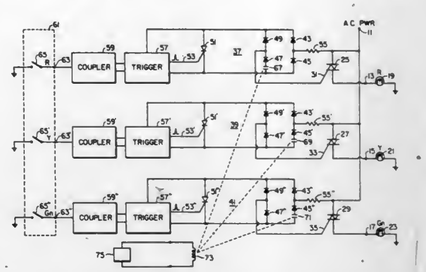
**4,293,796**

## TRAFFIC LIGHT DIMMING TECHNIQUE AND CIRCUITRY

**Clyde H. McMorrow, 1701 Fortune Dr., San Jose, Calif. 95131**

**Filed Jan. 7, 1980, Ser. No. 110,140**
**Int. Cl.³ H05B** *37/02, 39/06*
**U.S. Cl. 315—205** **2 Claims**




1. A traffic light switching circuit for connecting to an alternating current power source at least one conductor to which a traffic light is connected for energization in response to an input control signal, comprising:

a three-terminal switching device connected to provide an electrical connection between said conductor and said alternating current source through two terminals of said switching device in response to a control signal applied to a third terminal thereof, said three-terminal switching device being characterized by conducting between its said two terminals after an appropriate control signal is applied to its control terminal and continuing to conduct until the current therethrough goes to zero at which time the switching device ceases to conduct until another appropriate signal is applied to its control terminal, and said control signal generating means including a full wave rectifier connected for one leg to be disabled in response to one state of said external signal, whereby such disablement causes said switching device to conduct for only one-half of each cycle of said alternating current power source, and

means connected to said alternating current power source and responsive to an external signal for generating said control signal in a manner to apply either a full wave alternating current signal to said control terminal or a half-wave signal thereto depending upon the state of said external signal, whereby a light connected to said at least one conductor may be operated at one of two brightness levels depending upon the state of said external signal.

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**4,293,797**

## INDUCTIVE-CAPACITIVE CYCLIC CHARGE-DISCHARGE IGNITION SYSTEM

**Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705**

**Continuation-in-part of Ser. No. 35,013, May 1, 1979, abandoned. This application Jan. 16, 1980, Ser. No. 112,533**
**Int. Cl.³ H05B** *37/02, 39/04, 41/36*
**U.S. Cl. 315—209 R** **8 Claims**

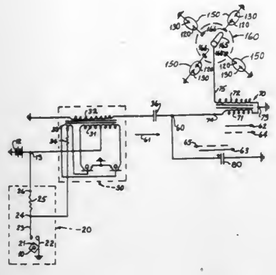
1. An inductive-capacitive cyclic charge-discharge ignition system for providing a plurality of ignition periods, comprising the combination of:

an ignition transformer having a primary winding;

a capacitor connected to the primary winding and forming a parallel circuit with said primary winding;

AC generating means having an output winding in series with said parallel circuit for powering said parallel circuit with AC energy during each said ignition period, said

output winding and parallel circuit forming a passive switchless network; and



timing means coupled to said AC generating means for controlling DC bias current to said generating means so as to duty cycle said generating means.

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**4,293,798**

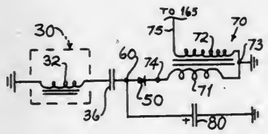
## INDUCTIVE-CAPACITIVE CYCLIC CHARGE-DISCHARGE IGNITION SYSTEM

**Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705**

**Continuation-in-part of Ser. No. 35,013, May 1, 1979, abandoned. This application Jan. 16, 1980, Ser. No. 112,714**

**Int. Cl.³ H05B** *37/02, 39/04, 41/36*

**U.S. Cl. 315—209 R** **10 Claims**



1. An inductive-capacitive cyclic charge-discharge ignition system for providing a plurality of ignition periods, comprising the combination of:

an ignition transformer having a primary winding;

a first capacitor connected to the primary winding and forming a parallel circuit with said primary winding;

a second capacitor in series with the parallel circuit;

AC generating means having an output winding in series with the second capacitor for powering said second capacitor and parallel circuit with AC energy during each said ignition period, said output winding, second capacitor and parallel circuit forming a switchless output network; and

timing means coupled to said AC generating means for controlling DC bias current to said generating means so as to duty cycle said generating means.

9. The method as stated in claim 8, including the further step of:

(e) creating an electrical arc between an electrically conductive tubular base and an electrode of said igniter, said arc having a filament of luminous particles extending between said base and electrode and a mass of luminous particles of lesser density than said filament which surrounds said filament.

**4,293,799**

## POWER SUPPLY SYSTEMS

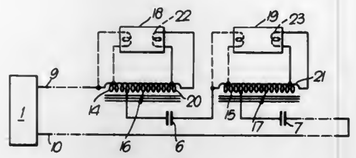
**Frank B. Roberts, Gateshead, England, assignor to Victor Products (Wallsend) Limited, Wallsend, England**

**Filed Nov. 19, 1979, Ser. No. 95,384**

**Claims priority, application United Kingdom, Oct. 5, 1979, 34722/79**

**Int. Cl.³ H05B** *41/24*

**U.S. Cl. 315—256** **9 Claims**



1. A power supply system for supplying electrical power to a plurality of fluorescent lamps in a potentially hazardous atmosphere, comprising a power supply which produces a substantially constant current output at a frequency in a range of about 1 kHz to about 500 kHz; a plurality of transformers each having a primary winding and a secondary winding; means to couple said primary windings of all of said transformers together in a series circuit; means to couple at least one respective fluorescent lamp across each said transformer secondary winding; voltage control means connected between said power supply and said series circuit to control the voltage level applied to said series circuit by said power supply to ensure that the amount of electrical energy supplied to said transformer primary windings by said power supply cannot be incendive to the atmosphere; and capacitance means coupled in said series circuit to reduce the reactance of said series circuit whereby an increased number of said lamps can be started for a given value of said applied voltage level.

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**4,293,800**

## DOUBLE-ENDED THYRATRON HAVING AT LEAST THREE GRIDS

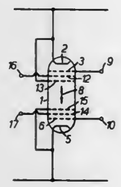
**Hugh Menown, Writtle, England, assignor to English Electric Valve Company, Chelmsford, England**

**Continuation of Ser. No. 909,259, May 24, 1978, abandoned, and a continuation of Ser. No. 780,486, Mar. 23, 1977, abandoned. This application Jun. 8, 1979, Ser. No. 46,902**

**Claims priority, application United Kingdom, Mar. 27, 1976, 12415/76**

**Int. Cl.³ H01J** *17/12*

**U.S. Cl. 315—350** **9 Claims**



9. A double-ended thyratron comprising, in combination:

an envelope having a pair of cathodes disposed in spaced apart relation therewithin; and

a first set of at least three grids adjacent one of said cathodes and a second set of at least three grids adjacent the other of said cathodes, the grids of each set being disposed in serially spaced fashion with the final grids of the two sets being disposed in remotely spaced, opposing relation and there being means providing at least one voltage with-



standing gap between said first and second sets of grids, each set being exclusive of said means and comprising a first grid disposed closest to the associated cathode and adapted to receive an electrical potential independently of the remainder of the grids of that set whereby independently to receive a current bias, an intermediary grid between such first grid and the final grid of that set and adapted to receive an electrical potential independently of the remainder of the grids of that set whereby independently to receive a trigger pulse, and said final grid which is electrically connected to its associated cathode.

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**4,293,801**

## CATHODE RAY TUBE ASSEMBLIES

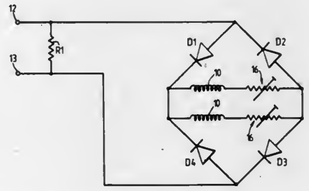
**Frank Cook, Rochdale, and Gordon H. Davies, Wilmslow, both of England, assignors to Thorn EMI Limited, Rochdale, England**

**Filed Mar. 5, 1980, Ser. No. 127,527**

**Claims priority, application United Kingdom, Mar. 6, 1979, 07913/79**

**Int. Cl.³ H01J** *29/56*

**U.S. Cl. 315—370** **6 Claims**



1. A cathode ray tube assembly having a circuit arrangement to connect the heater of the cathode ray tube to an associated D.C. supply, to energise the heater, there also being included in the circuit arrangement at least one component of the cathode ray tube assembly to be energized by the associated D.C. supply, together with a matrix of assymetrical conducting devices arranged such that the current flow through each of said at least one component individually is in one predetermined direction, irrespective of the direction of the flow of current from the associated D.C. supply to the circuit arrangement.

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**4,293,802**

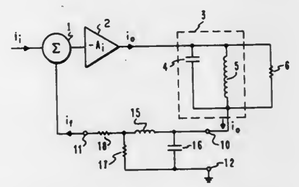
## TRANSRESONANT DEFLECTION YOKE OPERATIONS

**Trung Le, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 19, 1979, Ser. No. 105,322**

**Int. Cl.³ H01J** *29/70*

**U.S. Cl. 315—387** **10 Claims**



1. In a CRT display system having a deflection yoke having frequency characteristics defined by the inductance of and the distributed capacitance across said yoke and a driving amplifier circuit therefor, said circuit having an output connected to a first end of said yoke and a summing node receiving a signal corresponding to a desired CRT beam deflection and a feedback signal related to deflection yoke current, the improvement comprising:

a second-order feedback network including the equivalent of only two energy storage devices, said feedback network being tuned to said yoke frequency characteristics and having only one input terminal, one output terminal, and a ground terminal;

means for connecting said input terminal to a second end of said deflection yoke and said output terminal to said summing node; and

means for applying a signal from said feedback network to said summing node of said driver amplifier circuit, said signal being related by a constant factor to the instantaneous inductive current flow through said deflection yoke.

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**4,293,803**

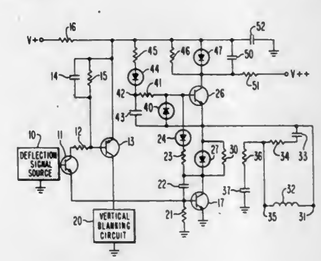
## VERTICAL DEFLECTION CIRCUIT

**William V. Fitzgerald, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Feb. 4, 1980, Ser. No. 118,120**

**Int. Cl.³ H01J** *29/70*

**U.S. Cl. 315—397** **4 Claims**




1. A resonant retrace vertical deflection circuit for a television receiver comprising:

a source of vertical deflection signals;

a yoke coupled to said signal source for providing vertical deflection of an electron beam in accordance with a deflection cycle having trace and retrace intervals;

a first source of potential;

means for utilizing a diode to complete a path for current flow from said first potential source to said yoke during a given portion of said trace interval and to disrupt said path during the remainder of said trace interval and during at least a major portion of said retrace interval;

a capacitor coupled for resonating with said yoke during said retrace interval portion;

a second source of potential, providing a potential of greater magnitude than the potential provided by said first source; and

means including first and second impedance means respectively coupled to said first and second sources, and to said capacitor for coupling a portion of the potential of said second source to said capacitor for charging said capacitor during said remainder of said trace interval, said portion of said second source potential determined by the ratio of said first and second impedance means.

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**4,293,804**

## RASTER-CENTERING CIRCUIT

**Joseph F. Yello, Wooddale, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

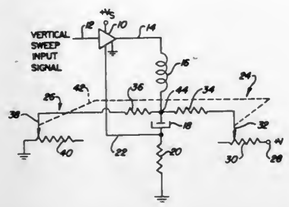
**Filed Feb. 22, 1980, Ser. No. 123,546**

**Int. Cl.³ H01J** *29/54*

**U.S. Cl. 315—398** **2 Claims**

1. A cathode ray tube raster-generating and centering circuit comprising:

deflection drive means for providing a varying sweep current;
deflection coil means having one end coupled to said deflection drive means in such manner that said sweep current flows through said deflection coil means and the voltage of said one end is controlled entirely by the output of said deflection drive means;




means forming a voltage divider with opposite ends clamped at respective different D.C. voltages and center tap means adjustable within a voltage range between said D.C. voltages;
and means connecting said center tap means to the other end of said deflection coil means whereby to control the D.C. voltage of said other end.

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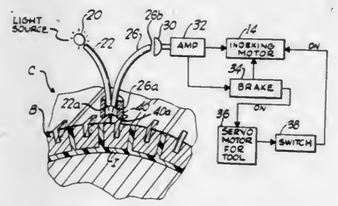
**4,293,805**
**SENSING AND CONTROL APPARATUS FOR A COMMUTATOR**
**Allan S. Warner, 50 Haliday St., Clark, N.J. 07066**
**Filed Jun. 25, 1979, Ser. No. 52,122**
**Int. Cl.³ B23Q** *5/10, 5/28*
**U.S. Cl. 318—39** **13 Claims**




1. Apparatus for sensing a predetermined location on a commutator and, in response thereto, actuating a tool for performing an operation on said commutator, comprising:
means for mounting and rotating said commutator;
a light source positioned a predetermined distance from the surface of said commutator:
first means for directing light from said light source to the surface of said commutator;
means for sensing the reflection of light from said commutator surface;
second means for directing light reflected from said commutator surface to said sensing means;
means responsive to said sensing means for actuating said tool for performing an operation on said commutator;
protective means at least partially enclosing said first and second light-directing means for preventing the interference of ambient and/or stray light with the operation of said sensing means, said protective means including a housing having a first end in rubbing engagement with said commutator surface and a second end for receiving the ends of said first and second light-directing means and spacing said ends of said first and second light-directing means from said first end of said housing to form a space within said housing between said ends of said first and second light-directing means and said first end of said housing; and
supplying means for supplying air under pressure into said space and directly onto said commutator surface.

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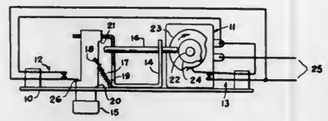
**4,293,806**
**SINGLE AND MULTICYCLE CONTROL DEVICE FOR ELECTRIC MOTORS**
**Leo Kull, 58 Westover Ave., West Caldwell, N.J. 07006, and Vello H. Ebrok, 376 Prospect St., East Orange, N.J. 07017**
**Filed May 21, 1979, Ser. No. 40,720**
**Int. Cl.³ G05B** *11/14*
**U.S. Cl. 318—673** **16 Claims**



1. A cycle control device for controlling the rotation of an electric motor driven output shaft comprising:
a parallel switching circuit for energizing said electric motor, said circuit having normally open first and second switching means in each branch of said circuit, a latchable actuating means for closing and maintaining the closure of said first switching means for starting the rotation of said output shaft,
an actuating means controlled by the motion generated by said output shaft, said actuating by means closing said second switching means before the opening of said first switching means and thereafter opening said second switching means to terminate the rotation of said output shaft, and a feedback means actuated by the rotation of said output shaft, said feedback means unlatching said latchable actuating means leading to an opening of said first switching means.

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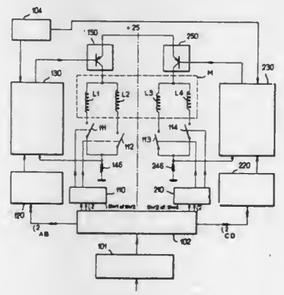
**4,293,807**
**STEPPING MOTOR CONTROL APPARATUS**
**George W. Foster, Middleton, Wis., and Alain M. Bonneyrat, St-Martin-du-Tertre, France, assignors to Gilson Medical Electronics (France), Villiers-le-Bel, France**
**Filed Oct. 29, 1979, Ser. No. 89,191**
**Claims priority, application France, Nov. 2, 1978, 78 31023**
**Int. Cl.³ G05B** *19/40*
**U.S. Cl. 318—696** **6 Claims**



1. In an apparatus for controlling a stepping motor having its



windings grouped by pairs while two windings of the same pair cannot be supplied simultaneously, said apparatus comprising means receiving a control signal, supply circuits adapted to controllably feed the individual windings of the stepping motor with respective electric currents, and a selection circuit adapted to selectively actuate the supply circuits depending upon said control signal, and adapted to further define an indication of gradation of the control current of each winding in accordance with the control signal, the improvement comprising a resistor associated with each pair of windings and a pair of switch means respectively arranged between one end of the two windings of a pair thereof and the associated resistor, said supply circuits feed in common the other end of the two windings of a respective pair thereof, with a current, the amplitude of which is defined by said indication of gradation and the fed current energizing the one of said windings being selected by said switch means.

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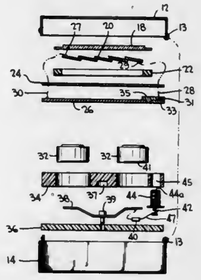
**4,293,808**
**BATTERY CHARGING DEVICE EMPLOYING SOLAR CELLS**
**Peter F. Varadi, and Ramon Dominguez, both of Rockville, Md., assignors to Solarex Corporation, Rockville, Md.**
**Filed Apr. 14, 1978, Ser. No. 896,451**
**Int. Cl.³ H02J** *7/00*
**U.S. Cl. 320—2** **15 Claims**



1. A device for charging a battery, comprising a container having parts movable between open and closed positions and having an array of solar cells disposed in light-receiving position thereon, said array having positive and negative electrical terminals, said container being formed with at least one part adapted to receive a battery therein, and the other of said parts including a first electrical contact connected to one of said array terminals and adapted to contact one terminal of said battery, a second electrical contact in said battery receiving part, the other terminal of said battery in said receiving portion being in contact with said second electrical contact, a third movable contact is electrically connected to said second electrical contact and adapted to be electrically connected to the other terminal of said solar array, and said third movable electrical contact moving into electrical connecting relationship with said other terminal of said solar cell array in a plane transverse to said first electrical contact and said first electrical contact contacting said one battery terminal to charge said battery when said movable parts are moved from an open to a closed position.

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**4,293,809**
**Patent Not Issued For This Number**

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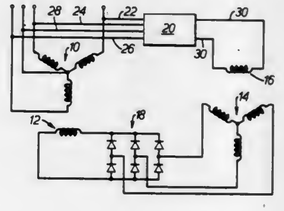
**4,293,810**
**CONTROL SYSTEMS FOR ELECTRIC GENERATORS**
**Michael J. Wright, Stamford, England, assignor to Newage Engineers Limited, Stamford, England**
**Filed Apr. 10, 1979, Ser. No. 28,697**
**Claims priority, application United Kingdom, Apr. 12, 1978, 14358/78**
**Int. Cl.³ H02P** *9/10, 9/30*
**U.S. Cl. 322—28** **21 Claims**



1. In a control system including a thyristor for controlling a generator having an excitation winding by which the excitation of the generator is produced or controlled, the excitation winding being connected, through the thyristor forming part of the control system, to at least one alternating current output terminal of the generator, the output terminal or terminals to which the excitation winding is connected together providing a waveform which is interrupted or changes polarity during each cycle of the waveform, thereby allowing the thyristor to turn off, the control system also including firing means arranged to fire the thyristor at a moment during the waveform which varies with variations in the required excitation, and the control system also including a starting excitation current path leading from an alternating current output terminal or terminals of the generator to the excitation winding, the improvement comprising providing in the said starting excitation cur-

rent path, means arranged, by varying the conductivity of the said means, to limit the current in the path to a value which is greater than the latching current of the thyristor.

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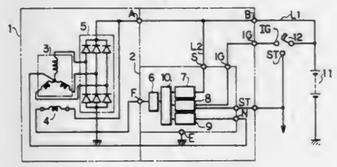
**4,293,811**

## VOLTAGE REGULATOR SYSTEM FOR VEHICLE GENERATOR

**Katsuya Muto, Kariya; Kazumasa Mori, Aichi; Akira Mase, Handa; Takayasu Nimura, Nagoya; Katsumi Itoh, Obu, and Yoshio Akita, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Mar. 19, 1979, Ser. No. 21,805**
**Claims priority, application Japan, Apr. 20, 1978, 53-47545**
**Int. Cl.³ H02J 7/16**
**U.S. Cl. 322—60** **6 Claims**



1. A voltage regulator for battery charging generator having a field exciting coil for an internal combustion engine having a starter motor comprising:

a switching circuit for supplying field exciting current in a controlled manner,

a battery voltage regulating circuit for controlling the switching operation of said switching circuit in response to the battery voltage,

first means for generating a first signal for a predetermined period of time in response to engine starting,

second means connected to said first means for causing said switching circuit to be nonconductive normally and to be conductive when said first signal is applied thereto, and

third means for causing said switching circuit to be conductive in response to operation of said generator independently of said first means until said battery voltage regulating circuit starts controlling.

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**4,293,812**

## CONTROLLED D-C CURRENT SUPPLY SYSTEM, WITH CONTROLLED CURRENT FLOW THROUGH A CHOKE

**Hans Kubach, Korntal-Münchingen, and Hartmann Rupp, Kornwestheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Sep. 26, 1979, Ser. No. 79,159**
**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841569**
**Int. Cl.³ H03K 3/01, 17/84**
**U.S. Cl. 323—272** **10 Claims**

1. Controlled d-c current supply system for connection to a d-c source (**10**) and to supply current to a load having

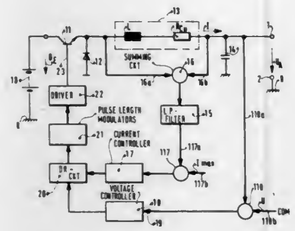
a controlled semiconductor switch (**11**) having a control terminal;

a choke coil (**13**) having windings serially connected with the switching path of the semiconductor switch;

a free-wheeling diode (**12**) connected between the switching path of the semiconductor switch and the choke coil;

a capacitor (**14**) connected to the choke coil at the side thereof remote from the free-wheeling diode;

means (**20, 21, 22**) providing conduction controlling pulses to the control terminal of the semiconductor switch to render the semiconductor switch cyclically conductive for controlled periods;



and means to sense current flow to the load to additionally control said pulse providing means

comprising, in accordance with the invention,

means (**16, 16a, 16b, 15**) connected across the choke and including a low-pass filter (**15**) to derive a signal representative of the d-c voltage drop ($U_R$) in the choke (**13**) due to the inherent resistance ($R_{Cu}$) of the windings thereof;

and a current control stage (**17**) having said voltage-drop-representative-signal applied thereto and connected to said pulse providing means (**20, 21, 22**) to control the duty cycle of the pulse providing means as a function of the output of the current control stage.

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**4,293,813**

## CURRENT MEASURING SYSTEM

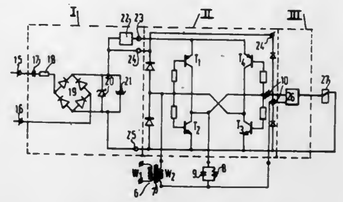
**Maarten Groenenboom, Enter, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands**

**Continuation of Ser. No. 815,274, Jul. 13, 1977, abandoned. This application Feb. 22, 1979, Ser. No. 14,089**
**Claims priority, application Netherlands, Jul. 13, 1976, 7607752; Jun. 8, 1977, 7706316; Jun. 8, 1977, 7706317**
**Int. Cl.³ G01R 33/02, 1/20, 31/02**
**U.S. Cl. 324—117 R** **7 Claims**

1. A current measuring system, more particularly suitable for use as an earth leakage detection system, comprising a weak magnetic circuit having a primary winding to be traversed by a current to be measured and having a secondary winding, a reversible transistor switch network comprising four transistors connected in a bridge such that the emitter/-collector paths of one pair of the transistors are connected between a first pair of points of said bridge whereas the emitter/collector paths of the other pair of the transistors are also connected between said first pair of points, in parallel with the



one pair of transistors, the bases of said one pair of transistors being connected through respective bias resistor means to a third point of said bridge and the bases of said other pair of transistors being connected through respective bias resistor means to a fourth point of said bridge, the transistors of each pair being of opposite conductivity type and the collectors of said one pair of transistors being connected to said fourth point and the collectors of said other pair of transistors being connected to said third point whereby only two of said transistors, one from each pair, are conducting at any one time and the polarity across said third and fourth points in relatively reversed when conduction is switched between those two transistors which are one transistor of each pair and those two transistors which are the other transistor of each pair, integrating load impedance means for producing an output signal in



response to unbalanced switching of said transistors, said secondary winding being connected in series with said load impedance means between said third and fourth points of said bridge, and a current limiting circuit means, for initiating switching of said transistors, a voltage source, said current limiting circuit means being connected across said source and in series with the source between said first pair of points of the bridge whereby the voltage across said first pair of points is abruptly reduced, when a predetermined limiting current value is reached by those two transistors conducting at that time, so that those two transistors conducting at that time are rendered non-conducting whereas the other two transistors are rendered conducting by the self inductance of said secondary winding thereby to switch the polarity across said secondary winding and the integrating load impedance.

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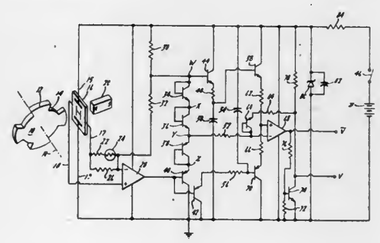
**4,293,814**

## CRANKSHAFT POSITION SENSOR CIRCUITRY FOR PROVIDING STABLE CYCLICAL OUTPUT SIGNALS WITHOUT REGARD TO PEAK TO PEAK VARIATIONS IN SENSOR SIGNALS

**Wesley D. Boyer, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 8, 1979, Ser. No. 64,699**
**Int. Cl.³ G01P 3/48, 3/54; G01B 7/14**
**U.S. Cl. 324—166** **2 Claims**



1. In an ignition system for an internal combustion engine, utilizing an electromagnetic sensor to monitor the crankshaft position in said engine, an improved circuit connected to said sensor for receiving a cyclical signal therefrom and generating a corresponding output signal that is a synchronized replica of said cyclical signal having constant high and low peak values wherein said circuit includes:

a first differential amplifier having opposite polarity input ports connected to said electromagnetic sensor to amplify said input cyclical signal;

a negative feedback circuit which includes a plurality of diode connected transistors connected in series between the output of said first differential amplifier and one of its input ports to provide said amplified input cyclical signal at a plurality of junctions at incrementally separated D.C. voltage levels;

a first peak detection circuit connected to one of said diode connected transistors for sampling the high peak values of said amplified input cyclical signal output from said first differential amplifier to derive a high peak voltage level;

a second peak detection circuit connected to the output of said first differential amplifier for sampling the low peak values of said amplified input cyclical signal to derive a low peak voltage level;

a voltage divider circuit connected between said first peak detection circuit and said second peak detection circuit to supply a threshold voltage level at a preselected fractional value between said high and low peak voltage levels;

a comparator circuit having a first input port of one polarity connected to said voltage divider circuit to receive said threshold voltage level and a second input port of an opposite polarity connected to a junction between two of said diode connected transistors in said negative feedback circuit to receive said amplified input cyclical signal at a D.C. level intermediate that of said signal supplied to said first peak detection circuit and that of said signal output from said first differential amplifier, whereby the output of said comparator circuit switches between two distinct voltage levels whenever the amplified input cyclical signal crosses the threshold voltage level and is a voltage replica of said cyclical input signal having constant peak values.

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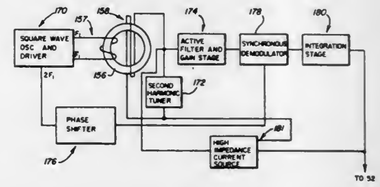
**4,293,815**

## FLUXGATE MAGNETOMETER CIRCUIT WITH EARTH'S FIELD ELIMINATION

**Jerry B. West; John L. Kretzschnar, and Bing-Fai Fung, all of Tulsa, Okla., assignors to Century Geophysical Corporation, Tulsa, Okla.**

**Filed May 1, 1978, Ser. No. 901,778**
**Int. Cl.³ G01R 33/04; G01V 3/26**
**U.S. Cl. 324—254** **4 Claims**




3. An improved fluxgate magnetometer for operating at a stabilized point including an oscillator and a driver, a fluxgate ring core sensor and a drive coil excited by the oscillator and driver, a sense winding differentially would around said core for sensing the difference in saturations of the earth's flux linkages in the core and circuit means for determining the polarity and magnitude of an error signal to be fed through the sense winding to eliminate the earth's field in the sensor for operating the magnetometer at a stabilized null point, wherein the improvement comprises:

means for integrating the error signal to be fed through the

sensor to provide the phase stability and memory for the magnitude of current to eliminate the earth's field, and

high impedance current source driven by said integrating means for summing a DC current into the output of the sense winding in a direction and magnitude determined by the error signal circuit means to eliminate the effect of the earth's field in the fluxgate sensor to improve the operational stability of the magnetometer by operating at a null point.

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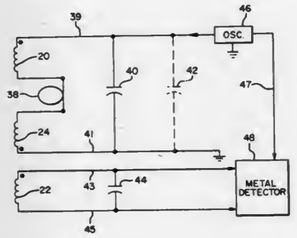
**4,293,816**

## BALANCED SEARCH LOOP FOR METAL DETECTOR

**Douglas L. Johnson, Lebanon, Oreg., assignor to White's Electronics, Inc., Sweet Home, Oreg.**

**Filed Jul. 9, 1979, Ser. No. 55,696**
**Int. Cl.³ G01V** *3/11*
**U.S. Cl. 324—329** **13 Claims**




1. A balanced search loop device, comprising:

a transmit inductor coil means;

means for applying an electrical signal to said transmit coil means to produce magnetic flux around the transmit coil;

a receive inductor coil means;

a magnetic flux feedback coil connected to said transmit coil so that its electromagnetic flux opposes the flux of the transmit coil in the region of the receive coil, the turns ratio of said transmit coil to said feedback coil being substantially the same as the ratio of the areas bounded by these coils to null balance the search loop in air; and

support means for supporting said feedback coil on said receive coil means throughout at least a major portion of its length to prevent movement of the feedback coil relative to the receive coil due to temperature changes or mechanical movement of said coils, and to position at least a major portion of said feedback coil between said receive coil and said transmit coil.

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**4,293,817**

## SIGNAL AMPLITUDE RANGE COMPRESSION EMPLOYING PULSE MODULATION

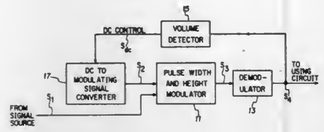
**Glenn A. DeMichele, Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Sep. 12, 1979, Ser. No. 74,642**
**Int. Cl.³ H03G** *7/00;* **H03L** *5/00*
**U.S. Cl. 328—169** **1 Claim**

1. For use with an amplitude varying signal which contains intelligence in its amplitude variations, a compressor comprising:

variable gain first means for receiving said amplitude varying signal and comprising (i) modulation means, responsive to said amplitude varying signal and a feedback signal, for outputting a signal comprising a train of pulses whose widths and heights are controlled, respectively, by said amplitude varying signal and said feedback signal, and (ii) demodulation means for converting said modulation means output signal into an amplitude varying, compressor output signal having a smaller range of amplitude variations than said amplitude varying signal, and

feedback second means for developing said feedback signal in response to input received from said first means, said feedback signal being appropriate for controlling the modulation means output signal pulse heights so as to effect in said first means gain change appropriate to reduce the range of amplitude variations in said compressor output signal relative to the range of amplitude variations




in said amplitude varying signal, said modulation means comprising (a) comparator means for receiving said amplitude varying signal and a substantially triangular waveform, and for outputting a pulse width modulated signal and (b) pulse height control means responsive to said feedback signal for converting said comparator means output signal into said modulation means output signal.

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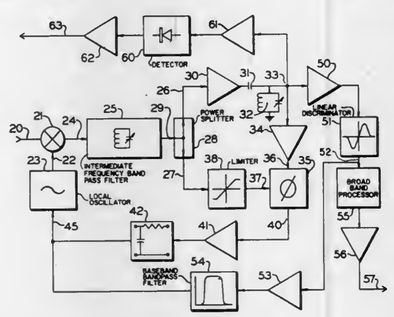
**4,293,818**

## FREQUENCY MODULATION THRESHOLD EXTENSION DEMODULATOR UTILIZING FREQUENCY COMPRESSION FEEDBACK WITH FREQUENCY DRIFT CORRECTION

**Harold F. Jarger, Rochelle Park, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Jan. 22, 1979, Ser. No. 5,060**
**Int. Cl.³ H03D** *3/18*
**U.S. Cl. 329—50** **10 Claims**




1. In a threshold extension receiver:

a source of frequency modulated radio frequency signals having a frequency deviation therebetween;

a mixer;

a local oscillator supplying local oscillations;

an intermediate frequency filter having a pass band substantially narrower than the frequency deviation of the said frequency modulated radio frequency signals;

means for feeding said source of frequency modulated radio frequency signals and the local osacillations to said mixer, to thereby produce intermediate frequency oscillations in said mixer, said intermediate frequency oscillations having an average frequency within the pass band of said intermediate frequency filter;



means for feeding the intermediate frequency oscillations of said mixer to said intermediate frequency filter, whereby the intermediate frequency filter will pass such components of said intermediate frequency oscillations as lie within the pass band;

negative frequency feedback means, responsive to the signals which are passed by the pass band of said intermediate frequency filter, for modulating the frequency of said local oscillator such as to cause the intermediate frequency oscillations produced by said mixer to have a reduced frequency deviation, compared to the frequency deviation of said radio frequency signals;

said negative feedback means having two independent feedback loops acting in parallel;

said first feedback loop comprising means, responsive to the average frequency of said intermediate frequency oscillations, for slowly causing said local oscillator to change frequency in such a sense as to maintain said average frequency at a desired value;

said second feedback loop comprising means, responsive to the instantaneous frequency of said intermediate frequency oscillations, for quickly causing said local oscillator to change frequency in such a sense as to drive the instantaneous frequency of said intermediate frequency oscillations towards said desired value; wherein

said first feedback loop comprises a band pass filter; and

said second feedback loop comprises a low pass filter; and wherein

the pass bands of the low pass filter and the band pass filter have no pass band in common; wherein

said first feedback loop comprises:

a resonant tank circuit tuned to said desired value;

means to reactively and loosely couple said resonant tank circuit to the signals passed by said intermediate frequency filter;

whereby said resonant circuit will sympathetically resonate approximately in quadrature to said signals when the instantaneous frequency of said signals is at said desired value; and

whereby as the instantaneous frequency of said signals departs from said value, the phase relationship between said signals and the resulting sympathetic oscillations varies rapidly and monotonically with the departure;

a phase detector having a first and second input and whose output is the vector cross product of two inputs;

means to feed the voltage across said resonant circuit to the first input of said phase detector;

means to feed the signals passed by said intermediate frequency filter to the second input of said phase detector; and

means to feed the output of said phase detector to said local oscillator.

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**4,293,819**

## HIGH-SPEED LOW-DRIFT OPERATIONAL AMPLIFIER

**Akinori Shibayama, Shakujiidai; Kenji Maio, Hinode, and Norio Yokozawa, Fuchu, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Hitachi, Ltd., both of Tokyo, Japan**

**Filed Sep. 17, 1979, Ser. No. 76,428**
**Claims priority, application Japan, Sep. 20, 1978, 53-114629**
**Int. Cl.³ H03F** *1/02*
**U.S. Cl. 330—9** **5 Claims**

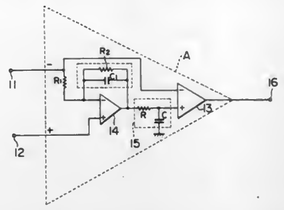
1. An operational amplifier comprising:

first and second input terminals;

a coefficient circuit connected to said first and second input terminals and including a first operational amplifier, said first operational amplifier having a low drift characteristic;

a low pass filter connected to receive the output of said coefficient circuit; and

a second wide-band operational amplifier having first and second inputs and being connected to receive at one of the inputs thereof the output of said low pass filter and connected to receive at the other input thereof a signal applied to said first input terminal; wherein said coefficient circuit includes said first operational amplifier having first and second inputs and being connected to receive at one of the inputs thereof a signal applied to said second input




terminal, a resistive element connected between said first input terminal and the other input of said first operational amplifier, and an impedance element connected between the said other input and the output of said first operational amplifier.

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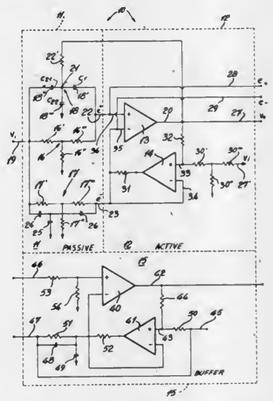
**4,293,820**

## POSITIVE FEEDBACK BIQUAD FILTER

**Chon T. L. Dinh, Brossard, Canada, assignor to Centre de Recherche Industrielle du Quebec, Pointe-Claire, Canada**

**Filed Aug. 23, 1979, Ser. No. 69,092**
**Int. Cl.³ H03F** *1/34*
**U.S. Cl. 330—85** **22 Claims**




22. A positive feedback RC filter circuit comprising a passive input RC section, and an active amplification output section having at least one operational amplifier, said RC section having two true resistive T-networks and a true capacitive T-network and a single resistive feedback connection to realize a true second order function.

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**4,293,821**

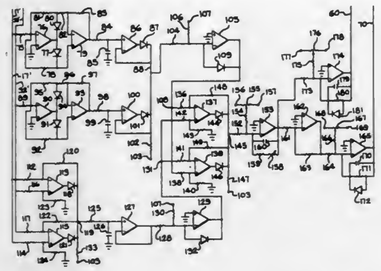
## AUDIO CHANNEL SEPARATING APPARATUS

**Angelo Boudouris, Sylvania, Ohio, and Edwin F. Peters, Lambertville, Mich., assignors to Eprad Incorporated, Toledo, Ohio**

**Filed Jun. 15, 1979, Ser. No. 48,840**
**Int. Cl.³ H04R** *5/00*
**U.S. Cl. 330—126** **3 Claims**

1. Apparatus for separating two audio signals of varying

amplitudes appearing on two input channels into output audio signals on at least three output channels comprising first amplifier means for applying the signal on a first of said input channels to a first of said output channels, second amplifier means for applying the signal on the second input channel to a second of said output channels, third amplifier means for applying the sum of the signals on said first and second input channels to a third output channel, means for attenuating the signals to said third output channel when the signal on said first input channel is appreciably larger in amplitude than the signal on said second input channel, means for attenuating the signals to said third output channel when the signal on said second input channel is appreciably larger in amplitude than the signal on said first input channel, means for attenuating the signals to



said first and second output channels when the signals on said first and second input channels are substantially identical in amplitude, frequency and phase, means for generating a first control signal having an amplitude responsive to the average absolute value of the highest amplitude audio signal on said first and second input channels, means for generating a second control signal having an amplitude responsive to the average absolute value of the difference between the audio signals on said first and second input channels, differential amplifier means for generating a third control signal having an amplitude responsive to the absolute value of the difference between said first and second control signals, and wherein said means for attenuating signals to said first, second and third output channels are responsive to said third control signal.

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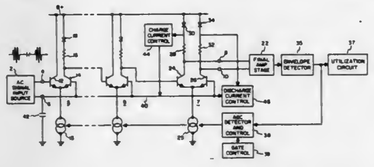
**4,293,822**

## GATED AGC AMPLIFIER WITH DC FEEDBACK

**Robert J. McFadyen, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.**

**Filed Nov. 9, 1979, Ser. No. 93,098**
**Int. Cl.³ H03F *3/45*; H03G *3/30***
**U.S. Cl. 330—254** **17 Claims**



11. An amplifier circuit in the form of a cascade arrangement of amplification stages each including a differentially connected pair of first and second transistors, said circuit comprising:

(a) an input stage and at least one other stage,

(b) input means for applying an ac input signal to the base of the first transistor of said input stage,

(c) a dc bus coupled to the base of the second transistor of each stage of said amplifier circuit,

(d) a capacitor coupled to said dc bus for providing a virtual ac ground to the base of each second transistor, said signal creating an ac imbalance between the first and second transistor of each stage, and

(e) dc feedback means coupled to said dc bus comprising bias control means for simultaneously charging and discharging said capacitor by currents respectively responsive to the currents flowing in said first and second transistors of said other stage, said charging and discharging currents being in a sense to achieve dc balance between the first and second transistors of said amplification stages.

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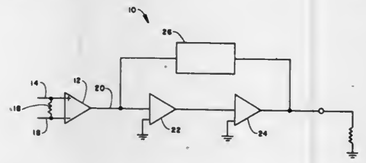
**4,293,823**

## BALANCED INPUT PHONOGRAPH PREAMPLIFIER CIRCUIT

**Lindsey S. Hochberg, and Montague C. Borland, both of Houston, Tex., assignors to Logitek Electronic Systems, Inc., Houston, Tex.**

**Filed Aug. 28, 1979, Ser. No. 70,508**
**Int. Cl.³ H03F *3/45***
**U.S. Cl. 330—260** **4 Claims**



1. A balanced-input preamplifier circuit for phonographs for use with balanced and unbalanced input signals, said preamplifier circuit comprising:

a differential voltage amplifier having a pair of inputs adapted to be coupled to the output of a phonograph cartridge having a pair of sides, one of said inputs being connectable to one of said sides and the other of said inputs being connectable to the other of said sides without referencing either of said inputs to ground;

an input load resistance being coupled to said differential voltage amplifier, said load being applied to the output of a phonographic cartridge to which said preamplifier circuit is connected;

a voltage amplifier having the input thereof coupled to the output of said differential voltage amplifier and the output thereof adapted to be interconnected with other amplifier circuitry of said phonograph;

a feedback loop network bridging said input and output of said voltage amplifier, said feedback loop network being isolated from said cartridge and being designed in accordance with the specific curve characteristics specified by the Record Industry Association of America for deemphasis of signals received from phonographic recordings.

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**4,293,824**

## LINEAR DIFFERENTIAL AMPLIFIER WITH UNBALANCED OUTPUT

**Bruno Murari, Monza, and Marco Siligoni, Vittuone, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Italy**

**Filed Nov. 2, 1979, Ser. No. 90,619**
**Claims priority, application Italy, Nov. 3, 1978, 29388 A/78**
**Int. Cl.³ H03F *3/04, 3/45***
**U.S. Cl. 330—301** **6 Claims**

1. A linear differential amplifier for converting an input signal into an unbalanced output signal, comprising:

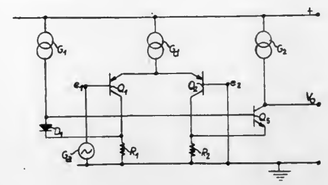
a supply of direct current having a grounded terminal and an ungrounded terminal;

a first and a second main transistor for one conductivity type having emitters connected in parallel to said ungrounded terminal by way of a first constant-current generator and



further having collectors respective connected to said grounded terminal via substantially identical first and second biasing resistors, said main transistors having respective bases between which said input signal is differentially applied;

voltage-control means inserted between said terminals in series with said first biasing resistor for maintaining across the latter a predetermined voltage drop in the absence of said input signal;



an ancillary transistor of opposite conductivity type having an emitter connected to ground through said second biasing resistor, a collector connected to said ungrounded terminal, and a base connected to said voltage-control means; and

a second constant-current generator inserted between said ungrounded terminal and the collector of said ancillary transistor, said output signal being available at the last-mentioned collector.

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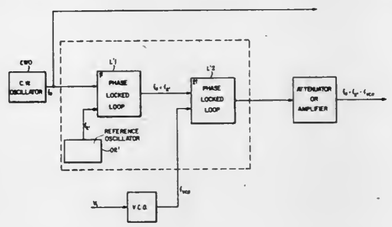
**4,293,825**

## FREQUENCY-SHIFTING SYSTEMS FOR FREQUENCY MODULATED SIGNALS

**Raffaele Cerra, Naples, Italy, assignor to Selenia Industrie Elettroniche Associate S.p.A., Italy**

**Filed Apr. 13, 1979, Ser. No. 30,267**
**Claims priority, application Italy, Apr. 18, 1978, 48945 A/78**
**Int. Cl.³ H03L *7/06***
**U.S. Cl. 331—2** **1 Claim**



1. A system of frequency shifting of frequency modulated signals, continuously above or below a pre-established frequency, said shift being possibly also null, characterized in comprising: a source of frequency modulated signals, the frequency of which is to be shifted; a reference oscillator; a first phase locked loop to which is applied the signals from said source and the output of said reference oscillator, the arrangement being such that said first phase locked loop is locked to a first conversion frequency differing by the oscillator output frequency from the frequency of said signal source; a controlled frequency oscillator; a second phase locked loop having the output of said first phase locked loop applied thereto together with the output of said controlled frequency oscillator, the arrangement being such that said second phase locked loop is locked to a second conversion frequency differing from that of said first phase locked loop such that the output frequency of said second phase locked loop is greater than, equal to, or less than the frequency of said signal source according to the value of the frequency of said controlled frequency oscillator.

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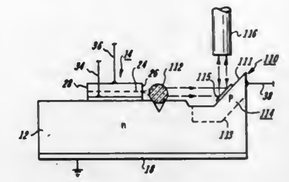
**4,293,826**

## HYBRID SEMICONDUCTOR LASER/DETECTORS

**Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 30, 1979, Ser. No. 34,237**
**Int. Cl.³ H01S *3/19***
**U.S. Cl. 331—94.5 H** **8 Claims**



1. A hybrid semiconductor laser/detector on a single semiconductive substrate, said laser having front and rear light emitting facets and being mounted on a flat surface of said substrate, an optical detector integral to said substrate, said detector being adjacent to one of said light emitting facets to detect a small portion of the light emitted therefrom, a bias circuit connected to supply an operating current to said laser, said detector being connected to said bias circuit to provide a feedback signal proportional to the detected light from said one facet to adjust and maintain said operating current to provide a predetermined optical power output level, said detector characterized by being positioned at an oblique angle relative to and dissecting the path of light emitted from said one facet to form a light receiving and reflecting surface, a portion of the facet light being reflected by said surface and another portion thereof being refracted into said detector to provide said feedback signal.

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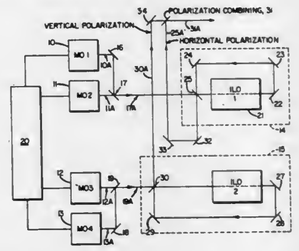
**4,293,827**

## MULTIWAVELENGTH DYE LASER

**Gary L. McAllister, and V. G. Draggoo, both of Richland, Wash., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.**

**Filed Sep. 14, 1979, Ser. No. 75,402**
**Int. Cl.³ H01S *3/082***
**U.S. Cl. 331—94.5 ML** **14 Claims**



1. A laser beam generating system for generating a composite laser beam comprised of at least two separate laser beams and having at least two separate wavelength components, said system comprising:

at least one multiwavelength laser for emitting a first multiwavelength laser beam having at least two separated wavelength components;

at least one additional laser for emitting a second laser beam;

means for polarizing said first and second laser beams;

means for directing the polarized beams onto polarization combining means; and

polarization combining means for receiving said polarized beams and combining them into a substantially colinear composite beam.

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**4,293,828**

## ARRANGEMENT FOR SUPPRESSING INTERFERENCE WAVES AND HARMONIC WAVES IN TRAVELING WAVE TUBES WITH A SHORT CIRCUITING SLIDE IN THE OUTPUT WAVE GUIDE

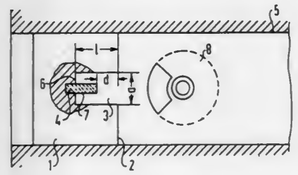
**Franz Gross, Loerrach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Feb. 4, 1980, Ser. No. 117,979**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908218**

**Int. Cl.³ H01P** *1/212, 1/26, 1/28*

**U.S. Cl. 333—27** **10 Claims**



1. An arrangement for suppressing interfering waves and harmonic waves in a traveling wave tube, comprising:

an output wave guide coupled to the traveling wave tube;

said output wave guide including a member therein comprising a frontal surface which is an effective short circuit plane which reflects the fundamental mode;

a groove in said frontal surface as a λ/4 wave guide element; and

attenuation means mounted in said wave guide element.

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**4,293,829**

## POLARIZATION SEPARATOR

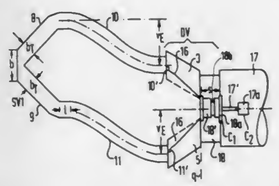
**Eberhard Schuegraf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Sep. 20, 1979, Ser. No. 77,190**

**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842576**

**Int. Cl.³ H01P** *1/16, 5/08*

**U.S. Cl. 333—125** **12 Claims**



1. A polarization separator for upper and lower of two frequency range devices having waveguide sections of rectangular and round cross-section, with a double branching waveguide, which is symmetrically constructed and has five-arms with a first arm lying in the longitudinal axis of the separator for connecting a continuing waveguide of round cross-section, and four partial branching arms of rectangular cross-section and which are mounted 90 degrees with respect to each other and extend generally parallel to the longitudinal axis of the separator and said four partial arms extending in a direction opposite to the first arm and with a first pair of said partial arms mounted opposite one another and each connected with one of a first pair of separator arm sections which connect said partial arms to a first pair of identically formed series waveguides, a second pair of said partial arms mounted opposite one another and each connected to one of a second pair of separator arm sections, and wherein two separator arm sections which lie opposite each other and the series waveguides are formed as E-offset waveguides and as H-offset waveguides, respectively and the E-offset waveguides are designed as rectangular waveguide sections which are provided on both sides with a waveguide bend and are respectively bent across the broad side of the waveguide in opposite directions on both sides and both E-offset waveguides are aligned with respect to their narrow sides obliquely to the longitudinal axis of the separator and extend parallel to each other and the H-offset waveguides are respectively designed as rectangular waveguide sections which have on both sides a waveguide bend and are respectively bent across the narrow side of the waveguide in opposite directions and one of the E-offset waveguide sections is mounted between the two H-offset waveguides in such manner that the series waveguides connected to the E-offset waveguide and the H-offset waveguides are formed so that their partial arms do not penetrate each other, characterized in that the partial arms (**6** through **9**) of the series waveguides (**SV1, SV2**) and the E-offset and H-offset waveguides (**10** through **13**) have a side ratio of at least approximately 1:4 with respect to their cross-section dimensions; and the partial arms (**2** through **5**) of the double branching waveguides consist of waveguides which have the same impedance as the E- and H-offset waveguides, and the first arm (**18**) of the double branching waveguides (DV) is connected to a continuing waveguide (**17**) which is formed as a coaxial waveguide and the transition from waveguide (**18**) to the continuing waveguide (**17**) is designed as an impedance level transformer by means of cross-section variations (**18***a*, **18***b*) of the inner conductor (**18'**) of the coaxial waveguide.

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**4,293,830**

## MICROSTRIP DELAY LINE COMPENSATED FOR THERMAL PHASE VARIATIONS

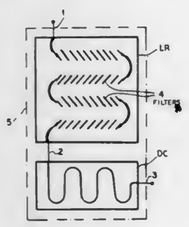
**Luciano Accatino, Turin, Italy, assignor to CSELT, Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy**

**Filed Oct. 23, 1979, Ser. No. 87,647**

**Claims priority, application Italy, Dec. 29, 1978, 69976 A/78**

**Int. Cl.³ H01P** *9/00, 1/30*

**U.S. Cl. 333—161** **5 Claims**



1. A method of transmitting microwaves along a signal path with a substantially temperature-independent phase shift within a predetermined temperature range, comprising the steps of cascading a microstrip delay line having a first thermal coefficient of dielectric-constant variation with a microstrip transmission line having a second thermal coefficient of dielectric-constant variation of a sign opposite that of said first thermal coefficient, and making said transmission line of a length substantially compensating for thermal phase variations of said delay line within said predetermined temperature range.



**4,293,831**

## MONOLITHICALLY INTEGRATED CHARGE TRANSFER CIRCUIT

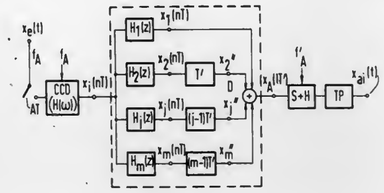
**Rainer Lueder, Oberhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Feb. 25, 1980, Ser. No. 124,128**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912745**

**Int. Cl.³ H03H** *17/06;* **G11C** *19/28, 27/02*

**U.S. Cl. 333—165** **4 Claims**



1. In a monolithically-integrated charge transfer device with a singal scanner, a first clock-controlled metalinsulator-semiconductor charge transfer and which is supplied with charge packets by the signal scanner, and which has a clock-controlled output stage connected to the first charge transfer system, the improvement therein comprising:

at least two additional metal-insulator-semiconductor clock-controlled charge transfer systems each including an input connected in common to the first charge transfer system and an output connected in common with each other so as to be in parallel;

each of said parallel charge transfer systems forming a filter and each constructed to have a respective different delay time;

sampling means connected to said common outputs for sampling the same at a frequency that is higher than that of the scanner; and

a low pass filter connected to said sampling means for smoothing the output of the sampling means.

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**4,293,832**

## TRANSVERSAL CHARGE TRANSFER FILTER

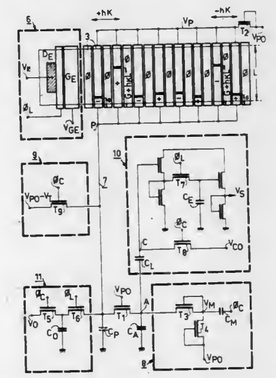
**Jean L. Berger, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Apr. 1, 1980, Ser. No. 136,375**

**Claims priority, application France, Apr. 6, 1979, 79 08789**

**Int. Cl.³ H03H** *15/02, 17/02;* **G11C** *19/28*

**U.S. Cl. 333—165** **6 Claims**



1. A transversal charge transfer filter comprising a semiconductor substrate covered by an insulating layer on which transfer electrodes alternate with charge-storing electrodes, wherein one storage electrode out of two is cut into two parts and the weighting coefficients are elaborated by reading means connected at a point P to a part of each cut storage electrode, which read negatively the charges leaving a so-called negative cut storage electrode and positively the charges arriving under the next so-called positive cut storage electrode.

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**4,293,833**

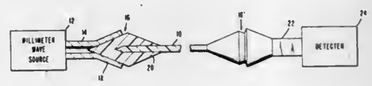
## MILLIMETER WAVE TRANSMISSION LINE USING THALLIUM BROMO-IODIDE FIBER

**Adrian E. Popa, Newbury Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed Nov. 1, 1979, Ser. No. 90,233**

**Int. Cl.³ H01P** *3/16*

**U.S. Cl. 333—239** **14 Claims**



1. A transmission line comprising:

a fiber of co-crystalized thallium bromo-iodide consisting of from about 40 mole percent to about 46 mole percent thallium bromide and from about 60 mole percent to about 54 mole percent thallium iodide, and

means for launching electromagnetic waves of a wavelength ranging from about 10 millimeters to about 0.4 millimeter onto said fiber.

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**4,293,834**

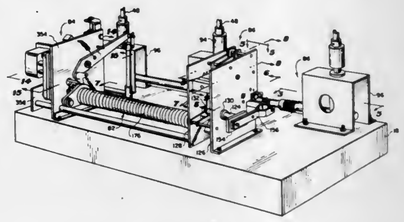
## LOAD BREAK SWITCH

**K. Henry Date, and Ronald Wainio, both of South Milwaukee, Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.**

**Filed Sep. 6, 1978, Ser. No. 940,104**

**Int. Cl.³ H01H** *3/30*

**U.S. Cl. 335—76** **4 Claims**



1. An operating mechanism for operating a disconnect switch having at least one pair of separable contacts movable to open and closed positions, which comprises:

a frame;

an operating shaft supported by the frame for rotation between a closed position and an open position, an output shaft being operably connected to effect opening of the disconnect switch when the output shaft is rotated from its closed position to its open position, and to effect closing of the disconnect switch when the output shaft is rotated from its open position to its closed position;

releasable latching means, for stopping and holding the output shaft in either its closed or opened positions;

solenoid actuated latch releasing means for momentarily releasing the latching means;

manually actuated latch releasing means for momentarily releasing the latching means;
torsion spring means for rotating the output shaft in one direction between its opened and closed positions;
motor actuated spring charging means for charging the torsion spring in one direction to a preset value of stored energy after each opening or closing operation;
manually actuated spring charging means for charging the torsion spring in one direction to said preset value of stored energy; and
latch locking means, for locking the latching means so that it can not be released by either the solenoid actuated or manually actuated latch releasing means, whenever the operating shaft is in its opened position and the energy stored by the torsion spring means is less than a preset value.

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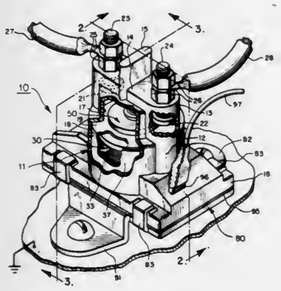
**4,293,835**

## SOLENOID FOR AN ELECTRIC STARTING MOTOR FOR GARDEN TRACTOR OR THE LIKE

**Robert K. Davis, Kankakee, Ill., and Michael J. Myers, Goshen, Ind., assignors to Roper Corporation, Kankakee, Ill. and Electromation, Inc., Elkhart, Ind.**

**Filed Jan. 28, 1980, Ser. No. 115,875**
**Int. Cl.³ H01H *50/02***
**U.S. Cl. 335—131** **14 Claims**



1. A solenoid for an electric starting motor for a garden tractor or the like comprising, in combination a housing in the form of a generally cylindrical inverted cup of molded plastic having a closed end wall and having an outwardly extending flange at its open end, a pair of diametrically arranged fixed contacts having a substantial cross section penetrating the end wall and being threaded externally thereof to form binding posts for a load circuit, a magnetic assembly including a cylindrical wound bobbin having an armature axially slidable therein with the bobbin being completely surrounded by a hollow magnetic annulus having axial clearance openings at its respective ends, means for holding the annulus axially within the open end of the cup, a movable contact assembly including a conductive disc for completing a circuit between the fixed contacts and having an axial plunger which projects from one side of the disc through the adjacent one of the clearance openings in the annulus and also having a return coil spring extending axially from the opposite side of the disc to the end wall, the end of the plunger being seated against the adjacent end of the armature, the armature when in its normal retracted position extending through the remote one of the clearance openings to a position outside of the annulus so that when control current is applied to the winding on the bobbin the armature is sucked into the annulus overcoming the force of the return spring and shifting the conductive disc into seated engagement with the fixed contacts thereby completing the load circuit, the disc and fixed contacts both having substantial axial thickness to provide high heat capacity and formed of a metal having high conductivity for flow of heat to the binding posts thereby to reduce the rise in temperature within the housing, the fixed contacts being spaced from the disc axis at a sufficient distance so that only a portion of the presented area of the fixed contacts is engaged by the edge portion of the disc thereby to develop a high contact pressure per unit area, the disc being freely rotatable with respect to the fixed contacts so that contact with the latter occurs in random positions on the disc for constant renewal of the contacting surface thereon.

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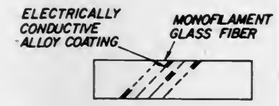
**4,293,836**

## ELECTRICAL FUSE WITH AN IMPROVED FUSIBLE ELEMENT

**Hiroo Arikawa, Tokyo, Japan, assignor to San-O Industrial Co., Ltd., Tokyo, Japan**

**Filed Jul. 11, 1979, Ser. No. 56,533**
**Int. Cl.³ H01H *85/04***
**U.S. Cl. 337—290** **2 Claims**




1. A fusible element for use in electrical fuses, said fusible element consisting of a support member made from a monofilament yarn of glass quartz fiber and a metallic alloy coating on the exterior surface of said support member, said metallic alloy consisting essentially of silver, copper, tin and antimony.

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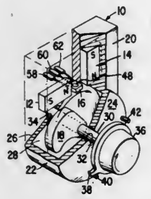
**4,293,837**

## HALL EFFECT POTENTIOMETER

**Wolfgang Jaffe, Roselle Park, and Bruce R. Rogan, Somerville, both of N.J., assignors to The Singer Company, Stamford, Conn.**

**Filed Jul. 23, 1980, Ser. No. 171,512**
**Int. Cl.³ H01L *43/04***
**U.S. Cl. 338—32 H** **8 Claims**



1. A potentiometer comprising a pair of magnets having their fields in quadrature, and a solid state Hall effect sensor with input and output terminals connected thereto, the magnets and sensor being located in a fixed spatial relationship with the sensor between the magnets and the magnets having their axes mutually perpendicular but parallel and perpendicular respectively with respect to the broad plane of the sensor in positions wherein flux from the magnets at least partially cancels in the sensor, said potentiometer further including a ferromagnetic member movable in a defined manner relative to the sensor and flux from the magnet, the ferromagnetic member having a predetermined asymmetrical shape resulting in a linearly varying voltage across said output leads throughout a range of movement of the ferromagnetic member while a constant voltage is applied to the input terminals.

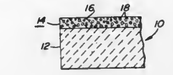


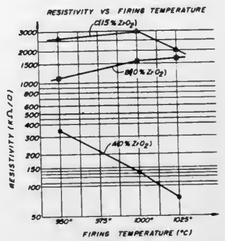
**4,293,838**

## RESISTANCE MATERIAL, RESISTOR AND METHOD OF MAKING THE SAME

**Richard L. Wahlers, Churchville, Pa., and Vernon E. Osborne, Boone, N.C., assignors to TRW, Inc., Cleveland, Ohio**

**Filed Jan. 29, 1979, Ser. No. 7,433**
**Int. Cl.³ H01C *1/012***
**U.S. Cl. 338—308** **23 Claims**






1. An electrical resistor of relatively high resistivity and rugged physical characteristics comprising an insulating substrate and a layer of resistor material on a surface of the substrate, the resistor material including a conductive phase of particles of tin oxide embedded in and dispersed throughout a glass which includes an insulating material containing an oxide of zirconium, the glass and insulating material being present in an amount up to about 70% by volume of the resistor material.

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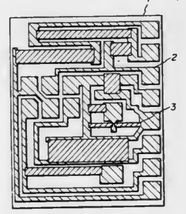
**4,293,839**

## THICK FILM RESISTOR

**Eiichi Asada, Tokyo; Toshio Inokuma, Fujisawa, and Isao Egawa, Tachikawa, all of Japan, assignors to Shoei Chemical Incorporated, Tokyo, Japan**

**Filed Mar. 12, 1980, Ser. No. 129,784**
**Claims priority, application Japan, Mar. 13, 1979, 54-29081**
**Int. Cl.³ H01C *1/012***
**U.S. Cl. 338—309** **6 Claims**



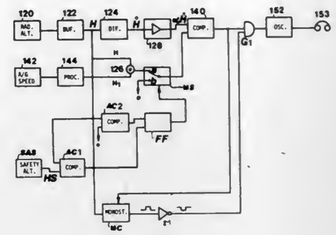
1. A thick film resistor, comprising: an electrically insulating substrate; a resistive film element on said substrate, said resistive film element consisting essentially of (A) 100 parts by weight of $RuO_2$ and glass, and (B) 0.1 to 15 parts by weight of Au, wherein the ratio of $RuO_2$ to glass is effective to provide the desired resistance of said thick film resistor; and electrodes on said substrate and overlapped with the terminal portions of said resistive film element, said electrodes containing not less than 50 weight percent of Ag.

**4,293,840**

## EXCESSIVE DESCENT-RATE WARNING SYSTEM PARTICULARLY USEFUL FOR HELICOPTERS

**Gideon Hadari, Ramat Hasharon, Israel, assignor to Israel Aircraft Industries Ltd. and Ben Gurion Industries Ltd., both of, Israel**

**Filed Sep. 11, 1979, Ser. No. 74,524**
**Claims priority, application Israel, May 25, 1978, 57402; Sep. 20, 1978, 55605**
**Int. Cl.³ G08B *21/00*; G01C *5/00***
**U.S. Cl. 340—27 AT** **11 Claims**



1. An excessive descent-rate warning system particularly useful for helicopter aircraft, characterized in that it includes means for measuring the aircraft altitude and for producing an altitude signal corresponding thereto; means for differentiating the altitude signal and for producing a descent-rate signal corresponding to the rate of change of the altitude signal; comparator means for comparing the altitude and descent-rate signals and for producing a warning signal whenever the descent-rate exceeds the maximum one for the respective altitude according to a predetermined relationship, which relationship includes an offset value defining the maximum descent-rate at "0" altitude; means for measuring the forward speed of the aircraft and for producing a forward-speed signal corresponding thereto; and forward-speed controlled means for causing an increase in said forward-speed signal to reduce said offset and thereby to decrease the maximum descent-rate at "0" altitude which produces said warning signal; said forward-speed controlled means including a sensitivity selector presettable by the pilot to permit him to preset the rate at which said latter means will reduce said offset.

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**4,293,841**

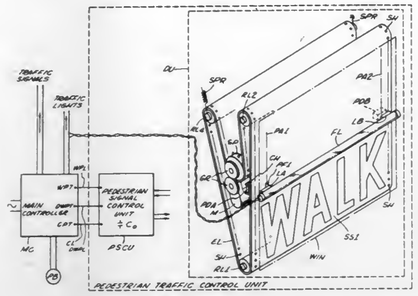
## PEDESTRIAN TRAFFIC CONTROL SYSTEM

**Thomas R. Potter, Los Alamitos, Calif., assignor to Detector Systems, Inc., Cypress, Calif.**

**Filed Aug. 3, 1978, Ser. No. 930,576**
**Int. Cl.³ G08G *1/09*; G09F *11/28, 11/16*; G08B *21/00***
**U.S. Cl. 340—44** **18 Claims**

1. A pedestrian traffic signal for displaying a traffic sign in a display position comprising:
an endless sign with indicia thereon;
support means to support the endless sign to place at least one of the indicia in the display position;
motion means connected to the endless sign and to a power supply to move the endless sign past the display position;
position detection means to detect the position of the indicia with respect to the display position; and
control means responsive to the position detection means to control the motion means to place a desired indicia on the

endless sign in the display position, the control means including a fail-safe means to detect failure of the power




supply and in response thereto place a previously selected indicia in the display position.

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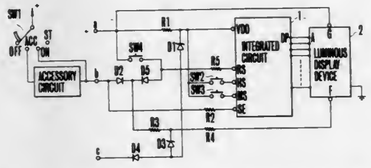
**4,293,842**
**ELECTRONIC DISPLAY DEVICE FOR USE IN MOTOR CARS**
**Toyonaru Tanaka, Tokyo, and Hideki Naito, Koganei, both of Japan, assignors to Jeco Co., Ltd., Kawasaki, Japan**
**Filed Jul. 25, 1979, Ser. No. 60,474**
**Claims priority, application Japan, Jul. 31, 1978, 53-105310[U]; Dec. 13, 1978, 53-170367[U]**
**Int. Cl.³ G08B *19/00***
**U.S. Cl. 340—52 F** **6 Claims**



1. An electronic display device for use in a motor car, comprising manually operated switch means for changing contents displayed by said display device, and a control circuit actuated by a signal generated by an engine key switch of said motor car, said control circuit including means responsive to the operation of said manually operated switch means for switching over the contents displayed by said display device.

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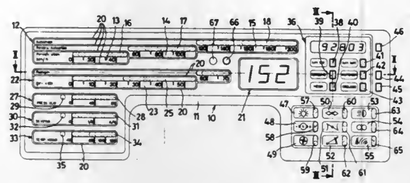
**4,293,843**
**MOTORCAR DASHBOARD**
**Luciano Bertoloni; Edoardo Rogora, both of Milan, and Ermanno Cressoni, Garbagnate, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy**
**Filed Aug. 3, 1979, Ser. No. 63,566**
**Claims priority, application Italy, Aug. 24, 1978, 26977 A/78**
**Int. Cl.³ B60Q *11/00***
**U.S. Cl. 340—52 F** **12 Claims**

1. A dashboard for a motor vehicles, said dashboard comprising a single panelboard including at least one speedometer scale with a pointer for indicating the speed of the vehicle and at least one engine RPM meter scale with a pointer for indicating the RPM of the vehicle engine, wherein said single panelboard further includes a number of control members and a first display controlled by said control members for selective indication of a corresponding number of measured physical magnitudes said speedometer having a bar-type scale partitioned into sectors, each sector comprising graduations of preselected values of the speed of the vehicle, the graduations of each



sector being arranged staggered relative to those of the preceding sector.

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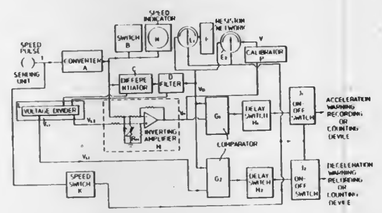
**4,293,844**
**VARIABLE ACCELERATION MONITORING SYSTEM**
**Hermann Ruhl, 30 Queen Elizabeth Blvd., Etobicoke, Ontario, Canada**
**Filed Apr. 29, 1980, Ser. No. 144,889**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—52 R** **14 Claims**



1. An acceleration monitoring system for monitoring the rate of acceleration of a motor driven vehicle, said system comprising in combination, speed measuring means providing an outout signal proportionate to and changing with the speed of the vehicle; acceleration measuring means providing an output signal corresponding to rate of change of the output signal from said speed measuring means; acceleration warning switch means with a variable switch point for switching at predetermined rates of acceleration; speed sensing means controlling the switch means and changing the switch point according to the predetermined rates of acceleration in relation to speed, said switch means being responsive to the output signal from said acceleration measuring means and monitoring means activated by said switch means.

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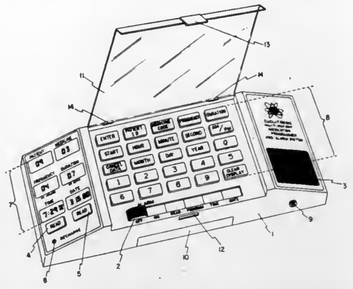
**4,293,845**
**ELECTRONIC MULTI-PATIENT MEDICATION-TIME-INTAKE PROGRAMMER AND ALARM SYSTEM**
**Antony-Euclid C. Villa-Real, 2512 Capistrano Ave., Las Vegas, Nev. 89121**
**Filed Apr. 17, 1980, Ser. No. 141,127**
**Int. Cl.³ G08B *7/00***
**U.S. Cl. 340—309.3** **22 Claims**

1. An electronic monitoring and alarm system for the time-intake of medications, comprising program entry and storage means for entering and storing a selected frequency of time, and for entering and storing a selected type of medication means for converting said selected frequency and medication to a visual display thereby permitting instant recognition of the programmed data, sequencing means for receiving a start signal and being responsive to clock signals, means responsive to the sequencing means and selected frequency data for producing an audible signal, thereby indicating that the pro-





grammed frequency of time for the selected medication has elapsed.

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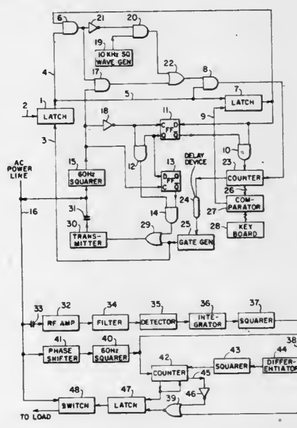
**4,293,846**
**REMOTE SELECTIVE SWITCHING SYSTEM FOR USE WITH AC POWER LINE**
**William W. Allison, Huntington Station, N.Y., assignor to Pilgrim Electric Company, Plainview, N.Y.**
**Filed Aug. 27, 1979, Ser. No. 69,699**
**Int. Cl.³ H04B *3/54***
**U.S. Cl. 340—310 A** **8 Claims**




1. A remote selective system comprising
(a) means coupled to an a-c power line at a control station for producing and applying to said line two r-f pulse bursts separated by an interval containing a whole number of complete clock cycles, said number designating a controlled station to be selected, said means coupled to an a-c power line including,
(b) a radio transmitter,
(c) a control station counter adapted to count clock cycles up to a predetermined number N and then produce an output,
(d) means for presetting said control station counter to a number equal to N minus said number designating the selected controlled station,
(e) means for actuating said transmitter to produce a first r-f pulse burst and start said control station counter,
(f) means responsive to said control station counter output on the count of N for actuating said transmitter to produce a second r-f pulse burst,
(g) at least one controlled station including r-f receiver means coupled to an a-c power line, said r-f receiver means including,
(h) controlled station counter means adapted to start counting said clock cycles upon reception of a first r-f pulse burst and to stop counting when the number designating said control station is reached, simultaneously producing an output, and
(i) means responsive to said counter means output and coincident reception of a second r-f pulse burst to actuate a switch.

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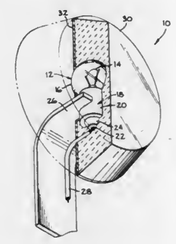
**4,293,847**
**WATERPROOF SIGNAL LIGHT**
**Daniel A. McCarty, 3182 Old San Jose Rd., Soquel, Calif. 95073**
**Filed May 29, 1979, Ser. No. 43,456**
**Int. Cl.³ G08B *5/22***
**U.S. Cl. 340—332** **6 Claims**



1. A waterproof signal light which comprises
an electric light bulb having a filament enclosed by a transparent member and connected at its opposite extremities to two terminals in a base supporting said transparent member,
first and second conductive leads connected to and extending from said terminals, and
means completely and sealingly encapsulating said bulb and portions of said leads where connected to said bulb;
said first conductive lead being formed by relatively massive and heat conductive material in the form of a rigid bracket adapted to mount the entire unit from an exterior support.

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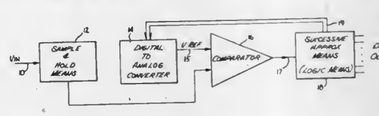
**4,293,848**
**MOS ANALOG-TO-DIGITAL CONVERTER**
**Edmund K. Cheng, Sunnyvale, and Wiley E. Hill, Cupertino, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.**
**Continuation of Ser. No. 828,254, Aug. 26, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,284**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 AD** **2 Claims**




1. An MOS analog-to-digital converter comprisng:
input means coupled for receiving an input signal and for capacitively dividing it by two;
a digital-to-analog converter, said converter including a first resistance ladder comprising a plurality of parallel first resistor strings each having a plurality of resistors separated by taps and switching means for selecting said taps to provide output reference signals, and a second resistance ladder comprising a plurality of second resistor

strings interlaced with said first resistor strings, said first ladder coupled to said second ladder;

comparator means coupled to receive said capacitively divided signal from said input means and said reference signals for comparing said signals;

logic means for controlling said digital-to-analog converter so as to select one of said reference signals most comparable to said analog signal, said logic means coupled to said digital-to-analog converter and to said comparator means;

whereby said second ladder provides a consistent reduction of a potential applied to said digital-to-analog converter and permits switching of said reference signals without bootstrapping.

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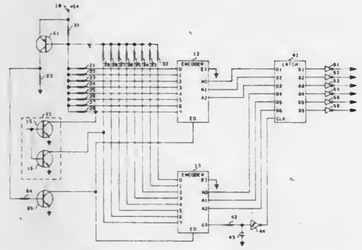
**4,293,849**

## KEYBOARD ENCODER USING PRIORITY ENCODERS

**Robert H. Lacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed May 23, 1979, Ser. No. 41,590**
**Int. Cl.³ G06F *3/02***
**U.S. Cl. 340—365 S** **8 Claims**



1. A keyboard encoder comprising:

a plurality of switching means, each of said plurality of switching means having at least two outputs;

a first priority encoder having a plurality of data inputs and a plurality of data outputs;

a second priority encoder having a plurality of data inputs and a plurality of data outputs;

a voltage supply;

means for electrically connecting the data inputs of said first priority encoder to said voltage supply;

means for electrically connecting the data inputs of said second priority encoder to said voltage supply;

means for connecting a first one of the outputs from each of said plurality of switching means to a respective one of the data inputs of said first priority encoder;

means for electrically connecting a second one of the outputs from each of said plurality of switching means to a respective one of the data inputs of said second priority encoder;

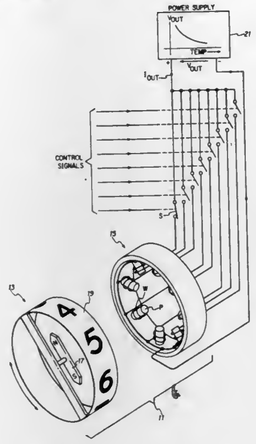
means for combining the data outputs of said first priority encoder with the data outputs of said second priority encoder to form a combined binary output, the closure of one of said plurality of switching means enabling said first priority encoder to provide a binary output representative of the particular data input of said first priority encoder which is electrically connected to said one of said plurality of switching means which is closed and enabling said second priority encoder to provide a binary output which is representative of the particular data input of said second priority encoder which is electrically connected to said one of said plurality of switching means which is closed, said combined binary output being representative of the one of said plurality of switching means which is closed.

**4,293,850**

## TEMPERATURE COMPENSATED ROTARY POSITIONER

**Lothar H. Bullinga, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Feb. 25, 1980, Ser. No. 124,195**
**Int. Cl.³ G08B *5/00***
**U.S. Cl. 340—378.5** **5 Claims**




1. In a rotary positioning system of the type comprising (i) prime movement means comprising a rotor, stator, and a plurality of windings disposed at different angular positions around one of said stator and rotor, and (ii) selecting means for selectively connecting at least one winding to an energizing source thereby causing the rotor to rotate to a predetermined position, an improved energizing source comprising means for supplying a temperature-variable voltage or current which automatically varies in a predetermined manner with temperature so as to lessen inherent temperature-caused variation in damping of the prime movement means rotor.

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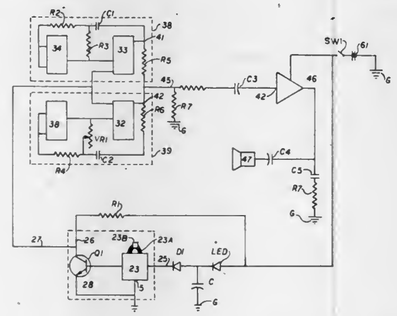
**4,293,851**

## SOUND ACTUATOR

**Earl Beyl, Jr., 4803 S. 5th St., Louisville, Ky. 40202**

**Filed Oct. 29, 1979, Ser. No. 88,779**
**Int. Cl.³ G08B *3/00***
**U.S. Cl. 340—384 E** **11 Claims**




1. A horn and actuator circuit to provide selective actuation and deactuation of horn means including:

(a) horn means located on a vehicle adapted to travel on cooperative track means;



(b) power supply means to supply direct current electric power to said horn means;

(c) switch means carried by said vehicle to control supply of power from said power supply means to said horn means;

(d) magnetic field sensitive switch actuator means carried by said vehicle to actuate said switch means between first conductive state and second nonconductive state and including magnetic field sensing, means where said actuator means is sensitive to magnetic fields of first and second polarity to position said switch in said first state in response to magnetic field of said first polarity and to position said switch in said second position in response to magnetic field of said second polarity; and

(e) at least two spaced magnetic field sources of different polarity positioned adjacent said tract means to relatively provide magnetic fields of said first and second polarity to said switch actuator means.

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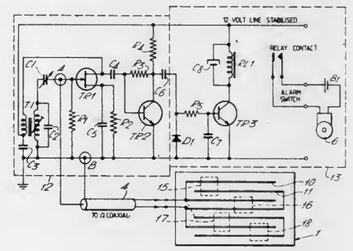
**4,293,852**

## CAPACITIVE ARTICLE REMOVAL ALARM

**Groby W. Rogers, London, England, assignor to Lawrence Security Services Ltd., London, England**

**Filed Dec. 5, 1979, Ser. No. 100,372**
**Claims priority, application United Kingdom, Dec. 8, 1978, 47724/78**
**Int. Cl.³ G08B *13/14***
**U.S. Cl. 340—568** **5 Claims**




1. An alarm system for indicating the removal of an article from a predetermined position comprising:

(a) sensing circuit means including

(i) two electrical conductors spaced from but adjacent each other and for positioning adjacent to the predetermined position to be occupied by at least one article when in use, and

(ii) signal generating means responsive to the capacitance present between these conductors to provide a first output condition indicative of substantially constant capacitance present between these conductors due to the undisturbed presence of said at least one article and to provide a second output condition indicative of a change in capacitance value present due to the disturbance of said at least one article, and

(b) alarm actuator means responsive to the output of said sensing circuit means to provide an alarm indication responsive to said second output condition of said sensing circuit means.

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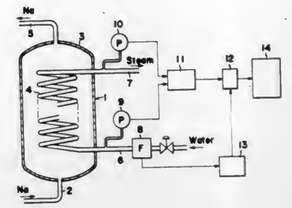
**4,293,853**

## METHOD AND APPARATUS FOR DETECTING FLOW INSTABILITY IN STEAM GENERATOR

**Jun Kubota, Tokyo, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan**

**Filed Feb. 27, 1980, Ser. No. 125,176**
**Claims priority, application Japan, Mar. 8, 1979, 54/26983**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—611** **5 Claims**

2. An apparatus for detecting the flow instability in steam generators comprising: a differential pressure detector for detecting the difference between the water pressure in a feedwater pipe and the steam pressure in a steam pipe of the steam generator; a bias signal generator which responds to a flow rate signal transmitted from a flow meter installed in the feedwater pipe and generates a signal corresponding to a limit value on the differential pressure between the waterside inlet and outlet,




said limit value defining the onset of the flow instability at a measured feedwater flow rate; a comparator for comparing the output from the differential pressure detector with that from the bias signal generator and outputting a comparison result; and an alarm means which responds to the comparison result obtained by the comparator.

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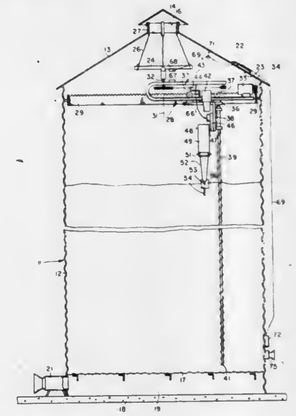
**4,293,854**

## MONITOR MEANS AND METHOD FOR GRAIN BIN

**William L. Gookins, R.R. 1, Box 49, Attica, Ind. 47918, and Junior K. King, R.R. 1, Box 106A, Russiaville, Ind. 46979**

**Filed Jul. 30, 1979, Ser. No. 61,770**
**Int. Cl.³ G08B *21/00*; G01N *11/14***
**U.S. Cl. 340—615** **17 Claims**



1. A method of monitoring condition of stored contents of a storage vessel comprising the steps of:

locating a contents condition sensor in said stored contents;

power driving and thereby transferring said sensor primarily horizontally through said contents and at a substantially uniform depth below the surface of said contents;

using the surface of the contents for at least partially supporting the sensor so that the sensor elevation is coordinated with the content surface elevation to follow surface contour and maintain said depth as said sensor is driven; and

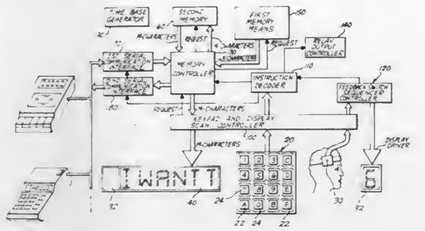
producing a signal in response to change of condition of said contents sensed by said sensor.

**4,293,855**

## COMMUNICATION DEVICE

**Arthur T. Perkins, 3120 107th Ave. SE., Bellevue, Wash. 98004**

**Filed Dec. 31, 1979, Ser. No. 108,412**
**Int. Cl.³ G06F *3/14***
**U.S. Cl. 340—712** **19 Claims**




1. A communication device comprising:

(a) keyboard means having a plurality of keys operable to establish the communication device operational mode and entry code to thereby create the alphanumeric characters forming the message to be communicated, or to select one of a plurality of predetermined messages to be communicated;

(b) user operable feedback switch means including a display sequentially presenting to the user a representation of each key on said keyboard means, said feedback switch means being operable during the time a key is represented to replicate actuation of the corresponding key on said keyboard means;

(c) display means presenting either the message to be communicated as it is being created by the user or the selected predetermined message; and,

(d) housing means having a first face for mounting said keyboard means and said user operable feedback switch means including said sequential display means, and a second face at an acute angle with respect to said first face for mounting said display means.

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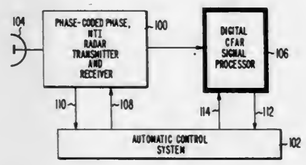
**4,293,856**

## DIGITAL CFAR SIGNAL PROCESSOR FOR PHASE CODED RADARS

**Andrew G. Chressanthis, Philadelphia, Pa.; Henry M. Halpern, Cherry Hill, and Brian P. Gaffney, Medford Lakes, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Oct. 26, 1979, Ser. No. 88,565**
**Int. Cl.³ G01S *13/00, 13/52***
**U.S. Cl. 343—5 CF** **6 Claims**




1. In the combination of a moving target indicator (MTI) radar and a digital constant false alarm rate (CFAR) signal processor for use with an automatic control system, wherein said radar derives separate in-phase and quadrature-phase detected signals in response to received echoes of transmitted exploratory pulses each of which pulses is phase-coded at a given frequency in accordance with a serial code of no more than n bits, wherein n is a first predetermined plural integer, said serial code having a duration which is short relative to that of a given range interval, the improvement wherein said digital CFAR signal processor comprises:

first means having said in-phase detected signal applied as an input thereto and second means having said quadrature-phase detected signal applied as an input thereto, each of said first and second means including an analog-to-digital converter and an MTI canceller for sampling its applied detected signal at a rate at least twice that of said given frequency over substantially said given range interval of each of a plurality of successive exploratory pulses to derive an MTI residue output signal in the form of a series of m-bit digital numbers each corresponding to the algebraic value of the respective samples of the instantaneous amplitude of the residue over said given range interval, wherein m is a second predetermined plural integer and one of said m bits represents the sign of the polarity of the instantaneous amplitude of said residue,

digital function-generator means responsive to the absolute digital value of the m-bits of the first-means residue output signal corresponding to each successive sample and to the absolute digital value of the m-bits of the second-means residue output signal corresponding to that sample for deriving a first p-bit digital signal corresponding to the absolute value of the cosine of the arctangent of the phase angle defined by the residue output signals of said first and second means for that sample and for deriving a second p-bit digital signal corresponding to the absolute value of the sine of the arctangent of the phase angle defined by the residue output signals of said first and second means for that sample,

third means for digitally adding the sign bit of the m-bits of the first-means residue output signal of each successive sample to the first p-bit digital signal for that sample to derive a first (p+1) bit digital signal for that sample and for adding the sign bit of the m-bits of the second-means residue output signal of each successive sample to the second p-bit digital signal for that sample to derive a second (p+1) bit digital signal for that sample,

correlation means including a first n-bit correlator for digitally correlating successive running sequences of n successive ones of said first (p+1) bit digital signals with said n-bit serial code and a second n-bit correlator for digitally correlating successive running sequences of n successive ones of said second (p+1) bit digital signals with said n-bit serial code,

fourth means for digitally summing the squares of each successive digital correlation by said first and second correlators to produce a digital valued output signal therefrom for each of said successive correlations, and

threshold comparator means having the output of said fourth means and a variable-threshold digital-valued signal applied as respective inputs thereto for deriving a digital CFAR output therefrom only when the digital value of the output signal from said fourth means exceeds the digital value of said threshold signal.

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**4,293,857**

## COLLISION AVOIDANCE WARNING SYSTEM

**Edwin L. Baldwin, Oakwood Garden Apts. So., Apt. Z-204 & 60 Saratoga Ave., San Jose, Calif. 95129**

**Filed Aug. 10, 1979, Ser. No. 65,749**
**Int. Cl.³ G01S *13/74***
**U.S. Cl. 343—6.5 R** **13 Claims**

1. A method of detecting a potential collision between a primary aircraft and a secondary aircraft flying in an area containing a known-location standard very-high-frequency omni-directional range-distance measuring ground station (or equivalent) and a known-location air surveillance radar of the rotating antenna type provided with an interrogator, the steps of:

(1) determining on the primary aircraft the bearing angle and distance from said omnidirectional range-distance measuring ground station, whereby to establish the position of the primary aircraft,

(2) calculating the radar range distance c between the radar and the primary aircraft, based on the known positions of the primary aircraft, the radar and the ground station,

(3) receiving an interrogation pulse at the primary aircraft from the radar,

(4) receiving at the primary aircraft the resultant transponder response signal from the secondary aircraft,

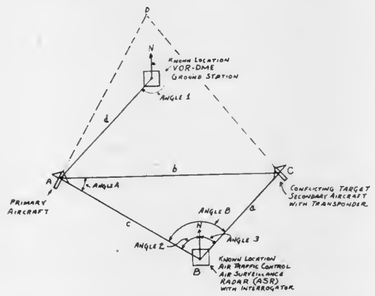
(5) measuring the time difference between receipt of said interrogator pulse and said transponder response signal at the primary aircraft,

(6) calculating the angle B between the bearing vector from the radar to the primary aircraft and the bearing vector from the radar to the secondary aircraft in accordance with said time difference as related to the known rotational period of the radar antenna,

(7) receiving at the primary aircraft the side lobe energy of each primary radar pulse from the radar,

(8) calculating the value x, which is the sum of the radar






range distance between the radar and the secondary aircraft and the distance between the two aircraft, in accordance with the time difference at the primary aircraft between receipt at the primary aircraft of the side lobe energy of the primary radar pulse synchronous with the interrogation to which the secondary aircraft responds and receipt at the primary aircraft of the transponder response signal from the secondary aircraft,

(9) calculating the distance from the secondary aircraft to the primary aircraft based on the known or previously calculated values of x, c and angle B, and

(10) calculating the bearing angle from the secondary aircraft to the primary aircraft based on the known angle B, the known bearing angle from the radar to the primary aircraft and the previously calculated distances between the primary aircraft, the secondary aircraft and the radar, whereby to establish the positional data of the secondary aircraft with respect to the primary aircraft.

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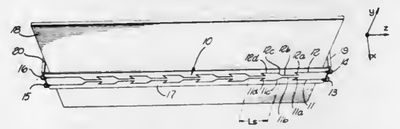
**4,293,858**

## POLARIZATION AGILE MEANDER LINE ARRAY

**George A. Hockham, Valencia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Nov. 23, 1979, Ser. No. 97,000**
**Int. Cl.³ H01Q *11/04, 15/24***
**U.S. Cl. 343—731** **10 Claims**



1. A polarization agile system with a meander line antenna array, comprising:

at least one periodic linear array having a first longitudinally extending meander line and a second relatively close-spaced longitudinally extending meander line, said lines being mirror images of each other and both lying in a first plane;

means within each of said meander lines comprising a plurality of longitudinally spaced radiating strips disposed in said first plane and each at the same angle with respect to the longitudinal center line of said linear array, and connecting conductors between adjacent ones of said radiating portions to provide a continuous series conductive path throughout each of said meander lines;

a conductive ground plane substantially parallel to said first plane and spaced therefrom by a first spacing;

and radio frequency feed means for end feeding said meander lines in a predetermined phase relationship to provide a corresponding plane of polarization for said array.

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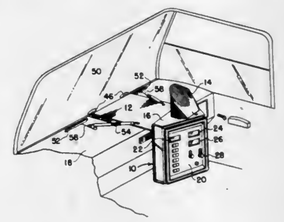
**4,293,859**

## TRAFFIC RADAR UNIT

**Edward W. Sergent, Chanute, Kans., assignor to M. P. H. Industries, Inc., Chanute, Kans.**

**Filed Sep. 14, 1979, Ser. No. 75,425**
**Int. Cl.³ H01Q *1/32***
**U.S. Cl. 343—702** **12 Claims**



1. A one-piece traffic radar unit comprising:

a housing having a top and containing Doppler radar apparatus capable of generating a microwave radar signal and processing return signals to provide an output that indicates the speed of a target vehicle;

a boom secured to said housing adjacent said top and extending therefrom for mounting the housing in a patrol vehicle to install the radar unit therein said boom being adapted to overlie the dashboard of the patrol vehicle with the housing depending from the boom in front of the dashboard;

means for securing said boom to said patrol vehicle on said dashboard thereof;

a directional antenna device connected with said apparatus for transmitting said radar signal and receiving said return signals, and mounted in said housing in a disposition to beam the transmitted signal along an upwardly extending path through said top of the housing; and

a reflector mounted on said top in said path for redirecting said transmitted signal along a generally horizontal path, whereby to beam the transmitted signal and receive the return signals through the windshield or a window of a patrol vehicle in which the unit is installed.

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**4,293,860**

## ANTENNA ALARM ASSEMBLY FOR VEHICLE

**Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan**

**Filed Aug. 14, 1980, Ser. No. 177,842**
**Claims priority, application Japan, Jan. 16, 1980, 55-3409[U]**
**Int. Cl.³ H01Q *1/32***
**U.S. Cl. 343—715** **4 Claims**

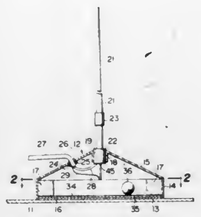
1. An antenna assembly for vehicle radio transceiver, comprising

an antenna;

a casing supporting the lower end of the antenna and including an internal space which is enclosed by a top plate, a side plate and a bottomplate;

a magnet mounted on the casing for securing the casing to a body of the vehicle by magnetic attraction;

a vibration detector for detecting any vibration caused to the casing, the detector including a d.c. power supply circuit, a printed circuit board mounted on the bottomplate of the casing, and a conductive spherical body placed on the printed circuit board, the printed circuit board being provided with a first and a second electrode each having



a plurality of mutually interdigitated fingers, one of the electrodes being connected to one terminal of the d.c. power supply circuit and the other electrode being connected to the other terminal thereof, the spherical body having a diameter which is sufficient to provide an electrical interconnection between two adjacent fingers of the both electrodes whenever it is located therebetween; and

an alarm circuit for producing an audible alarm in response to a change in the voltage which is developed in the d.c. power supply circuit as a result of a movement of the spherical body over the printed circuit board in response to the vibration applied to the casing.

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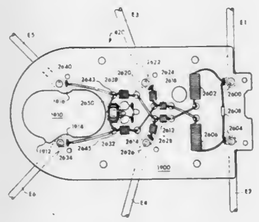
**4,293,861**

**COMPACT TELEVISION ANTENNA SYSTEM**

**John R. Winegard, Evergreen; Carey W. Shelledy, Lakewood, and Keith B. Cowan, Arvada, all of Colo., assignors to Winegard Company, Burlington, Iowa**

**Filed Jan. 8, 1980, Ser. No. 110,493**
**Int. Cl.³ H01Q *3/00, 21/00***
**U.S. Cl. 343—766** **30 Claims**



29. A low and high band VHF antenna comprising:

a longitudinal support,

a first element means mounted on said support,

a second element means mounted on said support, said first and second element means cooperating to receive low band VHF signals, said first and second element means each comprising:

(a) opposing element half sections having their inboard ends mounted to said support, and

(b) A lengthening coil connected to each inboard end and in substantial alignment with said connected half section, and

a third element means mounted on said support, said second and third element means cooperating to receive high band VHF signals, the physical spacings between said first and said second element and between said second and said third elements on said support being less than one-tenth the wavelength of the highest frequency in the high VHF band said half sections of said first element means being connected to said support and oriented to lay in a plane substantially perpendicular to the longitudinal axis of said support, said half sections of said second element means being connected to said support and oriented to form an open V-shaped configuration having an apex angle of substantially 135 degrees, the open end of the aforesaid V-shaped configuration being directed toward the front of said support, and said half sections of said third element being connected to said support and oriented to form an open V-shaped configuration having an apex angle of substantially 60 degrees, the open end of the aforesaid V-shaped configuration being directed toward the front of said support.

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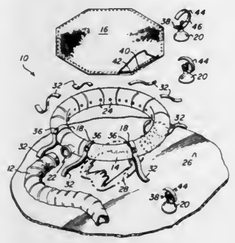
**4,293,862**

**CANOPY ASSEMBLY FOR PATCHED RADAR DOMES**

**Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.**

**Filed Jun. 6, 1980, Ser. No. 157,019**
**Int. Cl.³ H01Q *1/42;* B32B *35/00***
**U.S. Cl. 343—872** **7 Claims**



1. The canopy assembly for use with a force-fed supply of hot moist air as to cure repair patches on airborne radar domes temporarily housed therebeneath which comprises: a flexible donut-shaped air distribution sheath sized to enclose the repair patch to be cured while conforming in essentially air-tight sealed relation to the contours of the dome surrounding the latter, said sheath having an inlet on its outer surface connectable to the air supply and a plurality of air discharge openings being positioned and adapted to take the hot moist air circulating within the sheath and direct same across the patch so as to define an environment conducive to the curing thereof; anchoring means for temporarily anchoring the air distribution sheath in encircling relation to the patch, said means comprising a plurality of suction cup and strap subassemblies spaced around the sheath, the suction cup of each subassembly being detachably connectable to the surface of the dome while the strap defines a detachable connection between said cup and an adjacent portion of the sheath fastening the latter to said dome; and a shroud defining a loose-fitting protective cover over the sheath capable of permitting the air issuing from the latter to escape therefrom.

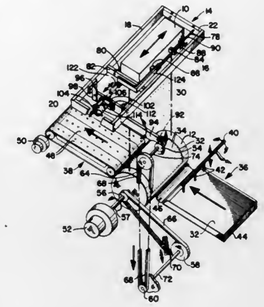


**4,293,863**

**INK JET PRINTER WITH LATERALLY MOVABLE PRINT HEAD**

**James W. Davis, Richardson, and Suresh C. Paranjpe, Dallas, both of Tex., assignors to The Mead Corporation, Dayton, Ohio**

**Filed Sep. 12, 1979, Ser. No. 75,056**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—75** **14 Claims**



1. An ink jet printer for depositing ink drops from a plurality of jet drop streams along a plurality of parallel adjacent print lines on a sheet of paper, comprising:

a sheet supporting drum,

means for rotating said drum,

print head means, slidably mounted adjacent said drum for linear movement in a direction parallel to the axis of rotation of said drum, said print head means generating a plurality of jet drop streams directed toward said drum, with adjacent streams being spaced apart in a direction parallel to the axis of rotation of said drum by a distance greater than the distance between adjacent print lines on said sheet of paper,

rotatable cam means defining a continuous camming surface,

cam drive means, interconnecting said rotatable cam means and said means for rotating said drum, for rotating said rotatable cam means, and

cam follower means for following said continuous camming surface and moving said print head means in a direction parallel to the axis of rotation of said paper supporting drum, said cam follower means comprising motion reducing means for moving said print head means in a direction parallel to the axis of rotation of said paper supporting drum by a distance substantially less than the distance which said cam follower means is moved by said rotatable cam means, such that said jet streams are directed to deposit drops along respective ones of said print lines during successive rotations of said drum.

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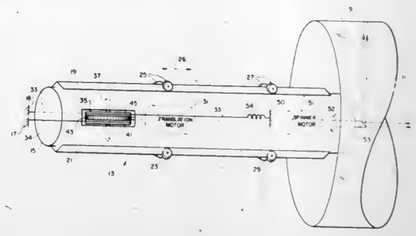
**4,293,864**

**LASER SCANNER TRANSPORT**

**Richard D. Scott, Cherry Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 24, 1980, Ser. No. 114,916**
**Int. Cl.³ G01D *15/14***
**U.S. Cl. 346—76 L** **12 Claims**

1. A high speed printer comprising, a transparent cylinder adapted to have wound on the periphery thereof a carrier containing an ink or dye with printing paper wound on top of said carrier, means to direct a modulated laser beam containing intelligence to be printed along the axis of said transparent cylinder from one side thereof, a laser scanner transport mechanism adjacent to and on the other side of said transparent cylinder, said laser scanner transport comprising, a hollow stationary frame with the center of its cross-section disposed along the axis of said transparent cylinder, a moveable housing adapted to reciprocate back and forth within said stationary frame, a rotating 45 degree mirror mounted at the end of said moveable housing nearest to said transparent cylinder, and on the axis thereof, means to rotate said 45 degree mirror around its axis, a translation motor mounted within said moveable housing, said translation motor driving a mechanical system



for providing traction between said moveable housing and said stationary frame, whereby said moveable housing will reciprocate so that said 45 degree mirror will periodically traverse the inside of said transparent cylinder from one end thereof to the other, along the axis thereof, to provide helical scanning patterns on said transparent cylinder and the paper and carrier mounted thereon.

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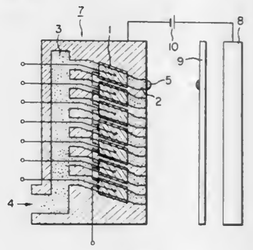
**4,293,865**

**INK-JET RECORDING APPARATUS**

**Koichiro Jinnai, Kawasaki; Masanori Horike, Tokyo; Kyuhachiro Iwasaki, Kanagawa, and Yutaka Kodama, Fujisawa, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Sep. 25, 1979, Ser. No. 78,903**
**Claims priority, application Japan, Apr. 10, 1978, 53-121430**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **7 Claims**



1. A multiple nozzle ink jet printing apparatus, comprising:

a plurality of ink jet nozzles;

a corresponding plurality of electromechanical transducers, each transducer being coupled to a corresponding nozzle to selectively apply sufficient pressure to ink therein to cause the ink to form a convex meniscus extending out of the corresponding nozzle, said ink being contained within said nozzle in the absence of a print signal applied to the corresponding transducer; and

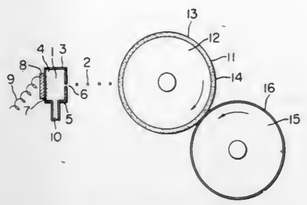
supplemental ink ejection means for applying sufficient force to said meniscus to cause said meniscus to form an ink drop, and to propel said ink drop toward a recording surface, said supplemental ink ejection means affecting only the ink associated with a nozzle or nozzles having a convex meniscus extending therefrom.

**4,293,866**

## RECORDING APPARATUS

**Seiki Takita, and Kiyomi Ichizuka, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed Dec. 3, 1979, Ser. No. 99,835**
**Claims priority, application Japan, Dec. 13, 1978, 53-154790**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **5 Claims**




1. Liquid jet recording apparatus, comprising:
an intermediate recording member comprising a supporting substrate, and a color developing layer of a liquid soluble pigment composition on said substrate,
said pigment composition comprising a comminuted pigment dispersed in a binder comprising at least one liquid-soluble resin and at least one surface-active agent, said pigment being insoluble in said liquid;
liquid jet generating means, including a piezoelectric element responsive to a print control signal for issuing a stream of liquid drops in accordance with a pattern to be printed, and means for directing said drops to impinge upon corresponding selected parts of said layer, so that said drops dissolve said binder at said selected parts, thereby rendering the associated pigment separable from said layer; and
means for transferring said separable pigment from said layer of said intermediate recording member to a recording sheet in accordance with said pattern, and for fixing the transferred pigment to said sheet.

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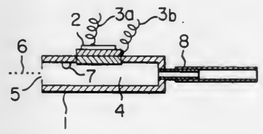
**4,293,867**

## DEVICE FOR REMOVING AIR BUBBLES FORMED AND TRAPPED IN INK CHAMBER OF PRINT HEAD OF INK-JET PRINTER

**Takuro Isayama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan**

**Filed May 6, 1980, Ser. No. 147,277**
**Claims priority, application Japan, May 14, 1979, 54-58025**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—140 R** **1 Claim**



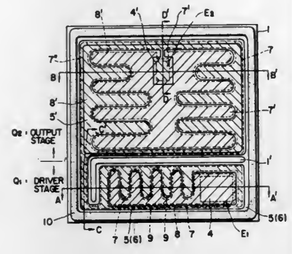

1. A device for removing air bubbles formed and trapped in an ink chamber of a print head of an ink-jet printer comprising
(a) a means for detecting the existence of air bubbles in said ink chamber,
(b) a means responsive to the output signal from said detection means for replacing the ink in the ink chamber with a liquid with a small surface tension and a low viscosity, and
(c) a means for replacing said liquid in said ink chamber with the ink.

**4,293,868**

## SEMICONDUCTOR DEVICE, METHOD OF MANUFACTURING THE SAME AND APPLICATION THEREOF

**Takashi Iizuka, Takasaki, and Masayuki Horie, Maebashi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 6, 1979, Ser. No. 9,968**
**Claims priority, application Japan, Oct. 30, 1978, 53-132677**
**Int. Cl.³ H01L *27/02***
**U.S. Cl. 357—46** **12 Claims**




1. A monolithic semiconductor device having a transistor and a Zener diode comprising:
a semiconductor substrate of a first conductivity type, having a low impurity concentration, serving as the collector of said transistor, and having a plane major surface;
a first semiconductor region of a second conductivity type opposite to said first conductivity type, disposed in a first prescribed area of said major surface except a second prescribed area of said major surface adjacent to said first prescribed area, said first semiconductor region extending to a first predetermined depth into said semiconductor substrate from said major surface, and serving as the base of said transistor;
a second semiconductor region of said first conductivity type, formed in said first semiconductor region, extending to a second predetermined depth into said first semiconductor region from said major surface, and serving as the emitter of said transistor;
a third semiconductor region of said second conductivity type, formed in said first semiconductor region except said second semiconductor region formed therein, having an impurity concentration higher than that of said first semiconductor region, said third semiconductor region extending to a third predetermined depth into said first semiconductor region from said major surface, and serving as the base contact region of said transistor;
a fourth semiconductor region of said second conductivity type, disposed in said second prescribed area of the major surface, extending to a fourth predetermined depth into said semiconductor substrate from said major surface, said fourth semiconductor region having an impurity concentration higher than that of said first semiconductor region, and serving as the contact region for one electrode of said Zener diode;
a fifth semiconductor region of said first conductivity type, formed in a portion of said semiconductor substrate immediately beneath said fourth semiconductor region adjacently to said fourth semiconductor region, said fifth semiconductor region defining a PN junction with said fourth semiconductor region, and having an impurity concentration higher than that of said semiconductor substrate, said PN junction defining the Zener-voltage of said Zener diode;
a first metal electrode disposed on said second semiconductor region and serving as the emitter electrode of said transistor;
a second metal electrode disposed on said third semiconductor region and serving as the base electrode of said transistor; and
a third metal electrode disposed on said fourth semiconductor region and serving as the electrode of said Zener diode.



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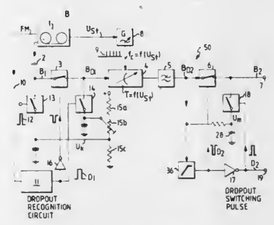
**4,293,869**

## CIRCUIT FOR REDUCING DROP-OUT ERRORS IN A VIDEO SIGNAL DERIVED FROM A RECORDING DEVICE

**Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to TED Bildplatten Aktiengesellschaft, Switzerland**

**Filed May 23, 1979, Ser. No. 41,623**
**Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822873**
**Int. Cl.³ H04N *5/76, 5/795***
**U.S. Cl. 358—8** **13 Claims**




1. A circuit for reducing drop-out errors in a video signal from a video recording apparatus comprising:
first switch means connected to the video recording apparatus for receiving the video signal and for receiving a marker pulse, said first switch means having at least one control input;
transit time means connected to said first switch means for receiving and passing at least one of the video signal and the marker pulse with a controllable transit time;
drop-out recognition means connected between the video recording apparatus and said first switch means control input for producing a flag signal with the occurrence of drop-out in the video signal, the flag signal operating on said first switch means control input to pass the marker pulse to said transit time means;
detection means connected to said transit time means for detecting the marker pulse and producing a switching pulse;
second switch means connected to said transit time means and having a control input connected to said detection means for receiving the switching pulse; and
signal forming means connected to said second switch means for producing an equivalent signal, said second switch means passing the equivalent signal to an output thereof when the switching pulse is applied to said second switch means control input.

13. A method of compensating for drop-out in a video signal from a video signal recording apparatus, comprising:
supplying the video signal to a transit time circuit having a controllable transit time for correcting time errors in the video signal;
disconnecting the video signal from the transit time circuit upon the occurrence of drop-out in the video signal and simultaneously supplying a marker voltage pulse to the transit time circuit;
detecting the occurrence of drop-out in the video signal for disconnecting the video signal from the transit time circuit and for supplying the marker voltage pulse to the transit time circuit;
detecting the video signal and marker voltage pulse coming from the transit time circuit to produce a switching signal corresponding to the occurrence of the marker voltage pulse; and
applying an equivalent voltage signal to the video signal upon the occurrence of the switching signal.

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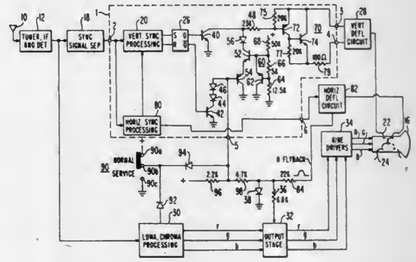
**4,293,870**

## CIRCUIT ARRANGEMENT FOR MULTIPLEXING AN INPUT FUNCTION AND AN OUTPUT FUNCTION AT A SINGLE TERMINAL

**Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 31, 1980, Ser. No. 117,237**
**Int. Cl.³ H04N *9/62***
**U.S. Cl. 358—10** **10 Claims**



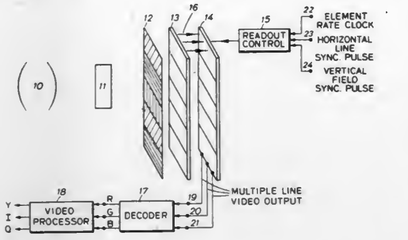

4. In a television receiver, a circuit arrangement for multiplexing recurrent signals and a service mode indication signal through a common circuit terminal comprising:
a source of service mode indication signals, coupled to said terminal, for selectively applying a signal indicative of the service mode to said terminal which has a signal level included within a first range of signals;
a source of recurrent signals;
means, including a first transistor having an input electrode responsive to said recurrent signals and an output electrode coupled to said terminal for producing, in the absence of said service mode indication signal, replicas of said recurrent signals at said terminal which occupy a second range of signal levels which is exclusive of said first range;
a second transistor having an input electrode coupled to said terminal and an output electrode; and
means coupled to said second transistor, for biasing said second transistor to be responsive to input signals occupying said first range of signal levels, and to be nonresponsive to input signals occupying said second range of signal levels.

**4,293,871**

## SOLID STATE COLOR TELEVISION CAMERA WITH MULTIPLE LINE READOUT

**Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025**

**Filed Dec. 3, 1979, Ser. No. 99,939**
**Int. Cl.³ H04N 9/07**
**U.S. Cl. 358—44** **10 Claims**




1. Apparatus for providing standard color television signals from a scene comprising:

an array of photosensitive elements arranged in horizontal lines;

color filters covering the horizontal lines of photosensitive elements arranged in a vertical sequence consisting of three primary colors where one color is repeated every alternate horizontal line and the other two are each repeated every fourth horizontal line;

means for imaging the scene, through the color filters, onto the array of photosensitive elements to provide stored information at each element;

means for simultaneously reading out the stored information from three adjacent lines consisting of three different colors to provide scanned signals; and

means for combining the scanned signals to provide the standard color television signals.

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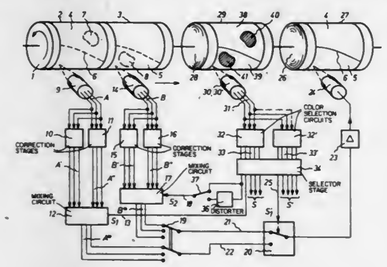
**4,293,872**

## PRODUCTION OF PRINTING BLOCKS OR FORMS

**Hans Keller, Kiel, and Hans-Georg Knop, Heikendorf, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany**

**Filed Jul. 20, 1979, Ser. No. 59,214**
**Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832467**
**Int. Cl.³ H04N 1/38**
**U.S. Cl. 358—75** **13 Claims**




1. A method for producing printing blocks or formes, in which at least two image signals are mixed electronically to generate a composite signal having a gradual or smooth transition within a mixing range, the method comprising the steps of:

(a) scanning at least one image opto-electronically point-by-point by means of a first scanning device to generate at least two image signals to be mixed;

(b) generating a coloured control mask including at least one mask area, said mask and said mask area having different colour information;

(c) scanning said control mask opto-electronically point-by-point by means of a second scanning device to obtain primary mask colour signals;

(d) generating an unsharp control signal from at least one mask colour signal by evaluating the colour signals of the actual point and the surrounding points scanned from said control mask, said unsharp control signal having a first level during scanning said control mask, a second level during scanning said at least one mask area and a gradual transition between the levels during scanning the contours of said mask area, said gradual transition defining the gradual transition of said composite signal within the mixing range;

(e) modulating one of said image signals by said control signals;

(f) modulating said other image signal by the amplitude-inverted control signal;

(g) combining the modulated image signal so as to obtain said composite signal, and

(h) producing printing blocks or formes from said composite signal.

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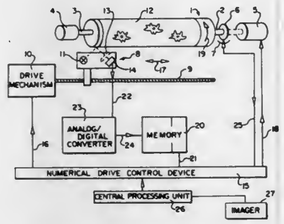
**4,293,873**

## METHOD AND A DEVICE FOR PRODUCING SEPARATION IMAGES HAVING THE EFFECT OF BEING ORTHOGONALLY SCREENED

**Frank Barendregt, and Leendert A. Boogaard, both of Boxmeer, Netherlands, assignors to Stork Brabant B.V., Boxmeer, Netherlands**

**Filed Sep. 28, 1979, Ser. No. 79,799**
**Claims priority, application Netherlands, Oct. 4, 1978, 7810032**
**Int. Cl.³ H04N 1/46**
**U.S. Cl. 358—75** **8 Claims**




1. A method of synthesizing a set of effective screened color separation images from an original composed of at least two different colors through the use of optical scanning in which the original is carried on a cylindrical surface which is rotated while a scanning beam is caused to move in two directions over the cylinder surface carrying said original, one direction being substantially parallel with the axis of the cylinder and the other direction being substantially perpendicular to said axis, the scanning mechanism being arranged to produce scanning points for reproduction at locations along the path of movement in said perpendicular direction, each separation image being synthesized in a program of movements of said beam relative to said cylinder which scans a predetermined area comprising at most all of said original and there being as many programs as separation images, said method comprising the following steps:

A. Establishing a base line on said cylinder which is parallel to the cylinder axis,

B. Scanning the surface of said cylinder in a first program of movements of said beam which program will include said area of said original image and which is composed of movements in said two directions, one being axial and unilateral and the other being substantially perpendicular to the axis and unilateral in such a manner that consecutive perpendicular lines of movement are traced by said beam which are spaced by a second spacing ($l_2$) equal distances apart along the length of the cylinder, each perpendicular line of movement being a full circle of said cylinder,

C. sequentially generating discrete scanning point signals from scanning points spaced along the lengths of the consecutive perpendicular lines, said points having a certain first spacing ($l_1$) relative to one another and the first point of each perpendicular line which is defined by the beam after passing the base line to start scanning having a certain third spacing ($l_3$) above said base line, the resulting field of scanning points if developed in a plane from the surface of the cylinder being rectangular and including said area, the lower horizontal edge of said field being coincident with said base line and one of its end edges comprising a coordinate perpendicular to said base line, all of the scanning points occurring above the base line and forming two sets of parallel lines, each set being orthogonal relative to the other, one set being at an angle ($\alpha$) relative to said coordinate, there being a fourth spacing (a) between the lines of each set and said fourth spacing being equal for both sets,

(i) the first, second and fourth spacings not necessarily being equal to one another but all distances of each respective spacing being the same for that particular spacing,

(ii) the third spacing being not necessarily the same for each particular line and being related to the order of scanning occurrence of said line with respect to the adjacent lines,

D. the program of movement being effected by driving said scanning mechanism in accordance with a certain trigonometrical relationship which takes the spacings and said angle into consideration to achieve said field of scanning points,

E. producing a first separation image from the scanning point signals derived from said field which fall on said area of said original, each signal adapted to form a printing element and the printing elements being respectively coincident with the scanning points of said field which fall on said image whereby said image area is reproduced on said separation image,

F. repeating steps A through E utilizing the identical base line and commencing the scanning at the identical point at which the first scanning program was commenced, but the second separation image differing from the first in that the angle relative to said perpendicular coordinate of the second field is a certain angle ($\alpha_2$) different from the first mentioned certain angle ($\alpha$) whereby there is a predetermined angular disposition of said one set of parallel lines of the one separation image relative to the corresponding set of parallel lines of said second separation image,

G. the fourth spacing (a) of both fields being equal and the dimensions of the separation images having the same propertional dimensions as said fields, the corresponding field dimensions being equal, respectively.



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**4,293,874**

## DC RESTORATION CIRCUIT FOR TELEVISION RECEIVER

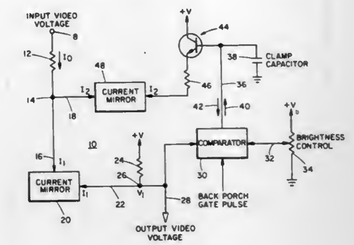
**Daniel L. Reneau, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

**Filed Feb. 4, 1980, Ser. No. 118,127**
**Int. Cl.³ H04N 5/18**
**U.S. Cl. 358—172** **13 Claims**

1. In a television receiver of the type having means for developing a DC black level reference voltage and means for developing a transmitted video voltage signal with a DC voltage component, an improved black level clamp circuit comprising:

means for converting said video voltage signal to a corresponding video current signal with a DC current component;

means for abstracting from said video current signal a DC current feedback signal representing a fraction of said DC current component of said video current signal;




means for reconverting said video current signal to a corresponding output video voltage signal; and

gating means operable during a constant level portion of the horizontal blanking interval of said video voltage signal for directly adjusting said DC current feedback signal to equalize the values of said black level reference voltage and the DC component of said output video voltage signal.

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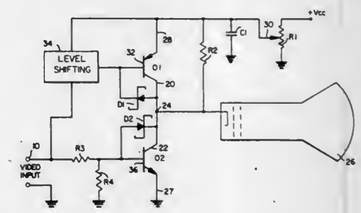
**4,293,875**

## WIDE BANDWIDTH VIDEO AMPLIFIER

**Bernard R. Katz, Rockaway, N.J., assignor to Telegram Communications Corp., Denville, N.J.**

**Filed Jan. 3, 1980, Ser. No. 109,195**
**Int. Cl.³ H04N 5/14**
**U.S. Cl. 358—184** **11 Claims**




1. A wide bandwidth video amplifier circuit for driving a CRT or other electro-optical device in response to alpha-numeric or other digital video signal input information comprising:

first and second solid state transistor amplifier elements connected in a complementary symmetrical configuration with a common collector output terminal adapted for connection to the cathode or grid of the cathode ray tube and with each transistor element having a base and emitter terminal;

level shifting circuit means coupling the base terminal of said first amplifier element to the video signal input such that said first amplifier element is enabled when said second amplifier element is disabled and vice versa;

DC shift means coupling the base terminal of said second amplifier element to the video signal input;

means for clamping the base to collector terminals of said first and second amplifier elements to prevent said ele-

ments from being driven deep into saturation in response to the video signal input;
a source of DC potential;
contrast control means coupling said source of DC potential across said first and second amplifier elements; and
capacitor means for bypassing said source of DC potential at video frequencies.

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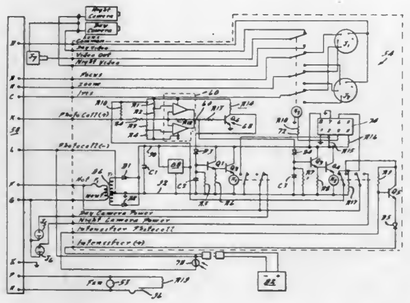
**4,293,876**
**TELEVISION MONITORING SYSTEM**
**Jarvis L. Williams, 901 Satterlee, Bloomfield Hills, Mich. 48013**
**Filed Jan. 11, 1980, Ser. No. 111,300**
**Int. Cl.³ H04N *7/18***
**U.S. Cl. 358—211** **28 Claims**



1. A camera unit for a television monitoring system, comprising:
a first camera, for monitoring principally during day-light conditions;
a second camera, for monitoring principally during low-light conditions;
a light intensifier in association with said second camera for intensifying the light received by said second camera; and
control circuit means for selectively energizing, utilizing, and de-energizing either said first camera or said second camera and said light intensifier in response to a predetermined variation in ambient light intensity, so that a time delay is provided between said energizing and said utilizing of said cameras and said light intensifier.

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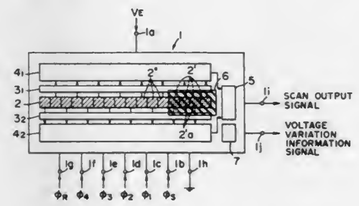
**4,293,877**
**PHOTO-SENSOR DEVICE AND IMAGE SCANNING SYSTEM EMPLOYING THE SAME**
**Tokuichi Tsunekawa, Yokohama; Makoto Masunaga, Tokyo; Kazuya Hosoe, Machida; Yukichi Niwa; Mitsutoshi Owada, both of Yokohama, and Noriyuki Asano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Mar. 30, 1979, Ser. No. 25,542**
**Claims priority, application Japan, Mar. 31, 1978, 53-38565**
**Int. Cl.³ H04N *3/15*; H01L *27/14***
**U.S. Cl. 358—213** **25 Claims**




17. A radiation sensing device comprising:
(a) radiation sensitive means for providing electrical signals corresponding to received radiations;
(b) means for providing an electrical signal indicative of a dark current of the sensing device;
(c) means for receiving a bias voltage to be supplied to said device; and
(d) means electrically coupled with said bias voltage receiving means so as to provide an electrical signal informing of internal voltage variation in said device relative to variation of said bias voltage,
wherein said radiation sensitive means, said dark current signal providing means, said bias voltage receiving means and said internal voltage variation information providing means are formed on or in the same semi-conductive substrate.

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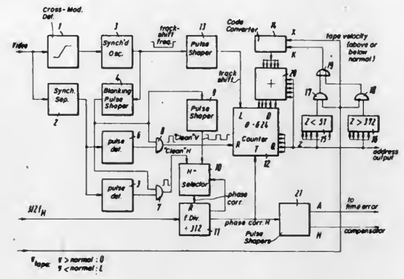
**4,293,878**
**IMAGE PROJECTOR FOR A TELEVISION RECEIVER**
**Jacinto Sanchez, 692 W. 29 St., Apt. 12, Hialeah, Fla. 33012**
**Filed May 12, 1980, Ser. No. 148,774**
**Int. Cl.³ H04N *5/74, 9/31***
**U.S. Cl. 358—231** **9 Claims**



1. In combination a television receiver having an image screen and an image projection device, said device comprising a housing sized to receive the television receiver, said housing including a front wall and said front wall having an opening sized and shaped to fit compatibly over the television receiver screen, means for supporting the housing and a television receiver in the housing with the opening of the screen of the television receiver and the housing tilted at a common angle with respect to a horizontal reference line through the screen,
an inner projection shroud fixedly mounted to the television receiver screen, said inner shroud extending a predetermined distance from the screen, and said inner shroud having tapered side walls converging to a terminal end at a common plane,
an outer shroud fitted over the open wall of the housing and enclosing said inner shroud, said outer shroud having an open terminal end spaced a predetermined distance from said open housing wall and said outer shroud having tapered side walls converging to a terminal end at a common plane spaced from said first mentioned common plane, and
lens extension means fixedly connected to the open terminal end of the outer shroud and said lens extension means including a lens.



**4,293,879**
**METHOD AND APPARATUS FOR THE VARIABLE SPEED REPRODUCTION OF A VIDEO SIGNAL STORED ON MAGNETIC TAPE**
**Jürgen Heitmann, Seeheim; Hans-Peter Maly, Darmstadt, and Rudolf Wilhelm, Büttelborn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**
**Filed Sep. 17, 1979, Ser. No. 75,978**
**Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841728**
**Int. Cl.³ H04N *5/78***
**U.S. Cl. 360—10** **12 Claims**



1. A method of reproducing, at a selectable magnetic tape speed different from that used in recording, a video signal recorded on a tape in a multiplicity of separate parallel tracks, each containing only a fraction of the total number of picture lines making up a television field and obliquely directed across the tape, the reproducing method being performed with a head wheel carrying peripherally arranged magnetic pick-up heads scanning across the tape as the tape is advanced in such a way as to follow the recorded tracks with substantial accuracy in normal sequence when the tape is moved at the speed used in recording, so that at other playback speeds portions of the picked up signals are subject to cross-modulation moire disturbances and amplitude variations as the active pick-up head shifts off one track and onto another, said method comprising the steps of:
generating a sequence of pulses at the frequency at which the active pick-up head shifts from one track to an adjacent track and synchronizing said track-shift pulses in frequency and phase by detected cross-modulation amplitude variations picked up by the active pick-up head;
generating a sequence of pulses at the picked-up horizontal synchronizing pulse frequency and substantially in phase with the picked up horizontal synchronizing pulses;
producing an uninterrupted series of horizontal synchronizing pulses by blanking any pick-up of horizontal synchronizing pulses during a gated interval derived from said track-shift pulses, while utilizing the unblanked picked-up horizontal synchronizing pulses to correct the phase of said generated horizontal synchronizing frequency pulses, thereby making available substitute pulses for utilization during blanking intervals;
counting the pulses of said uninterrupted series of horizontal synchronizing pulses in a counter;
detecting picked-up vertical synchronizing pulses and resetting said counter with each detected vertical synchronizing pulse;
determining the value and sign of a numerical alteration of the content of said counter necessary at the time of appearance of a track-shift pulse in order to enable the counter content to continue to represent the address of each picked-up horizontal line with reference to a television picture;
using a pulse derived from each said track-shift pulse to enable the content of said counter to be altered by said numerical value and sign;
storing picked-up video signal lines individually for a period of a plurality of picture fields;
utilizing the content of said counter to provide an address for each stored individual video signal line;
reproducing a picture from stored lines picked up over a plurality of field periods by reproducing the lines in a sequence determined by the addresses provided for the stored lines by the content of said counter.

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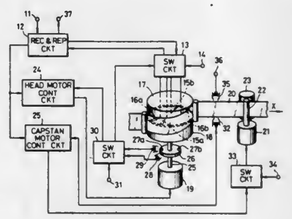
**4,293,880**
**APPARATUS FOR RECORDING AND REPRODUCING VIDEO SIGNALS AT SELECTABLE DIFFERENT TAPE TRAVELING SPEEDS FROM A PLURALITY OF PAIRS OF VIDEO HEADS**
**Haruo Tsukada, and Yohichiroh Nakatani, both of Mito, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**
**Filed Oct. 10, 1979, Ser. No. 83,326**
**Claims priority, application Japan, Oct. 16, 1978, 53-141979[U]**
**Int. Cl.³ H04N *5/78*; G11B *15/44***
**U.S. Cl. 360—10** **6 Claims**




1. An apparatus which selectively records and reproduces video signals on and from a tape in parallel tracks which are disposed obliquely relative to the longitudinal direction of the tape, and in any of a plurality of different tape speed modes, every field of the video signals being recorded and reproduced in a normal speed of picture motion for each of said different tape speed modes, said apparatus comprising:
a rotary member rotating at a predetermined speed;
a plurality of pairs of video heads for recording and reproducing the video signals on and from the tape, each of said pairs of video heads corresponding to one of said tape speed modes respectively and being mounted at different positions on a periphery of the rotary member with two video heads of each of said pairs diametrically disposed on opposite sides of the rotary member;
means for selecting one of said pairs of video heads to operate in conformance with one of the selected tape speed modes; and
means for driving the tape at a speed which is selected in conformance with said one selected tape speed mode;
the pair of video heads operating in conformance with the selected tape speed mode and having a track width selected for forming contiguous tracks without gaps therebetween on said tape traveling at the selected tape speed mode.

**4,293,881**

## SYSTEM FOR PRIORITY TRANSCRIBING OF DICTATION

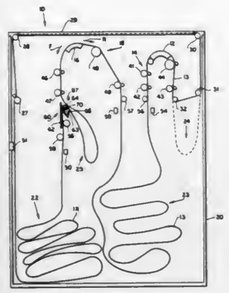
**Paul C. Mason, Thomaston, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.**

**Continuation of Ser. No. 781,357, Mar. 25, 1977, Pat. No. 4,150,261. This application Nov. 6, 1978, Ser. No. 957,910**

**The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.**

**Int. Cl.³ G11B** *15/04, 15/22*

**U.S. Cl. 360—60** **9 Claims**



7. In a recording system having a transcribe location at which units of dictation recorded in sequence on a recording medium are transcribed as said recording medium is moved in a first direction relative to said transcribe location and subsequently is moved in said first direction along a path of motion extending from said transcribe location into a holding location within said recording system from which said recording medium is withdrawn for the recording of additional units of dictation:

selectively operative diverting means for diverting said recording medium from said path of motion into a retaining location discrete from said holding location within said recording system as said recording medium is moved in said first direction relative to said transcribe location, said retaining location being located between said transcribe location and said holding location; and

means responsive to presence of recording medium in said retaining location for preventing said recording medium in said retaining location from being removed from said retaining location by motion of said recording medium in said first direction.

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**4,293,882**

## ENDLESS LOOP TAPE MAGAZINE, AND A RECORDING AND/OR PLAYBACK MACHINE UTILIZING THE MAGAZINE

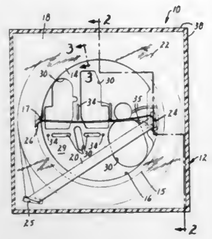
**Alfred H. Moris, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 820,250, Jul. 29, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,312**

**Int. Cl.³ G11B** *23/02*

**U.S. Cl. 360—93** **1 Claim**

1. In a tape magazine including a fixed hub having an axis, a peripheral surface, a central opening, and a through slot extending axially across the hub between the peripheral surface and central opening; and an endless length of tape having a major portion wrapped around the peripheral surface of the hub to form a coil and a minor portion extending along a path from the innermost wrap of the coil through said slot, partially across the central opening and around the side surface of the coil to the outermost wrap of the coil to afford engagement of a drive mechanism with the tape along the path to pull the tape from the innermost wrap of the coil past a transducer positioned along the path, the improvement wherein said hub includes a plurality of axially spaced annular ribs extending around said axis and defining said peripheral surface for the hub, which ribs both reduce the surface area on which the inner wrap of the tape bears against the hub to reduce friction therebetween, and reduce the areas of adjacent wraps of tape



in the coil that are pressed together in the tape coil, which wraps move relative to each other during rotation of the coil as the tape is pulled from the innermost wrap of the coil, to thereby reduce friction between the wraps.

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**4,293,883**

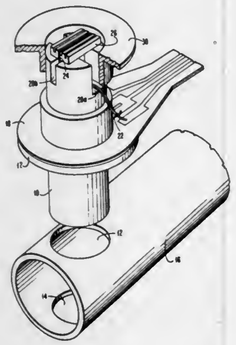
## MAGNETIC HEAD MOUNT ASSEMBLY

**Allen R. Cox, Chandlers Ford, England, and Edmond W. Smathers, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 107,103**

**Int. Cl.³ G11B** *5/48, 5/105, 21/20*

**U.S. Cl. 360—104** **7 Claims**



1. A magnetic head mount assembly comprising:

a mounting post having a slotted portion at one end;

an arm element having two opposing apertures for receiving said post in a close fit engagement; and

an air bearing slider for supporting a magnetic transducing means mounted to said one end of said post at said slotted portion.

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**4,293,884**

## MULTIPLE LEG MAGNETIC TRANSDUCER STRUCTURE

**Edward Schiller, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.**

**Filed Dec. 26, 1979, Ser. No. 106,792**

**Int. Cl.³ G11B** *5/12, 5/27, 5/105*

**U.S. Cl. 360—121** **18 Claims**

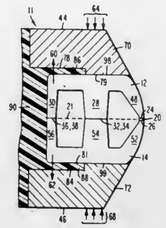
1. A magnetic transducer assembly having at least one pair of poles defining a transducing gap and a multiple leg back core contiguous with the poles, each leg providing a separate



flux path, the assembly being supported by a nonmagnetic core holder, comprising in combination:

(a) at least one magnetic core having two corresponding core portions made of a generally flexible magnetic material, each core portion comprising a pole and at least two leg portions contiguous with the pole, said pole and leg portions having smoothly lapped end faces defining a transducing gap plane;

(b) a nonmagnetic core holder having two corresponding side pieces each supporting one of said two corresponding magnetic core portions at the pole and intermediate leg



portions, while a rear leg portion most distant from said pole is unsupported by said holder; and

(c) the corresponding magnetic core portions being held in juxtaposition with corresponding end faces in registration at the transducing gap plane and with a transducing gap material disposed between said poles, said corresponding magnetic core portions being pressed together at said poles and intermediate leg portions supported by said core holder in a direction substantially normal to and towards said transducing gap plane while said rear leg portions unsupported by said core holder flex in a substantially opposite direction.

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**4,293,885**

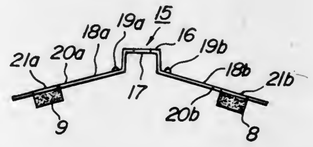
## PAD SPRING FOR A TAPE CASSETTE

**Hideo Shirako, Olympus Apartment House 146, No. 7-14-11, Owada-Cho, Hachioji City, Tokyo, and Shoichi Saito, No. 2-49-13,, Minami-dai, Nakano-ku, Tokyo, both of Japan**

**Filed Oct. 16, 1979, Ser. No. 85,304**

**Int. Cl.³ G11B** *15/60*

**U.S. Cl. 360—130.33** **3 Claims**




1. A pad spring for use in a tape cassette to press a magnetic tape in the cassette against a magnetic head which enters the cassette, the cassette including a pair of fulcrum supporting members, said pad spring comprising a generally U-shaped center portion and a pad supporting portion joined to said center portion at each free end thereof to form a generally elongated spring body, each said pad supporting portion including a substantially flat, free end section fixed to a different one of free ends of said center portion and extending in the long direction of said spring body away from said center portion, a pair of pads each secured to a different one of said free end sections on the surfaces of said free end sections which face toward the magnetic head, and a projection formed on the surface of each of said free end sections which surface faces toward the fulcrum supporting members in the cassette for contacting the fulcrum supporting members to provide a working fulcrum for each of said free end sections when the magnetic head is inserted into the cassette to contact one side of the tape and said pads contact the other side of the tape to press the tape against the magnetic head.

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**4,293,886**

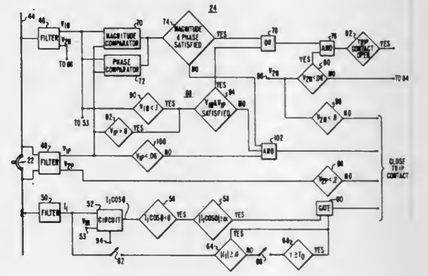
## NETWORK PROTECTOR RELAY

**Larry L. Church, Washington Township, Armstrong County; David R. Smith, McKeesport, and Shan C. Sun, Bell Township, Indiana County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Dec. 17, 1979, Ser. No. 104,647**

**Int. Cl.³ H02H** *3/26*

**U.S. Cl. 361—71** **14 Claims**



1. A network protector relay producing, entirely from sequence components, signals for opening and closing a connection between a polyphase feeder bus and a polyphase network bus, comprising:

input means producing signals representative of the positive and negative sequence components of the phase-to-ground voltages on the network side of said protector relay, the positive sequence component of the phasing voltages, and the positive sequence component of the phase currents;

first circuit means producing an $I_1 \cos \phi$ signal representative of the multiplication of said positive sequence component of said phase currents and the cosine of the phase angle between said positive sequence component of said phase currents and said positive sequence component of the phase-to-ground voltages;

means providing a first reference signal;

means comparing said $I_1 \cos \phi$ signal and said first reference signal, providing a trip signal opening said connection in response to a predetermined relationship therebetween;

second circuit means comparing the magnitude and the phase angle of said positive sequence component of said phase-to-ground voltages to the magnitude and the phase angle of said positive sequence component of said phasing voltages, providing a close signal closing said connection in response to a predetermined relationship therebetween;

means providing a second reference signal; and

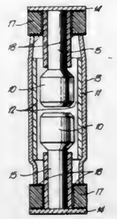
third circuit means comparing said negative sequence component of said phase-to-ground voltages and said second reference signal, said means inhibiting said close signal from closing said connection in response to a predetermined relationship therbetween.

**4,293,887**

## SURGE ARRESTER WITH IMPROVED IMPULSE RATIO

**Frank G. Splitt, Mount Prospect, and Donald B. Turner, Des Plaines, both of Ill., assignors to Northern Telecom Inc., Nashville, Tenn.**

**Filed May 4, 1979, Ser. No. 36,088**
**Int. Cl.³ H02H** *9/06*
**U.S. Cl. 361—120** **12 Claims**



1. A gas filled surge arrester having a design breakdown voltage value and having first and second electrodes defining a gaseous spark gap therebetween, characterized by:

a surface coating of ion source material outside of said spark gap adapted to emit ions into the spark gap region in response to an electric field;

said surface coating being conductive and in electrical contact with said first electrode;

said surface coating being insulated from said second electrode by a continuous solid insulator, and having an exposed surface facing said second electrode, a gap being present between said coating and said insulator; and

said surface coating cooperating with the second electrode to establish said electric field across said solid insulator in response to a rising surge voltage across the surge arrester, such that ions attracted from said surface coating are accelerated in the direction of said second electrode and exit into the spark gap region.

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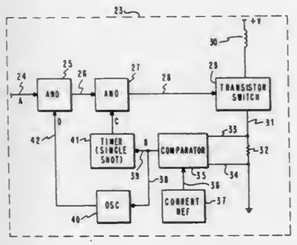
**4,293,888**

## PRINT HAMMER DRIVE CIRCUIT WITH COMPENSATION FOR VOLTAGE VARIATION

**Vincent D. McCarty, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 25, 1979, Ser. No. 51,580**
**Int. Cl.³ H01H** *47/32*
**U.S. Cl. 361—152** **2 Claims**




1. A control circuit for a solenoid for controlling the application of a current of a preselected magnitude to the coil of the solenoid for a preselected time, said circuit comprising:

a current source selectively connected to said coil;

means for connecting said current source to said coil; and

means for interrupting current to said coil a predetermined time after said current in said coil has reached a predetermined level;

said interrupting means including a current sensor for sensing said predetermined level, a current reference source and a comparator connected to both said current sensor and said current reference source.

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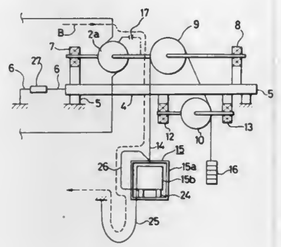
**4,293,889**

## DEVICE FOR GROUNDING AN ELEVATOR WINDER

**Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 9, 1979, Ser. No. 55,837**
**Claims priority, application Japan, Jul. 11, 1978, 53/84323**
**Int. Cl.³ H02H** *1/00*
**U.S. Cl. 361—212** **8 Claims**



1. A system for grounding an elevator winder comprising: an electric motor controlled by a semiconductor switching element; a first rotary element coupled to said electric motor; a main rope wound on said first rotary element; bearings adapted to support said electric motor and said first rotary element; a first grounding circuit for grounding said bearings through a resistor; and a second grounding circuit for grounding said main rope without a resistor.

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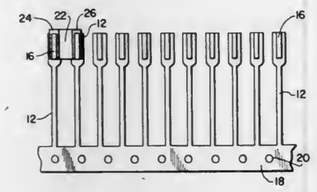
**4,293,890**

## CERAMIC CAPACITOR WITH END TERMINALS

**Robert G. Varsane, Oxford, Conn., assignor to Vitramon Incorporated, Monroe, Conn.**

**Filed Oct. 1, 1979, Ser. No. 80,174**
**Int. Cl.³ H01G** *1/14*
**U.S. Cl. 361—310** **4 Claims**



1. In combination a carrier for a monolithic ceramic capacitor and such capacitor, the capacitor comprising a dielectric material body, a first and a second major surface, two side surfaces and a first and a second end terminal; the carrier comprising a first conductive lead holding the capacitor adjacent the first end terminal and a second conductive lead holding the capacitor adjacent the second end terminal, each conductive lead having a first leg, said first leg having a first end and a second end, wherein the first end abuts against the first major surface of the capacitor and the second end is removably attached to a ribbon having a series of regularly spaced openings therein, a base extending outwardly from the first leg and abutting against a side surface of the capacitor and a second leg, connected at one end thereof to the base and abutting against the second major surface of the capacitor.

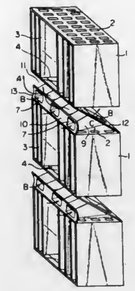


**4,293,891**

## NATURAL AIR COOLED RACK FOR VERTICALLY DISPOSED PRINTED BOARDS

**Kiyoshi Matsui; Katsuyuki Arai, and Sueo Shinbashi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed May 23, 1980, Ser. No. 152,559**
**Claims priority, application Japan, May 28, 1979, 54-64959**
**Int. Cl.³ H05K** *7/20*
**U.S. Cl. 361—383** **5 Claims**



1. A natural air cooled rack for supplying cooling air to vertically disposed printed circuit boards comprising

at least one vertical stack of cases, each case holding a plurality of said printed circuit boards in a vertical position, and, each case having draft openings on the upper surface and the lower surface thereof, said cases being arranged on said stack so that an interspace is formed between at least one uper case and a respective lower case;

a front member formed in the front portion of each said stack at each interspace to have at least one supply opening and at least one exhaust opening in the front portion of each said stack, said supply opening communicating with said draft opening on the lower surface of the respective upper case and said exhaust opening communicating with said draft opening on the upper surface of the respective lower case and said exhaust opening being located substantially above said supply opening in each said front member.

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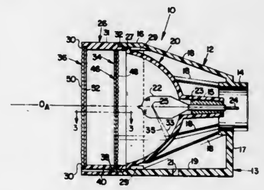
**4,293,892**

## ZOOM LIGHT APPARATUS

**William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 18, 1979, Ser. No. 104,860**
**Int. Cl.³ G03B** *15/02*
**U.S. Cl. 362—17** **28 Claims**



1. Optical apparatus for selectively changing the angular spread of a projected light beam, said apparatus comprising:

a pair of optical refracting elements; and

means for positioning said elements in the projected light beam so that at least part of the light from the light beam can pass successively through said elements and for mounting said elements for relative movement with respect to one another along an axis parallel to the general direction of projection of the beam,

said elements being optically structured to change the initial angular spread of the beam of light by a predetermined amount when said elements are separated by a predetermined distance along said axis and to continuously further change the initial angular spread of the beam of light as the distance separating said elements is made smaller than said predetermined separation distance.

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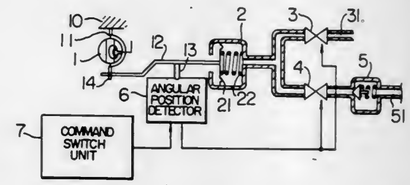
**4,293,893**

## APPARATUS FOR CONTROLLING LIGHT PROJECTION ANGLE OF HEAD LAMP OF MOTOR VEHICLE

**Yoshihiko Tsuzuki, Anjo; Sumihiro Kaga, Inazawa, and Nobuhito Hobo, Inuyama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Aug. 31, 1979, Ser. No. 71,568**
**Claims priority, application Japan, Oct. 20, 1978, 53-129655**
**Int. Cl.³ B60Q** *1/10;* **F21V** *21/30;* **B60Q** *1/06*
**U.S. Cl. 362—38** **3 Claims**




1. An apparatus for controlling the optical axis of a head lamp assembly of a motor vehicle, comprising:

a head lamp assembly supported so that the light projecting axis thereof can be angularly varied in upward and downward directions;

an actuator adapted to be selectively supplied with the atmospheric pressure and a negative pressure available from an intake conduit of an internal combustion engine of said motor vehicle through associated electromagnetic valves and produce mechanical displacements in dependence of said pressures;

a linkage mechanism for transmitting said mechanical displacements for bringing about corresponding variations in the angular position of said light projecting optical axis of said head lamp assembly;

first switch means for detecting angular position of said light projecting optical axis of said head lamp assembly, said first switch means including paired electric contacts, the contacting states of which are sequentially changed over in response to the operation of said linkage mechanism;

second switch means for setting angular position of said light projecting optical axis of said head lamp assembly in response to command, said second switch means including paired electric contacts, the contacting states of which are sequentially changed over to produce said command;

and an electric circuit which responds to difference in the contacting states between said first and second switch means thereby to produce correspondingly energizing signals for said electromagnetic valves.

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**4,293,894**

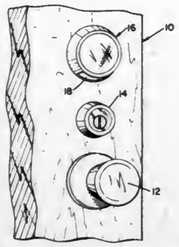
## BATTERY OPERATED ILLUMINATING DEVICE

**Nolan D. Blank, 2294 Stow Ave., Simi Valley, Calif. 93063**

**Filed Mar. 17, 1980, Ser. No. 130,604**
**Int. Cl.³ E05B** *17/10*
**U.S. Cl. 362—100** **10 Claims**

1. In a device adapted for mounting to a surface for illuminating an adjacent area, the combination comprising:

a base member having means for securing to a surface;
a housing having a closed end and at least one sidewall extending therefrom defining an open end, said closed end being deformable upon depression thereof;



coacting means on said base member and the open end of said sidewall for securing said housing to said base member;
lens means in said at least one sidewall; and
electrically operable illumination means within said housing operable upon depression of said closed end.

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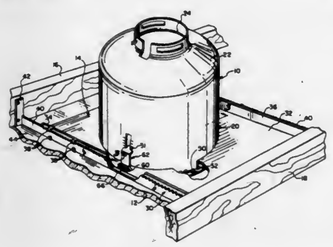
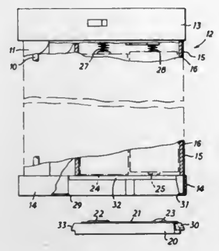
**4,293,895**
**MOUNTING ARRANGEMENT FOR RECESSED LIGHT FIXTURE HOUSING**
**Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.**
**Filed Aug. 23, 1979, Ser. No. 68,934**
**Int. Cl.³ F21V *33/00***
**U.S. Cl. 362—147** **6 Claims**



1. An arrangement for mounting an enclosed light fixture housing having an open end with a flange formed about the periphery thereof, in an aperture defined in a planar member having first and second surfaces, said housing being receivable in said aperture with said flange engaging said second surface, said arrangement including in combination:
a side wall of said light fixture housing defining a slotted aperture, locking means provided on said side wall adjacent said slotted aperture, said locking means including ratchet teeth formed along said housing wall adjacent said slotted aperture, support frame means mounted along the first surface of said planar member and defining an aperture dimensioned for receipt of said light fixture housing and being aligned with the aperture defined in said planar member and resilient mounting clip means extending outwardly from said support frame means toward said aperture, the free end of said mounting clip means being receivable in said slotted aperture in said housing side wall upon insertion of said housing into said aligned apertures of said planar member and support frame means, said mounting clip means further including means cooperating with said ratchet teeth for removably securing said housing on said support frame means.

**4,293,896**
**BATTERY-OPERATED LANTERN**
**Chung-Chee Wong, Kowloon, Hong Kong, assignor to San P. Kong, Kowloon, Hong Kong**
**Filed Jul. 16, 1979, Ser. No. 57,675**
**Claims priority, application United Kingdom, Jul. 20, 1978, 30445/78**
**Int. Cl.³ F21L *7/00***
**U.S. Cl. 362—200** **4 Claims**



1. A battery operated lantern comprising: a hollow body having therein an elongated tubular compartment for a plurality of single-cell batteries arranged end-to-end in two side-by-side rows and all electrically connected in series with each other, said body including a bottom wall having an aperture therein opening into one end of said compartment and through which aperture batteries can be inserted into and removed from the compartment lengthwise of the batteries; a closure member mounted in said aperture, which closure member is made from an electrically insulating material and which extends in a plane normal to the lengthwise dimension of said elongated compartment, said closure member being movable out of said aperture; a rigid metal contact plate mounted on and electrically insulated from the inner face of said closure member and adapted to make electrical contact with the base of the adjacent battery in one of said rows and with the central electrode of the adjacent battery in the other of said rows; a pair of contact elements at the end of said elongated compartment remote from the closure plate and arranged respectively to make electrical contact with the central electrode of the adjacent battery in said other row and said contact elements being resilient for pressing the batteries in the respective rows resiliently lengthwise of the batteries towards the closure member; a spring loaded catch at one edge of said closure member for automatically securing the member in its closed position as the plate is moved into said closed position; and a manually operable element for moving the catch into an inoperative position against the restraint of its spring loading.

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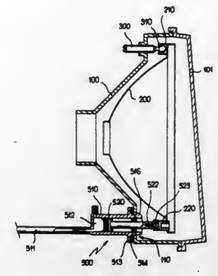
**4,293,897**
**MOTOR VEHICLE HEADLIGHT**
**Alain Deverrewaere, La Varenne, France, assignor to Cibie Projecteurs, France**
**Filed Jan. 31, 1980, Ser. No. 117,090**
**Claims priority, application France, Jan. 31, 1979, 79 02483**
**Int. Cl.³ F21V *7/00***
**U.S. Cl. 362—284** **6 Claims**

1. A motor vehicle headlight comprising a casing closed by a front glass, a mirror mounted to pivot inside the casing, said casing being formed with an aperture serving for mounting a control member constituting an end of a remote control chain, said control member having an active part comprising a movable member which passes through the aperture, said pivoting mirror being provided with connecting means opposite said aperture, said connecting means being arranged for cooperation with said movable active part, and the aperture, the connecting means and the control member being arranged so that the mounting of the control member on the casing brings about operational connection of said movable active part and the mirror.





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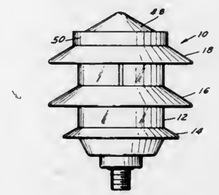
**4,293,898**
**GARDEN LIGHT FIXTURE**
**William F. Budnovitch, Summit; Salvatore C. Petralia, Sayreville, and Louis F. Silvestris, Bayonne, all of N.J., assignors to Keene Corporation, Union, N.J.**
**Filed Nov. 13, 1979, Ser. No. 93,273**
**Int. Cl.³ F21J *7/00***
**U.S. Cl. 362—291** **8 Claims**



1. A light fixture comprising:
a transparent cylindrical housing having open top and bottom ends;
at least one groove extending circumferentially about said housing intermediate said top and bottom ends;
at least one groove extending axially along said cylinder from said circumferential groove to one of said ends;
and at least one shade having a generally annular member including an inner opening substantially equal in diameter to that of said cylinder and at least one keyway extending into said inner opening, said keyway being dimensioned to fit into said cylindrical housing axially and circumferential grooves;
whereby said one shade may be locked into position about said housing when said one keyway is in said circumferential groove but not within said axial groove and said one shade may be positioned for removal by rotating said shade until said keyway is positioned within said axial groove.

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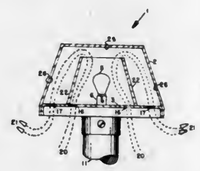
**4,293,899**
**LUMINAIRE**
**George E. Sanner, Cypress Hill, Sparks, Md. 21152**
**Filed Dec. 21, 1978, Ser. No. 971,739**
**Int. Cl.³ F21V *29/00***
**U.S. Cl. 362—294** **1 Claim**

1. A luminaire comprising: a transparent or translucent quadric globe telescoped over a transparent or translucent circular flat base member; said globe having a cylindrical section intersecting the lower base of a closed frustoconical section at a plane generally coincident with the plane of the flat base member; said flat base member spanning the opening of said cylindrical section of said globe, and a flange around the periphery of said flat portion abutting the interior of said cylindrical portion of said globe; means for securing said globe to said base providing for easy removal and replacement of said globe; a cylindrical cap centrally abutting and attached to the exterior surface of said base member; a lamp socket and lamp protruding through concentrically aligned center holes in said base member and in said cap, and attached to said cylindrical cap; means defining a first plurality of circumferentially spaced sets of vertical intake holes in said flat base in an annular area thereof abutting the peripheral extremity of said lamp socket; means defining a second plurality of circumferentially spaced sets of vertical exhaust holes in said flat base in an annular area thereof circumferentially abutting the external periphery of said flat base; said first and second sets of holes being equal in number and radially aligned with respect to the center of said flat base and spaced, radially, from each other to thereby define an annular, flat, closed area between said first and second sets of holes, whereby a convection air current system is defined by said base and within said globe for admission of air through the intake holes, past the lamp and out said exhaust holes to cool the luminaire during use and prevent its overheating; electrical connection means for energizing said lamp from an electrical source externally of said luminaire; and an open topped cylindrical partition located in the interior of said quadric globe, the lower end of said partition resting on said annular, flat closed area of said base member, and the upper, open end of said partition extending near to but being spaced from the interior surface of the frustoconical upper base of said globe thereby providing a convective intake flue and exhaust plenum for cooling of said luminaire.



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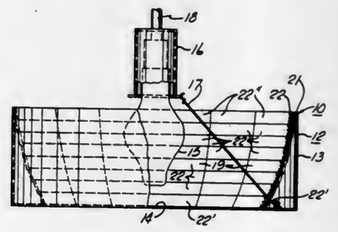
**4,293,900**
**LUMINAIRE REFLECTOR**
**Theodore D. Dziubaty, Gibsonia, Pa., assignor to Forum, Inc., Pittsburgh, Pa.**
**Filed Oct. 9, 1979, Ser. No. 82,577**
**Int. Cl.³ F21V *7/00***
**U.S. Cl. 362—342** **15 Claims**



1. A luminaire reflector comprising a side-by-side series of vertically-curved reflector segments forming in combination at least a larger segment of a bowl-like reflector with reflective surfaces on the inside thereof and having a mouth at its upper end which forms the largest diameter thereof, each of said

reflector segments consisting of a stepped vertical series of reflector sections pre-focused to direct light coming from a source within the bowl-like reflector out over said mouth into a predetermined radiation zone, said reflector sections having inwardly-convex curvature in the horizontal direction.

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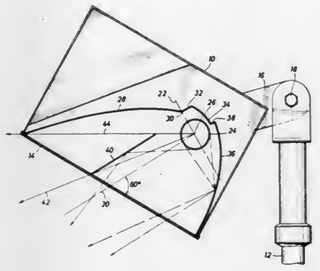
**4,293,901**

## REFLECTOR SYSTEM HAVING SHARP LIGHT CUTOFF CHARACTERISTICS

**Jose A. Hernandez, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 104,011**
**Int. Cl.³ F21V 7/06**
**U.S. Cl. 362—346** **12 Claims**



1. A sharp cutoff reflector including a plurality of parabolic segments and housing a lamp therein so that its center is at the concentric focal point of the parabolic segments of the reflector, comprising

a top parabolic reflector segment having a narrow beam reflective surface,

a bottom parabolic reflector segment having a narrow beam reflective surface,

said top and bottom parabolic reflectors terminating in a window opening plane approximately 60 degrees to the parabolic elongate axis,

a reflective shield above and parallel with the elongate axis, the window end thereof being at a position in the range of approximately 5–40 degrees to the horizontal with respect to the focal points, the rearward end thereof being on a line between the focal points and the exit pupil of the window opening at said top reflector segment.

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**4,293,902**

## TRANSFORMERLESS FAST CURRENT LIMITER WITH SYMETRY CORRECTION FOR A SWITCHED-MODE POWER SUPPLY

**John E. White, Port Moody, Canada, assignor to AEL Mirrotel, Ltd., Burnaby, Canada**

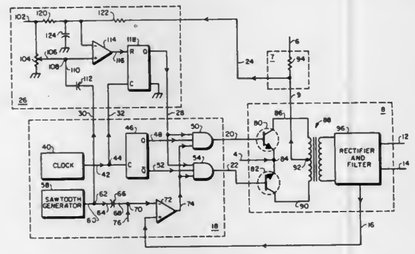
**Filed Dec. 4, 1979, Ser. No. 102,207**
**Int. Cl.³ H02P 13/22**
**U.S. Cl. 363—26** **4 Claims**

1. In a switched mode power supply which operates from a DC power source, a fast current limiter comprising:

a DC-to-DC converter adapted for connection to said DC power source includes a pair of switching transistors connected in push-pull wherein the emitters are connected together and to one terminal of the power source, the collectors are connected to the opposite ends of a primary winding of a center-tapped transformer, the center-tap is connected to the other terminal of the power source and the secondary winding is connected to a rectifier-filter circuit in which the pulsed output from the inverter is changed into a DC voltage which is available at output terminals thereof and in which a voltage representative of the output voltage is provided at a feedback output terminal;

a pulse width modulator having first and second gating circuits, the output terminals of which are connected to the bases of said first and second switching transistors, respectively, and provide the drive thereof, a clock for establishing a pulse repetition rate of the transistors and means connected to the output of said clock for alternately enabling said first and second gating circuits, a sawtooth generator operating at said predetermined pulse repetition rate for providing a sawtooth reference voltage at an output, and a first comparator having a first input connected to the output of said sawtooth generator, a second input connected to said feedback output terminal of said converter and an output connected to an input of each said gating circuit so as to control the on-time of the switching transistor connected to an enabled gating circuit as long as there is no overcurrent present;

a transformerless current-sensing means, adapted for connection in the path between said DC power source and



said converter, for providing, at an output terminal, an output signal representative of the current flowing in said path; and

a current-limiter control comprising:

a second comparator responsive to said sawtooth voltage and to the output signal of said transformerless current-sensing means for changing the second comparator output of a first binary state to the other binary state at an output terminal when the sensed current exceeds a predetermined value;

a third gating circuit responsive to the output condition from said second comparator means and a timing signal from said clock to provide an enable or pulse termination state at said output, depending upon whether the sensed current is below or exceeds said predetermined value; and

means for connecting the output of said third gating circuit to a third input of each of said first and second gating circuits, whereby said first and second switching transistors are turned off if an overcurrent occurs in either of the clock enabled states.

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**4,293,903**

## HIGH VOLTAGE RECTIFIER FOR TELEVISION RECEIVER SETS

**Hideyuki Mochida; Shingo Tamura, and Etsuo Tsurumi, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 29, 1980, Ser. No. 144,919**
**Claims priority, application Japan, May 2, 1979, 54-58234[U]**
**Int. Cl.³ H02M 7/10; H04N 3/18**
**U.S. Cl. 363—68** **5 Claims**

1. A high voltage rectifier for use in a television receiver set comprising:

(a) a core;

(b) a primary coil wound on a primary coil bobbin mounted on the core;

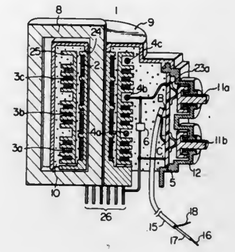
(c) rectifier means including a plurality of secondary coils wound on a secondary coil bobbin which surrounds the primary coil bobbin, and one or more diodes connected in series with the plurality of secondary coils;

(d) a casing which houses said primary and secondary coils and said diodes;

(e) an insulating resin material filled in the casing to make integral the primary coil, secondary coils and diodes and to provide electrical insulation therebetween;

(f) a resistor block, electrically connected to said rectifier means, for dividing voltage developing at said rectifier means so as to generate a first voltage and a second voltage which is lower than the first voltage;

(g) means for fixing the resistor block to said casing near said secondary coils;



(h) a first electrical conductor, electrically connected to said resistor block, for picking up the first voltage from said resistor block;

(i) a second electrical conductor, electrically connected to said resistor block, for picking up the second voltage from said resistor block, said second electrical conductor surrounding the first electrical conductor to sealingly cover it and extending in the same direction as the first electrical conductor;

(j) a first insulating member, interposed between the first and second electrical conductors, for insulating the two conductors under the application of DC voltage; and

(k) a second insulating member covering the second electrical conductor.

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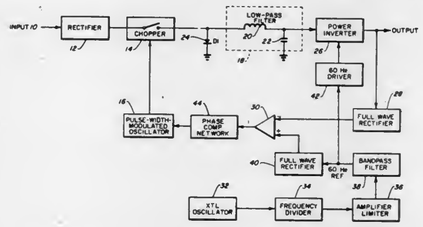
**4,293,904**

## POWER FREQUENCY CONVERTER

**James L. Brooks, Oxnard, Calif.; James C. Bowers, and Harry A. Nienhaus, both of Tampa, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 21, 1979, Ser. No. 97,028**
**Int. Cl.³ H02M 5/45, 5/458**
**U.S. Cl. 363—86** **14 Claims**



1. A power converter for receiving an input power signal and providing an AC output signal having a precisely regulated waveform comprising:

means for chopping a pulsating DC input signal at a chopper frequency to effectively destroy the form of of the input power wave and to provide a chopped signal at an output, said means for chopping being controllable for adjusting the duty cycle of said means for chopping, the input of said means for chopping coupled to receive said input power signal;

filter means having its input coupled to the output of said means for chopping for receiving the chopped output signal, said filter means removing the chopper frequency from its input signal; the input voltage to said means for chopping never being less than the desired peak output voltage of said filter means;

power inverter switching means for converting a DC signal at its input to an AC signal at its output, said power inverter means having its input coupled to the output of said filter means, the AC signal at the output of said power inverter switching means being said AC signal having a precisely regulated waveform;

means for providing a reference signal having the waveform of the desired AC output signal, said reference signal being coupled to said power inverter switching means for controlling the switching thereof;

means for comparing the reference signal with the AC output signal from said power inverter means switching to produce an error signal related to the difference therebetween, said means for comparing including:

differential amplifier means having a first input coupled to the output of said power inverter switching means, a second input coupled to said means of providing a reference signal, and an output; said differential amplifier means providing a signal related to the difference between its two inputs at its output; and

pulse-width-modulated oscillator means coupled to receive the output of said differential amplifier means for adjusting the duty cycle of said pulse-width-modulated oscillator means, the output of said pulse-width-modulated oscillator means being coupled to said means for chopping to adjust the duty cycle of said means for chopping;

phase compensation means coupled between said differential amplifier means and said pulse-width-modulated oscillator means for adjusting the phase of the output signal from said differential amplifier means; the waveform of the AC output signal of said power inverter switching means thereby being adjusted so that the error signal is driven toward zero, whereby the AC output waveform follows the waveform of the reference signal.

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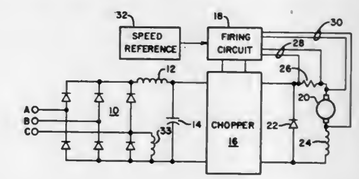
**4,293,905**

## METHOD AND APPARATUS FOR CONTROLLING POWER AND OPTIMIZING POWER FACTOR IN AN AC-TO-DC CONVERTER

**Kenneth E. Opal, Oakmont, Pa., assignor to Power Control Corporation, Pittsburgh, Pa.**

**Filed Jun. 18, 1979, Ser. No. 49,764**
**Int. Cl.³ H02M 7/00**
**U.S. Cl. 363—124** **7 Claims**



1. A method for supplying variable direct current power to a load while maintaining essentially unity power factor, which comprises rectifying a source of alternating current, applying the rectified current across an inductor in series with a capacitor with the size of the inductor being such as to maintain the current pulses at the input to the rectifier essentially continuous current pulses, said current pulses occurring during a portion of each half-cycle of said alternating current source,

chopping said rectified current to produce direct current pulses, and applying said direct current pulses to said load.

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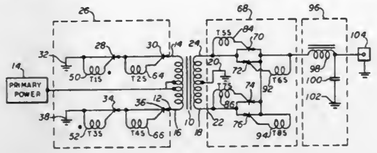
**4,293,906**
**CONVERTER**
**Lawrence E. Trowbridge, 4806 Oak St., Seabrook, Tex. 77658**
**Filed Mar. 5, 1979, Ser. No. 17,257**
**Int. Cl.³ H02M 7/515**
**U.S. Cl. 363—135** **8 Claims**




1. Power converting apparatus for changing direct current to a chosen frequency alternating current,

a transformer having

a primary winding with the direct current supplied intermediate its ends; and

a secondary winding being grounded intermediate its ends;

means mounted with the primary of said transformer for converting the direct current to a series of pulses in the primary winding which includes a pulse train forming an effective current with reciprocal positive and negative sine wave components for each half cycle of the chosen frequency wherein said converting means includes first and second silicon controlled rectifiers mounted in series with one end of the primary winding of said transformer, third and fourth silicon controlled rectifiers mounted in series with the other end of the primary, first signal generating means for alternatively firing the first and third silicon controlled rectifiers, and second signal generating means for simultaneously firing the second and fourth silicon controlled rectifiers, wherein said first and second signal generating means provide firing signals of different frequencies and chosen frequency of the effective current being proportionate to the difference between the firing signal frequencies;

gating means mounted with the secondary of said transformer for sequentially passing the pulses in the negative sine wave component of the effective current followed by the pulses in the positive sine wave component, said gating means passing the pulses received in the secondary winding synchronously with the pulses in each half cycle of the pulse train to form a chosen frequency alternating current component; and

a filter mounted with the said gating means for removing selected components of the gated signal while providing an output of the chosen frequency alternating current.

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**4,293,907**
**DATA PROCESSING APPARATUS HAVING OP-CODE EXTENSION REGISTER**
**Victor K. Huang, Scotch Plains, and Richard L. Ruth, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**
**Filed Dec. 29, 1978, Ser. No. 974,426**
**Int. Cl.³ G06F 13/00**
**U.S. Cl. 364—200** **6 Claims**

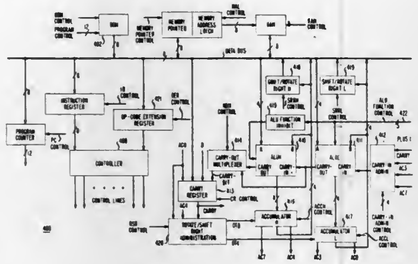
1. A processor designed for executing a program of stored instructions through a sequence of instruction cycles, the processor being adapted to be coupled to memory means having a multiplicity of addressable locations for storing instructions and data, each instruction having an op-code portion and an address portion, and the data including operands and op-code extension words, the processor comprising;

(a) instruction register means for storing an instruction;

(b) instruction retrieval means for transferring a current instruction from the memory means to the instruction register means in each instruction cycle;

(c) an op-code extension register for receiving and storing an op-code extension word;

(d) control means responsive to the combination of the op-code portion of the current instruction and the contents of the op-code extension register for generating control signals corresponding to processor operations specified by the combination; and



(e) data retrieval means responsive to particular control signals and to the address portion of the current instruction for transferring data specified by the address portion of the current instruction from the memory means to the processor, the data retrieval means transferring a specified op-code extension word from the memory means to the op-code extension register when the current instruction is a special instruction for transferring the specified op-code extension word to the op-code extension register.

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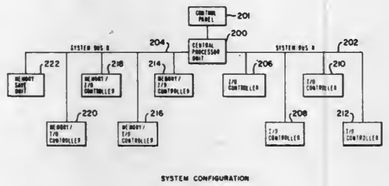
**4,293,908**
**DATA PROCESSING SYSTEM HAVING DIRECT MEMORY ACCESS BUS CYCLE**
**John J. Bradley, Framingham; Thomas O. Holtey, Newton Lower Falls; Robert C. Miller, Braintree; Ming T. Miu, Chelmsford; Jian-Kuo Shen, Watertown, and Theodore R. Staplin, Jr., Chelmsford, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**
**Filed Jan. 31, 1979, Ser. No. 8,001**
**Int. Cl.³ G06F 13/00**
**U.S. Cl. 364—200** **11 Claims**




1. A data processing system comprising a main memory capable of storing a plurality of data words, each data word of said plurality of data words having a unique memory address, said main memory coupled to a central processing unit (CPU) and an input/output controller (IOC) over a common bus for the bidirectional transfer of information between said main memory and said IOC during information transfer cycles, said system further comprising:

A. first means, included in said IOC and coupled to said common bus, for enabling the transfer of a request signal via said common bus, said request signal indicating a request for a transfer of data between said main memory and said IOC;

B. second means, included in said CPU and coupled to said common bus, responsive to said request signal for enabling the transfer of an address information from a third means via said common bus to said main memory during an address cycle generated at a point in time following receipt of said request signal, said address cycle being a particular type of said information transfer cycles;

C. said third means, included in said IOC and coupled to said common bus, for transmitting said address information to said main memory via said common bus;

D. fourth means, included in said IOC and coupled to said common bus, for enabling the receipt of data information transmitted from said main memory to said IOC via said common bus if a read operation or for enabling the transmission of said data information by said IOC via said common bus to said main memory if a write operation during a data transfer cycle generated at a point in time following said address cycle, said data transfer cycle being a particular type of said information transfer cycles;

E. fifth means, included in said IOC and coupled to said second means and said third means, for generating said address information, wherein said address information comprises a memory address and an indication of whether the addressed location is to be written into or read from said main memory;

F. sixth means, included in said IOC and coupled to said fifth means, for storing and augmenting said memory address, by one location said augmentation taking place once per address cycle;

G. seventh means, included in said IOC and coupled to said first means, for storing and decrementing a range as to the number of data words yet to be transferred, said range to be decremented by one once per address cycle;

H. an other IOC, coupled to said common bus, said other IOC including means for generating said request signal;

I. eighth means, included in said IOC and coupled to said first means and said common bus, for inhibiting the generating of said request signal when said other IOC has already generated said request signal; and

J. ninth means, included in said IOC and coupled to said first means and said eighth means, for receiving a synchronization signal via said common bus and enabling said first means to generate said request signal only if said synchronization signal indicates that it is said IOC's unique time to request allocation of said common bus, whereby said request signal will be generated on said common bus by said IOC only if it is said IOC's unique time to make requests and said other IOC is not already making a request for allocation of said common bus.



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**4,293,909**
**DIGITAL SYSTEM FOR DATA TRANSFER USING UNIVERSAL INPUT-OUTPUT MICROPROCESSOR**
**Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.**
**Filed Jun. 27, 1979, Ser. No. 52,336**
**Int. Cl.³ G06F 3/04**
**U.S. Cl. 364—200** **10 Claims**

1. In a digital system for the transfer of data between a main host computer, having a main memory, and a plurality of remote peripheral terminal devices wherein each peripheral terminal device is connected with its own dedicated peripheral-controller, and wherein a plurality of said peripheral-controllers are organized into groups designated as base modules such that each base module has its own message level interface bus connecting it, via a main system interface unit designated as an input-output translator, to a main host computer having a main processor and said main memory, and wherein said input-output translator provides means to connect and disconnect selected peripheral controllers, in each base module, with said main memory without interrupting the main processor, and further provides an I/O data transfer command word, an I/O descriptor-link word to identify each particular data transfer task for each peripheral-controller in said system, said peripheral-controller comprising:

(A) an Application Dependent Logic Module for interfacing a selected peripheral terminal device, and including:

(a) an external RAM memory for temporary storage of data undergoing transfer and for storing program data used for controlling data transfers to/from said peripheral terminal device and selected external registers;

(b) said plurality of external registers for temporary storage of data to be transferred to/from said peripheral terminal device, and data to be transferred to/from a microprocessor system, and including a message level interface bus to said main host system;

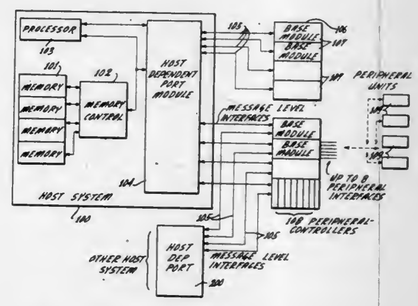
(c) a control logic unit, connected to a decoder-controller, for executing data transfers to/from said peripheral terminal device and for providing control signals to said microprocessor system;

(B) said microprocessor system operating in cooperation with said Application Dependent Logic Module, said microprocessor system including:

(a) data processing means including:

(a1) an arithmetic logic unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus said shift logic circuit functioning to rotate one or more bits of a word being processed, to the right or to the left;




(a3) said byte-swap circuit providing output to said I/O bus said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connecting lines from said data processing means to said external registers, to said external memory, to an accumulator register means, and to an addressing means;

(c) said addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an internal memory or said external memory storage, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;

(c2) a memory reference register for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;

(c2-2) and wherein a dedicated non-address bit in said memory reference register may be set to signal said decoder-controller to initiate a byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller

(c3) an address register in said decoder-controller con-

nected by means of an address bus to said accumulator register means, which includes a plurality of accumulator registers, for selection of data from one of said addressed accumulator registers;

(d) said internal program memory storage for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory reference register;

(e) register means for temporary storage of data, said register means including:

(e1) said plurality of addressable accumulator registers which provide an output to an input of said arithmetic logic unit, said accumulator registers receiving input data words from said I/O bus;

(e2) said memory operand register for receiving operand and data from said internal program memory via said instruction bus or from said external memory via a memory data bus and having an output connection to said arithmetic logic unit;

(e3) said instruction register for receiving instruction words from said internal program memory via said instruction bus and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means;

(f1) and wherein said decoder-controller further includes:

(f1a) connection means for receiving control signals from said control logic means;

(f1b) address lines to said external registers for selecting a specific register;

(f1c) control lines for strobing address signals to said external registers;

(g) said memory data bus for carrying data from said I/O bus and an output to said memory reference register;

(h) a repetition counter having an input from said I/O bus and an output to said memory reference register, and functioning to count a selected number of iterative operations;

(i) instruction word means in said internal program memory for signalling said decoder-controller, said instruction word means including:

(i) information for selecting a location as a source of data to be processed and transferred to a destination location;

(ii) information for selecting a location as a destination of data;

(iii) information for selecting a function to be executed.

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**4,293,910**

## RECONFIGURABLE KEY-IN-STORAGE MEANS FOR PROTECTING INTERLEAVED MAIN STORAGE

**Frederick O. Flusche, Hyde Park; Kwang G. Tan, Poughkeepsie, and Ralph W. Wright, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 2, 1979, Ser. No. 54,350**

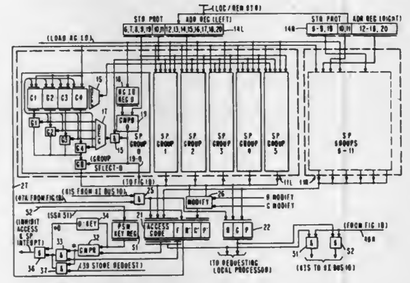
**Int. Cl.³ G11C *7/00*; G08B *29/00***

**U.S. Cl. 364—200** **6 Claims**

1. Reconfigurable storage protection (SP) array control means for a main storage having BSMs (basic storage modules) organizable on a plural BSM interleaved basis, a storage request register receiving the absolute address of each storage request, means for testing each SP key for determining the permissability of each access request to main storage, and prohibiting a requested main storage access when the key is violated, comprising:

a plurality of SP groups comprising the SP array, each group having at least one array chip,

at least one SP address register for receiving bits of each absolute address in the storage request register, the absolute address having: a BSM bit position which switches at main storage boundaries equal to the size of a BSM, and a block-related bit position which switches at main storage boundaries equal to an integral multiple of the size of a block, means connecting the bit positions of the absolute address in the storage request register to corresponding bit positions in the SP address register in the absolute address sequence of bits except that the block-related bit position is connected out-of-sequence to adjacently follow the BSM bit position in the SP address register, the SP address register being divided into at least a high-order field and a low-order field, the high-order field having both the BSM bit position and the block-related bit position,



decoder means in each SP group having an input connected to the low-order field of the SP address register, the decoder output connected to the array chip in the same SP group for locating an SP entry in the group,

a range identifier register in each SP group containing a value defining a range related to the size of a BSM,

a comparator in each SP group having one input connected to the high-order field in the SP address register, another input to the comparator connected to the range identifier register in the same SP group to select a required one of the SP groups in response to a storage request,

gating means with each SP group connected to the output of the comparator and to the output of the chip in the same SP group for outputting the SP entry located by the decoder means required by the storage request,

array output registering means, and

means for connecting the gating means of all SP groups in the array to the input to the array output registering means to output a selected SP entry.

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**4,293,911**

## ELECTRONIC CASH REGISTER WITH FACILITIES OF STORING MERCHANDISE INFORMATION

**Souichi Oonishi, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 24, 1979, Ser. No. 60,191**

**Claims priority, application Japan, Jul. 24, 1978, 53-90666**

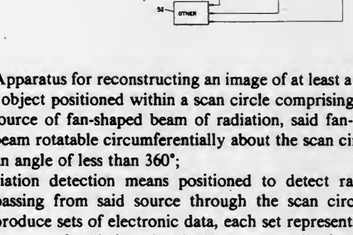
**Int. Cl.³ G06F *13/06***

**U.S. Cl. 364—405** **6 Claims**

1. A system for loading commodities information onto a memory of an electronic cash register, said system comprising:

means for sequentially producing code signals and for providing each of these signals to an operator, each of said code signals being representative of an item of merchandise; and

input means for entering data representative of commodities information into the memory, said commodities information being identified in the memory by its associated code signal received from said means for sequentially producing and providing representative of the item of merchandise said commodities information describes;



said means for sequentially producing and providing including means for incrementing a current code signal after the completion of entry of the data corresponding to the current code signal by said input means to produce a new code signal.

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**4,293,912**

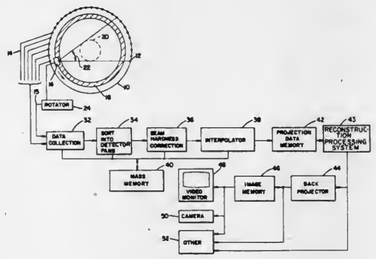
## TOMOGRAPHIC APPARATUS

**Ronald G. Walters, Aurora, Ohio, assignor to Technicare Corporation, Cleveland, Ohio**

**Division of Ser. No. 838,084, Sep. 30, 1977. This application Apr. 23, 1979, Ser. No. 32,452**

**Int. Cl.³ G01N *23/08***

**U.S. Cl. 364—414** **33 Claims**



1. Apparatus for reconstructing an image of at least a region of an object positioned within a scan circle comprising:

a source of fan-shaped beam of radiation, said fan-shaped beam rotatable circumferentially about the scan circle by an angle of less than 360°;

radiation detection means positioned to detect radiation passing from said source through the scan circle and produce sets of electronic data, each set representing the amount of radiation absorbed by a generally fan-shaped region of the object;

convolver means for performing a convolution operation on at least a part of the sets of electronic data which represent absorption in the fan-shaped regions without binning the electronic data into parallel ray data sets with a convolution function to form convolved data;

back projecting means for back projecting said convolved data into a memory means; and

display means operatively connected to said memory means for displaying said image.





**4,293,913**

## NUMERICAL CONTROLLER FOR A GRINDING MACHINE

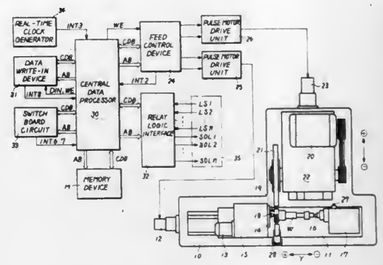
**Hideo Nishimura, Aichi; Takao Yoneda, Toyoake, and Minoru Enomoto, Ohbu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Jul. 25, 1979, Ser. No. 60,678**

**Claims priority, application Japan, Jul. 28, 1978, 53-92771**

**Int. Cl.³ B24B *51/00*; G06F *15/46***

**U.S. Cl. 364—474** **17 Claims**



1. A numerical controller, including a central processor, for controlling a grinding machine having a wheel head for supporting a grinding wheel, a work table for supporting a workpiece, and first and second servomechanisms connected to said wheel head and said worktable for relatively moving the same along first and second axes, said numerical controller comprising:

memory means connected to said central processor for storing and retrieving data, including:

a number of parameter kind storage means corresponding respectively to a number of grinding modes in any one of which a surface of said workpiece is ground and each storing a plurality of kinds of control parameters necessary for grinding said workpiece surface in a corresponding one of said grinding modes;

mode storage means for storing one of said grinding modes in which said workpiece is to be ground;

a data stack table for storing written-in control parameters;

operational sequence storage means for storing a number of operational sequence programs corresponding respectively to said grinding modes, each of said operational sequence programs prescribing the manner in which a series of relative movements between said wheel head and said work table are to be performed in a corresponding one of said grinding modes;

data write-in means connected to said central processor and manually operable for writing data into memory including writing control parameters into said data stack table;

read-out means connected to said central processor for receiving and displaying data retrieved from storage, including reading out said kinds of said control parameters from one of said parameter kind storage means which corresponds to said one of said grinding modes stored in said mode storage means, and visibly displaying said kinds of said control parameters read out so as to thereby request the writing-in of those control parameters;

said central processor being connected to said mode storage means for selecting one of said operational sequence programs which corresponds to said one of said grinding modes stored in said mode storage means; and

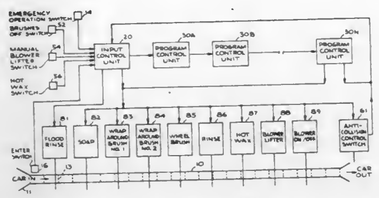
feed control means connected to said central processor and to said first and second servomechanisms for controlling the servomechanisms in accordance with said one of said operational sequence programs selected by said central processor and said control parameters stored in said data stack table.

**4,293,914**

## AUTOMATIC CONTROL SYSTEM FOR CARWASH INSTALLATIONS

**Nguyen Van Trang, 139 Alta Ave., Santa Monica, Calif. 90402**

**Filed May 24, 1979, Ser. No. 42,128**
**Int. Cl.³ G05B *19/00***
**U.S. Cl. 364—478** **4 Claims**



1. A control system for carwash installations incorporating a plurality of task-performing devices disposed along a conveyor adapted to bear vehicles from an entrance station towards a discharge station, comprising:

input control means, responsive to an enter switch disposed proximate to said entrance station and activated by the passage of a vehicle therethrough;

a plurality of program control units, each comprising timer control means adapted to be operative or inoperative and gate control means, responsive to signals from said input control means when said timer control means are inoperative, said program control units disposed sequentially along control paths between said input control means and said task-performing devices;

each of said timer control means operative to activiate said task-performing devices in a pre-determined time sequence corresponding to the transit time of said conveyor between said entrance station and said discharge station;

each of said gate control means adapted to activate the timer control means associated therewith or to transfer said signals sequentially to another of said program control units,

whereby said task performing devices incorporated in said carwash installation are activated in a time-synchronized manner as one or more vehicles transit said conveyor, with one of said program control units controlling the operation of the task-performing devices for each such vehicle.

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**4,293,915**

## PROGRAMMABLE ELECTRONIC REAL-TIME LOAD CONTROLLER

**Edward J. Carpenter, Lynnwood; William W. Korff, Seattle, both of Wash.; Alan E. Zoerb, deceased, late of Seattle, Wash. (by Delores E. Zoerb); Lawrence J. Barello, Bellevue, Wash.; Donald R. Hall, Edmonds, Wash., and Orlien N. Becker, Lynnwood, Wash., assignors to Pacific Technology, Inc., Renton, Wash.**

**Filed Apr. 16, 1979, Ser. No. 30,348**
**Int. Cl.³ G01R *21/00*; G06F *15/06***
**U.S. Cl. 364—493** **25 Claims**

1. An electronic controller for controlling the energization states of each of a plurality of electrical loads in real-time, said controller comprising:

a plurality of load control circuits, each said load control circuit being adapted to be interconnected with a load, and having a load-on state when its load is to be on, and a load-off state when its load is to be off;

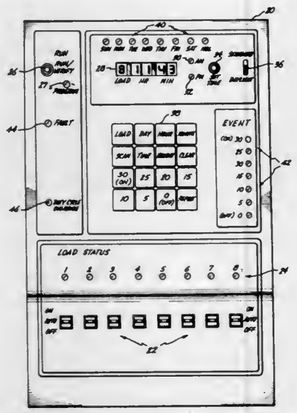
clock means for accumulating real-time information; and,

a data processor, including:

an event memory for storing a plurality of load groups of information, each said load group being uniquely associated with one of the plurality of electrical loads and comprising one or more control events and an event time corresponding to each said control event, said control events in each said load group representing: an on control function in which the associated load is to be on for the entirety of each predetermined control interval successive to the corresponding event time; an off control function in which the associated load is to be off for the entirety of each predetermined control interval successive to the corresponding event time; and, a duty-cycle control function in which the associated load is to be on for a predetermined portion of each predetermined control interval successive to the corresponding event time;

a program memory storing a set of program instructions; and,

a processing means operative in response to said set of



program instructions stored in said program memory, said processing means including: means operative to enter said control events and corresponding event times for each load into the associated load group in said event memory; means for obtaining said real-time information from said clock means; means for addressing and searching the associated load group for each load in said event memory to effect comparison of said event times therein with said real-time information obtained from said clock means; and, means for placing said load control circuit for each load in said load-on state or said load-off state in accordance with that one of said control events in said associated load group whose corresponding event time is at or immediately procedes the time represented by said real-time information obtained from said clock means.

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**4,293,916**

## APPARATUS FOR GENERATING SIGNALS SIMULATING THE OUTPUT OF A DEVICE FOR MEASURING A PHYSICAL VARIABLE

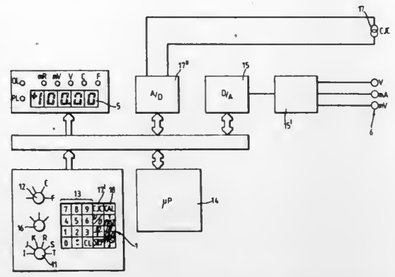
**Pietrantonio Del Re, Bra, and Pietro Fracassi, Milan, both of Italy, assignors to Carlo Gavazzi S.p.A., Milan, Italy**

**Filed Oct. 9, 1979, Ser. No. 82,479**
**Claims priority, application Italy, Oct. 31, 1978, 29297 A/78**
**Int. Cl.³ G06F *15/20***
**U.S. Cl. 364—571** **9 Claims**

1. An apparatus for generating electric signals for simulating the output of a measuring apparatus sensitive to a physical variable and providing an output electric signal indicative of the measured physical variable comprising a selector for choosing the type of measuring apparatus to be simulated, a measuring unit selector, a selector for selecting the value of a physical variable the measurement of which is to be simulated,



a computer circuit controlled by said selectors and including a memory to contain information concerning the types of measuring apparatus that can be selected, and means controlled by said computer circuit for supplying a simulated output signal to output terminals.



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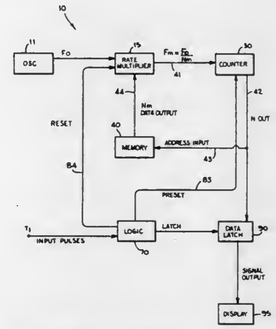
**4,293,917**

## NON-LINEAR FUNCTION GENERATOR

**Philip D. Wasserman, Cupertino, Calif., assignor to Stanford Associates, Inc., Menlo Park, Calif.**

**Filed Nov. 28, 1979, Ser. No. 97,913**
**Int. Cl.³ G06F *1/02, 15/31***
**U.S. Cl. 364—701** **16 Claims**



13. A function generator comprising:

(a) a rate multiplier circuit having a constant multiplicand;

(b) a memory circuit connected to said rate multiplier circuit for selecting the multiplier for said rate multiplier circuit;

(c) first means connected to the output of said rate multiplier circuit and to said memory circuit for addressing said memory circuit in response to the output of said rate multiplier circuit to select a multiplier for said rate multiplier circuit; and

(d) second means responsive to the output of said first means for presenting a non-linear function with respect to a time interval.

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**4,293,918**

## DIGITAL DIFFERENTIAL ANALYZER WITH AN INCREMENT OUTPUT FUNCTION

**Yukio Asakawa, Hitachiota, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 19, 1979, Ser. No. 86,444**
**Claims priority, application Japan, Oct. 20, 1978, 53-128487**
**Int. Cl.³ G06F *7/64***
**U.S. Cl. 364—702** **6 Claims**

1. A digital differential analyzer having a function of producing an increment of a time-variable input signal and comprising:

a first latch register for latching first data representing an instant value of said input signal at a predetermined timing,

a first register for storing second data whose value is renewed when a new value of said second data is applied thereto,

a second latch register coupled to said first register for latching the second data stored in said first register,

a first arithmetic logic unit coupled to said first and second latch registers for performing a first operation in which a first value represented by said first data latched in said first latch register has subtracted therefrom a second value represented by said second data latched in said second latch register, and for performing a second operation which determines whether or not said first value is equal to said second value,

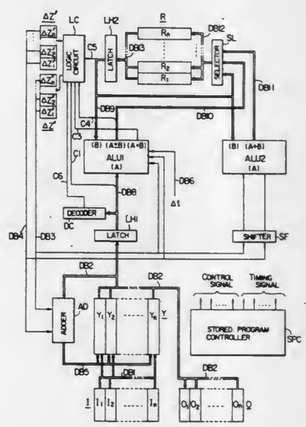
a logic circuit coupled to said first and second latch registers and said first arithmetic logic unit for determining whether or not any increment is present in said first value with respect to said second value, and for determining the sign of any such increment from the signs of said first and second values, the sign of the result of said first operation and the determination by said second operation,

a second register coupled to said logic circuit for storing a first signal indicative of the sign of said increment determined by said logic circuit,

a third register coupled to said logic circuit for storing a second signal indicative of the result of the determination by said logic circuit as to the presence of any increment in said first value,

a second arithmetic logic unit coupled to said second and third registers for performing a third operation in which the value of said second data latched in said second latch register is modified by an increment determined according to said first and second signals stored in said second and third registers, and

means coupled between said second arithmetic logic unit and said first register for renewing the value of said second data stored in said first register by the result of said third operation.

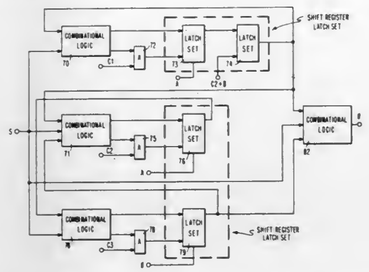


**4,293,919**

## LEVEL SENSITIVE SCAN DESIGN (LSSD) SYSTEM

**Sumit Dasgupta, Wappingers Falls; Prabhakar Goel, Poughkeepsie, both of N.Y., and Thomas W. Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 13, 1979, Ser. No. 66,130**
**Int. Cl.³ G06F *7/48, 11/00;* H03K *23/30***
**U.S. Cl. 364—716** **3 Claims**




1. A system of logic for performing at least one predetermined logical function, said system of logic including:
a plurality of combinational logic circuits;
a multi-stage shift register having an input, an output, and shift controls;
each stage of said multi-stage shift register comprising first and second interconnected DC latches;
and circuit means interconnecting said plurality of combinational logic circuits and said first and second interconnected D.C. latches of said multi-stage shift register, whereby said shift register is available for use in the testing of each of said plurality of combinational logic circuits and each of said D.C. latches of said multi-stage shift register is also available for use as an independently operable data latch in providing said at least one predetermined logical function.

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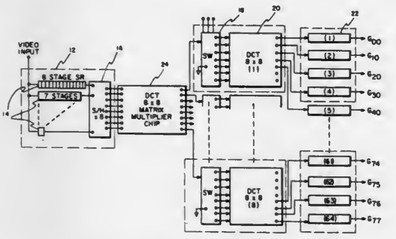
**4,293,920**

## TWO-DIMENSIONAL TRANSFORM PROCESSOR

**Pasquale A. Merola, 2020 Cottontail La., Brookfield, Wis. 53005**

**Filed Sep. 4, 1979, Ser. No. 71,645**
**Int. Cl.³ G06F *15/332***
**U.S. Cl. 364—725** **2 Claims**




1. A two-dimensional transform processor capable of sampling each pixel of raster scanned serial data every tp seconds comprising:
a series to parallel data converter means which accepts N raster scanned serial data samples and transforms the order of said samples into a parallel order;
a first matrix multiplier means capable of accepting data from said series to parallel data converter means in a parallel order every Ntp seconds and yielding N one-dimensional transformed data samples as output values every Ntp seconds;
at least N switching means, each of said switching means having one input terminal and N output terminals, each input terminal of each of said switching means being connected to said first matrix multiplier so as to accept one of the N one-dimensional transformed data samples, said N output terminals of each of said N switching means having one data sample and N-1 zero valued samples;
at least N second matrix multiplier means, each of said second matrix multiplier means having N input terminals and N output terminals, each of said N input terminals being connected to N output terminals of one of said N switching means, each of said N second matrix multiplier means computing N partial products every Ntp seconds;
an accumulator means which accumulates $N^2$ partial products which comprise the two-dimensional transform of said raster scanned serial pixel samples.

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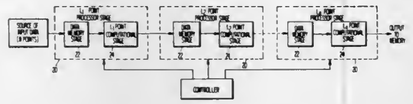
**4,293,921**

## METHOD AND SIGNAL PROCESSOR FOR FREQUENCY ANALYSIS OF TIME DOMAIN SIGNALS

**Winthrop W. Smith, Jr., Maitland, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.**

**Filed Jun. 15, 1979, Ser. No. 48,810**
**Int. Cl.³ G06F *15/332***
**U.S. Cl. 364—726** **54 Claims**




1. A processor for processing input data comprising N discrete samples $a_i$ (i=0,1,2, . . . , N−1) of a quantized time domain signal having real components $a_{iR}$ and imaginary components $a_{iI}$ in order to determine the frequency content thereof, said processor having a computational stage comprising:
means connected to receive signals representing the real and imaginary components for calculating sums and differences of the real components of the input data and for calculating sums and differences of the imaginary components of the input data;
first data storage means for storing said sums and differences of the real and imaginary components of the input data and for retrieving the stored sums and differences of the real and imaginary components in a first predetermined order;
means connected to receive said retrieved sums and differences of the real and imaginary components, in said first predetermined order, for multiplying the retrieved sums and differences by predetermined constant values and for summing the products with at least some of the retrieved sums and differences to produce partial sums of the real and imaginary components;
second data storage means for storing the partial sums as they are produced and for retrieving the stored partial sums in accordance with a second predetermined order of retrieval in order to separately retrieve the partial sums of the real and imaginary components, respectively; and
means for calculating the sums and differences of the partial sums of the real components and the imaginary components of the data retrieved from said second storage means to produce real and imaginary output data representating the frequency content of the time domain signal.

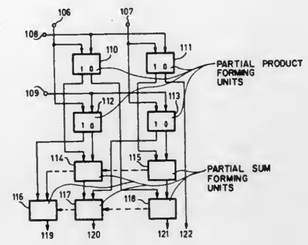


**4,293,922**

## DEVICE FOR MULTIPLYING BINARY NUMBERS

**Marc Davio, and Gery J. A. Bioul, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 812,244, Jul. 1, 1977, abandoned. This application Jul. 18, 1979, Ser. No. 58,414**
**Int. Cl.³ G06F *7/52***
**U.S. Cl. 364—757** **15 Claims**




1. A device for multiplying a first number having a first plurality of m groups, by a second number having a second plurality of p groups of binary digits, each of said groups consisting of n digits, of corresponding directly successive significance levels, where m, p, and n are positive integers, comprising:
a plurality of q partial product forming devices, q being a positive integer greater than or equal to m×p, each of said partial product forming devices comprising 2n inputs for simultaneously receiving a first and second group of binary digits from said first and second plurality of groups respectively, each of said groups of said first plurality being applied to p partial product forming devices, and each of said p groups of said second plurality being applied to m different ones of said partial product forming devices, so that each of said partial product forming devices receives a first group of digits from said first plurality and a second group of digits from said second plurality;
each of said product forming devices further including combinatorial gating means which form a partial product consisting of 2n binary digits of successive significance levels;
a sum forming device having inputs connected to said outputs of said combinatorial gating means which form a complete sum of q partial products, comprising a plurality of r partial sum forming devices, each sum forming device comprising inputs for simultaneously receiving first and second groups of binary digits, each group comprising j binary digits of directly successive significance levels, both of said groups originating from at least two partial products derived from said combinatorial gating means, where r and j are positive integers;
each partial sum forming device having a further input for receiving a binary output carry signal from a partial sum forming device of next lower significance level, simultaneously with said first and second groups of binary digits;
each partial sum forming device further including j outputs for outputting the partial sum of the signals received by said partial sum forming devices, and a carry output for outputting simultaneously therewith a binary output carry signal to a partial sum forming device of next higher significance level;
an array of said partial sum forming devices cooperating with said partial product forming devices of lowest significance level in order to form the complete product in parallel.

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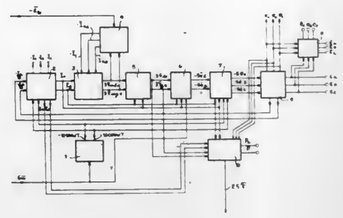
**4,293,923**

## SYSTEM FOR SIMULATING THE OPERATING CHARACTERISTICS OF ELECTRIC MACHINES

**Gilles Jasmin, Sherbrooke, and John P. Bowles, St.-Bruno, both of Canada, assignors to Hydro-Quebec, Montreal, Canada**

**Filed Apr. 17, 1979, Ser. No. 30,787**
**Int. Cl.³ G06G *7/63, 7/34***
**U.S. Cl. 364—802** **20 Claims**



1. A system for the analogic simulation of a three-phase rotating machine, comprising
first means for transforming the armature currents of the machine into equivalent diphase currents and for transforming said diphase currents into currents along axes called direct and quadrature axes;
means for generating and controlling parameters and characteristics relative to the operation of the machine in response to said direct axis and quadrature axis currents;
means for generating diphase voltages in response to said means for generating and controlling the parameters and the characteristics of the machines;
second means for transforming said diphase voltages into three-phase voltages; and
means for generating dynamic characteristics of the machine as a function of said the voltages and of said parameters and characteristics of operation generated by said generating and controlling means.

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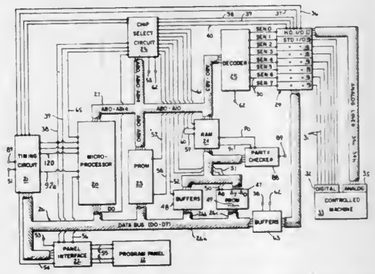
**4,293,924**

## PROGRAMMABLE CONTROLLER WITH HIGH DENSITY INTELLIGENT I/O INTERFACE

**Odo J. Struger, Chagrin Falls; Ronald A. Brown, Willowick, and Craig A. Black, Lyndhurst, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.**

**Filed May 30, 1979, Ser. No. 43,886**
**Int. Cl.³ G06F *9/22***
**U.S. Cl. 364—900** **13 Claims**




1. A digital controller for monitoring and controlling I/O devices on a controlled system, wherein the I/O devices include word-oriented I/O device circuits, the controller comprising:
a bidirectional data port;
a main processor having:
(a) main memory means located therein for storing a

plurality of instructions, and for storing a plurality of words of I/O status data in a storage area, and

(b) main processor means located in the main processor, the main processor means being connected to the bidirectional data port and to the main memory means, and the main processor means being operable to sequentially read and execute the instructions stored in the main memory means to couple a plurality of words of I/O status data between the bidirectional data port and the storage area in the main memory means during a main I/O scan; and

a high density I/O interface module coupled to the main processor of the controller through the bidirectional data port and including:

(c) high density memory means for storing a plurality of words of I/O status data, for storing a first group of machine instructions for coupling the words of I/O status data between the high density I/O interface module and the I/O device circuits during a peripheral I/O scan, and for storing a second group of machine instructions for inter-processor communication through the data port;

(d) a module I/O bus;

(e) sequencing means, connecting a plurality of the word-oriented I/O device circuits to the module I/O bus, for coupling the plurality of words of I/O status data therebetween; and

(f) high density processor means coupled to the bidirectional data port, connected to the high density memory means, and connected to the sequencing means through the module I/O bus and through sequencing control lines, the high density processor means being operable to sequentially read and execute the second group of machine instructions in the high density memory means to couple words of I/O status data between the high density memory means and the bidirectional data port during the main I/O scan, and being operable to sequentially read and execute the first group of machine instructions in the high density memory means to operate the sequencing means through the sequencing control lines and sequentially couple the plurality of words of I/O status data between the high density memory means and a corresponding plurality of word-oriented I/O device circuits to accomplish the peripheral I/O scan,

whereby the plurality of words of I/O status data are coupled between the storage area in the main memory means and the word-oriented I/O device circuits through the peripheral I/O scan at the I/O interface to monitor and control the I/O devices on the controlled system.

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**4,293,925**

## APPARATUS AND METHOD FOR INDICATING A MINIMUM DEGREE OF ACTIVITY OF DIGITAL SIGNALS

**George A. Haag, Colorado Spring; O. Douglas Fogg, Loveland; Gordon A. Greenley, Colorado Spring; Steve A. Shepard, Colorado Spring, all of Colo., and F. Duncan Terry, Meridan, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Division of Ser. No. 828,138, Aug. 29, 1977, abandoned, which is a continuation of Ser. No. 75,787, Sep. 17, 1979, abandoned, which is a continuation of Ser. No. 210,462, Nov. 25, 1980. This application May 31, 1979, Ser. No. 43,987**

**Int. Cl.**[3] **G06F** *3/14, 7/02*

**U.S. Cl. 364—900** **4 Claims**

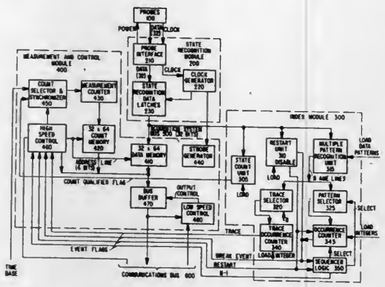
1. A method of indicating the existence of at least a minimum amount of activity of individual digital signals among a collection of digital signals, the method comprising the steps of:

monitoring the individual digital signals to determine in accordance with preselected thresholds and polarities the logical value of each of the individual digital signals;

periodically capturing the logical values of the individual digital signals determined by the monitoring step;

comparing after each capturing step each set of newly captured logical values with the most recent previously captured set, each such comparison being between the old and new logical values for each of the individual digital signals, for producing a set of indications indicating which individual digital signals have a newly captured logical value that differs from the most recent previously captured corresponding logical value;

combining after each comparing step the newest set of indications with a most recent cumulative result from previously combined previous sets of indications to provide a new cumulative result, the combining being the forming of the plurality of logical conjunctions between each



individual value in the newest set of indications and the corresponding value in the most recent previous cumulative result and the subsequent taking of the outcome of each of those logical conjunctions as a corresponding portion of the new cumulative result; and

displaying the cumulative result of the combining step in a series of annunciator locations each associated with an individual digital signal, each annunciator location displaying one of first and second indications respectively representing the two possible outcomes of each of the logical conjunctions of the combining step, thereby indicating which digital signals are experiencing a minimum amount of activity and which are not.

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**4,293,926**

## DYNAMIC TYPE SEMICONDUCTOR MEMORY EQUIPMENT

**Yutaka Amano, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 13, 1979, Ser. No. 11,846**

**Claims priority, application Japan, Feb. 13, 1978, 53-14099**

**Int. Cl.**[3] **G11C** *7/00, 8/00, 11/00*

**U.S. Cl. 364—900** **16 Claims**

1. A data processing system comprising at least a central processing unit and a plurality of dynamic type semiconductor memory equipments operative in an asynchronous refresh mode and connected in common to a memory address bus, a memory data bus and a memory busy signal bus, respectively, which extend to said central processing unit, each of said memory equipments including:

(a) means for receiving a memory starting synchronous signal from said central processing unit and fetching therein a designated memory address,

(b) memory busy signal sender means for sending a memory busy signal to said central processing unit through said busy signal bus,

(c) means for effecting transaction of memory data with said central processing unit through said memory data bus in accordance with said memory address,

wherein said dynamic type semiconductor memory equipment operative in an asynchronous refresh mode includes:

(i) a memory starting register for receiving at the input thereof said memory starting synchronous signal from said central processing unit, latching said memory starting synchronous signal and sending a memory access request signal, and adapted to be reset upon reception of a first reset signal produced when said refresh operation indicating signal is absent,

(ii) an address register for fetching therein said memory address from said central processing unit through said memory address bus in response to said memory starting synchronous signal, latching said memory address and sending an addressing output signal therefrom to a memory block incorporated in each of said dynamic type semiconductor memory equipments, and adapted to be reset upon reception of said first reset signal produced when said refresh operation indicating signal is absent,

(iii) a refresh request circuit including means for producing a refresh request pulse at a predetermined refresh period, means for latching said refresh request pulse to send a refresh request signal and means for resetting said refresh request signal by said first reset signal when a refresh operation indicating signal for indicating that refresh operation takes place is present,

(iv) a preference control circuit including a memory access flip-flop and a refresh operation indicating flip-flop for producing said refresh operation indicating signal, said flip-flops being so adapted that either one of them is set with preference over the other in response to



either one of said memory access request signal and said refresh request signal, while both of said flip-flops are adapted to be reset by said second reset signal, and a timing start flip-flop adapted to be set in dependence on the logical sum of the output signals from both of said memory access flip-flop and said refresh operation indicating flip-flop and reset by a third reset signal, (v) a timing circuit adapted to be started in response to said output signal from said timing start flip-flop thereby to produce a predetermined memory block drive signal, said timing circuit being further adapted to produce said first reset signal at a given time after termination of said memory block drive signal, to produce said second reset signal at a given time after termination of said first reset signal and to produce said third reset signal after a predetermined time elapse required for producing said memory block drive signal, and

(vi) means for transmitting said memory busy signal to said central processing unit through said memory busy bus by controlling said memory busy signal sender means with the aid of the output signal from said memory access flip-flop,

wherein said preference control circuit includes means for selecting said memory access request signal with preference over said refresh request signal upon concurrent occurrence of both said request signals by utilizing as said refresh operation indicating signal a logical product of the output of said refresh operation indicating flip-flop and the inverted output of said memory access flip-flop.

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**4,293,927**

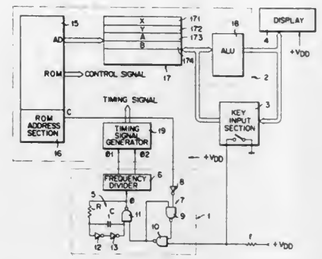
## POWER CONSUMPTION CONTROL SYSTEM FOR ELECTRONIC DIGITAL DATA PROCESSING DEVICES

**Toshifumi Hoshii, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Dec. 12, 1979, Ser. No. 102,768**

**Int. Cl.**[3] **G06F** *11/30;* **H03K** *5/13*

**U.S. Cl. 364—900** **9 Claims**



1. A power consumption system for electronic digital data processing devices comprising:

an oscillating circuit for producing a basis clock driving signal;

a key input section having a plurality of key switches;

counting means coupled to said key input section for updating and initiating a count operation every time any one of the key switches is operated; and

control means coupled to said oscillating circuit to cause said oscillating circuit to stop oscillating and to thereby stop producing said basic clock driving signal when none of said key switches is operated before said count means completes counting for a given period of time after initiation of said count operation.

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**4,293,928**

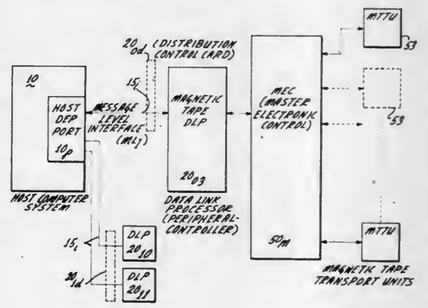
## PERIPHERAL DEPENDENT CIRCUIT FOR PERIPHERAL CONTROLLER

**Kenneth W. Baun, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Dec. 14, 1979, Ser. No. 103,452**

**Int. Cl.**[3] **G06F** *3/04, 3/06*

**U.S. Cl. 364—900** **10 Claims**



1. A peripheral dependent circuit board, which when combined with a common control circuit card having a RAM buffer storage memory, forms a peripheral-controller operat-

ing to control data transfers between a host computer system and a peripheral terminal unit, said peripheral dependent circuit board comprising:

(a) bi-directional data path means to said peripheral terminal unit;

(b) address logic means for formulating addresses for the reading out and writing in of data in said RAM buffer storage memory;

(c) multiplexor means for selecting a source of data that is to be transmitted to said RAM buffer storage memory;

(d) error detection means for checking messages sent between said peripheral-controller and said host system and for checking messages between said peripheral controller and said peripheral terminal unit;

(e) means to set a unique address to identify said peripheral-controller;

(f) word-generation shift register means to provide control and information data to said peripheral teminal unit and-/or said host computer system;

(g) logic means for executing micro-code word operators received from said common control circuit card.

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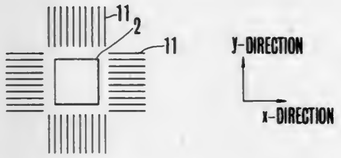
**4,293,929**

## MAGNETIC BUBBLE MEMORY DEVICES

**Hirofumi Ohta, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 16, 1979, Ser. No. 67,121**
**Claims priority, application Japan, Aug. 23, 1978, 53-101774**
**Int. Cl.³ G11C *19/08***
**U.S. Cl. 365—2** **6 Claims**




1. In a magnetic bubble memory device comprising an insulating substrate, a magnetic bubble memory chip placed within a recess formed in the approximate center of said insulating substrate, and rotating magnetic field generating coils wound around the outer periphery of the insulating substrate so as to encircle the chip, said device operating under a bias magnetic field vertical to said magnetic bubble memory chip and a rotating magnetic field parallel to said chip, the improvement which comprises a plurality of rod-like members made of soft ferromagnetic material and placed in a second recess formed in said substrate to surround said chip, being on a plane substantially the same as the major surface of said chip.

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**4,293,930**

## BUBBLE DETECTION SYSTEM

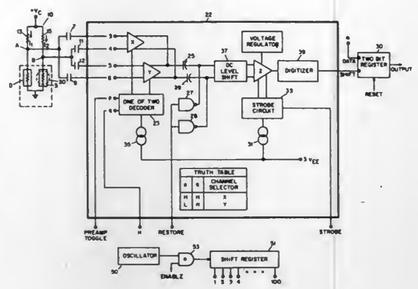
**Joseph Van Reymersdal, Fairless Hills, Pa., assignor to Sperry Corporation, New York, N.Y.**

**Filed Oct. 24, 1979, Ser. No. 87,911**
**Int. Cl.³ G11C *7/02, 19/08***
**U.S. Cl. 365—8** **6 Claims**

1. Apparatus for determining presence or absence of a magnetic bubble comprising:

(a) means for twice strobing a signal produced by said magnetic bubble;

(b) means coupled to said sensing means for-twice detecting (said) signals produced by said dual strobing within a specified time period,




whereby the detection of said bubble signal twice indicates the presence of a bubble, and the failure to detect a bubble signal twice indicates the absence of a bubble signal.

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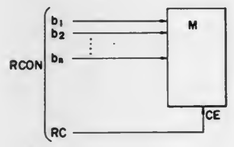
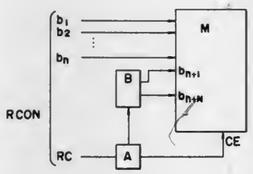
**4,293,931**

## MEMORY REFRESH CONTROL SYSTEM

**Yoshikazu Tanaka, Kawasaki; Hitoshi Shirai, and Yoshiharu Kan'o, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 28, 1980, Ser. No. 135,184**
**Claims priority, application Japan, Apr. 2, 1979, 54-39550**
**Int. Cl.³ G11C *7/00***
**U.S. Cl. 365—222** **10 Claims**




1. A memory refresh control system comprising:

refresh control circuit means for generating refresh addresses respectively corresponding to combinations of n bits, and for producing in a limited period of time $2^n$ refresh clocks corresponding to said refresh addresses;

means for dividing each of said refresh clocks into $2^N$ sub-intervals; and

overhead bit generator means, supplied with said sub-intervals, for yielding successive N bit outputs respectively corresponding to all combinations of N bits, for each sub-interval;

wherein the n bits available from said refresh control circuit means are conjoined with said N bit outputs generated by the overhead bit generator means, and are provided as a refresh address corresponding to the respective sub-interval.

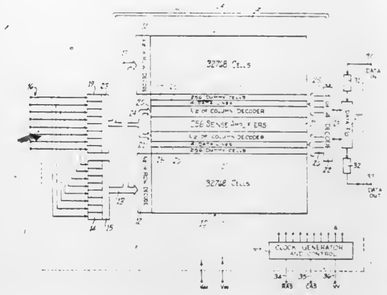


**4,293,932**

## REFRESH OPERATIONS FOR SEMICONDUCTOR MEMORY

**Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Feb. 11, 1980, Ser. No. 120,594**
**Int. Cl.³ G11C *7/00***
**U.S. Cl. 365—222** **9 Claims**




5. An electronic device comprising: an array of elements; means for accessing the array by a first address along with a first strobe signal and by a second address along with a second strobe signal, said means being activated by either said first strobe signal only or by both said first and second strobe signals; and clock generator means in said device for generating clock voltages for use with said second address and boosted in voltage by said first strobe signal.

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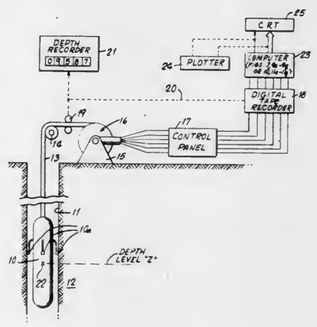
**4,293,933**

## WELL LOGGING APPARATUS AND METHOD: SYNTHETIC LOGS AND SYNTHETIC SEISMOGRAMS WITH EXTRAPOLATED REFLECTOR DIP FROM LOG MEASUREMENTS

**Sung K. Park, Bethel, and William E. Kenyon, Ridgefield, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.**

**Filed Mar. 17, 1975, Ser. No. 558,832**
**Int. Cl.³ G01V *1/32, 1/40***
**U.S. Cl. 367—25** **46 Claims**




15. A method of exploring a subsurface earth formation comprising the steps of:

providing log and dip signals derived from an investigating device passed through an actual borehole traversing the earth formation, and providing location signals defining the spatial relationship between said actual borehole and a virtual borehole spaced therefrom; and

automatically combining said log, dip, and location signals in automatic signal processing means to provide synthetic log signals characterizing the earth formation adjacent said virtual borehole.

36. A system for exploring a subsurface earth formation comprising:

means for providing log and dip signals derived from an investigating device passed through an actual borehole traversing the earth formation, and for providing location signals defining the spatial relationship between said actual borehole and a virtual borehole spaced therefrom; and

automatic means for combining said log, dip, and location signals to provide synthetic log signals characterizing the earth formation adjacent said virtual borehole.

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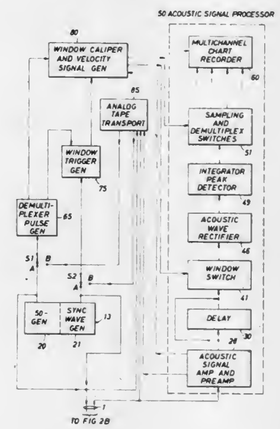
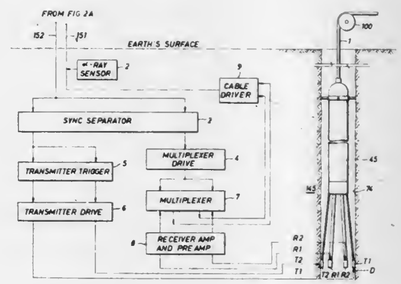
**4,293,934**

## CIRCUMFERENTIAL ACOUSTIC DEVICE

**Robert A. Heroiz, Willis, and Charles B. Vogel, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Jun. 18, 1979, Ser. No. 49,753**
**Int. Cl.³ G01V *1/40***
**U.S. Cl. 367—27** **21 Claims**




1. An apparatus for obtaining a circumferential acoustic well log of a borehole comprising:

an elongated logging tool adaptable for passing through the borehole;

a plurality of transducers attached to said logging tool so as to define a path concentric with said borehole, at least two of said transducers functioning as transmitters, and at least two of said transducers functioning as receivers;

wave generating means for generating electrical signals

which define measurement intervals, said wave-generating means including an alternating wave source for providing an alternating wave comprised of parts of a wave cycle and, a pulse source for providing one or more synchronizing pulses of short duration during each part of said wave cycle, each pulse being approximately equal in amplitude and duration;

means for transmitting both said alternating wave and said synchronizing pulses to said logging tool over a single conductor;

controlling means for selectively actuating said transmitters and receivers during said measurement intervals, said controlling means being synchronized by said electrical signals such that only one transmitter and one receiver, forming a transmitter-receiver pair, is operative during said measurement interval;

means responsive of said electrical signals for actuating a transmitter to provide a pulse of acoustic energy to be transmitted about an arcuate path between a transmitter and receiver of a transmitter-receiver pair, said path defining at least a portion of the circumference of said borehole, said pulse of acoustic energy generating a transient acoustic wave comprised of shear waves and compressional direct fluid waves and compressional guided fluid waves, one of said last-mentioned waves arriving at the receiver of said transmitter-receiver pair in one time period, the other wave arriving in a successive time period, both acoustic waves arriving at said receiver during a measurement interval;

latching means for preventing any other transmitter from becoming actuated during, or within a measurement interval immediately following, the actuation of said transmitter;

means for providing an electrical response indicative of variations in acoustic energy amplitude caused by said pulse of acoustic energy passing through the wall of said borehole and arriving at a receiver which is actuated during said measurement interval;

means for selectively processing said electrical response from either of said shear waves, said guided fluid waves, or parts or all of each, during each measurement interval, providing recorded signals; and,

means for displaying said recorded signals so as to provide an acoustical well log that can be used to detect the presence of vertical fractures or anomalies in the borehole wall.

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**4,293,935**

## METHOD OF SEISMIC EXPLORATION

**Pierre Gros, Buc; Jean Millouet, La Celle Saint Cloud, and Philippe Staron, Mennecy, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France**

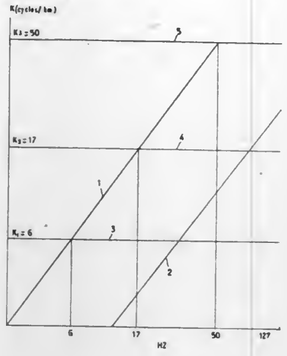
**Filed Jun. 16, 1978, Ser. No. 916,352**
**Claims priority, application France, Jun. 30, 1977, 77 20098**
**Int. Cl.³ G01V *1/02, 1/28***
**U.S. Cl. 367—43** **16 Claims**

1. A method of improving the signal-to-noise ratio of a final seismogram in seismic exploration of a medium to be explored having different reflectors, said method comprising the steps of:

(a) determining a maximum frequency to be emitted in a frequency spectrum for the medium to be explored;

(b) determining a minimum frequency to be emitted in said frequency spectrum for the medium to be explored;

(c) emitting, in said medium from at least one emission source, vibrational acoustic signals of long time-duration, the frequencies of said emitted signals being within said frequency spectrum, said frequency spectrum divided into a number of separate, contiguous, non-overlapping bands, each band having a different bandwidth than immediately adjacent bands, each bandwidth a function of the ratio $V_S/CV_B$, where said number of bands is at least equal to a whole number which is immediately below and closest to the value of the ratio




$$N = \left(\frac{F_{max}}{F_{min}}\right) \frac{CV_B}{V_S}$$

where

$F_{max}$ is the highest frequency of said desired spectrum,

$F_{min}$ is the lowest frequency of said desired spectrum,

C is a coefficient higher than 1 and dependent upon the cutoff of a wave-number filter,

$V_B$ is the apparent velocity of sound within said medium, and

$V_S$ is the lowest apparent velocity of waves refelected within said medium;

(d) receiving, in at least on receiver, the waves reflected by the different reflectors of said medium, said receiver defining with said source emission, said wave number filter;

(e) processing the received signals in order to determine the detected reflectors by (1) forming the complex spectrum for each band of frequencies of the received signal corresponding to the emitted signal, (2) forming the complex spectrum for each band of frequencies corresponding to a reference of the emitted signal, (3) dividing the complex spectrum of the received signal by the complex spectrum of the reference of the emitted signal to obtain an elementary complex spectrum for each band of frequencies, and (4) setting the amplitude of at least one portion of the elementary complex spectrum to zero if that portion is external to the band; and

(f) producing a seismogram from said received processed signals in which, for each of said frequency bands, an improved signal-to-noise ratio is obtained, whereby said final seismogram has an improved signal-to-noise ratio.

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**4,293,936**

## TELEMETRY SYSTEM

**William H. Cox, Groves, and Preston E. Chaney, Dallas, both of Tex., assignors to Sperry-Sun, Inc., Sugar Land, Tex.**

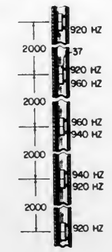
**Continuation-in-part of Ser. No. 755,620, Dec. 30, 1976, abandoned. This application Dec. 13, 1978, Ser. No. 968,879**
**Int. Cl.³ G01V *1/40***
**U.S. Cl. 367—82** **33 Claims**

1. A telemetry system for transmitting acoustical signals over a string of standard drill pipe positioned in a borehole and having pipe sections of approximately 31.3 feet including:

acoustical transmitting and receiving means occurring at first and second spaced locations on the string of pipe; and



means for operating said transmitting means at a frequency above 600 Hz and occurring within passbands having a




frequency band width of 130 Hz and base frequencies which are 20 Hz above integral multiples of 283 Hz.

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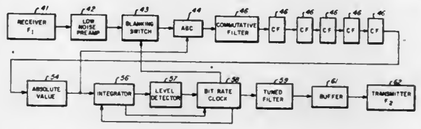
**4,293,937**

## BOREHOLE ACOUSTIC TELEMETRY SYSTEM

**H. Eugene Sharp, Missouri City; Octavio A. Vela, and Miles A. Smither, both of Houston, all of Tex., assignors to Sperry-Sun, Inc., Sugar Land, Tex.**

**Filed Aug. 10, 1979, Ser. No. 65,476**
**Int. Cl.³ G01V *1/40***
**U.S. Cl. 367—82** **4 Claims**




1. In an acoustic telemetry system including a first transmitter clocked by a first crystal controlled oscillator for transmitting an acoustic signal at a first frequency over an elongated column acting as an acoustic path in the borehole, such acoustic signal having a data component embedded in a noise background, circuit means forming a circuit path to receive, and retransmit said acoustic signal, which means comprises:

AGC means for amplifying the received acoustic signal;

filter means for filtering noise from said received acoustic signals to provide a clean data component;

feedback means for passing the signal to said AGC means for controlling the AGC gain;

means for retransmitting the received signal at a frequency other than the first frequency;

clock means having a second crystal controlled oscillator for operating said retransmitting means, said first and second crystal controlled oscillators being operated at substantially the same precise frequency.

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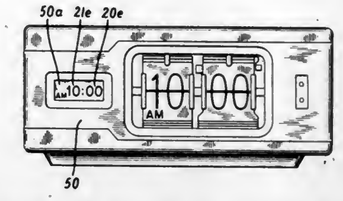
**4,293,938**

## ALARM SIGNALING TIME DETECTING DEVICE FOR DIGITAL CLOCK

**Masuo Ogihara; Kozo Chimura; Nobuo Shinozaki, and Yoichi Seki, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 27, 1979, Ser. No. 107,516**
**Claims priority, application Japan, Dec. 28, 1978, 53-163743**
**Int. Cl.³ G04B *23/02, 19/02;* G04C *21/16***
**U.S. Cl. 368—72** **10 Claims**

1. In an alarm signaling time indicating device for a digital clock having an alarm device and hour and minute time wheels, said time indicating device comprising: an alarm signaling time setting member; a minute indication drum positionable by said alarm signaling time setting member and provided on the outer periphery with minute-scale alarm signaling time graduations; an hour indication drum intermittently fed by said minute indication drum and provided on the outer periphery with hour-scale alarm signaling time graduations; at least first and second detection members provided in correspondence with the hour and minute time wheels respectively for detecting the alarm time; and a gear train coupling said first detection member to said minute indication drum to permit continuous setting of said first detection member by setting said minute indicating drum.

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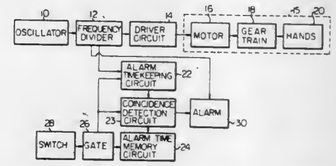
**4,293,939**

## ELECTRONIC TIMEPIECE HAVING AN ALARM SYSTEM

**Yasuhiko Nishikubo, Iruma, and Mitsuo Sekine, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan**

**Filed Jul. 5, 1978, Ser. No. 921,956**
**Claims priority, application Japan, Jul. 8, 1977, 52/81803; Jul. 25, 1977, 52/89117; Jul. 27, 1977, 52/89982**
**Int. Cl.³ G04B *23/02;* G04C *21/16***
**U.S. Cl. 368—74** **2 Claims**




1. An electronic timepiece comprising, in combination:

a source of standard frequency signal;

drive circuit means responsive to said standard frequency signal for producing a drive signal;

a motor driven by said drive signal;

time indicating hands driven by said motor to indicate current time;

an alarm system including at least one external operating member, switch means coupled to said external operating member, alarm timekeeping circuit means responsive to said standard frequency signal for counting at least the hours of time, alarm time memory circuit means responsive to a signal generated by actuation of said external operating member for counting and storing at least the hours of alarm time, coincidence detection circuit means coupled to said alarm timekeeping circuit means and to said alarm time memory circuit means for generating a coincidence signal when the contents of said alarm timekeeping circuit means and of said alarm time memory circuit means become identical, alarm signal generation means responsive to said coincidence signal for generating an alarm signal, and gate circuit means coupled to said switch means and responsive to actuation of said external operating member for resetting said alarm timekeeping circuit means and said alarm time memory circuit means and for applying an input alarm time count into said alarm time memory circuit; and

drive input signal generation means coupled between said source of at least one standard frequency signal and said

drive circuit means and responsive to said standard frequency signal and a control signal from said gate circuit means for generating a first drive input signal applied to said drive circuit means when said electronic timepiece is in a normal timekeeping mode of operation and for generating a second drive input signal applied to said drive circuit means when said electronic timepiece is in an alarm time setting mode of operation, said first drive input signal and said second drive input signal having different waveforms.

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**4,293,940**

## TIME SOUND GENERATING DEVICE

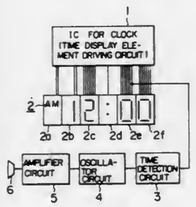
**Satoshi Noguchi, Fujisawa, and Takaya Kitao, Kamakura, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 5, 1978, Ser. No. 912,535**

**Claims priority, application Japan, Jun. 16, 1977, 52-79568[U]; Aug. 25, 1977, 52-114362[U]; Aug. 26, 1977, 52-115041[U]**

**Int. Cl.³ G04B *21/02*; G04C *23/00*; G04B *23/02*; G04C *21/16***

**U.S. Cl. 368—75** **8 Claims**




1. A time sound generating device comprising:

a time display element having a display portion for a 10-minute digit having seven display segments, one segment of said seven segments being at a high-level light on state during display of the numbers "0" to "4" and at a low-level light off state during display of the number "5";

a time signal generating device for dividing a reference frequency supplied from a reference frequency source and generating a time display driving signal from a resulting frequency-divided output signal to drive said time display element;

a first differentiation time constant circuit connected to said one segment for detecting a change of time by detecting a change in state of the display element driving signal applied to said one segment and for generating a pulse of a predetermined duration upon detection of said change in state;

a switch circuit which changes on-off states in response to said pulse;

a second time constant circuit responsive to said switch circuit changing to a particular on-off state for generating a gradually changing output signal;

an audio frequency signal generating circuit for generating an audio signal;

a gain control circuit having an input terminal receiving said audio signal and an ouput terminal, said gain control circuit changing the amplitude of the audio signal applied to said input terminal and producing the amplitude changed signal from said output terminal in response to the output signal of said second time constant circuit; and

loudspeaker means connected to receive the amplitude changed signal from said output terminal.

**4,293,941**

## MEMORY ACCESS CONTROL SYSTEM IN VECTOR PROCESSING SYSTEM

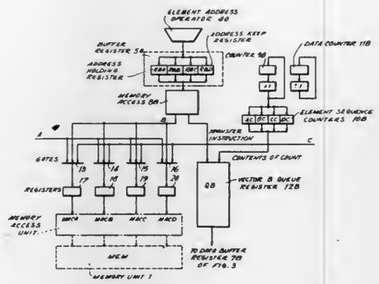
**Takatoshi Murooka, Kyoto; Keiichiro Uchida, Kawasaki; Minoru Koshino, Yokohama; Masanori Motegi, Kawasaki, and Shigeru Nagasawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 624,915, Oct. 22, 1975, abandoned. This application May 21, 1979, Ser. No. 40,994**

**Claims priority, application Japan, Oct. 25, 1974, 49-122438**

**Int. Cl.³ G06F *13/00***

**U.S. Cl. 364—200** **2 Claims**




1. A memory access control system for a memory unit in a data processing system for reading out element data from the memory unit and providing sequential data processing, especially for vector processing, said memory access control system comprising

address holding register means for holding addresses which indicate where the element data is stored when an element address is set in said address holding register means;

memory means for storing sequence data indicating the sequence of an element data stored in the memory unit;

shift register means connected to the memory means at least for storing the contents of the memory means corresponding to the address which is in use for accessing to said memory unit in accordance with a selected content of said address holding register means, said shift register means having outputs; and

data buffer register means connected to said memory unit and controlled by the outputs of said shift register means whereby the element data read out from said memory unit is stored at a location of said data buffer register means by means of the outputs of said shift register means.

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**4,293,942**

## WATERPROOF WATCH AND METHOD FOR MAKING

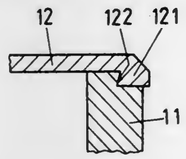
**Hans Baumgartner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

**Filed Nov. 29, 1979, Ser. No. 98,684**

**Claims priority, application Switzerland, Dec. 15, 1978, 12782/78**

**Int. Cl.³ G04B *37/00*; B23P *13/00, 11/02***

**U.S. Cl. 368—280** **10 Claims**




1. A watch comprising:



an encasement; and

a base adapted for detachable water tight sealing connection to said encasement, wherein said base is comprised of a reversible memory form alloy.

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**4,293,943**

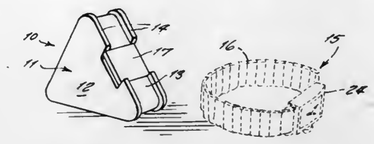
## WATCH STAND

**Victor S. Avery, c/o George Spector, 3615 Woolworth Bldg., and George Spector, 3615 Woolworth Bldg., both of New York, N.Y. 10007**

**Filed Jun. 15, 1979, Ser. No. 48,718**

**Int. Cl.³ G04B *37/00*; A47F *7/00***

**U.S. Cl. 368—316** **4 Claims**




1. A watch stand, for supporting a wrist watch in a utility position on a table comprising a triangular shaped base having an encompassing outer surface between parallel triangular side surfaces in combination with a pad mounted on said outer surface said pad being slidable inwardly and outwardly of said surfaces to provide an adjustable outer support platform for said watch body said outer surface being adapted to support the wrist watch band including peripheral extensions beyond said outer surface to form a channel thereabout for the wristband.

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**4,293,944**

## INFORMATION PLAY-BACK APPARATUS WITH ASTIGMATIC AUTO-FOCUSING

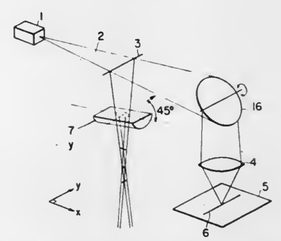
**Morishi Izumita, Hachioji; Takeshi Maeda, Kokubunji, both of Japan; Yoshito Tsunoda, Stanford, Conn., and Susumu Sawano, Tachikawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 27, 1977, Ser. No. 810,166**

**Claims priority, application Japan, Jun. 25, 1976, 51-74353; Aug. 9, 1976, 51-94000**

**Int. Cl.³ G11B *7/12, 17/00***

**U.S. Cl. 369—45** **11 Claims**




1. An information play-back apparatus comprising a laser source, a recording medium on which information is recorded in the form of a track, first optical means for projecting a laser beam from said laser source onto the information track on said recording medium, detection means for detecting a reflected laser beam from the information track as an electric signal, second optical means for guiding the reflected laser beam to said detection means through an optical element having a unidirectional lens action, and control means for processing outputs of said detection means to control the operation of said first optical means, said information play-back apparatus characterized in that said optical element is arranged with its optical axis defining an angle of about 45 degrees with respect to a direction of the information track, and that said detection means has at least four light receiving portions divided symmetrically about two axes such that at least one light receiving portion is in each of the four quadrants formed by the two axes, wherein one of the axes for the division is arranged in parallel with the direction of the information track.

11. Apparatus for reading a radiation-reflecting record carrier on which information is stored in an optically readable information structure arranged in tracks, comprising radiation source means for providing a read beam of radiation, radiation-sensitive detection system means for converting modulated radiation reflected from said record carrier into an electrical signal, an objective system means for focussing the read beam on an area of the record carrier and for passing the read beam reflected from the record carrier to said radiation-sensitive detection system means, said tracks being oriented in a particular direction in the area of the record carrier on which the read beam is focussed, astigmatic element means in the path of the radiation reflected from the record carrier for imparting astigmatism to said reflected radiation beam, and an array of four sub-detectors disposed in four different quadrants of an imaginary X-Y coordinate system, the X and Y axes being disposed at an angle of 45° with astigmatic focal lines of the astigmatic element means, one of the axes of the coordinate system in whose quadrants the sub-detectors are disposed being parallel to the effective track direction, the astigmatic focal lines being disposed at an angle of 45° to the effective track direction.

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**4,293,945**

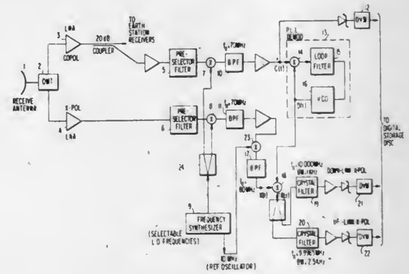
## MULTICHANNEL CORRELATION RECEIVER FOR DETERMINING DEPOLARIZATION OF SIGNALS ALONG SIGNAL PROPAGATION PATHS

**Ali E. E. Atia, Gaithersburg; Arnold L. Berman, Kensington, both of Md., and Christoph Mahle, Washington, D.C., assignors to Communications Satellite Corporation, Washington, D.C.**

**Filed Aug. 29, 1979, Ser. No. 70,554**

**Int. Cl.³ H04B *7/10*; H04J *11/00***

**U.S. Cl. 370—17** **10 Claims**




1. A multichannel correlation receiver comprising:

(a) means for receiving a first signal having a first polarization;

(b) means for receiving a second signal having a second polarization orthogonal to said first polarization, said second signal being produced by depolarization of said first signal along a first propagation path;

(c) local oscillator means;

(d) first and second mixers for converting said first and second signals to first and second IF signals under the control of said local oscillator;

(e) phase locked means for providing a relatively noise-free replica of said first IF signal;

(f) means for correlating said first IF signal replica with a

signal related to said second IF signal to produce a correlated signal; and

(g) means for providing the levels of said first IF signal and said correlated signal to thereby indicate the amount of said depolarization of said first signal along said first propagation path.

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**4,293,946**

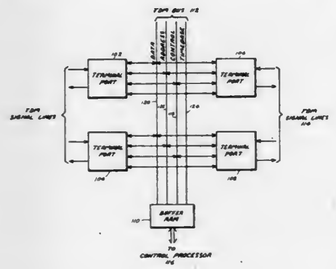
## TRILATERAL DUPLEX PATH CONFERENCING SYSTEM WITH BROADCAST CAPABILITY

**Michael L. Kuras, Stratford; Daniel C. Upp, Easton, and Herbert J. Toegel, Fairfield, all of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Nov. 21, 1979, Ser. No. 96,599**

**Int. Cl.³ H04M *3/56***

**U.S. Cl. 370—62** **14 Claims**



10. A digital telecommunication system for providing a plurality of conferencing functions simultaneously between a plurality of terminals having frames of digitally encoded data in a plurality of channels originating at one or more sources coupled thereto, comprising:

a plurality of terminal port means for receiving frames of said digitally encoded data from a plurality of terminals;

means for providing a plurality of duplex paths over a plurality of time division multiplex bus means between said terminal ports to be interconnected thru a digital switching network;

memory means coupled to said bus means for selectively storing frames of data coupled to said bus means from one or more of said plurality of terminal port means;

means at each terminal port for coupling said frames of digitally encoded data of each channel into said memory means coupled to said bus means, said bus means being coupled to a plurality of terminal ports;

means for recalling said frames of digitally encoded data from said memory means such that the contents of a plurality of said memory locations are combined to form a sum; and

means for transmitting a signal representative of said sum over said established communication path.

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**4,293,947**

## INFORMATION HANDLING SYSTEM

**William J. Brittain, Westcliff-On-Sea, England, assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Oct. 10, 1978, Ser. No. 950,095**

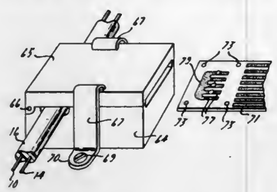
**Claims priority, application United Kingdom, Oct. 12, 1977, 42402/77; Oct. 12, 1977, 42403/77; Oct. 12, 1977, 42404/77**

**Int. Cl.³ H04J *6/00***

**U.S. Cl. 370—89** **1 Claim**

1. An improved information handling system of the type which comprises a signal bus, a master station arranged to transmit on the signal bus pulse signals divided into serial information frames, a plurality of sensors or controlled devices, a plurality of peripheral stations, having address decoding circuitry, each connected to the signal bus for actuation in response to a given information frame, and a connector connecting each of the peripheral stations to at least one of the sensors or controlled devices, wherein the improvement comprises:

an address setting means in the connector, the address setting means setting a code determining the information frame to which the peripheral station associated with the connector responds, the connector comprising a housing



through which the signal bus passes to facilitate electrical connection thereto, the connector further including a printed circuit having conductive strips located within the connector housing, the conductive strips being drilled or punched to set the code for the peripheral station, and the connector housing having contacts cooperating with the conductive strips and address decoding circuitry of the peripheral station.

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**4,293,948**

## DATA TRANSMISSION SYSTEM

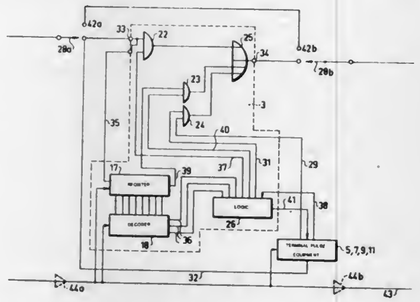
**Olof Soderblom, Kragenasvagen 21, 181 62 Lidingo, Sweden**

**Continuation of Ser. No. 391,717, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 773,056, Nov. 4, 1968, abandoned. This application Oct. 29, 1974, Ser. No. 518,450**

**Claims priority, application Sweden, Nov. 23, 1967, 16077/67; May 15, 1968, 6589/68**

**Int. Cl.³ H04J *3/16***

**U.S. Cl. 370—90** **22 Claims**



1. Apparatus for the transmission of data characters in pulse form from a plurality of terminal units to a master unit comprising in combination:

pulse input and pulse output means for each said terminal unit and for said master unit,

a single series loop connecting said terminal units in series along said loop between the pulse output means and pulse input means of said master unit and over which pulses originating either with said master unit or any terminal unit are transmitted always in the same predetermined direction,

each said terminal unit including:

(a) pulse responsive means connected to said pulse input means for receiving pulses appearing at said pulse input means,

(b) decoding means distinctively responsive to pulses received by said pulse responsive means,



(c) and logic means responsive to said decoding means for normally interconnecting said pulse input and pulse output means to thereby complete the loop at said terminal unit,

(d) said logic means in response to a distinctive pattern of said pulses appearing at the associated pulse input means interrrupting the loop between said pulse input and pulse output means only at a terminal unit having data to transmit and enabling the application to the associated pulse output means of stored data of arbitrary variable length as required by said terminal unit for transmission over the loop to said master unit,

(e) said logic means being effective upon the opening of said loop at the first upstream terminal unit having data to send for inhibiting the receipt at any downstream terminal unit of pulses otherwise effective to control said downstream terminal unit to transmit data.

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**4,293,949**

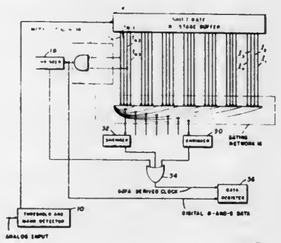
## CLOCK INVARIANT SYNCHRONIZATION FOR RANDOM BINARY SEQUENCES

**Constantinos Philippides, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 30, 1979, Ser. No. 89,672**

**Int. Cl.³ G06F *11/00*; H03K *13/34***

**U.S. Cl. 371—6** **14 Claims**



1. Apparatus for clocking digital marks and spaces of equal period into a data register and for deriving the data register clock directly from the digital mark and space data itself, comprising:

means for periodically sampling the digital mark and space data a plurality (p) of times for each mark and space and for providing a digital signal corresponding to each sample, and

means for gating the digital signals of selected samples and for generating pulses when the digital signals of the selected samples are in a desired logic configuration which indicates the presence of either a valid mark or a valid space.

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**4,293,950**

## TEST PATTERN GENERATING APPARATUS

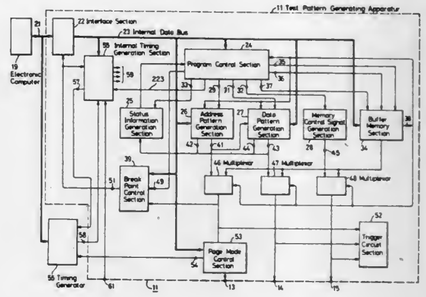
**Masao Shimizu; Takashi Tokuno, both of Gyoda; Kohji Ishikawa, Funabashi; Naoaki Narumi, Tokyo, and Osamu Ohguchi, Sayama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Takeda Riken Kogyo Kabushikikaisha, both of Tokyo, Japan**

**Filed Apr. 2, 1979, Ser. No. 26,246**

**Claims priority, application Japan, Apr. 3, 1978, 53-038949; Apr. 3, 1978, 53-038950; Apr. 3, 1978, 53-038951; Apr. 3, 1978, 53-038952; May 18, 1978, 53-059381; May 18, 1978, 53-059382; May 18, 1978, 53-059383; Oct. 13, 1978, 53-126523; Oct. 30, 1978, 53-133936**

**Int. Cl.³ G06F *11/00*; G01R *31/28***

**U.S. Cl. 371—21** **21 Claims**



1. A test pattern generating apparatus comprising:

a program control section comprising an instruction memory into which is loaded a microprogram for determining a test pattern to be generated by the test pattern generating apparatus, means for reading the loaded microprogram, for interpretation and execution, and for outputting an address pattern generate instruction, a data pattern generate instruction, a memory control instruction and a status information select instruction, and means for receiving status information to control the order of the execution of the microprogram;

an address pattern generation section connected to the program control section and comprising means for receiving therefrom the address pattern generate instruction and means for performing an arithmetic operation in response thereto for generating an address pattern;

a memory control signal generation section connected to the program control section and comprising means for receiving therefrom the memory control instruction and means for generating memory control signals responsive thereto;

a status information generation section connected to the program control section and comprising means for receiving therefrom the status information select instruction and for receiving from selected components of said generating apparatus a plurality of data including at least the address pattern from the address pattern generating section, said status information comprising said address pattern data in a form derived from said microprogram, and said status information generation section comprising means for comparing the two sets of address pattern data to provide the result of comparison as the status information to the program control section in response to the status information select information; and

a data pattern generation section connected to the program control section and the address pattern generation section and comprising

an arithmetic operation part which is supplied with the data pattern generate instruction, said arithmetic operation part comprising means for performing an arithmetic operation in response to the data pattern generate instruction for generating a data pattern,

an area inversion control signal generator comprising means for receiving the address pattern from the address pattern generation section and means for generating an inversion control signal selectively indicating inversion of the data pattern in accordance with the address pattern, and

an inverter connected to the output of the area inversion control signal generator and of the arithmetic operation part to selectively invert the data pattern from the arithmetic operation part dependent upon the inversion control signal to provide output data corresponding to the test pattern of said generating apparatus.

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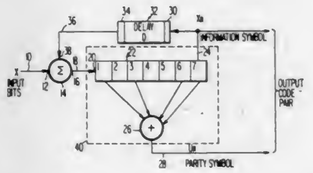
**4,293,951**

## METHOD AND APPARATUS FOR ENCODING/DECODING A CONVOLUTIONAL CODE TO A PERIODIC CONVOLUTIONAL CODE BLOCK

**Smith A. Rhodes, Chantilly, Va., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Mar. 16, 1979, Ser. No. 21,296**
**Int. Cl.³ G06F *11/10***
**U.S. Cl. 371—43** **15 Claims**




1. In a method of encoding a bit stream of $B_1$ information symbols in a convolutional encoder of the type in which said bits are serially fed through a $K_1$ stage shift register and in which r parity symbols are generated for every k information symbols to achieve a code rate of $\rho=k/n$ defined as the ratio of the number of information symbols k to the total number of symbols n in the code, where $n=k+r$, the improvement comprising feeding back the output of said encoder shift register with a delay $D_1=B_1-K_1$ to the input of said shift register by re-introducing the first $K_1-1$ information symbols into the encoder shift register.

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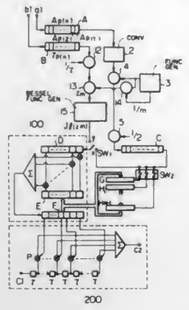
**4,293,952**

## SAMPLING FUNCTION TYPE EQUALIZER

**Michitoshi Tamori, Tokyo, and Kazuo Kawai, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan**

**Filed Jul. 27, 1979, Ser. No. 61,398**
**Claims priority, application Japan, Jul. 27, 1978, 53-90988**
**Int. Cl.³ H04B *3/04*; H03H *21/00*; G06F *15/34***
**U.S. Cl. 375—14** **3 Claims**

1. A sampling function type equalizer having a transversal filter with a plurality of automatically adjusted potentiometers, said equalizer comprising means for converting the amplitude-frequency characteristic and the delay-frequency characteristic to a sampling function type characteristic with the peak value $A_p(n)$ and $\tau_p(n)$, wherein the desired amplitude-frequency characteristic and the delay-frequency characteristic are obtained by superimposing the sampling function type characteristics, first and second multiplying means for multiplying each input $A_p(n)$ and $\tau_p(n)$ by the output of a predetermined discrete function generator, a first convolution integrator means for performing convolution integration on the output of said first multiplying means for obtaining the amplitude equalization characteristic, Bessel function generator means for providing a Bessel function in response to the output of said second multiplying means, a second convolution integrator means for performing convolution integration on the output of said Bessel function generator means, and means for adjusting



the tap weight of said potentiometers as a function of the outputs of said first and second convolution integrator means.

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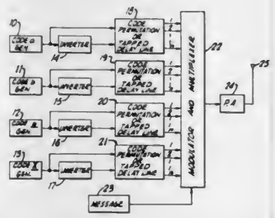
**4,293,953**

## BI-ORTHOGONAL PCM COMMUNICATIONS SYSTEM EMPLOYING MULTIPLEXED NOISE CODES

**Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 28, 1979, Ser. No. 108,195**
**Int. Cl.³ H03K *13/01*; H04J *1/04***
**U.S. Cl. 375—25** **9 Claims**



1. In a pulse code modulation communications system operative in conjunction with a timing reference signal, the combination therewith of:

first means for generating a first pair of coded pulse signals for transmission during a predetermined period;

second means for generating a time related second pair of coded pulse signals for transmission during said predetermined period;

delay means for delaying each of said coded pulse signals of each said pair to occur during respective different intervals of time during said predetermined period;

means coupling said pairs of coded pulse signals directly to respective said delay means;

inverter means for inverting said pairs of coded pulse signals and coupling the inverted signals to respective said delay means;

a source of message signals;

means for multiplexing said message signals with said first and second pairs of delayed coded pulse signals into two channels for transmission to users accessing said system at predetermined intervals of time; and

means for receiving and detecting said coded pulse signals to produce an output signal having an impulse correlation function during an assigned predetermined interval of time within said predetermined period, said receiving and detecting means including demultiplexing means separat-



ing the transmitted signals into two channels, matched filter detector means for detecting predetermined pairs of coded pulse signals from each said channel, adder means connected to said filter detector means of each channel for combining said coded pulse signals from each of said pairs of signals from each of said channels, and amplitude detector means for detecting the maximum amplitude signal from said adder means of each channel and pairs of signals to provide said output signal.

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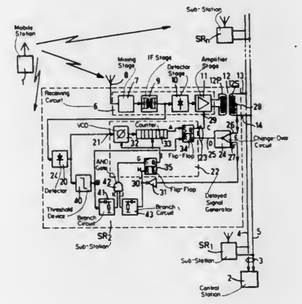
**4,293,954**

## RECEIVING SYSTEM FOR TRANSMITTING INFORMATION TRANSMITTED BY A MOBILE TRANSMITTER TO A CENTRAL STATION

**Jean-Pierre Vilatte, Villebon, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 10, 1979, Ser. No. 2,271**
**Claims priority, application France, Jan. 13, 1978, 78 00894**
**Int. Cl.³ H04B *7/26***
**U.S. Cl. 455—54** **8 Claims**




8. In a receiving system for transmitting information from a mobile station to a fixed central station via one sub-station out of a plurality of sub-stations connected to the central station by means of a transmission line wherein each sub-station comprises, a radio receiving circuit having an output coupled to the transmission line, a device for measuring the quality of a received signal and having an output connected to a first input terminal of a delayed-signal generator, said delayed-signal generator having a second input terminal and an output terminal, a frequency generator, means including said frequency generator for coupling the output terminal of the delayed-signal generator to the transmission line for applying a rest condition signal to the other sub-stations, means coupling the second input terminal of the delayed-signal generator to the transmission line via a frequency detection device for applying a rest condition signal, generated by one of the other sub-stations, to said one substation, and means further connecting the output terminal of the delayed-signal generator to an input of the receiving circuit for applying a signal thereto for releasing the receiving circuit.

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**4,293,955**

## DIVERSITY RECEPTION SYSTEM

**Marvin M. Gehr, and Howell D. Pabian, both of Lincoln, Nebr., assignors to Telex Communications, Inc., Minneapolis, Minn.**

**Filed Mar. 17, 1980, Ser. No. 131,029**
**Int. Cl.³ H04B *1/16, 7/08***
**U.S. Cl. 455—276** **25 Claims**

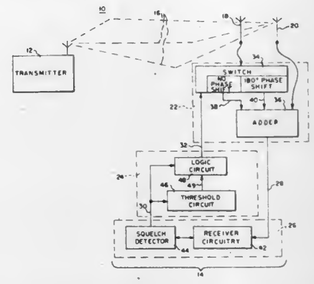
1. A method of processing signals transmitted over multipath routes on a carrier frequency comprising the steps of:

receiving said signals through at least two antennas;

adding the signals received on said antennas;

selecting one of a first mode for adding the signals received on said antennas in which there is a first phase shift in the signals from a first of said antennas and a second mode in which there is a second phase shift more than 90° of the carrier frequency difference from said first phase shift of said signal received from said one of said antennas before said signals are added;

the step of selecting further including the steps of comparing the amplitude of the sum of the added signals to a predetermined threshold value; determining which of said first and second modes provides the highest amplitude signal and switching to the mode which provides the highest amplitude signal;




said step of determining comprising the steps of switching from one of said modes to the other mode when said amplitude is lower than said predetermined threshold value; and comparing the amplitude of the sum of the added signals after switching to said other mode with the sum before switching; and

the step of switching to the mode that provides the highest amplitude signal including the step of returning to the one of said first and second modes if the strength of said sum of the signals is below that amplitude at the time of switching between one and other of said first and second modes.

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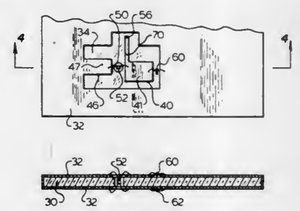
**4,293,956**

## DOUBLE-BALANCED MIXER

**John E. Altstatt, Palo Alto, Calif., assignor to California Microwave, Inc., Sunnyvale, Calif.**

**Filed Nov. 23, 1979, Ser. No. 96,845**
**Int. Cl.³ H04B *1/26*; H03H *7/42***
**U.S. Cl. 455—327** **6 Claims**



3. In a double-balanced mixer device including first conductive means disposed upon surfaces of a dielectric substrate and forming a first balun for receiving an input LO signal, second conductive means likewise disposed upon surfaces of said substrate and forming a second balun for receiving an input RF signal, diode means coupling said first balun to said second balun, and output means coupled to said first balun and said second balun to form an output port for IF signals, and improved second balun and output means comprising:

a first body of conductive material having first and second portions disposed on one side of said substrate, said second portion being elongated and narrow relative to said first

portion and having a length equal to one quarter of the wavelength of said IF signal; and

a second body of conductive material having third and fourth portions disposed on an opposite side of said substrate in overlying relationship to said first and second portions, said fourth portion being elongated and narrow relative to said third portion and having a length equal to one quarter of the wavelength of said IF signal, the distal ends of said second and fourth portions being connected together to form a terminal of said output port.

# DESIGN PATENTS

## GRANTED OCT. 6, 1981

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D34–024 | 261,125 |
| D34–034 | 261,126 |
| D34–034 | 261,127 |
| D34–045 | 261,193 |
| D34–046 | 261,194 |

261,070

**FIELD AND WINTER SPORTS JACKET**

Robert E. Pettibone, 1925 Sunset Ave. SW., Seattle, Wash. 98116

Filed Jan. 15, 1980, Ser. No. 112,356

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—185

261,071

**JACKET**

Pierluigi Rolando, Vicolungo, Italy, assignor to Maglificid Biellese Fratelli S.p.A., Italy

Filed Mar. 28, 1978, Ser. No. 891,165

Claims priority, application Italy, Nov. 15, 1977, 22721 A/77

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—187

261,072

**PLEATED NURSE CAP**

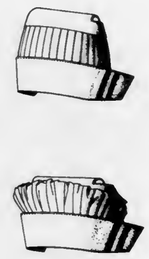
Pamela Barich, 690 NE. 160th Ter., North Miami Beach, Fla. 33162

Filed Dec. 29, 1978, Ser. No. 974,323

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—230



261,073

**COMBINED FIREMAN'S HOOD AND FACE MASK**

Mark C. Spruill, 503 Windsor Ave., Goleta, Calif. 93017; Michael D. Hipes, 3839 Sunset Rd., Santa Barbara, Calif. 93110; Carl J. Durtche, 4546 El Carro, Carpinteria, Calif. 93013, and Keith D. Cullom, 164 Lancaster Pl., Goleta, Calif. 93017

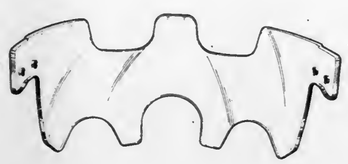
Filed Feb. 5, 1979, Ser. No. 9,748

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—232

261,074
VISOR FOR ATTACHMENT TO HELMET OR THE LIKE
Jan L. Grönborg, Fullerstavägen 42, S-141 44 Huddinge, Sweden
Filed Feb. 5, 1979, Ser. No. 9,503
Claims priority, application Sweden, Aug. 7, 1978, 781815
Term of patent 7 years
Int. Cl. D02—*03*
U.S. Cl. D2—233

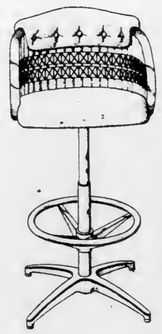


261,075
MONEY POUCH
Michael Dolas, 1164 Crestline Dr., Santa Barbara, Calif. 93105
Filed Apr. 13, 1978, Ser. No. 896,191
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—41

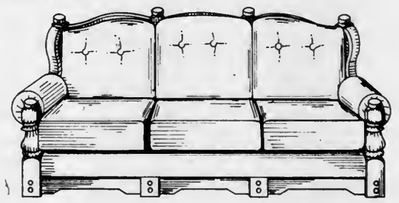
261,076
TOTE BAG
Maxwell B. Chernoff, Midlothian, Va., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Oct. 9, 1979, Ser. No. 82,827
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—42

261,077
NECKWEAR PURSE
Judith J. Loomis, 232 Lafayette St., Memphis, Tenn. 38111
Filed Jun. 1, 1979, Ser. No. 44,705
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—52

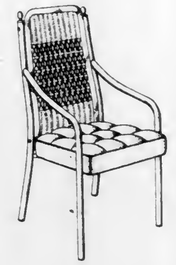
261,078
BAR STOOL
Robert L. Wilson, Memphis, Tenn., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Oct. 11, 1979, Ser. No. 84,007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35



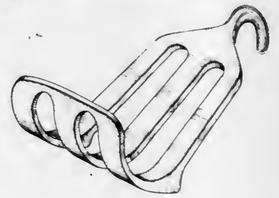
261,079
SEAT
Samuel T. Collins, Bassett, Va., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Oct. 5, 1979, Ser. No. 82,393
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



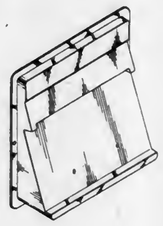
261,080
CHAIR
Robert L. Wilson, Memphis, Tenn., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Oct. 11, 1979, Ser. No. 83,919
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70



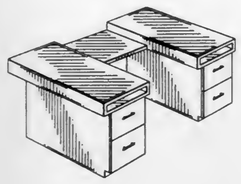
261,081
SOAP-DISH
Anita Nagel, 3 Anchorage La., Oyster Bay, N.Y. 11771
Filed Jun. 22, 1979, Ser. No. 50,862
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89



261,082
DISPLAY STAND
Var E. Lordahl, Chicago, Ill., assignor to T.S.G. Mfg. Co., Chicago, Ill.
Filed May 23, 1979, Ser. No. 41,690
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—114



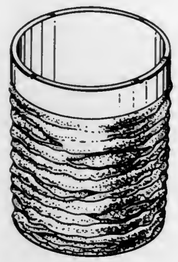
261,083
COMPUTER TERMINAL DESK
Theodore L. Bogert, and Frances P. Bogert, both of 300 Thalia Dr., Orlando, Fla. 32807
Filed Jan. 21, 1980, Ser. No. 114,129
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—161



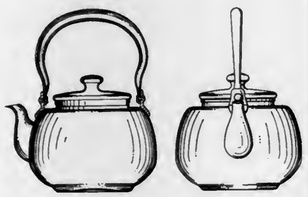
261,084
PORTABLE BACK REST
Janet Scott, 18502 Haas Ave., Torrance, Calif. 90504
Filed May 29, 1979, Ser. No. 43,354
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—200

261,085
DRINKING CUP
Frank Ventura, 9932 Lindo Lake Pl., Lakeside, Calif. 92040
Filed Feb. 2, 1979, Ser. No. 8,922
Term of patent 3½ years
Int. Cl. D07—*01*
U.S. Cl. D7—6

261,086
TUMBLER
Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 13, 1979, Ser. No. 29,609
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—15



261,087
KETTLE
Kenichi Myodo, Tsubame, Japan, assignor to Shinko Kinzoku Kabushiki Kaisha, Japan
Filed Oct. 24, 1979, Ser. No. 87,749
Term of patent 7 years
Int. Cl. D07—*02*
U.S. Cl. D7—66

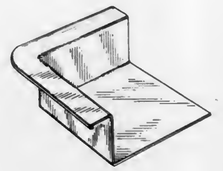




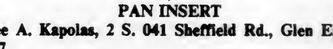
261,088
VACUUM VESSEL FOR COMESTIBLES OR THE LIKE
Boris M. Akimov, ulitsa Dzerzhinskogo, 81/85, kv. 16; Viktor I. Morozov, ulitsa Zernovaya, 6/6, kv. 90; Vitaly I. Shalaev, ulitsa Bairona, 161-G, kv. 32; Viktor V. Telegin, prospekt Gagarina, 175-A, kv. 61; Alexandr M. Vasiltsov, ulitsa Chernoglazovskaya, 12, kv. 24; Georgy S. Tsoglin, ulitsa Geroev Truda, 38, kv. 68, and Vladimir I. Vasiliev, ulitsa Bljukhera, 26, kv. 172, all of Kharkov, U.S.S.R.
Filed Nov. 3, 1977, Ser. No. 848,367
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—77

261,089
TENDERIZER
Jessop I. McDonnell, P.O. Box 156, Seaview, Wash. 98644, and Rodney Maxwell-Muir, Box 124, Chinook, Wash. 98614
Filed Jul. 9, 1979, Ser. No. 55,340
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—101

261,090
PAN INSERT
Melodee A. Kapolas, 2 S. 041 Sheffield Rd., Glen Ellyn, Ill. 60137
Filed Jun. 8, 1979, Ser. No. 46,654
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—102

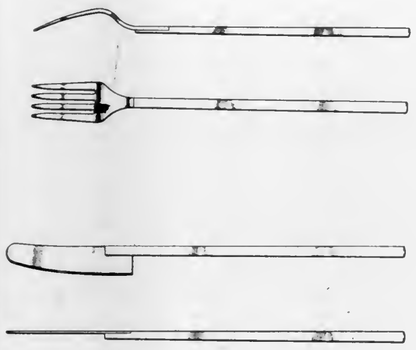


261,091
SHELL-FISH UTENSIL
Weldon W. Stiggers, 2730 NE. 16th, Oklahoma City, Okla. 73117
Filed Oct. 1, 1979, Ser. No. 80,990
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—106

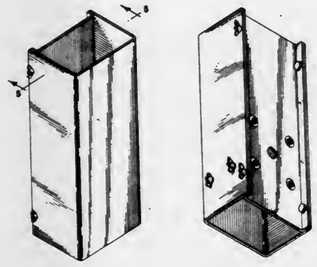


261,092
ROTATING MULTIPLE SKEWER ASSEMBLY
Gerald J. Menard, 1116 Juniper Ct., Fort Collins, Colo. 80521
Filed Aug. 7, 1979, Ser. No. 64,567
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

261,093
EATING UTENSIL
William J. Segal, 13010 Debby St., Van Nuys, Calif. 91401
Filed Mar. 5, 1979, Ser. No. 17,088
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—151



261,094
CASING FOR FOOD GRINDER
Ralph E. Reiner, 6474 Chestnut La., Orchard Park, N.Y. 14127
Filed Nov. 4, 1977, Ser. No. 848,454
Term of patent 14 years
Int. Cl. D7—*04*; D15—*08*
U.S. Cl. D7—155



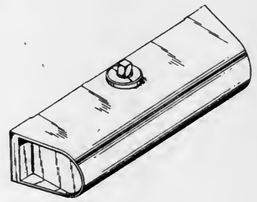
261,095
ALL PURPOSE BEATER
Ng-Fai A. Tsang, Kowloon, Hong Kong, assignor to Manmouhong Manufacturing Co., Kowloon, Hong Kong
Filed Dec. 26, 1978, Ser. No. 973,655
Claims priority, application United Kingdom, Dec. 5, 1978, 987538/78
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—157

261,096
HAND TOOL
Christian Petersen, DeWitt, Nebr., assignor to Petersen Manufacturing Co., Inc., DeWitt, Nebr.
Filed Sep. 18, 1978, Ser. No. 943,180
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—22

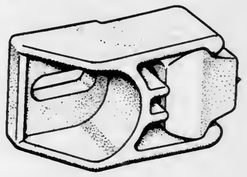
261,097
PNEUMATIC NUT RUNNER WITH TORQUE INDICATOR
William K. Wallace, Barneveld, and David A. Giardino, Deerfield, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Jun. 25, 1979, Ser. No. 51,497
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—61

261,098
FENCE POST SETTING CHUCK
Benny J. Hendon, 327 N. McKinley St., and Julius Malinowski, Jr., 4514 Middleton Dr., both of Joplin, Mo. 64801
Filed Nov. 9, 1978, Ser. No. 959,439
Term of patent 14 years
Int. Cl. D8—*05, 99*
U.S. Cl. D8—70

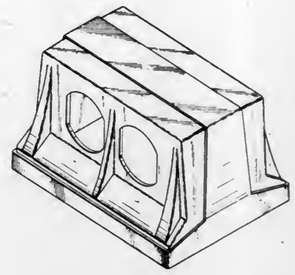
261,099
DOOR CLOSER
Richard H. Russell, Farmington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed May 16, 1979, Ser. No. 39,695
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—330



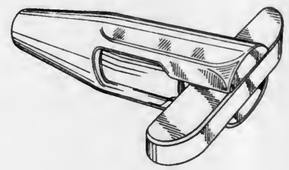
261,100
LATCH
Robert S. Wallace, Los Angeles, Calif., assignor to Dan F. Wallace, Karlua-Kona, Hi.
Filed Jun. 28, 1979, Ser. No. 53,085
Term of patent 14 years
Int. Cl. D08—*07*
U.S. Cl. D8—336



261,101
FLOOR OUTLET HOUSING
Thomas J. Sotolongo, Clearwater Beach, Fla., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 26, 1979, Ser. No. 61,102
Term of patent 14 years
Int. Cl. D8—*09*; D13—*03*
U.S. Cl. D8—353



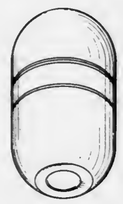
261,102
CHOKER LINE COUPLER
Charles J. Hoover, P.O. Box 713, Mill City, Oreg. 97360
Filed Jun. 11, 1979, Ser. No. 47,788
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—383



261,103
COMBINED FLUIDS CONTAINER AND APPLICATOR
Lowell T. Fears, 2716 Echo St., The Woodlands, Tex. 77380
Filed Apr. 3, 1978, Ser. No. 893,125
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—300

261,104
BOTTLE
Robert A. Cohen Skalli, 72, Rte. Montpellier, Sete, France (34204)
Filed Mar. 19, 1979, Ser. No. 22,077
Claims priority, application France, Oct. 24, 1978, 78 053
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—329

261,105
DISPENSING CONTAINER
Ira Schwartz, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Feb. 14, 1979, Ser. No. 11,792
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—353

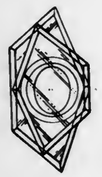


261,106
BOTTLE
David A. Winchell, Twin Lakes, Wis., and William M. Evans, Mundelein, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 24, 1978, Ser. No. 899,381
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—369

261,107
COMBINED BOTTLE AND CAP
Ned Harris, New City, N.Y., assignor to Charles of the Ritz Group Ltd., New York, N.Y.
Filed Oct. 12, 1979, Ser. No. 84,224
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

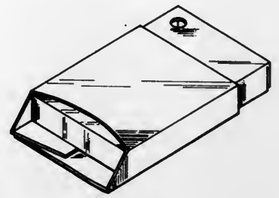
261,108
COMBINED BOTTLE AND CAP
Ned Harris, New City, N.Y., assignor to Charles of the Ritz Group Ltd., New York, N.Y.
Filed Oct. 12, 1979, Ser. No. 84,225
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

261,109
BOTTLE
Aaron A. Rosenblatt, New York; Walter J. Mann, Little Neck, and James C. Adkins, Chappaqua, all of N.Y., assignors to QED, Chappaqua, N.N.Y.
Filed Aug. 24, 1979, Ser. No. 69,604
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—384





261,110
PILLBOX
Noboru Yoshimoto, Kyoto, Japan, assignor to Morishita Jintan Co., Ltd., Osaka, Japan
Filed Apr. 2, 1979, Ser. No. 26,218
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

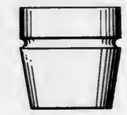


261,111
WRIST WATCH
Yutaka Fukumura, Higashimurayama, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan
Filed Jun. 15, 1979, Ser. No. 49,486
Claims priority, application Japan, Mar. 2, 1979, 54-7732
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—38

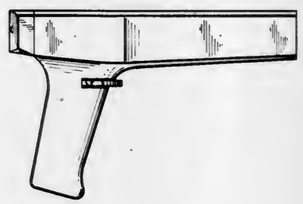
261,112
WRIST WATCH
Yutaka Fukumura, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 10, 1979, Ser. No. 83,531
Claims priority, application Japan, Apr. 17, 1979, 54-15333
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

261,113
WRIST WATCH
Yutaka Fukumura, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed May 30, 1979, Ser. No. 43,889
Claims priority, application Japan, Dec. 21, 1978, 53-54082
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

261,114
LEVEL INDICATING FLOAT
Eugene Kask, Willimantic, Conn., assignor to Rogers Corporation, Rogers, Conn.
Filed Oct. 18, 1978, Ser. No. 952,578
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103

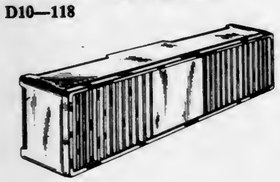


261,115
TIMING LIGHT
Hugh T. Greenlee, Gates Mills; Roy P. Hess, Vermillion, both of Ohio, and Donald C. McKinnon, Cheboygan, Mich., assignors to Fox Valley Instrument Company, Cheboygan, Mich.
Filed May 31, 1979, Ser. No. 44,055
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—112

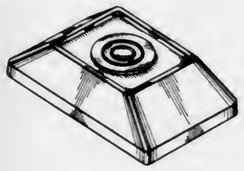


261,116
WARNING FLASHER OR SIMILAR ARTICLE
Wayne R. Repak, Park Ridge, Ill., assignor to Safe-T-Signal, Inc., Park Ridge, Ill.
Filed Oct. 10, 1978, Ser. No. 950,216
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—114

261,117
DOOR ANNUNCIATOR HOUSING
Kenneth T. Lewis, 300 N. Sixth, Longview, Tex. 75601
Filed Feb. 5, 1979, Ser. No. 9,160
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—118

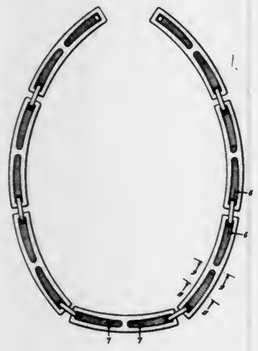


261,118
SONIC SIGNAL GENERATOR
Leslie Perhacs, Jr., Port Ludlow, Wash., assignor to Proctor & Associates Company, Redmond, Wash.
Filed Jun. 4, 1979, Ser. No. 44,977
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



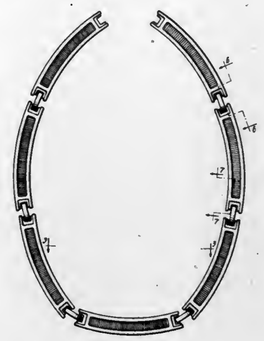
261,119
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 17, 1979, Ser. No. 104,053
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—7

261,120
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 17, 1979, Ser. No. 104,052
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—15

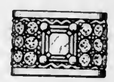




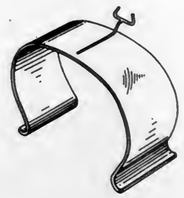
261,121
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 17, 1979, Ser. No. 104,054
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—15



261,122
FINGER RING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Jun. 29, 1979, Ser. No. 54,302
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

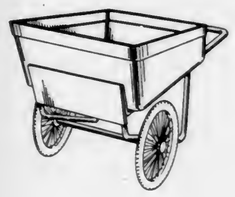


261,123
BRACELET SUPPORT
Mortimer Saffran, 2 Derbyshire, Derby, Conn. 06418, and Emil Turcek, 9 Garden Ter., Shelton, Conn. 06484
Filed Aug. 29, 1979, Ser. No. 70,852
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—86

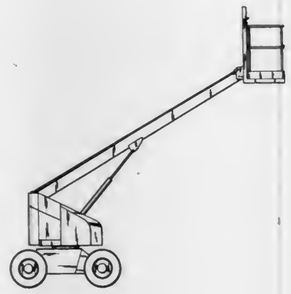


261,124
TEST TUBE BABY FIGURINE
Scott Dunham, 9 Briarcliff Rd., Mt. Lakes, N.J. 07046
Filed Aug. 6, 1979, Ser. No. 64,199
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

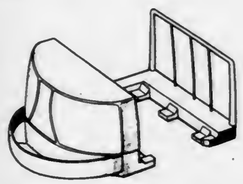
261,125
HAND CART
Donald J. Gordon, Rockwood; Frank H. Johnson, Cambridge, both of Canada; George L. Schick, Easton, Conn., and J. David Smart, Cambridge, Canada, assignors to Slater Steel Industries Limited, Ontario, Canada
Filed Feb. 12, 1979, Ser. No. 11,371
Claims priority, application Canada, Dec. 21, 1978, 2112781
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24



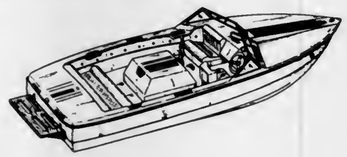
261,127
MOBILE SELF-POWERED HYDRAULIC LIFT
Rallie P. Rallis; Richard E. Cullity, both of Los Angeles County, and Lyle R. Tamplin, Orange County, all of Calif., assignors to Mark Industries, Carson, Calif.
Continuation of Ser. No. 880,300, Feb. 22, 1978, abandoned.
This application Jan. 31, 1980, Ser. No. 117,255
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—34



261,126
REMOTE CONTROLLED FORK TRUCK
Olof H. Lindfors, Gothenburg, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Nov. 24, 1978, Ser. No. 963,568
Claims priority, application Sweden, May 25, 1978, 78-1361
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—34

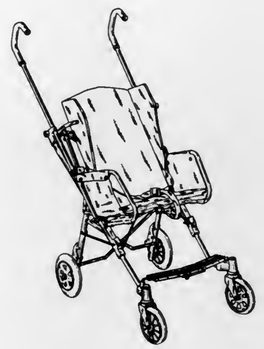


261,128
BOAT
George D. Fowler, Maryville, Tenn., assignor to Supreme Industries, Inc., Louisville, Tenn.
Filed Dec. 11, 1978, Ser. No. 968,115
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300

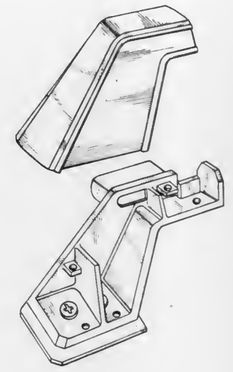




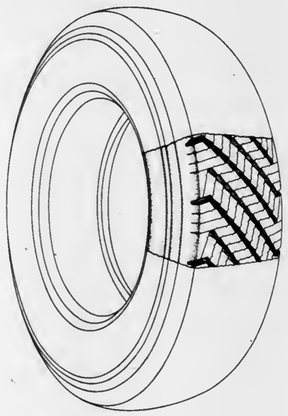
261,129
FOLDABLE BABY STROLLER
Giuseppe Perego, Via De Gasperi, Arcore (Milano), Italy (20043)
Filed Apr. 12, 1979, Ser. No. 29,482
Claims priority, application Italy, Oct. 30, 1978, 23166/78[U]
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129



261,131
ARTICLE CARRIER STANCHION
Ray G. Mareydt, Warren, and Daniel J. Kowalski, Ortonville, both of Mich., assignors to Four Star Corporation, Troy, Mich.
Filed Jun. 11, 1979, Ser. No. 46,996
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

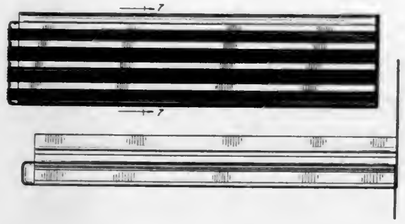


261,130
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 16, 1978, Ser. No. 951,843
Claims priority, application France, Apr. 25, 1978, 78 557
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

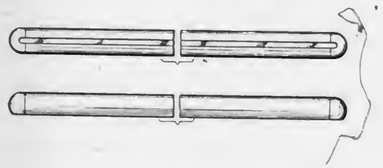


261,132
MOTORCYCLE FAIRING
Craig W. Vetter, Manitou Springs, Colo.; Charles M. Perethian, Arroyo Grande, and Kenneth W. Cummings, San Luis Obispo, both of Calif., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Oct. 31, 1979, Ser. No. 89,913
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

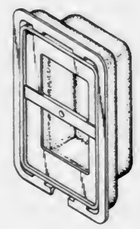
261,133
COMBINED RUNNING BOARD AND SPLASH GUARD
Martin A. Makela, Waconia, Minn., assignor to J-Mark, Inc., Minneapolis, Minn.
Filed May 3, 1979, Ser. No. 35,896
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



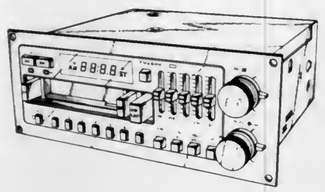
261,134
ELECTRICAL CURRENT SUPPLY TRACK
Robert Heritage, London, England, assignor to Rotaflex (Great Britain) Limited, London, England
Filed Jun. 14, 1979, Ser. No. 48,679
Claims priority, application United Kingdom, Dec. 22, 1978, 987816/78
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13



261,135
SAFETY COVER FOR ELECTRICAL OUTLETS
James Horne, 42 Duncaster Rd., Bloomfield, Conn. 06002
Filed Feb. 14, 1979, Ser. No. 12,136
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

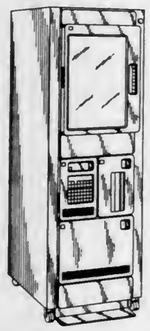


261,136
COMBINED AUTOMOBILE CARTRIDGE PLAYER AND RADIO RECEIVER OR THE LIKE
Nobuo Yamada, Kobe; Masayoshi Kamikubo, Akashi; Koichi Chikaishi, and Junichi Terahata, both of Kobe, all of Japan, assignors to Rujitsu Ten Limited, Hyogo, Japan
Filed Nov. 23, 1979, Ser. No. 96,687
Claims priority, application Japan, May 29, 1979, 54-21908
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5



261,137
AUTOMOTIVE AUDIO SYSTEM SPEAKER ENCLOSURE
Peter G. De Lillo, 161 3rd St., Staten Island, N.Y. 10306
Filed Dec. 15, 1978, Ser. No. 969,875
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

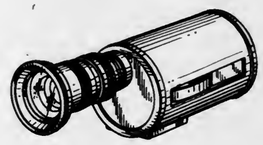
261,138
MAGNETIC TAPE UNIT
Myron F. Davis, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 8, 1979, Ser. No. 2,032
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—108



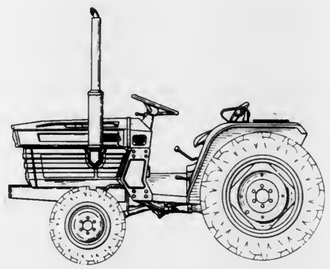


261,139
TELEPHONE APPARATUS
Knud Jakobsen, Horsens, Denmark, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Apr. 5, 1979, Ser. No. 27,348
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

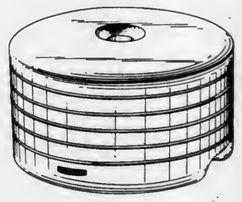
261,140
TELEVISION CAMERA
Tameaki Ikeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 6, 1978, Ser. No. 884,042
Claims priority, application Japan, Sep. 6, 1977, 52-35514
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—78



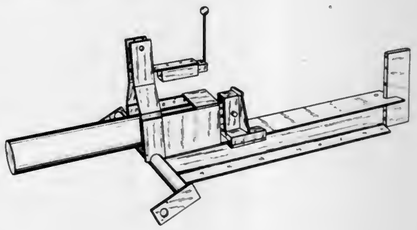
261,141
AGRICULTURAL TRACTOR
Teizo Takahashi, and Kazuo Toyokuni, both of Sakai, Japan, assignors to Kubota, Ltd., Naniwa, Japan
Filed Jul. 3, 1979, Ser. No. 54,617
Claims priority, application Japan, Jan. 11, 1979, 54-873
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23



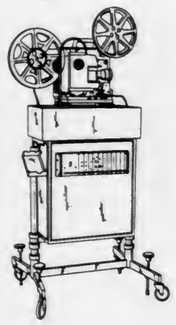
261,142
FOOD DEHYDRATOR
Chad S. Erickson, Minneapolis, and W. Robert Worrell, Hopkins, both of Minn., assignors to Alternative Pioneering Systems, Inc., Minneapolis, Minn.
Filed Jan. 15, 1979, Ser. No. 3,472
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—110



261,143
WOOD SPLITTER
Robert H. Green, 16967 Bowling Green, West, Bowling Green, Ohio 43402
Filed Dec. 16, 1977, Ser. No. 861,443
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—127

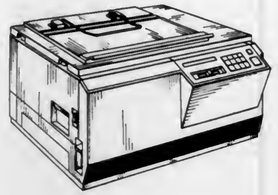


261,144
MOVING TARGET PROJECTOR CONSOLE
Brian T. Brooksby, 156 Earlsbrook Rd., Redhill, Surrey; Harold J. Murray, 32 New Odiham Rd., Alton, Hampshire; Anthony Simpson, 65 South Hill, Godalming, Surrey, and Stuart M. Peterkin, 30 Leewood Way, Effingham, Surrey, all of England
Filed Feb. 21, 1979, Ser. No. 13,393
Claims priority, application United Kingdom, Aug. 24, 1978, 986058/78
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—11

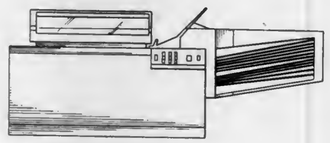


261,145
COPIER OR SIMILAR ARTICLE
Taro Etoh, Okazaki, and Sadao Ishihara, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 13, 1979, Ser. No. 93,482
Claims priority, application Japan, May 21, 1979, 54-20774
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

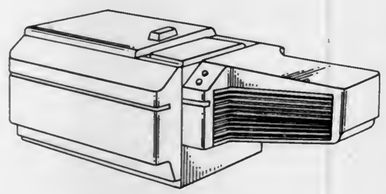
261,146
ELECTROSTATIC COPIER OR SIMILAR ARTICLE
Masaaki Sakai, Toyokawa, Japan, and Toshihiko Sakow, Teaneck, N.J., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sep. 7, 1979, Ser. No. 73,349
Claims priority, application Japan, Mar. 8, 1979, 54/9247
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



261,147
COMBINED COPYING AND SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Sep. 24, 1979, Ser. No. 78,399
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32

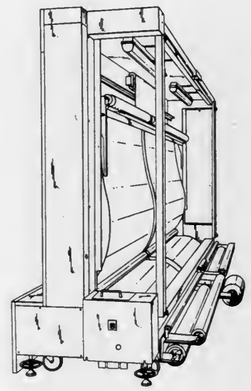


261,148
COMBINED COPYING AND SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Newport Beach, Calif.
Filed Nov. 29, 1979, Ser. No. 98,538
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



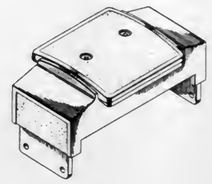


261,149
SCREEN UNIT
Brian T. Brooksby, 156 Earlsbrook Rd., Redhill, Surrey; Harold J. Murray, 32 New Odiham Rd., Alton, Hampshire; Anthony Simpson, 65 South Hill, Godalming, Surrey, and Stuart M. Peterkin, 30 Leewood Way, Effingham, Surrey, all of England
Filed Feb. 21, 1979, Ser. No. 13,391
Claims priority, application United Kingdom, Aug. 24, 1978, 986060/78
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—43

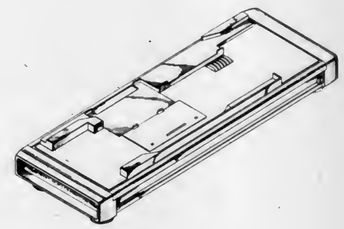


261,150
COMBINED GUITAR AND SYNTHESIZER SOUND BOX, OR SIMILAR ARTICLE
Forest L. Terry, Jr., 90 Brunswick St., Boston, Mass. 02121
Filed Jan. 23, 1980, Ser. No. 114,639
Term of patent 14 years
Int. Cl. D17—*01, 03*
U.S. Cl. D17—2

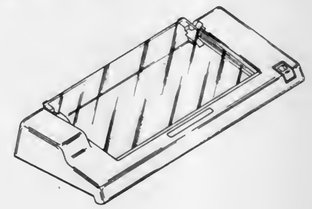
261,151
HANDLE AND CAP ASSEMBLY FOR THE PRINT HEAD OF IMPRINTING MACHINES
William P. Barbour, Mount Prospect, Ill., assignor to Security Imprinter Corporation, Walkersville, Md.
Filed Jan. 16, 1980, Ser. No. 114,057
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—14



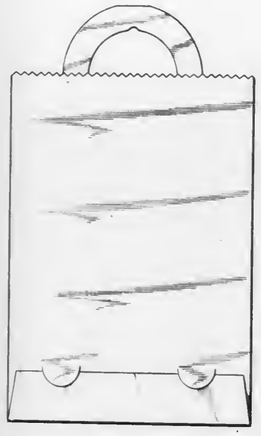
261,152
PRINTING BED ASSEMBLY FOR IMPRINTING MACHINES
William P. Barbour, Mount Prospect, Ill., assignor to Security Imprinter Corporation, Walkersville, Md.
Filed Jan. 16, 1980, Ser. No. 114,058
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—14



261,153
ACOUSTICAL HOOD ASSEMBLY FOR A PRINTER APPARATUS
Wayne C. Cathey, Bedford, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 20, 1979, Ser. No. 58,961
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—22

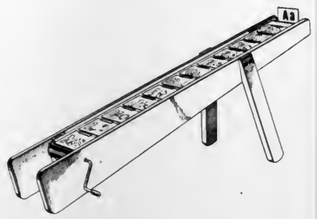


261,154
ENVELOPE
Glenn A. Thresher, Pineville, N.C., assignor to Rexham Corporation, Pineville, N.C.
Filed Sep. 10, 1979, Ser. No. 73,618
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—4

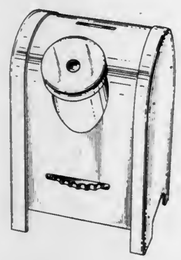


261,155
TRANSPARENT STORAGE ENVELOPE FOR A FLEXIBLE MAGNETIC COMPUTER DISC
Richard Nast, 309 Whippoorwill La., Brentwood, Tenn. 37027
Filed Oct. 15, 1979, Ser. No. 84,871
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33

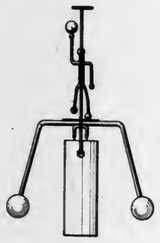
261,156
BELT ELEVATOR TYPE EDUCATIONAL TOY
Emmet Crawford, 2602 Central Ave., Kearney, Nebr. 68847
Filed Sep. 25, 1980, Ser. No. 190,836
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



261,157
COMBINED KALEIDOSCOPE AND TOY MAIL BOX
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055
Filed Feb. 12, 1979, Ser. No. 11,524
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—60

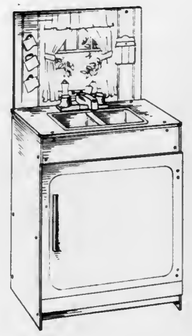


261,158
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Sep. 12, 1979, Ser. No. 75,303
Claims priority, application Japan, May 25, 1979, 54-21552
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—102

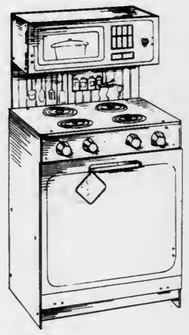




261,159
TOY KITCHEN SINK
Gerald M. Rapaport, 5933 N. Lincoln Ave., Chicago, Ill. 60659
Filed Sep. 21, 1979, Ser. No. 77,747
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122

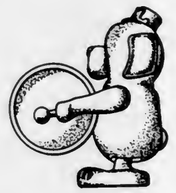


261,160
TOY STOVE
Gerald M. Rapaport, 5933 N. Lincoln Ave., Chicago, Ill. 60659
Filed Sep. 21, 1979, Ser. No. 77,752
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122

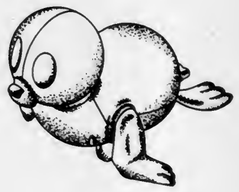


261,161
TOY BEAR FIGURINE
Hiroshi Ohkawa, Tokyo, Japan, assignor to Tomy Kogyo, Co., Inc., Tokyo, Japan
Filed Sep. 27, 1979, Ser. No. 79,250
Claims priority, application Japan, Mar. 30, 1979, 54/12725
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

261,162
TOY DOG FIGURINE
Hiroshi Ohkawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 27, 1979, Ser. No. 79,344
Claims priority, application Japan, Mar. 30, 1979, 54-12724
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



261,163
ANIMATED SEAL FIGURINE
Toshiaki Takizawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 15, 1979, Ser. No. 85,062
Claims priority, application Japan, Apr. 13, 1979, 54-15225
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



261,164
ANIMATED FROG FIGURINE
Kazue Kudo, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 15, 1979, Ser. No. 85,060
Claims priority, application Japan, Apr. 13, 1979, 54-15223
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—158

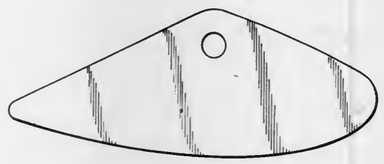
261,165
TOY ANIMAL FIGURE
Kenzo Kurosawa, and Fukuji Hachimura, both of Tokyo, Japan, assignors to Gakken Co., Ltd, Tokyo, Japan
Filed Jun. 4, 1979, Ser. No. 45,431
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—160



261,166
ANIMATED PENGUIN FIGURINE
Kazue Kudo, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 15, 1979, Ser. No. 85,061
Claims priority, application Japan, Apr. 13, 1979, 54-15224
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—160

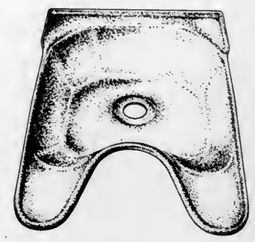
261,167
GOLF CLUB HEAD
Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025
Filed Nov. 12, 1980, Ser. No. 206,270
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220

261,168
SKATEBOARD ICE BLADE
Kenneth Rice, Jr., Cerritos, Calif., assignor to Donald B. Allen, Oklahoma City, Okla.
Filed Oct. 20, 1978, Ser. No. 953,840
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225



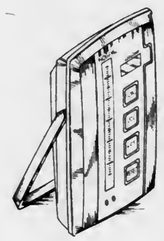
261,169
FISHING LURE
Larry R. Snyder, 5909 Clark Ave., Lakewood, Calif. 90712
Filed Jan. 11, 1980, Ser. No. 111,271
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

261,170
SHAMPOO SINK
James S. McFarlane, 413 S. 284th, Redondo Beach, Wash. 98054
Filed Jan. 7, 1980, Ser. No. 109,771
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—64

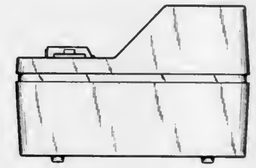


261,171
WATER CLOSET
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Sep. 12, 1980, Ser. No. 186,689
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65

261,172
PULMONARY FUNCTION MEASUREMENT APPARATUS OR THE LIKE
Tsvi Lissack, Englewood, Colo., assignor to Hospal Medical Corp., Littleton, Colo.
Filed Sep. 5, 1978, Ser. No. 939,889
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

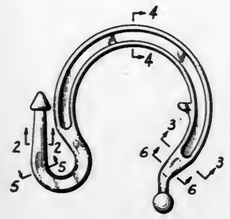


261,173
BILIRUBINOMETER
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1979, Ser. No. 9,339
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

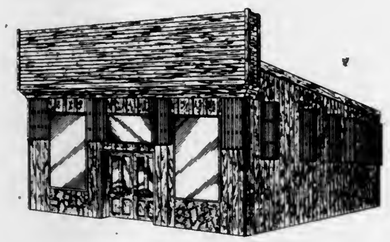


261,174
BOTTOM PLATE FOR A SPHYGMOMANOMETER
Emanuel Berliner, Valley Stream, N.Y., assignor to Bristoline Inc., Freeport, N.Y.
Filed Sep. 5, 1978, Ser. No. 939,677
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—29

261,175
MEDICAL CONTAINER HANGER
David L. O'Day, Canoga Park, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 25, 1978, Ser. No. 936,820
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

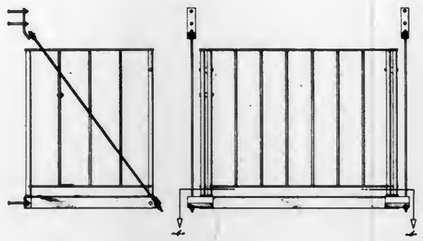


261,176
BUILDING
Samuel Chernin, 300 E. 54th St., New York, N.Y. 10022
Filed Mar. 14, 1979, Ser. No. 20,261
Term of patent 3½ years
Int. Cl. D25—*03*
U.S. Cl. D25—11

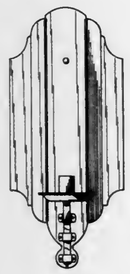


261,177
BUILDING STRUCTURE OR THE LIKE
Eric Gschwandtner, 5413 Sylvan La., Raleigh, N.C. 27612
Filed Dec. 14, 1979, Ser. No. 104,030
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17

261,178
FIRE ESCAPE PLATFORM
Cheyenne A. Reinhard, 29372 Providence Way, Hayward, Calif. 94544
Filed Dec. 14, 1978, Ser. No. 969,566
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D25—62

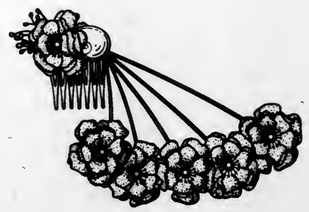


261,179
CANDLE SCONCE
John P. Alley, Sr., 10841 Meadow La., Philadelphia, Pa. 19154
Filed Aug. 9, 1979, Ser. No. 65,266
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—9

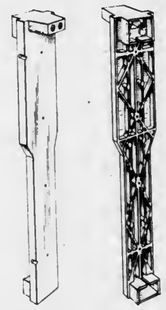


261,180
TRACK LIGHT SYSTEM
Herbert Lagin, 31 Deer Park Rd., Great Neck, N.Y. 11024
Filed Apr. 16, 1979, Ser. No. 30,555
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—66

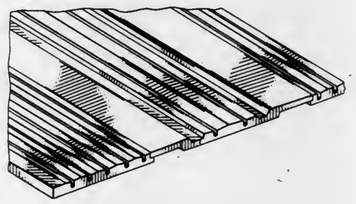
261,181
COMB WITH ARTIFICIAL FLOWERS AND SEASHELLS
Gloria J. Sands, 21805 Ulmus Dr., Woodland Hills, Calif. 91364
Filed Jun. 16, 1980, Ser. No. 160,126
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—32



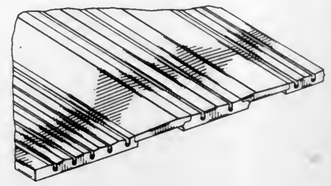
261,182
BEE FRAME END BAR
John L. Guilfoyle, 772 Boundary Rd., Darra, Queensland, 4076, Australia
Filed Feb. 28, 1979, Ser. No. 16,040
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



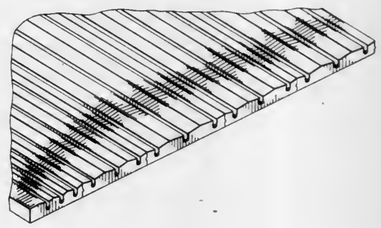
261,183
FLUME PLATFORM FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed Aug. 9, 1979, Ser. No. 65,356
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



261,184
FLUME PLATFORM FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed Aug. 10, 1979, Ser. No. 65,716
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



261,185
FLUME PLATFORM FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034
Filed Aug. 10, 1979, Ser. No. 65,717
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2

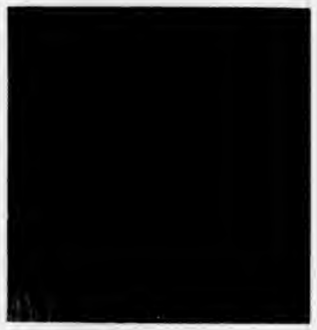


261,186
COMBINED CAT PLAYGROUND AND EXERCISER
Robert J. Michalski, Paramus, N.J., assignor to Abeta Pet Supply, Inc., Dumont, N.J.
Division of Ser. No. 5,695, Jan. 23, 1979. This application Jul. 14, 1980, Ser. No. 168,161
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—42

261,187
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 30, 1979, Ser. No. 43,687
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 1187
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E

261,188
DESIGN FOR CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Luzern, Switzerland
Filed Jan. 9, 1980, Ser. No. 110,750
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1979, 752
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E

261,189
LAMINATE SHEET
Harry R. Ford, Parkdale, Ohio, and Yasuo Yoshihashi, Tokyo, Japan, assignors to Formica Corporation, Cincinnati, Ohio
Filed Jul. 11, 1978, Ser. No. 923,615
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 R

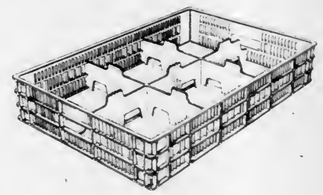


261,190
LAMINATE SHEET
Harry R. Ford, Parkdale, Ohio, and Yasuo Yoshihashi, Tokyo, Japan, assignors to Formica Corporation, Cincinnati, Ohio
Filed Jul. 11, 1978, Ser. No. 923,617
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 R

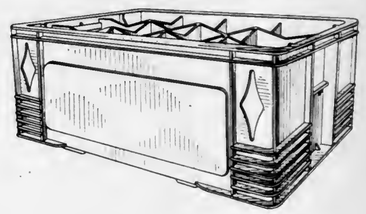
261,191
LAMINATE SHEET
Harry R. Ford, Parkdale, Ohio, and Yasuo Yoshihashi, Tokyo, Japan, assignors to Formica Corporation, Cincinnati, Ohio
Filed Jul. 11, 1978, Ser. No. 923,618
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 Y

261,192
CURTAIN MATERIAL
Hans Stocker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Jan. 23, 1980, Ser. No. 114,582
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, URA 813
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 A

261,193
TOTE TRAY
Jean Cornou, Verrieres-le-Buisson, France, assignor to Allibert Exploitation Societe Anonyme, Grenoble, France
Filed Dec. 1, 1978, Ser. No. 965,483
Claims priority, application France, Jun. 1, 1978, 78 2491
Term of patent 14 years
Int. Cl. D99—*99*
U.S. Cl. D34—45



261,194
BEVERAGE CASE
Theodor M. Box, Brielle, N.J., assignor to Cities Service Company, Tulsa, Okla.
Filed Dec. 6, 1978, Ser. No. 967,053
Term of patent 14 years
Int. Cl. D99—*99*
U.S. Cl. D34—46



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 6TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See—*
Lykes, Robert E., 4,293,114, Cl. 248-604.000.

A-T-O Inc.: *See—*
Winiasz, Michael E., 4,293,010, Cl. 141-392.000.

AB Bofors: *See—*
Furendal, Allan R. B.; Larsson, Bernt; and Nilsson, Erik R., 4,293,596, Cl. 427-160.000.

AB Svenska Flacktfabriken, Fack: *See—*
Bjorklund, Bjorn A., 4,292,809, Cl. 60-676.000.

AB Volvo: *See—*
Ronbeck, Arne I., 4,293,271, Cl. 414-737.000.

Abatti, Cinto A.; and Ash, Harold T. Field crop harvesting and loading machine. 4,292,784, Cl. 53-391.000.

Abbott, Bernard J.; and Fukuda, David S., to Eli Lilly and Company. A-30912A Nucleus. 4,293,482, Cl. 260-112.50R.

Abbott, Bernard J.; and Fukuda, David S., to Eli Lilly and Company. A-30912H Nuclei. 4,293,490, Cl. 260-112.50K.

Abbott Laboratories: *See—*
Raden, Daniel S.; and Arbir, Francis W., 4,293,658, Cl. 521-129.000.
Seely, John H., 4,293,689, Cl. 536-17.00R.

Abramian, Eduard S.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Abrash, Muriel: *See—*
Langley, Robert C.; Myers, Herbert; and Abrash, Muriel, 4,293,513, Cl. 264-60.000.

Accatino, Luciano, to CSELT, Centro Studi e Laboratori Telecomunicazioni S.p.A. Microstrip delay line compensated for thermal phase variations. 4,293,830, Cl. 333-161.000.

ACF Industries, Incorporated: *See—*
Hinrichs, John M., 4,293,116, Cl. 251-173.000.

Acheson, John L., to Rexnord Inc. Servo-valve convertible construction. 4,292,805, Cl. 60-450.000.

Acker, Donald J., to J. F. Enterprises, Inc. Convertible sofa-bed with back restraining mechanism. 4,292,698, Cl. 5-45.000.

Adachi, Hideo; Minai, Kiichi; Moriyasu, Kozo; and Imagawa, Shunjiro, to Murata Manufacturing Co., Ltd. Infrared radiation detecting apparatus and method of manufacturing. 4,293,768, Cl. 250-338.000.

Adams, Phillip: *See—*
Swift, Harold E.; Innes, Robert A.; and Adams, Phillip, 4,293,716, Cl. 564-480.000.

Adidas Fabrique de Chaussures de Sport: *See—*
Johansen, Arne W., 4,293,143, Cl. 280-615.000.

AEL Mirrotel, Ltd.: *See—*
White, John E., 4,293,902, Cl. 363-26.000.

Aeration Industries, Inc.: *See—*
Inhofer, Harold G., 4,293,169, Cl. 308-121.000.

AGA Aktiebolag: *See—*
Braun, Stellan, 4,293,096, Cl. 239-419.300.

Agency of Industrial Science & Technology: *See—*
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

AGFA-Gevaert Aktiengesellschaft: *See—*
Wagner, Karl; Engelsmann, Dieter; Hackenberg, Hubert; and Stiefel, Peter, 4,293,204, Cl. 354-21.000.

AGFA-GEVAERT N.V.: *See—*
Heirbaut, Wilfried A.; and Rens, Walter J., 4,293,508, Cl. 264-25.000.

Aine, Harry E.: *See—*
Block, Barry, 4,293,316, Cl. 55-16.000.

Aketa, Kohichi: *See—*
Suzuki, Yukio; Kasamatsu, Kiyoshi; and Aketa, Kohichi, 4,293,504, Cl. 260-465.00D.

Akita, Yoshio: *See—*
Muto, Katsuya; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,293,811, Cl. 322-60.000.

Akizuki, Katsufumi: *See—*
Segawa, Hiroshi; and Akizuki, Katsufumi, 4,293,523, Cl. 422-139.000.

Aktiebolaget Draco: *See—*
Mono, Rune G.; Moren, Nils F. E.; and Wetterlin, Kjell I. L., 4,292,966, Cl. 128-200.230.

Aktiebolaget Platmanufaktur AB: *See—*
Jakobsen, Kjell M., 4,293,359, Cl. 156-156.000.

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Akzona Incorporated: *See—*
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,293,345, Cl. 106-270.000.

Aladdin Industries, Incorporated: *See—*
Bridges, John A., 4,293,071, Cl. 206-503.000.

Albin Sprenger KG GmbH & Co.: *See—*
Bachem, Christian, 4,292,850, Cl. 73-702.000.

Albright, Jay D.: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,293,554, Cl. 424-250.000.

Alcan Aluminum Corporation: *See—*
Chalmers, Alexander A.; and Gailey, J. Lynn, 4,292,781, Cl. 52-547.000.

Alembik, Alfred. Furniture for sitting and reclining. 4,292,697, Cl. 5-18.00R.

Alf Hannaford & Co. Pty. Ltd.: *See—*
Hopkins, Donald L., 4,292,931, Cl. 119-103.000.

Alfa Romeo S.p.A.: *See—*
Bertoloni, Luciano; Rogora, Edoardo; and Cressoni, Ermanno, 4,293,843, Cl. 340-52.00F.

Alkem GmbH: *See—*
Ledebrink, Friedrich-Wilheim; Stoll, Wolfgang; and Schafer, Dieter, 4,293,438, Cl. 252-301.10W.

Alleman, James E.: *See—*
Slavens, Clyde M.; Clavin, Edward A.; and Alleman, James E., 4,293,758, Cl. 219-125.120.

Allen-Bradley Company: *See—*
Struger, Odo J.; Brown, Ronald A.; and Black, Craig A., 4,293,924, Cl. 364-900.000.

Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., to American Cyanamid Company. Method of treating asthma. 4,293,554, Cl. 424-250.000.

Allen, Robert J.; Lindstrom, Robert; and Juda, Walter, to Prototech Company. Thin carbon-cloth-based electrocatalytic gas diffusion electrodes, and electrochemical cells comprising the same. 4,293,396, Cl. 204-106.000.

Alley, David W., to Mosely, Neal J., a part interest. Fingernail hone. 4,292,987, Cl. 132-73.000.

Allied Chemical Corporation: *See—*
Marshall, Robert M.; and Dardoufas, Kimon C., 4,293,460, Cl. 260-18.0PF.
Weman, Per O., 4,293,105, Cl. 242-107.40B.

Allied Paper Incorporated: *See—*
Shaw, Michael J.; and Thiessen, Robert J., 4,293,629, Cl. 430-64.000.

Allis-Chalmers Corporation: *See—*
Bhide', Yeshwant K., 4,292,992, Cl. 137-340.000.
Lucas, James H., 4,293,059, Cl. 192-3.570.
O'Connor, John W., 4,293,040, Cl. 172-7.000.

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Altstatt, John E., to California Microwave, Inc. Double-balanced mixer. 4,293,956, Cl. 455-327.000.

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American Can Company: *See—*
Detroit, William J., 4,293,342, Cl. 106-90.000.
Detroit, William J., 4,293,459, Cl. 260-17.500.

American Cyanamid Company: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,293,554, Cl. 424-250.000.
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,293,704, Cl. 556-442.000.
Granzow, Albrecht H., 4,293,464, Cl. 260-45.70P.
Granzow, Albrecht H., 4,293,465, Cl. 260-45.70P.
Hardy, William B.; and Loffelman, Frank F., 4,293,467, Cl. 260-45.80N.
Pai, Venkatrao K.; and Skrivan, Joseph F., 4,293,692, Cl. 544-196.000.
Werneke, Michael F.; and Jones, James A., 4,293,406, Cl. 209-166.000.

American Home Products Corporation: *See—*
Wei, Peter H. L.; and Bell, Stanley C., 4,293,696, Cl. 546-83.000.

American Safety Equipment Corporation: *See—*
Ziv, Avraham, 4,293,107, Cl. 242-107.700.

American Standard Inc.: *See—*
Olson, Paul E.; and Lyons, Michael D., 4,293,118, Cl. 251-297.000.
Weseloh, Roger J.; Kanjo, Wajih; and Karim, Syed, 4,292,721, Cl. 29-243.520.

AMP Incorporated: *See—*
Hughes, Donald W. K.; and Myers, Ronald W., 4,292,736, Cl. 29-884.000.
Tucci, John J., 4,292,732, Cl. 29-749.000.
Weisenburger, Lawrence P., 4,293,177, Cl. 339-99.00R.

Ampex Corporation: *See—*
Schiller, Edward, 4,293,884, Cl. 360-121.000.

Amrhein, Herbert, to Siemens Aktiengesellschaft. Control console. 4,293,764, Cl. 200-302.000.

Anchor Building Products Limited: *See—*
Hammond, Leslie G., 4,292,785, Cl. 53-399.000.

Anderson, Andrew W., to Scandia Packaging Machinery Co. Conveyor assembly for a wrapping machine. 4,293,067, Cl. 198-851.000.

Anderson, J. Edward C., to Marquette Metal Products Co. Manually-actuated rotary-impact tool. 4,293,044, Cl. 173-93.500.

Anderson, Kjell, to Seco Tools AB. Device for transferring fluid to a rotating unit. 4,293,251, Cl. 408-59.000.

Andersson, Kjell R.; and Johansson, Hans E., to Elektrokemiska Aktiebolaget. Needle-punch carpet with binder containing alkali-stabilized silicic acid. 4,293,612, Cl. 428-281.000.

Andersson, Roland J. E.: *See—*
Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., 4,293,409, Cl. 210-96.200.

Andrews, Gerald D., to Du Pont de Nemours, E. I., and Company. Dienyl methacrylates. 4,293,674, Cl. 526-327.000.

Anglo-American Clays Corporation: *See—*
Lewis, Herbert I.; McConnell, Anthony D.; and Price, William M., 4,293,097, Cl. 241-16.000.

Anisimov, Vyacheslav I.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.

Anneflod, Weimar A.: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,293,607, Cl. 428-212.000.

Annesberg Associates N.V.: *See—*
Berger, Gordon, 4,292,696, Cl. 4-505.000.

Ansley, Incorporated: *See—*
Newton, John C., Jr., 4,292,770, Cl. 51-170.0PT.

Anzai, Shunichi: *See—*
Kobayashi, Nariyoshi; Sakamoto, Takeshi; Anzai, Shunichi; and Matsumoto, Manabu, 4,293,275, Cl. 416-97.00R.

Aoki, Harumi; Kawasaki, Masahiro; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,293,207, Cl. 354-25.000.

Aoki, Harumi: *See—*
Tokutomi, Seijiro; Jyojiki, Masao; Aoki, Harumi; Nakamura, Kazuo; and Watanabe, Koichiro, 4,293,206, Cl. 354-25.000.

Aoto, Yoshiyuki: *See—*
Itogawa, Zirou; and Aoto, Yoshiyuki, 4,292,985, Cl. 132-9.000.

Appel, Douglas C.: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,293,031, Cl. 165-95.000.

Applegate, Lynn E.; and Brown, Charles J., Jr., to Du Pont de Nemours, E. I., and Company. Treatment of reverse osmosis membranes. 4,293,420, Cl. 210-500.200.

Applied Technologies Associates: *See—*
Van Steenwyk, Donald H., 4,293,046, Cl. 175-45.000.

Arai, Hajime: *See—*
Kako, Hiroyoshi; and Arai, Hajime, 4,292,860, Cl. 74-665.0GA.

Arai, Katsuyuki: *See—*
Matsui, Kiyoshi; Arai, Katsuyuki; and Shinbashi, Sueo, 4,293,891, Cl. 361-383.000.

Arbir, Francis W.: *See—*
Raden, Daniel S.; and Arbir, Francis W., 4,293,658, Cl. 521-129.000.

Arena, Joseph P. Support for traversing window covering device. 4,293,021, Cl. 160-178.00R.

Arena, Salvador. Method for continuous casting of metal strips. 4,293,022, Cl. 164-476.000.

Arendt, Ronald H., to General Electric Company. Molten salt synthesis of alkaline earth titanates, zirconates and their solid solutions. 4,293,534, Cl. 423-593.000.

Arendt, Ronald H., to General Electric Company. Molten salt synthesis of alkaline zirconate powder. 4,293,535, Cl. 423-593.000.

Arikawa, Hiroo, to San-O Industrial Co., Ltd. Electrical fuse with an improved fusible element. 4,293,836, Cl. 337-290.000.

Armstrong Cork Company: *See—*
Tricca, Raymond A., 4,293,173, Cl. 339-38.000.

Arnot, Larry K.: *See—*
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,293,031, Cl. 165-95.000.

Arrigoni-Martelli, Edoardo: *See—*
Rachlin, Schneur; and Arrigoni-Martelli, Edoardo, 4,293,549, Cl. 424-245.000.

Asada, Eiichi; Inokuma, Toshio; and Egawa, Isao, to Shoei Chemical Incorporated. Thick film resistor. 4,293,839, Cl. 338-309.000.

Asahi Glass Company, Ltd.: *See—*
Tamamura, Ryo; and Kutsukake, Yukinori, 4,293,335, Cl. 75-124.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Harumi; Kawasaki, Masahiro; and Sawada, Yoshio, 4,293,207, Cl. 354-25.000.
Kando, Toru; and Morisawa, Tahei, 4,293,210, Cl. 354-269.000.
Kobayashi, Koichi; and Okudaira, Sadao, 4,293,197, Cl. 350-454.000.
Kurei, Hiroshi, 4,293,209, Cl. 354-153.000.
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, 4,293,205, Cl. 354-23.00D.
Tokutomi, Seijiro; Jyojiki, Masao; Aoki, Harumi; Nakamura, Kazuo; and Watanabe, Koichiro, 4,293,206, Cl. 354-25.000.

Asakawa, Yukio, to Hitachi, Ltd. Digital differential analyzer with an increment output function. 4,293,918, Cl. 364-702.000.

Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for producing solid carbon material having high flexural strength. 4,293,533, Cl. 423-449.000.

Asano, Noriyuki: *See—*
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

ASEA Aktiebolag: *See—*
Lundren, Jan, 4,293,773, Cl. 250-506.000.

Ash, David J.: *See—*
Silva, Roy; Ash, David J.; and Scheible, Clement E., 4,293,572, Cl. 426-19.000.

Ash, Harold T.: *See—*
Abatti, Cinto A.; and Ash, Harold T., 4,292,784, Cl. 53-391.000.

Ashcraft, Thomas L.: *See—*
Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., 4,293,428, Cl. 252-8.55D.

Ashland Oil, Inc.: *See—*
Martin, Ralph D.; Dunnavant, William R.; Sturtz, Gregory P.; and Langer, Heimo J., 4,293,480, Cl. 260-38.000.

Asp, Donald J. Combination forced air furnace and air cooler. 4,293,032, Cl. 165-101.000.

Astarita, Domenico: *See—*
Senni, Paolo; and Astarita, Domenico, 4,293,494, Cl. 260-239.30A.

Atara Corporation: *See—*
Lipert, Peter, 4,293,506, Cl. 261-77.000.

Atia, Ali E. E.; Berman, Arnold L.; and Mahle, Christoph, to Communications Satellite Corporation. Multichannel correlation receiver for determining depolarization of signals along signal propagation paths. 4,293,945, Cl. 370-17.000.

Atlantic Richfield Company: *See—*
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, 4,293,025, Cl. 165-1.000.

Aubry, Jacques A., to Societe Nationale Ind. Aerospatiale. Supple mounting arrangement for helicopter rotor with through strip. 4,293,277, Cl. 416-134.00A.

Aucktor, Erich: *See—*
Sandstrom, Anders; and Aucktor, Erich, 4,293,304, Cl. 440-83.000.

Auger, Arnold J. Dubbing winder. 4,292,797, Cl. 57-24.000.

Aziz, Victor; and Spector, George. Watch stand. 4,293,943, Cl. 368-316.000.

Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., to Wynn Oil Company. Engine cooling system flushing apparatus and method. 4,293,031, Cl. 165-95.000.

Bach, Hartwig C.; and Hinderer, Helmuth E., to Monsanto Company. Acrylic fiber having improved basic dyeability. 4,293,613, Cl. 428-364.000.

Bachem, Christian, to Albin Sprenger KG GmbH & Co. Air pressure transmitter. 4,292,850, Cl. 73-702.000.

Bachl, Herbert, to Getewent Gesellschaft fur technische und Wissenschaftlichs Energieumsatzentwicklungen m.b.H. Fluid-flow machine. 4,293,278, Cl. 416-186.00R.

Bagdis, Judy, to Polaroid Corporation. Prebias for digital light integrator. 4,293,208, Cl. 354-29.000.

Bailey, David C.; and Keesler, Floyd F., to Harris Corporation. System for automatically loading planar film sheets onto a film positioning device. 4,293,124, Cl. 271-233.000.

Bailey, John M., to Caterpillar Tractor Co. Apparatus for controlling the quantity of fuel delivery to an engine and engine timing. 4,292,940, Cl. 123-387.000.

Baizer, Manuel M.: *See—*
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,392, Cl. 204-59.00R.
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,393, Cl. 204-59.00R.

Baker International Corporation: *See—*
Evans, Robert W., 4,293,038, Cl. 166-331.000.

Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,293,870, Cl. 358-10.000.

Baldwin, Edwin L. Collision avoidance warning system. 4,293,857, Cl. 343-6.50R.

Baldwin Piano & Organ Company: *See—*
Jones, Edward M.; and Simmons, Carlton J., Jr., 4,292,874, Cl. 84-1.030.

Balke, Roy L.: *See—*
Zdaniewski, Joseph J.; Penn, William B.; and Balke, Roy L., 4,293,784, Cl. 310-45.000.

Ball Corporation: *See—*
Lowe, Earl L., 4,293,004, Cl. 137-884.000.

Ballestra Chemica, S.p.A.: *See—*
Bertini, Fausto A.; and Noe', Sergio, 4,293,318, Cl. 55-85.000.

Banka, Vidya S. Right ventricular injection catheter; right ventricular angiographic method; and method of monitoring septal wall motion. 4,292,976, Cl. 128-656.000.





Bany, Stephen W.: *See—*
Blachunis, Robert J.; and Bany, Stephen W., 4,293,675, Cl. 528-14.000.

Barello, Lawrence J.: *See—*
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.

Barendregt, Frank; and Boogaard, Leendert A., to Stork Brabant B.V. Method and a device for producing separation images having the effect of being orthogonally screened. 4,293,873, Cl. 358-75.000.

Barker, Craig S.; and Bockwinkel, Joe L., to Shakertown Corporation. Staggered butt sidewall shingle panel and method of making the same. 4,292,780, Cl. 52-541.000.

Barnes, Paul R.; and Shapira, Hanna B., to United States of America, Energy. Reflective insulating blinds for windows and the like. 4,292,763, Cl. 49-64.000.

Barnett, Loren A. Liquid proportioning container. 4,292,846, Cl. 73-427.000.

Baron, Martin; and Retterer, Ronald J. Game device. 4,293,133, Cl. 273-345.000.

Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, to Swingline Inc. Electronically operated portable fastener driving tool. 4,293,088, Cl. 227-131.000.

Barrineau, Wade H. Shelf system. 4,292,902, Cl. 108-146.000.

Barton, Edwin A.: *See—*
White, Thomas M.; Barton, Edwin A.; and Ware, Jesse P., 4,293,011, Cl. 144-3.00R.

BASF Aktiengesellschaft: *See—*
Hahn, Klaus; Naarmann, Herbert; and Penzien, Klaus, 4,293,656, Cl. 521-88.000.
Laurer, Peter R., 4,293,448, Cl. 252-463.000.
Nissen, Dietmar; Marx, Matthias; Jarre, Wolfgang; Schoen, Ernst; and Decker, Walter, 4,293,657, Cl. 521-121.000.
Portugall, Michael; Finkelmann, Heino; and Ringsdorf, Helmut, 4,293,435, Cl. 252-299.010.

Battery Engineering, Inc.: *See—*
Marincic, Nikola; and Epstein, James, 4,293,622, Cl. 429-50.000.

Bauer, Werner R., to Robertshaw Controls Company. Method of making reversing valve construction and parts therefor. 4,292,720, Cl. 29-157.10R.

Baumann, Hans, to Sulzer Brothers Limited. Holding device for the electrical contact elements of a wrap stop motion of a weaving machine. 4,293,007, Cl. 139-358.000.

Baumgartner, Hans, to BBC Brown, Boveri & Company, Limited. Waterproof watch and method for making. 4,293,942, Cl. 368-280.000.

Baumgartner, Hans U.: *See—*
Maag, Willi; Baumgartner, Hans U.; Vollenweider, Max; and Wolf, Hans J., 4,292,769, Cl. 51-169.000.

Baun, Kenneth W., to Burroughs Corporation. Peripheral dependent circuit for peripheral controller. 4,293,928, Cl. 364-900.000.

Baur, Rudolf; Merki, Emil; and Krahenbuhl, Hanspeter, to Swiss Aluminium Ltd. Process for cleaning rolling lubricant. 4,293,424, Cl. 210-737.000.

Baxter, Andrew J. G.: *See—*
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,293,501, Cl. 260-430.000.

Baxter Travenol Laboratories, Inc.: *See—*
Caruso, Stephen; and Dighe, Kamalakar D., 4,293,222, Cl. 356-319.000.
Schnell, William J., 4,293,413, Cl. 210-188.000.

Bayer Aktiengesellschaft: *See—*
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,293,331, Cl. 71-118.000.
Dieterich, Dieter; and Markusch, Peter, 4,293,474, Cl. 260-29.2TN.
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,293,566, Cl. 424-304.000.
Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, 4,293,662, Cl. 525-184.000.
Kinast, Gunther; Muller, Lutz; Puls, Walter; and Sitt, Rudiger, 4,293,551, Cl. 424-249.000.
Kramer, Wolfgang, 4,293,715, Cl. 564-256.000.
Mazanek, Jan; and Nuller, Hanns P., 4,293,680, Cl. 528-67.000.
Probst, Joachim; Sonntag, Michael; and Kolb, Gunter, 4,293,661, Cl. 525-127.000.
Reischl, Artur, 4,293,456, Cl. 260-9.000.
Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, 4,293,669, Cl. 525-452.000.
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,293,717, Cl. 568-485.000.
Weissel, Oskar; Serini, Volker; and Buysch, Hans-Josef, 4,293,687, Cl. 528-346.000.

BBC Brown, Boveri & Company, Limited: *See—*
Baumgartner, Hans, 4,293,942, Cl. 368-280.000.
Germann, Willy, 4,292,828, Cl. 72-54.000.
Starcevic, Mihailo, 4,293,786, Cl. 310-157.000.

Beach, David L.; and Harrison, James J., to Gulf Research & Development Company. Nickel ylides. 4,293,502, Cl. 260-439.00R.

Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Alkylation of aromatics with propylene and higher olefins. 4,293,724, Cl. 585-457.000.

Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Use of metal modified refractory metal oxide/silica supported nickel cluster catalyst to oligomerize ethylene. 4,293,725, Cl. 585-523.000.

Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Process for the oligomerization of propylene and higher olefins. 4,293,726, Cl. 585-523.000.

Beach, David L.; and Harrison, James J., to Gulf Research & Development Company. Process for the oligomerization of ethylene. 4,293,727, Cl. 585-526.000.

Beam, Clark W.: *See—*
Parks, Glenn C., Jr.; and Beam, Clark W., 4,293,115, Cl. 251-1.00A.

Beavan, Elton L.; and Moynahan, E. Bradley, to GAF Corporation. In photographic emulsion adhesion to a polyester film base. 4,293,642, Cl. 430-534.000.

Beavers, Allan E., to T. A. Pelsue Company. Canopy assembly for patched radar domes. 4,293,862, Cl. 343-872.000.

Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Novel acyloxamides and plant growth regulant compositions. 4,293,331, Cl. 71-118.000.

Becker, Orlien N.: *See—*
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.

Becker, Reinhold, to Hoechst Aktiengesellschaft. Process for the simultaneous filling and turning of a tubular casing with an outside coating. 4,292,711, Cl. 17-49.000.

Becton, Dickinson and Company: *See—*
Percarpio, Edward P.; and Holderith, William J., 4,293,078, Cl. 215-247.000.

Beecham Group Limited: *See—*
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,293,501, Cl. 260-430.000.

Beers, M. Dale: *See—*
Smith, Alfred H., Jr.; and Beers, M. Dale, 4,293,616, Cl. 428-447.000.

Begunov, Petr M.: *See—*
Ragoza, Igor V.; Begunov, Petr M.; Tonikian, Robert T.; and Vasiljuk, Petr J., 4,292,820, Cl. 66-8.000.

Belanger, Guy; and Missout, Gilles, to Hydro-Quebec. Device for detecting and measuring the concentration of gaseous hydrogen dissolved in a fluid. 4,293,399, Cl. 204-195.00P.

Bell, Stanley C.: *See—*
Wei, Peter H. L.; and Bell, Stanley C., 4,293,696, Cl. 546-83.000.

Bell, Ted A.; and Lehner, Daniel F., to Pretty Products, Inc. Automobile splash guard and attachment means therefor. 4,293,140, Cl. 280-154.50R.

Bell Telephone Laboratories, Incorporated: *See—*
Huang, Victor K.; and Ruth, Richard L., 4,293,907, Cl. 364-200.000.

Bell, William T.; and Garcia, Jose B., to Schlumberger Technology Corporation. Explosive safe-arming apparatus for perforating guns. 4,292,895, Cl. 102-306.000.

Belozerov, Nikolai P.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Ben Gurion Industries Ltd.: *See—*
Hadari, Gideon, 4,293,840, Cl. 340-27.0AT.

Bencksier-Knapsack GmbH: *See—*
Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, 4,293,526, Cl. 422-205.000.

Bendig, Lothar, to Filterwerk Mann & Hummel GmbH. Electronically controlled combustion air mixing valve for internal combustion engines. 4,292,949, Cl. 123-556.000.

Bendix Corporation, The: *See—*
Brown, Arthur K., 4,293,061, Cl. 192-67.00R.
Brown, Arthur K., 4,293,139, Cl. 280-6.00H.

Benfield Corporation: *See—*
Field, Joseph H.; and McCrea, Donald H., 4,293,531, Cl. 423-232.000.

Bente, Paul F., III; Zerenner, Ernest H.; and Dandeneau, Raymond D., to Hewlett-Packard Company. Silica chromatographic column. 4,293,415, Cl. 210-198.200.

Beranek, Miroslav. Guard for tennis rackets and like articles. 4,293,130, Cl. 273-73.00R.

Berger, Gordon, to Annesberg Associates N.V. Swimmer arrival signal panels incorporated in a swimming pool bulkhead. 4,292,696, Cl. 4-505.000.

Berger, Jean L., to Thomson-CSF. Transversal charge transfer filter. 4,293,832, Cl. 333-165.000.

Berghofer, Hans. Flexible pipe-connecting fitting. 4,293,152, Cl. 285-229.000.

Bergkvist, Jorgen, to Stal-Laval Turbin AB. Combined air and fuel nozzle for fluidized bed combustion chamber. 4,293,298, Cl. 432-58.000.

Berman, Arnold L.: *See—*
Atia, Ali E. E.; Berman, Arnold L.; and Mahle, Christoph, 4,293,945, Cl. 370-17.000.

Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel 2-substituted-3,4-epoxycyclopentan-1-ones, 2-substituted-3,4-epoxycyclopentan-1-ols, and various 2-substituted-cyclopentenones. 4,293,704, Cl. 556-442.000.

Bernat, Georg, to Friedrich Grohe Armaturenfabrik GmbH & Co. Cartridge valve. 4,292,997, Cl. 137-454.600.

Bertholet, Raymond: *See—*
Hirsbrunner, Pierre; and Bertholet, Raymond, 4,293,581, Cl. 426-630.000.

Bertini, Fausto A.; and Noe', Sergio, to Ballestra Chemica, S.p.A. Wet purification of gaseous mixtures containing detergent powders in suspension. 4,293,318, Cl. 55-85.000.

Bertoloni, Luciano; Rogora, Edoardo; and Cressoni, Ermanno, to Alfa Romeo S.p.A. Motorcar dashboard. 4,293,843, Cl. 340-52.00F.

Bessmer, Stanley J.; and Lampe, Warren R., to General Electric Company. Method of forming a roofing composite using silicone rubber composition. 4,293,597, Cl. 427-186.000.

Bethay, Willis D., Jr., to Du Pont de Nemours, E. I., and Company. Control of synthetic yarns during drawing with heated rolls. 4,293,518, Cl. 264-210.200.

Bexford Limited: *See—*
Huffey, Roy F.; and Pope, John A., 4,293,633, Cl. 430-152.000.

Beyl, Earl, Jr. Sound actuator. 4,293,851, Cl. 340-384.00E.

Beyler, Arvil L.: *See—*
Pap, Joe P.; Pap, Marilyn D.; Beyler, Arvil L.; and Beyler, Doris M., 4,293,162, Cl. 297-184.000.

Beyler, Doris M.: *See—*
Pap, Joe P.; Pap, Marilyn D.; Beyler, Arvil L.; and Beyler, Doris M., 4,293,162, Cl. 297-184.000.

Beynet, Pierre A.; Lucksinger, James E.; and Jansen, Martin B., Jr., to Standard Oil Company (Indiana). VMP Casing tieback. 4,293,146, Cl. 285-24.000.

BFG Glassgroup: *See—*
Terneu, Robert; and Van Cauter, Albert, 4,293,326, Cl. 65-60.00D.

Bhide', Yeshwant K., to Allis-Chalmers Corporation. Valve for handling solids capable of gas-pressure-tight closure against a gas pressure differential. 4,292,992, Cl. 137-340.000.

Bible, Dennis E.; Crano, Richard N.; and Welch, John A., to General Tire & Rubber Co., The. Pneumatic tire assembly. 4,293,016, Cl. 152-158.000.

Bickel, Hans: *See—*
Woodward, Robert B.; and Bickel, Hans, 4,293,462, Cl. 260-239.00A.

Bickford, John H., to Raymond Engineering, Inc. Calibration apparatus and method for strain measuring instruments. 4,292,835, Cl. 73-1.00B.

Biggs, Candice B.: *See—*
Wovcha, Merle G.; and Biggs, Candice B., 4,293,644, Cl. 435-55.000.
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., 4,293,645, Cl. 435-55.000.

Bik, Joannes D.: *See—*
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,293,345, Cl. 106-270.000.

Binder, Georg, to Robert Bosch GmbH. Three-phase vehicular generator construction. 4,293,788, Cl. 310-227.000.

Bingaman, David E.: *See—*
Robey, Melvin J.; Bingaman, David E.; and Read, Arthur E., 4,293,237, Cl. 405-39.000.

Bio-Melktechnik Swiss Hoefelmayr & Co.: *See—*
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Davio, Marc; and Bioul, Gery J. A., 4,293,922, Cl. 364-757.000.

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Lewis, Charles; and Birkenmeyer, Robert D., 4,293,547, Cl. 424-180.000.

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Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D., 4,293,700, Cl. 546-321.000.

Bison-werke Bahre & Greten GmbH & Co. KG: *See—*
Bucking, Gunter, 4,293,509, Cl. 264-26.000.

Bjorklund, Bjorn A., to AB Svenska Flacktfabriken, Fack. Procedure for converting low-grade thermal energy into mechanical energy in a turbine for further utilization and plant for implementing the procedure. 4,292,809, Cl. 60-676.000.

Blachunis, Robert J.; and Bany, Stephen W., to Minnesota Mining and Manufacturing Company. Antimony halide-organic phosphonate ester cationic polymerization catalysts. 4,293,675, Cl. 528-14.000.

Black, Craig A.: *See—*
Struger, Odo J.; Brown, Ronald A.; and Black, Craig A., 4,293,924, Cl. 364-900.000.

Blaich, Diether: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Blank, Nolan D. Battery operated illuminating device. 4,293,894, Cl. 362-100.000.

Blessing, Hubert, to Levi Strauss & Co. Hemmer-seamer. 4,292,908, Cl. 112-306.000.

Block, Barry, to Aine, Harry E., a part interest. Inlet system for a gas analyzer. 4,293,316, Cl. 55-16.000.

Blumbach, Jurgen; Durckheimer, Walter; and Schrinner, Elmar, to Hoechst Aktiengesellschaft. Cephalosporin derivatives. 4,293,550, Cl. 424-246.000.

Blumhardt, Rolf: *See—*
Hatz, Ernst; Eibl, Heinz; Peter, Erwin; and Blumhardt, Rolf, 4,293,092, Cl. 237-12.100.

Bobchenok, Meri I.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

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Barker, Craig S.; and Bockwinkel, Joe L., 4,292,780, Cl. 52-541.000.

Boehringer Ingelheim GmbH: *See—*
Merz, Herbert; and Stockhaus, Klaus, 4,293,556, Cl. 424-267.000.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.

Boeing Company, The: *See—*
Middleton, Wilbur D.; and Paulson, John A., 4,293,110, Cl. 244-199.000.

Boer, Werner; Lachner, Hans; Maschonat, Guenter; Richter, Joerg; Schulte, Heinrich; and Warnke, Hans, to Klockner-Werke AG. Mine roof support structure. 4,293,246, Cl. 405-291.000.

Boidenko, Nikolai G.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Bolhofer, William A., to Merck & Co., Inc. Imidazole or imidazoline substituted ureas. 4,293,703, Cl. 548-337.000.

Bolie, Victor W. Vertical axis wind turbine. 4,293,279, Cl. 416-227.00A.

Bolton, Theodore S., to Carrier Corporation. Door assembly for a self-contained air conditioning unit. 4,292,815, Cl. 62-262.000.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,292,819, Cl. 64-28.00R.

Bona, Istvan: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Bonel, Federico A., to Industrias Neoplast, S.A. Rapid coupling for plastic pipes. 4,293,149, Cl. 285-111.000.

Bonner, Alvin T., Sr., to John D. Hollingsworth on Wheels, Inc. Card coiler can changer. 4,292,712, Cl. 19-159.00A.

Bonneyrat, Alain M.: *See—*
Foster, George W.; and Bonneyrat, Alain M., 4,293,807, Cl. 318-696.000.

Boogaard, Leendert A.: *See—*
Barendregt, Frank; and Boogaard, Leendert A., 4,293,873, Cl. 358-75.000.

Borg, Paul E.; and Lechinger, Terry M., to PRE Corporation. Trailer mounted high floor drilling mast and substructure arrangement. 4,292,772, Cl. 52-118.000.

Borland, Montague C.: *See—*
Hochberg, Lindsey S.; and Borland, Montague C., 4,293,823, Cl. 330-260.000.

Borror, Jack A.; and Rowe, Edward A., Jr., to Diamond Shamrock Corporation. Perchloroethylene dielectric fluid containing pyrrole and phenol. 4,293,433, Cl. 336-94.000.

Bosy, Vladimir N.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.

Bott, John A. Flexible wind deflector. 4,293,159, Cl. 296-91.000.

Boudouris, Angelo; and Peters, Edwin F., to Eprad Incorporated. Audio channel separating apparatus. 4,293,821, Cl. 330-126.000.

Boveri, Sergio: *See—*
Pedrazzoli, Andrea; and Boveri, Sergio, 4,293,560, Cl. 424-271.000.

Bowen, Griffith; and Fowell, Peter A., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral laminates. 4,293,615, Cl. 428-412.000.

Bowers, James C.: *See—*
Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., 4,293,904, Cl. 363-86.000.

Bowles, John P.: *See—*
Jasmin, Gilles; and Bowles, John P., 4,293,923, Cl. 364-802.000.

Boyer, Wesley D., to Ford Motor Company. Crankshaft position sensor circuitry for providing stable cyclical output signals without regard to peak to peak variations in sensor signals. 4,293,814, Cl. 324-166.000.

Braaten, Ronald J. Foot operated control unit. 4,293,746, Cl. 200-86.500.

Brachet, Alain, to Electricite de France (Service National). Secondary coolant circuit for nuclear-reactors. 4,293,385, Cl. 376-283.000.

Braddick, Britt O., to Texas Iron Works, Inc. Valve for closing the fluid passage of a well bore tubular member with balanced operating arrangement. 4,293,163, Cl. 251-283.000.

Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., to Honeywell Information Systems Inc. Data processing system having direct memory access bus cycle. 4,293,908, Cl. 364-200.000.

Bradley, Lindell P.: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,292,916, Cl. 116-205.000.

Bradley, Robert F.; and Bradley, Lindell P., to Micro-Circuits Company. Timer and storage condition indicator. 4,292,916, Cl. 116-205.000.

Bradley, Robert L., Jr.; and Hekmati, Majid, to Wisconsin Alumni Research Foundation. Preparation of frozen yogurt. 4,293,573, Cl. 426-43.000.

Bragg, Ralph J.: *See—*
Dudley, Hubert T.; and Bragg, Ralph J., 4,293,341, Cl. 106-88.000.





Bramwell, Frank, to United States of America, Navy. Pivotable cable guard for retaining a swingable-movable cable. 4,293,109, Cl. 244-17.110.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,293,166, Cl. 308-6.00C.

Brandes, Wilhelm: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,293,566, Cl. 424-304.000.

Brandt, Cecil R. Furnace and boiler system and method of operation thereof. 4,292,904, Cl. 110-198.000.

Brann, Theodore L.: *See—*
Stanback, Harris I.; Brann, Theodore L.; and Polston, Larry D., 4,293,153, Cl. 292-85.000.

Braun, Anton. Heat pump. 4,292,814, Cl. 62-243.000.

Braun, Stellan, to AGA Aktiebolag. Arrangement in a burner. 4,293,096, Cl. 239-419.300.

Brawley, Thomas S. Machine for abrading outside diameters and the method of making same. 4,292,765, Cl. 51-103.0TF.

Bremer, Noel J.: *See—*
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,293,498, Cl. 260-346.750.
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,293,443, Cl. 252-432.000.

Breslow, Jeffrey D.: *See—*
Jaworski, Eugene; and Breslow, Jeffrey D., 4,292,756, Cl. 46-72.000.

Brewer, Earl G., to General Motors Corporation. Copper grid for strain analysis of sheet metal deformation. 4,292,851, Cl. 73-762.000.

Brezosky, Bernard J., to General Electric Company. Thrust bearing assembly. 4,293,170, Cl. 308-161.000.

Bridges, John A., to Aladdin Industries, Incorporated. Slant stacking tray system. 4,293,071, Cl. 206-503.000.

Brilando, Frank, to Schwinn Bicycle Company. Frame for lightweight bicycle. 4,293,141, Cl. 280-281.00R.

Brinker, Reiner G., to Philip Morris Incorporated. Apparatus for perforating hollow cylinders. 4,292,872, Cl. 83-866.000.

British Gas Corporation: *See—*
Metcalfe, Ronald S.; and Greig, John M., 4,293,147, Cl. 285-39.000.

Brittain, William J., to Ford Motor Company. Information handling system. 4,293,947, Cl. 370-89.000.

Britton, Francis D., Jr. Engine valve lifter service tool. 4,292,719, Cl. 29-156.40R.

Brogdon, Vas H.; and Williams, David L., to Textron Inc. Laminated composite rotor yoke. 4,293,276, Cl. 416-134.00A.

Bronstein, Allen I. Solar reflector with flexible sheet tightly secured around form surfaces. 4,293,192, Cl. 350-296.000.

Brooks, George D.; and Bushey, Donald J., Sr., to General Electric Company. Ammunition orientation mechanism. 4,292,878, Cl. 86-48.000.

Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., to United States of America, Navy. Power frequency converter. 4,293,904, Cl. 363-86.000.

Brooks, Kevin E.: *See—*
Wovcha, Merle G.; and Brooks, Kevin E., 4,293,646, Cl. 435-55.000.

Broughton, Donald B.: *See—*
Landis, Arthur M.; Broughton, Donald B.; and Fickel, R. Gene, 4,293,346, Cl. 127-46.00A.

Brown, Arthur K., to Bendix Corporation, The. Remote controlled hub clutch. 4,293,061, Cl. 192-67.00R.

Brown, Arthur K., to Bendix Corporation, The. Power steering pump powered load leveler. 4,293,139, Cl. 280-6.00H.

Brown, Charles J., Jr.: *See—*
Applegate, Lynn E.; and Brown, Charles J., Jr., 4,293,420, Cl. 210-500.200.

Brown Company: *See—*
Haas, Richard G., 4,293,354, Cl. 156-69.000.

Brown Oil Tools, Inc.: *See—*
Montgomery, James W., 4,292,988, Cl. 137-68.00R.

Brown, Ronald A.: *See—*
Struger, Odo J.; Brown, Ronald A.; and Black, Craig A., 4,293,924, Cl. 364-900.000.

Brown, Timothy E.: *See—*
Luchessa, Charles E.; and Brown, Timothy E., 4,292,843, Cl. 73-171.000.

Brugner, Frank S., Jr., to Square D Company. Silver, cadmium oxide, lithium carbonate contact material and method of making the material. 4,293,337, Cl. 75-232.000.

Bucher-Guyer AG Maschinenfabrik: *See—*
Hauser, Hans-Ulrich, 4,292,793, Cl. 56-378.000.

Bucking, Gunter, to Bison-werke Bahre & Greten GmbH & Co. KG. Process for the production of chipboards, fiberboards, or like boards. 4,293,509, Cl. 264-26.000.

Buckley, William D., to Perkin-Elmer Corporation, The. Method for making a mask useful in X-ray lithography. 4,293,624, Cl. 430-5.000.

Buckman, John D.; Buckman, Stanley J.; Johnson, Betty S.; and Pera, John D., to Buckman Laboratories, Inc. Slime control compositions and methods of using the same. 4,293,559, Cl. 424-270.000.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; Buckman, Stanley J.; Johnson, Betty S.; and Pera, John D., 4,293,559, Cl. 424-270.000.

Buckman, Stanley J.: *See—*
Buckman, John D.; Buckman, Stanley J.; Johnson, Betty S.; and Pera, John D., 4,293,559, Cl. 424-270.000.

Bucsi, Jozsef: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Budnovitch, William F.; Petralia, Salvatore C.; and Silvestris, Louis F., to Keene Corporation. Garden light fixture. 4,293,898, Cl. 362-291.000.

Budzich, Tadeusz. Load responsive fluid control valve. 4,293,000, Cl. 137-596.200.

Budzich, Tadeusz. Load responsive fluid control valve. 4,293,001, Cl. 137-596.130.

Buffalo Color Corporation: *See—*
Malik, Edward P., 4,293,681, Cl. 528-115.000.

Buhler, Marcel: *See—*
Olofsson, Mats; Buhler, Marcel; and Wood, Robert, 4,293,571, Cl. 426-7.000.

Bula, Russell P., to Du Pont de Nemours, E. I., and Company. Rotatable pallet post for plastic pallets. 4,292,900, Cl. 108-51.100.

Bullinga, Lothar H., to Rockwell International Corporation. Temperature compensated rotary positioner. 4,293,850, Cl. 340-378.500.

Bunker Ramo Corporation: *See—*
Taylor, Derek, 4,293,180, Cl. 339-217.00R.

Burk, Emmett H., Jr.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan. Catalyst demetallization by converting the metal poisons to a sulfur containing metal compound having a defined low amount of sulfur. 4,293,403, Cl. 208-120.000.

Burkl, Erich: *See—*
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,293,166, Cl. 308-6.00C.

Burnham, Robert D.: *See—*
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,293,826, Cl. 331-94.50H.

Burroughs Corporation: *See—*
Baun, Kenneth W., 4,293,928, Cl. 364-900.000.
Catiller, Robert D.; and Forbes, Brian K., 4,293,909, Cl. 364-200.000.

Burton, Charles G., to Chisholm-Ryder Company, Inc. Adjustable harvesting machine for blueberries and other plants. 4,292,792, Cl. 56-330.000.

Burton, John D., to William R. Selwood Limited. Pump. 4,293,285, Cl. 417-240.000.

Burton, Stanley J., to Fisco Products Limited. Brake. 4,293,058, Cl. 188-65.100.

Buschor, Josef J.; and Jennings, Frederick R., to Pneumatic Scale Corporation. Paperboard carton. 4,292,787, Cl. 53-456.000.

Bushey, Donald J., Sr.: *See—*
Brooks, George D.; and Bushey, Donald J., Sr., 4,292,878, Cl. 86-48.000.

Bushman, John A.: *See—*
Williams, Garnet M. E.; Hutton, Stanley P.; and Bushman, John A., 4,292,853, Cl. 73-861.790.

Bustos, Rafael T., to Leggett & Platt, Inc. Conveyor belt assembly for a display rack. 4,293,062, Cl. 193-2.00D.

Butcher, Lawrence D. Leaf stripper for tobacco stalks and the like. 4,292,982, Cl. 130-30.00R.

Butter, Stephen A.; and Chester, Arthur W., to Mobil Oil Corporation. Conversion of synthesis gas with iron-containing catalyst. 4,293,446, Cl. 252-455.00Z.

Buysch, Hans-Josef: *See—*
Weissel, Oskar; Serini, Volker; and Buysch, Hans-Josef, 4,293,687, Cl. 528-346.000.

C M Industries: *See—*
Pedrazzoli, Andrea; and Boveri, Sergio, 4,293,560, Cl. 424-271.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,292,819, Cl. 64-28.00R.

Cable Conveyor Systems, Inc.: *See—*
Rauscher, David A., 4,292,723, Cl. 29-402.010.

Cabot Corporation: *See—*
Wacker, Albert R., 4,293,355, Cl. 156-73.200.

Cahen, George L., Jr. Collapsible wing aircraft. 4,292,757, Cl. 46-80.000.

Caiello, Joseph A.; and Caiello, Ronald J., to Caiello, Joseph A. Apparatus and methods for making cheese topping, and cheese mold assemblies. 4,293,296, Cl. 425-547.000.

Caiello, Ronald J.: *See—*
Caiello, Joseph A.; and Caiello, Ronald J., 4,293,296, Cl. 425-547.000.

Cairns, Hugh; and Lee, Thomas B., to Fisons Limited. Compounds. 4,293,541, Cl. 424-45.000.

Calderon, Reynaldo, to Texaco Inc. Method of forming and assembling a self-cleaning helical spring screen. 4,293,037, Cl. 166-312.000.

California Microwave, Inc.: *See—*
Altstatt, John E., 4,293,956, Cl. 455-327.000.

Cambier, James L.: *See—*
Kay, David B.; Wheeless, Leon L., Jr.; and Cambier, James L., 4,293,221, Cl. 356-318.000.

Campana, Patsie C. Ingot mold reconditioning process. 4,292,726, Cl. 29-527.600.

Campbell, Billy H.: *See—*
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., 4,292,880, Cl. 89-1.815.

Campbell, Douglas D., to Minnesota Mining and Manufacturing Company. Flocked three-dimensional network mat. 4,293,604, Cl. 428-90.000.

Campbell, Robert W.; and Hill, H. Wayne, Jr., to Phillips Petroleum Co. Polyamides of 1,4-cyclohexane dicarboxylic acid and 5-methyl-1,9-nonanediamine and fibers thereof. 4,293,688, Cl. 528-346.000.

Canaris, Valerie M., to Rohco, Inc. Cadmium plating baths and methods for electrodepositing bright cadmium deposits. 4,293,391, Cl. 204-50.00R.

Candid Logic, Inc.: *See—*
Vis, Arthur D.; and Feinberg, Billie, 4,292,740, Cl. 33-172.00E.

Canon Kabushiki Kaisha: *See—*
Kohayakawa, Yoshimi; Ishikawa, Yasuyuki; and Maruyama, Shigeo, 4,293,198, Cl. 351-13.000.
Minoura, Kazuo; Sugiura, Muneharu; Minami, Setsuo; and Sato, Tadashi, 4,293,184, Cl. 350-6.300.
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

Capella Inc.: *See—*
Ergaver, Nevenka; and Ergaver, Rayko, 4,292,986, Cl. 132-11.00R.

Caratsch, Hans-Peter. Air foil nozzle dryer. 4,292,745, Cl. 34-156.000.

Carborundum Company, The: *See—*
Hortman, Michael T.; and Naum, Robert G., 4,293,598, Cl. 427-203.000.

Cardenas, Carlos G.; and Din, Zia U., to SCM Corporation. Coupling reaction involving a grignard and allylic halide. 4,293,497, Cl. 260-345.500.

Cargill, Incorporated: *See—*
Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., 4,292,898, Cl. 105-238.00R.

Carl Still GmbH & Co. KG, Firma: *See—*
Clement, Heinrich-Josef, 4,293,389, Cl. 202-248.000.
Lorenz, Kurt; Dungs, Horst; Koenigs, Hans B.; and Kurtz, Roman, 4,293,388, Cl. 202-126.000.

Carlo Erba Strumentazione S.p.A.: *See—*
Sisti, Giorgio; and Colombo, Bruno, 4,293,308, Cl. 23-230.0PC.

Carlo Gavazzi S.p.A.: *See—*
Del Re, Pietrantonio; and Fracassi, Pietro, 4,293,916, Cl. 364-571.000.

Carlson, Allen J.; and Vander Kaay, Henry A., to Double A Products Company. Power limiting control apparatus for pressure-flow compensated variable displacement pump assemblies. 4,293,284, Cl. 417-218.000.

Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased (by Zoerb, Delores E.); Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., to Pacific Technology, Inc. Programmable electronic real-time load controller. 4,293,915, Cl. 364-493.000.

Carrens, Donald E., to Dresser Industries, Inc. Reversing valve assembly for a fluid operated well pump. 4,293,287, Cl. 417-393.000.

Carrier Corporation: *See—*
Bolton, Theodore S., 4,292,815, Cl. 62-262.000.
Raymond, Glendon A.; Honnold, Fred V.; and Spath, Herbert J., 4,293,093, Cl. 237-19.000.

Carter, Richard G.; Watson, Stuart L., Jr.; and Pines, Arthur N., to Union Carbide Corporation. Radiation-curable acrylated epoxy silicone compositions. 4,293,678, Cl. 528-32.000.

Caruso, Stephen; and Dighe, Kamalakar D., to Baxter Travenol Laboratories, Inc. Control apparatus for spectrophotometer. 4,293,222, Cl. 356-319.000.

Casio Computer Co., Ltd.: *See—*
Hoshii, Toshifumi, 4,293,927, Cl. 364-900.000.

Cassells, Melvin K. Safety lock for window sashes and the like. 4,293,154, Cl. 292-144.000.

Cassidy, John V.: *See—*
Lindblad, Nero R.; Rezanka, Ivan; and Cassidy, John V., 4,292,924, Cl. 118-658.000.

Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,292,940, Cl. 123-387.000.
Goloff, Alexander; and Denning, Ralph E., 4,293,050, Cl. 180-6.260.
Hoefer, Wayne A.; and Tanty, Paul J., 4,293,164, Cl. 303-13.000.

Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Digital system for data transfer using universal input-output microprocessor. 4,293,909, Cl. 364-200.000.

Catozzo, Leo, to Costruzione Incollatrici Rapide C.I.R. S.r.L. Film splicing devices. 4,293,368, Cl. 156-506.000.

Cattani, Augusto, to Officine Augusto Cattani & C. S.A.S. Liquid separating and evacuating device for fluid suction equipment. 4,293,300, Cl. 433-92.000.

Cazzaniga, Italo; and Pasquinelli, Ottorino, to Grove Valve and Regulator Company. Fire safe seal. 4,292,989, Cl. 137-72.000.

Celanese Corporation: *See—*
Edelman, Robert, 4,293,469, Cl. 260-45.90P.
Hughes, O. Richard, 4,293,499, Cl. 260-410.90R.

Centra-Burkle GmbH & Co.: *See—*
Knoll, Alois, 4,293,028, Cl. 165-12.000.

Central Glass Company, Limited: *See—*
Sasaki, Hiromi; and Takahara, Yoshiyuki, 4,293,532, Cl. 423-356.000.

Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag": *See—*
Pretor, Wincenty; Rozmus, Edward; Korecki, Zbigniew; and Karmanski, Stanislaw, 4,293,248, Cl. 405-300.000.

Centre de Recherche Industrielle du Quebec: *See—*
Dinh, Chon T. L., 4,293,820, Cl. 330-85.000.

Century Geophysical Corporation: *See—*
West, Jerry B.; Kretzschnar, John L.; and Fung, Bing, 4,293,815, Cl. 324-254.000.

Cepelinski, Jacob, to Mitel Corporation. Ringing decoder circuit. 4,293,737, Cl. 179-17.00E.

Cerra, Raffaele, to Selenia Industrie Elettroniche Associate S.p.A. Frequency-shifting systems for frequency modulated signals. 4,293,825, Cl. 331-2.000.

Cetus Corporation: *See—*
Cohen, Stanley N., 4,293,652, Cl. 435-172.000.

Chalmers, Alexander A.; and Gailey, J. Lynn, to Alcan Aluminum Corporation. Siding panel system with modular insulating and mounting units. 4,292,781, Cl. 52-547.000.

Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., to Davy McKee Corporation. Apparatus for treatment of hydrocarbon-containing mineral material. 4,293,390, Cl. 202-100.000.

Chamberlin, James W.: *See—*
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., 4,293,558, Cl. 424-270.000.

Champion, Carolyn; Wolcott, Judith; Hart, Barbara; and Garcia, Zulma C. Brassiere. 4,292,975, Cl. 128-498.000.

Chaney, Preston E.: *See—*
Cox, William H.; and Chaney, Preston E., 4,293,936, Cl. 367-82.000.

Chapalain, Jean-Pierre. Hook. 4,293,156, Cl. 294-82.00R.

Chatterson, Louis M.: *See—*
Nielsen, Edward G.; Mosley, Kenneth C.; and Chatterson, Louis M., 4,293,218, Cl. 356-138.000.

Chaudhari, Praveen; Chou, Ned J.; Feder, Ralph; Fowler, Alan B.; and VanVechten, James A., to International Business Machines Corporation. High aspect ratio, high resolution mask fabrication. 4,293,374, Cl. 156-628.000.

Chelsea Instruments Limited: *See—*
Wheaton, John E. G.; Griffiths, David; and Learner, Richard C. M., 4,293,225, Cl. 356-417.000.

Cheng, Edmund K.; and Hill, Wiley E., to Intel Corporation. MOS Analog-to-digital converter. 4,293,848, Cl. 340-347.0AD.

Cheng, William J.; Guthrie, David B.; and Leiendecker, Donald M., to Petrolite Corporation. MgO Dispensions. 4,293,429, Cl. 252-18.000.

Chester, Arthur W.: *See—*
Butter, Stephen A.; and Chester, Arthur W., 4,293,446, Cl. 252-455.00Z.

Chevron Research Company: *See—*
Sieg, Robert P.; and Spars, Byron G., 4,293,401, Cl. 208-11.00R.

Chicago Display Company: *See—*
Snyder, H. Kent, Jr., 4,292,751, Cl. 40-517.000.

Chikanari, Kenichi: *See—*
Sekino, Masaaki; Chikanari, Kenichi; and Taniyama, Tsukasa, 4,293,419, Cl. 210-321.100.

Chimicasa GmbH: *See—*
Vadasz, Kalman, 4,293,570, Cl. 426-3.000.

Chimura, Kozo: *See—*
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,293,938, Cl. 368-72.000.

Chin, Albert K.: *See—*
Fogarty, Thomas J.; and Chin, Albert K., 4,292,974, Cl. 128-344.000.

Chirino, Agustin M.; and Yost, Gerald H., to Corning Glass Works. Method of forming hermetic seals. 4,293,325, Cl. 65-43.000.

Chisholm-Ryder Company, Inc.: *See—*
Burton, Charles G., 4,292,792, Cl. 56-330.000.

Chou, Ned J.: *See—*
Chaudhari, Praveen; Chou, Ned J.; Feder, Ralph; Fowler, Alan B.; and VanVechten, James A., 4,293,374, Cl. 156-628.000.

Chressanthis, Andrew G.; Halpern, Henry M.; and Gaffney, Brian P., to RCA Corporation. Digital CFAR signal processor for phase coded radars. 4,293,856, Cl. 343-5.0CF.

Christ, Charles; LeBeault, Jean-Michel; and Noel, Claude, to Christ, Charles. Apparatus for ensilaging and fermenting. 4,293,655, Cl. 435-316.000.

Christensen, Burton G.; and DiNinno, Frank P., to Merck & Co., Inc. 6- and 6,6-Disubstituted-2-substituted-oxapen-2-em-3-carboxylic acids. 4,293,555, Cl. 424-263.000.

Chryssostomidis, Chryssostomos: *See—*
Morgan, Dean T.; Chryssostomidis, Chryssostomos; and LaRue, George J., 4,293,527, Cl. 423-6.000.

Chuang, Wen-Shou: *See—*
Wang, Wei Ko; Hoh, Ying-Chu; Chuang, Wen-Shou; and Shaw, I-Sine, 4,293,332, Cl. 75-99.000.

Chukhno, Valery V.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.

Church, Larry L.; Smith, David R.; and Sun, Shan C., to Westinghouse Electric Corp. Network protector relay. 4,293,886, Cl. 361-71.000.

Ciba-Geigy AG: *See—*
Rody, Jean, 4,293,468, Cl. 260-45.80N.

Ciba-Geigy Corporation: *See—*
Woodward, Robert B.; and Bickel, Hans, 4,293,462, Cl. 260-239.00A.





Cibie Projecteurs: *See—*
Deverrewaere, Alain, 4,293,897, Cl. 362-284.000.

Cillario, Renzo, to P. Ferrero & C. S.p.A. Preservable baked pastry product, substantially free from sucrose and sweetened with fructose. 4,293,577, Cl. 426-244.000.

Citizen Watch Company Limited: *See—*
Nishikubo, Yasuhiko; and Sekine, Mitsuo, 4,293,939, Cl. 368-74.000.

Claassen, Ben J., Jr., to United States of America, Agriculture. Electrostatic precipitator apparatus using liquid collection electrodes. 4,293,319, Cl. 55-122.000.

Clark-Reliance Corp., The: *See—*
Winiasz, Michael E., 4,292,998, Cl. 137-489.500.

Clark, William D. Display sign. 4,292,752, Cl. 40-576.000.

Clausen, Carol W. Armor comprising a plurality of loosely related sheets in association with a frontal sheet comprising metal abrading particles. 4,292,882, Cl. 89-36.00A.

Clavin, Edward A.: *See—*
Slavens, Clyde M.; Clavin, Edward A.; and Alleman, James E., 4,293,758, Cl. 219-125.120.

Clayton, Erith T. Method of plating with a portable mechanical plater. 4,293,584, Cl. 427-11.000.

Clement, Donald E.: *See—*
Gibb, William D.; and Clement, Donald E., 4,293,740, Cl. 179-99.00A.

Clement, Heinrich-Josef, to Carl Still GmbH & Co. KG, Firma. Door closure construction for sealing the sealing edge of a coke oven door in a framed coke oven opening. 4,293,389, Cl. 202-248.000.

Clevepak Corporation: *See—*
Gardner, Roland C.; and Mortellito, Ronald, 4,293,090, Cl. 229-5.600.

Clover, George R., to Oakeridge Management Services B.V. Transparency viewers. 4,293,190, Cl. 350-241.000.

CMI Corporation: *See—*
Swisher, George W., Jr.; Garbelman, David L.; and Shaw, Arthur G., 4,293,228, Cl. 366-25.000.

Coates, John P.; and Lewis, David H., to Lumenition Limited. Fail safe devices for use with devices for limiting the speed of revolution of an internal combustion engine. 4,292,939, Cl. 123-335.000.

Coats, John H.: *See—*
Whaley, Howard A.; and Coats, John H., 4,293,651, Cl. 435-169.000.

Coburn, John F., Jr., to Exxon Research & Engineering Co. Solar energy collection system. 4,292,959, Cl. 126-438.000.

Coca-Cola Company, The: *See—*
Coleman, Charles E., 4,293,008, Cl. 141-95.000.

Cockram, Geoffrey N.; and Munden, Jeffrey E., to Du Pont de Nemours, E. I., and Company. Method and apparatus for texturizing a proteinaceous substance. 4,293,575, Cl. 426-104.000.

Coffey, Bettie L.: *See—*
Coffey, James P.; and Coffey, Bettie L., 4,293,602, Cl. 428-28.000.

Coffey, James P.; and Coffey, Bettie L. Natural botanical ornament. 4,293,602, Cl. 428-28.000.

Cogliano, Joseph A., to W. R. Grace & Co. Composition and method of controlling solid polyurethane particle size with water reactant. 4,293,679, Cl. 528-48.000.

Cohen, Frederick. Waste heat energy recovery system. 4,293,323, Cl. 62-238.600.

Cohen, Saul M.; and LeBlanc, John R., to Monsanto Company. Hemiacetals of adducts of acrolein and isocyanuric acid. 4,293,693, Cl. 544-221.000.

Cohen, Stanley N., to Cetus Corporation. Method for synthesizing DNA sequentially. 4,293,652, Cl. 435-172.000.

Cole, Bernard M. Flower-like decorative ornament. 4,293,601, Cl. 428-24.000.

Coleman, Charles E., to Coca-Cola Company, The. Ratio graduate for use with post-mix beverage dispenser. 4,293,008, Cl. 141-95.000.

Coleman, William J.; and Logue, Jay. Pipe railing system. 4,293,122, Cl. 256-69.000.

Collier, Bobby D.: *See—*
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., 4,292,880, Cl. 89-1.815.

Collin, Herbert S. Hanger bar. 4,293,076, Cl. 211-124.000.

Colombo, Bruno: *See—*
Sisti, Giorgio; and Colombo, Bruno, 4,293,308, Cl. 23-230.0PC.

Colt Industries Operating Corp: *See—*
Kiesling, Norbert W., 4,292,945, Cl. 123-438.000.

Combs, William. Conveyor apparatus for press machines. 4,292,892, Cl. 100-218.000.

Comer, Robert C.: *See—*
Holmstadt, Ronald J.; and Comer, Robert C., 4,293,041, Cl. 172-39.000.

Communications Satellite Corporation: *See—*
Atia, Ali E. E.; Berman, Arnold L.; and Mahle, Christoph, 4,293,945, Cl. 370-17.000.
Rhodes, Smith A., 4,293,951, Cl. 371-43.000.

Compagnie Generale des Etablissements Michelin: *See—*
Dubois, Gerard, 4,293,018, Cl. 152-347.000.

Condon, Michael E.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Tripeptide inhibitors of angiotensin-converting enzyme. 4,293,481, Cl. 260-112.50R.

Conoco, Inc.: *See—*
Hunter, Andrew F., 4,292,912, Cl. 114-219.000.

Continental Group, Inc., The: *See—*
Pelton, Peter G.; and Pulciani, Sam C., 4,293,353, Cl. 156-69.000.

Control Data Corporation: *See—*
Fogg, Lewis W.; Metzler, Robert W.; Satterfield, H. Eugene; and Scott, Eion G., 4,292,762, Cl. 47-17.000.

Conway, Charles S. Spill overflow prevention system for tanker vessels. 4,292,909, Cl. 114-74.00R.

Cook, Frank; and Davies, Gordon H., to Thorn EMI Limited. Cathode ray tube assemblies. 4,293,801, Cl. 315-370.000.

Cooper, David: *See—*
Nash, Claude H., III; Shearer, Marcia C.; Snader, Kenneth M.; Valenta, Joseph R.; and Cooper, David, 4,293,546, Cl. 424-119.000.

Cooperatieve Landbouw aan- en verkoopcombinatie, B.A. "C.L.C.": *See—*
Locker, Jan A. K., 4,293,407, Cl. 209-253.000.

Copal Company Limited: *See—*
Shimizu, Munetaka, 4,293,236, Cl. 400-593.000.

Corbett, Daniel W.; and Guile, Donald L., to Corning Glass Works. Gelled solder glass suspensions for sealing glass or ceramic parts. 4,293,439, Cl. 252-316.000.

Cordes, Gunter; Giesselmann, Ewald; and Munch, Ulrich, to Sanol Schwarz-Monheim GmbH. Transdermal medication system for isosorbide dinitrate. 4,293,565, Cl. 424-285.000.

Corning Glass Works: *See—*
Chirino, Agustin M.; and Yost, Gerald H., 4,293,325, Cl. 65-43.000.
Corbett, Daniel W.; and Guile, Donald L., 4,293,439, Cl. 252-316.000.

Coronet Foods, Inc.: *See—*
Long, Howard W.; and Flowers, Robert L., 4,292,786, Cl. 53-434.000.

Costello, Carmon R.: *See—*
Petty, Terry D.; Costello, Carmon R.; Rao, Gude P.; and Gansar, David, 4,293,239, Cl. 405-195.000.

Costruzione Incollatrici Rapide C.I.R. S.r.L.: *See—*
Catozzo, Leo, 4,293,368, Cl. 156-506.000.

Cotte, Jean-Marie; and Potin, Philippe, to Societe Nationale Elf Aquitaine. Process and composition for the coloration of keratin-containing substances. 4,293,543, Cl. 424-59.000.

Coulter, John P.: *See—*
Gore, Colin E.; and Coulter, John P., 4,292,798, Cl. 57-86.000.

Cowan, Keith B.: *See—*
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., 4,293,861, Cl. 343-766.000.

Cox, Allen R.; and Smathers, Edmond W., to International Business Machines Corporation. Magnetic head mount assembly. 4,293,883, Cl. 360-104.000.

Cox, Clayton E. Cornerboard for pallets. 4,292,901, Cl. 108-55.100.

Cox, Joseph V.: *See—*
Graybeal, Carl N.; Rogers, Basil E.; Cox, Joseph V.; and Rogers, Roy R., 4,293,243, Cl. 405-259.000.

Cox, William H.; and Chaney, Preston E., to Sperry-Sun, Inc. Telemetry system. 4,293,936, Cl. 367-82.000.

Crane Co.: *See—*
Hirzel, Edgar A., 4,293,165, Cl. 303-93.000.

Crano, Richard N.: *See—*
Bible, Dennis E.; Crano, Richard N.; and Welch, John A., 4,293,016, Cl. 152-158.000.

Creative Tool Company: *See—*
Wesley, William M., 4,292,841, Cl. 73-119.00A.

Crepaco, Inc.: *See—*
Swanson, Victor E., 4,293,290, Cl. 418-94.000.

Cressoni, Ermanno: *See—*
Bertoloni, Luciano; Rogora, Edoardo; and Cressoni, Ermanno, 4,293,843, Cl. 340-52.00F.

Crown Zellerbach Corporation: *See—*
Geyser, Joseph E.; Rehr, Henry W.; Schutz, Rudolph W.; and Weis, Rudolf R., 4,293,365, Cl. 156-364.000.

CSELT, Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Accatino, Luciano, 4,293,830, Cl. 333-161.000.

CTS Corporation: *See—*
Van Benthuysen, John D.; and Osburn, Carlton M., 4,293,751, Cl. 200-156.000.

Cucchi, Giovanni: *See—*
Cucchi, Pietro; and Cucchi, Giovanni, 4,292,864, Cl. 82-2.700.

Cucchi, Pietro; and Cucchi, Giovanni. Automatic magazine and feeder for automatic multi-mandrel lathe. 4,292,864, Cl. 82-2.700.

Cuddihy, Robert W.: *See—*
Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., 4,292,898, Cl. 105-238.00R.

Cuscurida, Michael, to Texaco Inc. Stabilizing polyurea polymer polyols by treating with a secondary amine. 4,293,470, Cl. 260-45.90R.

Cutchaw, John M. Connector for integrated circuit packages. 4,293,175, Cl. 339-75.0MP.

CXA Ltd./CXA Ltee: *See—*
Morrey, William B.; and Welsh, David M., 4,292,896, Cl. 102-275.800.

Czako, Charles A.: *See—*
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,293,390, Cl. 202-100.000.

D. L. Auld Company, The: *See—*
Waugh, Robert E., 4,292,827, Cl. 72-46.000.

Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG: *See—*
Kuckens, Alexander, 4,293,081, Cl. 222-83.000.

Dai-Ichi Seiko Co., Ltd.: *See—*
Kashiwagi, Tutomu, 4,293,765, Cl. 235-144.00R.
Daicel Ltd.: *See—*
Sawada, Hideo; Shinohara, Koji; and Shiga, Makoto, 4,292,984, Cl. 131-345.000.
Daido Metal Company Ltd.: *See—*
Iijima, Yoshio, 4,292,718, Cl. 29-149.5DP.
Daiichi Seiyaku Co., Ltd.: *See—*
Tanaka, Yoshiaki; and Hayakawa, Isao, 4,293,695, Cl. 546-83.000.
Daimler-Benz Aktiengesellschaft: *See—*
Lutze, Hans; Weisshappel, Helmut; Klie, Wolfgang; and Weidemann, Dieter, 4,293,160, Cl. 296-188.000.
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Kinoshita, Minoru; Sugou, Kiyoshi; and Onoda, Yukio, 4,293,226, Cl. 356-443.000.
Dalla Bona, Hans. Joint for connecting a partial dental prosthesis to the remaining natural human teeth. 4,293,303, Cl. 433-177.000.
D'Amato, Ralph J., to RCA Corporation. Color picture tube having improved corrugated apertured mask. 4,293,791, Cl. 313-403.000.
Dana Corporation: *See—*
Schaeffer, Jack A., 4,292,782, Cl. 52-696.000.
Dandeneau, Raymond D.: *See—*
Bente, Paul F., III; Zerenner, Ernest H.; and Dandeneau, Raymond D., 4,293,415, Cl. 210-198.200.
Dardoufas, Kimon C.: *See—*
Marshall, Robert M.; and Dardoufas, Kimon C., 4,293,460, Cl. 260-18.0PF.
Darlington, William B.; DuBois, Donald W.; and White, Preston S., to PPG Industries, Inc. Electrolytically producing chlorine using a solid polymer electrolyte-cathode unit. 4,293,394, Cl. 204-98.000.
Dasgupta, Sumit; Goel, Prabhakar; and Williams, Thomas W., to International Business Machines Corporation. Level sensitive scan design (LSSD) system. 4,293,919, Cl. 364-716.000.
Daswick, Alexander C.; and Landry, Archie C. Lightweight two-wheeled vehicle. 4,293,052, Cl. 180-219.000.
Data Packaging Corporation: *See—*
Yonkers, Edward H.; and LeDoux, Gilbert A., 4,293,234, Cl. 400-196.100.
Date, K. Henry; and Wainio, Ronald, to McGraw-Edison Company. Load break switch. 4,293,834, Cl. 335-76.000.
Daverport, Stanley, Jr., to Kendall Company, The. Protective shoulder pad construction. 4,292,687, Cl. 2-2.000.
Davies, Gordon H.: *See—*
Cook, Frank; and Davies, Gordon H., 4,293,801, Cl. 315-370.000.
Davignon, Alan J., to K-2 Corporation. Vibration damped ski. 4,293,142, Cl. 280-610.000.
Davino, Arthur A., to G. D. Searle & Co. Process for esterification of α-L-aspartyl-L-phenylalanine. 4,293,648, Cl. 435-70.000.
Davio, Marc; and Bioul, Gery J. A., to U.S. Philips Corporation. Device for multiplying binary numbers. 4,293,922, Cl. 364-757.000.
Davis, Gayron N.; Sellers, Larry S.; and Hagborg, Winston E., to West Point Pepperell, Inc. Apparatus for applying liquid chemicals to a moving web. 4,292,918, Cl. 118-33.000.
Davis, James W.; and Paranjpe, Suresh C., to Mead Corporation, The. Ink jet printer with laterally movable print head. 4,293,863, Cl. 346-75.000.
Davis, Robert K.; and Myers, Michael J., to Roper Corporation; and Electromation, Inc. Solenoid for an electric starting motor for garden tractor or the like. 4,293,835, Cl. 335-131.000.
Davis, Steven S., to Envirotech Corporation. Steam seal for disc filter. 4,293,411, Cl. 210-178.000.
Davison, Peter A.: *See—*
Dobson, John S.; and Davison, Peter A., 4,293,200, Cl. 351-36.000.
Davy McKee Corporation: *See—*
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,293,390, Cl. 202-100.000.
Dawdy, Terrance H.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,293,665, Cl. 525-255.000.
Day, Jerome A. Energy conserver. 4,293,026, Cl. 165-11.000.
Deberdeev, Rustem J.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.
Debona, Edward J.: *See—*
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., 4,292,880, Cl. 89-1.815.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912A nucleus. 4,293,483, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912H nucleus. 4,293,484, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of S31794/F-1 nucleus. 4,293,485, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of S31794/F-1 nucleus. 4,293,486, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912D nucleus. 4,293,487, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912B nucleus. 4,293,488, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912A nucleus. 4,293,489, Cl. 260-112.50R.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912H nucleus. 4,293,491, Cl. 260-112.50R.
De Busscher, Cyriel R. J.; and Van Herpe, Francois, to Sperry Corporation. Combine harvester conveyor. 4,292,981, Cl. 130-27.00F.
Decker, Walter: *See—*
Nissen, Dietmar; Marx, Matthias; Jarre, Wolfgang; Schoen, Ernst; and Decker, Walter, 4,293,657, Cl. 521-121.000.
De Graan, Henry R. Washer. 4,292,876, Cl. 411-542.000.
de Klein, Willem J.: *See—*
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., 4,293,345, Cl. 106-270.000.
Delaney, Glen J. Light weight insulated athletic shoe. 4,292,746, Cl. 36-83.000.
Del Re, Pietrantonio; and Fracassi, Pietro, to Carlo Gavazzi S.p.A. Apparatus for generating signals simulating the output of a device for measuring a physical variable. 4,293,916, Cl. 364-571.000.
DeMichele, Glenn A., to Rockwell International Corporation. Signal amplitude range compression employing pulse modulation. 4,293,817, Cl. 328-169.000.
Demoures, Bernard; and Le Coent, Jean-Louis, to Orogil. Process of preparing metallic detergent-dispersant additives of high alkalinity in particular for lubricating oils, and product obtained thereby. 4,293,431, Cl. 252-33.200.
Demus, Dietrich: *See—*
Deutscher, Hans-Joachim; Schubert, Herrmann; Seidel, Christina; Demus, Dietrich; and Kresse, Horst, 4,293,434, Cl. 252-299.630.
Denning, Ralph E.: *See—*
Goloff, Alexander; and Denning, Ralph E., 4,293,050, Cl. 180-6.260.
Denpatsu Fly Ash: *See—*
Segawa, Hiroshi; and Akizuki, Katsufumi, 4,293,523, Cl. 422-139.000.
Denton, Medona B.; and Windsor, David L., to United States of America, Navy. Application of inductively coupled plasma emission spectrometry to the elemental analysis of organic compounds and to the determination of the empirical formulas for these and other compounds. 4,293,220, Cl. 356-316.000.
Detector Systems, Inc.: *See—*
Potter, Thomas R., 4,293,841, Cl. 340-44.000.
Detroit, William J., to American Can Company. Lignosulfonate derivatives. 4,293,342, Cl. 106-90.000.
Detroit, William J., to American Can Company. Asphalt emulsion-conditioner. 4,293,459, Cl. 260-17.500.
Deucker, Walter: *See—*
Hoyer, Ernst; Steckelberg, Willi; Deucker, Walter; and Schickfluss, Rudolf, 4,293,306, Cl. 8-471.000.
Deutscher, Hans-Joachim; Schubert, Herrmann; Seidel, Christina; Demus, Dietrich; and Kresse, Horst, to VEB Werk fur Fernsehelektronik Berlin im VEB Kombinat Mikroelektronik. Liquid crystal compounds. 4,293,434, Cl. 252-299.630.
Deverrewaere, Alain, to Cibie Projecteurs. Motor vehicle headlight. 4,293,897, Cl. 362-284.000.
Diamond Shamrock Corporation: *See—*
Borror, Jack A.; and Rowe, Edward A., Jr., 4,293,433, Cl. 336-94.000.
Metz, Fred L., 4,293,340, Cl. 106-74.000.
Dias, Francisco J.: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.
Di Battista, Piero; Fontanelli, Renzo; Gratani, Francesco; and Nelli, Giuseppe, to Montedison S.p.A. Piperidine phosphite stabilizers for polymers and polymers stabilized thereby. 4,293,466, Cl. 260-45.80N.
Dickerson, Charles G.; and Erhardt, Peter F., to Xerox Corporation. Attrition process for alteration of toner particles containing conductive materials. 4,293,632, Cl. 430-137.000.
Dickinson, Norman L. Pollutant-free low temperature slurry combustion process utilizing the super-critical state. 4,292,953, Cl. 126-263.000.
Diederichs, John M. Tool for removing staples. 4,293,119, Cl. 254-28.000.
Diehl GmbH & Co.: *See—*
Weber, Adolf; and Rhau, Siegfried, 4,292,829, Cl. 72-76.000.
Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Polyurethane ionomer dispersions containing electrolytes. 4,293,474, Cl. 260-29.2TN.
Dighe, Kamalakar D.: *See—*
Caruso, Stephen; and Dighe, Kamalakar D., 4,293,222, Cl. 356-319.000.
Digre, Clifford B. Magnet assembly. 4,293,741, Cl. 179-115.5PC.
Dilot, Rolf M.; and Hakansson, Jan T., to Tetra Pak International AB. Machine for the application of suction tubes to packing containers. 4,293,369, Cl. 156-521.000.
DiMatteo, Paul, to Solid Photography, Inc. Arrangement for constructing surfaces and bodies. 4,292,724, Cl. 29-418.000.
Din, Zia U.: *See—*
Cardenas, Carlos G.; and Din, Zia U., 4,293,497, Cl. 260-345.500.
Dinh, Chon T. L., to Centre de Recherche Industrielle du Quebec. Positive feedback biquad filter. 4,293,820, Cl. 330-85.000.
DiNinno, Frank P.: *See—*
Christensen, Burton G.; and DiNinno, Frank P., 4,293,555, Cl. 424-263.000.
Dinklage, Horst: *See—*
Fink, Herbert; Huebner, Klaus; Dinklage, Horst; and Ottofrickenstein, Hans, 4,293,600, Cl. 427-385.500.
Dobbins, Hugh L. Liquid measure dip stick. 4,292,739, Cl. 33-126.40R.



Dobson, John S.; and Davison, Peter A. Visual faculty testing apparatus. 4,293,200, Cl. 351-36.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Mairle, Hans, 4,292,774, Cl. 52-208.000.
Dr.-Ing. Rudolf Hell GmbH: *See—*
Keller, Hans; and Knop, Hans-Georg, 4,293,872, Cl. 358-75.000.
Dofasco Inc.: *See—*
Tait, William H., 4,292,847, Cl. 73-587.000.
Dolhyj, Serge R.: *See—*
Velenyi, Louis J.; Dolhyj, Serge R.; and Sundeen, Marcia H., 4,293,719, Cl. 568-573.000.
Dominguez, Ramon: *See—*
Varadi, Peter F.; and Dominguez, Ramon, 4,293,808, Cl. 320-2.000.
Donald MacMillan & Son, Inc.: *See—*
MacMillan, Kenneth T., 4,293,293, Cl. 425-23.000.
Donan, David C., Jr., to Waimea Company Inc. Pick arm anchor assembly. 4,293,244, Cl. 405-259.000.
Doryokuro Kakunenryo Ksihatsu Jigyodan: *See—*
Kubota, Jun, 4,293,853, Cl. 340-611.000.
Double A Products Company: *See—*
Carlson, Allen J.; and Vander Kaay, Henry A., 4,293,284, Cl. 417-218.000.
Douke, Harumi: *See—*
Iwata, Masayosi; and Douke, Harumi, 4,293,743, Cl. 200-4.000.
Dow Chemical Company, The: *See—*
Erickson, Robert E., 4,293,609, Cl. 428-246.000.
Haschke, Elliot M.; and Lewis, Bennie J., 4,293,347, Cl. 134-11.000.
Kelly, Kerry J.; and Kamp, Arthur J., 4,293,379, Cl. 376-159.000.
Moore, Carl; and Kirchoff, Robert A., 4,293,476, Cl. 260-29.70W.
Dow Corning Corporation: *See—*
Homan, Gary R.; and Lee, Chi-Long, 4,293,676, Cl. 528-15.000.
Dragerwerk Aktiengesellschaft: *See—*
Pasternack, Adalbert, 4,292,967, Cl. 128-202.260.
Draggoo, V. G.: *See—*
McAllister, Gary L.; and Draggoo, V. G., 4,293,827, Cl. 331-94.5ML.
Dresser Industries, Inc.: *See—*
Carrens, Donald E., 4,293,287, Cl. 417-393.000.
Dresser, Thorpe: *See—*
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, 4,293,025, Cl. 165-1.000.
Drobina, Dezso D. Method of forming decorative panels. 4,293,362, Cl. 156-264.000.
Drobot, Walter, to Engelhard Minerals & Chemicals Corporation. Microbiological recovery of metals. 4,293,333, Cl. 75-101.0BE.
Drobot, Walter; and Lechavelier, Hubert A., to Engelhard Minerals & Chemicals Corporation. Recovery of metals. 4,293,334, Cl. 75-101.0BE.
DuBois, Donald W.: *See—*
Darlington, William B.; DuBois, Donald W.; and White, Preston S., 4,293,394, Cl. 204-98.000.
Dubois, Gerard, to Compagnie Generale des Etablissements Michelin. Tire for two-wheel vehicle. 4,293,018, Cl. 152-347.000.
Dubur, Gunar Y.: *See—*
Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D., 4,293,700, Cl. 546-321.000.
Ducloux, Marcel, to Societe Generale Pour L'Emballage. Method and apparatus for inspecting transparent objects. 4,293,219, Cl. 356-240.000.
Dudley, Hubert T.; and Bragg, Ralph J., to W. R. Grace & Co. Thin section insulating concrete of high strength and low water requirement. 4,293,341, Cl. 106-88.000.
Dudley, Peter B., to Mono-Kinetics. Mono-kinetic exercise device. 4,293,127, Cl. 272-133.000.
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A. Apparatus for helically coiling bands after slitting wide strip. 4,293,101, Cl. 242-56.400.
Dungs, Horst: *See—*
Lorenz, Kurt; Dungs, Horst; Koenigs, Hans B.; and Kurtz, Roman, 4,293,388, Cl. 202-126.000.
Dunnavant, William R.: *See—*
Martin, Ralph D.; Dunnavant, William R.; Sturtz, Gregory P.; and Langer, Heimo J., 4,293,480, Cl. 260-38.000.
Dunsky, Joel L. Root canal equipment packaging. 4,293,074, Cl. 206-572.000.
Dunwald, Willi: *See—*
Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, 4,293,669, Cl. 525-452.000.
Du Pont de Nemours, E. I., and Company: *See—*
Andrews, Gerald D., 4,293,674, Cl. 526-327.000.
Applegate, Lynn E.; and Brown, Charles J., Jr., 4,293,420, Cl. 210-500.200.
Bethay, Willis D., Jr., 4,293,518, Cl. 264-210.200.
Bowen, Griffith; and Fowell, Peter A., 4,293,615, Cl. 428-412.000.
Bula, Russell P., 4,292,900, Cl. 108-51.100.
Cockram, Geoffrey N.; and Munden, Jeffrey E., 4,293,575, Cl. 426-104.000.
Eastman, Ernest F., 4,293,473, Cl. 260-27.00R.
Flint, William L.; and Pilette, Yvan P., 4,293,635, Cl. 430-271.000.
Heiberger, Philip, 4,293,471, Cl. 260-22.0CB.
Knox, Kenneth L., 4,293,517, Cl. 264-176.00R.
Levitt, George, 4,293,330, Cl. 71-94.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith, Kline & French Laboratories Limited. Pharmacologically active thiourea and urea compounds. 4,293,697, Cl. 546-121.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active guanidine compounds. 4,293,699, Cl. 546-121.000.
Durckheimer, Walter: *See—*
Blumbach, Jurgen; Durckheimer, Walter; and Schrinner, Elmar, 4,293,550, Cl. 424-246.000.
Duret, Christian H. Nodal structure switching network. 4,293,735, Cl. 179-18.0GE.
Dyer, Thomas A.; and Huelster, Richard L., to Pentek Corporation. Drive/take-up assembly for accumulating live roller conveyor systems. 4,293,065, Cl. 198-781.000.
Dziubaty, Theodore D., to Forum, Inc. Luminaire reflector. 4,293,900, Cl. 362-342.000.
E. D. Bullard Company: *See—*
Moretti, Anthony L.; and Ferris, Lester W., 4,292,692, Cl. 2-418.000.
E. R. Squibb & Sons, Inc.: *See—*
Condon, Michael E.; and Ondetti, Miguel A., 4,293,481, Cl. 260-112.50R.
Haugwitz, Rudiger D.; Wade, Peter C.; and Maurer, Barbara V., 4,293,569, Cl. 424-300.000.
Pawelchak, John M.; Wang, Yu-Chang J.; and LaVia, Anthony L., 4,292,972, Cl. 128-296.000.
Eagle-Picher Industries, Inc.: *See—*
King, Clyde R., 4,292,713, Cl. 24-24.000.
Eastman, Ernest F., to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol - crystalline solvent system based compositions modified with ethylene polymer. 4,293,473, Cl. 260-27.00R.
Eastman Kodak Company: *See—*
Fyson, John R.; and Levenson, Gerald I. P., 4,293,638, Cl. 430-373.000.
Kroll, Arthur S.; and Shuster, Frank A., 4,292,921, Cl. 118-648.000.
Rosborough, Robert S., Jr.; and Wright, Luther M., deceased, 4,293,215, Cl. 355-40.000.
Webster, Frank G.; Regan, Michael T.; and Rossi, Louis J., 4,293,626, Cl. 430-17.000.
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for adhesion of ceramics. 4,293,356, Cl. 156-89.000.
Ebauches S.A.: *See—*
Wiget, Fridolin, 4,292,836, Cl. 73-6.000.
Ebel, John C. Center of gravity-appraisal block game. 4,293,128, Cl. 273-1.0GF.
Ebrok, Vello H.: *See—*
Kull, Leo; and Ebrok, Vello H., 4,293,806, Cl. 318-673.000.
Ecodyne Corporation: *See—*
Gianneli, Joseph F., 4,293,414, Cl. 210-193.000.
Edelman, Robert, to Celanese Corporation. Production of an improved non-reinforced polyoxymethylene molding composition which forms reduced mold deposits upon molding. 4,293,469, Cl. 260-45.90P.
Edison, Robert R.: *See—*
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, 4,293,025, Cl. 165-1.000.
Effem Foods Pty. Ltd.: *See—*
Sentance, Christopher B., 4,293,576, Cl. 426-104.000.
Egawa, Isao: *See—*
Asada, Eiichi; Inokuma, Toshio; and Egawa, Isao, 4,293,839, Cl. 338-309.000.
Egawa, Takeshi: *See—*
Yamazaki, Yasuo; and Egawa, Takeshi, 4,293,185, Cl. 350-18.000.
Egorov, Jury P.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.
Eguchi, Yukuo: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,293,553, Cl. 424-250.000.
Eibl, Heinz: *See—*
Hatz, Ernst; Eibl, Heinz; Peter, Erwin; and Blumhardt, Rolf, 4,293,092, Cl. 237-12.100.
Ekberg, Hakan, to STAL-LAVAL Turbin AB. Plant for drying fuel. 4,292,742, Cl. 34-35.000.
Eklund, David R.: *See—*
Fincher, Paul A.; and Eklund, David R., 4,293,086, Cl. 225-1.000.
Elder, Richard B.: *See—*
Thornhill, John, Jr.; and Elder, Richard B., 4,292,861, Cl. 74-813.00R.
Electricite de France (Service National): *See—*
Brachet, Alain, 4,293,385, Cl. 376-283.000.
Electromation, Inc.: *See—*
Davis, Robert K.; and Myers, Michael J., 4,293,835, Cl. 335-131.000.
Elektrokemiska Aktiebolaget: *See—*
Andersson, Kjell R.; and Johansson, Hans E., 4,293,612, Cl. 428-281.000.
Eli Lilly and Company: *See—*
Abbott, Bernard J.; and Fukuda, David S., 4,293,482, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,293,490, Cl. 260-112.50K.

Debono, Manuel, 4,293,483, Cl. 260-112.50R.
Debono, Manuel, 4,293,484, Cl. 260-112.50R.
Debono, Manuel, 4,293,485, Cl. 260-112.50R.
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Hoehn, Marvin M.; and Michel, Karl H., 4,293,649, Cl. 435-118.000.
Kukolja, Stjepan; and Pfeil, Janice L., 4,293,493, Cl. 260-239.00A.
Kukolja, Stjepan; and Pfeil, Janice L., 4,293,495, Cl. 260-245.400.
Ludwig, Nelson H.; and Ose, Earl E., 4,293,539, Cl. 424-19.000.
Miesel, John L., 4,293,552, Cl. 424-250.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., 4,293,558, Cl. 424-270.000.

Elliott Brothers (London) Limited: *See—*
Ellis, Stafford M., 4,292,688, Cl. 2-6.000.

Ellis, Franklin H., to Sybron Corporation. Electric supply for ion therapy. 4,292,968, Cl. 128-207.210.

Ellis, James D., to Viking Industries, Inc. Split mullion window frame design. 4,292,771, Cl. 52-98.000.

Ellis, Stafford M., to Elliott Brothers (London) Limited. Latch mechanisms. 4,292,688, Cl. 2-6.000.

Elmi, Steele J., to Finetex Incorporated. Fluid and semi-fluid compositions including benzoate esters. 4,293,544, Cl. 424-60.000.

Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., to Halliburton Company. Temperature gelation activated aqueous silicate mixtures and process of forming impermeable gels. 4,293,440, Cl. 252-317.000.

Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,697, Cl. 546-121.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,699, Cl. 546-121.000.

Endo, Norio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor integrated circuits utilizing special contact formation. 4,292,728, Cl. 29-571.000.

Energetics Systems Corp.: *See—*
Tepe, James R.; Sandor, Robert P.; Wesselman, Bernard W.; and Woeste, David R., 4,293,027, Cl. 165-12.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Drobot, Walter, 4,293,333, Cl. 75-101.0BE.
Drobot, Walter; and Lechavelier, Hubert A., 4,293,334, Cl. 75-101.0BE.
Langley, Robert C.; Myers, Herbert; and Abrash, Muriel, 4,293,513, Cl. 264-60.000.

Engelsmann, Dieter: *See—*
Wagner, Karl; Engelsmann, Dieter; Hackenberg, Hubert; and Stiefel, Peter, 4,293,204, Cl. 354-21.000.

English Electric Valve Company: *See—*
Menown, Hugh, 4,293,800, Cl. 315-350.000.

Enomoto, Minoru: *See—*
Nishimura, Hideo; Yoneda, Takao; and Enomoto, Minoru, 4,293,913, Cl. 364-474.000.

Enright, Dorothy P.: *See—*
Lucas, James M.; Enright, Dorothy P.; and Perricone, Alphonse C., 4,293,427, Cl. 252-8.50C.

Entenmann's, Inc.: *See—*
Keoteklian, Hagop, 4,293,416, Cl. 210-208.000.

Envirotech Corporation: *See—*
Davis, Steven S., 4,293,411, Cl. 210-178.000.
Guttman, Murray M.; and Fismer, William L., 4,293,417, Cl. 210-230.000.

Eprad Incorporated: *See—*
Boudouris, Angelo; and Peters, Edwin F., 4,293,821, Cl. 330-126.000.

Epstein, James: *See—*
Marincic, Nikola; and Epstein, James, 4,293,622, Cl. 429-50.000.

Ergaver, Nevenka; and Ergaver, Rayko, to Capella Inc. Electric hair brush. 4,292,986, Cl. 132-11.00R.

Ergaver, Rayko: *See—*
Ergaver, Nevenka; and Ergaver, Rayko, 4,292,986, Cl. 132-11.00R.

Erhardt, Peter F.: *See—*
Dickerson, Charles G.; and Erhardt, Peter F., 4,293,632, Cl. 430-137.000.

Erickson, Robert E., to Dow Chemical Company, The. Flexible absorbent laminates. 4,293,609, Cl. 428-246.000.

Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, to SKF Kugellagerfabriken GmbH. Rolling bearing for relative linear movement on a shaft. 4,293,166, Cl. 308-6.00C.

Erofeenko, Igor V.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Ersoy, Okan K., to Sentralinstitutt for Industriell Forskning. Method of holographic recording and reconstruction of spatial waves. 4,293,183, Cl. 350-3.770.

Erwin Sick GmbH-Optik-Elektronik: *See—*
Sick, Erwin; and Mankel, Siegfried, 4,293,776, Cl. 250-572.000.

Escher Wyss Limited: *See—*
Marchioro, Ignazio, 4,292,716, Cl. 29-116.0AD.

Esquire, Inc.: *See—*
Hernandez, Jose A., 4,293,901, Cl. 362-346.000.

Ethyl Corporation: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,293,432, Cl. 252-49.900.

Etoh, Yukihiro: *See—*
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,292,938, Cl. 123-198.00F.

Eubanks, James E., Jr.: *See—*
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., 4,292,880, Cl. 89-1.815.

Evans, Robert W., to Baker International Corporation. Ball valve assembly. 4,293,038, Cl. 166-331.000.

Everede Tool Company: *See—*
Markovics, Michael, 4,293,254, Cl. 408-229.000.

Exxon Production Research Company: *See—*
Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., 4,293,428, Cl. 252-8.55D.

Exxon Research & Engineering Co.: *See—*
Coburn, John F., Jr., 4,292,959, Cl. 126-438.000.
Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, 4,293,623, Cl. 429-194.000.
Shewmaker, James E., 4,293,348, Cl. 134-22.00R.

Ezaki, Norio. Pastry topping depositing machine. 4,292,917, Cl. 118-16.000.

Ezekiel, Frederick D. Magnetic liquid shaft sealing. 4,293,137, Cl. 277-80.000.

Fabryka Obrabiarek Precyzyjnych "Ponar-Pruszkow" Zaklad "i Maja": *See—*
Matusz, Zbigniew, 4,292,857, Cl. 74-466.000.

Facet Enterprises, Inc.: *See—*
Miller, Donald L., 4,293,060, Cl. 192-56.00R.

Fahnler, Friedrich: *See—*
Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, 4,293,662, Cl. 525-184.000.

Fainzilber, Mikhail L.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Familant, Harold M.: *See—*
Plischke, LeMoyne W.; Familant, Harold M.; and Kelly, Darrell A., 4,293,614, Cl. 428-370.000.

Fantacia: *See—*
Hilbert, Robert S., 4,293,196, Cl. 350-452.000.

Farcasiu, Dan: *See—*
Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, 4,293,623, Cl. 429-194.000.

Farcasiu, Malvina; and Whitehurst, Darrell D., to Mobil Oil Corporation. Dehydroxylation and/or demercaptolation of heavy petroleum oils. 4,293,404, Cl. 208-214.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,293,705, Cl. 560-53.000.

Farmstead Industries, Div. of Farmhand, Inc.: *See—*
Sassmann, Stanley W., 4,292,927, Cl. 119-16.000.

Farr, David R.; and Magnolato, Daniele, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for debittering a protein hydrolysate and the debittered hydrolysate obtained by this process. 4,293,583, Cl. 426-657.000.

Farrar, James G.: *See—*
St. Lawrence, David S.; Morris, Robert; and Farrar, James G., 4,293,266, Cl. 414-411.000.

Fatula, James J., to Ryman Engineering Company. Belt grinder for grinding non-circular workpiece. 4,292,767, Cl. 51-145.00R.

Faustini, Franco: *See—*
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,293,705, Cl. 560-53.000.

Feder, Ralph: *See—*
Chaudhari, Praveen; Chou, Ned J.; Feder, Ralph; Fowler, Alan B.; and VanVechten, James A., 4,293,374, Cl. 156-628.000.

Feinberg, Billie: *See—*
Vis, Arthur D.; and Feinberg, Billie, 4,292,740, Cl. 33-172.00E.

Feldstein, Nathan. Process using activated electroless plating catalysts. 4,293,591, Cl. 427-97.000.

Fellman, Marc M.; and Wright, Wade S. Electrical award signaling means for a pinball machine. 4,293,131, Cl. 273-121.00A.

Felthuis, Jacob; and Rumphorst, Jacobus A., to Hoogovens Ijmuiden B.V.; and Zimmermann & Jansen GmbH, a part interest. Closure plate for hot blast slide valves. 4,292,993, Cl. 137-340.000.

Ferranti Limited: *See—*
Liebing, Alan P., 4,292,854, Cl. 74-5.340.

Ferraris Development and Engineering Co., Ltd.: *See—*
Williams, Garnet M. E.; Hutton, Stanley P.; and Bushman, John A., 4,292,853, Cl. 73-861.790.

Ferris, Lester W.: *See—*
Moretti, Anthony L.; and Ferris, Lester W., 4,292,692, Cl. 2-418.000.

Ferry, Paul B.: *See—*
McCormick, James T.; Ferry, Paul B.; and Hall, John C., 4,293,089, Cl. 228-215.000.

Feuerstake, Ewald; and Schwarz, Klaus, to Mannesmann DeMag AG. Ozone pipe for ozone production plant. 4,293,775, Cl. 250-535.000.





Fickel, R. Gene: *See—*
Landis, Arthur M.; Broughton, Donald B.; and Fickel, R. Gene, 4,293,346, Cl. 127-46.00A.

Fidrych, Alfred W., to Harvey Hubbell Incorporated. Split cable grip closure and method of forming same. 4,293,157, Cl. 294-86.0CG.

Field, Joseph H.; and McCrea, Donald H., to Benfield Corporation. Selective removal of $H_2S$ from gas mixtures containing $CO_2$ and $H_2S$. 4,293,531, Cl. 423-232.000.

Fields, Carlo, to Southern Pacific Transportation Company. Solid state flasher relay. 4,293,795, Cl. 315-200.00A.

Filer, Burt, to Filer, Sandra Lee. Tube removal machine. 4,292,731, Cl. 29-726.000.

Filer, Sandra Lee: *See—*
Filer, Burt, 4,292,731, Cl. 29-726.000.

Filterwerk Mann & Hummel GmbH: *See—*
Bendig, Lothar, 4,292,949, Cl. 123-556.000.

Fincher, Paul A.; and Eklund, David R. Apparatus and method for separating case flaps. 4,293,086, Cl. 225-1.000.

Finetex Incorporated: *See—*
Elmi, Steele J., 4,293,544, Cl. 424-60.000.

Fink, Herbert; Huebner, Klaus; Dinklage, Horst; and Ottofrickenstein, Hans, to Rohm GmbH. Method of finishing fibers or fabrics with dispersions of hydrophilic acrylic resins. 4,293,600, Cl. 427-385.500.

Finkelmann, Heino: *See—*
Portugall, Michael; Finkelmann, Heino; and Ringsdorf, Helmut, 4,293,435, Cl. 252-299.010.

Firestone Tire & Rubber Company, The: *See—*
Loeffler, Earl F.; and Weyand, Harley P., Jr., 4,293,358, Cl. 156-131.000.

Fischer, Helmut; Ott, Albert; and Steegmuller, Willi. Apparatus for measuring the thickness of thin layers. 4,293,767, Cl. 250-308.000.

Fisco Products Limited: *See—*
Burton, Stanley J., 4,293,058, Cl. 188-65.100.

Fismer, William L.: *See—*
Guttman, Murray M.; and Fismer, William L., 4,293,417, Cl. 210-230.000.

Fisons Limited: *See—*
Cairns, Hugh; and Lee, Thomas B., 4,293,541, Cl. 424-45.000.

Fitch, John L., to Mobil Oil Corporation. Solvent convection technique for recovering viscous petroleum. 4,293,035, Cl. 166-273.000.

Fitzgerald, William V., to RCA Corporation. Vertical deflection circuit. 4,293,803, Cl. 315-397.000.

Flasche, Gunter: *See—*
Funk, Hans-Wolfgang; Frank, Kurt; and Flasche, Gunter, 4,293,790, Cl. 313-101.000.

Flint, William L.; and Pilette, Yvan P., to Du Pont de Nemours, E. I., and Company. Photopolymerizable composition with polymeric binder. 4,293,635, Cl. 430-271.000.

Florent, Jean; Lunel, Jean; and Mancy, Denise, to Rhone-Poulenc Industries. Anti-coccidial substance and its preparation. 4,293,650, Cl. 435-119.000.

Flowers, Robert L.: *See—*
Long, Howard W.; and Flowers, Robert L., 4,292,786, Cl. 53-434.000.

Floyd, Middleton B., Jr.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,293,704, Cl. 556-442.000.

Flusche, Frederick O.; Tan, Kwang G.; and Wright, Ralph W., to International Business Machines Corporation. Reconfigurable key-in-storage means for protecting interleaved main storage. 4,293,910, Cl. 364-200.000.

FMC Corporation: *See—*
Milberger, Lionel J., 4,293,148, Cl. 285-90.000.

Focke & Co.: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,293,068, Cl. 206-264.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Multi-layered foil cigarette pack with strip sealed tear flap. 4,293,068, Cl. 206-264.000.

Fogarty, Thomas J.; and Chin, Albert K., to Fogarty, Thomas J. Dilatation catheter apparatus and method. 4,292,974, Cl. 128-344.000.

Fogg, Lewis W.; Metzler, Robert W.; Satterfield, H. Eugene; and Scott, Eion G., to Control Data Corporation. Modular transportable controlled environment agriculture facility. 4,292,762, Cl. 47-17.000.

Fogg, O. Douglas: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,293,925, Cl. 364-900.000.

Fontanelli, Renzo: *See—*
Di Battista, Piero; Fontanelli, Renzo; Gratani, Francesco; and Nelli, Giuseppe, 4,293,466, Cl. 260-45.80N.

Forbes, Brian K.: *See—*
Catiller, Robert D.; and Forbes, Brian K., 4,293,909, Cl. 364-200.000.

Ford Motor Company: *See—*
Boyer, Wesley D., 4,293,814, Cl. 324-166.000.
Brittain, William J., 4,293,947, Cl. 370-89.000.
Graessley, William J., 4,292,948, Cl. 123-490.000.
Kuhn, Robert L.; and Kostan, Charles C., 4,293,744, Cl. 200-19.00R.
Theodore, Ares N., 4,293,477, Cl. 260-29.1SB.

Ford, Robert S. Training splint for wrist-ganglion. 4,292,963, Cl. 128-87.00R.

Forestier, Serge: *See—*
Lang, Gerard; and Forestier, Serge, 4,293,542, Cl. 424-47.000.

Forrest, Michael R.; and Kohn, Alfred, to Michael Forrest, Inc. Method of making a composite fur garment. 4,292,690, Cl. 2-65.000.

Forrest, Michael R.; and Kohn, Alfred, to Michael Forrest, Inc. Composite fur pelt and garment. 4,292,691, Cl. 2-65.000.

Fortune, William S. Heavy duty desoldering tool. 4,292,706, Cl. 15-341.000.

Forum, Inc.: *See—*
Dziubaty, Theodore J., 4,293,900, Cl. 362-342.000.

Fost, Dennis L., to New England Nuclear Corporation. Autofluorogram and composition and method for making the same. 4,293,436, Cl. 252-301.10R.

Foster, Francis W.: *See—*
Neumeyer, Tom A.; and Foster, Francis W., 4,292,871, Cl. 83-661.000.

Foster, George W.; and Bonneyrat, Alain M., to Gilson Medical Electronics (France). Stepping motor control apparatus. 4,293,807, Cl. 318-696.000.

Fowell, Peter A.: *See—*
Bowen, Griffith; and Fowell, Peter A., 4,293,615, Cl. 428-412.000.

Fowler, Alan B.: *See—*
Chaudhari, Praveen; Chou, Ned J.; Feder, Ralph; Fowler, Alan B.; and VanVechten, James A., 4,293,374, Cl. 156-628.000.

Fox, Robert B.; and Kim, Oh-Kil, to United States of America, Navy. Electrically conductive polymeric compositions. 4,293,452, Cl. 252-518.000.

Fox, Rodney T., to Reckitt & Colman Products Limited. Combustible compositions and processes for their production. 4,293,312, Cl. 44-1.00R.

Fox, Rodney T., to Reckitt & Colman Products Limited. Combustible compositions and processes for their production. 4,293,313, Cl. 44-1.00R.

Fracassi, Pietro: *See—*
Del Re, Pietrantonio; and Fracassi, Pietro, 4,293,916, Cl. 364-571.000.

Frame, Robert R., to UOP Inc. Catalytic composite, method of manufacture, and process for use. 4,293,442, Cl. 252-428.000.

Francis, Norman L.: *See—*
Bird, Alvin N., Jr.; Francis, Norman L.; and Thomas, Albert L., Jr., 4,293,217, Cl. 356-37.000.

Frank, Kurt: *See—*
Funk, Hans-Wolfgang; Frank, Kurt; and Flasche, Gunter, 4,293,790, Cl. 313-101.000.

Frano, Francis G., to Illinois Tool Works Inc. Reinforcing sealing sheet metal fastener anchor. 4,293,261, Cl. 411-85.000.

Freeman Chemical Corporation: *See—*
Svoboda, Glenn R., 4,293,659, Cl. 525-28.000.

Freund, Jurgen: *See—*
Lakra, Ruhama J.; Freund, Jurgen; and Rauschert, Gerd, 4,293,383, Cl. 376-290.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Bernat, Georg, 4,292,997, Cl. 137-454.600.

Fritz Gegauf AG, Bernina-Naehmaschinenfabrik Steckborn: *See—*
Widmer, Hans, 4,292,905, Cl. 112-121.110.

Frolov, Sergei A.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Fuji Photo Film Co., Ltd.: *See—*
Furutachi, Nobuo; and Seto, Nobuo, 4,293,691, Cl. 544-140.000.
Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, 4,293,639, Cl. 430-393.000.
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,293,202, Cl. 354-5.000.
Takahashi, Osamu; and Sakaguchi, Shinji, 4,293,641, Cl. 430-502.000.

Fuji Seal Industry Co., Ltd.: *See—*
Fujio, Masaaki, 4,293,364, Cl. 156-344.000.

Fujii, Yoshishige; Nagao, Syozo; and Kumazawa, Shunji, to Toray Industries, Inc. Fluid separation apparatus. 4,293,418, Cl. 210-321.100.

Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, to Taiho Pharmaceutical Company Limited. Novel 1,1,3,5-substituted biuret compound and a pharmaceutical composition containing the same. 4,293,713, Cl. 564-38.000.

Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Method and machine for opening up a cylindrical film tube and fitting it over an object. 4,293,364, Cl. 156-344.000.

Fujisawa, Kazuo: *See—*
Yamaguchi, Hisao; and Fujisawa, Kazuo, 4,292,849, Cl. 73-643.000.

Fujita, Yoshiki: *See—*
Kakumoto, Ken-Ichi; and Fujita, Yoshiki, 4,293,171, Cl. 308-188.000.

Fujitsu Limited: *See—*
Matsui, Kiyoshi; Arai, Katsuyuki; and Shinbashi, Sueo, 4,293,891, Cl. 361-383.000.
Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, 4,293,941, Cl. 364-200.000.
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, 4,293,589, Cl. 427-93.000.
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, 4,293,590, Cl. 427-93.000.
Tanaka, Yoshikazu; Shirai, Hitoshi; and Kan'o, Yoshiharu, 4,293,931, Cl. 365-222.000.

Fukuda, David S.: *See—*
Abbott, Bernard J.; and Fukuda, David S., 4,293,482, Cl. 260-112.50R.

Abbott, Bernard J.; and Fukuda, David S., 4,293,490, Cl. 260-112.50K.

Fukuda, Takeshi; and Tutida, Tomiyoshi, to Shin-Etsu Chemical Co., Ltd. Rubber-padded frames of eye spectacles and method for preparing same. 4,293,201, Cl. 351-178.000.

Fukushima, Toshihiko: *See—*
Kamejima, Kohji; Tanaka, Hideki; Kano, Minoru; and Fukushima, Toshihiko, 4,292,811, Cl. 62-56.000.

Fulton, Hugh C. Pressurized gas filling head. 4,293,009, Cl. 141-311.00R.

Fumagalli, Angelo: *See—*
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,293,705, Cl. 560-53.000.

Fung, Bing: *See—*
West, Jerry B.; Kretzschnar, John L.; and Fung, Bing, 4,293,815, Cl. 324-254.000.

Funk, Hans-Wolfgang; Frank, Kurt; and Flasche, Gunter, to Robert Bosch GmbH. Image converter having cylindrical housing and photocathode separated by spacing element from luminescent screen on frustrum. 4,293,790, Cl. 313-101.000.

Furendal, Allan R. B.; Larsson, Bernt; and Nilsson, Erik R., to AB Bofors. Surface coating method employing a temporary bonding. 4,293,596, Cl. 427-160.000.

Furutachi, Nobuo; and Seto, Nobuo, to Fuji Photo Film Co., Ltd. Method for preparing magenta couplers having thioether groups. 4,293,691, Cl. 544-140.000.

Fyson, John R.; and Levenson, Gerald I. P., to Eastman Kodak Company. Method for alleviating partial inactivation of color couplers. 4,293,638, Cl. 430-373.000.

G. D. Searle & Co.: *See—*
Davino, Arthur A., 4,293,648, Cl. 435-70.000.

Gaddes, Robert N. Load support device for heat furnaces. 4,293,299, Cl. 432-234.000.

GAF Corporation: *See—*
Beavan, Elton L.; and Moynahan, E. Bradley, 4,293,642, Cl. 430-534.000.
Gruber, Bruce A.; and Lorenz, Donald H., 4,293,714, Cl. 564-249.000.
Parthasarathy, R.; and Hort, Eugene V., 4,293,444, Cl. 252-432.000.

Gaffney, Brian P.: *See—*
Chressanthis, Andrew G.; Halpern, Henry M.; and Gaffney, Brian P., 4,293,856, Cl. 343-5.0CF.

Gago, Ignace, to Interox. Coated calcium peroxide particles useful in the treatment of water. 4,293,426, Cl. 210-759.000.

Gaida, Wolfram: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.

Gailey, J. Lynn: *See—*
Chalmers, Alexander A.; and Gailey, J. Lynn, 4,292,781, Cl. 52-547.000.

Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., to Exxon Production Research Company. Propoxylated ethoxylated surfactants and method of recovering oil therewith. 4,293,428, Cl. 252-8.55D.

Gambro AB: *See—*
Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., 4,293,409, Cl. 210-96.200.

Gamell, Joseph A., to Joseph Gamell Industries, Inc. Turbo-electric power plant and process. 4,293,777, Cl. 290-52.000.

Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, to Farmitalia Carlo Erba S.p.A. 13,14-Dehydro-11-deoxy-prostaglandins and process for their preparation. 4,293,705, Cl. 560-53.000.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,697, Cl. 546-121.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,699, Cl. 546-121.000.

Gansar, David: *See—*
Petty, Terry D.; Costello, Carmon R.; Rao, Gude P.; and Gansar, David, 4,293,239, Cl. 405-195.000.

Gansley, Byron J.: *See—*
Phelps, Harold E.; and Gansley, Byron J., 4,293,013, Cl. 144-193.00A.

Garbelman, David L.: *See—*
Swisher, George W., Jr.; Garbelman, David L.; and Shaw, Arthur G., 4,293,228, Cl. 366-25.000.

Garbis, Dennis: *See—*
Hill, Lawrence; Garbis, Dennis; and Heller, Robert, 4,293,755, Cl. 219-10.410.

Garcia, Jose B.: *See—*
Bell, William T.; and Garcia, Jose B., 4,292,895, Cl. 102-306.000.

Garcia, Zulma C.: *See—*
Champion, Carolyn; Wolcott, Judith; Hart, Barbara; and Garcia, Zulma C., 4,292,975, Cl. 128-498.000.

Gardner, Hugh C., to Union Carbide Corporation. Thermosetting polyester resin composition. 4,293,686, Cl. 528-192.000.

Gardner, Roland C.; and Mortellito, Ronald, to Clevepak Corporation. Container seam. 4,293,090, Cl. 229-5.600.

Gartzke, Rudolph E. Ice making apparatus. 4,292,816, Cl. 62-345.000.

Gaschenko, Viktor P.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Gascon, Lorenzo. Rake. 4,292,794, Cl. 56-400.160.

Gaston, Charles A.; Kirk, Joseph P.; and Wasik, Chester A., to International Business Machines Corporation. Optical system and technique for unambiguous film thickness monitoring. 4,293,224, Cl. 356-357.000.

Gaughan, Edmund J.: *See—*
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,293,701, Cl. 546-335.000.

Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Preparation of acetaldehyde. 4,293,718, Cl. 568-487.000.

Gawthorpe, Janet A.: *See—*
Simpson, Roger J.; Gawthorpe, Janet A.; and Lawrence, C. Alexander, 4,293,307, Cl. 23-230.00B.

Gazdag, Andras: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Gearhart Industries, Inc.: *See—*
Hallmark, Bobby J., 4,292,842, Cl. 73-155.000.

Gehle, Warren D.: *See—*
Smith, Kendall O.; and Gehle, Warren D., 4,292,920, Cl. 118-425.000.

Gehr, Marvin M.; and Pabian, Howell D., to Telex Communications, Inc. Diversity reception system. 4,293,955, Cl. 455-276.000.

General Electric Company: *See—*
Arendt, Ronald H., 4,293,534, Cl. 423-593.000.
Arendt, Ronald H., 4,293,535, Cl. 423-593.000.
Bessmer, Stanley J.; and Lampe, Warren R., 4,293,597, Cl. 427-186.000.
Brezosky, Bernard J., 4,293,170, Cl. 308-161.000.
Brooks, George D.; and Bushey, Donald J., Sr., 4,292,878, Cl. 86-48.000.
King, Harold B., 4,292,788, Cl. 53-500.000.
McFadyen, Robert J., 4,293,822, Cl. 330-254.000.
Morris, Jesse L., 4,292,852, Cl. 73-827.000.
Smith, Alfred H., Jr.; and Beers, M. Dale, 4,293,616, Cl. 428-447.000.
Snow, Barton H., 4,292,802, Cl. 60-204.000.
Takekoshi, Tohru; and Klopfer, Howard J., 4,293,683, Cl. 528-180.000.
Takekoshi, Tohru, 4,293,684, Cl. 528-185.000.
Vavrek, Robert M., 4,293,770, Cl. 250-445.00R.
Wilkes, Colin; and Hilt, Milton B., 4,292,801, Cl. 60-39.060.
Zdaniewski, Joseph J.; Penn, William B.; and Balke, Roy L., 4,293,784, Cl. 310-45.000.

General Instrument Corporation: *See—*
Hill, Lawrence; Garbis, Dennis; and Heller, Robert, 4,293,755, Cl. 219-10.410.

General Motors Corporation: *See—*
Brewer, Earl G., 4,292,851, Cl. 73-762.000.
King, Dallas E., 4,293,789, Cl. 310-239.000.

General Signal Corporation: *See—*
Link, John R., 4,293,291, Cl. 418-104.000.

General Tire & Rubber Co., The: *See—*
Bible, Dennis E.; Crano, Richard N.; and Welch, John A., 4,293,016, Cl. 152-158.000.

Genovese, Nicholas J.: *See—*
Stoffels, Carl A.; and Genovese, Nicholas J., 4,292,867, Cl. 82-47.000.

Geoffroy, Jean-Claude: *See—*
Gedard, Pierre; and Geoffroy, Jean-Claude, 4,293,029, Cl. 165-29.000.

George, Clifford L.; and Olson, Jon S., to Xerox Corporation. Sheet set separation device. 4,293,214, Cl. 355-14.00R.

George, Larry T., to Wallace Murray Corporation. Anodized seal nose for damper. 4,293,136, Cl. 277-12.000.

George, Robert W.; Miller, Casper W.; and Rapey, Kenneth, to National Can Corporation. Method of lining closures. 4,293,510, Cl. 264-40.700.

Gerard, Thomas J., to Weyerhaeuser Company. Reinforced container with integral divider. 4,293,091, Cl. 229-27.000.

Germann, Willy, to BBC Brown, Boveri & Company Ltd. Apparatus for manufacturing cold-work hardened cylinders. 4,292,828, Cl. 72-54.000.

Gerry, Martin E. Inductive-capacitive cyclic charge-discharge ignition system. 4,293,797, Cl. 315-209.00R.

Gerry, Martin E. Inductive-capacitive cyclic charge-discharge ignition system. 4,293,798, Cl. 315-209.00R.

Getewent Gesellschaft fur technische und Wissenschaftlichs Energieumsatzentwicklungen m.b.H.: *See—*
Bachl, Herbert, 4,293,278, Cl. 416-186.00R.

Gewerkschaft Eisenhutte Westfalia: *See—*
Rosenberg, Harry; and Holken, Norbert, 4,293,247, Cl. 405-296.000.

Geyser, Joseph E.; Rehr, Henry W.; Schutz, Rudolph W.; and Weis, Rudolf R., to Crown Zellerbach Corporation. Apparatus for applying labels or the like. 4,293,365, Cl. 156-364.000.

Gianneli, Joseph F., to Ecodyne Corporation. Slotted sheet filter element. 4,293,414, Cl. 210-193.000.

Gibb, William D.; and Clement, Donald E., to Northern Telecom Limited. Hands free answer intercom. 4,293,740, Cl. 179-99.00A.

Giesselmann, Ewald: *See—*
Cordes, Gunter; Giesselmann, Ewald; and Munch, Ulrich, 4,293,565, Cl. 424-285.000.





Gilbert, John J. Connection assembly for rigid stem dial gauge. 4,292,845, Cl. 73-362.100.

Gilbride, Andrew J.; and Wickers, Francis A., to USM Corporation. Presser-foot apparatus. 4,292,907, Cl. 112-236.000.

Gillette Company, The: *See—*
Packham, Charles C., 4,292,737, Cl. 30-43.920.

Gilman, Frederick C. Vertical axis wind turbine for generating usable energy. 4,293,274, Cl. 416-51.000.

Gilson Medical Electronics (France): *See—*
Foster, George W.; and Bonneyrat, Alain M., 4,293,807, Cl. 318-696.000.

Gilts, Richard G.; Hille, Earl A.; Kleine, Albert W., Jr.; and Shamp, Donald E., to Libbey-Owens-Ford Company. Pivotal shipping rack supporting apparatus. 4,293,264, Cl. 414-38.000.

Glass, Howard L., to Rockwell International Corporation. Growth of single-crystal magnetoplumbite. 4,293,372, Cl. 156-624.000.

Glenn, Robert G., to Westinghouse Electric Corp. Gas turbine combustion chamber. 4,292,810, Cl. 60-757.000.

Globus, Richard D.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 4,293,057, Cl. 185-37.000.

Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., to Globuscope, Inc. Spring motor especially suitable for use in a panoramic camera. 4,293,057, Cl. 185-37.000.

Globus, Stephen E.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 4,293,057, Cl. 185-37.000.

Globuscope, Inc.: *See—*
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 4,293,057, Cl. 185-37.000.

Godard, Pierre; and Geoffroy, Jean-Claude, to Saft-Societe des Accumulateurs Fixes et de Traction. Temperature control device for a heat pump. 4,293,029, Cl. 165-29.000.

Goel, Prabhakar: *See—*
Dasgupta, Sumit; Goel, Prabhakar; and Williams, Thomas W., 4,293,919, Cl. 364-716.000.

Goetzmann, Claus; and Rau, Peter, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor having control rod holding latch. 4,293,381, Cl. 376-230.000.

Goguen, Clarence J. Ventilated cushions. 4,292,703, Cl. 5-468.000.

Goldberger, William M.: *See—*
Parekh, Bhupendra K.; and Goldberger, William M., 4,293,099, Cl. 241-24.000.

Goldenberg, Carol: *See—*
Zeidman, Zvi; Goldenberg, Carol; and Grinbaum, Zvi, 4,293,045, Cl. 173-121.000.

Golder, John C. Solar oven. 4,292,957, Cl. 126-451.000.

Goloff, Alexander; and Denning, Ralph E., to Caterpillar Tractor Co. Transmission-differential combination. 4,293,050, Cl. 180-6.260.

Gomi, Yoshifumi, to Kabushiki Kaisha Suwa Seikosha. Structure for a linear motor for a printer. 4,293,235, Cl. 400-322.000.

Goodin, Richard D.: *See—*
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,392, Cl. 204-59.00R.
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,393, Cl. 204-59.00R.

Gookins, William L.; and King, Junior K. Monitor means and method for grain bin. 4,293,854, Cl. 340-615.000.

Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., to Cargill, Incorporated; and Structural Composite Industries, Inc. Filament composite railroad car. 4,292,898, Cl. 105-238.00R.

Gore, Colin E.; and Coulter, John P., to Wool Development International Limited. Strand break-out device. 4,292,798, Cl. 57-86.000.

Gorman, Susan B.; Thompson, Ralph B.; and Yonan, Edward E., to PPG Industries, Inc. Preparation of N-benzyloxycarbonyl aspartic acid. 4,293,706, Cl. 560-163.000.

Gould, George E. Fireplaces and attachments. 4,292,951, Cl. 126-120.000.

Gould Inc.: *See—*
Nagy, Albert E., 4,293,617, Cl. 428-469.000.

Graessley, William J., to Ford Motor Company. Method for extending the range of operation of an electromagnetic fuel injector. 4,292,948, Cl. 123-490.000.

Grant, Peter S., to Weyerhaeuser Company. Log handling and transport system. 4,293,155, Cl. 294-75.000.

Granzow, Albrecht H., to American Cyanamid Company. Phosphine oxide flame retarded, rubber-modified, polyphenylene ether resin compositions. 4,293,464, Cl. 260-45.70P.

Granzow, Albrecht H., to American Cyanamid Company. Bis phosphine oxide flame retarded, rubber-modified, polyphenylene ether resin compositions. 4,293,465, Cl. 260-45.70P.

Grasselli, Robert K.: *See—*
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,293,443, Cl. 252-432.000.

Gratani, Francesco: *See—*
Di Battista, Piero; Fontanelli, Renzo; Gratani, Francesco; and Nelli, Giuseppe, 4,293,466, Cl. 260-45.80N.

Gray, David L. Universal fishing rod support. 4,293,113, Cl. 248-518.000.

Graybeal, Carl N.; Rogers, Basil E.; Cox, Joseph V.; and Rogers, Roy R., to Graybeal, Carl N. Mine roof bolt assembly guard. 4,293,243, Cl. 405-259.000.

Green, Alvin W. Method and equipment for a wrap-around upflow submerged anaerobic filter for sewage. 4,293,421, Cl. 210-603.000.

Greene, William J.: *See—*
Hoyt, Harold C., Jr.; and Greene, William J., 4,293,756, Cl. 219-133.000.

Greenley, Gordon A.: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,293,925, Cl. 364-900.000.

Greenwald, Robert J. Fecal examination device (B). 4,293,405, Cl. 209-17.000.

Greenwood, John C., to International Standard Electric Corporation. Method of making transducer. 4,293,373, Cl. 156-628.000.

Greig, John M.: *See—*
Metcalfe, Ronald S.; and Greig, John M., 4,293,147, Cl. 285-39.000.

Griffiths, David: *See—*
Wheaton, John E. G.; Griffiths, David; and Learner, Richard C. M., 4,293,225, Cl. 356-417.000.

Griggs, Calvin: *See—*
Shea, John J.; and Griggs, Calvin, 4,292,693, Cl. 3-1.900.

Grinbaum, Zvi: *See—*
Zeidman, Zvi; Goldenberg, Carol; and Grinbaum, Zvi, 4,293,045, Cl. 173-121.000.

Groenenboom, Maarten, to Hazemeijer B.V. Current measuring system. 4,293,813, Cl. 324-117.00R.

Gros, Pierre; Millouet, Jean; and Staron, Philippe, to Societe Nationale Elf Aquitaine (Production). Method of seismic exploration. 4,293,935, Cl. 367-43.000.

Gross, Franz, to Siemens Aktiengesellschaft. Arrangement for suppressing interference waves and harmonic waves in traveling wave tubes with a short circuiting slide in the output wave guide. 4,293,828, Cl. 333-27.000.

Grove, Russell E. Manually operable chain drive for a boat loader. 4,293,267, Cl. 414-462.000.

Grove Valve and Regulator Company: *See—*
Cazzaniga, Italo; and Pasquinelli, Ottorino, 4,292,989, Cl. 137-72.000.

Grove, William S., to PPG Industries, Inc. Substituted diphenyl ethers having herbicidal activity. 4,293,329, Cl. 71-88.000.

Grove, William S.: *See—*
Richter, Sidney B.; and Grove, William S., 4,293,707, Cl. 562-472.000.

Growth International Industries Corp.: *See—*
Yates, George, Jr., 4,293,073, Cl. 206-519.000.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber 4-alkoxy-2'-allyloxybenzazines. 4,293,714, Cl. 564-249.000.

Gruenberger, Eberhard; and Muller, Roswitha, to Henkel Kommanditgesellschaft auf Aktien. Thermoplastic polymer composition materials for pretreating paper. 4,293,458, Cl. 260-17.4GC.

Grumman Aerospace Corporation: *See—*
Savio, Ferdinando; and Peterson, William, 4,293,361, Cl. 156-242.000.

GTE Automatic Electric Labs Inc.: *See—*
Stelte, David J.; and Kobylar, Alex W., 4,293,738, Cl. 179-18.0FC.
Vonder, David L., 4,293,179, Cl. 339-176.0MP.

Guile, Donald L.: *See—*
Corbett, Daniel W.; and Guile, Donald L., 4,293,439, Cl. 252-316.000.

Guim, Armando. Hand-held fishing reel. 4,293,104, Cl. 242-96.000.

Gulf Research & Development Company: *See—*
Beach, David L.; and Harrison, James J., 4,293,502, Cl. 260-439.00R.
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,724, Cl. 585-457.000.
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,725, Cl. 585-523.000.
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,726, Cl. 585-523.000.
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Swift, Harold E.; Innes, Robert A.; and Adams, Phillip, 4,293,716, Cl. 564-480.000.

Guth, Richard U. Breath test mouthpiece. 4,292,978, Cl. 128-730.000.

Guthrie, David B.: *See—*
Cheng, William J.; Guthrie, David B.; and Leiendecker, Donald M., 4,293,429, Cl. 252-18.000.

Gutleber, Frank S., to United States of America, Army. Bi-orthogonal PCM communications system employing multiplexed noise codes. 4,293,953, Cl. 375-25.000.

Guttman, Murray M.; and Fismer, William L., to Envirotech Corporation. Filter press. 4,293,417, Cl. 210-230.000.

H & H Tube & Mfg. Co.: *See—*
Lee, Marlow, 4,292,958, Cl. 126-448.000.

Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, to Hewlett-Packard Company. Apparatus and method for indicating a minimum degree of activity of digital signals. 4,293,925, Cl. 364-900.000.

Haas, Richard G., to Brown Company. Process and machine for fastening a closure member to a container. 4,293,354, Cl. 156-69.000.

Haberle, Friedrich: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,293,252, Cl. 408-224.000.

Hackenberg, Hubert: *See—*
Wagner, Karl; Engelsmann, Dieter; Hackenberg, Hubert; and Stiefel, Peter, 4,293,204, Cl. 354-21.000.

Hadari, Gideon, to Israel Aircraft Industries Ltd.; and Ben Gurion Industries Ltd. Excessive descent-rate warning system particularly useful for helicopters. 4,293,840, Cl. 340-27.0AT.

Hagborg, Winston E.: *See—*
Davis, Gayron N.; Sellers, Larry S.; and Hagborg, Winston E., 4,292,918, Cl. 118-33.000.

Hagedorn, Myrna L.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Hahn, Klaus; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Flame retardant polystyrene. 4,293,656, Cl. 521-88.000.

Hahn, Steven: *See—*
Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, 4,293,088, Cl. 227-131.000.

Hakansson, Jan T.: *See—*
Dilot, Rolf M.; and Hakansson, Jan T., 4,293,369, Cl. 156-521.000.

Hakuju Institute for Health Science Co., Ltd.: *See—*
Suzuki, Shotaro, 4,292,980, Cl. 128-783.000.

Hall, Donald R.: *See—*
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.

Hall, John C.: *See—*
McCormick, James T.; Ferry, Paul B.; and Hall, John C., 4,293,089, Cl. 228-215.000.

Hall, Woodrow A.: *See—*
Liu, Chunghorng R.; Nayak, Jnaneshwar H.; Stenberg, Herbjorn; Huerta, Felipe J.; and Hall, Woodrow A., 4,292,865, Cl. 82-36.00R.

Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., to Monsanto Company. Alkylation of nitriles using an electrogenerated base and an alkylating agent. 4,293,392, Cl. 204-59.00R.

Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., to Monsanto Company. Use of electrogenerated bases in condensation reactions. 4,293,393, Cl. 204-59.00R.

Halliburton Company: *See—*
Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., 4,293,440, Cl. 252-317.000.

Hallmark, Bobby J., to Gearhart Industries, Inc. Tool for testing earth formations in boreholes. 4,292,842, Cl. 73-155.000.

Halpern, Henry M.: *See—*
Chressanthis, Andrew G.; Halpern, Henry M.; and Gaffney, Brian P., 4,293,856, Cl. 343-5.0CF.

Hamada, Seiya: *See—*
Okumura, Takatoshi; Hamada, Seiya; and Imamura, Akio, 4,292,873, Cl. 84-1.010.

Hamann, Michael L.; and Pinegar, Richard K., to J. R. Simplot Company. Potato dough with process oil for formed and extruded potato products. 4,293,582, Cl. 426-637.000.

Hamer, Anthony D.; and Karol, Frederick J., to Union Carbide Corporation. Spheroidal polymerization catalyst, process for preparing, and use for ethylene polymerization. 4,293,673, Cl. 526-88.000.

Hamilton, Joel A. Controlled film advance apparatus with differential speed. 4,292,856, Cl. 74-63.000.

Hamilton, Peter W.; and Lewis, William P., to Procter & Gamble Company, The. Air treating device. 4,293,095, Cl. 239-35.000.

Hammann, Ingeborg: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,293,566, Cl. 424-304.000.

Hammond, Leslie G., to Anchor Building Products Limited. Tile packaging. 4,292,785, Cl. 53-399.000.

Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pesticidally active 1-arylamino-2,4-dinitronaphthalenes. 4,293,566, Cl. 424-304.000.

Hanada, Tsuneo; Koshii, Taro; and Shinmi, Hideo, to Toray Silicone Company, Ltd. Heat curable molding composition. 4,293,479, Cl. 260-37.0EP.

Hanifin, John W., Jr.: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,293,554, Cl. 424-250.000.

Hans Streuli AG: *See—*
Streuli, Hans; and Ruedi, Joseph, 4,293,410, Cl. 210-107.000.

Hara, Akio; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Sintered body for use in a cutting tool and the method for producing the same. 4,293,618, Cl. 428-551.000.

Harand, Elmar; and Michel, Eberhard, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor with a cylindrical reactor pressure vessel. 4,293,386, Cl. 376-461.000.

Hardy, William B.; and Loffelman, Frank F., to American Cyanamid Company. Isopropylidenedicyclohexylene esters and their use as light stabilizers. 4,293,467, Cl. 260-45.80N.

Harris Corporation: *See—*
Bailey, David C.; and Keesler, Floyd F., 4,293,124, Cl. 271-233.000.
Ports, Kenneth A., 4,292,730, Cl. 29-577.00C.

Harrison, James J.: *See—*
Beach, David L.; and Harrison, James J., 4,293,502, Cl. 260-439.00R.
Beach, David L.; and Harrison, James J., 4,293,727, Cl. 585-526.000.

Hart, Barbara: *See—*
Champion, Carolyn; Wolcott, Judith; Hart, Barbara; and Garcia, Zulma C., 4,292,975, Cl. 128-498.000.

Hartmann, Alfons: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,293,566, Cl. 424-304.000.

Hartness International, Inc.: *See—*
Hartness, Thomas S., 4,292,839, Cl. 73-49.200.

Hartness, Thomas S., to Hartness International, Inc. Crown release pressure tester. 4,292,839, Cl. 73-49.200.

Haruna, Tohru: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,293,472, Cl. 260-23.0XA.

Harvey Hubbell Incorporated: *See—*
Fidrych, Alfred W., 4,293,157, Cl. 294-86.0CG.

Haschke, Elliot M.; and Lewis, Bennie J., to Dow Chemical Company, The. Process for depolymerization of acrylic acid polymers. 4,293,347, Cl. 134-11.000.

Hasegawa, Haruyoshi: *See—*
Nakajima, Shunichi; and Hasegawa, Haruyoshi, 4,293,085, Cl. 222-311.000.

Hasegawa, Shinji: *See—*
Toriyama, Kazuhisa; Hata, Tsujiaki; Hasegawa, Shinji; and Sasaki, Ken, 4,293,698, Cl. 546-301.000.

Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, to Ricoh Co., Ltd. Electrophotographic elements containing disazo compounds. 4,293,628, Cl. 430-58.000.

Hashimoto, Mitsuru: *See—*
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, 4,293,492, Cl. 260-160.000.

Hashimura, Taiji: *See—*
Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, 4,293,639, Cl. 430-393.000.

Hassler, Craig R.; and Messing, Gary L., to Scientific Advances, Inc. Tooth implants. 4,293,302, Cl. 433-173.000.

Hata, Tsujiaki: *See—*
Toriyama, Kazuhisa; Hata, Tsujiaki; Hasegawa, Shinji; and Sasaki, Ken, 4,293,698, Cl. 546-301.000.

Hatada, Kenzo; and Kajiwara, Takao, to Matsushita Electric Industrial Co., Ltd. Method of making metal electrode of semiconductor device. 4,293,637, Cl. 430-314.000.

Hatz, Ernst; Eibl, Heinz; Peter, Erwin; and Blumhardt, Rolf, to Motorenfabrik Hatz GmbH & Co. KG. Heating system with heat pump and auxiliary heater. 4,293,092, Cl. 237-12.100.

Haugwitz, Rudiger D.; Wade, Peter C.; and Maurer, Barbara V., to E. R. Squibb & Sons, Inc. Substituted phenylguanindines and method. 4,293,569, Cl. 424-300.000.

Hauser, Hans-Ulrich, to Bucher-Guyer AG Maschinenfabrik. Hay harvesting machine. 4,292,793, Cl. 56-378.000.

Havens, Donald F. Leg weights. 4,293,126, Cl. 272-119.000.

Hawkins, Joel W. Double action pump. 4,293,286, Cl. 417-253.000.

Hayakawa, Isao: *See—*
Tanaka, Yoshiaki; and Hayakawa, Isao, 4,293,695, Cl. 546-83.000.

Hayashi, Takeshi. Apparatus for transferring solids. 4,293,250, Cl. 406-109.000.

Haybuster Manufacturing, Inc.: *See—*
Neukom, Chester G.; and Kopecky, Ivyl D., 4,293,043, Cl. 172-267.000.

Hayman-Chaffey, Charles R.; and Hayman-Chaffey, Frederick W. Acrylic sheet-lacquer laminates and articles of furniture made therefrom. 4,293,603, Cl. 428-86.000.

Hayman-Chaffey, Frederick W.: *See—*
Hayman-Chaffey, Charles R.; and Hayman-Chaffey, Frederick W., 4,293,603, Cl. 428-86.000.

Hazemeijer B.V.: *See—*
Groenenboom, Maarten, 4,293,813, Cl. 324-117.00R.

Hehl, Karl. Hydraulic controls for injection unit of injection molding machine. 4,293,229, Cl. 366-78.000.

Heiberger, Philip, to Du Pont de Nemours, E. I., and Company. Fast-drying alkyd latex. 4,293,471, Cl. 260-22.0CB.

Heimsch, Robert A., to Monsanto Company. Refining olefin/maleic acid copolymers by extraction with alkanes. 4,293,668, Cl. 525-369.000.

Heir, James L.: *See—*
Wells, Alton R.; Wells, Robert M.; and Heir, James L., 4,292,888, Cl. 99-312.000.

Heirbaut, Wilfried A.; and Rens, Walter J., to AGFA-GEVAERT N.V. Method and apparatus for longitudinally stretching a substantially amorphous polyethylene terephthalate film. 4,293,508, Cl. 264-25.000.

Heitmann, Jurgen; Maly, Hans-Peter; and Wilhelm, Rudolf, to Robert Bosch GmbH. Method and apparatus for the variable speed reproduction of a video signal stored on magnetic tape. 4,293,879, Cl. 360-10.000.

Heitzer, Helmut: *See—*
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,293,331, Cl. 71-118.000.

Hekmati, Majid: *See—*
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Helix Technology Corporation: *See—*
Ryan, James M.; and Holmes, Arthur S., 4,293,322, Cl. 62-17.000.

Heller, Robert: *See—*
Hill, Lawrence; Garbis, Dennis; and Heller, Robert, 4,293,755, Cl. 219-10.410.

Helveston, Wilton L.; and Pecoraro, Richard J., to International Moorings & Marine, Inc. Barge bumper assembly. 4,293,241, Cl. 405-213.000.





Henkel Kommanditgesellschaft auf Aktien: *See—*
Gruenberger, Eberhard; and Muller, Roswitha, 4,293,458, Cl. 260-17.4GC.

Hennessy Industries, Inc.: *See—*
Leeper, Charles G.; and Wood, John F., 4,293,020, Cl. 157-1.280.

Henri, Paul, to Kennecott Corporation. Bag filter support cage. 4,293,111, Cl. 248-95.000.

Hercules Incorporated: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,293,666, Cl. 525-284.000.
Maslanka, William W.; and Spence, Gavin G., 4,293,667, Cl. 525-284.000.

Herder, Gary A., to Prab Conveyors, Inc. Bar end separator. 4,293,408, Cl. 209-638.000.

Hernandez, Jose A., to Esquire, Inc. Reflector system having sharp light cutoff characteristics. 4,293,901, Cl. 362-346.000.

Herolz, Robert A.; and Vogel, Charles B., to Shell Oil Company. Circumferential acoustic device. 4,293,934, Cl. 367-27.000.

Herrington, Daniel R.; and Schwerko, Albert P., to Standard Oil Company, The. High-surface area coated support for catalysts and process for their preparation. 4,293,449, Cl. 252-465.000.

Hession, William M., Jr. Apparatus for intravenous catheter starter. 4,292,970, Cl. 128-214.400.

Hewlett-Packard Company: *See—*
Bente, Paul F., III; Zerenner, Ernest H.; and Dandeneau, Raymond D., 4,293,415, Cl. 210-198.200.
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,293,925, Cl. 364-900.000.

Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, to Bayer Aktiengesellschaft. Polyamides containing oxidized polyethylene. 4,293,662, Cl. 525-184.000.

Hickman, Jack L. Automatic socket ejector. 4,292,863, Cl. 81-184.000.

Hidvegi, Ferenc: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Higgins, Pink M. Electric heating system for heating the interior of a motor vehicle prior to starting. 4,293,759, Cl. 219-202.000.

Higuchi, Noboru; Yano, Teruo; and Ohnishi, Masahiro, to NGK Insulators, Ltd. Method for producing ceramic honeycomb filters. 4,293,357, Cl. 156-89.000.

Hilbert, Robert S., to Fantacia. Objective lens system with aspheric Fresnel elements. 4,293,196, Cl. 350-452.000.

Hill, David A.; and Lomnitzer, Abraham, to Qualetron (PTY) Ltd. Stackable equipment containers. 4,293,072, Cl. 206-512.000.

Hill, H. Wayne, Jr.: *See—*
Campbell, Robert W.; and Hill, H. Wayne, Jr., 4,293,688, Cl. 528-346.000.

Hill, Lawrence; Garbis, Dennis; and Heller, Robert, to General Instrument Corporation. Method of cooling induction-heated vapor deposition apparatus and cooling apparatus therefor. 4,293,755, Cl. 219-10.410.

Hill, Richard N., to W. R. Grace & Co. Phosphoric acid crystallizer underflow return. 4,293,311, Cl. 23-301.000.

Hill, Wiley E.: *See—*
Cheng, Edmund K.; and Hill, Wiley E., 4,293,848, Cl. 340-347.0AD.

Hille, Earl A.: *See—*
Gilts, Richard G.; Hille, Earl A.; Kleine, Albert W., Jr.; and Shamp, Donald E., 4,293,264, Cl. 414-38.000.

Hillmann, Hans: *See—*
Hilzinger, Hans-Reiner; and Hillmann, Hans, 4,293,023, Cl. 164-479.000.

Hilt, Milton B.: *See—*
Wilkes, Colin; and Hilt, Milton B., 4,292,801, Cl. 60-39.060.

Hilzinger, Hans-Reiner; and Hillmann, Hans, to Vacuumschmelze GmbH. Method and device for the manufacture of metal bands. 4,293,023, Cl. 164-479.000.

Hinderer, Helmuth E.: *See—*
Bach, Hartwig C.; and Hinderer, Helmuth E., 4,293,613, Cl. 428-364.000.

Hinds, Robert S. Jump rope handle. 4,293,125, Cl. 272-75.000.

Hinosugi, Misturu: *See—*
Unnai, Takaaki; Izumi, Akiya; and Hinosugi, Misturu, 4,293,586, Cl. 427-68.000.

Hinrichs, John M., to ACF Industries, Incorporated. Metallic seat assembly for valves. 4,293,116, Cl. 251-173.000.

Hirabayashi, Masaya: *See—*
Shikita, Takuji; and Hirabayashi, Masaya, 4,293,540, Cl. 424-26.000.

Hiramatsu, Yasuzo: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.

Hirsbrunner, Pierre; and Bertholet, Raymond, to Societe d'Assistance Technique Pour Produits Nestle S.A. Saponification treatment of spent coffee grounds. 4,293,581, Cl. 426-630.000.

Hirzel, Edgar A., to Crane Co. Electronic control brake and skid control system. 4,293,165, Cl. 303-93.000.

Hisaki, Masakatu: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.

Hitachi, Ltd.: *See—*
Amano, Yutaka, 4,293,926, Cl. 364-900.000.
Asakawa, Yukio, 4,293,918, Cl. 364-702.000.
Iizuka, Takashi; and Horie, Masayuki, 4,293,868, Cl. 357-46.000.
Isahaya, Fumio; and Yukitake, Tugihiro, 4,293,521, Cl. 422-62.000.
Ito, Motoya; Sato, Masaki; Watanabe, Masatoshi; and Okuda, Hironori, 4,293,787, Cl. 310-181.000.
Izumita, Morishi; Maeda, Takeshi; Tsunoda, Yoshito; and Sawano, Susumu, 4,293,944, Cl. 369-45.000.
Kamejima, Kohji; Tanaka, Hideki; Kano, Minoru; and Fukushima, Toshihiko, 4,292,811, Cl. 62-56.000.
Katada, Hiroshi; and Kyogoku, Yoshito, 4,292,942, Cl. 123-418.000.
Kishi, Tuneo; and Sasaki, Koji, 4,293,749, Cl. 200-144.0AP.
Kobayashi, Nariyoshi; Sakamoto, Takeshi; Anzai, Shunichi; and Matsumoto, Manabu, 4,293,275, Cl. 416-97.00R.
Kyogoku, Yoshito; and Katada, Hiroshi, 4,292,943, Cl. 123-427.000.
Makino, Kazuhiro, 4,293,077, Cl. 212-219.000.
Mochida, Hideyuki; Tamura, Shingo; and Tsurumi, Etsuo, 4,293,903, Cl. 363-68.000.
Morishita, Hirosada; Kawamoto, Mineo; and Murakami, Kanzi, 4,293,592, Cl. 427-98.000.
Morooka, Yasuo; Tanifuji, Shinya; and Tanuma, Masaya, 4,292,825, Cl. 72-8.000.
Nakae, Hideo; Ozaki, Toshinori; Shimaguchi, Takashi; and Morimoto, Syogo, 4,292,832, Cl. 72-365.000.
Ohsumi, Katsumi; and Miki, Minoru, 4,293,382, Cl. 376-308.000.
Ohta, Hirofumi, 4,293,929, Cl. 365-2.000.
Shibayama, Akinori; Maio, Kenji; and Yokozawa, Norio, 4,293,819, Cl. 330-9.000.
Terashima, Isamu, 4,292,925, Cl. 118-690.000.
Toriyama, Kazuhisa; Hata, Tsujiaki; Hasegawa, Shinji; and Sasaki, Ken, 4,293,698, Cl. 546-301.000.
Unnai, Takaaki; Izumi, Akiya; and Hinosugi, Misturu, 4,293,586, Cl. 427-68.000.

Hitachi Shipbuilding & Engineering Co. Ltd.: *See—*
Inaba, Hideya; Nagai, Kenichi; Ichiki, Masayoshi; Kamino, Yasumi; and Maeda, Kazuo, 4,293,447, Cl. 252-461.000.

Hobo, Nobuhito: *See—*
Tsuzuki, Yoshihiko; Kaga, Sumihiro; and Hobo, Nobuhito, 4,293,893, Cl. 362-38.000.

Hochberg, Lindsey S.; and Borland, Montague C., to Logitek Electronic Systems, Inc. Balanced input phonograph preamplifier circuit. 4,293,823, Cl. 330-260.000.

Hochiki Corporation: *See—*
Sawa, Hiroshi; and Yamauchi, Yukio, 4,292,844, Cl. 73-359.00A.

Hockema, Robert J. Adjustable box stool. 4,292,903, Cl. 108-146.000.

Hockham, George A., to International Telephone and Telegraph Corporation. Polarization agile meander line array. 4,293,858, Cl. 343-731.000.

Hoechst Aktiengesellschaft: *See—*
Becker, Reinhold, 4,292,711, Cl. 17-49.000.
Blumbach, Jurgen; Durckheimer, Walter; and Schrinner, Elmar, 4,293,550, Cl. 424-246.000.
Hoyer, Ernst; Steckelberg, Willi; Deucker, Walter; and Schickfluss, Rudolf, 4,293,306, Cl. 8-471.000.

Hoefer, Wayne A.; and Tanty, Paul J., to Caterpillar Tractor Co. Brake control circuit with parking and retarding valves. 4,293,164, Cl. 303-13.000.

Hoefke, Wolfgang: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.

Hoehn, Marvin M.; and Michel, Karl H., to Eli Lilly and Company. Process for production of antibiotic A-33853. 4,293,649, Cl. 435-118.000.

Hoffman, Mark H., to SCI Systems, Inc. Printer control system. 4,293,233, Cl. 400-144.200.

Hoh, Ying-Chu: *See—*
Wang, Wei Ko; Hoh, Ying-Chu; Chuang, Wen-Shou; and Shaw, I-Sine, 4,293,332, Cl. 75-99.000.

Holderith, William J.: *See—*
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Holken, Norbert: *See—*
Rosenberg, Harry; and Holken, Norbert, 4,293,247, Cl. 405-296.000.

Holmes, Arthur S.: *See—*
Ryan, James M.; and Holmes, Arthur S., 4,293,322, Cl. 62-17.000.

Holmes, Horace D. Reusable prevailing torque nut. 4,293,262, Cl. 411-311.000.

Holmstadt, Ronald J.; and Comer, Robert C., to Toro Company, The. Power cultivator with debris excluding barrier and scraper. 4,293,041, Cl. 172-39.000.

Holtey, Thomas O.: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Homan, Gary R.; and Lee, Chi-Long, to Dow Corning Corporation. Oxygen-curable mercaptoorganosiloxane compositions containing both redox and iron carbonyl compounds and method of forming higher molecular weight products therefrom. 4,293,676, Cl. 528-15.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao, 4,293,051, Cl. 180-133.000.

Honeywell Information Systems Inc.: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Honna, Takaji: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.

Honnold, Fred V.: *See—*
Raymond, Glendon A.; Honnold, Fred V.; and Spath, Herbert J., 4,293,093, Cl. 237-19.000.

Hoogovens Ijmuiden B.V.: *See—*
Felthuis, Jacob; and Rumphorst, Jacobus A., 4,292,993, Cl. 137-340.000.

Hooser, Oneida O. Retractable safety handle means for a ladder. 4,293,055, Cl. 182-106.000.

Hopkins, Donald L., to Alf Hannaford & Co. Pty. Ltd. Method and means for holding a sheep. 4,292,931, Cl. 119-103.000.

Hoppe, Walter, to Zimmermann & Jansen GmbH. Compressed air dredge. 4,292,747, Cl. 37-58.000.

Hori, Kiyoshi; and Nagata, Nobuyoshi, to Nippon Paint Co., Ltd. Method of forming decorative relief pattern and pattern-forming device therefor. 4,293,599, Cl. 427-274.000.

Horie, Masayuki: *See—*
Iizuka, Takashi; and Horie, Masayuki, 4,293,868, Cl. 357-46.000.

Horike, Masanori: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,293,865, Cl. 346-140.00R.

Hornaman, Ernest C.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,293,665, Cl. 525-255.000.

Hort, Eugene V.: *See—*
Parthasarathy, R.; and Hort, Eugene V., 4,293,444, Cl. 252-432.000.

Hortman, Michael T.; and Naum, Robert G., to Carborundum Company, The. Method for increasing boron$^{10}$ contents of neutron absorbing articles. 4,293,598, Cl. 427-203.000.

Horton, Charles R.: *See—*
Siryj, Bohdan W.; Scott, Richard D.; and Horton, Charles R., 4,293,212, Cl. 354-299.000.

Horton, James A., to Jersey Nuclear-Avco Isotopes, Inc. Compact mirror mount. 4,293,112, Cl. 248-487.000.

Horzinek, Marian C.; and Osterhaus, Albertus D. M. E. Method for propagating feline infectious peritonitis virus. 4,293,653, Cl. 435-237.000.

Hoshii, Toshifumi, to Casio Computer Co., Ltd. Power consumption control system for electronic digital data processing devices. 4,293,927, Cl. 364-900.000.

Hosoe, Kazuya: *See—*
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

Hospelhorn, Verne D.: *See—*
Jensen, Elwood V.; and Hospelhorn, Verne D., 4,293,536, Cl. 424-1.000.

Hotogi, Akira: *See—*
Kosaka, Kenji; Iwatsuka, Takeshi; Shindo, Ikuo; and Hotogi, Akira, 4,293,423, Cl. 210-676.000.

Houn, Lin P. Air floating saucer toy. 4,292,755, Cl. 46-44.000.

Howard, David. Building wall structure. 4,292,775, Cl. 52-220.000.

Hoya Corporation: *See—*
Ishibai, Isao; and Kobayashi, Kunimitsu, 4,293,187, Cl. 350-36.000.

Hoyer, Ernst; Steckelberg, Willi; Deucker, Walter; and Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Process for the dyeing and printing of hydrophobic synthetic organic fiber materials with water-insoluble azo dyestuffs. 4,293,306, Cl. 8-471.000.

Hoyt, Harold C., Jr.; and Greene, William J., to Teledyne Walterboro. Electric welder. 4,293,756, Cl. 219-133.000.

Hoyt, John G. Spinnaker post for sailing vessel. 4,292,910, Cl. 114-102.000.

Hrasche, Heinrich, to Swiss Aluminium Ltd. Load carrying platform or back for vehicles. 4,293,255, Cl. 410-104.000.

Huang, Victor K.; and Ruth, Richard L., to Bell Telephone Laboratories, Incorporated. Data processing apparatus having op-code extension register. 4,293,907, Cl. 364-200.000.

Huddon, Lawrence T. Jewelry clutch. 4,292,715, Cl. 24-155.00C.

Huebner, Klaus: *See—*
Fink, Herbert; Huebner, Klaus; Dinklage, Horst; and Ottofrickenstein, Hans, 4,293,600, Cl. 427-385.500.

Huelster, Richard L.: *See—*
Dyer, Thomas A.; and Huelster, Richard L., 4,293,065, Cl. 198-781.000.

Huerta, Felipe J.: *See—*
Liu, Chunghorng R.; Nayak, Jnaneshwar H.; Stenberg, Herbjorn; Huerta, Felipe J.; and Hall, Woodrow A., 4,292,865, Cl. 82-36.00R.

Huffey, Roy F.; and Pope, John A., to Bexford Limited. Reflex copying process onto light-sensitive recording materials. 4,293,633, Cl. 430-152.000.

Huffsmith, Sarah A.: *See—*
Landingham, Richard L.; and Huffsmith, Sarah A., 4,293,619, Cl. 428-623.000.

Huggins, Raymond W., to Xerox Corporation. Development system. 4,292,923, Cl. 118-658.000.

Hughes Aircraft Company: *See—*
Popa, Adrian E., 4,293,833, Cl. 333-239.000.

Hughes, Donald W. K.; and Myers, Ronald W., to AMP Incorporated. Method for making jack type receptacles. 4,292,736, Cl. 29-884.000.

Hughes, O. Richard, to Celanese Corporation. Process for producing a carboxylate ester using a supported acidic catalyst. 4,293,499, Cl. 260-410.90R.

Hughes Tool Company: *See—*
Mullins, John M.; and Kelly, Joseph L., Jr., 4,293,039, Cl. 166-341.000.

Hunter, Andrew F., to Conoco, Inc. Transfer and docking apparatus for use on variable draft marine vessels. 4,292,912, Cl. 114-219.000.

Hunter Douglas International N.V.: *See—*
Landheer, Hugo A. J., 4,292,779, Cl. 52-486.000.

Hupp, Gerhard; and Mader, Helmut, to Mauser-Werke Obendorf GmbH. Automatic firearm construction. 4,292,881, Cl. 89-33.0CA.

Hurni, William M.: *See—*
McAleer, William J.; Hurni, William M.; and Miller, William J., 4,293,538, Cl. 424-1.000.

Hutterian Society of Brothers: *See—*
Meier, Daniel; and Maendel, Carl, 4,292,933, Cl. 122-114.000.

Hutton, Stanley P.: *See—*
Williams, Garnet M. E.; Hutton, Stanley P.; and Bushman, John A., 4,292,853, Cl. 73-861.790.

Hydril Company: *See—*
Mott, James D., 4,293,034, Cl. 166-208.000.
Parks, Glenn C., Jr.; and Beam, Clark W., 4,293,115, Cl. 251-1.00A.

Hydro-Quebec: *See—*
Belanger, Guy; and Missout, Gilles, 4,293,399, Cl. 204-195.00P.
Jasmin, Gilles; and Bowles, John P., 4,293,923, Cl. 364-802.000.

Ichiki, Masayoshi: *See—*
Inaba, Hideya; Nagai, Kenichi; Ichiki, Masayoshi; Kamino, Yasumi; and Maeda, Kazuo, 4,293,447, Cl. 252-461.000.

Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Kuroki, Katsuro, to Nippon Steel Corporation. Grain-oriented electromagnetic steel sheet with improved watt loss. 4,293,350, Cl. 148-111.000.

Ichizuka, Kiyomi: *See—*
Takita, Seiki; and Ichizuka, Kiyomi, 4,293,866, Cl. 346-140.00R.

Ida, Minoru, to Manten Co., Ltd. Protective handrail for folding baby carriage. 4,293,144, Cl. 280-644.000.

Ihaya, Kazuhiko: *See—*
Nagano, Katsuto; Ihaya, Kazuhiko; Sasa, Syozo; and Nakada, Takeshi, 4,293,370, Cl. 156-612.000.

Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for electrolysis of an aqueous alkali metal chloride solution. 4,293,395, Cl. 204-98.000.

Iijima, Yasuo, to Nippon Electric Co., Ltd. Circuit with crosstalk elimination capability. 4,293,739, Cl. 179-18.0GF.

Iijima, Yoshio, to Daido Metal Company Ltd. Method of producing metal bearings. 4,292,718, Cl. 29-149.5DP.

Iimura, Yoshitaka, to Yoshida Kogyo, K.K. Apparatus for coupling a pair of elongate slide fastener stringers. 4,292,733, Cl. 29-766.000.

Iizuka, Takashi; and Horie, Masayuki, to Hitachi, Ltd. Semiconductor device, method of manufacturing the same and application thereof. 4,293,868, Cl. 357-46.000.

Illinois Tool Works Inc.: *See—*
Frano, Francis G., 4,293,261, Cl. 411-85.000.
Peterson, Francis C., 4,293,257, Cl. 411-11.000.

Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-etsu Chemical Co., Ltd. Method for the preparation of polarizing films or sheets. 4,293,585, Cl. 427-40.000.

Imagawa, Shunjiro: *See—*
Adachi, Hideo; Minai, Kiichi; Moriyasu, Kozo; and Imagawa, Shunjiro, 4,293,768, Cl. 250-338.000.

Imai, Takeshi, to Toray Silicone Company, Ltd. Curable organopolysiloxane composition containing microcapsules. 4,293,677, Cl. 528-15.000.

Imamura, Akio: *See—*
Okumura, Takatoshi; Hamada, Seiya; and Imamura, Akio, 4,292,873, Cl. 84-1.010.

Imperial Chemical Industries, Limited: *See—*
Parkin, Paul C., 4,293,516, Cl. 264-168.000.

Inaba, Hideya; Nagai, Kenichi; Ichiki, Masayoshi; Kamino, Yasumi; and Maeda, Kazuo, to Hitachi Shipbuilding & Engineering Co. Ltd. Process for repairing plate-shaped denitrating catalysts. 4,293,447, Cl. 252-461.000.

Industrias Neoplast, S.A.: *See—*
Bonel, Federico A., 4,293,149, Cl. 285-111.000.

Industrie Pirelli S.p.A.: *See—*
Maiocchi, Luigi, 4,293,019, Cl. 152-361.00R.

Inglefield, Joseph T., Jr.; and Mahood, William L. Allergy testing apparatus. 4,292,979, Cl. 128-743.000.

Inhofer, Harold G., to Aeration Industries, Inc. Water bearing. 4,293,169, Cl. 308-121.000.

Innes, Robert A.: *See—*
Swift, Harold E.; Innes, Robert A.; and Adams, Phillip, 4,293,716, Cl. 564-480.000.

Inokuma, Toshio: *See—*
Asada, Eiichi; Inokuma, Toshio; and Egawa, Isao, 4,293,839, Cl. 338-309.000.

Inomata, Hiroshi: *See—*
Sato, Yasuhiko; and Inomata, Hiroshi, 4,293,397, Cl. 204-159.130.

Inoue, Tomohiro: *See—*
Ogimoto, Kazuo; Inoue, Tomohiro; Tanaka, Susumu; and Kobayashi, Yoshio, 4,293,240, Cl. 405-195.000.

Inoue, Yoshimichi: *See—*
Ohta, Ryuji; and Inoue, Yoshimichi, 4,292,887, Cl. 92-94.000.

Insolar Inc.: *See—*
Wasserman, Kurt J., 4,292,956, Cl. 126-439.000.

Institute of Nuclear Energy Research: *See—*
Wang, Wei Ko; Hoh, Ying-Chu; Chuang, Wen-Shou; and Shaw, I-Sine, 4,293,332, Cl. 75-99.000.





Intel Corporation: *See—*
Cheng, Edmund K.; and Hill, Wiley E., 4,293,848, Cl. 340-347.0AD.

Intensiv-Filter GmbH & Co. KG: *See—*
Kordas, Friedel, 4,293,321, Cl. 55-357.000.

Interatom, Internationale Atomreaktorbau GmbH: *See—*
Lakra, Ruhama J.; Freund, Jurgen; and Rauschert, Gerd, 4,293,383, Cl. 376-290.000.

Intercontinental Valve Manufacturing Company: *See—*
Mueller, John H., 4,293,117, Cl. 251-229.000.

International Business Machines Corporation: *See—*
Chaudhari, Praveen; Chou, Ned J.; Feder, Ralph; Fowler, Alan B.; and VanVechten, James A., 4,293,374, Cl. 156-628.000.
Cox, Allen R.; and Smathers, Edmond W., 4,293,883, Cl. 360-104.000.
Dasgupta, Sumit; Goel, Prabhakar; and Williams, Thomas W., 4,293,919, Cl. 364-716.000.
Flusche, Frederick O.; Tan, Kwang G.; and Wright, Ralph W., 4,293,910, Cl. 364-200.000.
Gaston, Charles A.; Kirk, Joseph P.; and Wasik, Chester A., 4,293,224, Cl. 356-357.000.
Le, Trung, 4,293,802, Cl. 315-387.000.
McCarty, Vincent D., 4,293,888, Cl. 361-152.000.
Vigar, James M. L., 4,293,620, Cl. 428-667.000.

International Flavors & Fragrances Inc.: *See—*
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,293,579, Cl. 426-535.000.
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'-Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

International Moorings & Marine, Inc.: *See—*
Helveston, Wilton L.; and Pecoraro, Richard J., 4,293,241, Cl. 405-213.000.

International Paper Company: *See—*
Kreiling, William H.; and Jones, Edward S., 4,293,595, Cl. 427-121.000.
Kreiling, William H.; and Jones, Edward S., 4,293,610, Cl. 428-246.000.

International Standard Electric Corporation: *See—*
Greenwood, John C., 4,293,373, Cl. 156-628.000.

International Telephone and Telegraph Corporation: *See—*
Hockham, George A., 4,293,858, Cl. 343-731.000.
Jarger, Harold F., 4,293,818, Cl. 329-50.000.
Kuras, Michael L.; Upp, Daniel C.; and Toegel, Herbert J., 4,293,946, Cl. 370-62.000.
Lacaze, Leonard, Jr., 4,293,181, Cl. 339-258.00R.
Schwartz, Lawrence, 4,293,182, Cl. 339-275.00R.
Silva, Roy; Ash, David J.; and Scheible, Clement E., 4,293,572, Cl. 426-19.000.

Interox: *See—*
Gago, Ignace, 4,293,426, Cl. 210-759.000.

Irie, Toshio: *See—*
Matsumura, Ko; Nakamura, Hiroto; and Irie, Toshio, 4,293,336, Cl. 75-124.000.

Isaacs, Jim W.: *See—*
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, 4,293,507, Cl. 264-0.500.

Isahaya, Fumio; and Yukitake, Tugihiro, to Hitachi, Ltd. Apparatus for cleaning waste flue gases. 4,293,521, Cl. 422-62.000.

Isaka, Tsutomu; and Kumada, Saburoh, to Toyo Baseki Kabushiki Kaisha. Olefin packaging laminate. 4,293,608, Cl. 428-220.000.

Isayama, Takuro, to Ricoh Co., Ltd. Device for removing air bubbles formed and trapped in ink chamber of print head of ink-jet printer. 4,293,867, Cl. 346-140.00R.

Ishibai, Isao; and Kobayashi, Kunimitsu, to Hoya Corporation. Binocular optical system with automatic focussing. 4,293,187, Cl. 350-36.000.

Ishihara, Taketoshi: *See—*
Wada, Shinzi; Kitao, Ikuo; Oana, Yoshinori; Kato, Yasuo; and Ishihara, Taketoshi, 4,293,199, Cl. 351-13.000.

Ishikawa, Hiroshi; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Pyrido[3,2,1-jk]carbazols. 4,293,694, Cl. 546-72.000.

Ishikawa, Kohji: *See—*
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.

Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, to Ishikawa, Masayuki. 1-Phthalazone derivatives, and use thereof. 4,293,553, Cl. 424-250.000.

Ishikawa, Takatoshi: *See—*
Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, 4,293,639, Cl. 430-393.000.

Ishikawa, Yasuyuki: *See—*
Kohayakawa, Yoshimi; Ishikawa, Yasuyuki; and Maruyama, Shigeo, 4,293,198, Cl. 351-13.000.

Ishizuka, Ichiro: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,293,328, Cl. 71-88.000.

Israel Aircraft Industries Ltd.: *See—*
Hadari, Gideon, 4,293,840, Cl. 340-27.0AT.

Israel, Benjamin, to North Eastern Timber (U.S.A.) Incorporated. Candy floss machine. 4,293,292, Cl. 425-9.000.

Itaya, Toshihisa: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.

Ito, Motoya; Sato, Masaki; Watanabe, Masatoshi; and Okuda, Hironori, to Hitachi, Ltd. Stator winding holding structure for rotary electric machine. 4,293,787, Cl. 310-181.000.

Ito, Shigeru: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,293,553, Cl. 424-250.000.

Itogawa, Zirou; and Aoto, Yoshiyuki, to Sharp Kabushiki Kaisha. Hair waving appliance. 4,292,985, Cl. 132-9.000.

Itoh, Isamu; Hashimura, Taiji; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Bleaching compositions for photographic processing. 4,293,639, Cl. 430-393.000.

Itoh, Katsumi: *See—*
Muto, Katsuya; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,293,811, Cl. 322-60.000.

Iuchi, Tohru: *See—*
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Kuroki, Katsuro, 4,293,350, Cl. 148-111.000.

Ivanov, Boris N.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Iwai, Yasuyuki: *See—*
Yamazaki, Yoshio; Kamogawa, Nin-ichi; and Iwai, Yasuyuki, 4,292,922, Cl. 118-657.000.

Iwaki, Tetsuo; Takahashi, Yukio; Moriuchi, Shuji; and Kaneko, Hisamitsu, to Mitsui Petrochemical Industries, Ltd. Process for preparation of hydroperoxides. 4,293,720, Cl. 568-575.000.

Iwasaki, Kyuhachiro: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,293,865, Cl. 346-140.00R.

Iwasaki, Yasuhiro: *See—*
Koike, Mitsuhito; and Iwasaki, Yasuhiro, 4,292,821, Cl. 66-75.200.

Iwata Electric Co., Ltd.: *See—*
Iwata, Keisuke, 4,293,860, Cl. 343-715.000.

Iwata, Keisuke, to Iwata Electric Co., Ltd. Antenna alarm assembly for vehicle. 4,293,860, Cl. 343-715.000.

Iwata, Masayosi; and Douke, Harumi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Combination switching means of lever type for motor vehicles. 4,293,743, Cl. 200-4.000.

Iwatsuka, Takeshi: *See—*
Kosaka, Kenji; Iwatsuka, Takeshi; Shindo, Ikuo; and Hotogi, Akira, 4,293,423, Cl. 210-676.000.

Izawa, Kyoichi: *See—*
Matsuda, Takehiko; and Izawa, Kyoichi, 4,293,745, Cl. 200-52.00R.

Izumi, Akiya: *See—*
Unnai, Takaaki; Izumi, Akiya; and Hinosugi, Misturu, 4,293,586, Cl. 427-68.000.

Izumita, Morishi; Maeda, Takeshi; Tsunoda, Yoshito; and Sawano, Susumu, to Hitachi, Ltd. Information play-back apparatus with astigmatic auto-focusing. 4,293,944, Cl. 369-45.000.

J. C. Bamford Excavators Limited: *See—*
Prime, Derek A., 4,293,270, Cl. 414-690.000.

J. F. Enterprises, Inc.: *See—*
Acker, Donald J., 4,292,698, Cl. 5-45.000.

J. F. Tonnies Erben K.G.: *See—*
Krause, Heinz; and Sanner, Bert, 4,292,977, Cl. 128-712.000.

J. R. Simplot Company: *See—*
Hamann, Michael L.; and Pinegar, Richard K., 4,293,582, Cl. 426-637.000.

Jach, Jan: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.

Jackson, John T., Jr., to Jackson Research, Inc. Rotating electric machines with enhanced radiation cooling. 4,293,785, Cl. 310-64.000.

Jackson Research, Inc.: *See—*
Jackson, John T., Jr., 4,293,785, Cl. 310-64.000.

Jackson, Roy J., to Shell Oil Company. Process for stabilizing polyester compositions. 4,293,672, Cl. 525-507.000.

Jacobson, Martin, to United States of America, Agriculture. Anti-feedant for boll weevils. 4,293,567, Cl. 424-312.000.

Jaecklin, Felix P. Structural system and structural elements for use and construction of earth filled walls. 4,293,245, Cl. 405-272.000.

Jaffe, Wolfgang; and Rogan, Bruce R., to Singer Company, The. Hall effect potentiometer. 4,293,837, Cl. 338-32.00H.

Jagenberg Werke: *See—*
Schmitz, Rolf, 4,293,087, Cl. 226-172.000.

Jakobsen, Kjell M., to Aktiebolaget Platmanufaktur AB. Method for fastening a stabilizing arrangement on a container. 4,293,359, Cl. 156-156.000.

Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., to Lilly Industries Limited. Thenyl hydantoins and anti-asthmatic compositions thereof. 4,293,563, Cl. 424-273.00R.

Jansen, Martin B., Jr.: *See—*
Beynet, Pierre A.; Lucksinger, James E.; and Jansen, Martin B., Jr., 4,293,146, Cl. 285-24.000.

Jarger, Harold F., to International Telephone and Telegraph Corporation. Frequency modulation threshold extension demodulator utilizing frequency compression feedback with frequency drift correction. 4,293,818, Cl. 329-50.000.

Jarre, Wolfgang: *See—*
Nissen, Dietmar; Marx, Matthias; Jarre, Wolfgang; Schoen, Ernst; and Decker, Walter, 4,293,657, Cl. 521-121.000.

Jasmin, Gilles; and Bowles, John P., to Hydro-Quebec. System for simulating the operating characteristics of electric machines. 4,293,923, Cl. 364-802.000.

Jaworski, Eugene; and Breslow, Jeffrey D., to Marvin Glass & Associates. Toy launching device. 4,292,756, Cl. 46-72.000.

Jeco Co., Ltd.: *See—*
Tanaka, Toyonaru; and Naito, Hideki, 4,293,842, Cl. 340-52.00F.

Jedlinski, Stanislaw: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.

Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, to Polska Akademia Nauk Zaklad Polimerow. Method for manufacturing crosslinked polyether-ester resins. 4,293,685, Cl. 528-190.000.

Jellema, Auke, to Staalkat B.V. Method and apparatus for denesting a plurality of containers filled with articles. 4,293,272, Cl. 414-744.00B.

Jennings, Frederick R.: *See—*
Buschor, Josef J.; and Jennings, Frederick R., 4,292,787, Cl. 53-456.000.

Jensen, Elwood V.; and Hospelhorn, Verne D., to University Patents, Inc. Estrophilin detection. 4,293,536, Cl. 424-1.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Horton, James A., 4,293,112, Cl. 248-487.000.
McAllister, Gary L.; and Draggoo, V. G., 4,293,827, Cl. 331-94.5ML.

Jidosha Kiki Co., Ltd.: *See—*
Ohta, Ryuji; and Inoue, Yoshimichi, 4,292,887, Cl. 92-94.000.

Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Co., Ltd. Ink-jet recording apparatus. 4,293,865, Cl. 346-140.00R.

Jinnouchi, Takeshi. Bellows apparatus. 4,292,885, Cl. 92-43.000.

Joanis, Marvin A., Sr. Sewer cleaning blade stabilizer. 4,292,704, Cl. 15-104.3SN.

Johannes, Gerald E. Silicone rubber explosive and method of making. 4,293,351, Cl. 149-19.200.

Johansen, Arne W., to Adidas Fabrique de Chaussures de Sport. Ski binding for cross-country skis. 4,293,143, Cl. 280-615.000.

Johansson, Hans E.: *See—*
Andersson, Kjell R.; and Johansson, Hans E., 4,293,612, Cl. 428-281.000.

John D. Hollingsworth on Wheels, Inc.: *See—*
Bonner, Alvin T., Sr., 4,292,712, Cl. 19-159.00A.

Johnson, Betty S.: *See—*
Buckman, John D.; Buckman, Stanley J.; Johnson, Betty S.; and Pera, John D., 4,293,559, Cl. 424-270.000.

Johnson, Douglas L., to White's Electronics, Inc. Balanced search loop for metal detector. 4,293,816, Cl. 324-329.000.

Johnson & Johnson Baby Products Company: *See—*
Klasek, Ladislav J.; Lamber, Clarence F.; and Passafiume, Anthony, 4,293,367, Cl. 156-494.000.

Johnson, Julius T.; and Johnson, Robert R. Raw milk transfer systems. 4,292,994, Cl. 137-351.000.

Johnson, Lewis A.: *See—*
Wirostko, Emil; and Johnson, Lewis A., 4,293,568, Cl. 424-330.000.

Johnson, Ralph E., to Singer Company, The. Rotatable loop taker and bobbin case assembly. 4,292,906, Cl. 112-184.000.

Johnson, Robert R.: *See—*
Johnson, Julius T.; and Johnson, Robert R., 4,292,994, Cl. 137-351.000.

Johnston, J. O'Neal: *See—*
Metcalf, Brian W.; and Johnston, J. O'Neal, 4,293,548, Cl. 424-242.000.

Jones, Edward M.; and Simmons, Carlton J., Jr., to Baldwin Piano & Organ Company. Automatic control apparatus for chords and sequences. 4,292,874, Cl. 84-1.030.

Jones, Edward S.: *See—*
Kreiling, William H.; and Jones, Edward S., 4,293,595, Cl. 427-121.000.
Kreiling, William H.; and Jones, Edward S., 4,293,610, Cl. 428-246.000.

Jones, James A.: *See—*
Werneke, Michael F.; and Jones, James A., 4,293,406, Cl. 209-166.000.

Jonsson, Carldavid. Method and apparatus for facilitating underwater work on ship hulls and like objects. 4,292,914, Cl. 114-222.000.

Joseph, Christian M., to Manufacture de Produits Chimiques Protex. Setting retardatives for compositions with a gypsum plaster base or anhydrite. 4,293,344, Cl. 106-111.000.

Joseph Gamell Industries, Inc.: *See—*
Gamell, Joseph A., 4,293,777, Cl. 290-52.000.

Josson, Sven A.: *See—*
Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., 4,293,409, Cl. 210-96.200.

Joyce, Glover C.: *See—*
Kirk, Calvin K.; Joyce, Glover C.; and Messier, Francis L., 4,292,766, Cl. 51-105.0SP.

Juda, Walter: *See—*
Allen, Robert J.; Lindstrom, Robert; and Juda, Walter, 4,293,396, Cl. 204-106.000.

Judelshon Industries Division, John Dusenbery Co., Inc.: *See—*
Stoffels, Carl A.; and Genovese, Nicholas J., 4,292,867, Cl. 82-47.000.

Jyojiki, Masao: *See—*
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, 4,293,205, Cl. 354-23.00D.
Tokutomi, Seijiro; Jyojiki, Masao; Aoki, Harumi; Nakamura, Kazuo; and Watanabe, Koichiro, 4,293,206, Cl. 354-25.000.

K.R.P. Plastiques: *See—*
Vernon, Michel, 4,293,511, Cl. 264-55.000.

K-2 Corporation: *See—*
Davignon, Alan J., 4,293,142, Cl. 280-610.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Tanaka, Kojiro; Ochiai, Shozo; and Noda, Hideki, 4,293,782, Cl. 307-350.000.

Kabushiki Kaisha GEMVAC: *See—*
Sakuma, Shinzo; and Yanagisawa, Hifumi, 4,293,748, Cl. 200-144.00B.

Kabushiki Kaisha Kurio-Medikaru: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,292,973, Cl. 128-303.100.

Kabushiki Kaisha Meidensha: *See—*
Sakuma, Shinzo; and Yanagisawa, Hifumi, 4,293,748, Cl. 200-144.00B.

Kabushiki Kaisha Sato Kenkyusho: *See—*
Sato, Yo, 4,292,894, Cl. 101-291.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Gomi, Yoshifumi, 4,293,235, Cl. 400-322.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Iwata, Masayosi; and Douke, Harumi, 4,293,743, Cl. 200-4.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Tanasawa, Yasusi; Muto, Norio; Saito, Akinori; and Kawamura, Kiyomi, 4,292,947, Cl. 123-445.000.

Kaczynski, Thomas E., to Kennametal Inc. Toolholder with expansible shank. 4,292,866, Cl. 82-36.00R.

Kaga, Sumihiro: *See—*
Tsuzuki, Yoshihiko; Kaga, Sumihiro; and Hobo, Nobuhito, 4,293,893, Cl. 362-38.000.

Kai Cutlery Center Co., Ltd.: *See—*
Osada, Hiroshi, 4,292,738, Cl. 30-162.000.

Kaiya, Nobuo: *See—*
Sasaki, Shosaku; and Kaiya, Nobuo, 4,293,671, Cl. 525-478.000.

Kajitani, Makoto: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.

Kajiwara, Takao: *See—*
Hatada, Kenzo; and Kajiwara, Takao, 4,293,637, Cl. 430-314.000.

Kakinuma, Mitsuru; and Takahashi, Yoshitaka, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Control device for ice making machine. 4,292,812, Cl. 62-157.000.

Kako, Hiroyoshi; and Arai, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transfer device associated with power transmission. 4,292,860, Cl. 74-665.0GA.

Kakumoto, Ken-Ichi; and Fujita, Yoshiki, to Koyo Seiko Company Limited. Anti-friction bearing. 4,293,171, Cl. 308-188.000.

Kamejima, Kohji; Tanaka, Hideki; Kano, Minoru; and Fukushima, Toshihiko, to Hitachi, Ltd. Operating method for refrigerating machine. 4,292,811, Cl. 62-56.000.

Kamino, Yasumi: *See—*
Inaba, Hideya; Nagai, Kenichi; Ichiki, Masayoshi; Kamino, Yasumi; and Maeda, Kazuo, 4,293,447, Cl. 252-461.000.

Kamioka, Hajime: *See—*
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, 4,293,589, Cl. 427-93.000.
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, 4,293,590, Cl. 427-93.000.

Kamogawa, Nin-ichi: *See—*
Yamazaki, Yoshio; Kamogawa, Nin-ichi; and Iwai, Yasuyuki, 4,292,922, Cl. 118-657.000.

Kamp, Arthur J.: *See—*
Kelly, Kerry J.; and Kamp, Arthur J., 4,293,379, Cl. 376-159.000.

Kanada, Hiroshi, to Matsushita Electric Works, Ltd. Switch. 4,293,753, Cl. 200-315.000.

Kanda, Hiroshi: *See—*
Mikami, Yasuo; Kanda, Hiroshi; and Uno, Akio, 4,293,574, Cl. 426-46.000.

Kando, Toru; and Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Release button device for camera. 4,293,210, Cl. 354-269.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, 4,293,395, Cl. 204-98.000.

Kaneko, Hisamitsu: *See—*
Iwaki, Tetsuo; Takahashi, Yukio; Moriuchi, Shuji; and Kaneko, Hisamitsu, 4,293,720, Cl. 568-575.000.

Kangol Magnet Limited: *See—*
Standing, David L., 4,293,106, Cl. 242-107.40A.

Kanjo, Wajih: *See—*
Weseloh, Roger J.; Kanjo, Wajih; and Karim, Syed, 4,292,721, Cl. 29-243.520.

Kano, Minoru: *See—*
Kamejima, Kohji; Tanaka, Hideki; Kano, Minoru; and Fukushima, Toshihiko, 4,292,811, Cl. 62-56.000.





Kano, Toshiji: *See—*
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, 4,293,395, Cl. 204-98.000.

Kan'o, Yoshiharu: *See—*
Tanaka, Yoshikazu; Shirai, Hitoshi; and Kan'o, Yoshiharu, 4,293,931, Cl. 365-222.000.

Kapetanakos, Christos A. Generation of intense, high-energy ion pulses by magnetic compression of ion rings. 4,293,794, Cl. 315-111.810.

Karch, John A.: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,293,403, Cl. 208-120.000.

Karev, Nikolai V.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Karim, Syed: *See—*
Weseloh, Roger J.; Kanjo, Wajih; and Karim, Syed, 4,292,721, Cl. 29-243.520.

Karmanski, Stanislaw: *See—*
Pretor, Wincenty; Rozmus, Edward; Korecki, Zbigniew; and Karmanski, Stanislaw, 4,293,248, Cl. 405-300.000.

Karol, Frederick J.: *See—*
Hamer, Anthony D.; and Karol, Frederick J., 4,293,673, Cl. 526-88.000.

Kasamatsu, Kiyoshi: *See—*
Suzuki, Yukio; Kasamatsu, Kiyoshi; and Aketa, Kohichi, 4,293,504, Cl. 260-465.00D.

Kashiwagi, Tutomu, to Dai-Ichi Seiko Co., Ltd. Counter. 4,293,765, Cl. 235-144.00R.

Kasuga, Muneo: *See—*
Nishikawa, Masaji; and Kasuga, Muneo, 4,293,213, Cl. 355-14.00R.

Katada, Hiroshi; and Kyogoku, Yoshito, to Hitachi, Ltd. Ignition system for internal combustion engines. 4,292,942, Cl. 123-418.000.

Katada, Hiroshi: *See—*
Kyogoku, Yoshito; and Katada, Hiroshi, 4,292,943, Cl. 123-427.000.

Kato, Yasuo: *See—*
Wada, Shinzi; Kitao, Ikuo; Oana, Yoshinori; Kato, Yasuo; and Ishihara, Taketoshi, 4,293,199, Cl. 351-13.000.

Katz, Bernard R., to Telegram Communications Corp. Wide bandwidth video amplifier. 4,293,875, Cl. 358-184.000.

Kaufmann, Kenneth M., to Pako Corporation. Automatic replenisher control system. 4,293,211, Cl. 354-298.000.

Kawai, Kazuo: *See—*
Tamori, Michitoshi; and Kawai, Kazuo, 4,293,952, Cl. 375-14.000.

Kawai, Yoshio: *See—*
Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, 4,293,533, Cl. 423-449.000.

Kawakami, Yoshiyuki: *See—*
Sawa, Yoichi; Kawakami, Yoshiyuki; and Marumoto, Ryuji, 4,293,690, Cl. 536-24.000.

Kawamoto, Mineo: *See—*
Morishita, Hirosada; Kawamoto, Mineo; and Murakami, Kanzi, 4,293,592, Cl. 427-98.000.

Kawamura, Kiyomi: *See—*
Tanasawa, Yasusi; Muto, Norio; Saito, Akinori; and Kawamura, Kiyomi, 4,292,947, Cl. 123-445.000.

Kawasaki, Masahiro: *See—*
Aoki, Harumi; Kawasaki, Masahiro; and Sawada, Yoshio, 4,293,207, Cl. 354-25.000.

Kawasaki Steel Corporation: *See—*
Matsumura, Ko; Nakamura, Hiroto; and Irie, Toshio, 4,293,336, Cl. 75-124.000.

Kawashima, Kazuma, to Olympus Optical Company Ltd. Apparatus for automatically controlling the position of endoscopes or similar devices in a cavity. 4,292,961, Cl. 128-6.000.

Kay, David B.; Wheeless, Leon L., Jr.; and Cambier, James L., to Research Corporation. Multidimensional slit-scan flow system. 4,293,221, Cl. 356-318.000.

Kaznacheevsky, Nikolai A.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Keene Corporation: *See—*
Budnovitch, William F.; Petralia, Salvatore C.; and Silvestris, Louis F., 4,293,898, Cl. 362-291.000.

Keesler, Floyd F.: *See—*
Bailey, David C.; and Keesler, Floyd F., 4,293,124, Cl. 271-233.000.

Keller, Ernst. Double sided tumbler cylinder for a security lock. 4,292,824, Cl. 70-373.000.

Keller, Hans; and Knop, Hans-Georg, to Dr.-Ing. Rudolf Hell GmbH. Production of printing blocks or forms. 4,293,872, Cl. 358-75.000.

Kelly, Darrell A.: *See—*
Plischke, LeMoyne W.; Familant, Harold M.; and Kelly, Darrell A., 4,293,614, Cl. 428-370.000.

Kelly, James J. Apparatus for fastening insulation to a pipe. 4,293,005, Cl. 138-149.000.

Kelly, Joseph L., Jr.: *See—*
Mullins, John M.; and Kelly, Joseph L., Jr., 4,293,039, Cl. 166-341.000.

Kelly, Kerry J.; and Kamp, Arthur J., to Dow Chemical Company, The. Neutron activation analysis method and apparatus for determining sodium and sodium compounds in liquid samples. 4,293,379, Cl. 376-159.000.

Kendall Company, The: *See—*
Daverport, Stanley, Jr., 4,292,687, Cl. 2-2.000.

Kennametal Inc.: *See—*
Kaczynski, Thomas E., 4,292,866, Cl. 82-36.00R.

Kennecott Corporation: *See—*
Henri, Paul, 4,293,111, Cl. 248-95.000.

Kennedy, Jerome J.; Wayne, Harold S.; and White, Charles A., to U.S. Industries, Inc. Egg transporting system. 4,293,066, Cl. 198-813.000.

Kenyon, William E.: *See—*
Park, Sung K.; and Kenyon, William E., 4,293,933, Cl. 367-25.000.

Keoteklian, Hagop, to Entenmann's, Inc. Apparatus for treating plant effluent. 4,293,416, Cl. 210-208.000.

Kernforschungsanlage Julich GmbH: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.

Kewanee Industries: *See—*
Swift, Harold E.; Innes, Robert A.; and Adams, Phillip, 4,293,716, Cl. 564-480.000.

Kiesling, Norbert W., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,292,945, Cl. 123-438.000.

Kikuchi, Tsuyoshi; and Takusagawa, Kiyoshi, to Toshiba Kikai Kabushiki Kaisha. Spray device for a die casting machine. 4,293,024, Cl. 164-303.000.

Kim, Matthew S. Adjustable convex rearview mirror. 4,293,191, Cl. 350-293.000.

Kim, Oh-Kil: *See—*
Fox, Robert B.; and Kim, Oh-Kil, 4,293,452, Cl. 252-518.000.

Kimura, Tsutomu: *See—*
Ohnishi, Masahiro; and Kimura, Tsutomu, 4,293,202, Cl. 354-5.000.

Kinast, Gunther; Muller, Lutz; Puls, Walter; and Sitt, Rudiger, to Bayer Aktiengesellschaft. N-Amino-3,4,5-trihydroxypiperidines, their production and their medicinal use. 4,293,551, Cl. 424-249.000.

King, Clyde R., to Eagle-Picher Industries, Inc. Tool for applying insulation to pipes. 4,292,713, Cl. 24-24.000.

King, Dallas E., to General Motors Corporation. Dynamoelectric machine brush rigging. 4,293,789, Cl. 310-239.000.

King, Harold B., to General Electric Company. Nuclear fuel rod loading apparatus. 4,292,788, Cl. 53-500.000.

King, Harry A.: *See—*
Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., 4,292,898, Cl. 105-238.00R.

King, Junior K.: *See—*
Gookins, William L.; and King, Junior K., 4,293,854, Cl. 340-615.000.

Kinoshita, Makoto: *See—*
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

Kinoshita, Minoru; Sugou, Kiyoshi; and Onoda, Yukio, to Dainippon Screen Seizo Kabushiki Kaisha. Photographic film blackening area measuring device. 4,293,226, Cl. 356-443.000.

Kirby, Raymond L., Jr., to Monarch Marking Systems, Inc. Endless band printer with spacers between drive wheels. 4,292,893, Cl. 101-111.000.

Kirchoff, Robert A.: *See—*
Moore, Carl; and Kirchoff, Robert A., 4,293,476, Cl. 260-29.70W.

Kirk, Calvin K.; Joyce, Glover C.; and Messier, Francis L., to Warner & Swasey Company, The. Method and apparatus for grinding a workpiece. 4,292,766, Cl. 51-105.0SP.

Kirk, Joseph P.: *See—*
Gaston, Charles A.; Kirk, Joseph P.; and Wasik, Chester A., 4,293,224, Cl. 356-357.000.

Kirzner, Felix I.: *See—*
Romanov, Viktor I.; Kirzner, Felix I.; and Soroka, Yakov K., 4,293,273, Cl. 415-78.000.

Kishi, Tuneo; and Sasaki, Koji, to Hitachi, Ltd. Puffer type gas circuit breaker. 4,293,749, Cl. 200-144.0AP.

Kishimoto, Kazuo: *See—*
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, 4,293,395, Cl. 204-98.000.

Kistler Instrumente AG: *See—*
Maag, Willi; Baumgartner, Hans U.; Vollenweider, Max; and Wolf, Hans J., 4,292,769, Cl. 51-169.000.

Kitao, Ikuo: *See—*
Wada, Shinzi; Kitao, Ikuo; Oana, Yoshinori; Kato, Yasuo; and Ishihara, Taketoshi, 4,293,199, Cl. 351-13.000.

Kitao, Takaya: *See—*
Noguchi, Satoshi; and Kitao, Takaya, 4,293,940, Cl. 368-75.000.

Klasek, Ladislav J.; Lamber, Clarence F.; and Passafiume, Anthony, to Johnson & Johnson Baby Products Company. Apparatus for effecting securement of a transversely moved elastic ribbon to a moving web. 4,293,367, Cl. 156-494.000.

Klauke, Erich: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm, 4,293,566, Cl. 424-304.000.

Klein, Max. Enhanced wet strength filter mats to separate particulates from fluids and/or coalesce entrained droplets from gases. 4,293,378, Cl. 162-145.000.

Kleine, Albert W., Jr.: *See—*
Gilts, Richard G.; Hille, Earl A.; Kleine, Albert W., Jr.; and Shamp, Donald E., 4,293,264, Cl. 414-38.000.

Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, to Exxon Research &

Engineering Co. Electrolytes for alkali-metal electrochemical devices. 4,293,623, Cl. 429-194.000.

Klemarczyk, Philip: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Klements, Walter S.: *See—*
Meares, Harry E., Jr., 4,293,083, Cl. 222-133.000.

Klemm, Walter: *See—*
Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, 4,293,526, Cl. 422-205.000.

Kleppner, Daniel, to Massachusetts Institute of Technology. Detecting IR and mm radiation. 4,293,769, Cl. 250-338.000.

Klie, Wolfgang: *See—*
Lutze, Hans; Weisshappel, Helmut; Klie, Wolfgang; and Weidemann, Dieter, 4,293,160, Cl. 296-188.000.

Klockner-Humboldt-Deutz AG: *See—*
Sauert, Fried, 4,293,123, Cl. 266-268.000.

Klockner-Werke AG: *See—*
Boer, Werner; Lachner, Hans; Maschonat, Guenter; Richter, Joerg; Schulte, Heinrich; and Warnke, Hans, 4,293,246, Cl. 405-291.000.

Kloesel, Joseph A., Jr., to Smith International, Inc. Jet dual bit. 4,293,048, Cl. 175-340.000.

Klopfer, Howard J.: *See—*
Takekoshi, Tohru; and Klopfer, Howard J., 4,293,683, Cl. 528-180.000.

Kluger, Edward W.; and Su, Tien-Kuei, to Milliken Research Corporation. Nitrogen containing compounds and compositions. 4,293,682, Cl. 528-123.000.

Knappenberger, Thomas A.; and Landers, James F., Jr., to Motorola Inc. Method for potting and encapsulating electronic circuits. 4,293,519, Cl. 264-272.130.

Knickerbocker, Robert H., to Siemon Company, The. Electrical circuit tester. 4,293,174, Cl. 339-64.00M.

Knoll, Alois, to Centra-Burkle GmbH & Co. Arrangement for controlling room temperature. 4,293,028, Cl. 165-12.000.

Knop, Hans-Georg: *See—*
Keller, Hans; and Knop, Hans-Georg, 4,293,872, Cl. 358-75.000.

Knowles, Richard P., to Lucas Industries Limited. Starting aids for internal combustion engines. 4,292,934, Cl. 123-145.00A.

Knox, Kenneth L., to Du Pont de Nemours, E. I., and Company. Die with insert and its use. 4,293,517, Cl. 264-176.00R.

Kobayakawa, Masaki: *See—*
Kojima, Masayuki; Kobayakawa, Masaki; and Tanaka, Kozo, 4,293,793, Cl. 313-497.000.

Kobayashi, Keizou: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,292,973, Cl. 128-303.100.

Kobayashi, Koichi; and Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telephoto lens with small telephoto ratio. 4,293,197, Cl. 350-454.000.

Kobayashi, Kunimitsu: *See—*
Ishibai, Isao; and Kobayashi, Kunimitsu, 4,293,187, Cl. 350-36.000.

Kobayashi, Masahiko: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,293,553, Cl. 424-250.000.

Kobayashi, Nariyoshi; Sakamoto, Takeshi; Anzai, Shunichi; and Matsumoto, Manabu, to Hitachi, Ltd. Gas turbine blade cooling structure. 4,293,275, Cl. 416-97.00R.

Kobayashi, Yoshio: *See—*
Ogimoto, Kazuo; Inoue, Tomohiro; Tanaka, Susumu; and Kobayashi, Yoshio, 4,293,240, Cl. 405-195.000.

Kobylar, Alex W.: *See—*
Stelte, David J.; and Kobylar, Alex W., 4,293,738, Cl. 179-18.0FC.

Kobylinski, Thaddeus P.: *See—*
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,724, Cl. 585-457.000.
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,725, Cl. 585-523.000.
Beach, David L.; and Kobylinski, Thaddeus P., 4,293,726, Cl. 585-523.000.

Kochis, August J. Multi-panel closures. 4,292,764, Cl. 49-237.000.

Kodama, Yutaka: *See—*
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,293,865, Cl. 346-140.00R.

Koeneman, James B., to Lord Corporation. Prosthesis anchoring means. 4,292,694, Cl. 3-1.910.

Koeneman, James B., to Lord Corporation. Prosthesis stem. 4,292,695, Cl. 3-1.910.

Koenig, Robert H., to Tapeswitch Corporation of America. Self adhering tape switch. 4,293,752, Cl. 200-295.000.

Koenigs, Hans B.: *See—*
Lorenz, Kurt; Dungs, Horst; Koenigs, Hans B.; and Kurtz, Roman, 4,293,388, Cl. 202-126.000.

Kohayakawa, Yoshimi; Ishikawa, Yasuyuki; and Maruyama, Shigeo, to Canon Kabushiki Kaisha. Eye refractometer. 4,293,198, Cl. 351-13.000.

Kohn, Alfred: *See—*
Forrest, Michael R.; and Kohn, Alfred, 4,292,690, Cl. 2-65.000.
Forrest, Michael R.; and Kohn, Alfred, 4,292,691, Cl. 2-65.000.

Koike, Mitsuhito; and Iwasaki, Yasuhiro, to Silver Seiko, Ltd. Needle selection mechanism in a hand-operated knitting machine. 4,292,821, Cl. 66-75.200.

Koizumi, Naoyuki: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.

Kojima, Masaharu; and Mitomi, Seiji, to Nifco Inc. Screw grommet. 4,293,260, Cl. 411-44.000.

Kojima, Masayuki; Kobayakawa, Masaki; and Tanaka, Kozo, to Nippon Electric Co., Ltd. Fluorescent display tube. 4,293,793, Cl. 313-497.000.

Kokta, Milan R.; and Taylor, Roger W., to Union Carbide Corporation. Method of making magnetic film-substrate composites. 4,293,371, Cl. 156-624.000.

Kokubun Inc.: *See—*
Kokubun, Shusuke, 4,292,879, Cl. 87-57.000.

Kokubun, Shusuke, to Kokubun Inc. Hook assembly for spring tension carrier in braiding machine. 4,292,879, Cl. 87-57.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Tamori, Michitoshi; and Kawai, Kazuo, 4,293,952, Cl. 375-14.000.

Kolb, Gunter: *See—*
Probst, Joachim; Sonntag, Michael; and Kolb, Gunter, 4,293,661, Cl. 525-127.000.

Kolb, Norman P.; and Webb, Orlando, to Stratford/Graham Engineering Corp. Alkylation with DIB vapor acid wash. 4,293,729, Cl. 585-715.000.

Kolbasov, Valery K.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Komabashiri, Takamichi: *See—*
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, 4,293,395, Cl. 204-98.000.

Komaki, Shigeki, to Sharp Kabushiki Kaisha. Thin and flat keyboard integral with a metallic housing. 4,293,754, Cl. 200-340.000.

Kong, San P.: *See—*
Wong, Chung-Chee, 4,293,896, Cl. 362-200.000.

Konishi, Kunihiro: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Yamazaki, Yoshio; Kamogawa, Nin-ichi; and Iwai, Yasuyuki, 4,292,922, Cl. 118-657.000.

Konstantinov, Alexei K.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Kopecky, Ivyl D.: *See—*
Neukom, Chester G.; and Kopecky, Ivyl D., 4,293,043, Cl. 172-267.000.

Koppe, Herbert: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.

Kopperschlager, Dieter: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A. Poultry brooding plant. 4,292,928, Cl. 119-17.000.

Korber, Helmut: *See—*
Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, 4,293,662, Cl. 525-184.000.

Kordas, Friedel, to Intensiv-Filter GmbH & Co. KG. Fastening device for filter bags in dust-laden gas filters. 4,293,321, Cl. 55-357.000.

Korecki, Zbigniew: *See—*
Pretor, Wincenty; Rozmus, Edward; Korecki, Zbigniew; and Karmanski, Stanislaw, 4,293,248, Cl. 405-300.000.

Korelin, Vladimir F.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Korff, William W.: *See—*
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.

Kosaka, Kenji; Iwatsuka, Takeshi; Shindo, Ikuo; and Hotogi, Akira, to Rohm and Haas Company. Process and apparatus for ion exchange by use of thermally regenerable resin. 4,293,423, Cl. 210-676.000.

Kose, Saburo: *See—*
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

Koshii, Taro: *See—*
Hanada, Tsuneo; Koshii, Taro; and Shinmi, Hideo, 4,293,479, Cl. 260-37.0EP.





Koshino, Minoru: *See—*
Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, 4,293,941, Cl. 364-200.000.

Kostan, Charles C.: *See—*
Kuhn, Robert L.; and Kostan, Charles C., 4,293,744, Cl. 200-19.00R.

Kotas, Antoni: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.

Koty, Antal: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Kovach, Julius L. Fission product adsorbent impregnated with quinuclidene. 4,293,317, Cl. 55-71.000.

Koyo Seiko Company Limited: *See—*
Kakumoto, Ken-Ichi; and Fujita, Yoshiki, 4,293,171, Cl. 308-188.000.

Kozima, Akio: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,293,628, Cl. 430-58.000.

Kozlov, Jury S.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Goetzmann, Claus; and Rau, Peter, 4,293,381, Cl. 376-230.000.
Harand, Elmar; and Michel, Eberhard, 4,293,386, Cl. 376-461.000.

Krahenbuhl, Hanspeter: *See—*
Baur, Rudolf; Merki, Emil; and Krahenbuhl, Hanspeter, 4,293,424, Cl. 210-737.000.

Kramer, Wolfgang, to Bayer Aktiengesellschaft. Preparation of ω-azolyl-acetophenone oxide ethers employing ω-halogeno-acetophenone oxide ethers. 4,293,715, Cl. 564-256.000.

Krause, Heinz; and Sanner, Bert, to J. F. Tonnies Erben K.G. Method and device for representing electrical spatial lines and spatial images. 4,292,977, Cl. 128-712.000.

Krause, Nicolaas J. P. R. Apparatus for postural treatment of humans. 4,292,962, Cl. 128-68.000.

Krave, Carl A. Method, apparatus and package for sprouting seeds. 4,292,760, Cl. 47-14.000.

Krave, Carl A. Method, apparatus and package for sprouting seeds. 4,292,761, Cl. 47-14.000.

Kreiling, William H.; and Jones, Edward S., to International Paper Company. Aqueous process for making a conductive medium for electrostatic printing. 4,293,595, Cl. 427-121.000.

Kreiling, William H.; and Jones, Edward S., to International Paper Company. Electrostatic printing medium. 4,293,610, Cl. 428-246.000.

Kress, Dieter; and Haberle, Friedrich, to Mapal Fabrik fur Prazisionswerkzeuge. Drill bit. 4,293,252, Cl. 408-224.000.

Kresse, Horst: *See—*
Deutscher, Hans-Joachim; Schubert, Herrmann; Seidel, Christina; Demus, Dietrich; and Kresse, Horst, 4,293,434, Cl. 252-299.630.

Kretzschnar, John L.: *See—*
West, Jerry B.; Kretzschnar, John L.; and Fung, Bing, 4,293,815, Cl. 324-254.000.

Kristofek, Paul J., to McGraw-Edison Company. Mounting arrangement for recessed light fixture housing. 4,293,895, Cl. 362-147.000.

Kroll, Arthur S.; and Shuster, Frank A., to Eastman Kodak Company. Electrographic development apparatus. 4,292,921, Cl. 118-648.000.

Krugener, Rolf: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Kubach, Hans; and Rupp, Hartmann, to Robert Bosch GmbH. Controlled d-c current supply system, with controlled current flow through a choke. 4,293,812, Cl. 323-272.000.

Kubota, Jun, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method and apparatus for detecting flow instability in steam generator. 4,293,853, Cl. 340-611.000.

Kubota, Ltd.: *See—*
Murayama, Yoshinobu, 4,292,855, Cl. 74-15.400.

Kucera, Carrell J., to Norden Laboratories, Inc. Modified *Pasteurella multocida* bacteria vaccines. 4,293,545, Cl. 424-92.000.

Kuckens, Alexander, to Dagma Deutsche Automaten und Getrankemaschinen GmbH & Co. KG. Method and device for metered dispensing of liquids, in particular concentrates or syrups, for the production of beverages. 4,293,081, Cl. 222-83.000.

Kudish, Viktor B.: *See—*
Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I., 4,293,238, Cl. 405-175.000.

Kuhn, Robert L.; and Kostan, Charles C., to Ford Motor Company. Alignment devices for removable spark plug terminals in an ignition commutation distributor. 4,293,744, Cl. 200-19.00R.

Kukolja, Stjepan; and Pfeil, Janice L., to Eli Lilly and Company. Azetidinone alcohol disulfides and process for cyclization. 4,293,493, Cl. 260-239.00A.

Kukolja, Stjepan; and Pfeil, Janice L., to Eli Lilly and Company. Symmetrical azetidinone aldehyde disulfides and process. 4,293,495, Cl. 260-245.400.

Kull, Leo; and Ebrok, Vello H. Single and multicycle control device for electric motors. 4,293,806, Cl. 318-673.000.

Kumada, Saburoh: *See—*
Isaka, Tsutomu; and Kumada, Saburoh, 4,293,608, Cl. 428-220.000.

Kumazawa, Shunji: *See—*
Fujii, Yoshishige; Nagao, Syozo; and Kumazawa, Shunji, 4,293,418, Cl. 210-321.100.

Kummer, Werner: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.

Kuna, Wayne A.; Thibault, James G.; and Schoenfield, Palmer J., to Marvin Glass & Associates. Jet toy boat. 4,292,758, Cl. 46-93.000.

Kuras, Michael L.; Upp, Daniel C.; and Toegel, Herbert J., to International Telephone and Telegraph Corporation. Trilateral duplex path conferencing system with broadcast capability. 4,293,946, Cl. 370-62.000.

Kurata, Shigeru: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, 4,293,533, Cl. 423-449.000.

Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mirror operating mechanism in single lens reflex camera. 4,293,209, Cl. 354-153.000.

Kuroki, Katsuro: *See—*
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Kuroki, Katsuro, 4,293,350, Cl. 148-111.000.

Kurth, Hermann W.: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Kurtz, Roman: *See—*
Lorenz, Kurt; Dungs, Horst; Koenigs, Hans B.; and Kurtz, Roman, 4,293,388, Cl. 202-126.000.

Kustom Kreations, Inc.: *See—*
Veralrud, Guy G., 4,293,075, Cl. 211-40.000.

Kutsukake, Yukinori: *See—*
Tamamura, Ryo; and Kutsukake, Yukinori, 4,293,335, Cl. 75-124.000.

Kuwana, Masayuki: *See—*
Moriyama, Yoshiki; and Kuwana, Masayuki, 4,293,002, Cl. 137-625.640.

Kuzin, Eduard N.; Korelin, Vladimir F.; Fainzilber, Mikhail L.; Egorov, Jury P.; Erofeenko, Igor V.; Karev, Nikolai V.; Kozlov, Jury S.; Kudish, Viktor B.; Kolbasov, Valery K.; and Bobchenok, Meri I. Ditchless drainlayer. 4,293,238, Cl. 405-175.000.

Kuzmenko, Valentin T.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Kyogoku, Yoshito; and Katada, Hiroshi, to Hitachi, Ltd. Contactless ignition system for use with internal combustion engines. 4,292,943, Cl. 123-427.000.

Kyogoku, Yoshito: *See—*
Katada, Hiroshi; and Kyogoku, Yoshito, 4,292,942, Cl. 123-418.000.

Kyokuto Kaihatsu Kogyo Co., Ltd.: *See—*
Tanaka, Katsushi; and Okamoto, Taro, 4,293,227, Cl. 366-11.000.

Kyoto Ceramic Co., Ltd.: *See—*
Shikita, Takuji; and Hirabayashi, Masaya, 4,293,540, Cl. 424-26.000.

L. S. Starrett Company, The: *See—*
Neumeyer, Tom A.; and Foster, Francis W., 4,292,871, Cl. 83-661.000.

Labes, Mortimer M.; and MacMillan, John H., to Temple University. Amine-substituted liquid crystal compositions. 4,293,193, Cl. 350-350.00R.

Lacaze, Leonard, Jr., to International Telephone and Telegraph Corporation. Low insertion force electrical socket connector. 4,293,181, Cl. 339-258.00R.

Lachner, Hans: *See—*
Boer, Werner; Lachner, Hans; Maschonat, Guenter; Richter, Joerg; Schulte, Heinrich; and Warnke, Hans, 4,293,246, Cl. 405-291.000.

Lacy, Robert H., to Phillips Petroleum Company. Keyboard encoder using priority encoders. 4,293,849, Cl. 340-365.00S.

Laing, Ingeborg: *See—*
Laing, Karsten; Laing, Ingeborg; and Laing, Oliver, 4,292,773, Cl. 52-171.000.

Laing, Karsten; Laing, Ingeborg; and Laing, Oliver. Double pane systems with little reflection, in particular for greenhouses. 4,292,773, Cl. 52-171.000.

Laing, Oliver: *See—*
Laing, Karsten; Laing, Ingeborg; and Laing, Oliver, 4,292,773, Cl. 52-171.000.

Laird, William J.: *See—*
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., 4,292,880, Cl. 89-1.815.

Lakra, Ruhama J.; Freund, Jurgen; and Rauschert, Gerd, to Interatom, Internationale Atomreaktorbau GmbH. Nuclear reactor with equip-

ment for preventing convection of metal vapors. 4,293,383, Cl. 376-290.000.
Lalonde, Jean-Paul. Cutting and mulching lawn mower blade assembly. 4,292,791, Cl. 56-255.000.
Lambe, Donald M. Dual-chamber pneumatic tire. 4,293,017, Cl. 152-339.000.
Lamber, Clarence F.: *See*—
Klasek, Ladislav J.; Lamber, Clarence F.; and Passafiume, Anthony, 4,293,367, Cl. 156-494.000.
Lamoreaux, Charles L. Mobile air charging system. 4,293,281, Cl. 417-9.000.
Lampe, Warren R.: *See*—
Bessmer, Stanley J.; and Lampe, Warren R., 4,293,597, Cl. 427-186.000.
Lamson & Sessions Co., The: *See*—
Pamer, Walter R., 4,293,256, Cl. 411-11.000.
Land-O-Nod: *See*—
Woychick, John, 4,292,701, Cl. 5-422.000.
Landers, James F., Jr.: *See*—
Knappenberger, Thomas A.; and Landers, James F., Jr., 4,293,519, Cl. 264-272.130.
Landheer, Hugo A. J., to Hunter Douglas International N.V. Supporting system for panel assembly. 4,292,779, Cl. 52-486.000.
Landingham, Richard L.; and Huffsmith, Sarah A., to United States of America, Energy. Silicon-nitride and metal composite. 4,293,619, Cl. 428-623.000.
Landis, Arthur M.; Broughton, Donald B.; and Fickel, R. Gene, to UOP Inc. Simulated countercurrent sorption process employing ion exchange resins with backflushing. 4,293,346, Cl. 127-46.00A.
Landry, Archie C.: *See*—
Daswick, Alexander C.; and Landry, Archie C., 4,293,052, Cl. 180-219.000.
Lang, Edna B., nee Wright executrix: *See*—
Rosborough, Robert S., Jr.; and Wright, Luther M., deceased, 4,293,215, Cl. 355-40.000.
Lang, Gerard; and Forestier, Serge, to L'Oreal. Cosmetic composition for imparting to human skin a coloration resembling a natural tan. 4,293,542, Cl. 424-47.000.
Langenecker, Bertwin. Wire drawing apparatus employing macrosonic techniques. 4,292,826, Cl. 72-45.000.
Langer, Heimo J.: *See*—
Martin, Ralph D.; Dunnavant, William R.; Sturtz, Gregory P.; and Langer, Heimo J., 4,293,480, Cl. 260-38.000.
Langley, Robert C.; Myers, Herbert; and Abrash, Muriel, to Engelhard Minerals & Chemicals Corporation. Method of making honeycomb structures. 4,293,513, Cl. 264-60.000.
Lanier Business Products, Inc.: *See*—
Mason, Paul C., 4,293,881, Cl. 360-60.000.
Lapp, Ellsworth W. Crimping tool. 4,292,833, Cl. 72-416.000.
Larsen, Tor G., to Measurex Corporation. Caliper gauge for the measurement of sheet members over a wide range of thicknesses. 4,292,838, Cl. 73-37.700.
Larsson, Bernt: *See*—
Furendal, Allan R. B.; Larsson, Bernt; and Nilsson, Erik R., 4,293,596, Cl. 427-160.000.
Larsson, Lars-Ake L.: *See*—
Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., 4,293,409, Cl. 210-96.200.
Larsson, Leif; and Warren, Richard, to Volvo Flygmotor AB. Method of producing an object of fiber reinforced metal material. 4,292,725, Cl. 29-419.00R.
LaRue, George J.: *See*—
Morgan, Dean T.; Chryssostomidis, Chryssostomos; and LaRue, George J., 4,293,527, Cl. 423-6.000.
Laser Alignment, Inc.: *See*—
Nielsen, Edward G.; Mosley, Kenneth C.; and Chatterson, Louis M., 4,293,218, Cl. 356-138.000.
Launay, Noel, to Societe d'Assistance Technique pour Produits Nestle S.A. Metering and balancing device and filling machine including such a device. 4,293,049, Cl. 177-212.000.
Laurer, Peter R., to BASF Aktiengesellschaft. Preparation of a catalyst carrier from alumina mixtures. 4,293,448, Cl. 252-463.000.
LaVia, Anthony L.: *See*—
Pawelchak, John M.; Wang, Yu-Chang J.; and LaVia, Anthony L., 4,292,972, Cl. 128-296.000.
Lawrence, C. Alexander: *See*—
Simpson, Roger J.; Gawthorpe, Janet A.; and Lawrence, C. Alexander, 4,293,307, Cl. 23-230.00B.
Lawrence Security Services Ltd.: *See*—
Rogers, Groby W., 4,293,852, Cl. 340-568.000.
Le, Trung, to International Business Machines Corporation. Transresonant deflection yoke operations. 4,293,802, Cl. 315-387.000.
Lear Siegler, Inc.: *See*—
Pareja, Ramon, 4,292,990, Cl. 137-115.000.
Learner, Richard C. M.: *See*—
Wheaton, John E. G.; Griffiths, David; and Learner, Richard C. M., 4,293,225, Cl. 356-417.000.
LeBeault, Jean-Michel: *See*—
Christ, Charles; LeBeault, Jean-Michel; and Noel, Claude, 4,293,655, Cl. 435-316.000.
LeBlanc, John R.: *See*—
Cohen, Saul M.; and LeBlanc, John R., 4,293,693, Cl. 544-221.000.
Strazik, William F.; LeBlanc, John R.; and Santer, J. Owen, 4,293,461, Cl. 260-18.00N.
Lechavelier, Hubert A.: *See*—
Drobot, Walter; and Lechavelier, Hubert A., 4,293,334, Cl. 75-101.0BE.
Lechinger, Terry M.: *See*—
Borg, Paul E.; and Lechinger, Terry M., 4,292,772, Cl. 52-118.000.
Le Coent, Jean-Louis: *See*—
Demoures, Bernard; and Le Coent, Jean-Louis, 4,293,431, Cl. 252-33.200.
Ledebrink, Friedrich-Wilheim; Stoll, Wolfgang; and Schafer, Dieter, to Alkem GmbH. Method of processing radioactive wastes. 4,293,438, Cl. 252-301.10W.
LeDoux, Gilbert A.: *See*—
Yonkers, Edward H.; and LeDoux, Gilbert A., 4,293,234, Cl. 400-196.100.
Lee, Benjamin Y. S.; Reed, Russell, Jr.; and Miller, Roger L., to United States of America, Navy. Degradable binder explosives. 4,293,352, Cl. 149-19.400.
Lee, Chi-Long: *See*—
Homan, Gary R.; and Lee, Chi-Long, 4,293,676, Cl. 528-15.000.
Lee, Hop. Coupling for an electric cable. 4,293,178, Cl. 339-103.00R.
Lee, Marlow, to H & H Tube & Mfg. Co. Solar heat absorber for solar heat collectors. 4,292,958, Cl. 126-448.000.
Lee, Richard J. Ammunition loader with improved charge bar. 4,292,877, Cl. 86-31.000.
Lee, Thomas B.: *See*—
Cairns, Hugh; and Lee, Thomas B., 4,293,541, Cl. 424-45.000.
Leeper, Charles G.; and Wood, John F., to Hennessy Industries, Inc. Tire changing apparatus. 4,293,020, Cl. 157-1.280.
Leggett & Platt, Inc.: *See*—
Bustos, Rafael T., 4,293,062, Cl. 193-2.00D.
Lehner, Daniel F.: *See*—
Bell, Ted A.; and Lehner, Daniel F., 4,293,140, Cl. 280-154.50R.
Leiendecker, Donald M.: *See*—
Cheng, William J.; Guthrie, David B.; and Leiendecker, Donald M., 4,293,429, Cl. 252-18.000.
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., to Standard Oil Co. Preparation of maleic anhydride. 4,293,498, Cl. 260-346.750.
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Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, 4,293,088, Cl. 227-131.000.
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Lescrenier, Charles. Indicator for use with projected beam of radiation. 4,293,771, Cl. 250-491.000.
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Letica, Ilija, 4,293,080, Cl. 220-306.000.
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Fyson, John R.; and Levenson, Gerald I. P., 4,293,638, Cl. 430-373.000.
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Blessing, Hubert, 4,292,908, Cl. 112-306.000.
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Levit, Viktor M.: *See*—
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Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal N-(pyridinylaminocarbonyl)benzenesulfonamides. 4,293,330, Cl. 71-94.000.
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Riquart, Christian; and Levrai, Roland, 4,292,883, Cl. 91-29.000.
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Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, 4,293,669, Cl. 525-452.000.
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Lewis, David H.: *See*—
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Liebig, Heinrich. Locking toggle bolt. 4,293,259, Cl. 411-32.000.
Liebing, Alan P., to Ferranti Limited. Gyroscopic apparatus having three-axis inertial platform with rapid warm-up. 4,292,854, Cl. 74-5.340.
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Lien, Larry A.: *See*—
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Peter, Erich, 4,293,006, Cl. 139-102.000.
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Nasser, Gamal E. D., 4,293,033, Cl. 165-166.000.
Linder, Uno K. E., to U.S. Philips Corporation. Bearing for the printing head of a matrix printer, and printing head comprising such a bearing. 4,293,232, Cl. 400-124.000.
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Lindsay, John. Roller chock. 4,292,911, Cl. 114-218.000.
Lindstrom, Robert: *See*—
Allen, Robert J.; Lindstrom, Robert; and Juda, Walter, 4,293,396, Cl. 204-106.000.
Lingaraju, Bhartoor, to Square D Company. Case for electrical multiple outlet. 4,293,172, Cl. 339-14.00P.
Link, John R., to General Signal Corporation. Gear pump with improved shaft seal. 4,293,291, Cl. 418-104.000.
Linn, Orville J. Straw and chaff chopper and spreader. 4,292,795, Cl. 56-503.000.
Lipert, Peter, to Atara Corporation. Liquid circulating device. 4,293,506, Cl. 261-77.000.
Lipshield, Eugene C., to Orscheln Brake Lever Mfg. Co. Brake cable operating means of the overcenter toggle type. 4,292,858, Cl. 74-501.00R.
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Sharlow, Roger C., 4,293,100, Cl. 242-55.000.
Liu, Chunghorng R.; Nayak, Jnaneshwar H.; Stenberg, Herbjorn; Huerta, Felipe J.; and Hall, Woodrow A., to Liu, Chunghorng R. Tool holder for varying tool rake angle. 4,292,865, Cl. 82-36.00R.
Livesey-Goldblatt, Eric, to Livesey-Goldblatt, Eric. Recovery of gold and uranium from calcines. 4,293,530, Cl. 423-18.000.
Locker, Jan A. K., to Machinefabriek A. Wijnveen B.V.; and Cooperatieve Landbouw aan- en verkoopcombinatie, B.A. "C.L.C.". Sieve device for separating a mixture of particulate material in components of different sizes. 4,293,407, Cl. 209-253.000.
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Loffelman, Frank F.: *See*—
Hardy, William B.; and Loffelman, Frank F., 4,293,467, Cl. 260-45.80N.
Loft, Fredrick A.; and Peterson, John O. H., to Scott Paper Company. Coated sheet material for use in making decorative laminates. 4,293,360, Cl. 156-230.000.
Logitek Electronic Systems, Inc.: *See*—
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Logue, Jay: *See*—
Coleman, William J.; and Logue, Jay, 4,293,122, Cl. 256-69.000.
Lohmiller, Edward W. Energy converter. 4,292,808, Cl. 60-673.000.
Lomnitzer, Abraham: *See*—
Hill, David A.; and Lomnitzer, Abraham, 4,293,072, Cl. 206-512.000.
Long, Howard W.; and Flowers, Robert L., to Coronet Foods, Inc. Chopped leafy vegetable packaging machine. 4,292,786, Cl. 53-434.000.
Long, Lennart E.; and Wiseman, Robert L., to United States of America, Transportation. Rail car identification apparatus. 4,293,766, Cl. 235-462.000.
Lopez, Bennie F.; Campbell, Billy H.; Collier, Bobby D.; Laird, William J.; Debona, Edward J.; and Eubanks, James E., Jr., to United States of America, Army. Quadrant elevation control device. 4,292,880, Cl. 89-1.815.
Lord Corporation: *See*—
Koeneman, James B., 4,292,694, Cl. 3-1.910.
Koeneman, James B., 4,292,695, Cl. 3-1.910.
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,293,665, Cl. 525-255.000.
L'Oreal: *See*—
Lang, Gerard; and Forestier, Serge, 4,293,542, Cl. 424-47.000.
Lorenz, Donald H.: *See*—
Gruber, Bruce A.; and Lorenz, Donald H., 4,293,714, Cl. 564-249.000.
Lorenz, Kurt; Dungs, Horst; Koenigs, Hans B.; and Kurtz, Roman, to Carl Still GmbH & Co. KG, Firma. Apparatus for producing abrasion-proof coke forms from bituminous coal, brown coal or peat briquets. 4,293,388, Cl. 202-126.000.
Loucks, Terry L., to Mead Corporation, The. Controlled temperature shipping assembly. 4,292,817, Cl. 62-457.000.
Lowe, Earl L., to Ball Corporation. Electronic valve assembly for glassware forming machinery. 4,293,004, Cl. 137-884.000.
Lu, Chin H., to Xerox Corporation. Electrographic toner compositions. 4,293,631, Cl. 430-106.000.
Lucas Industries Limited: *See*—
Knowles, Richard P., 4,292,934, Cl. 123-145.00A.
Lucas, James H., to Allis-Chalmers Corporation. Detent mechanism and transmission speed range selector valve. 4,293,059, Cl. 192-3.570.
Lucas, James M.; Enright, Dorothy P.; and Perricone, Alphonse C., to Milchem Incorporated. Drilling fluid containing a copolymer filtration control agent. 4,293,427, Cl. 252-8.50C.
Lucchesi, Joseph: *See*—
Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, 4,292,834, Cl. 72-482.000.
Luchessa, Charles E.; and Brown, Timothy E., to Sierra Misco, Inc. Temperature-compensated precipitation gauge. 4,292,843, Cl. 73-171.000.
Luck, Klaus; and Poeppel, Fritz-Otto, to Preussag Aktiengesellschaft. Hydraulically operated hoisting apparatus for a ship for picking floating objects up out of the sea. 4,293,265, Cl. 414-140.000.
Lucksinger, James E.: *See*—
Beynet, Pierre A.; Lucksinger, James E.; and Jansen, Martin B., Jr., 4,293,146, Cl. 285-24.000.
Ludwig, Nelson H.; and Ose, Earl E., to Eli Lilly and Company. Controlled release formulations and method of treatment. 4,293,539, Cl. 424-19.000.
Lueder, Rainer, to Siemens Aktiengesellschaft. Monolithically integrated charge transfer circuit. 4,293,831, Cl. 333-165.000.
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, to Kernforschungsanlage Julich GmbH. Making temperature-stable protectively coated graphite molded body. 4,293,512, Cl. 264-58.000.
Lukaszewski, Charles. Bat-like, bubble-blowing device. 4,292,754, Cl. 46-6.000.
Lumenition Limited: *See*—
Coates, John P.; and Lewis, David H., 4,292,939, Cl. 123-335.000.
Lundmark, Lorentz, to Skega Aktiebolag. Barking drum. 4,293,014, Cl. 144-208.00B.
Lundren, Jan, to ASEA Aktiebolag. Method for containing spent nuclear fuel rods in a protective container to facilitate disposal. 4,293,773, Cl. 250-506.000.
Lunel, Jean: *See*—
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,293,650, Cl. 435-119.000.
Lurssen, Klaus: *See*—
Beck, Gunther; Heitzer, Helmut; and Lurssen, Klaus, 4,293,331, Cl. 71-118.000.
Lussier, Claude. Dispensing container with ingredient level indicia. 4,293,084, Cl. 222-158.000.
Lustig, Stanley; and Vicik, Stephen J., to Union Carbide Corporation. Cook-in film containing a blend of ionomer and elastomer. 4,293,664, Cl. 525-196.000.
Lutz, Alfons, to Webasto-Werk W. Baier GmbH & Co. Vehicle roof. 4,293,161, Cl. 296-213.000.
Lutze, Hans; Weisshappel, Helmut; Klie, Wolfgang; and Weidemann, Dieter, to Daimler-Benz Aktiengesellschaft. Side guard for motor vehicle. 4,293,160, Cl. 296-188.000.
Lykes Bros. Steamship Co., Inc.: *See*—
Nemec, Frank A.; and Pearlson, Raymond, 4,292,915, Cl. 114-260.000.
Lykes, Robert E., to A. O. Smith Corporation. Flexible motor mounting. 4,293,114, Cl. 248-604.000.
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Lyon, Colin E.: *See*—
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, 4,293,507, Cl. 264-0.500.
Lyons, Michael D.: *See*—
Olson, Paul E.; and Lyons, Michael D., 4,293,118, Cl. 251-297.000.
Lytle, Thomas G., to TLB Plastics Corporation. Hinged closure. 4,293,079, Cl. 220-306.000.
M. P. H. Industries, Inc.: *See*—
Sergent, Edward W., 4,293,859, Cl. 343-702.000.
Maag, Willi; Baumgartner, Hans U.; Vollenweider, Max; and Wolf, Hans J., to Kistler Instrumente AG. Balancing and monitoring apparatus. 4,292,769, Cl. 51-169.000.
MacDonald, Milton. Unitary combined backer and siding board. 4,292,776, Cl. 52-394.000.
Machinefabriek A. Wijnveen B.V.: *See*—
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MacMillan, John H.: *See*—
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MacMillan, Kenneth T., to Donald MacMillan & Son, Inc. Tire retreading bladder. 4,293,293, Cl. 425-23.000.
Macovski, Albert. Solid state color television camera with multiple line readout. 4,293,871, Cl. 358-44.000.
Mader, Helmut: *See*—
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Maeda, Kazuo: *See*—
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Maeda, Mamoru: *See—*
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Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, 4,293,590, Cl. 427-93.000.

Maeda, Takeshi: *See—*
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Maendel, Carl: *See—*
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Mahle, Christoph: *See—*
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Mahood, William L.: *See—*
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Maio, Kenji: *See—*
Shibayama, Akinori; Maio, Kenji; and Yokozawa, Norio, 4,293,819, Cl. 330-9.000.

Maiocchi, Luigi, to Industrie Pirelli S.p.A. Breaker for radial tire. 4,293,019, Cl. 152-361.00R.

Mair, William J., to Plastic Recycling Limited. Manufacture of plastics products. 4,293,515, Cl. 264-120.000.

Mairle, Hans, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Window mounting for automotive vehicles. 4,292,774, Cl. 52-208.000.

Makino, Kazuhiro, to Hitachi, Ltd. Container handling apparatus. 4,293,077, Cl. 212-219.000.

Malik, Edward P., to Buffalo Color Corporation. Liquid anhydride blends. 4,293,681, Cl. 528-115.000.

Maly, Hans-Peter: *See—*
Heitmann, Jurgen; Maly, Hans-Peter; and Wilhelm, Rudolf, 4,293,879, Cl. 360-10.000.

Mancy, Denise: *See—*
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Mankel, Siegfried: *See—*
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Mannesmann DeMag AG: *See—*
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Manten Co., Ltd.: *See—*
Ida, Minoru, 4,293,144, Cl. 280-644.000.

Manufacture de Produits Chimiques Protex: *See—*
Joseph, Christian M., 4,293,344, Cl. 106-111.000.

Manzel, Ernest V. Connectors for electrical cables. 4,293,151, Cl. 285-161.000.

Mapal Fabrik fur Prazisionswerkzeuge: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,293,252, Cl. 408-224.000.

Marchioro, Ignazio, to Escher Wyss Limited. Controlled deflection roll. 4,292,716, Cl. 29-116.0AD.

Maresca, Louis M.: *See—*
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,293,670, Cl. 525-436.000.

Marin, Heiner, to Siemens Aktiengesellschaft. Electric gas blast circuit breaker. 4,293,750, Cl. 200-148.00A.

Marincic, Nikola; and Epstein, James, to Battery Engineering, Inc. Step cell. 4,293,622, Cl. 429-50.000.

Mark Twain Marine Industries, Inc.: *See—*
Siebert, Lee S.; and Ritsch, Charles J., 4,292,913, Cl. 114-219.000.

Markel, Raymond A. Sleeping bag liner. 4,292,700, Cl. 5-413.000.

Markin, Valentin G.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Markovics, Michael, to Everede Tool Company. Countersinking tool with removable cutting inserts. 4,293,254, Cl. 408-229.000.

Markusch, Peter: *See—*
Dieterich, Dieter; and Markusch, Peter, 4,293,474, Cl. 260-29.2TN.

Marquette Metal Products Co.: *See—*
Anderson, J. Edward C., 4,293,044, Cl. 173-93.500.

Marshall, Robert M.; and Dardoufas, Kimon C., to Allied Chemical Corporation. Polyamide yarn spin finish containing a rearranged glyceride and oxidized polyethylene. 4,293,460, Cl. 260-18.0PF.

Martin, Eugene R., to SWS Silicones Corporation. Silicone polyether copolymers. 4,293,611, Cl. 428-266.000.

Martin Industries, Inc.: *See—*
Wilhoite, Murray O., 4,292,954, Cl. 126-290.000.

Martin Marietta Corporation: *See—*
Smith, Winthrop W., Jr., 4,293,921, Cl. 364-726.000.

Martin, Ralph D.; Dunnavant, William R.; Sturtz, Gregory P.; and Langer, Heimo J., to Ashland Oil, Inc. Urethane binder compositions for no-bake and cold box foundry application utilizing isocyanato-urethane polymers. 4,293,480, Cl. 260-38.000.

Marumoto, Ryuji: *See—*
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Maruyama, Shigeo: *See—*
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Marvin Glass & Associates: *See—*
Jaworski, Eugene; and Breslow, Jeffrey D., 4,292,756, Cl. 46-72.000.
Kuna, Wayne A.; Thibault, James G.; and Schoenfield, Palmer J., 4,292,758, Cl. 46-93.000.

Marx, Matthias: *See—*
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Maryland Cup Corporation: *See—*
Rubenstein, Irving H., 4,293,580, Cl. 426-565.000.

Masaki, Kenji, to Nissan Motor Company, Limited. Air-fuel ratio control system. 4,292,946, Cl. 123-440.000.

Maschinenfabrik Schweiter AG: *See—*
Werffeli, Hermann, 4,292,868, Cl. 83-13.000.

Maschonat, Guenter: *See—*
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Mase, Akira: *See—*
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Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,293,666, Cl. 525-284.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,293,667, Cl. 525-284.000.

Mason, Paul C., to Lanier Business Products, Inc. System for priority transcribing of dictation. 4,293,881, Cl. 360-60.000.

Masoneilan International, Inc.: *See—*
Wing, Paul, 4,292,991, Cl. 137-329.050.

Massachusetts Institute of Technology: *See—*
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Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,293,654, Cl. 435-241.000.
Patil, Suhas S., 4,293,783, Cl. 307-465.000.

Masu, Masanobu: *See—*
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Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, 4,293,660, Cl. 525-68.000.

Masunaga, Makoto: *See—*
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

Mathews, Bernard C. Spring wire blades for drum type mowers. 4,292,789, Cl. 56-12.700.

Mathews, Bernard C. Blade arrangement for multiple rotor mowers. 4,292,790, Cl. 56-13.600.

Matsuda, Takehiko; and Izawa, Kyoichi, to Toyostar Corporation. Capacitance type contact switch. 4,293,745, Cl. 200-52.00R.

Matsueda, Shinji, to Nippon Light Metal Co., Ltd. Liquid dispensing stand with cooling support. 4,293,082, Cl. 222-131.000.

Matsui, Kiyoshi; Arai, Katsuyuki; and Shinbashi, Sueo, to Fujitsu Limited. Natural air cooled rack for vertically disposed printed boards. 4,293,891, Cl. 361-383.000.

Matsumoto, Hiromitsu; Sugiyama, Keiichi; and Uchiyama, Kazuo, to Yamaha Hatsukoki Kabushiki Kaisha. Intake control system for internal combustion engine. 4,292,944, Cl. 123-432.000.

Matsumoto, Manabu: *See—*
Kobayashi, Nariyoshi; Sakamoto, Takeshi; Anzai, Shunichi; and Matsumoto, Manabu, 4,293,275, Cl. 416-97.00R.

Matsumura, Ko; Nakamura, Hiroto; and Irie, Toshio, to Kawasaki Steel Corporation. Cold rolled non-oriented electrical steel sheet. 4,293,336, Cl. 75-124.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hatada, Kenzo; and Kajiwara, Takao, 4,293,637, Cl. 430-314.000.
Noguchi, Satoshi; and Kitao, Takaya, 4,293,940, Cl. 368-75.000.

Matsushita Electric Works, Ltd.: *See—*
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Mattox, Douglas M.: *See—*
Yoldas, Bulent E.; and Mattox, Douglas M., 4,293,594, Cl. 427-107.000.

Mattsson, Bengt. Dental absorptive pads and dispensing means therefor. 4,293,301, Cl. 433-136.000.

Matunaga, Masatugu: *See—*
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, 4,293,660, Cl. 525-68.000.

Matusz, Zbigniew, to Fabryka Obrabiarek Precyzyjnych "Ponar-Pruszkow" Zaklad "i Maja". Cylindrical gear with helical tooth wheels. 4,292,857, Cl. 74-466.000.

Matzner, Markus: *See—*
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,293,670, Cl. 525-436.000.

Maurer, Barbara V.: *See—*
Haugwitz, Rudiger D.; Wade, Peter C.; and Maurer, Barbara V., 4,293,569, Cl. 424-300.000.

Mauser-Werke Obendorf GmbH: *See—*
Hupp, Gerhard; and Mader, Helmut, 4,292,881, Cl. 89-33.0CA.

Maxner, Richard B., to USM Corporation. Automatic insertion equipment. 4,292,727, Cl. 29-566.300.

Mayo, Terry H.; and Parrish, John D., to Reed Tool Company. Rolling cutter drill bit with improved journal configuration. 4,293,167, Cl. 308-8.200.

Mazanek, Jan; and Nuller, Hanns P., to Bayer Aktiengesellschaft. Process for the production of diisocyanato toluene mixtures having an increased content of 2,6-diisocyanato toluene, and the use thereof as synthesis components in the production of polyurethane elastomers. 4,293,680, Cl. 528-67.000.



Mazzola, Mario, to Richardson-Vicks Inc. Locking valve apparatus. 4,292,995, Cl. 137-384.200.

McAdams, Hugh P., to Texas Instruments Incorporated. Refresh operations for semiconductor memory. 4,293,932, Cl. 365-222.000.

McAleer, William J.; Hurni, William M.; and Miller, William J., to Merck & Co. Inc. Assay for hepatitis A antigen. 4,293,538, Cl. 424-1.000.

McAllister, Gary L.; and Draggoo, V. G., to Jersey Nuclear-Avco Isotopes, Inc. Multiwavelength dye laser. 4,293,827, Cl. 331-94.5ML.

McCarty, Daniel A. Waterproof signal light. 4,293,847, Cl. 340-332.000.

McCarty, Vincent D., to International Business Machines Corporation. Print hammer drive circuit with compensation for voltage variation. 4,293,888, Cl. 361-152.000.

McConnell, Anthony D.: *See—*
Lewis, Herbert I.; McConnell, Anthony D.; and Price, William M., 4,293,097, Cl. 241-16.000.

McCormick, James T.; Ferry, Paul B.; and Hall, John C., to United States of America, Energy. Brazing method. 4,293,089, Cl. 228-215.000.

McCrea, Donald H.: *See—*
Field, Joseph H.; and McCrea, Donald H., 4,293,531, Cl. 423-232.000.

McDonald, Charles B. Fireplace furnace. 4,292,952, Cl. 126-121.000.

McFadyen, Robert J., to General Electric Company. Gated AGC amplifier with dc feedback. 4,293,822, Cl. 330-254.000.

McGillis, Hugh D., to McGillis, Hugh D. Supplemental heating system. 4,293,094, Cl. 237-55.000.

McGough, Bonnie. Insulated beverage cozy. 4,293,015, Cl. 150-52.00R.

McGraw-Edison Company: *See—*
Date, K. Henry; and Wainio, Ronald, 4,293,834, Cl. 335-76.000.
Kristofek, Paul J., 4,293,895, Cl. 362-147.000.

McKewan, Arthur J., to Microdot Inc. Self drilling blind rivet. 4,293,258, Cl. 411-30.000.

McLaughlin, Homer C.: *See—*
Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., 4,293,440, Cl. 252-317.000.

McMahon, Donald H., to Sperry Corporation. Fiber optic small displacement sensor. 4,293,188, Cl. 350-96.290.

McMorrow, Clyde H. Traffic light dimming technique and circuitry. 4,293,796, Cl. 315-205.000.

McMullan, James P. Electrically insulated resistance heater. 4,293,763, Cl. 219-528.000.

Mead Corporation, The: *See—*
Davis, James W.; and Paranjpe, Suresh C., 4,293,863, Cl. 346-75.000.
Loucks, Terry L., 4,292,817, Cl. 62-457.000.

Meares, Harry E., Jr., to Klements, Walter S. Shower dispenser. 4,293,083, Cl. 222-133.000.

Measurex Corporation: *See—*
Larsen, Tor G., 4,292,838, Cl. 73-37.700.

Meier, Daniel; and Maendel, Carl, to Hutterian Society of Brothers. Furnace. 4,292,933, Cl. 122-114.000.

Meinhardt, Frederich: *See—*
Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, 4,293,526, Cl. 422-205.000.

Mendiratta, Sudhir K., to Olin Corporation. Process for the purification of alkaline solution of lower alkyl alcohols containing alkali metal alkoxides. 4,293,721, Cl. 568-916.000.

Menown, Hugh, to English Electric Valve Company. Double-ended thyratron having at least three grids. 4,293,800, Cl. 315-350.000.

Mensik, John A. Filter cartridge assembly. 4,292,983, Cl. 131-187.000.

Merck & Co., Inc.: *See—*
Bolhofer, William A., 4,293,703, Cl. 548-337.000.
Christensen, Burton G.; and DiNinno, Frank P., 4,293,555, Cl. 424-263.000.
McAleer, William J.; Hurni, William M.; and Miller, William J., 4,293,538, Cl. 424-1.000.
Willard, Alvin K., 4,293,496, Cl. 260-343.500.

Mericle, John E. Guide plate for wood working tools. 4,292,870, Cl. 83-471.200.

Merjan, Stanley. Piles. 4,293,242, Cl. 405-239.000.

Merki, Emil: *See—*
Baur, Rudolf; Merki, Emil; and Krahenbuhl, Hanspeter, 4,293,424, Cl. 210-737.000.

Merola, Pasquale A. Two-dimensional transform processor. 4,293,920, Cl. 364-725.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Metcalf, Brian W.; and Johnston, J. O'Neal, 4,293,548, Cl. 424-242.000.

Merrifield, Robert B.; and Wong, Tai W., to Rockefeller University. $N^{\alpha}$-Desacetylthymosin$\alpha_1$ and process. 4,293,455, Cl. 260-8.000.

Merten, Rudolf: *See—*
Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, 4,293,669, Cl. 525-452.000.

Merz, Herbert; and Stockhaus, Klaus, to Bochringer Ingelheim GmbH. Analgesic 2-(2-alkoxy-ethyl)-2'-hydroxy-6,7-benzomorphans and salts thereof. 4,293,556, Cl. 424-267.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Schweig, Helmut; and von Bassewitz, Henning, 4,293,731, Cl. 136-245.000.

Messier, Francis L.: *See—*
Kirk, Calvin K.; Joyce, Glover C.; and Messier, Francis L., 4,292,766, Cl. 51-105.0SP.

Messing, Gary L.: *See—*
Hassler, Craig R.; and Messing, Gary L., 4,293,302, Cl. 433-173.000.

Metcalf, Brian W.; and Johnston, J. O'Neal, to Merrell Dow Pharmaceuticals Inc. 18-Substituted pregn-4-ene-3,20-diones. 4,293,548, Cl. 424-242.000.

Metcalfe, Ronald S.; and Greig, John M., to RM Fabircations Limited; and British Gas Corporation. Method and apparatus for securing a pipe to a fitting. 4,293,147, Cl. 285-39.000.

Metz, Fred L., to Diamond Shamrock Corporation. Composition and process for stabilizing soil. 4,293,340, Cl. 106-74.000.

Metzler, Robert W.: *See—*
Fogg, Lewis W.; Metzler, Robert W.; Satterfield, H. Eugene; and Scott, Eion G., 4,292,762, Cl. 47-17.000.

Micafil AG: *See—*
Nabholz, Hans U., 4,292,744, Cl. 34-73.000.

Michael Forrest, Inc.: *See—*
Forrest, Michael R.; and Kohn, Alfred, 4,292,690, Cl. 2-65.000.
Forrest, Michael R.; and Kohn, Alfred, 4,292,691, Cl. 2-65.000.

Michel, Eberhard: *See—*
Harand, Elmar; and Michel, Eberhard, 4,293,386, Cl. 376-461.000.

Michel, Karl H.: *See—*
Hoehn, Marvin M.; and Michel, Karl H., 4,293,649, Cl. 435-118.000.

Micro-Circuits Company: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,292,916, Cl. 116-205.000.

Microdot Inc.: *See—*
McKewan, Arthur J., 4,293,258, Cl. 411-30.000.

Midcon Pipeline Equipment Co.: *See—*
Slavens, Clyde M.; Clavin, Edward A.; and Alleman, James E., 4,293,758, Cl. 219-125.120.

Middleton, Wilbur D.; and Paulson, John A., to Boeing Company, The. Leading edge vortex flap for wings. 4,293,110, Cl. 244-199.000.

Miesel, John L., to Eli Lilly and Company. Novel 1-(mono-o-substituted benzoyl)-3-(substituted pyrazinyl) ureas. 4,293,552, Cl. 424-250.000.

Mikami, Yasuo; Kanda, Hiroshi; and Uno, Akio, to Nisshin Oil Mills, Ltd., The. Process for preparing mayonnaise-like foods. 4,293,574, Cl. 426-46.000.

Miki, Minoru: *See—*
Ohsumi, Katsumi; and Miki, Minoru, 4,293,382, Cl. 376-308.000.

Milberger, Ernest C.: *See—*
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,293,498, Cl. 260-346.750.

Milberger, Lionel J., to FMC Corporation. Pile connector. 4,293,148, Cl. 285-90.000.

Milchem Incorporated: *See—*
Lucas, James M.; Enright, Dorothy P.; and Perricone, Alphonse C., 4,293,427, Cl. 252-8.50C.

Miller, Betty J. Clamp stand for needlework frames. 4,292,748, Cl. 38-102.000.

Miller, Casper W.: *See—*
George, Robert W.; Miller, Casper W.; and Rapey, Kenneth, 4,293,510, Cl. 264-40.700.

Miller, Donald L., to Facet Enterprises, Inc. Electromagnetic friction clutch with overload release. 4,293,060, Cl. 192-56.00R.

Miller, Robert C.: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Miller, Roger L.: *See—*
Lee, Benjamin Y. S.; Reed, Russell, Jr.; and Miller, Roger L., 4,293,352, Cl. 149-19.400.

Miller, Sylvester T., to STM Corporation. Method of obtaining and recording seismic and geochemical data. 4,293,309, Cl. 23-230.0EP.

Miller, William J.: *See—*
McAleer, William J.; Hurni, William M.; and Miller, William J., 4,293,538, Cl. 424-1.000.

Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, to Orebro Pappersbruks AB. Flexible sheet covering material for wrapping heat, cold and sound insulation. 4,293,607, Cl. 428-212.000.

Milliken Research Corporation: *See—*
Kluger, Edward W.; and Su, Tien-Kuei, 4,293,682, Cl. 528-123.000.

Millouet, Jean: *See—*
Gros, Pierre; Millouet, Jean; and Staron, Philippe, 4,293,935, Cl. 367-43.000.

Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Pneumatic yarn splicing apparatus. 4,292,796, Cl. 57-22.000.

Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru. Stabilized synthetic resin composition. 4,293,472, Cl. 260-23.0XA.

Minai, Kiichi: *See—*
Adachi, Hideo; Minai, Kiichi; Moriyasu, Kozo; and Imagawa, Shunjiro, 4,293,768, Cl. 250-338.000.

Minami, Setsuo: *See—*
Minoura, Kazuo; Sugiura, Muneharu; Minami, Setsuo; and Sato, Tadashi, 4,293,184, Cl. 350-6.300.

Ministry of International Trade & Industry: *See—*
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

Mink, George. Material handling device. 4,293,268, Cl. 414-591.000.

Minnesota Mining and Manufacturing Company: *See—*
Blachunis, Robert J.; and Bany, Stephen W., 4,293,675, Cl. 528-14.000.
Campbell, Douglas D., 4,293,604, Cl. 428-90.000.
Moris, Alfred H., 4,293,882, Cl. 360-93.000.
Myers, Joseph F., 4,293,625, Cl. 430-9.000.

Newell, Richard G.; and Perry, Dale C., 4,293,441, Cl. 252-389.00A.
Niles, Gerald J.; and Ritter, Norman C., 4,293,102, Cl. 242-71.800.
Stivers, David A., 4,293,663, Cl. 525-187.000.
Zollinger, J. Lamar; and Lien, Larry A., 4,293,606, Cl. 428-203.000.

Minolta Camera Kabushiki Kaisha: *See—*
Yamazaki, Yasuo; and Egawa, Takeshi, 4,293,185, Cl. 350-18.000.

Minoura, Kazuo; Sugiura, Muneharu; Minami, Setsuo; and Sato, Tadashi, to Canon Kabushiki Kaisha. Scanning projection device. 4,293,184, Cl. 350-6.300.

Minrad Corporation: *See—*
Weinberg, Norman L., 4,293,640, Cl. 430-421.000.

Mishell, Daniel R., Jr.: *See—*
Nash, Harold A.; and Mishell, Daniel R., Jr., 4,292,965, Cl. 128-260.000.

Misikov, Ivan I.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Missout, Gilles: *See—*
Belanger, Guy; and Missout, Gilles, 4,293,399, Cl. 204-195.00P.

Mitel Corporation: *See—*
Cepelinski, Jacob, 4,293,737, Cl. 179-17.00E.

Mitomi, Seiji: *See—*
Kojima, Masaharu; and Mitomi, Seiji, 4,293,260, Cl. 411-44.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Watanabe, Eiki, 4,293,889, Cl. 361-212.000.

Mitsubishi Gas Chemical Co., Inc.: *See—*
Sugio, Akitoshi; Masu, Masanobu; Nakai, Hiroshi; and Sasaki, Yukio, 4,293,478, Cl. 260-37.00R.
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, 4,293,660, Cl. 525-68.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Iwaki, Tetsuo; Takahashi, Yukio; Moriuchi, Shuji; and Kaneko, Hisamitsu, 4,293,720, Cl. 568-575.000.

Miu, Ming T.: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Miyajima, Masanobu, to Rogers Corporation. Manufacturing method for circuit board. 4,293,377, Cl. 156-656.000.

Miyake, Hidekazu: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.

Miyake, Kenji: *See—*
Morishita, Tuyoshi; Miyake, Kenji; and Tobita, Kouji, 4,292,936, Cl. 123-193.00P.

Miyamoto, Yukihiko: *See—*
Yamada, Tsuneo; and Miyamoto, Yukihiko, 4,293,781, Cl. 307-273.000.

Mobil Oil Corporation: *See—*
Butter, Stephen A.; and Chester, Arthur W., 4,293,446, Cl. 252-455.00Z.
Farcasiu, Malvina; and Whitehurst, Darrell D., 4,293,404, Cl. 208-214.000.
Fitch, John L., 4,293,035, Cl. 166-273.000.
Paul, James M., 4,293,528, Cl. 423-7.000.

Mochida, Hideyuki; Tamura, Shingo; and Tsurumi, Etsuo, to Hitachi, Ltd. High voltage rectifier for television receiver sets. 4,293,903, Cl. 363-68.000.

Momot, Valery I.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Monarch Marking Systems, Inc.: *See—*
Kirby, Raymond L., Jr., 4,292,893, Cl. 101-111.000.

Mono-Kinetics: *See—*
Dudley, Peter B., 4,293,127, Cl. 272-133.000.

Mono, Rune G.; Moren, Nils F. E.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Aerosol inhalation device. 4,292,966, Cl. 128-200.230.

Monosov, Yakov A. Method of recording images on a radiation sensitive material. 4,293,634, Cl. 430-269.000.

Monsanto Company: *See—*
Bach, Hartwig C.; and Hinderer, Helmuth E., 4,293,613, Cl. 428-364.000.
Cohen, Saul M.; and LeBlanc, John R., 4,293,693, Cl. 544-221.000.
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,392, Cl. 204-59.00R.
Hallcher, Richard C.; Goodin, Richard D.; and Baizer, Manuel M., 4,293,393, Cl. 204-59.00R.
Heimsch, Robert A., 4,293,668, Cl. 525-369.000.
Plischke, LeMoyne W.; Familant, Harold M.; and Kelly, Darrell A., 4,293,614, Cl. 428-370.000.
Strazik, William F.; LeBlanc, John R.; and Santer, J. Owen, 4,293,461, Cl. 260-18.00N.

Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Method of dissolving collagen-containing tissues. 4,293,647, Cl. 435-69.000.

Monsimer, Harold G.; and Sandler, Stanley R., to Pennwalt Corporation. Process for reacting chloral with nitrogen compositions. 4,293,454, Cl. 252-609.000.

Montedison S.p.A.: *See—*
Di Battista, Piero; Fontanelli, Renzo; Gratani, Francesco; and Nelli, Giuseppe, 4,293,466, Cl. 260-45.80N.

Montgomery, Dean P., to Phillips Petroleum Co. Pretreatment of butene-1 in isomerization of it to butene-2. 4,293,728, Cl. 585-670.000.

Montgomery, James W., to Brown Oil Tools, Inc. Soft shock pressure plug. 4,292,988, Cl. 137-68.00R.

Mookherjee, Braja D.: *See—*
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,293,579, Cl. 426-535.000.

Moore, Carl; and Kirchoff, Robert A., to Dow Chemical Company, The. Interfacial cross-linking of latex films. 4,293,476, Cl. 260-29.70W.

Moore, Joseph E. Method of producing color separation negatives with reduced contrast. 4,293,216, Cl. 355-77.000.

Moore, M. Samuel; and Paluka, Charles F., to Semco Instruments, Inc. Turbocharger control system. 4,292,806, Cl. 60-600.000.

Moran, Daniel B.: *See—*
Allen, George R., Jr.; Hanifin, John W., Jr.; Moran, Daniel B.; and Albright, Jay D., 4,293,554, Cl. 424-250.000.

Morel, Didier, to Rhone-Poulenc Industries. Unsaturated esters and method of preparing them. 4,293,500, Cl. 260-410.90R.

Moren, Nils F. E.: *See—*
Mono, Rune G.; Moren, Nils F. E.; and Wetterlin, Kjell I. L., 4,292,966, Cl. 128-200.230.

Moretti, Anthony L.; and Ferris, Lester W., to E. D. Bullard Company. Self-setting adjustable headband. 4,292,692, Cl. 2-418.000.

Morgan, Dean T.; Chryssostomidis, Chryssostomos; and LaRue, George J., to Thermo Electron Corporation. Metals extraction from sea water. 4,293,527, Cl. 423-6.000.

Mori, Kazumasa: *See—*
Muto, Katsuya; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,293,811, Cl. 322-60.000.

Mori, Masaaki, to Ricoh Company, Ltd. Simultaneous multi-beam optical modulation system. 4,293,195, Cl. 350-358.000.

Morikawa, Yoshiharu, to Solid Corporation. Light reflecting device. 4,293,189, Cl. 350-105.000.

Morimoto, Syogo: *See—*
Nakae, Hideo; Ozaki, Toshinori; Shimaguchi, Takashi; and Morimoto, Syogo, 4,292,832, Cl. 72-365.000.

Morino, Haruki: *See—*
Umemura, Takeaki; Morino, Haruki; Watanabe, Tetsuhiko; and Uematsu, Tamon, 4,293,702, Cl. 548-165.000.

Moris, Alfred H., to Minnesota Mining and Manufacturing Company. Endless loop tape magazine, and a recording and/or playback machine utilizing the magazine. 4,293,882, Cl. 360-93.000.

Morisawa, Tahei: *See—*
Kando, Toru; and Morisawa, Tahei, 4,293,210, Cl. 354-269.000.

Morishita, Hirosada; Kawamoto, Mineo; and Murakami, Kanzi, to Hitachi, Ltd. Method for production of printed circuits by electroless metal plating. 4,293,592, Cl. 427-98.000.

Morishita, Tuyoshi; Miyake, Kenji; and Tobita, Kouji, to Toyo Kogyo Co., Ltd. Aluminum based alloy pistons for internal combustion engines. 4,292,936, Cl. 123-193.00P.

Morita, Yasuyuki, to Toyo Kogyo Co., Ltd. Lubricating means for rotary piston engines with pressure and temperature responsive valve means in the eccentric shaft. 4,293,289, Cl. 418-84.000.

Moriuchi, Shuji: *See—*
Iwaki, Tetsuo; Takahashi, Yukio; Moriuchi, Shuji; and Kaneko, Hisamitsu, 4,293,720, Cl. 568-575.000.

Moriya, Jyunichiro: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,292,973, Cl. 128-303.100.

Moriyama, Yoshiki; and Kuwana, Masayuki, to Toyooki Kogyo Kabushiki Kaisha. Electrically operated fluid control device. 4,293,002, Cl. 137-625.640.

Moriyasu, Kozo: *See—*
Adachi, Hideo; Minai, Kiichi; Moriyasu, Kozo; and Imagawa, Shunjiro, 4,293,768, Cl. 250-338.000.

Morooka, Yasuo; Tanifuji, Shinya; and Tanuma, Masaya, to Hitachi, Ltd. Gauge and tension control system for tandem rolling mill. 4,292,825, Cl. 72-8.000.

Morrey, William B.; and Welsh, David M., to CXA Ltd./CXA Ltee. Detonating device. 4,292,896, Cl. 102-275.800.

Morris, Jesse L., to General Electric Company. Method and apparatus for physically testing the integrity of the connection between an electrode assembly and a terminal conductor of an electrochemical cell. 4,292,852, Cl. 73-827.000.

Morris, Robert: *See—*
St. Lawrence, David S.; Morris, Robert; and Farrar, James G., 4,293,266, Cl. 414-411.000.

Mortellito, Ronald: *See—*
Gardner, Roland C.; and Mortellito, Ronald, 4,293,090, Cl. 229-5.600.

Mosely, Neal J.: *See—*
Alley, David W., 4,292,987, Cl. 132-73.000.

Mosley, Kenneth C.: *See—*
Nielsen, Edward G.; Mosley, Kenneth C.; and Chatterson, Louis M., 4,293,218, Cl. 356-138.000.

Motegi, Masanori: *See—*
Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, 4,293,941, Cl. 364-200.000.





Motorenfabrik Hatz GmbH & Co. KG: *See—*
Hatz, Ernst; Eibl, Heinz; Peter, Erwin; and Blumhardt, Rolf, 4,293,092, Cl. 237-12.100.

Motorola Inc.: *See—*
Knappenberger, Thomas A.; and Landers, James F., Jr., 4,293,519, Cl. 264-272.130.
Powell, Michael W., 4,292,729, Cl. 29-571.000.

Mott, James D., to Hydril Company. Well safety system method and apparatus. 4,293,034, Cl. 166-208.000.

Moynahan, E. Bradley: *See—*
Beavan, Elton L.; and Moynahan, E. Bradley, 4,293,642, Cl. 430-534.000.

Mueller, John H., to Intercontinental Valve Manufacturing Company. Plug valve actuator. 4,293,117, Cl. 251-229.000.

Mullen, H. Gerald, to Virginia Industries, Inc. Method for manufacturing of bearings. 4,292,717, Cl. 29-148.40A.

Muller, Lutz: *See—*
Kinast, Gunther; Muller, Lutz; Puls, Walter; and Sitt, Rudiger, 4,293,551, Cl. 424-249.000.

Muller, Roswitha: *See—*
Gruenberger, Eberhard; and Muller, Roswitha, 4,293,458, Cl. 260-17.4GC.

Mullins, John M.; and Kelly, Joseph L., Jr., to Hughes Tool Company. Non-rotating stabilizer for drill string. 4,293,039, Cl. 166-341.000.

Mulvihill, Dan R. Insulated building structure and method for making same. 4,292,783, Cl. 52-741.000.

Munch, Ulrich: *See—*
Cordes, Gunter; Giesselmann, Ewald; and Munch, Ulrich, 4,293,565, Cl. 424-285.000.

Munden, Jeffrey E.: *See—*
Cockram, Geoffrey N.; and Munden, Jeffrey E., 4,293,575, Cl. 426-104.000.

Murakami, Kanzi: *See—*
Morishita, Hirosada; Kawamoto, Mineo; and Murakami, Kanzi, 4,293,592, Cl. 427-98.000.

Muralidhara, H. S., to Systems Consultants, Inc. Recovery of active chitin and enhanced protein meal. 4,293,098, Cl. 241-19.000.

Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, to Fujitsu Limited. Memory access control system in vector processing system. 4,293,941, Cl. 364-200.000.

Murari, Bruno; and Siligoni, Marco, to SGS-ATES Componenti Elettronici S.p.A. Linear differential amplifier with unbalanced output. 4,293,824, Cl. 330-301.000.

Murata Kikai Kabushiki Kaisha: *See—*
Mima, Hiroshi, 4,292,796, Cl. 57-22.000.

Murata Manufacturing Co., Ltd.: *See—*
Adachi, Hideo; Minai, Kiichi; Moriyasu, Kozo; and Imagawa, Shunjiro, 4,293,768, Cl. 250-338.000.

Murayama, Yoshinobu, to Kubota, Ltd. Transmission for a farm tractor of four wheel drive type. 4,292,855, Cl. 74-15.400.

Murphy, Cornelius B.; and Sypula, Donald S., to Xerox Corporation. Process of developing magnetic images and dry magnetic toner compositions. 4,293,627, Cl. 430-39.000.

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Muto, Norio: *See—*
Tanasawa, Yasusi; Muto, Norio; Saito, Akinori; and Kawamura, Kiyomi, 4,292,947, Cl. 123-445.000.

Myers, Herbert: *See—*
Langley, Robert C.; Myers, Herbert; and Abrash, Muriel, 4,293,513, Cl. 264-60.000.

Myers, Joseph F., to Minnesota Mining and Manufacturing Company. Anchor layer in photolithographic receptor base contains oxide surface treated titanium dioxide. 4,293,625, Cl. 430-9.000.

Myers, Michael J.: *See—*
Davis, Robert K.; and Myers, Michael J., 4,293,835, Cl. 335-131.000.

Myers, Robert W., to Owens-Corning Fiberglas Corporation. Method and apparatus for detecting a ground on electric furnaces. 4,293,730, Cl. 13-6.000.

Myers, Ronald W.: *See—*
Hughes, Donald W. K.; and Myers, Ronald W., 4,292,736, Cl. 29-884.000.

Naarmann, Herbert: *See—*
Hahn, Klaus; Naarmann, Herbert; and Penzien, Klaus, 4,293,656, Cl. 521-88.000.

Nabholz, Hans U., to Micafil AG. Separation apparatus for a condensation-drying plant. 4,292,744, Cl. 34-73.000.

Nagai, Kenichi: *See—*
Inaba, Hideya; Nagai, Kenichi; Ichiki, Masayoshi; Kamino, Yasumi; and Maeda, Kazuo, 4,293,447, Cl. 252-461.000.

Nagano, Katsuto; Ihaya, Kazuhiko; Sasa, Syozo; and Nakada, Takeshi, to TDK Electronics Co., Ltd. Method for the epitaxial growth of boron phosphorous semiconductors. 4,293,370, Cl. 156-612.000.

Nagao, Syozo: *See—*
Fujii, Yoshishige; Nagao, Syozo; and Kumazawa, Shunji, 4,293,418, Cl. 210-321.100.

Nagasawa, Shigeru: *See—*
Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, 4,293,941, Cl. 364-200.000.

Nagata, Nobuyoshi: *See—*
Hori, Kiyoshi; and Nagata, Nobuyoshi, 4,293,599, Cl. 427-274.000.

Nagode, Larry R., to Quaker Oats Company, The. Push-pull wheel action toy. 4,292,759, Cl. 46-205.000.

Nagy, Albert E., to Gould Inc. Process for producing strippable copper on an aluminum carrier and the article so obtained. 4,293,617, Cl. 428-469.000.

Naito, Hideki: *See—*
Tanaka, Toyonaru; and Naito, Hideki, 4,293,842, Cl. 340-52.00F.

Nakada, Takeshi: *See—*
Nagano, Katsuto; Ihaya, Kazuhiko; Sasa, Syozo; and Nakada, Takeshi, 4,293,370, Cl. 156-612.000.

Nakae, Hideo; Ozaki, Toshinori; Shimaguchi, Takashi; and Morimoto, Syogo, to Hitachi, Ltd. Method of producing vibration attenuating metallic material. 4,292,832, Cl. 72-365.000.

Nakagawa, Kazuyuki: *See—*
Ishikawa, Hiroshi; and Nakagawa, Kazuyuki, 4,293,694, Cl. 546-72.000.

Nakagawa, Kiyoshi: *See—*
Otaki, Yukio; Umeda, Kazuo; and Nakagawa, Kiyoshi, 4,292,799, Cl. 57-246.000.

Nakahara, Yutaka: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Haruna, Tohru, 4,293,472, Cl. 260-23.0XA.

Nakai, Hiroshi: *See—*
Sugio, Akitoshi; Masu, Masanobu; Nakai, Hiroshi; and Sasaki, Yukio, 4,293,478, Cl. 260-37.00R.

Nakajima, Shunichi; and Hasegawa, Haruyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Toner feeding device. 4,293,085, Cl. 222-311.000.

Nakamura, Hiroto: *See—*
Matsumura, Ko; Nakamura, Hiroto; and Irie, Toshio, 4,293,336, Cl. 75-124.000.

Nakamura, Kazuo: *See—*
Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, 4,293,205, Cl. 354-23.00D.
Tokutomi, Seijiro; Jyojiki, Masao; Aoki, Harumi; Nakamura, Kazuo; and Watanabe, Koichiro, 4,293,206, Cl. 354-25.000.

Nakamura, Masahiro: *See—*
Ohtake, Yukio; and Nakamura, Masahiro, 4,293,643, Cl. 435-39.000.

Nakanishi Metal Works Co., Ltd.: *See—*
Wakabayashi, Takao, 4,292,897, Cl. 104-172.00S.

Nakatani, Yohichiroh: *See—*
Tsukada, Haruo; and Nakatani, Yohichiroh, 4,293,880, Cl. 360-10.000.

Narumi, Naoaki: *See—*
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.

Nash, Claude H., III; Shearer, Marcia C.; Snader, Kenneth M.; Valenta, Joseph R.; and Cooper, David, to SmithKline Corporation. Anthracycline antibiotics produced by *Streptosporangium fragilis* Shearer sp. nov. ATCC 31519. 4,293,546, Cl. 424-119.000.

Nash, Harold A.; and Mishell, Daniel R., Jr., to Population Council, Inc., The. Intravaginal ring. 4,292,965, Cl. 128-260.000.

Nasser, Gamal E. D., to Linde Aktiengesellschaft. Plate-type heat exchanger. 4,293,033, Cl. 165-166.000.

National Can Corporation: *See—*
George, Robert W.; Miller, Casper W.; and Rapey. Kenneth, 4,293,510, Cl. 264-40.700.

Naum, Robert G.: *See—*
Hortman, Michael T.; and Naum, Robert G., 4,293,598, Cl. 427-203.000.

Nauomidis, Aristides: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.

Nayak, Jnaneshwar H.: *See—*
Liu, Chunghorng R.; Nayak, Jnaneshwar H.; Stenberg, Herbjorn; Huerta, Felipe J.; and Hall, Woodrow A., 4,292,865, Cl. 82-36.00R.

Nelli, Giuseppe: *See—*
Di Battista, Piero; Fontanelli, Renzo; Gratani, Francesco; and Nelli, Giuseppe, 4,293,466, Cl. 260-45.80N.

Nelson, Carl J.: *See—*
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,293,390, Cl. 202-100.000.

Nelson, Robert L.: *See—*
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, 4,293,507, Cl. 264-0.500.

Nemec, Frank A.; and Pearlson, Raymond, to Lykes Bros. Steamship Co., Inc. Ocean-going barge carrier. 4,292,915, Cl. 114-260.000.

Nesseth, Clifford B.: *See—*
Nesseth, Clinton A.; and Nesseth, Clifford B., 4,293,282, Cl. 417-53.000.

Nesseth, Clinton A.; and Nesseth, Clifford B., to Nesseth, Inc. Manure handling system having recirculating pump. 4,293,282, Cl. 417-53.000.

Nesseth, Inc.: *See—*
Nesseth, Clinton A.; and Nesseth, Clifford B., 4,293,282, Cl. 417-53.000.

Nestler, Johannes; and Wrede, Hans, to Licentia Patent-Verwaltungs-G.m.b.H. Control of power semiconductors through center-tapped transformer with self-demagnetizing circuitry. 4,293,779, Cl. 307-252.00C.

Neukom, Chester G.; and Kopecky, Ivyl D., to Haybuster Manufacturing, Inc. Soil undercutter with trip release for pivotally mounted shank. 4,293,043, Cl. 172-267.000.

Neukomm, Hans-Rudolf, to U.S. Philips Corporation. Method of manufacturing a device and device manufactured according to the method. 4,293,375, Cl. 156-643.000.

Neukomm, Hans-Rudolf, to U.S. Philips Corporation. Method of manufacturing a semiconductor device using different etch rates. 4,293,588, Cl. 427-93.000.

Neumeyer, Tom A.; and Foster, Francis W., to L. S. Starrett Company, The. Welded edge band saw tooth geometry. 4,292,871, Cl. 83-661.000.

Neuray, Dieter: *See—*
Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, 4,293,662, Cl. 525-184.000.

New England Nuclear Corporation: *See—*
Fost, Dennis L., 4,293,436, Cl. 252-301.10R.

Newage Engineers Limited: *See—*
Wright, Michael J., 4,293,810, Cl. 322-28.000.

Newell, Richard G.; and Perry, Dale C., to Minnesota Mining and Manufacturing Company. Corrosion inhibiting heat transfer liquid. 4,293,441, Cl. 252-389.00A.

Newman, Gerald H.: *See—*
Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, 4,293,623, Cl. 429-194.000.

Newton, John C., Jr., to Ansley, Incorporated. Yarn heater track cleaning apparatus and method. 4,292,770, Cl. 51-170.0PT.

Nezu, Yushi: *See—*
Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, 4,293,533, Cl. 423-449.000.

NGK Insulators, Ltd.: *See—*
Higuchi, Noboru; Yano, Teruo; and Ohnishi, Masahiro, 4,293,357, Cl. 156-89.000.
Wada, Shigetaka, 4,293,514, Cl. 264-61.000.

Nguyen, Liem, to Orion Industries, Inc. Fuel consumption efficiency gauge. 4,292,840, Cl. 73-115.000.

Nickel, Hubertus: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.

Nielsen, Edward G.; Mosley, Kenneth C.; and Chatterson, Louis M., to Laser Alignment, Inc. Reference light beam projector. 4,293,218, Cl. 356-138.000.

Niemi, Francis J. Automatic welder's helmet having ventilation means. 4,293,757, Cl. 219-147.000.

Nienhaus, Harry A.: *See—*
Brooks, James L.; Bowers, James C.; and Nienhaus, Harry A., 4,293,904, Cl. 363-86.000.

Nifco Inc.: *See—*
Kojima, Masaharu; and Mitomi, Seiji, 4,293,260, Cl. 411-44.000.

Niles, Gerald J.; and Ritter, Norman C., to Minnesota Mining and Manufacturing Company. Reel weight assembly. 4,293,102, Cl. 242-71.800.

Nill, Edgar: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Nilsson, Erik R.: *See—*
Furendal, Allan R. B.; Larsson, Bernt; and Nilsson, Erik R., 4,293,596, Cl. 427-160.000.

Nimura, Takayasu: *See—*
Muto, Katsuya; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,293,811, Cl. 322-60.000.

Nippon Cable System Inc.: *See—*
Teraura, Makoto, 4,292,859, Cl. 74-501.00R.

Nippon Electric Co., Ltd.: *See—*
Iijima, Yasuo, 4,293,739, Cl. 179-18.0GF.
Kojima, Masayuki; Kobayakawa, Masaki; and Tanaka, Kozo, 4,293,793, Cl. 313-497.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Okumura, Takatoshi; Hamada, Seiya; and Imamura, Akio, 4,292,873, Cl. 84-1.010.

Nippon Hoso Kyokai: *See—*
Togami, Yuji, 4,293,621, Cl. 428-678.000.

Nippon Kogaku K.K.: *See—*
Takahashi, Yosuke, 4,293,194, Cl. 350-357.000.

Nippon Light Metal Co., Ltd.: *See—*
Matsueda, Shinji, 4,293,082, Cl. 222-131.000.

Nippon Paint Co., Ltd.: *See—*
Hori, Kiyoshi; and Nagata, Nobuyoshi, 4,293,599, Cl. 427-274.000.

Nippon Steel Corporation: *See—*
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Kuroki, Katsuro, 4,293,350, Cl. 148-111.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Shibayama, Akinori; Maio, Kenji; and Yokozawa, Norio, 4,293,819, Cl. 330-9.000.
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.

Nippondenso Co., Ltd.: *See—*
Muto, Katsuya; Mori, Kazumasa; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,293,811, Cl. 322-60.000.
Tsuzuki, Yoshihiko; Kaga, Sumihiro; and Hobo, Nobuhito, 4,293,893, Cl. 362-38.000.

Nishikawa, Masaji; and Kasuga, Muneo, to Olympus Optical Company Limited. Bias voltage adjusting means for electrophotographic apparatus. 4,293,213, Cl. 355-14.00R.

Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Power steering device for vehicles. 4,293,051, Cl. 180-133.000.

Nishikubo, Yasuhiko; and Sekine, Mitsuo, to Citizen Watch Company Limited. Electronic timepiece having an alarm system. 4,293,939, Cl. 368-74.000.

Nishimura, Hideo; Yoneda, Takao; and Enomoto, Minoru, to Toyoda Koki Kabushiki Kaisha. Numerical controller for a grinding machine. 4,293,913, Cl. 364-474.000.

Nishina, Yasuhide: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,293,585, Cl. 427-40.000.

Nishizaki, Tadao: *See—*
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,293,445, Cl. 252-438.000.

Nissan Motor Company, Limited: *See—*
Masaki, Kenji, 4,292,946, Cl. 123-440.000.
Tanaka, Toshiaki; and Etoh, Yukihiro, 4,292,938, Cl. 123-198.00F.
Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,293,363, Cl. 156-272.000.

Nissen, Dietmar; Marx, Matthias; Jarre, Wolfgang; Schoen, Ernst; and Decker, Walter, to BASF Aktiengesellschaft. Stable melamine polyol dispersions, a process for their manufacture and for the preparation of foamed polyurethane plastics. 4,293,657, Cl. 521-121.000.

Nisshin Oil Mills, Ltd., The: *See—*
Mikami, Yasuo; Kanda, Hiroshi; and Uno, Akio, 4,293,574, Cl. 426-46.000.

Niwa, Yukichi: *See—*
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

Noda, Hideki: *See—*
Tanaka, Kojiro; Ochiai, Shozo; and Noda, Hideki, 4,293,782, Cl. 307-350.000.

Noe', Sergio: *See—*
Bertini, Fausto A.; and Noe', Sergio, 4,293,318, Cl. 55-85.000.

Noel, Claude: *See—*
Christ, Charles; LeBeault, Jean-Michel; and Noel, Claude, 4,293,655, Cl. 435-316.000.

Nogami, Sadao: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,292,973, Cl. 128-303.100.

Noguchi, Satoshi; and Kitao, Takaya, to Matsushita Electric Industrial Co., Ltd. Time sound generating device. 4,293,940, Cl. 368-75.000.

Nomura, Hirokazu: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,293,585, Cl. 427-40.000.

Norden Laboratories, Inc.: *See—*
Kucera, Carrell J., 4,293,545, Cl. 424-92.000.

North Eastern Timber (U.S.A.) Incorporated: *See—*
Israel, Benjamin, 4,293,292, Cl. 425-9.000.

Northern Telecom Inc.: *See—*
Splitt, Frank G.; and Turner, Donald B., 4,293,887, Cl. 361-120.000.

Northern Telecom Limited: *See—*
Gibb, William D.; and Clement, Donald E., 4,293,740, Cl. 179-99.00A.

Northup, John D. Method for manufacturing glass bottles. 4,293,327, Cl. 65-64.000.

Northwestern Laboratories, Inc.: *See—*
Wilson, Robert B., 4,293,305, Cl. 8-115.600.

Norwalk Investment Club: *See—*
Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, 4,292,834, Cl. 72-482.000.

Nosovitsky, Alexandr Y.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Nourney, Carl-Ernst. Strain-gauge sound pickup for string instrument. 4,292,875, Cl. 84-1.140.

Nuller, Hanns P.: *See—*
Mazanek, Jan; and Nuller, Hanns P., 4,293,680, Cl. 528-67.000.

Oakeridge Management Services B.V.: *See—*
Clover, George R., 4,293,190, Cl. 350-241.000.

Oakman, Ronald A., to Stanhope-Seta Limited. Liquid testing apparatus. 4,292,837, Cl. 73-17.00R.

Oana, Yoshinori: *See—*
Wada, Shinzi; Kitao, Ikuo; Oana, Yoshinori; Kato, Yasuo; and Ishihara, Taketoshi, 4,293,199, Cl. 351-13.000.

O'Brien, Joseph P.: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,293,432, Cl. 252-49.900.

Ochiai, Shozo: *See—*
Tanaka, Kojiro; Ochiai, Shozo; and Noda, Hideki, 4,293,782, Cl. 307-350.000.

O'Connor, John W., to Allis-Chalmers Corporation. Hydraulic draft load sensing system including quill shaft bendable in response to draft loads. 4,293,040, Cl. 172-7.000.

Odeco Engineers Inc.: *See—*
Petty, Terry D.; Costello, Carmon R.; Rao, Gude P.; and Gansar, David, 4,293,239, Cl. 405-195.000.

Officine Augusto Cattani & C. S.A.S.: *See—*
Cattani, Augusto, 4,293,300, Cl. 433-92.000.

Offner, Abe, to Perkin-Elmer Corporation, The. Restricted off-axis field optical system. 4,293,186, Cl. 350-27.000.

Ogawa, Genshirou. Temperature-controlled electric heating device for heating instillation or transfusion liquids. 4,293,762, Cl. 219-302.000.



Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Alarm signaling time detecting device for digital clock. 4,293,938, Cl. 368-72.000.

Ogimoto, Kazuo; Inoue, Tomohiro; Tanaka, Susumu; and Kobayashi, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for installing an electric power plant. 4,293,240, Cl. 405-195.000.

Ogita, Minoru. Noise eliminator for radio receiver. 4,293,736, Cl. 179-1.0GD.

Ohguchi, Osamu: *See—*
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.

Ohlbach, Ralph C. For protecting printed circuit boards and other items against the ravages of a discharge of static electricity. 4,293,070, Cl. 206-328.000.

Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, to Atlantic Richfield Company. Method and apparatus for the distribution of liquid-vapor mixture. 4,293,025, Cl. 165-1.000.

Ohnishi, Masahiro; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Light beam recording device. 4,293,202, Cl. 354-5.000.

Ohnishi, Masahiro: *See—*
Higuchi, Noboru; Yano, Teruo; and Ohnishi, Masahiro, 4,293,357, Cl. 156-89.000.

Ohsumi, Katsumi; and Miki, Minoru, to Hitachi, Ltd. Method of starting up a nuclear reactor. 4,293,382, Cl. 376-308.000.

Ohta, Hirofumi, to Hitachi, Ltd. Magnetic bubble memory devices. 4,293,929, Cl. 365-2.000.

Ohta, Masafumi: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,293,628, Cl. 430-58.000.
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, 4,293,492, Cl. 260-160.000.

Ohta, Ryuji; and Inoue, Yoshimichi, to Jidosha Kiki Co., Ltd. Power servo booster. 4,292,887, Cl. 92-94.000.

Ohtake Works Company, Ltd.: *See—*
Ohtake, Yukio; and Nakamura, Masahiro, 4,293,643, Cl. 435-39.000.

Ohtake, Yukio; and Nakamura, Masahiro, to Ohtake Works Company, Ltd. Rotary shaking culture measuring method and apparatus. 4,293,643, Cl. 435-39.000.

Oka, Kozo, to Rank Xerox Limited. Electrophotographic photosensitive member. 4,293,630, Cl. 430-59.000.

Okamoto, Taro: *See—*
Tanaka, Katsushi; and Okamoto, Taro, 4,293,227, Cl. 366-11.000.

Okuda, Hironori: *See—*
Ito, Motoya; Sato, Masaki; Watanabe, Masatoshi; and Okuda, Hironori, 4,293,787, Cl. 310-181.000.

Okudaira, Sadao: *See—*
Kobayashi, Koichi; and Okudaira, Sadao, 4,293,197, Cl. 350-454.000.

Okumura, Takatoshi; Hamada, Seiya; and Imamura, Akio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,292,873, Cl. 84-1.010.

Okuya, Ken, to Tamura Kaken Co., Ltd. Photopolymerizable polyester containing compositions. 4,293,636, Cl. 430-281.000.

Olin Corporation: *See—*
Mendiratta, Sudhir K., 4,293,721, Cl. 568-916.000.
Saeman, Walter C., 4,293,324, Cl. 65-27.000.

Olofsson, Mats; Buhler, Marcel; and Wood, Robert, to Societe d'Assistance Technique pour Produits Nestle S.A. Process for the preparation of a purified protein hydrolysate. 4,293,571, Cl. 426-7.000.

Olschewski, Armin: *See—*
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,293,166, Cl. 308-6.00C.

Olsen, Edward C. Horse-feeding apparatus. 4,292,930, Cl. 119-51.110.

Olson, John S., to Phillips Petroleum Company. Hydrocarbon heating. 4,293,402, Cl. 208-93.000.

Olson, Jon S.: *See—*
George, Clifford L.; and Olson, Jon S., 4,293,214, Cl. 355-14.00R.

Olson, Paul E.; and Lyons, Michael D., to American Standard Inc. Multi-function operator for control valve device. 4,293,118, Cl. 251-297.000.

Olympus Optical Company Ltd.: *See—*
Kawashima, Kazuma, 4,292,961, Cl. 128-6.000.
Nishikawa, Masaji; and Kasuga, Muneo, 4,293,213, Cl. 355-14.00R.
Sato, Masanobu; and Satoh, Ken, 4,293,742, Cl. 179-178.000.

OMUV Orvosi Muszer es Vasipari Szovetkezet: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.

Ondetti, Miguel A.: *See—*
Condon, Michael E.; and Ondetti, Miguel A., 4,293,481, Cl. 260-112.50R.

Onoda, Yukio: *See—*
Kinoshita, Minoru; Sugou, Kiyoshi; and Onoda, Yukio, 4,293,226, Cl. 356-443.000.

Oonishi, Souichi, to Sharp Kabushiki Kaisha. Electronic cash register with facilities of storing merchandise information. 4,293,911, Cl. 364-405.000.

Opal, Kenneth E., to Power Control Corporation. Method and apparatus for controlling power and optimizing power factor in an AC-to-DC converter. 4,293,905, Cl. 363-124.000.

Optical Coating Laboratory, Inc.: *See—*
Rancourt, James D.; and Seddon, Richard I., 4,293,732, Cl. 136-257.000.

Orebro Pappersbruks AB: *See—*
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,293,607, Cl. 428-212.000.

Orion Industries, Inc.: *See—*
Nguyen, Liem, 4,292,840, Cl. 73-115.000.

Ormat Turbines, Ltd.: *See—*
Rambach, Claude, 4,293,030, Cl. 165-40.000.

Orogil: *See—*
Demoures, Bernard; and Le Coent, Jean-Louis, 4,293,431, Cl. 252-33.200.
Rivier, Georges, 4,293,430, Cl. 252-32.70E.

O'Rourke, Thomas J.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Orscheln Brake Lever Mfg. Co.: *See—*
Lipshield, Eugene C., 4,292,858, Cl. 74-501.00R.

Osada, Hiroshi, to Kai Cutlery Center Co., Ltd. Knife. 4,292,738, Cl. 30-162.000.

Osborne, Vernon E.: *See—*
Wahlers, Richard L.; and Osborne, Vernon E., 4,293,838, Cl. 338-308.000.

Osburn, Carlton M.: *See—*
Van Benthuysen, John D.; and Osburn, Carlton M., 4,293,751, Cl. 200-156.000.

Ose, Earl E.: *See—*
Ludwig, Nelson H.; and Ose, Earl E., 4,293,539, Cl. 424-19.000.

Osterhaus, Albertus D. M. E.: *See—*
Horzinek, Marian C.; and Osterhaus, Albertus D. M. E., 4,293,653, Cl. 435-237.000.

Otaki, Yukio; Umeda, Kazuo; and Nakagawa, Kiyoshi, to Toray Industries, Inc. Spun yarn-like textured yarns and process for producing same. 4,292,799, Cl. 57-246.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Ishikawa, Hiroshi; and Nakagawa, Kazuyuki, 4,293,694, Cl. 546-72.000.

Ott, Albert: *See—*
Fischer, Helmut; Ott, Albert; and Steegmuller, Willi, 4,293,767, Cl. 250-308.000.

Ott, Clyde E. Tool holder and carbide insert. 4,293,253, Cl. 408-226.000.

Ottofrickenstein, Hans: *See—*
Fink, Herbert; Huebner, Klaus; Dinklage, Horst; and Ottofrickenstein, Hans, 4,293,600, Cl. 427-385.500.

Owada, Mitsutoshi: *See—*
Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, 4,293,877, Cl. 358-213.000.

Owens-Corning Fiberglas Corporation: *See—*
Myers, Robert W., 4,293,730, Cl. 13-6.000.
Shannon, Richard F., 4,293,343, Cl. 106-99.000.
Thompson, Thomas K., 4,292,862, Cl. 76-4.000.

Ozaki, Toshinori: *See—*
Nakae, Hideo; Ozaki, Toshinori; Shimaguchi, Takashi; and Morimoto, Syogo, 4,292,832, Cl. 72-365.000.

P. Ferrero & C. S.p.A.: *See—*
Cillario, Renzo, 4,293,577, Cl. 426-244.000.

Pabian, Howell D.: *See—*
Gehr, Marvin M.; and Pabian, Howell D., 4,293,955, Cl. 455-276.000.

Pacific Technology, Inc.: *See—*
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.

Pacific Western Systems, Inc.: *See—*
Worsham, Daniel A., 4,292,722, Cl. 29-402.210.

Packham, Charles C., to Gillette Company, The. Dry shaver with differentially biased inner cutter and base members. 4,292,737, Cl. 30-43.920.

Paddock, Stephen W., to Whirlpool Corporation. Adaptive temperature control system. 4,292,813, Cl. 62-158.000.

Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., to Eli Lilly and Company. Antiviral thiazolinyl benzimidazoles and derivatives. 4,293,558, Cl. 424-270.000.

Paglione, Robert W., to RCA Corporation. Apparatus and method for application of radioactive and microwave energy to the body. 4,292,960, Cl. 128-1.100.

Pai, Venkatrao K.; and Skrivan, Joseph F., to American Cyanamid Company. Continuous process for manufacturing substantially fully methylated substantially fully methylolated melamine compositions. 4,293,692, Cl. 544-196.000.

Pako Corporation: *See—*
Kaufmann, Kenneth M., 4,293,211, Cl. 354-298.000.

Pallos, Ferenc M.; and Gaughan, Edmund J., to Stauffer Chemical Company. N-(Benzenesulfonyl) carbamates - herbicidal antidotes. 4,293,701, Cl. 546-335.000.

Paluka, Charles F.: *See—*
Moore, M. Samuel; and Paluka, Charles F., 4,292,806, Cl. 60-600.000.

Pamer, Walter R., to Lamson & Sessions Co., The. Load indicating fastener. 4,293,256, Cl. 411-11.000.

Panetti, Romolo, to Speno International S.A. Grinding tool. 4,292,768, Cl. 51-168.000.

Pap, Joe P.; Pap, Marilyn D.; Beyler, Arvil L.; and Beyler, Doris M. Sun shade for infant seat and the like. 4,293,162, Cl. 297-184.000.

Pap, Marilyn D.: *See—*
Pap, Joe P.; Pap, Marilyn D.; Beyler, Arvil L.; and Beyler, Doris M., 4,293,162, Cl. 297-184.000.
Papay, Andrew G.; and O'Brien, Joseph P., to Ethyl Corporation. Lubricating oil composition. 4,293,432, Cl. 252-49.900.
Paranjpe, Suresh C.: *See—*
Davis, James W.; and Paranjpe, Suresh C., 4,293,863, Cl. 346-75.000.
Pareja, Ramon, to Lear Siegler, Inc. High pressure unloader valve. 4,292,990, Cl. 137-115.000.
Parekh, Bhupendra K.; and Goldberger, William M., to Silag, Inc. Recovery of silicon carbide whiskers from coked, converted rice hulls by froth flotation. 4,293,099, Cl. 241-24.000.
Park, Sung K.; and Kenyon, William E., to Schlumberger Technology Corporation. Well logging apparatus and method: synthetic logs and synthetic seismograms with extrapolated reflector dip from log measurements. 4,293,933, Cl. 367-25.000.
Parker-Hannifin Corporation: *See—*
Wallace, Joseph E., 4,293,135, Cl. 277-9.000.
Parker Italiana S.a.s.: *See—*
Pedrazzini, Giuseppe, 4,293,349, Cl. 148-6.15R.
Parkin, Paul C., to Imperial Chemical Industries, Limited. Process for spinning bicomponent filaments. 4,293,516, Cl. 264-168.000.
Parks-Cramer Company: *See—*
Werst, Lyman L., 4,292,800, Cl. 57-264.000.
Parks, Glenn C., Jr.; and Beam, Clark W., to Hydril Company. Testing mechanism for blowout preventer ram lock. 4,293,115, Cl. 251-1.00A.
Parrish, John D.: *See—*
Mayo, Terry H.; and Parrish, John D., 4,293,167, Cl. 308-8.200.
Partain, James H., to Stone Container Corporation. Wardrobe container. 4,293,069, Cl. 206-279.000.
Parthasarathy, R.; and Hort, Eugene V., to GAF Corporation. Solid catalysts for oxidative dehydrogenation of alkenes or alkadienes to furan compounds. 4,293,444, Cl. 252-432.000.
Pasquinelli, Ottorino: *See—*
Cazzaniga, Italo; and Pasquinelli, Ottorino, 4,292,989, Cl. 137-72.000.
Passafiume, Anthony: *See—*
Klasek, Ladislav J.; Lamber, Clarence F.; and Passafiume, Anthony, 4,293,367, Cl. 156-494.000.
Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Respirator having oxygen delivering chemical cartridge. 4,292,967, Cl. 128-202.260.
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, to OMUV Orvosi Muszer es Vasipari Szovetkezet. Stop valve. 4,292,996, Cl. 137-393.000.
Patil, Suhas S., to Massachusetts Institute of Technology. Storage/logic array. 4,293,783, Cl. 307-465.000.
Paul, James M., to Mobil Oil Corporation. Yellowcake processing in uranium recovery. 4,293,528, Cl. 423-7.000.
Paulson, John A.: *See—*
Middleton, Wilbur D.; and Paulson, John A., 4,293,110, Cl. 244-199.000.
Pawelchak, John M.; Wang, Yu-Chang J.; and LaVia, Anthony L., to E. R. Squibb & Sons, Inc. Lyophilized hydrocolloio foam. 4,292,972, Cl. 128-296.000.
Pearlson, Raymond: *See—*
Nemec, Frank A.; and Pearlson, Raymond, 4,292,915, Cl. 114-260.000.
Pecoraro, Richard J.: *See—*
Helveston, Wilton L.; and Pecoraro, Richard J., 4,293,241, Cl. 405-213.000.
Pedrazzini, Giuseppe, to Parker Italiana S.a.s. Protective compositions for steel surfaces and the process for their preparation. 4,293,349, Cl. 148-6.15R.
Pedrazzoli, Andrea; and Boveri, Sergio, to C M Industries. Talampicillin 2-methoxyphenoxyacetate and pharmaceutical compositions containing it. 4,293,560, Cl. 424-271.000.
Peery, Walter E. Phototypesetter, method and apparatus. 4,293,203, Cl. 354-17.000.
Pellegata, Renato: *See—*
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,293,705, Cl. 560-53.000.
Pelton, Peter G.; and Pulciani, Sam C., to Continental Group, Inc., The. Sealing-attaching system for bag type aerosol containers. 4,293,353, Cl. 156-69.000.
Penn, William B.: *See—*
Zdaniewski, Joseph J.; Penn, William B.; and Balke, Roy L., 4,293,784, Cl. 310-45.000.
Pennwalt Corporation: *See—*
Monsimer, Harold G.; and Sandler, Stanley R., 4,293,454, Cl. 252-609.000.
Pentek Corporation: *See—*
Dyer, Thomas A.; and Huelster, Richard L., 4,293,065, Cl. 198-781.000.
Penzien, Klaus: *See—*
Hahn, Klaus; Naarmann, Herbert; and Penzien, Klaus, 4,293,656, Cl. 521-88.000.
Pepper, William, Jr., to Peptek, Incorporated. Touch panel system and method. 4,293,734, Cl. 178-18.000.
Peptek, Incorporated: *See—*
Pepper, William, Jr., 4,293,734, Cl. 178-18.000.
Pera, John D.: *See—*
Buckman, John D.; Buckman, Stanley J.; Johnson, Betty S.; and Pera, John D., 4,293,559, Cl. 424-270.000.
Percarpio, Edward P.; and Holderith, William J., to Becton, Dickinson and Company. Vacuum indicator closure for a blood collection tube. 4,293,078, Cl. 215-247.000.
Perkin-Elmer Corporation, The: *See—*
Buckley, William D., 4,293,624, Cl. 430-5.000.
Offner, Abe, 4,293,186, Cl. 350-27.000.
Perkins, Arthur T. Communication device. 4,293,855, Cl. 340-712.000.
Perricone, Alphonse C.: *See—*
Lucas, James M.; Enright, Dorothy P.; and Perricone, Alphonse C., 4,293,427, Cl. 252-8.50C.
Perron, Robert: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,293,718, Cl. 568-487.000.
Perry, Dale C.: *See—*
Newell, Richard G.; and Perry, Dale C., 4,293,441, Cl. 252-389.00A.
Persson, Alf; and Soderberg, Nils O. Tie for wood piles. 4,293,605, Cl. 428-126.000.
Perulfi, John R., to Westinghouse Electric Corp. High-voltage puffer-type compressed-gas circuit-interrupter assemblage. 4,293,747, Cl. 200-145.000.
Peter, Erich, to Lindauer Dornier Gesellschaft mbH. Pile warp thread unwinding device for a terry cloth loom. 4,293,006, Cl. 139-102.000.
Peter, Erwin: *See—*
Hatz, Ernst; Eibl, Heinz; Peter, Erwin; and Blumhardt, Rolf, 4,293,092, Cl. 237-12.100.
Peters, Edwin F.: *See—*
Boudouris, Angelo; and Peters, Edwin F., 4,293,821, Cl. 330-126.000.
Peterson, Francis C., to Illinois Tool Works Inc. Tension indicating washer. 4,293,257, Cl. 411-11.000.
Peterson, John O. H.: *See—*
Loft, Fredrick A.; and Peterson, John O. H., 4,293,360, Cl. 156-230.000.
Peterson, William: *See—*
Savio, Ferdinando; and Peterson, William, 4,293,361, Cl. 156-242.000.
Petralia, Salvatore C.: *See—*
Budnovitch, William F.; Petralia, Salvatore C.; and Silvestris, Louis F., 4,293,898, Cl. 362-291.000.
Petrolite Corporation: *See—*
Cheng, William J.; Guthrie, David B.; and Leiendecker, Donald M., 4,293,429, Cl. 252-18.000.
Petty, Terry D.; Costello, Carmon R.; Rao, Gude P.; and Gansar, David, to Odeco Engineers Inc. Method of erecting a very large diameter offshore column. 4,293,239, Cl. 405-195.000.
Pfeil, Janice L.: *See—*
Kukolja, Stjepan; and Pfeil, Janice L., 4,293,493, Cl. 260-239.00A.
Kukolja, Stjepan; and Pfeil, Janice L., 4,293,495, Cl. 260-245.400.
Pflaum, Peter: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.
Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,293,647, Cl. 435-69.000.
Phelps, Harold E.; and Gansley, Byron J. Log splitter. 4,293,013, Cl. 144-193.00A.
Philip Morris Incorporated: *See—*
Brinker, Reiner G., 4,292,872, Cl. 83-866.000.
Philippides, Constantinos, to United States of America, Navy. Clock invariant synchronization for random binary sequences. 4,293,949, Cl. 371-6.000.
Phillips Petroleum Co.: *See—*
Campbell, Robert W.; and Hill, H. Wayne, Jr., 4,293,688, Cl. 528-346.000.
Lacy, Robert H., 4,293,849, Cl. 340-365.00S.
Montgomery, Dean P., 4,293,728, Cl. 585-670.000.
Olson, John S., 4,293,402, Cl. 208-93.000.
Swanson, Billy L., 4,293,036, Cl. 166-302.000.
Phillips, Raymond M. Surge dampened water bed mattress. 4,292,702, Cl. 5-451.000.
PIAT Impalcature Automatiche S.p.A.: *See—*
Pieri, Antonio, 4,293,054, Cl. 182-63.000.
Pichler, Ludwig: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, 4,293,564, Cl. 424-273.00R.
Pidou B.V.: *See—*
Swantee, Klaus B. M., 4,293,138, Cl. 277-207.00A.
Pieri, Antonio, to PIAT Impalcature Automatiche S.p.A. Scaffolding for supporting lifting working bridges and platforms. 4,293,054, Cl. 182-63.000.
Pierlas, Rene: *See—*
Taponier, Jean; and Pierlas, Rene, 4,293,437, Cl. 252-301.10W.
Pierrat, Michel A. Log splitter with overload protection. 4,293,012, Cl. 144-193.00A.
Pilat, Wladyslaw: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.
Pilette, Yvan P.: *See—*
Flint, William L.; and Pilette, Yvan P., 4,293,635, Cl. 430-271.000.
Pilgrim Electric Company: *See—*
Allison, William W., 4,293,846, Cl. 340-310.00A.



Pinczewski, Morris: *See—*
Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, 4,293,088, Cl. 227-131.000.
Pinegar, Richard K.: *See—*
Hamann, Michael L.; and Pinegar, Richard K., 4,293,582, Cl. 426-637.000.
Pines, Arthur N.: *See—*
Carter, Richard G.; Watson, Stuart L., Jr.; and Pines, Arthur N., 4,293,678, Cl. 528-32.000.
Planakis, Leo N. Game rackets and paddles with nonparallel playing surfaces. 4,293,129, Cl. 273-67.00R.
Plastic Recycling Limited: *See—*
Mair, William J., 4,293,515, Cl. 264-120.000.
Plesnetsov, Jury A.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.
Plischke, LeMoyne W.; Familant, Harold M.; and Kelly, Darrell A., to Monsanto Company. Crimped polyester filament. 4,293,614, Cl. 428-370.000.
Plummer, William T., to Polaroid Corporation. Zoom light apparatus. 4,293,892, Cl. 362-17.000.
Pneumatic Scale Corporation: *See—*
Buschor, Josef J.; and Jennings, Frederick R., 4,292,787, Cl. 53-456.000.
Poeppel, Fritz-Otto: *See—*
Luck, Klaus; and Poeppel, Fritz-Otto, 4,293,265, Cl. 414-140.000.
Polaroid Corporation: *See—*
Bagdis, Judy, 4,293,208, Cl. 354-29.000.
Plummer, William T., 4,293,892, Cl. 362-17.000.
Poletto, John F.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,293,704, Cl. 556-442.000.
Polidoro, Aldo. Gas burner, in particular for liquid gases. 4,293,297, Cl. 431-286.000.
Polska Akademia Nauk Zaklad Polimerow: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.
Polston, Larry D.: *See—*
Stanback, Harris I.; Brann, Theodore L.; and Polston, Larry D., 4,293,153, Cl. 292-85.000.
Pongracz, Endre, to SAPAL Societe Anonyme des Plieuses Automatiques. Method and devices for regulation of the forward travel of a strip bearing marks at regular intervals, and a wrapping-machine employing such a device. 4,293,774, Cl. 250-548.000.
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, to Beecham Group Limited. β-Lactam antibiotics, a process for their preparation and their use in pharmaceutical compositions. 4,293,501, Cl. 260-430.000.
Popa, Adrian E., to Hughes Aircraft Company. Millimeter wave transmission line using thallium bromo-iodide fiber. 4,293,833, Cl. 333-239.000.
Pope, John A.: *See—*
Huffey, Roy F.; and Pope, John A., 4,293,633, Cl. 430-152.000.
Population Council, Inc., The: *See—*
Nash, Harold A.; and Mishell, Daniel R., Jr., 4,292,965, Cl. 128-260.000.
Ports, Kenneth A., to Harris Corporation. Method of fabricating mesa bipolar memory cell utilizing epitaxial deposition, substrate removal and special metallization. 4,292,730, Cl. 29-577.00C.
Portugall, Michael; Finkelmann, Heino; and Ringsdorf, Helmut, to BASF Aktiengeselischaft. Liquid-crystalline polymer phase having a cholesteric structure, processes for its preparation and its use. 4,293,435, Cl. 252-299.010.
Poticha, Stuart M.: *See—*
Raible, Donald A.; Poticha, Stuart M.; and Stauffer, Rita, 4,292,969, Cl. 128-214.00R.
Potin, Philippe: *See—*
Cotte, Jean-Marie; and Potin, Philippe, 4,293,543, Cl. 424-59.000.
Potter, Thomas R., to Detector Systems, Inc. Pedestrian traffic control system. 4,293,841, Cl. 340-44.000.
Powell, Michael W., to Motorola, Inc. Electron-beam programmable semiconductor device structure. 4,292,729, Cl. 29-571.000.
Power Control Corporation: *See—*
Opal, Kenneth E., 4,293,905, Cl. 363-124.000.
PPG Industries, Inc.: *See—*
Darlington, William B.; DuBois, Donald W.; and White, Preston S., 4,293,394, Cl. 204-98.000.
Gorman, Susan B.; Thompson, Ralph B.; and Yonan, Edward E., 4,293,706, Cl. 560-163.000.
Grove, William S., 4,293,329, Cl. 71-88.000.
Prucnal, Paul J., 4,293,398, Cl. 204-181.00C.
Richter, Sidney B.; and Grove, William S., 4,293,707, Cl. 562-472.000.
Simon, Martin J., 4,293,457, Cl. 260-15.000.
Young, Elgin E., 4,293,503, Cl. 260-463.000.
Prab Conveyors, Inc.: *See—*
Herder, Gary A., 4,293,408, Cl. 209-638.000.
Pramaggiore, Luigi. Cigarette lighters, particularly for motor vehicles. 4,293,761, Cl. 219-269.000.
PRE Corporation: *See—*
Borg, Paul E.; and Lechinger, Terry M., 4,292,772, Cl. 52-118.000.
Preisa, Ieva E.: *See—*
Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D., 4,293,700, Cl. 546-321.000.
Press, Irving D., to Resistoflex Corporation. Fluid conduit assembly. 4,293,150, Cl. 285-149.000.
Pretor, Wincenty; Rozmus, Edward; Korecki, Zbigniew; and Karmanski, Stanislaw, to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych "Komag". Walking roof support. 4,293,248, Cl. 405-300.000.
Pretty Products, Inc.: *See—*
Bell, Ted A.; and Lehner, Daniel F., 4,293,140, Cl. 280-154.50R.
Preussag Aktiengesellschaft: *See—*
Luck, Klaus; and Poeppel, Fritz-Otto, 4,293,265, Cl. 414-140.000.
Price, Kenneth E., to Price, Kenneth E. Method of chlorinating swimming pools and the like. 4,293,425, Cl. 210-754.000.
Price, William M.: *See—*
Lewis, Herbert I.; McConnell, Anthony D.; and Price, William M., 4,293,097, Cl. 241-16.000.
Prime, Derek A., to J. C. Bamford Excavators Limited. Excavators. 4,293,270, Cl. 414-690.000.
Prior, Barry, to Rohr Industries, Inc. Turbo fan engine mixer. 4,292,803, Cl. 60-230.000.
Probst, Joachim; Sonntag, Michael; and Kolb, Gunter, to Bayer Aktiengesellschaft. Low molecular weight acrylate resins containing hydroxyl and tertiary amino groups. 4,293,661, Cl. 525-127.000.
Procter & Gamble Company, The: *See—*
Hamilton, Peter W.; and Lewis, William P., 4,293,095, Cl. 239-35.000.
Prototech Company: *See—*
Allen, Robert J.; Lindstrom, Robert; and Juda, Walter, 4,293,396, Cl. 204-106.000.
Prucnal, Paul J., to PPG Industries, Inc. Process for cathodically electrodepositing polymers having tertiary amine oxide groups. 4,293,398, Cl. 204-181.00C.
Puerto, Maura C.: *See—*
Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., 4,293,428, Cl. 252-8.55D.
Pulciani, Sam C.: *See—*
Pelton, Peter G.; and Pulciani, Sam C., 4,293,353, Cl. 156-69.000.
Puls, Walter: *See—*
Kinast, Gunther; Muller, Lutz; Puls, Walter; and Sitt, Rudiger, 4,293,551, Cl. 424-249.000.
Pyke, Thomas R.: *See—*
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., 4,293,645, Cl. 435-55.000.
Quaker Oats Company, The: *See—*
Nagode, Larry R., 4,292,759, Cl. 46-205.000.
Qualetron (PTY) Ltd.: *See—*
Hill, David A.; and Lomnitzer, Abraham, 4,293,072, Cl. 206-512.000.
Rachlin, Schneur; and Arrigoni-Martelli, Edoardo, to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktion-saktieselskab). Quinolinyl guanidines having antiinflammatory, analgesic or antipyretic activity. 4,293,549, Cl. 424-245.000.
Radakovich, Thomas: *See—*
Supcoe, Robert F.; and Radakovich, Thomas, 4,293,339, Cl. 106-18.290.
Raden, Daniel S.; and Arbir, Francis W., to Abbott Laboratories. Process for rigid foams of improved friability. 4,293,658, Cl. 521-129.000.
Radjukevich, Leonid V.: *See—*
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.
Raetz, Karlheinz. Mixture control device for service water installations having a low supply temperature. 4,293,003, Cl. 137-637.400.
Ragoza, Igor V.; Begunov, Petr M.; Tonikian, Robert T.; and Vasiljuk, Petr J. Method of and apparatus for knitting the heel of a hosiery article. 4,292,820, Cl. 66-8.000.
Raible, Donald A.; Poticha, Stuart M.; and Stauffer, Rita. Fluid regulating device with torsional control. 4,292,969, Cl. 128-214.00R.
Rainey, J. Montgomery; and Taylor, Francis M., to Systems Research Laboratories, Inc. Walking-gate ultrasonic flaw detector. 4,292,848, Cl. 73-602.000.
Rambach, Claude, to Ormat Turbines, Ltd. Method of and means for passively cooling a shelter containing a heat source. 4,293,030, Cl. 165-40.000.
Rancourt, James D.; and Seddon, Richard I., to Optical Coating Laboratory, Inc. Silicon solar cell and 350 nanometer cut-on filter for use therein. 4,293,732, Cl. 136-257.000.
Randall, David I. Preparation of β-haloethylphosphonic acids and half esters thereof. 4,293,505, Cl. 260-983.000.
Randel, Harry M. Take-up device speed controller using magnetic sensing means. 4,293,108, Cl. 242-189.000.
Rank Xerox Limited: *See—*
Oka, Kozo, 4,293,630, Cl. 430-59.000.
Rannenberg, George C., to United Technologies Corporation. Variable geometry turbosupercharger system for internal combustion engine. 4,292,807, Cl. 60-601.000.
Rao, Gude P.: *See—*
Petty, Terry D.; Costello, Carmon R.; Rao, Gude P.; and Gansar, David, 4,293,239, Cl. 405-195.000.

Rapey, Kenneth: *See—*
George, Robert W.; Miller, Casper W.; and Rapey, Kenneth, 4,293,510, Cl. 264-40.700.

Rasmussen, Ole-Bendt. Circular extrusion apparatus providing for rotation around the extrusion opening. 4,293,294, Cl. 425-112.000.

Rau, Peter: *See—*
Goetzmann, Claus; and Rau, Peter, 4,293,381, Cl. 376-230.000.

Rauscher, David A., to Cable Conveyor Systems, Inc. Sheave and method of providing same. 4,292,723, Cl. 29-402.010.

Rauschert, Gerd: *See—*
Lakra, Ruhama J.; Freund, Jurgen; and Rauschert, Gerd, 4,293,383, Cl. 376-290.000.

Raymond Engineering, Inc.: *See—*
Bickford, John H., 4,292,835, Cl. 73-1.00B.

Raymond, Glendon A.; Honnold, Fred V.; and Spath, Herbert J., to Carrier Corporation. Co-axial fitting for use with a refrigeration circuit heat reclaim apparatus. 4,293,093, Cl. 237-19.000.

Razus, Virgiliu T. Cereal dryer. 4,292,743, Cl. 34-65.000.

RCA Corporation: *See—*
Chressanthis, Andrew G.; Halpern, Henry M.; and Gaffney, Brian P., 4,293,856, Cl. 343-5.0CF.
D'Amato, Ralph J., 4,293,791, Cl. 313-403.000.
Fitzgerald, William V., 4,293,803, Cl. 315-397.000.
Paglione, Robert W., 4,292,960, Cl. 128-1.100.
Roberts, Donald L., 4,293,792, Cl. 313-403.000.
Siryj, Bohdan W.; Scott, Richard D.; and Horton, Charles R., 4,293,212, Cl. 354-299.000.
Steckler, Steven A.; and Balaban, Alvin R., 4,293,870, Cl. 358-10.000.
Thornhill, John, Jr.; and Elder, Richard B., 4,292,861, Cl. 74-813.00R.

Read, Arthur E.: *See—*
Robey, Melvin J.; Bingaman, David E.; and Read, Arthur E., 4,293,237, Cl. 405-39.000.

Reckitt & Colman Products Limited: *See—*
Fox, Rodney T., 4,293,312, Cl. 44-1.00R.
Fox, Rodney T., 4,293,313, Cl. 44-1.00R.

Reed, Ronald L.: *See—*
Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., 4,293,428, Cl. 252-8.55D.

Reed, Russell, Jr.: *See—*
Lee, Benjamin Y. S.; Reed, Russell, Jr.; and Miller, Roger L., 4,293,352, Cl. 149-19.400.

Reed Tool Company: *See—*
Mayo, Terry H.; and Parrish, John D., 4,293,167, Cl. 308-8.200.

Reese, Stanton L.; and Schroeder, William E., to Uranium Recovery Corporation. Process for recovering uranium from wet-process phosphoric acid using alkyl pyrophosphoric acid extractants. 4,293,529, Cl. 423-10.000.

Regan, Michael T.: *See—*
Webster, Frank G.; Regan, Michael T.; and Rossi, Louis J., 4,293,626, Cl. 430-17.000.

Regie Nationale des Usines Renault: *See—*
Vallaude, Jean-Pierre, 4,292,937, Cl. 123-193.00P.

Rehr, Henry W.: *See—*
Geyser, Joseph E.; Rehr, Henry W.; Schutz, Rudolph W.; and Weis, Rudolf R., 4,293,365, Cl. 156-364.000.

Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, to Daimler-Benz Aktiengesellschaft. Cylinder lock with plate tumblers. 4,292,823, Cl. 70-364.00R.

Reischl, Artur, to Bayer Aktiengesellschaft. Process for the production of polyurethane plastics. 4,293,456, Cl. 260-9.000.

Reitzenstein, Hermann. Apparatus for recovering sulfur from gases containing hydrogen sulfide. 4,293,525, Cl. 422-176.000.

Reneau, Daniel L., to Zenith Radio Corporation. DC Restoration circuit for television receiver. 4,293,874, Cl. 358-172.000.

Rens, Walter J.: *See—*
Heirbaut, Wilfried A.; and Rens, Walter J., 4,293,508, Cl. 264-25.000.

Research Corporation: *See—*
Kay, David B.; Wheeless, Leon L., Jr.; and Cambier, James L., 4,293,221, Cl. 356-318.000.

Research-Cottrell: *See—*
Robinson, James W., 4,293,320, Cl. 55-273.000.

Resistoflex Corporation: *See—*
Press, Irving D., 4,293,150, Cl. 285-149.000.

Retief, Andries; and Zovitsky, Gert J. Toy. 4,293,134, Cl. 273-428.000.

Retterer, Ronald J.: *See—*
Baron, Martin; and Retterer, Ronald J., 4,293,133, Cl. 273-345.000.

Reuber, August M. Portable oscillating-ring harrow. 4,293,042, Cl. 172-110.000.

Rexnord Inc.: *See—*
Acheson, John L., 4,292,805, Cl. 60-450.000.

Rezanka, Ivan: *See—*
Lindblad, Nero R.; Rezanka, Ivan; and Cassidy, John V., 4,292,924, Cl. 118-658.000.

Rhau, Siegfried: *See—*
Weber, Adolf; and Rhau, Siegfried, 4,292,829, Cl. 72-76.000.

Rhodes, Smith A., to Communications Satellite Corporation. Method and apparatus for encoding/decoding a convolutional code to a periodic convolutional code block. 4,293,951, Cl. 371-43.000.

Rhone-Poulenc Industries: *See—*
Florent, Jean; Lunel, Jean; and Mancy, Denise, 4,293,650, Cl. 435-119.000.
Gauthier-Lafaye, Jean; and Perron, Robert, 4,293,718, Cl. 568-487.000.
Morel, Didier, 4,293,500, Cl. 260-410.90R.

Richards Manufacturing Company, Inc.: *See—*
Shea, John J.; and Griggs, Calvin, 4,292,693, Cl. 3-1.900.

Richardson-Vicks Inc.: *See—*
Mazzola, Mario, 4,292,995, Cl. 137-384.200.

Richter, Joerg: *See—*
Boer, Werner; Lachner, Hans; Maschonat, Guenter; Richter, Joerg; Schulte, Heinrich; and Warnke, Hans, 4,293,246, Cl. 405-291.000.

Richter, Sidney B.; and Grove, William S., to PPG Industries, Inc. Process for preparing trichlorophenoxy alkanoic acid and hydrolyzable derivatives thereof free of chlorinated dibenzo-p-dioxins. 4,293,707, Cl. 562-472.000.

Ricoh Co., Ltd.: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,293,628, Cl. 430-58.000.
Isayama, Takuro, 4,293,867, Cl. 346-140.00R.
Jinnai, Koichiro; Horike, Masanori; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,293,865, Cl. 346-140.00R.
Mori, Masaaki, 4,293,195, Cl. 350-358.000.
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, 4,293,492, Cl. 260-160.000.
Takita, Seiki; and Ichizuka, Kiyomi, 4,293,866, Cl. 346-140.00R.

Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., to Gambro AB. Artificial kidney dialysate preparation system. 4,293,409, Cl. 210-96.200.

Ringsdorf, Helmut: *See—*
Portugall, Michael; Finkelmann, Heino; and Ringsdorf, Helmut, 4,293,435, Cl. 252-299.010.

Riquart, Christian; and Levrai, Roland, to Societe Anonyme DBA. Wheel cylinder. 4,292,883, Cl. 91-29.000.

Ritsch, Charles J.: *See—*
Siebert, Lee S.; and Ritsch, Charles J., 4,292,913, Cl. 114-219.000.

Ritter, Arnold. Methods of obtaining anorexic effects using a combination of amphetamines and cimetidine. 4,293,562, Cl. 424-273.00R.

Ritter, Norman C.: *See—*
Niles, Gerald J.; and Ritter, Norman C., 4,293,102, Cl. 242-71.800.

Rivier, Georges, to Orogil. Sulfurized metallic dithiophosphates and their use as additives for lubricating oils. 4,293,430, Cl. 252-32.70E.

RM Fabircations Limited: *See—*
Metcalfe, Ronald S.; and Greig, John M., 4,293,147, Cl. 285-39.000.

Robbins, Thomas R. Reactor and fuel assembly design for improved fuel utilization in liquid moderated thermal reactors. 4,293,380, Cl. 376-209.000.

Robert Bosch GmbH: *See—*
Binder, Georg, 4,293,788, Cl. 310-227.000.
Funk, Hans-Wolfgang; Frank, Kurt; and Flasche, Gunter, 4,293,790, Cl. 313-101.000.
Heitmann, Jurgen; Maly, Hans-Peter; and Wilhelm, Rudolf, 4,293,879, Cl. 360-10.000.
Kubach, Hans; and Rupp, Hartmann, 4,293,812, Cl. 323-272.000.
Schumacher, Werner; and Schwerin, Gunther, 4,292,884, Cl. 91-445.000.

Roberts, Donald L., to RCA Corporation. Color picture tube having improved slit type shadow mask. 4,293,792, Cl. 313-403.000.

Roberts, Frank B., to Victor Products (Wallsend) Limited. Power supply systems. 4,293,799, Cl. 315-256.000.

Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,292,720, Cl. 29-157.10R.

Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., to Union Carbide Corporation. Blends of poly(aryl ether) resins and polyetherimide resins. 4,293,670, Cl. 525-436.000.

Robey, Melvin J.; Bingaman, David E.; and Read, Arthur E. Irrigation and drainage apparatus. 4,293,237, Cl. 405-39.000.

Robins, Robert R. Tire holder and bead expander. 4,293,120, Cl. 254-50.200.

Robinson, James A. L., to Syracuse Supply Company. Roll conveyor. 4,293,064, Cl. 198-779.000.

Robinson, James W., to Research-Cottrell. High energy reverse air dust collector 4,293,320, Cl. 55-273.000.

Rockefeller University: *See—*
Merrifield, Robert B.; and Wong, Tai W., 4,293,455, Cl. 260-8.000.

Rockwell International Corporation: *See—*
Bullinga, Lothar H., 4,293,850, Cl. 340-378.500.
DeMichele, Glenn A., 4,293,817, Cl. 328-169.000.
Glass, Howard L., 4,293,372, Cl. 156-624.000.
Wagner, William R., 4,292,935, Cl. 123-285.000.

Rody, Jean, to Ciba-Geigy AG. Malonate derivatives as stabilizers for organic materials. 4,293,468, Cl. 260-45.80N.

Roeder, George K. Jet with variable throat areas using a deflector. 4,293,283, Cl. 417-172.000.

Roesler, Helmut, to Siemens Aktiengesellschaft. Digital integrated semiconductor circuit. 4,293,780, Cl. 307-262.000.

Roessler, Peter: *See—*
Hamprecht, Rainer; Hartmann, Alfons; Klauke, Erich; Hammann, Ingeborg; Roessler, Peter; and Brandes, Wilhelm. 4,293,566, Cl. 424-304.000.

Rogan, Bruce R.: *See—*
Jaffe, Wolfgang; and Rogan, Bruce R., 4,293,837, Cl. 338-32.00H.

Rogers, Basil E.: *See—*
Graybeal, Carl N.; Rogers, Basil E.; Cox, Joseph V.; and Rogers, Roy R., 4,293,243, Cl. 405-259.000.

Rogers Corporation: *See—*
Miyajima, Masanobu, 4,293,377, Cl. 156-656.000.





Rogers, Groby W., to Lawrence Security Services Ltd. Capacitive article removal alarm. 4,293,852, Cl. 340-568.000.

Rogers, Leroy K., Sr. Method and apparatus for operating an engine on compressed gas. 4,292,804, Cl. 60-407.000.

Rogers, Roy R.: *See—*
Graybeal, Carl N.; Rogers, Basil E.; Cox, Joseph V.; and Rogers, Roy R., 4,293,243, Cl. 405-259.000.

Rogora, Edoardo: *See—*
Bertoloni, Luciano; Rogora, Edoardo; and Cressoni, Ermanno, 4,293,843, Cl. 340-52.00F.

Rohco, Inc.: *See—*
Canaris, Valerie M., 4,293,391, Cl. 204-50.00R.

Rohm GmbH: *See—*
Fink, Herbert; Huebner, Klaus; Dinklage, Horst; and Ottofrickenstein, Hans, 4,293,600, Cl. 427-385.500.
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,293,647, Cl. 435-69.000.

Rohm and Haas Company: *See—*
Kosaka, Kenji; Iwatsuka, Takeshi; Shindo, Ikuo; and Hotogi, Akira, 4,293,423, Cl. 210-676.000.

Rohr Industries, Inc.: *See—*
Prior, Barry, 4,292,803, Cl. 60-230.000.

Romanov, Viktor I.; Kirzner, Felix I.; and Soroka, Yakov K. Axial-flow reversible turbine. 4,293,273, Cl. 415-78.000.

Ronbeck, Arne I., to AB Volvo. Device for translating a movement in one plane to a movement in a plane essentially perpendicular thereto. 4,293,271, Cl. 414-737.000.

Roper Corporation: *See—*
Davis, Robert K.; and Myers, Michael J., 4,293,835, Cl. 335-131.000.

Rosborough, Robert S., Jr.; and Wright, Luther M., deceased (by Lang, Edna B., nee Wright executrix), to Eastman Kodak Company. Print inspection and packaging method and apparatus. 4,293,215, Cl. 355-40.000.

Rose, Bernard R.; and Willis, John K., to Walbar Metals, Inc. Diffusion coating composition of improved flowability. 4,293,338, Cl. 75-253.000.

Rosenberg, Harry; and Holken, Norbert, to Gewerkschaft Eisenhutte Westfalia. Seals for mine roof supports. 4,293,247, Cl. 405-296.000.

Ross, Bernd. Screenable contact structure and method for semiconductor devices. 4,293,451, Cl. 252-512.000.

Ross, William J.: *See—*
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,293,563, Cl. 424-273.00R.

Rossi, Louis J.: *See—*
Webster, Frank G.; Regan, Michael T.; and Rossi, Louis J., 4,293,626, Cl. 430-17.000.

Rothmaier, Franz: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, to Bayer Aktiengesellschaft. Heat-resistant cross-linked polymers and the use thereof as binders. 4,293,669, Cl. 525-452.000.

Rowe, Edward A., Jr.: *See—*
Borror, Jack A.; and Rowe, Edward A., Jr., 4,293,433, Cl. 336-94.000.

Roy, Denis R. J.: *See—*
Teller, Aaron J.; Roy, Denis R. J.; and Lin, Shih K., 4,293,524, Cl. 422-169.000.

Royer, George R., to Weithman, John A., a part interest. Safety cover for electrical outlets. 4,293,733, Cl. 174-67.000.

Rozmus, Edward: *See—*
Pretor, Wincenty; Rozmus, Edward; Korecki, Zbigniew; and Karmanski, Stanislaw, 4,293,248, Cl. 405-300.000.

Rubenstein, Irving H., to Maryland Cup Corporation. Frozen fruit and vegetable juices. 4,293,580, Cl. 426-565.000.

Ruedi, Joseph: *See—*
Streuli, Hans; and Ruedi, Joseph, 4,293,410, Cl. 210-107.000.

Ruhl, Hermann. Variable acceleration monitoring system. 4,293,844, Cl. 340-52.00R.

Rumphorst, Jacobus A.: *See—*
Felthuis, Jacob; and Rumphorst, Jacobus A., 4,292,993, Cl. 137-340.000.

Rupp, Hartmann: *See—*
Kubach, Hans; and Rupp, Hartmann, 4,293,812, Cl. 323-272.000.

Ruth, Richard L.: *See—*
Huang, Victor K.; and Ruth, Richard L., 4,293,907, Cl. 364-200.000.

Ryan, James M.; and Holmes, Arthur S., to Helix Technology Corporation. Distillative separation of carbon dioxide from hydrogen sulfide. 4,293,322, Cl. 62-17.000.

Ryman Engineering Company: *See—*
Fatula, James J., 4,292,767, Cl. 51-145.00R.

Saeman, Walter C., to Olin Corporation. Process for the production of layered glass batch pellets. 4,293,324, Cl. 65-27.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Godard, Pierre; and Geoffroy, Jean-Claude, 4,293,029, Cl. 165-29.000.

St. Lawrence, David S.; Morris, Robert; and Farrar, James G., to Sensormatic Electronics Corporation. Anti-theft security enclosure and releasing mechanism. 4,293,266, Cl. 414-411.000.

Saint Peter's Research Trust Limited: *See—*
Simpson, Roger J.; Gawthorpe, Janet A.; and Lawrence, C. Alexander, 4,293,307, Cl. 23-230.00B.

Saito, Akinori: *See—*
Tanasawa, Yasusi; Muto, Norio; Saito, Akinori; and Kawamura, Kiyomi, 4,292,947, Cl. 123-445.000.

Saito, Shoichi: *See—*
Shirako, Hideo; and Saito, Shoichi, 4,293,885, Cl. 360-130.330.

Saito, Tsuyoshi: *See—*
Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, 4,293,533, Cl. 423-449.000.

Sakaguchi, Shinji: *See—*
Takahashi, Osamu; and Sakaguchi, Shinji, 4,293,641, Cl. 430-502.000.

Sakai, Kiyoshi: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,293,628, Cl. 430-58.000.
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, 4,293,492, Cl. 260-160.000.

Sakamoto, Takeshi: *See—*
Kobayashi, Nariyoshi; Sakamoto, Takeshi; Anzai, Shunichi; and Matsumoto, Manabu, 4,293,275, Cl. 416-97.00R.

Sakuma, Hideki: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.

Sakuma, Shinzo; and Yanagisawa, Hifumi, to Kabushiki Kaisha Meidensha; and Kabushiki Kaisha GEMVAC. Vacuum circuit interrupter electrodes. 4,293,748, Cl. 200-144.00B.

Salete-Garces, Felipe. Grain polishing and whitening machine. 4,292,890, Cl. 99-603.000.

Samarin, Alexei P.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

Samejima, Yasushi: *See—*
Iijima, Tokuzo; Samejima, Yasushi; Kishimoto, Kazuo; Komabashiri, Takamichi; and Kano, Toshiji, 4,293,395, Cl. 204-98.000.

Samoilov, Vladimir A.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.

San-O Industrial Co., Ltd.: *See—*
Arikawa, Hiroo, 4,293,836, Cl. 337-290.000.

Sanchez, Jacinto. Image projector for a television receiver. 4,293,878, Cl. 358-231.000.

Sanders, James M.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Sandler, Stanley R.: *See—*
Monsimer, Harold G.; and Sandler, Stanley R., 4,293,454, Cl. 252-609.000.

Sandor, Robert P.: *See—*
Tepe, James R.; Sandor, Robert P.; Wesselman, Bernard W.; and Woeste, David R., 4,293,027, Cl. 165-12.000.

Sandstone, Inc.: *See—*
Williams, William H., 4,293,778, Cl. 307-147.000.

Sandstrom, Anders; and Aucktor, Erich, to Scatra Ab. Flexibly mounted drive arrangement for ships. 4,293,304, Cl. 440-83.000.

Sanner, Bert: *See—*
Krause, Heinz; and Sanner, Bert, 4,292,977, Cl. 128-712.000.

Sanner, George E. Luminaire. 4,293,899, Cl. 362-294.000.

Sanol Schwarz-Monheim GmbH: *See—*
Cordes, Gunter; Giesselmann, Ewald; and Munch, Ulrich, 4,293,565, Cl. 424-285.000.

Santer, J. Owen: *See—*
Strazik, William F.; LeBlanc, John R.; and Santer, J. Owen, 4,293,461, Cl. 260-18.00N.

Sanyo Electric Co., Ltd.: *See—*
Kakinuma, Mitsuru; and Takahashi, Yoshitaka, 4,292,812, Cl. 62-157.000.

SAPAL Societe Anonyme des Plieuses Automatiques: *See—*
Pongracz, Endre, 4,293,774, Cl. 250-548.000.

Sasa, Syozo: *See—*
Nagano, Katsuto; Ihaya, Kazuhiko; Sasa, Syozo; and Nakada, Takeshi, 4,293,370, Cl. 156-612.000.

Sasaki, Hiromi; and Takahara, Yoshiyuki, to Central Glass Company, Limited. Process for producing hydrogen chloride and ammonia. 4,293,532, Cl. 423-356.000.

Sasaki, Ken: *See—*
Toriyama, Kazuhisa; Hata, Tsujiaki; Hasegawa, Shinji; and Sasaki, Ken, 4,293,698, Cl. 546-301.000.

Sasaki, Koji: *See—*
Kishi, Tuneo; and Sasaki, Koji, 4,293,749, Cl. 200-144.0AP.

Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, to Ricoh Co., Ltd. Disazo compounds derived from 3,6-bis(styryl)-9-ethylcarbazole. 4,293,492, Cl. 260-160.000.

Sasaki, Masaomi: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; Kozima, Akio; Sakai, Kiyoshi; and Sasaki, Masaomi, 4,293,628, Cl. 430-58.000.

Sasaki, Shosaku; and Kaiya, Nobuo, to Toray Silicone Company, Ltd. Organopolysiloxane composition for preparing peelable film. 4,293,671, Cl. 525-478.000.

Sasaki, Yukio: *See—*
Sugio, Akitoshi; Masu, Masanobu; Nakai, Hiroshi; and Sasaki, Yukio, 4,293,478, Cl. 260-37.00R.

Sassmann, Stanley W., to Farmstead Industries, Div. of Farmhand, Inc. Swine shelter ventilating system. 4,292,927, Cl. 119-16.000.

Sato, Masaki: *See—*
Ito, Motoya; Sato, Masaki; Watanabe, Masatoshi; and Okuda, Hironori, 4,293,787, Cl. 310-181.000.

Sato, Masanobu; and Satoh, Ken, to Olympus Optical Company Limited. Microphone device. 4,293,742, Cl. 179-178.000.

Sato, Tadashi: *See—*
Minoura, Kazuo; Sugiura, Muneharu; Minami, Setsuo; and Sato, Tadashi, 4,293,184, Cl. 350-6.300.

Sato, Yasuhiko; and Inomata, Hiroshi, to Shin-Etsu Chemical Co., Ltd. Photocurable organopolysiloxane compositions. 4,293,397, Cl. 204-159.130.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Constant printing pressure mechanisms for label printing machine. 4,292,894, Cl. 101-291.000.

Satoh, Ken: *See—*
Sato, Masanobu; and Satoh, Ken, 4,293,742, Cl. 179-178.000.

Satterfield, H. Eugene: *See—*
Fogg, Lewis W.; Metzler, Robert W.; Satterfield, H. Eugene; and Scott, Eion G., 4,292,762, Cl. 47-17.000.

Sauert, Fried, to Klockner-Humboldt-Deutz AG. Blow lance. 4,293,123, Cl. 266-268.000.

Saunders, Rhoderick K.: *See—*
Gale, Walter W.; Puerto, Maura C.; Ashcraft, Thomas L.; Saunders, Rhoderick K.; and Reed, Ronald L., 4,293,428, Cl. 252-8.55D.

Savio, Ferdinando; and Peterson, William, to Grumman Aerospace Corporation. Work support for forming laminations. 4,293,361, Cl. 156-242.000.

Sawa, Hiroshi; and Yamauchi, Yukio, to Hochiki Corporation. Temperature detecting device. 4,292,844, Cl. 73-359.00A.

Sawa, Yoichi; Kawakami, Yoshiyuki; and Marumoto, Ryuji, to Takeda Chemical Industries, Ltd. Production of 2,6-diaminonebularines. 4,293,690, Cl. 536-24.000.

Sawada, Hideo; Shinohara, Koji; and Shiga, Makoto, to Daicel Ltd. Filter for cigarette smoke. 4,292,984, Cl. 131-345.000.

Sawada, Hiroomi: *See—*
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,292,973, Cl. 128-303.100.

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Sawano, Susumu: *See—*
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Scandella, Louis, to Stanley Mabo, S.A. Universal level vial holder. 4,292,741, Cl. 33-379.000.

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Anderson, Andrew W., 4,293,067, Cl. 198-851.000.

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Schaeffer, Jack A., to Dana Corporation. Sheet metal structural beam. 4,292,782, Cl. 52-696.000.

Schafer, Dieter: *See—*
Ledebrink, Friedrich-Wilheim; Stoll, Wolfgang; and Schafer, Dieter, 4,293,438, Cl. 252-301.10W.

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Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,293,704, Cl. 556-442.000.

Scheible, Clement E.: *See—*
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Schickfluss, Rudolf: *See—*
Hoyer, Ernst; Steckelberg, Willi; Deucker, Walter; and Schickfluss, Rudolf, 4,293,306, Cl. 8-471.000.

Schiller, Edward, to Ampex Corporation. Multiple leg magnetic transducer structure. 4,293,884, Cl. 360-121.000.

Schirbach, Arno: *See—*
Luhleich, Hartmut; Pflaum, Peter; Dias, Francisco J.; Nauomidis, Aristides; Schirbach, Arno; and Nickel, Hubertus, 4,293,512, Cl. 264-58.000.

Schlumberger Technology Corporation: *See—*
Bell, William T.; and Garcia, Jose B., 4,292,895, Cl. 102-306.000.
Park, Sung K.; and Kenyon, William E., 4,293,933, Cl. 367-25.000.

Schmitz, Heinz: *See—*
Reinhard, Theodor; Krugener, Rolf; Kurth, Hermann W.; Blaich, Diether; Rothmaier, Franz; Kopperschlager, Dieter; Schmitz, Heinz; and Nill, Edgar, 4,292,823, Cl. 70-364.00R.

Schmitz, Rolf, to Jagenberg Werke. Apparatus for introducing the head end of a web into a treating station. 4,293,087, Cl. 226-172.000.

Schnell, William J., to Baxter Travenol Laboratories, Inc. Dialyzer blood circuit and bubble traps. 4,293,413, Cl. 210-188.000.

Schoen, Ernst: *See—*
Nissen, Dietmar; Marx, Matthias; Jarre, Wolfgang; Schoen, Ernst; and Decker, Walter, 4,293,657, Cl. 521-121.000.

Schoenfield, Palmer J.: *See—*
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Scholz, Werner, to TED Bildplatten Aktiengesellschaft. Circuit for reducing drop-out errors in a video signal derived from a recording device. 4,293,869, Cl. 358-8.000.

Schonmann, Gerhard: *See—*
Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, 4,293,526, Cl. 422-205.000.

Schossow, George W. Gas burner system. 4,292,950, Cl. 126-110.00A.

Schreiber, William L.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Schrinner, Elmar: *See—*
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Schroeder, William E.: *See—*
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Schubert, Herrmann: *See—*
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Schuegraf, Eberhard, to Siemens Aktiengesellschaft. Polarization separator. 4,293,829, Cl. 333-125.000.

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Boer, Werner; Lachner, Hans; Maschonat, Guenter; Richter, Joerg; Schulte, Heinrich; and Warnke, Hans, 4,293,246, Cl. 405-291.000.

Schumacher, Werner; and Schwerin, Gunther, to Robert Bosch GmbH. Control arrangement for a hydraulically operated device. 4,292,884, Cl. 91-445.000.

Schurger, Rainer: *See—*
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,293,166, Cl. 308-6.00C.

Schutz, Rudolph W.: *See—*
Geyser, Joseph E.; Rehr, Henry W.; Schutz, Rudolph W.; and Weis, Rudolf R., 4,293,365, Cl. 156-364.000.

Schwartz, Lawrence, to International Telephone and Telegraph Corporation. Electrical connector body and method of making same. 4,293,182, Cl. 339-275.00R.

Schwarz, Klaus: *See—*
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Schweig, Helmut; and von Bassewitz, Henning, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Solar generator, especially for space craft. 4,293,731, Cl. 136-245.000.

Schwerdtel, Wulf: *See—*
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,293,717, Cl. 568-485.000.

Schwerin, Gunther: *See—*
Schumacher, Werner; and Schwerin, Gunther, 4,292,884, Cl. 91-445.000.

Schwerko, Albert P.: *See—*
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Schwinn Bicycle Company: *See—*
Brilando, Frank, 4,293,141, Cl. 280-281.00R.

SCI Systems, Inc.: *See—*
Hoffman, Mark H., 4,293,233, Cl. 400-144.200.

Scientific Advances, Inc.: *See—*
Hassler, Craig R.; and Messing, Gary L., 4,293,302, Cl. 433-173.000.

Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Hybrid semiconductor laser/detectors. 4,293,826, Cl. 331-94.50H.

SCM Corporation: *See—*
Cardenas, Carlos G.; and Din, Zia U., 4,293,497, Cl. 260-345.500.

Scott, Eion G.: *See—*
Fogg, Lewis W.; Metzler, Robert W.; Satterfield, H. Eugene; and Scott, Eion G., 4,292,762, Cl. 47-17.000.

Scott Paper Company: *See—*
Loft, Fredrick A.; and Peterson, John O. H., 4,293,360, Cl. 156-230.000.

Scott, Richard D., to United States of America, Army. Laser scanner transport. 4,293,864, Cl. 346-76.00L.

Scott, Richard D.: *See—*
Siryj, Bohdan W.; Scott, Richard D.; and Horton, Charles R., 4,293,212, Cl. 354-299.000.

Seaton, Norman T. Method and apparatus for controlling resonant frequency of an optical interferometer cavity. 4,293,223, Cl. 356-352.000.

Seco Tools AB: *See—*
Anderson, Kjell, 4,293,251, Cl. 408-59.000.

Seddon, Richard I.: *See—*
Rancourt, James D.; and Seddon, Richard I., 4,293,732, Cl. 136-257.000.

Sederquist, Richard A., to United Technologies Corporation. Reaction apparatus for producing a hydrogen containing gas. 4,293,315, Cl. 48-94.000.

Seely, John H., to Abbott Laboratories. Method of producing 3-O-demethylfortimicin B from fortimicin AN. 4,293,689, Cl. 536-17.00R.



Segawa, Hiroshi; and Akizuki, Katsufumi, to Denpatsu Fly Ash. Apparatus for producing potassium silicate fertilizer. 4,293,523, Cl. 422-139.000.

Seidel, Christina: *See—*
Deutscher, Hans-Joachim; Schubert, Herrmann; Seidel, Christina; Demus, Dietrich; and Kresse, Horst, 4,293,434, Cl. 252-299.630.

Seiko Koki Kabushiki Kaisha: *See—*
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Seki, Yoichi: *See—*
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Sekine, Mitsuo: *See—*
Nishikubo, Yasuhiko; and Sekine, Mitsuo, 4,293,939, Cl. 368-74.000.

Sekino, Masaaki; Chikanari, Kenichi; and Taniyama, Tsukasa, to Toyo Boseki Kabushiki Kaisha. Hollow fiber membrane separation apparatus. 4,293,419, Cl. 210-321.100.

Selenia Industrie Elettroniche Associate S.p.A.: *See—*
Cerra, Raffaele, 4,293,825, Cl. 331-2.000.

Sellers, Larry S.: *See—*
Davis, Gayron N.; Sellers, Larry S.; and Hagborg, Winston E., 4,292,918, Cl. 118-33.000.

Semco Instruments, Inc.: *See—*
Moore, M. Samuel; and Paluka, Charles F., 4,292,806, Cl. 60-600.000.

Senni, Paolo; and Astarita, Domenico, to Snia Viscosa S.p.A. Method for the purification of raw caprolactam which contains amides and other by-products. 4,293,494, Cl. 260-239.30A.

Sensormatic Electronics Corporation: *See—*
St. Lawrence, David S.; Morris, Robert; and Farrar, James G., 4,293,266, Cl. 414-411.000.

Sentance, Christopher B., to Effem Foods Pty. Ltd. Food product and process of manufacture. 4,293,576, Cl. 426-104.000.

Sentralinstitutt for Industriell Forskning: *See—*
Ersoy, Okan K., 4,293,183, Cl. 350-3.770.

Sergent, Edward W., to M. P. H. Industries, Inc. Traffic radar unit. 4,293,859, Cl. 343-702.000.

Serini, Volker: *See—*
Weissel, Oskar; Serini, Volker; and Buysch, Hans-Josef, 4,293,687, Cl. 528-346.000.

Seto, Nobuo: *See—*
Furutachi, Nobuo; and Seto, Nobuo, 4,293,691, Cl. 544-140.000.

Setree, Robert R., II. Device for lubricating a hub with bearings. 4,293,056, Cl. 184-1.00D.

Sexsmith, Frederick H.: *See—*
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., 4,293,665, Cl. 525-255.000.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Murari, Bruno; and Siligoni, Marco, 4,293,824, Cl. 330-301.000.

Shakertown Corporation: *See—*
Barker, Craig S.; and Bockwinkel, Joe L., 4,292,780, Cl. 52-541.000.

Shamp, Donald E.: *See—*
Gilts, Richard G.; Hille, Earl A.; Kleine, Albert W., Jr.; and Shamp, Donald E., 4,293,264, Cl. 414-38.000.

Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Mortars and cements having improved freeze-thaw properties and method of achieving same. 4,293,343, Cl. 106-99.000.

Shapira, Hanna B.: *See—*
Barnes, Paul R.; and Shapira, Hanna B., 4,292,763, Cl. 49-64.000.

Shapiro, Alexandr I.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Sharlow, Roger C., to Liquid Paper Corporation. Apparatus for ganging and cutting a plurality of layers of strip material. 4,293,100, Cl. 242-55.000.

Sharp, H. Eugene; Vela, Octavio A.; and Smither, Mils A., to Sperry-Sun, Inc. Borehole acoustic telemetry system. 4,293,937, Cl. 367-82.000.

Sharp Kabushiki Kaisha: *See—*
Itogawa, Zirou; and Aoto, Yoshiyuki, 4,292,985, Cl. 132-9.000.
Komaki, Shigeki, 4,293,754, Cl. 200-340.000.
Oonishi, Souichi, 4,293,911, Cl. 364-405.000.

Shaw, Arthur G.: *See—*
Swisher, George W., Jr.; Garbelman, David L.; and Shaw, Arthur G., 4,293,228, Cl. 366-25.000.

Shaw, I-Sine: *See—*
Wang, Wei Ko; Hoh, Ying-Chu; Chuang, Wen-Shou; and Shaw, I-Sine, 4,293,332, Cl. 75-99.000.

Shaw, Michael J.; and Thiessen, Robert J., to Allied Paper Incorporated. Electrostatic master and method for making the same. 4,293,629, Cl. 430-64.000.

Shea, John J.; and Griggs, Calvin, to Richards Manufacturing Company, Inc. Locking bail stapedial prosthesis. 4,292,693, Cl. 3-1.900.

Shearer, Marcia C.: *See—*
Nash, Claude H., III; Shearer, Marcia C.; Snader, Kenneth M.; Valenta, Joseph R.; and Cooper, David, 4,293,546, Cl. 424-119.000.

Shell Oil Company: *See—*
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Jackson, Roy J., 4,293,672, Cl. 525-507.000.
Slaugh, Lynn H., 4,293,723, Cl. 585-407.000.

Shelledy, Carey W.: *See—*
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., 4,293,861, Cl. 343-766.000.

Shelley, James D. Aluminum can crusher. 4,292,891, Cl. 100-193.000.

Shen, Jian-Kuo: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Shepard, Steve A.: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,293,925, Cl. 364-900.000.

Shewmaker, James E., to Exxon Research & Engineering Co. Method for removing oil-based materials from water surface. 4,293,348, Cl. 134-22.00R.

Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, to Teikoku Hormone Mfg. Co., Ltd. Antiulcer phenoxypropylamine derivatives. 4,293,557, Cl. 424-267.000.

Shibayama, Akinori; Maio, Kenji; and Yokozawa, Norio, to Nippon Telegraph and Telephone Public Corporation; and Hitachi, Ltd. High-speed low-drift operational amplifier. 4,293,819, Cl. 330-9.000.

Shields, Walter. Apparatus for inverting and transporting articles. 4,293,063, Cl. 198-404.000.

Shiga, Makoto: *See—*
Sawada, Hideo; Shinohara, Koji; and Shiga, Makoto, 4,292,984, Cl. 131-345.000.

Shikita, Takuji; and Hirabayashi, Masaya, to Kyoto Ceramic Co., Ltd. Granular ceramic carrier for administration of medicines and medicine supported therein. 4,293,540, Cl. 424-26.000.

Shimaguchi, Takashi: *See—*
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Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, to Nippon Telegraph and Telephone Public Corporation; and Takeda Riken Kogyo Kabushikikaisha. Test pattern generating apparatus. 4,293,950, Cl. 371-21.000.

Shimizu, Munetaka, to Copal Company Limited. Printer. 4,293,236, Cl. 400-593.000.

Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, to Sumitomo Chemical Company, Limited. Method for production of molded product containing titanium oxide. 4,293,445, Cl. 252-438.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Fukuda, Takeshi; and Tutida, Tomiyoshi, 4,293,201, Cl. 351-178.000.
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,293,585, Cl. 427-40.000.
Sato, Yasuhiko; and Inomata, Hiroshi, 4,293,397, Cl. 204-159.130.

Shinbashi, Sueo: *See—*
Matsui, Kiyoshi; Arai, Katsuyuki; and Shinbashi, Sueo, 4,293,891, Cl. 361-383.000.

Shindo, Ikuo: *See—*
Kosaka, Kenji; Iwatsuka, Takeshi; Shindo, Ikuo; and Hotogi, Akira, 4,293,423, Cl. 210-676.000.

Shinmi, Hideo: *See—*
Hanada, Tsuneo; Koshii, Taro; and Shinmi, Hideo, 4,293,479, Cl. 260-37.0EP.

Shinohara, Koji: *See—*
Sawada, Hideo; Shinohara, Koji; and Shiga, Makoto, 4,292,984, Cl. 131-345.000.

Shinozaki, Nobuo: *See—*
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,293,938, Cl. 368-72.000.

Shionogi & Co., Ltd.: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,293,328, Cl. 71-88.000.

Shirai, Hitoshi: *See—*
Tanaka, Yoshikazu; Shirai, Hitoshi; and Kan'o, Yoshiharu, 4,293,931, Cl. 365-222.000.

Shirako, Hideo; and Saito, Shoichi. Pad spring for a tape cassette. 4,293,885, Cl. 360-130.330.

Shoei Chemical Incorporated: *See—*
Asada, Eiichi; Inokuma, Toshio; and Egawa, Isao, 4,293,839, Cl. 338-309.000.

Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with 3,5-di-(2-methylpropyl)-1,2,4-trithiolane. 4,293,579, Cl. 426-535.000.

Shuster, Edward J.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,293,453, Cl. 252-522.00R.

Shuster, Frank A.: *See—*
Kroll, Arthur S.; and Shuster, Frank A., 4,292,921, Cl. 118-648.000.

Shuttleworth, Richard G.; and Snyder, Gene R., to United Technologies Corporation. Sound absorbing structure. 4,293,053, Cl. 181-213.000.

Sick, Erwin; and Mankel, Siegfried, to Erwin Sick GmbH-Optik-Elektronik. Banknote condition monitoring apparatus. 4,293,776, Cl. 250-572.000.

Sidi, Henri, to Tenneco Chemicals, Inc. Pigment dispersions for surface-coating compositions and surface-coating compositions containing same. 4,293,475, Cl. 260-29.6TA.

Siebert, Lee S.; and Ritsch, Charles J., to Mark Twain Marine Industries, Inc. Boat rub rail. 4,292,913, Cl. 114-219.000.

Sieg, Robert P.; and Spars, Byron G., to Chevron Research Company. Shale retorting with supplemental combustion fuel. 4,293,401, Cl. 208-11.00R.

Siemens Aktiengesellschaft: *See—*
Amrhein, Herbert, 4,293,764, Cl. 200-302.000.
Gross, Franz, 4,293,828, Cl. 333-27.000.
Lueder, Rainer, 4,293,831, Cl. 333-165.000.
Marin, Heiner, 4,293,750, Cl. 200-148.00A.
Roesler, Helmut, 4,293,780, Cl. 307-262.000.
Schuegraf, Eberhard, 4,293,829, Cl. 333-125.000.
Weingand, Kaspar, 4,293,376, Cl. 156-644.000.

Siemens Medical Laboratories, Inc.: *See—*
Stieber, Volker A. W., 4,293,772, Cl. 250-492.200.

Siemon Company, The: *See—*
Knickerbocker, Robert H., 4,293,174, Cl. 339-64.00M.

Sierra Misco, Inc.: *See—*
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Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-11-hydroxymethyl-19-oxo-$PGE_1$ compounds. 4,293,708, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Dihydro-9-deoxy-9-methylene-19-oxo-$PGF_2$ compounds. 4,293,709, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-19-oxo-$PGF_2$ compounds. 4,293,710, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. Inter-oxa-19-oxo-$PGE_1$ compounds. 4,293,711, Cl. 562-503.000.

Sih, John C., to Upjohn Company, The. Inter-oxa-19-oxo-$PGF_1$ compounds. 4,293,712, Cl. 562-503.000.

Silag, Inc.: *See—*
Parekh, Bhupendra K.; and Goldberger, William M., 4,293,099, Cl. 241-24.000.

Siligoni, Marco: *See—*
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Silva, Roy; Ash, David J.; and Scheible, Clement E., to International Telephone and Telegraph Corporation. Process for applying a moisture barrier coating to baked and fried food products. 4,293,572, Cl. 426-19.000.

Silver Seiko, Ltd.: *See—*
Koike, Mitsuhito; and Iwasaki, Yasuhiro, 4,292,821, Cl. 66-75.200.

Silvestris, Louis F.: *See—*
Budnovitch, William F.; Petralia, Salvatore C.; and Silvestris, Louis F., 4,293,898, Cl. 362-291.000.

Simmonds, Robin G.: *See—*
Jamieson, William B.; Ross, William J.; Simmonds, Robin G.; and Verge, John P., 4,293,563, Cl. 424-273.00R.

Simmons, Carlton J., Jr.: *See—*
Jones, Edward M.; and Simmons, Carlton J., Jr., 4,292,874, Cl. 84-1.030.

Simon-Heesen B.V.: *See—*
van Deuren, Franciscus, 4,293,295, Cl. 425-331.000.

Simon, Joseph A. Process for extruding a metal tube with inwardly thickened end portions. 4,292,831, Cl. 72-260.000.

Simon, Martin J., to PPG Industries, Inc. Sealerless primers. 4,293,457, Cl. 260-15.000.

Simpson, Roger J.; Gawthorpe, Janet A.; and Lawrence, C. Alexander, to Saint Peter's Research Trust Limited. Method and apparatus for analyzing liquid. 4,293,307, Cl. 23-230.00B.

Singer Company, The: *See—*
Jaffe, Wolfgang; and Rogan, Bruce R., 4,293,837, Cl. 338-32.00H.
Johnson, Ralph E., 4,292,906, Cl. 112-184.000.

Siryj, Bohdan W.; Scott, Richard D.; and Horton, Charles R., to RCA Corporation. Thermal processor in an apparatus for developing photographic film. 4,293,212, Cl. 354-299.000.

Sisti, Giorgio; and Colombo, Bruno, to Carlo Erba Strumentazione S.p.A. Method and apparatus for the analysis of sulphur contents in samples. 4,293,308, Cl. 23-230.0PC.

Sitt, Rudiger: *See—*
Kinast, Gunther; Muller, Lutz; Puls, Walter; and Sitt, Rudiger, 4,293,551, Cl. 424-249.000.

Skakunov, Ivan G.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Skega Aktiebolag: *See—*
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SKF Industrial Trading & Development, B.V.: *See—*
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SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,293,166, Cl. 308-6.00C.

Skrivan, Joseph F.: *See—*
Pai, Venkatrao K.; and Skrivan, Joseph F., 4,293,692, Cl. 544-196.000.

Slaugh, Lynn H., to Shell Oil Company. Conversion of isobutene to aromatics or polyisobutylene with modified gamma alumina composition. 4,293,723, Cl. 585-407.000.

Slavens, Clyde M.; Clavin, Edward A.; and Alleman, James E., to Midcon Pipeline Equipment Co. Welding apparatus including means for depositing the weld metal along parallel paths. 4,293,758, Cl. 219-125.120.

Smal, Henri, to Societe Anonyme FACO. Apparatus for electrically heating hair curlers. 4,293,760, Cl. 219-222.000.

Smathers, Edmond W.: *See—*
Cox, Allen R.; and Smathers, Edmond W., 4,293,883, Cl. 360-104.000.

Smit, Helen; and Smit, Julie. Acne skin treatment appliance and method. 4,292,971, Cl. 128-256.000.

Smit, Julie: *See—*
Smit, Helen; and Smit, Julie, 4,292,971, Cl. 128-256.000.

Smith, Alfred H., Jr.; and Beers, M. Dale, to General Electric Company. Paintable one-component RTV systems. 4,293,616, Cl. 428-447.000.

Smith, Charles W.: *See—*
Elphingstone, Eugene A.; McLaughlin, Homer C.; and Smith, Charles W., 4,293,440, Cl. 252-317.000.

Smith, David R.: *See—*
Church, Larry L.; Smith, David R.; and Sun, Shan C., 4,293,886, Cl. 361-71.000.

Smith, Harold W. Solar energy collector. 4,292,955, Cl. 126-417.000.

Smith International, Inc.: *See—*
Kloesel, Joseph A., Jr., 4,293,048, Cl. 175-340.000.
Young, David E., 4,293,047, Cl. 175-195.000.

Smith, Kendall O.; and Gehle, Warren D. Magnetic attraction transfer devices for use in solid phase radioimmunoassays and in other assay methods. 4,292,920, Cl. 118-425.000.

Smith, Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,697, Cl. 546-121.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,293,699, Cl. 546-121.000.

Smith, Winthrop W., Jr., to Martin Marietta Corporation. Method and signal processor for frequency analysis of time domain signals. 4,293,921, Cl. 364-726.000.

Smither, Mils A.: *See—*
Sharp, H. Eugene; Vela, Octavio A.; and Smither, Mils A., 4,293,937, Cl. 367-82.000.

SmithKline Corporation: *See—*
Nash, Claude H., III; Shearer, Marcia C.; Snader, Kenneth M.; Valenta, Joseph R.; and Cooper, David, 4,293,546, Cl. 424-119.000.

Snader, Kenneth M.: *See—*
Nash, Claude H., III; Shearer, Marcia C.; Snader, Kenneth M.; Valenta, Joseph R.; and Cooper, David, 4,293,546, Cl. 424-119.000.

Snia Viscosa S.p.A.: *See—*
Senni, Paolo; and Astarita, Domenico, 4,293,494, Cl. 260-239.30A.

Snow, Barton H., to General Electric Company. Method and apparatus for increasing compressor inlet pressure. 4,292,802, Cl. 60-204.000.

Snyder, Gene R.: *See—*
Shuttleworth, Richard G.; and Snyder, Gene R., 4,293,053, Cl. 181-213.000.

Snyder, H. Kent, Jr., to Chicago Display Company. Roll type display sign. 4,292,751, Cl. 40-517.000.

Sobelman, Seymour: *See—*
Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, 4,293,088, Cl. 227-131.000.

Societe Anonyme DBA: *See—*
Riquart, Christian; and Levrai, Roland, 4,292,883, Cl. 91-29.000.

Societe Anonyme FACO: *See—*
Smal, Henri, 4,293,760, Cl. 219-222.000.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Farr, David R.; and Magnolato, Daniele, 4,293,583, Cl. 426-657.000.
Hirsbrunner, Pierre; and Bertholet, Raymond, 4,293,581, Cl. 426-630.000.
Launay, Noel, 4,293,049, Cl. 177-212.000.
Olofsson, Mats; Buhler, Marcel; and Wood, Robert, 4,293,571, Cl. 426-7.000.

Societe Generale Pour L'Emballage: *See—*
Ducloux, Marcel, 4,293,219, Cl. 356-240.000.

Societe Generale pour les Techniques Nouvelles S.G.N.: *See—*
Taponier, Jean; and Pierlas, Rene, 4,293,437, Cl. 252-301.10W.

Societe Nationale Elf Aquitaine: *See—*
Cotte, Jean-Marie; and Potin, Philippe, 4,293,543, Cl. 424-59.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Gros, Pierre; Millouet, Jean; and Staron, Philippe, 4,293,935, Cl. 367-43.000.

Societe Nationale Ind. Aerospatiale: *See—*
Aubry, Jacques A., 4,293,277, Cl. 416-134.00A.

Soderberg, Nils O.: *See—*
Persson, Alf; and Soderberg, Nils O., 4,293,605, Cl. 428-126.000.

Soderblom, Olof. Data transmission system. 4,293,948, Cl. 370-90.000.

Solarex Corporation: *See—*
Varadi, Peter F.; and Dominguez, Ramon, 4,293,808, Cl. 320-2.000.

Solid Corporation: *See—*
Morikawa, Yoshiharu, 4,293,189, Cl. 350-105.000.

Solid Photography, Inc.: *See—*
DiMatteo, Paul, 4,292,724, Cl. 29-418.000.

Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, to Benckiser-Knapsack GmbH. Process and apparatus for the condensation of solids. 4,293,526, Cl. 422-205.000.

Sonntag, Michael: *See—*
Probst, Joachim; Sonntag, Michael; and Kolb, Gunter, 4,293,661, Cl. 525-127.000.



Soroka, Arseny M.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Soroka, Yakov K.: *See—*
Romanov, Viktor I.; Kirzner, Felix I.; and Soroka, Yakov K., 4,293,273, Cl. 415-78.000.

Southern Pacific Transportation Company: *See—*
Fields, Carlo, 4,293,795, Cl. 315-200.00A.

Southgate, Robert: *See—*
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,293,501, Cl. 260-430.000.

Spars, Byron G.: *See—*
Sieg, Robert P.; and Spars, Byron G., 4,293,401, Cl. 208-11.00R.

Spath, Herbert J.: *See—*
Raymond, Glendon A.; Honnold, Fred V.; and Spath, Herbert J., 4,293,093, Cl. 237-19.000.

Spatz, Wilhelm: *See—*
Sommer, Klaus; Klemm, Walter; Weber, Hermann; Meinhardt, Frederich; Schonmann, Gerhard; and Spatz, Wilhelm, 4,293,526, Cl. 422-205.000.

Spector, George: *See—*
Aziz, Victor; and Spector, George, 4,293,943, Cl. 368-316.000.

Spence, Gavin G.: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,293,666, Cl. 525-284.000.
Maslanka, William W.; and Spence, Gavin G., 4,293,667, Cl. 525-284.000.

Spencer, Mike R.: *See—*
Lewis, Mack A.; and Spencer, Mike R., 4,293,158, Cl. 296-24.00C.

Speno International S.A.: *See—*
Panetti, Romolo, 4,292,768, Cl. 51-168.000.

Sperry Corporation: *See—*
De Busscher, Cyriel R. J.; and Van Herpe, Francois, 4,292,981, Cl. 130-27.00F.
McMahon, Donald H., 4,293,188, Cl. 350-96.290.
Van Reymersdal, Joseph, 4,293,930, Cl. 365-8.000.

Sperry-Sun, Inc.: *See—*
Cox, William H.; and Chaney, Preston E., 4,293,936, Cl. 367-82.000.
Sharp, H. Eugene; Vela, Octavio A.; and Smither, Mils A., 4,293,937, Cl. 367-82.000.

Splitt, Frank G.; and Turner, Donald B., to Northern Telecom Inc. Surge arrester with improved impulse ratio. 4,293,887, Cl. 361-120.000.

Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, to International Flavors & Fragrances Inc. Process for using bridged ketones in augmenting or enhancing the organoleptic properties of consumable materials. 4,293,453, Cl. 252-522.00R.

Springrose, James V.: *See—*
Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., 4,292,898, Cl. 105-238.00R.

Square D Company: *See—*
Brugner, Frank S., Jr., 4,293,337, Cl. 75-232.000.
Lingaraju, Bhartoor, 4,293,172, Cl. 339-14.00P.
Stanback, Harris I.; Brann, Theodore L.; and Polston, Larry D., 4,293,153, Cl. 292-85.000.

Staalkat B.V.: *See—*
Jellema, Auke, 4,293,272, Cl. 414-744.00B.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Hoefke, Wolfgang; Gaida, Wolfram; and Pichler, Ludwig, to Boehringer Ingelheim GmbH. 2-(3,5-Dibromo-4-amino-phenylimino)-imidazolidine, salts and compositions thereof. 4,293,564, Cl. 424-273.00R.

Stal-Laval Turbin AB: *See—*
Bergkvist, Jorgen, 4,293,298, Cl. 432-58.000.
Ekberg, Hakan, 4,292,742, Cl. 34-35.000.

Stanback, Harris I.; Brann, Theodore L.; and Polston, Larry D., to Square D Company. Panelboard vent assembly. 4,293,153, Cl. 292-85.000.

Standard Oil Company, The: *See—*
Herrington, Daniel R.; and Schwerko, Albert P., 4,293,449, Cl. 252-465.000.
Lemanski, Michael F.; Bremer, Noel J.; and Milberger, Ernest C., 4,293,498, Cl. 260-346.750.
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,293,443, Cl. 252-432.000.
Velenyi, Louis J.; Dolhyj, Serge R.; and Sundeen, Marcia H., 4,293,719, Cl. 568-573.000.

Standard Oil Company (Indiana): *See—*
Beynet, Pierre A.; Lucksinger, James E.; and Jansen, Martin B., Jr., 4,293,146, Cl. 285-24.000.

Standing, David L., to Kangol Magnet Limited. Emergency locking seat belt retractor. 4,293,106, Cl. 242-107.40A.

Stanford Associates, Inc.: *See—*
Wasserman, Philip D., 4,293,917, Cl. 364-701.000.

Stanhope-Seta Limited: *See—*
Oakman, Ronald A., 4,292,837, Cl. 73-17.00R.

Stanley Mabo, S.A.: *See—*
Scandella, Louis, 4,292,741, Cl. 33-379.000.

Staplin, Theodore R., Jr.: *See—*
Bradley, John J.; Holtey, Thomas O.; Miller, Robert C.; Miu, Ming T.; Shen, Jian-Kuo; and Staplin, Theodore R., Jr., 4,293,908, Cl. 364-200.000.

Starcevic, Mihailo, to BBC Brown, Boveri & Company, Limited. Carrying and guiding spider for the support of a rotor of a vertical electrical machine. 4,293,786, Cl. 310-157.000.

Staron, Philippe: *See—*
Gros, Pierre; Millouet, Jean; and Staron, Philippe, 4,293,935, Cl. 367-43.000.

Starr, Louis J. Skidwheel game. 4,293,132, Cl. 273-126.00R.

Stauffer Chemical Company: *See—*
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,293,701, Cl. 546-335.000.

Stauffer, Rita: *See—*
Raible, Donald A.; Poticha, Stuart M.; and Stauffer, Rita, 4,292,969, Cl. 128-214.00R.

Steckelberg, Willi: *See—*
Hoyer, Ernst; Steckelberg, Willi; Deucker, Walter; and Schickfluss, Rudolf, 4,293,306, Cl. 8-471.000.

Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Circuit arrangement for multiplexing an input function and an output function at a single terminal. 4,293,870, Cl. 358-10.000.

Steegmuller, Willi: *See—*
Fischer, Helmut; Ott, Albert; and Steegmuller, Willi, 4,293,767, Cl. 250-308.000.

Stefanovic, Miroslav, to Stocker Hinge Mfg. Co. Hinges with position-locking filaments. 4,292,708, Cl. 16-140.000.

Steffen, Vincent B. Protective element for fork-lift pallets. 4,292,899, Cl. 108-51.100.

Stelte, David J.; and Kobylar, Alex W., to GTE Automatic Electric Labs Inc. Analog access arrangement for a digital telephone office. 4,293,738, Cl. 179-18.0FC.

Stenberg, Herbjorn: *See—*
Liu, Chunghorng R.; Nayak, Jnaneshwar H.; Stenberg, Herbjorn; Huerta, Felipe J.; and Hall, Woodrow A., 4,292,865, Cl. 82-36.00R.

Stepanov, Alexandr N.: *See—*
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.

Stieber, Volker A. W., to Siemens Medical Laboratories, Inc. Wobbling device for a charged particle accelerator. 4,293,772, Cl. 250-492.200.

Stiefel, Peter: *See—*
Wagner, Karl; Engelsmann, Dieter; Hackenberg, Hubert; and Stiefel, Peter, 4,293,204, Cl. 354-21.000.

Still, W. Clark. Flash chromatography. 4,293,422, Cl. 210-656.000.

Stivers, David A., to Minnesota Mining and Manufacturing Company. Fluoroelastomer/polyepichlorohydrin elastomer articles. 4,293,663, Cl. 525-187.000.

STM Corporation: *See—*
Miller, Sylvester T., 4,293,309, Cl. 23-230.0EP.

Stocker Hinge Mfg. Co.: *See—*
Stefanovic, Miroslav, 4,292,708, Cl. 16-140.000.

Stockhaus, Klaus: *See—*
Merz, Herbert; and Stockhaus, Klaus, 4,293,556, Cl. 424-267.000.

Stoffels, Carl A.; and Genovese, Nicholas J., to Judelshon Industries Division, John Dusenbery Co., Inc. Apparatus and method for slitting elongated rolls of material. 4,292,867, Cl. 82-47.000.

Stogryn, Eugene L.: *See—*
Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, 4,293,623, Cl. 429-194.000.

Stoll, Wolfgang: *See—*
Ledebrink, Friedrich-Wilheim; Stoll, Wolfgang; and Schafer, Dieter, 4,293,438, Cl. 252-301.10W.

Stone Container Corporation: *See—*
Partain, James H., 4,293,069, Cl. 206-279.000.

Stone, Everett W. Method of treating fresh shrimp to reduce moisture and nutrient loss. 4,293,578, Cl. 426-332.000.

Stork Brabant B.V.: *See—*
Barendregt, Frank; and Boogaard, Leendert A., 4,293,873, Cl. 358-75.000.

Stork PMT B.V.: *See—*
van Mil, Martinus P. G., 4,292,709, Cl. 17-11.10R.

Story, Edward R. Insulation-confining panel and method of using the same. 4,292,777, Cl. 52-407.000.

Stouffer, James F. Tongue toothbrush. 4,292,705, Cl. 15-110.000.

Stratford/Graham Engineering Corp.: *See—*
Kolb, Norman P.; and Webb, Orlando, 4,293,729, Cl. 585-715.000.

Strazik, William F.; LeBlanc, John R.; and Santer, J. Owen, to Monsanto Company. Unsaturated melamine condensates. 4,293,461, Cl. 260-18.00N.

Streifer, William: *See—*
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,293,826, Cl. 331-94.50H.

Streuli, Hans; and Ruedi, Joseph, to Hans Streuli AG. Magnetic filter. 4,293,410, Cl. 210-107.000.

Stringer, Brian: *See—*
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, 4,293,507, Cl. 264-0.500.

Structural Composite Industries, Inc.: *See—*
Gordon, Robert; King, Harry A.; Springrose, James V.; and Cuddihy, Robert W., 4,292,898, Cl. 105-238.00R.
Struger, Odo J.; Brown, Ronald A.; and Black, Craig A., to Allen-Bradley Company. Programmable controller with high density intelligent I/O interface. 4,293,924, Cl. 364-900.000.
Stull, Bertram O., to United States of America, Navy. Gelled fuel-air explosive method. 4,293,314, Cl. 44-7.00A.
Sturtz, Gregory P.: *See—*
Martin, Ralph D.; Dunnavant, William R.; Sturtz, Gregory P.; and Langer, Heimo J., 4,293,480, Cl. 260-38.000.
Stusenko, Jury A.: *See—*
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.
Su, Tien-Kuei: *See—*
Kluger, Edward W.; and Su, Tien-Kuei, 4,293,682, Cl. 528-123.000.
Sugio, Akitoshi; Masu, Masanobu; Nakai, Hiroshi; and Sasaki, Yukio, to Mitsubishi Gas Chemical Co., Inc. Process for producing polyphenylene ether composition containing inorganic pigment. 4,293,478, Cl. 260-37.00R.
Sugio, Akitoshi; Masu, Masanobu; and Matunaga, Masatugu, to Mitsubishi Gas Chemical Co., Inc. Polyphenylene ether resin composition. 4,293,660, Cl. 525-68.000.
Sugita, Jitsuo: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,293,328, Cl. 71-88.000.
Sugiura, Muneharu: *See—*
Minoura, Kazuo; Sugiura, Muneharu; Minami, Setsuo; and Sato, Tadashi, 4,293,184, Cl. 350-6.300.
Sugiyama, Keiichi: *See—*
Matsumoto, Hiromitsu; Sugiyama, Keiichi; and Uchiyama, Kazuo, 4,292,944, Cl. 123-432.000.
Sugou, Kiyoshi: *See—*
Kinoshita, Minoru; Sugou, Kiyoshi; and Onoda, Yukio, 4,293,226, Cl. 356-443.000.
Sulzer Brothers Limited: *See—*
Baumann, Hans, 4,293,007, Cl. 139-358.000.
Weber, Max, 4,293,384, Cl. 376-391.000.
Sumimoto, Shinzaburo: *See—*
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, 4,293,328, Cl. 71-88.000.
Sumitomo Chemical Company, Limited: *See—*
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,293,445, Cl. 252-438.000.
Suzuki, Yukio; Kasamatsu, Kiyoshi; and Aketa, Kohichi, 4,293,504, Cl. 260-465.00D.
Umemura, Takeaki; Morino, Haruki; Watanabe, Tetsuhiko; and Uematsu, Tamon, 4,293,702, Cl. 548-165.000.
Sumitomo Electric Industries, Ltd.: *See—*
Hara, Akio; and Yazu, Shuji, 4,293,618, Cl. 428-551.000.
Sumitomo Metal Industries, Ltd.: *See—*
Yamaguchi, Hisao; and Fujisawa, Kazuo, 4,292,849, Cl. 73-643.000.
Sun, Jui-Yuan: *See—*
Burk, Emmett H., Jr.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,293,403, Cl. 208-120.000.
Sun, Shan C.: *See—*
Church, Larry L.; Smith, David R.; and Sun, Shan C., 4,293,886, Cl. 361-71.000.
Sundeen, Marcia H.: *See—*
Velenyi, Louis J.; Dolhyj, Serge R.; and Sundeen, Marcia H., 4,293,719, Cl. 568-573.000.
Supcoe, Robert F.; and Radakovich, Thomas, to United States of America, Navy. Underwater wax formulation and method. 4,293,339, Cl. 106-18.290.
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., to Standard Oil Company. Oxidation catalysts. 4,293,443, Cl. 252-432.000.
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, to United Kingdom Atomic Energy Authority. Preparation of shaped bodies. 4,293,507, Cl. 264-0.500.
Suzuki, Seigo, to Tokyo Shibaura Electric Co., Ltd. Electronic ignition control systems. 4,292,941, Cl. 123-416.000.
Suzuki, Shotaro, to Hakuju Institute for Health Science Co., Ltd. Electrode assembly for use in electric field therapy apparatus. 4,292,980, Cl. 128-783.000.
Suzuki, Yukio; Kasamatsu, Kiyoshi; and Aketa, Kohichi, to Sumitomo Chemical Company, Limited. Process for preparing optically active α-cyano-3-(4-halogenophenoxy)-benzyl 2-(4-chlorophenyl)isovalerate. 4,293,504, Cl. 260-465.00D.
Svoboda, Glenn R., to Freeman Chemical Corporation. Composition for coating molded articles. 4,293,659, Cl. 525-28.000.
Swanson, Billy L., to Phillips Petroleum Co. Shear-thickening compositions. 4,293,036, Cl. 166-302.000.
Swanson, Douglas L.; and Yeo, Norman H., to Swanson-Erie Corporation. Commonly actuated in-line assembly machine. 4,292,734, Cl. 29-791.000.
Swanson-Erie Corporation: *See—*
Swanson, Douglas L.; and Yeo, Norman H., 4,292,734, Cl. 29-791.000.
Swanson, Victor E., to Crepaco, Inc. Positive displacement rotary pump with bearings in countersunk portions of the rotors. 4,293,290, Cl. 418-94.000.
Swantee, Klaus B. M., to Pidou B.V. Sealing device. 4,293,138, Cl. 277-207.00A.
Swift, Harold E.; Innes, Robert A.; and Adams, Phillip, to Gulf Research & Development Company; and Kewanee Industries. Process for preparing alkyldimethylamines. 4,293,716, Cl. 564-480.000.
Swingline Inc.: *See—*
Barrett, Edward E.; Hahn, Steven; Lensky, Albert; Pinczewski, Morris; and Sobelman, Seymour, 4,293,088, Cl. 227-131.000.
Swisher, George W., Jr.; Garbelman, David L.; and Shaw, Arthur G., to CMI Corporation. Drum for an asphalt mixing apparatus. 4,293,228, Cl. 366-25.000.
Swiss Aluminium Ltd.: *See—*
Baur, Rudolf; Merki, Emil; and Krahenbuhl, Hanspeter, 4,293,424, Cl. 210-737.000.
Hrasche, Heinrich, 4,293,255, Cl. 410-104.000.
Swodenk, Wolfgang: *See—*
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,293,717, Cl. 568-485.000.
SWS Silicones Corporation: *See—*
Martin, Eugene R., 4,293,611, Cl. 428-266.000.
Sybron Corporation: *See—*
Ellis, Franklin H., 4,292,968, Cl. 128-207.210.
Syndicat National des Fabricants de Sucre de France: *See—*
Lescure, Jean-Pierre, 4,293,412, Cl. 210-179.000.
Syntex (U.S.A.) Inc.: *See—*
Walker, Keith A. M., 4,293,561, Cl. 424-273.00R.
Sypula, Donald S.: *See—*
Murphy, Cornelius B.; and Sypula, Donald S., 4,293,627, Cl. 430-39.000.
Syracuse Supply Company: *See—*
Robinson, James A. L., 4,293,064, Cl. 198-779.000.
Systems Consultants, Inc.: *See—*
Muralidhara, H. S., 4,293,098, Cl. 241-19.000.
Systems Research Laboratories, Inc.: *See—*
Rainey, J. Montgomery; and Taylor, Francis M., 4,292,848, Cl. 73-602.000.
Szabo, Tibor. Grinding machine for delimited groove machining on cutting tools. 4,292,699, Cl. 51-94.00R.
Szanto, Elmer G.; Wu, George; and Ulrich, Charles J., to Velo-Bind, Inc. Punching and binding machine. 4,293,366, Cl. 156-477.00B.
Szilvasi, Endre: *See—*
Pataki, Jozsef; Bucsi, Jozsef; Bona, Istvan; Szilvasi, Endre; Gazdag, Andras; Koty, Antal; and Hidvegi, Ferenc, 4,292,996, Cl. 137-393.000.
Szollmann, Anton. Valve for toy balloons. 4,292,999, Cl. 137-560.000.
T. A. Pelsue Company: *See—*
Beavers, Allan E., 4,293,862, Cl. 343-872.000.
Tacke, Peter: *See—*
Heydenreich, Frieder; Korber, Helmut; Tacke, Peter; Fahnler, Friedrich; and Neuray, Dieter, 4,293,662, Cl. 525-184.000.
Taiho Pharmaceutical Company Limited: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.
Tait, William H., to Dofasco Inc. Testing the material of a product for defects therein and processing the material employing such a method. 4,292,847, Cl. 73-587.000.
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, to Fujitsu Limited. Process for high pressure oxidation of silicon. 4,293,589, Cl. 427-93.000.
Takagi, Mikio; Maeda, Mamoru; and Kamioka, Hajime, to Fujitsu Limited. Process for high pressure oxidation of silicon. 4,293,590, Cl. 427-93.000.
Takagishi, Haruyoshi: *See—*
Wakabayashi, Makoto; and Takagishi, Haruyoshi, 4,293,363, Cl. 156-272.000.
Takahara, Yoshiyuki: *See—*
Sasaki, Hiromi; and Takahara, Yoshiyuki, 4,293,532, Cl. 423-356.000.
Takahashi, Osamu; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,293,641, Cl. 430-502.000.
Takahashi, Yoshitaka: *See—*
Kakinuma, Mitsuru; and Takahashi, Yoshitaka, 4,292,812, Cl. 62-157.000.
Takahashi, Yosuke, to Nippon Kogaku K.K. Solid electrochromic element. 4,293,194, Cl. 350-357.000.
Takahashi, Yukio: *See—*
Iwaki, Tetsuo; Takahashi, Yukio; Moriuchi, Shuji; and Kaneko, Hisamitsu, 4,293,720, Cl. 568-575.000.
Takashima, Yoshimi: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,293,553, Cl. 424-250.000.
Takeda Chemical Industries, Ltd.: *See—*
Sawa, Yoichi; Kawakami, Yoshiyuki; and Marumoto, Ryuji, 4,293,690, Cl. 536-24.000.
Takeda Riken Kogyo Kabushikikaisha: *See—*
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.
Takekoshi, Tohru; and Klopfer, Howard J., to General Electric Company. Method for making polyetherimides using carboxylic acid salts of alkali metals or zinc as catalysts. 4,293,683, Cl. 528-180.000.
Takekoshi, Tohru, to General Electric Company. Polyetherimide having long chain aliphatic end groups and method for making. 4,293,684, Cl. 528-185.000.



Takikawa, Katsuo: *See—*
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.
Takita, Seiki; and Ichizuka, Kiyomi, to Ricoh Co., Ltd. Recording apparatus. 4,293,866, Cl. 346-140.00R.
Takusagawa, Kiyoshi: *See—*
Kikuchi, Tsuyoshi; and Takusagawa, Kiyoshi, 4,293,024, Cl. 164-303.000.
Tamamura, Ryo; and Kutsukake, Yukinori, to Asahi Glass Company, Ltd. Roll for manufacturing float glass. 4,293,335, Cl. 75-124.000.
Tamori, Michitoshi; and Kawai, Kazuo, to Kokusai Denshin Denwa Co., Ltd. Sampling function type equalizer. 4,293,952, Cl. 375-14.000.
Tamura, Humio: *See—*
Asano, Kiro; Tamura, Humio; Nezu, Yushi; Saito, Tsuyoshi; and Kawai, Yoshio, 4,293,533, Cl. 423-449.000.
Tamura Kaken Co., Ltd.: *See—*
Okuya, Ken, 4,293,636, Cl. 430-281.000.
Tamura, Shingo: *See—*
Mochida, Hideyuki; Tamura, Shingo; and Tsurumi, Etsuo, 4,293,903, Cl. 363-68.000.
Tan, David: *See—*
Tan, Lu J.; Tan, David; and Tan, Jeff, 4,293,230, Cl. 366-101.000.
Tan, Jeff: *See—*
Tan, Lu J.; Tan, David; and Tan, Jeff, 4,293,230, Cl. 366-101.000.
Tan, Kwang G.: *See—*
Flusche, Frederick O.; Tan, Kwang G.; and Wright, Ralph W., 4,293,910, Cl. 364-200.000.
Tan, Lu J.; Tan, David; and Tan, Jeff. Apparatus for providing fuel for an oil burner. 4,293,230, Cl. 366-101.000.
Tanaka, Hideki: *See—*
Kamejima, Kohji; Tanaka, Hideki; Kano, Minoru; and Fukushima, Toshihiko, 4,292,811, Cl. 62-56.000.
Tanaka, Hiromichi: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,293,553, Cl. 424-250.000.
Tanaka, Katsushi; and Okamoto, Taro, to Kyokuto Kaihatsu Kogyo Co., Ltd. Spraying unit for unhardened concrete and the like. 4,293,227, Cl. 366-11.000.
Tanaka, Kojiro; Ochiai, Shozo; and Noda, Hideki, to Kabushiki Kaisha Daini Seikosha. Voltage detecting circuit. 4,293,782, Cl. 307-350.000.
Tanaka, Kozo: *See—*
Kojima, Masayuki; Kobayakawa, Masaki; and Tanaka, Kozo, 4,293,793, Cl. 313-497.000.
Tanaka, Susumu: *See—*
Ogimoto, Kazuo; Inoue, Tomohiro; Tanaka, Susumu; and Kobayashi, Yoshio, 4,293,240, Cl. 405-195.000.
Tanaka, Toshiaki; and Etoh, Yukihiro, to Nissan Motor Company, Limited. Internal combustion engine. 4,292,938, Cl. 123-198.00F.
Tanaka, Toyonaru; and Naito, Hideki, to Jeco Co., Ltd. Electronic display device for use in motor cars. 4,293,842, Cl. 340-52.00F.
Tanaka, Yoshiaki; and Hayakawa, Isao, to Daiichi Seiyaku Co., Ltd. Furonaphthyridine compounds. 4,293,695, Cl. 546-83.000.
Tanaka, Yoshikazu; Shirai, Hitoshi; and Kan'o, Yoshiharu, to Fujitsu Limited. Memory refresh control system. 4,293,931, Cl. 365-222.000.
Tanasawa, Yasusi; Muto, Norio; Saito, Akinori; and Kawamura, Kiyomi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Spill type swirl injector. 4,292,947, Cl. 123-445.000.
Tanifuji, Shinya: *See—*
Morooka, Yasuo; Tanifuji, Shinya; and Tanuma, Masaya, 4,292,825, Cl. 72-8.000.
Taniyama, Tsukasa: *See—*
Sekino, Masaaki; Chikanari, Kenichi; and Taniyama, Tsukasa, 4,293,419, Cl. 210-321.100.
Tanty, Paul J.: *See—*
Hoefer, Wayne A.; and Tanty, Paul J., 4,293,164, Cl. 303-13.000.
Tanuma, Masaya: *See—*
Morooka, Yasuo; Tanifuji, Shinya; and Tanuma, Masaya, 4,292,825, Cl. 72-8.000.
Tapeswitch Corporation of America: *See—*
Koenig, Robert H., 4,293,752, Cl. 200-295.000.
Taponier, Jean; and Pierlas, Rene, to Societe Generale pour les Techniques Nouvelles S.G.N. Process for the treatment and packaging of low or average activity radio-active waste. 4,293,437, Cl. 252-301.10W.
Tarutani, Masaaki: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.
Taylor, Derek, to Bunker Ramo Corporation. Resilient biasing means. 4,293,180, Cl. 339-217.00R.
Taylor, Francis M.: *See—*
Rainey, J. Montgomery; and Taylor, Francis M., 4,292,848, Cl. 73-602.000.
Taylor, Glenn E. Auxiliary lift axle wheel assembly. 4,293,145, Cl. 280-704.000.
Taylor, Roger W.: *See—*
Kokta, Milan R.; and Taylor, Roger W., 4,293,371, Cl. 156-624.000.
Taylor, Walter C. Non-metallic paste sectors and methods of fabricating and utilizing same. 4,292,919, Cl. 118-212.000.
TDK Electronics Co., Ltd.: *See—*
Nagano, Katsuto; Ihaya, Kazuhiko; Sasa, Syozo; and Nakada, Takeshi, 4,293,370, Cl. 156-612.000.
Technicare Corporation: *See—*
Walters, Ronald G., 4,293,912, Cl. 364-414.000.
TED Bildplatten Aktiengesellschaft: *See—*
Scholz, Werner, 4,293,869, Cl. 358-8.000.
Teikoku Hormone Mfg. Co., Ltd.: *See—*
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.
Teledyne Walterboro: *See—*
Hoyt, Harold C., Jr.; and Greene, William J., 4,293,756, Cl. 219-133.000.
Telegram Communications Corp.: *See—*
Katz, Bernard R., 4,293,875, Cl. 358-184.000.
Telex Communications, Inc.: *See—*
Gehr, Marvin M.; and Pabian, Howell D., 4,293,955, Cl. 455-276.000.
Teller, Aaron J.; Roy, Denis R. J.; and Lin, Shih K., to Teller Environmental Systems, Inc. Method and apparatus for cooling and neutralizing acid gases. 4,293,524, Cl. 422-169.000.
Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J.; Roy, Denis R. J.; and Lin, Shih K., 4,293,524, Cl. 422-169.000.
Tellers, Donald W. Calf incubator. 4,292,929, Cl. 119-27.000.
Temple University: *See—*
Labes, Mortimer M.; and MacMillan, John H., 4,293,193, Cl. 350-350.00R.
Tenneco Chemicals, Inc.: *See—*
Sidi, Henri, 4,293,475, Cl. 260-29.6TA.
Tepe, James R.; Sandor, Robert P.; Wesselman, Bernard W.; and Woeste, David R., to Energetics Systems Corp. Control system for heating and cooling units. 4,293,027, Cl. 165-12.000.
Terashima, Isamu, to Hitachi, Ltd. Toner concentration detecting apparatus. 4,292,925, Cl. 118-690.000.
Teraura, Makoto, to Nippon Cable System Inc. Steering device. 4,292,859, Cl. 74-501.00R.
Terneu, Robert; and Van Cauter, Albert, to BFG Glassgroup. Glass coating. 4,293,326, Cl. 65-60.00D.
Terry, F. Duncan: *See—*
Haag, George A.; Fogg, O. Douglas; Greenley, Gordon A.; Shepard, Steve A.; and Terry, F. Duncan, 4,293,925, Cl. 364-900.000.
Tetra Pak International AB: *See—*
Dilot, Rolf M.; and Hakansson, Jan T., 4,293,369, Cl. 156-521.000.
Texaco Inc.: *See—*
Calderon, Reynaldo, 4,293,037, Cl. 166-312.000.
Cuscurida, Michael, 4,293,470, Cl. 260-45.90R.
Texas Instruments Incorporated: *See—*
McAdams, Hugh P., 4,293,932, Cl. 365-222.000.
Whelan, Paul L., 4,293,249, Cl. 406-72.000.
Texas Iron Works, Inc.: *See—*
Braddick, Britt O., 4,293,163, Cl. 251-283.000.
Textron Inc.: *See—*
Brogdon, Vas H.; and Williams, David L., 4,293,276, Cl. 416-134.00A.
Theodore, Ares N., to Ford Motor Company. Highly filled thermally conductive elastomers III. 4,293,477, Cl. 260-29.1SB.
Thermo Electron Corporation: *See—*
Morgan, Dean T.; Chryssostomidis, Chryssostomos; and LaRue, George J., 4,293,527, Cl. 423-6.000.
Thibault, James G.: *See—*
Kuna, Wayne A.; Thibault, James G.; and Schoenfield, Palmer J., 4,292,758, Cl. 46-93.000.
Thiessen, Robert J.: *See—*
Shaw, Michael J.; and Thiessen, Robert J., 4,293,629, Cl. 430-64.000.
Thillays, Jacques C., to U.S. Philips Corporation. Method of manufacturing a coplanar photocoupler. 4,292,735, Cl. 29-854.000.
Thilly, William G.: *See—*
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,293,654, Cl. 435-241.000.
Thomalla, Bogdan: *See—*
Jedlinski, Zbigniew; Thomalla, Bogdan; Kotas, Antoni; Jedlinski, Stanislaw; Pilat, Wladyslaw; and Jach, Jan, 4,293,685, Cl. 528-190.000.
Thomas, Albert L., Jr.: *See—*
Bird, Alvin N., Jr.; Francis, Norman L.; and Thomas, Albert L., Jr., 4,293,217, Cl. 356-37.000.
Thomas, Claude E. Display device for coupon clip. 4,292,749, Cl. 40-308.000.
Thompson, Ralph B.: *See—*
Gorman, Susan B.; Thompson, Ralph B.; and Yonan, Edward E., 4,293,706, Cl. 560-163.000.
Thompson, Thomas K., to Owens-Corning Fiberglas Corporation. Method and apparatus for production of a stream feeder. 4,292,862, Cl. 76-4.000.
Thomson-CSF: *See—*
Berger, Jean L., 4,293,832, Cl. 333-165.000.
Thorn EMI Limited: *See—*
Cook, Frank; and Davies, Gordon H., 4,293,801, Cl. 315-370.000.
Thornhill, John, Jr.; and Elder, Richard B., to RCA Corporation. Earth self-orienting apparatus. 4,292,861, Cl. 74-813.00R.
Tilman, Hoefelmayr, to Bio-Melktechnik Swiss Hoefelmayr & Co. Method for the automatic finish milking during a mechanical milk removal procedure. 4,292,926, Cl. 119-14.020.
Timmer, Hendrikus J. M., to SKF Industrial Trading & Development, B.V. Housing for Y-bearing. 4,293,168, Cl. 308-72.000.

Tirzit, Gunar D.: *See*—
Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D., 4,293,700, Cl. 546-321.000.

Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, to Norwalk Investment Club. Irregular shape rod bending apparatus. 4,292,834, Cl. 72-482.000.

Tishler, Irving: *See*—
Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, 4,292,834, Cl. 72-482.000.

Tishler, Murray: *See*—
Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, 4,292,834, Cl. 72-482.000.

Tishler, William: *See*—
Tishler, Albert; Tishler, Murray; Tishler, William; Tishler, Irving; and Lucchesi, Joseph, 4,292,834, Cl. 72-482.000.

TLB Plastics Corporation: *See*—
Lytle, Thomas G., 4,293,079, Cl. 220-306.000.

Tobita, Kouji: *See*—
Morishita, Tuyoshi; Miyake, Kenji; and Tobita, Kouji, 4,292,936, Cl. 123-193.00P.

Toegel, Herbert J.: *See*—
Kuras, Michael L.; Upp, Daniel C.; and Toegel, Herbert J., 4,293,946, Cl. 370-62.000.

Togami, Yuji, to Nippon Hoso Kyokai. Recording medium. 4,293,621, Cl. 428-678.000.

Toibana, Yasuo: *See*—
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

Tokuno, Takashi: *See*—
Shimizu, Masao; Tokuno, Takashi; Ishikawa, Kohji; Narumi, Naoaki; and Ohguchi, Osamu, 4,293,950, Cl. 371-21.000.

Tokutomi, Seijiro; Jyojiki, Masao; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,293,205, Cl. 354-23.00D.

Tokutomi, Seijiro; Jyojiki, Masao; Aoki, Harumi; Nakamura, Kazuo; and Watanabe, Koichiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrically operated automatic focalizing camera. 4,293,206, Cl. 354-25.000.

Tokyo Kogaku Kikai Kakushiki Kaisha: *See*—
Wada, Shinzi; Kitao, Ikuo; Oana, Yoshinori; Kato, Yasuo; and Ishihara, Taketoshi, 4,293,199, Cl. 351-13.000.

Tokyo Sanyo Electric Co., Ltd.: *See*—
Kakinuma, Mitsuru; and Takahashi, Yoshitaka, 4,292,812, Cl. 62-157.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Endo, Norio, 4,292,728, Cl. 29-571.000.
Nakajima, Shunichi; and Hasegawa, Haruyoshi, 4,293,085, Cl. 222-311.000.
Ogimoto, Kazuo; Inoue, Tomohiro; Tanaka, Susumu; and Kobayashi, Yoshio, 4,293,240, Cl. 405-195.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Suzuki, Seigo, 4,292,941, Cl. 123-416.000.

Toland, James, to World Carpets, Inc. Apparatus for randomly coloring pile fabric. 4,292,822, Cl. 68-5.00D.

Tonikian, Robert T.: *See*—
Ragoza, Igor V.; Begunov, Petr M.; Tonikian, Robert T.; and Vasiljuk, Petr J., 4,292,820, Cl. 66-8.000.

Toray Industries, Inc.: *See*—
Fujii, Yoshishige; Nagao, Syozo; and Kumazawa, Shunji, 4,293,418, Cl. 210-321.100.
Otaki, Yukio; Umeda, Kazuo; and Nakagawa, Kiyoshi, 4,292,799, Cl. 57-246.000.

Toray Silicone Company, Ltd.: *See*—
Hanada, Tsuneo; Koshii, Taro; and Shinmi, Hideo, 4,293,479, Cl. 260-37.0EP.
Imai, Takeshi, 4,293,677, Cl. 528-15.000.
Sasaki, Shosaku; and Kaiya, Nobuo, 4,293,671, Cl. 525-478.000.

Toriyama, Kazuhisa; Hata, Tsujiaki; Hasegawa, Shinji; and Sasaki, Ken, to Hitachi, Ltd. Compound for controlling dielectric constant of liquid crystal. 4,293,698, Cl. 546-301.000.

Toro Company, The: *See*—
Holmstadt, Ronald J.; and Comer, Robert C., 4,293,041, Cl. 172-39.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Kikuchi, Tsuyoshi; and Takusagawa, Kiyoshi, 4,293,024, Cl. 164-303.000.

Townsend, Charles E., Jr. Visored hat construction. 4,292,689, Cl. 2-12.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,292,710, Cl. 17-21.000.
Townsend, Ray T., 4,292,889, Cl. 99-533.000.

Townsend, Ray T., to Townsend Engineering Company. Membrane skinner. 4,292,710, Cl. 17-21.000.

Townsend, Ray T., to Townsend Engineering Company. Method and means for injecting fluids into meat products. 4,292,889, Cl. 99-533.000.

Toyo Baseki Kabushiki Kaisha: *See*—
Isaka, Tsutomu; and Kumada, Saburoh, 4,293,608, Cl. 428-220.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Sekino, Masaaki; Chikanari, Kenichi; and Taniyama, Tsukasa, 4,293,419, Cl. 210-321.100.

Toyo Kogyo Co., Ltd.: *See*—
Morishita, Tuyoshi; Miyake, Kenji; and Tobita, Kouji, 4,292,936, Cl. 123-193.00P.
Morita, Yasuyuki, 4,293,289, Cl. 418-84.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Nishimura, Hideo; Yoneda, Takao; and Enomoto, Minoru, 4,293,913, Cl. 364-474.000.

Toyooki Kogyo Kabushiki Kaisha: *See*—
Moriyama, Yoshiki; and Kuwana, Masayuki, 4,293,002, Cl. 137-625.640.

Toyostar Corporation: *See*—
Matsuda, Takehiko; and Izawa, Kyoichi, 4,293,745, Cl. 200-52.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kako, Hiroyoshi; and Arai, Hajime, 4,292,860, Cl. 74-665.0GA.

Traven, Lars J. C.: *See*—
Riede, Gerhard; Larsson, Lars-Ake L.; Andersson, Roland J. E.; Josson, Sven A.; and Traven, Lars J. C., 4,293,409, Cl. 210-96.200.

Tricca, Raymond A., to Armstrong Cork Company. Electrical outlet insulation system. 4,293,173, Cl. 339-38.000.

Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V. Mill for making transverse deformations on sheet metal. 4,292,830, Cl. 72-197.000.

Trishevsky, Oleg I.: *See*—
Trishevsky, Igor S.; Trishevsky, Oleg I.; Bosy, Vladimir N.; Deberdeev, Rustem J.; Radjukevich, Leonid V.; Anisimov, Vyacheslav I.; Plesnetsov, Jury A.; and Chukhno, Valery V., 4,292,830, Cl. 72-197.000.

Trowbridge, Lawrence E. Converter. 4,293,906, Cl. 363-135.000.

Trueblood, Richard K., to Zilog, Inc. Low resistance backside preparation for semiconductor integrated circuit chips. 4,293,587, Cl. 427-90.000.

TRW, Inc.: *See*—
Wahlers, Richard L.; and Osborne, Vernon E., 4,293,838, Cl. 338-308.000.

Tsuda, Masabumi: *See*—
Shimizu, Shinkichi; Nishizaki, Tadao; and Tsuda, Masabumi, 4,293,445, Cl. 252-438.000.

Tsukada, Haruo; and Nakatani, Yohichiroh, to Victor Company of Japan, Ltd. Apparatus for recording and reproducing video signals at selectable different tape traveling speeds from a plurality of pairs of video heads. 4,293,880, Cl. 360-10.000.

Tsukamoto, Kotaro. Metal wire winding apparatus. 4,293,103, Cl. 242-83.000.

Tsunekawa, Tokuichi; Masunaga, Makoto; Hosoe, Kazuya; Niwa, Yukichi; Owada, Mitsutoshi; and Asano, Noriyuki, to Canon Kabushiki Kaisha. Photo-sensor device and image scanning system employing the same. 4,293,877, Cl. 358-213.000.

Tsunoda, Yoshito: *See*—
Izumita, Morishi; Maeda, Takeshi; Tsunoda, Yoshito; and Sawano, Susumu, 4,293,944, Cl. 369-45.000.

Tsurumi, Etsuo: *See*—
Mochida, Hideyuki; Tamura, Shingo; and Tsurumi, Etsuo, 4,293,903, Cl. 363-68.000.

Tsutsui, Kyoji: *See*—
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Tsutsui, Kyoji, 4,293,492, Cl. 260-160.000.

Tsuzuki, Yoshihiko; Kaga, Sumihiro; and Hobo, Nobuhito, to Nippondenso Co., Ltd. Apparatus for controlling light projection angle of head lamp of motor vehicle. 4,293,893, Cl. 362-38.000.

Tucci, John J., to AMP Incorporated. Applicator for metal strain relief clamp. 4,292,732, Cl. 29-749.000.

Turner, Donald B.: *See*—
Splitt, Frank G.; and Turner, Donald B., 4,293,887, Cl. 361-120.000.

Tutida, Tomiyoshi: *See*—
Fukuda, Takeshi; and Tutida, Tomiyoshi, 4,293,201, Cl. 351-178.000.

Uchida, Keiichiro: *See*—
Muraoka, Takatoshi; Uchida, Keiichiro; Koshino, Minoru; Motegi, Masanori; and Nagasawa, Shigeru, 4,293,941, Cl. 364-200.000.

Uchiyama, Kazuo: *See*—
Matsumoto, Hiromitsu; Sugiyama, Keiichi; and Uchiyama, Kazuo, 4,292,944, Cl. 123-432.000.

Uematsu, Tamon: *See*—
Umemura, Takeaki; Morino, Haruki; Watanabe, Tetsuhiko; and Uematsu, Tamon, 4,293,702, Cl. 548-165.000.

Ueno, Susumu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,293,585, Cl. 427-40.000.

Uetsuki, Tsuneo: *See*—
Ebata, Yoshihiro; Toibana, Yasuo; Uetsuki, Tsuneo; Kose, Saburo; and Kinoshita, Makoto, 4,293,356, Cl. 156-89.000.

Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D. 2,6-Dimethyl-1,4-dihydropyridine-3,5-dicarboxylic acid esters and method for preparing same. 4,293,700, Cl. 546-321.000.

Ulrich, Charles J.: *See*—
Szanto, Elmer G.; Wu, George; and Ulrich, Charles J., 4,293,366, Cl. 156-477.00B.

Ulrich, Max B. Method of and apparatus for pinning a fractured pelvis. 4,292,964, Cl. 128-92.0EB.

Umeda, Kazuo: *See*—
Otaki, Yukio; Umeda, Kazuo; and Nakagawa, Kiyoshi, 4,292,799, Cl. 57-246.000.

Umemura, Takeaki; Morino, Haruki; Watanabe, Tetsuhiko; and Uematsu, Tamon, to Sumitomo Chemical Company, Limited. Method for preparing 4-substituted-N-methylbenzothiazolone derivatives. 4,293,702, Cl. 548-165.000.





Union Carbide Corporation: *See*—
Carter, Richard G.; Watson, Stuart L., Jr.; and Pines, Arthur N., 4,293,678, Cl. 528-32.000.
Gardner, Hugh C., 4,293,686, Cl. 528-192.000.
Hamer, Anthony D.; and Karol, Frederick J., 4,293,673, Cl. 526-88.000.
Kokta, Milan R.; and Taylor, Roger W., 4,293,371, Cl. 156-624.000.
Lustig, Stanley; and Vicik, Stephen J., 4,293,664, Cl. 525-196.000.
Robeson, Lloyd M.; Matzner, Markus; and Maresca, Louis M., 4,293,670, Cl. 525-436.000.

United Kingdom Atomic Energy Authority: *See*—
Sutcliffe, Peter W.; Isaacs, Jim W.; Nelson, Robert L.; Lyon, Colin E.; and Stringer, Brian, 4,293,507, Cl. 264-0.500.

U.S. Industries, Inc.: *See*—
Kennedy, Jerome J.; Wayne, Harold S.; and White, Charles A., 4,293,066, Cl. 198-813.000.

United States of America
Agriculture: *See*—
Claassen, Ben J., Jr., 4,293,319, Cl. 55-122.000.
Jacobson, Martin, 4,293,567, Cl. 424-312.000.
Army: *See*—
Bird, Alvin N., Jr.; Francis, Norman L.; and Thomas, Albert L., Jr., 4,293,217, Cl. 356-37.000.
Gutleber, Frank S., 4,293,953, Cl. 375-25.000.
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Vogel, F. Lincoln. Process for conducting electricity utilizing a specifically defined graphite intercalation compound. 4,293,450, Cl. 252-503.000.
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Cogliano, Joseph A., 4,293,679, Cl. 528-48.000.
Dudley, Hubert T.; and Bragg, Ralph J., 4,293,341, Cl. 106-88.000.
Hill, Richard N., 4,293,311, Cl. 23-301.000.
Wacker, Albert R., to Cabot Corporation. Method for ultrasonically welding plasticized thermoplastic polymeric foam wares. 4,293,355, Cl. 156-73.200.
Wada, Shigetaka, to NGK Insulators, Ltd. Method of producing honeycomb structural bodies consisting of barium titanate series ceramics having a positive temperature coefficient of electric resistance. 4,293,514, Cl. 264-61.000.
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Wagner, William R., to Rockwell International Corporation. Low nitrous oxide (NOX) precombustor. 4,292,935, Cl. 123-285.000.
Wahlers, Richard L.; and Osborne, Vernon E., to TRW, Inc. Resistance material, resistor and method of making the same. 4,293,838, Cl. 338-308.000.
Waimea Company Inc.: *See*—
Donan, David C., Jr., 4,293,244, Cl. 405-259.000.
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Wakabayashi, Takao, to Nakanishi Metal Works Co., Ltd. Trolley rotation stabilizing device. 4,292,897, Cl. 104-172.00S.
Walbar Metals, Inc.: *See*—
Rose, Bernard R.; and Willis, John K., 4,293,338, Cl. 75-253.000.
Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for preparing aldehydes and diols. 4,293,717, Cl. 568-485.000.
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Walker, Robert J. Easy opening and secure closing closure. 4,292,714, Cl. 24-30.50R.
Wallace, Joseph E., to Parker-Hannifin Corporation. Segmented seal. 4,293,135, Cl. 277-9.000.
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Wallis, Bernard J. Unitary punch and die assembly. 4,292,869, Cl. 83-137.000.
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Walters, Ronald G., to Technicare Corporation. Tomographic apparatus. 4,293,912, Cl. 364-414.000.
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Wang, Wei Ko; Hoh, Ying-Chu; Chuang, Wen-Shou; and Shaw, I-Sine, to Institute of Nuclear Energy Research. Hydrometallurgical process for recovering precious metals from anode slime. 4,293,332, Cl. 75-99.000.
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Wasserman, Philip D., to Stanford Associates, Inc. Non-linear function generator. 4,293,917, Cl. 364-701.000.
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Watanabe, Koichiro: *See*—
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Kennedy, Jerome J.; Wayne, Harold S.; and White, Charles A., 4,293,066, Cl. 198-813.000.
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Webster, Frank G.; Regan, Michael T.; and Rossi, Louis J., to Eastman Kodak Company. Electrophotosensitive materials for migration imaging processes. 4,293,626, Cl. 430-17.000.
Wei, Peter H. L.; and Bell, Stanley C., to American Home Products Corporation. 3-Substituted phenylthiazolo[3'2':1,2]imidazo[4,5-b]pyridine-2-alkanoic acids. 4,293,696, Cl. 546-83.000.
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Weingand, Kaspar, to Siemens Aktiengesellschaft. Method of producing perforated glass plate. 4,293,376, Cl. 156-644.000.
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Werneke, Michael F.; and Jones, James A., to American Cyanamid Company. Synergistic promoter combination for zinc sulfide ores. 4,293,406, Cl. 209-166.000.
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Weseloh, Roger J.; Kanjo, Wajih; and Karim, Syed, to American Standard Inc. Crimping device for use in assembling an overtravel spring assembly for slack adjuster. 4,292,721, Cl. 29-243.520.
Wesley, William M., to Creative Tool Company. Compression rate analyzer. 4,292,841, Cl. 73-119.00A.
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White, Charles A.: *See*—
Kennedy, Jerome J.; Wayne, Harold S.; and White, Charles A., 4,293,066, Cl. 198-813.000.
White, John E., to AEL Mirrotel, Ltd. Transformerless fast current limiter with symetry correction for a switched-mode power supply. 4,293,902, Cl. 363-26.000.
White, Preston S.: *See*—
Darlington, William B.; DuBois, Donald W.; and White, Preston S., 4,293,394, Cl. 204-98.000.
White, Thomas M.; Barton, Edwin A.; and Ware, Jesse P., to Vermont Log Buildings, Inc. Rafter cutting machine. 4,293,011, Cl. 144-3.00R.
Whitehurst, Darrell D.: *See*—
Farcasiu, Malvina; and Whitehurst, Darrell D., 4,293,404, Cl. 208-214.000.
White's Electronics, Inc.: *See*—
Johnson, Douglas L., 4,293,816, Cl. 324-329.000.
Whitney, Thomas A.: *See*—
Klemann, Lawrence P.; Newman, Gerald H.; Stogryn, Eugene L.; Whitney, Thomas A.; and Farcasiu, Dan, 4,293,623, Cl. 429-194.000.
Wickers, Francis A.: *See*—
Gilbride, Andrew J.; and Wickers, Francis A., 4,292,907, Cl. 112-236.000.
Widmer, Hans, to Fritz Gegauf AG, Bernina-Naehmaschinenfabrik Steckborn. Data display device for sewing machine adjustment and set-up. 4,292,905, Cl. 112-121.110.
Wiget, Fridolin, to Ebauches S.A. Apparatus for measuring the rate of an analog-display electronic timepiece. 4,292,836, Cl. 73-6.000.
Wikel, James W.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., 4,293,558, Cl. 424-270.000.
Wilhelm, Rudolf: *See*—
Heitmann, Jurgen; Maly, Hans-Peter; and Wilhelm, Rudolf, 4,293,879, Cl. 360-10.000.
Wilhoite, Murray O., to Martin Industries, Inc. Wood burning heater. 4,292,954, Cl. 126-290.000.
Wilkes, Colin; and Hilt, Milton B., to General Electric Company. Dual stage-dual mode low nox combustor. 4,292,801, Cl. 60-39.060.
Willard, Alvin K., to Merck & Co., Inc. 6(R)-[2-(8-Hydroxy-2,6-dimethylpolyhydronaphthyl-1)-ethyl]-4(R)-hydroxy-3,4,5,6-tetrahydro-2H-pyran-2-ones. 4,293,496, Cl. 260-343.500.
William R. Selwood Limited: *See*—
Burton, John D., 4,293,285, Cl. 417-240.000.
Williams, Clarence E. Frictional retainer for holding a door open. 4,292,707, Cl. 16-48.500.
Williams, David L.: *See*—
Brogdon, Vas H.; and Williams, David L., 4,293,276, Cl. 416-134.00A.
Williams, Garnet M. E.; Hutton, Stanley P.; and Bushman, John A., to Ferraris Development and Engineering Co., Ltd. Fluid flow measuring apparatus. 4,292,853, Cl. 73-861.790.
Williams, Jarvis L. Television monitoring system. 4,293,876, Cl. 358-211.000.
Williams, Thomas W.: *See*—
Dasgupta, Sumit; Goel, Prabhakar; and Williams, Thomas W., 4,293,919, Cl. 364-716.000.
Williams, William H., to Sandstone, Inc. Anti-theft screen construction. 4,293,778, Cl. 307-147.000.
Willis, John K.: *See*—
Rose, Bernard R.; and Willis, John K., 4,293,338, Cl. 75-253.000.
Wilson, Robert B., to Northwestern Laboratories, Inc. Diester composition and textile processing compositions therefrom. 4,293,305, Cl. 8-115.600.
Wilson Trailer Company: *See*—
Lewis, Mack A.; and Spencer, Mike R., 4,293,158, Cl. 296-24.00C.
Wimelius, Bjorn: *See*—
Millgardh, Ulf J.; Lindberg, Ulf W.; Anneflod, Weimar A.; Werner, Nils H.; and Wimelius, Bjorn, 4,293,607, Cl. 428-212.000.
Windsor, David L.: *See*—
Denton, Medona B.; and Windsor, David L., 4,293,220, Cl. 356-316.000.
Winegard Company: *See*—
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., 4,293,861, Cl. 343-766.000.
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., to Winegard Company. Compact television antenna system. 4,293,861, Cl. 343-766.000.
Wing, Paul, to Masoneilan International, Inc. Erosion resistant valve. 4,292,991, Cl. 137-329.050.
Winiasz, Michael E., to Clark-Reliance Corp., The. Pressure reducing valve. 4,292,998, Cl. 137-489.500.
Winiasz, Michael E., to A-T-O Inc. Adjustable volumetric filler head. 4,293,010, Cl. 141-392.000.
Winkler, H. Eugene, to United States of America, National Aeronautics and Space Administration. Electrophotolysis oxidation system for measurement of organic concentration in water. 4,293,522, Cl. 422-80.000.
Winter, George R., III, to UOP Inc. Apparatus for the solvent extraction of aromatic hydrocarbons from a hydrocarbon mixture. 4,293,387, Cl. 196-14.520.
Wirostko, Emil; and Johnson, Lewis A. Method for treatment of human eye disease. 4,293,568, Cl. 424-330.000.
Wisconsin Alumni Research Foundation: *See*—
Bradley, Robert L., Jr.; and Hekmati, Majid, 4,293,573, Cl. 426-43.000.
Wiseman, Robert L.: *See*—
Long, Lennart E.; and Wiseman, Robert L., 4,293,766, Cl. 235-462.000.
Woeste, David R.: *See*—
Tepe, James R.; Sandor, Robert P.; Wesselman, Bernard W.; and Woeste, David R., 4,293,027, Cl. 165-12.000.

Wolcott, Judith: *See*—
Champion, Carolyn; Wolcott, Judith; Hart, Barbara; and Garcia, Zulma C., 4,292,975, Cl. 128-498.000.
Wolf, Hans J.: *See*—
Maag, Willi; Baumgartner, Hans U.; Vollenweider, Max; and Wolf, Hans J., 4,292,769, Cl. 51-169.000.
Wong, Chung-Chee, to Kong, San P. Battery-operated lantern. 4,293,896, Cl. 362-200.000.
Wong, Dennis W. Novel chemical method of labeling proteins with $^{99m}$Tc-Technetium at physiological condition. 4,293,537, Cl. 424-1.000.
Wong, Jason S.: *See*—
Levine, David W.; Thilly, William G.; Wang, Daniel I. C.; and Wong, Jason S., 4,293,654, Cl. 435-241.000.
Wong, Tai W.: *See*—
Merrifield, Robert B.; and Wong, Tai W., 4,293,455, Cl. 260-8.000.
Wood, John F.: *See*—
Leeper, Charles G.; and Wood, John F., 4,293,020, Cl. 157-1.280.
Wood, Robert: *See*—
Olofsson, Mats; Buhler, Marcel; and Wood, Robert, 4,293,571, Cl. 426-7.000.
Wooderson, Charles R. Vehicular pet anchor. 4,292,932, Cl. 119-109.000.
Woodward, Robert B.; and Bickel, Hans, to Ciba-Geigy Corporation. Process for the manufacture of enol derivatives, and intermediates. 4,293,462, Cl. 260-239.00A.
Wool Development International Limited: *See*—
Gore, Colin E.; and Coulter, John P., 4,292,798, Cl. 57-86.000.
World Carpets, Inc.: *See*—
Toland, James, 4,292,822, Cl. 68-5.00D.
Worsham, Daniel A., to Pacific Western Systems, Inc. Renewable nut for a lead screw drive and method of making same. 4,292,722, Cl. 29-402.210.
Wovcha, Merle G.; and Biggs, Candice B., to Upjohn Company, The. Process for preparing androst-4-ene-3,17-dione. 4,293,644, Cl. 435-55.000.
Wovcha, Merle G.; Biggs, Candice B.; and Pyke, Thomas R., to Upjohn Company, The. Process for preparing androsta-1,4-diene-3,17-dione and androst-4-ene-3,17-dione. 4,293,645, Cl. 435-55.000.
Wovcha, Merle G.; and Brooks, Kevin E., to Upjohn Company, The. Composition of matter and process. 4,293,646, Cl. 435-55.000.
Woychick, John, to Land-O-Nod. Water bed construction with enclosure. 4,292,701, Cl. 5-422.000.
Wrede, Hans: *See*—
Nestler, Johannes; and Wrede, Hans, 4,293,779, Cl. 307-252.00C.
Wright, Luther M., deceased: *See*—
Rosborough, Robert S., Jr.; and Wright, Luther M., deceased, 4,293,215, Cl. 355-40.000.
Wright, Michael J., to Newage Engineers Limited. Control systems for electric generators. 4,293,810, Cl. 322-28.000.
Wright, Ralph W.: *See*—
Flusche, Frederick O.; Tan, Kwang G.; and Wright, Ralph W., 4,293,910, Cl. 364-200.000.
Wright, Wade S.: *See*—
Fellman, Marc M.; and Wright, Wade S., 4,293,131, Cl. 273-121.00A.
Wu, George: *See*—
Szanto, Elmer G.; Wu, George; and Ulrich, Charles J., 4,293,366, Cl. 156-477.00B.
Wynn Oil Company: *See*—
Babish, John A.; Arnot, Larry K.; and Appel, Douglas C., 4,293,031, Cl. 165-95.000.
Xerox Corporation: *See*—
Dickerson, Charles G.; and Erhardt, Peter F., 4,293,632, Cl. 430-137.000.
George, Clifford L.; and Olson, Jon S., 4,293,214, Cl. 355-14.00R.
Huggins, Raymond W., 4,292,923, Cl. 118-658.000.
Lindblad, Nero R.; Rezanka, Ivan; and Cassidy, John V., 4,292,924, Cl. 118-658.000.
Lu, Chin H., 4,293,631, Cl. 430-106.000.
Murphy, Cornelius B.; and Sypula, Donald S., 4,293,627, Cl. 430-39.000.
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,293,826, Cl. 331-94.50H.
Yabuuchi, Takahiro: *See*—
Fujimura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,293,713, Cl. 564-38.000.
Yamada, Tsuneo; and Miyamoto, Yukihiko. Monostable multivibrator. 4,293,781, Cl. 307-273.000.
Yamaguchi, Hisao; and Fujisawa, Kazuo, to Sumitomo Metal Industries, Ltd. Method for correcting the sensitivity of an electromagnetic ultrasonic probe. 4,292,849, Cl. 73-643.000.
Yamaguchi, Shigehiro: *See*—
Ichiyama, Tadashi; Yamaguchi, Shigehiro; Iuchi, Tohru; and Kuroki, Katsuro, 4,293,350, Cl. 148-111.000.
Yamaha Hatsukoki Kabushiki Kaisha: *See*—
Matsumoto, Hiromitsu; Sugiyama, Keiichi; and Uchiyama, Kazuo, 4,292,944, Cl. 123-432.000.
Yamakoshi, Nobuaki: *See*—
Shibata, Kenyu; Itaya, Toshihisa; Yamakoshi, Nobuaki; Kurata, Shigeru; Koizumi, Naoyuki; Tarutani, Masaaki; Sakuma, Hideki; and Konishi, Kunihiro, 4,293,557, Cl. 424-267.000.
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, to Kabushiki Kaisha Kurio-Medikaru. Apparatus for refrigeration treatment. 4,292,973, Cl. 128-303.100.
Yamauchi, Yukio: *See*—
Sawa, Hiroshi; and Yamauchi, Yukio, 4,292,844, Cl. 73-359.00A.
Yamazaki, Yasuo; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Optical conversion assembly for objective camera lenses. 4,293,185, Cl. 350-18.000.
Yamazaki, Yoshio; Kamogawa, Nin-ichi; and Iwai, Yasuyuki, to Konishiroku Photo Industry Co., Ltd. Developing device for an electrophotographic copying machine. 4,292,922, Cl. 118-657.000.
Yanagisawa, Hifumi: *See*—
Sakuma, Shinzo; and Yanagisawa, Hifumi, 4,293,748, Cl. 200-144.00B.
Yano, Teruo: *See*—
Higuchi, Noboru; Yano, Teruo; and Ohnishi, Masahiro, 4,293,357, Cl. 156-89.000.
Yates, George, Jr., to Growth International Industries Corp. Container with collar. 4,293,073, Cl. 206-519.000.
Yazu, Shuji: *See*—
Hara, Akio; and Yazu, Shuji, 4,293,618, Cl. 428-551.000.
Yello, Joseph F., to Zenith Radio Corporation. Raster-centering circuit. 4,293,804, Cl. 315-398.000.
Yeo, Norman H.: *See*—
Swanson, Douglas L.; and Yeo, Norman H., 4,292,734, Cl. 29-791.000.
Yesuratnam, Richard J. Fish landing net. 4,292,753, Cl. 43-5.000.
Yim, Bohyun, to United States of America, Navy. Transcavitating propeller. 4,293,280, Cl. 416-237.000.
Yokozawa, Norio: *See*—
Shibayama, Akinori; Maio, Kenji; and Yokozawa, Norio, 4,293,819, Cl. 330-9.000.
Yoldas, Bulent E., to Westinghouse Electric Corp. Method of fabricating heat mirror for incandescent lamp envelope. 4,293,593, Cl. 427-106.000.
Yoldas, Bulent E.; and Mattox, Douglas M., to Westinghouse Electric Corp. Method for forming conductive, transparent coating on a substrate. 4,293,594, Cl. 427-107.000.
Yonan, Edward E.: *See*—
Gorman, Susan B.; Thompson, Ralph B.; and Yonan, Edward E., 4,293,706, Cl. 560-163.000.
Yoneda, Takao: *See*—
Nishimura, Hideo; Yoneda, Takao; and Enomoto, Minoru, 4,293,913, Cl. 364-474.000.
Yonkers, Edward H.; and LeDoux, Gilbert A., to Data Packaging Corporation. Ribbon cartridge for band printer. 4,293,234, Cl. 400-196.100.
Yoo, Jin S.: *See*—
Burk, Emmett H., Jr.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,293,403, Cl. 208-120.000.
Yoshida Kogyo, K.K.: *See*—
Iimura, Yoshitaka, 4,292,733, Cl. 29-766.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Akutsu, Masao, 4,293,520, Cl. 264-513.000.
Yost, Gerald H.: *See*—
Chirino, Agustin M.; and Yost, Gerald H., 4,293,325, Cl. 65-43.000.
Young, David E., to Smith International, Inc. Drilling head. 4,293,047, Cl. 175-195.000.
Young, Elgin E., to PPG Industries, Inc. Synthesis of polyol bis(allyl carbonate) utilizing reagent recovery and recycle. 4,293,503, Cl. 260-463.000.
Yukinaga, Hisajiro; Sumimoto, Shinzaburo; Ishizuka, Ichiro; and Sugita, Jitsuo, to Shionogi & Co., Ltd. N-(5-t-Butyl-3-isoxazolyl)alkanamide derivatives and herbicidal compositions containing them. 4,293,328, Cl. 71-88.000.
Yukitake, Tugihiro: *See*—
Isahaya, Fumio; and Yukitake, Tugihiro, 4,293,521, Cl. 422-62.000.
Zalucha, Denis J.; Sexsmith, Frederick H.; Hornaman, Ernest C.; and Dawdy, Terrance H., to Lord Corporation. Structural adhesive formulations. 4,293,665, Cl. 525-255.000.
Zankl, Robert H. Screw lock rivet. 4,293,263, Cl. 411-500.000.
Zapara, Boris M.: *See*—
Dunaevsky, Vladimir I.; Boidenko, Nikolai G.; Samarin, Alexei P.; Levit, Viktor M.; Zapara, Boris M.; Ivanov, Boris N.; Frolov, Sergei A.; Voronin, Rostislav A.; Belozerov, Nikolai P.; Momot, Valery I.; Stusenko, Jury A.; and Samoilov, Vladimir A., 4,293,101, Cl. 242-56.400.
Zdaniewski, Joseph J.; Penn, William B.; and Balke, Roy L., to General Electric Co. Insulated pole and coil assembly and method of making same. 4,293,784, Cl. 310-45.000.
Zecher, Wilfried: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Lewalter, Jurgen; Zecher, Wilfried; and Dunwald, Willi, 4,293,669, Cl. 525-452.000.
Zeidman, Zvi; Goldenberg, Carol; and Grinbaum, Zvi. Impacting device. 4,293,045, Cl. 173-121.000.
Zeilstra, Jacobus J.; de Klein, Willem J.; and Bik, Joannes D., to Akzona Incorporated. Wax composition for entirely or partly replacing carnauba wax or montan wax. 4,293,345, Cl. 106-270.000.
Zenith Radio Corporation: *See*—
Reneau, Daniel L., 4,293,874, Cl. 358-172.000.
Yello, Joseph F., 4,293,804, Cl. 315-398.000.
Zerenner, Ernest H.: *See*—
Bente, Paul F., III; Zerenner, Ernest H.; and Dandeneau, Raymond D., 4,293,415, Cl. 210-198.200.



Zidermane, Aina A.: *See*—
Uldrikis, Yan R.; Preisa, Ieva E.; Dubur, Gunar Y.; Zidermane, Aina A.; Biseniex, Egils A.; and Tirzit, Gunar D., 4,293,700, Cl. 546-321.000.
Zilog, Inc.: *See*—
Trueblood, Richard K., 4,293,587, Cl. 427-90.000.
Zimmermann & Jansen GmbH: *See*—
Felthuis, Jacob; and Rumphorst, Jacobus A., 4,292,993, Cl. 137-340.000.
Hoppe, Walter, 4,292,747, Cl. 37-58.000.
Zinchenko, Yakov A.: *See*—
Kopylov, Alexei A.; Kuzmenko, Valentin T.; Stepanov, Alexandr N.; Gaschenko, Viktor P.; Kaznacheevsky, Nikolai A.; Nosovitsky, Alexandr Y.; Misikov, Ivan I.; Shapiro, Alexandr I.; Skakunov, Ivan G.; Markin, Valentin G.; Konstantinov, Alexei K.; Abramian, Eduard S.; Soroka, Arseny M.; and Zinchenko, Yakov A., 4,292,928, Cl. 119-17.000.
Ziv, Avraham, to American Safety Equipment Corporation. Tension relieving selective engagement mechanism with memory. 4,293,107, Cl. 242-107.700.
Zoerb, Alan E., deceased: *See*—
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.
Zoerb, Delores E.: *See*—
Carpenter, Edward J.; Korff, William W.; Zoerb, Alan E., deceased; Barello, Lawrence J.; Hall, Donald R.; and Becker, Orlien N., 4,293,915, Cl. 364-493.000.
Zollinger, J. Lamar; and Lien, Larry A., to Minnesota Mining and Manufacturing Company. Low friction, abrasion resistant coating for transparent film. 4,293,606, Cl. 428-203.000.
Zook, Grant W. Conversion or extension beam. 4,293,269, Cl. 414-686.000.
Zovitsky, Gert J.: *See*—
Retief, Andries; and Zovitsky, Gert J., 4,293,134, Cl. 273-428.000.
Zuffellato, Giuseppe. Writing instrument with holder or grip portion incorporating a partially visible movable ribbon. 4,292,750, Cl. 40-334.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arvin Industries, Inc.: *See—*
Maxey, Alexander R., Re. 30,762, Cl. 360-85.000.

Ban, Itsuki; and Shiraki, Manabu. Three-phase DC motor having non-superimposed armature coils. Re. 30,761, Cl. 318-439.000.

Bayer Aktiengesellschaft: *See—*
Kubens, Rolf; and Heine, Heinrich, Re. 30,760, Cl. 528-67.000.

Burkner, Wolfgang, to Carl Schenck AG. Method and apparatus for producing and transporting single and multilayer chipboards. Re. 30,759, Cl. 264-118.000.

Carl Schenck AG: *See—*
Burkner, Wolfgang, Re. 30,759, Cl. 264-118.000.

Cook, Robert D.: *See—*
Hirzel, Edgar A.; and Cook, Robert D., Re. 30,763, Cl. 364-426.000.

Crane Co., Hydro-Aire Division: *See—*
Hirzel, Edgar A.; and Cook, Robert D., Re. 30,763, Cl. 364-426.000.

Gerber Garment Technology, Inc.: *See—*
Gerber, Heinz J., Re. 30,757, Cl. 83-74.000.

Gerber, Heinz J., to Gerber Garment Technology, Inc. Closed loop apparatus for cutting sheet material. Re. 30,757, Cl. 83-74.000.

Heine, Heinrich: *See—*
Kubens, Rolf; and Heine, Heinrich, Re. 30,760, Cl. 528-67.000.

Hirzel, Edgar A.; and Cook, Robert D., to Crane Co., Hydro-Aire Division. Selective deceleration brake control system. Re. 30,763, Cl. 364-426.000.

Kubens, Rolf; and Heine, Heinrich, to Bayer Aktiengesellschaft. Process for the production of synthetic resins containing isocyanurate groups. Re. 30,760, Cl. 528-67.000.

Lang, Richard A. Pedal-actuated bicycle gear shift means. Re. 30,758, Cl. 474-80.000.

Maxey, Alexander R., to Arvin Industries, Inc. Method and apparatus for video signal recording. Re. 30,762, Cl. 360-85.000.

Muir, Andrew R.; and Vergato, Joseph A., to Perkin-Elmer Corporation, The. Electrical output peak detecting apparatus. Re. 30,764, Cl. 364-487.000.

Perkin-Elmer Corporation, The: *See—*
Muir, Andrew R.; and Vergato, Joseph A., Re. 30,764, Cl. 364-487.000.

Shiraki, Manabu: *See—*
Ban, Itsuki; and Shiraki, Manabu, Re. 30,761, Cl. 318-439.000.

Vergato, Joseph A.: *See—*
Muir, Andrew R.; and Vergato, Joseph A., Re. 30,764, Cl. 364-487.000.

# LIST OF DESIGN PATENTEES

Abeta Pet Supply, Inc.: *See—*
Michalski, Robert J., 261,186, Cl. D30-42.000.

Adkins, James C.: *See—*
Rosenblatt, Aaron A.; Mann, Walter J.; and Adkins, James C., 261,109, Cl. D9-384.000.

Akimov, Boris M.; Morozov, Viktor I.; Shalaev, Vitaly I.; Telegin, Viktor V.; Vasiltsov, Alexandr M.; Tsoglin, Georgy S.; and Vasiliev, Vladimir I. Vacuum vessel for comestibles or the like. 261,088, 10-6-81, Cl. D7-77.000.

Aktiebolaget Volvo: *See—*
Lindfors, Olof H., 261,126, Cl. D34-34.000.

Allen, Donald B.: *See—*
Rice, Kenneth, Jr., 261,168, Cl. D21-225.000.

Alley, John P., Sr. Candle sconce. 261,179, 10-6-81, Cl. D26-9.000.

Allibert Exploitation Societe Anonyme: *See—*
Cornou, Jean, 261,193, Cl. D34-45.000.

Alternative Pioneering Systems, Inc.: *See—*
Erickson, Chad S.; and Worrell, W. Robert, 261,142, Cl. D15-110.000.

Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,130, 10-6-81, Cl. D12-147.000.

American Hospital Supply Corporation: *See—*
O'Day, David L., 261,175, Cl. D24-99.000.

American Optical Corporation: *See—*
Armbruster, John T., 261,173, Cl. D24-21.000.

AMP Incorporated: *See—*
Sotolongo, Thomas J., 261,101, Cl. D8-353.000.

Armbruster, John T., to American Optical Corporation. Bilirubinometer. 261,173, 10-6-81, Cl. D24-21.000.

Barbour, William P., to Security Imprinter Corporation. Handle and cap assembly for the print head of imprinting machines. 261,151, 10-6-81, Cl. D18-14.000.

Barbour, William P., to Security Imprinter Corporation. Printing bed assembly for imprinting machines. 261,152, 10-6-81, Cl. D18-14.000.

Barich, Pamela. Pleated nurse cap. 261,072, 10-6-81, Cl. D2-230.000.

Barr, Josef J. Necklace or similar article. 261,119, 10-6-81, Cl. D11-7.000.

Barr, Josef J. Necklace or similar article. 261,120, 10-6-81, Cl. D11-15.000.

Barr, Josef J. Necklace or similar article. 261,121, 10-6-81, Cl. D11-15.000.

Barr, Josef J. Finger ring. 261,122, 10-6-81, Cl. D11-34.000.

Baxter Travenol Laboratories, Inc.: *See—*
Winchell, David A.; and Evans, William M., 261,106, Cl. D9-369.000.

Berliner, Emanuel, to Bristoline Inc. Bottom plate for a sphygmomanometer. 261,174, 10-6-81, Cl. D24-29.000.

Bogert, Frances P.: *See—*
Bogert, Theodore L.; and Bogert, Frances P., 261,083, Cl. D6-161.000.

Bogert, Theodore L.; and Bogert, Frances P. Computer terminal desk. 261,083, 10-6-81, Cl. D6-161.000.

Box, Theodor M., to Cities Service Company. Beverage case. 261,194, 10-6-81, Cl. D34-46.000.

Bristoline Inc.: *See—*
Berliner, Emanuel, 261,174, Cl. D24-29.000.

Brooksby, Brian T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M. Moving target projector console. 261,144, 10-6-81, Cl. D16-11.000.

Brooksby, Brian T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M. Screen unit. 261,149, 10-6-81, Cl. D16-43.000.

Bunger, Richard E. Flume platform for animal confinement pens. 261,183, 10-6-81, Cl. D30-2.000.

Bunger, Richard E. Flume platform for animal confinement pens. 261,184, 10-6-81, Cl. D30-2.000.

Bunger, Richard E. Flume platform for animal confinement pens. 261,185, 10-6-81, Cl. D30-2.000.

Cathey, Wayne C., to Xerox Corporation. Acoustical hood assembly for a printer apparatus. 261,153, 10-6-81, Cl. D18-22.000.

Charles of the Ritz Group Ltd.: *See—*
Harris, Ned, 261,107, Cl. D9-370.000.
Harris, Ned, 261,108, Cl. D9-370.000.

Chernin, Samuel. Building. 261,176, 10-6-81, Cl. D25-11.000.

Chernoff, Maxwell B., to Dart Industries Inc. Tote bag. 261,076, 10-6-81, Cl. D3-42.000.

Chicago Pneumatic Tool Company: *See—*
Wallace, William K.; and Giardino, David A., 261,097, Cl. D8-61.000.

Chikaishi, Koichi: *See—*
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Cohen Skalli, Robert A. Bottle. 261,104, 10-6-81, Cl. D9-329.000.

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Compagnie Generale des Etablissements Michelin: *See—*
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Cornou, Jean, to Allibert Exploitation Societe Anonyme. Tote tray. 261,193, 10-6-81, Cl. D34-45.000.

Crawford, Emmet. Belt elevator type educational toy. 261,156, 10-6-81, Cl. D19-59.000.

Cullity, Richard E.: *See—*
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., 261,127, Cl. D34-34.000.

Cullom, Keith D.: *See—*
Spruill, Mark C.; Hipes, Michael D.; Durtche, Carl J.; and Cullom, Keith D., 261,073, Cl. D2-232.000.

Cummings, Kenneth W.: *See—*
Vetter, Craig W.; Perethian, Charles M.; and Cummings, Kenneth W., 261,132, Cl. D12-182.000.

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Dart Industries Inc.: *See—*
Chernoff, Maxwell B., 261,076, Cl. D3-42.000.
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Davis, Myron F., Jr., to International Business Machines Corporation. Magnetic tape unit. 261,138, 10-6-81, Cl. D14-108.000.

De Lillo, Peter G. Automotive audio system speaker enclosure. 261,137, 10-6-81, Cl. D14-33.000.

Dolas, Michael. Money pouch. 261,075, 10-6-81, Cl. D3-41.000.

Dunham, Scott. Test tube baby figurine. 261,124, 10-6-81, Cl. D11-160.000.

Durtche, Carl J.: *See—*
Spruill, Mark C.; Hipes, Michael D.; Durtche, Carl J.; and Cullom, Keith D., 261,073, Cl. D2-232.000.

Emhart Industries, Inc.: *See—*
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Erickson, Chad S.; and Worrell, W. Robert, to Alternative Pioneering Systems, Inc. Food dehydrator. 261,142, 10-6-81, Cl. D15-110.000.

Etoh, Taro; and Ishihara, Sadao, to Minolta Camera Kabushiki Kaisha. Copier or similar article. 261,145, 10-6-81, Cl. D16-30.000.

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First Champaign Corporation: *See—*
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Ford, Harry R.; and Yoshihashi, Yasuo, to Formica Corporation. Laminate sheet. 261,189, 10-6-81, Cl. D92-1.00R.

Ford, Harry R.; and Yoshihashi, Yasuo, to Formica Corporation. Laminate sheet. 261,190, 10-6-81, Cl. D92-1.00R.

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Fowler, George D., to Supreme Industries, Inc. Boat. 261,128, 10-6-81, Cl. D12-300.000.

Fox Valley Instrument Company: *See—*
Greenlee, Hugh T.; Hess, Roy P.; and McKinnon, Donald C., 261,115, Cl. D10-112.000.

Fukumura, Yutaka, to Citizen Watch Co. Ltd. Wrist watch. 261,111, 10-6-81, Cl. D10-38.000.

Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 261,112, 10-6-81, Cl. D10-38.000.

Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 261,113, 10-6-81, Cl. D10-39.000.

Gakken Co., Ltd: *See—*
Kurosawa, Kenzo; and Hachimura, Fukuji, 261,165, Cl. D21-160.000.

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Stocker, Hans, 261,187, Cl. D47-6.00E.
Stocker, Hans, 261,188, Cl. D47-6.00E.
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Giardino, David A.: *See—*
Wallace, William K.; and Giardino, David A., 261,097, Cl. D8-61.000.

Gordon, Donald J.; Johnson, Frank H.; Schick, George L.; and Smart, J. David, to Slater Steel Industries Limited. Hand cart. 261,125, 10-6-81, Cl. D34-24.000.

Gradco/Dendoki, Inc.: *See—*
Lawrence, Frederick J., 261,147, Cl. D16-32.000.
Lawrence, Frederick J., 261,148, Cl. D16-32.000.

Green, Robert H. Wood splitter. 261,143, 10-6-81, Cl. D15-127.000.

Greenlee, Hugh T.; Hess, Roy P.; and McKinnon, Donald C., to Fox Valley Instrument Company. Timing light. 261,115, 10-6-81, Cl. D10-112.000.

Gronborg, Jan L. Visor for attachment to helmet or the like. 261,074, 10-6-81, Cl. D2-233.000.

Gruber Systems, Inc.: *See—*
Cuttriss, Richard J., 261,171, Cl. D23-65.000.

Gschwandtner, Eric. Building structure or the like. 261,177, 10-6-81, Cl. D25-17.000.

Guilfoyle, John L. Bee frame end bar. 261,182, 10-6-81, Cl. D30-2.000.

Hachimura, Fukuji: *See—*
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Harris, Ned, to Charles of the Ritz Group Ltd. Combined bottle and cap. 261,107, 10-6-81, Cl. D9-370.000.

Harris, Ned, to Charles of the Ritz Group Ltd. Combined bottle and cap. 261,108, 10-6-81, Cl. D9-370.000.

Hendon, Benny J.; and Malinowski, Julius, Jr. Fence post setting chuck. 261,098, 10-6-81, Cl. D8-70.000.

Heritage, Robert, to Rotaflex (Great Britain) Limited. Electrical current supply track. 261,134, 10-6-81, Cl. D13-13.000.

Hess, Roy P.: *See—*
Greenlee, Hugh T.; Hess, Roy P.; and McKinnon, Donald C., 261,115, Cl. D10-112.000.

Hipes, Michael D.: *See—*
Spruill, Mark C.; Hipes, Michael D.; Durtche, Carl J.; and Cullom, Keith D., 261,073, Cl. D2-232.000.

Hoover, Charles J. Choker line coupler. 261,102, 10-6-81, Cl. D8-383.000.

Horne, James. Safety cover for electrical outlets. 261,135, 10-6-81, Cl. D13-30.000.

Hospal Medical Corp.: *See—*
Lissack, Tsvi, 261,172, Cl. D24-17.000.

Ikeda, Tameaki, to Sony Corporation. Television camera. 261,140, 10-6-81, Cl. D14-78.000.

International Business Machines Corporation: *See—*
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Ishihara, Sadao: *See—*
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J-Mark, Inc.: *See—*
Makela, Martin A., 261,133, Cl. D12-203.000.

Jakobsen, Knud, to International Standard Electric Corporation. Telephone apparatus. 261,139, 10-6-81, Cl. D14-53.000.

Johnson, Frank H.: *See—*
Gordon, Donald J.; Johnson, Frank H.; Schick, George L.; and Smart, J. David, 261,125, Cl. D34-24.000.

Kamikubo, Masayoshi: *See—*
Yamada, Nobuo; Kamikubo, Masayoshi; Chikaishi, Koichi; and Terahata, Junichi, 261,136, Cl. D14-5.000.

Kapolas, Melodee A. Pan insert. 261,090, 10-6-81, Cl. D7-102.000.

Kask, Eugene, to Rogers Corporation. Level indicating float. 261,114, 10-6-81, Cl. D10-103.000.

Kowalski, Daniel J.: *See—*
Mareydt, Ray G.; and Kowalski, Daniel J., 261,131, Cl. D12-157.000.

Kubota, Ltd.: *See—*
Takahashi, Teizo; and Toyokuni, Kazuo, 261,141, Cl. D15-23.000.

Kudo, Kazue, to Tomy Kogyo Co., Inc. Animated frog figurine. 261,164, 10-6-81, Cl. D21-158.000.

Kudo, Kazue, to Tomy Kogyo Co., Inc. Animated penguin figurine. 261,166, 10-6-81, Cl. D21-160.000.

Kurosawa, Kenzo; and Hachimura, Fukuji, to Gakken Co., Ltd. Toy animal figure. 261,165, 10-6-81, Cl. D21-160.000.

Lagin, Herbert. Track light system. 261,180, 10-6-81, Cl. D26-66.000.

Lawrence, Frederick J., to Gradco/Dendoki, Inc. Combined copying and sorting apparatus. 261,147, 10-6-81, Cl. D16-32.000.

Lawrence, Frederick J., to Gradco/Dendoki, Inc. Combined copying and sorting apparatus. 261,148, 10-6-81, Cl. D16-32.000.

Lewis, Kenneth T. Door annunciator housing. 261,117, 10-6-81, Cl. D10-118.000.

Lindfors, Olof H., to Aktiebolaget Volvo. Remote controlled fork truck. 261,126, 10-6-81, Cl. D34-34.000.

Lissack, Tsvi, to Hospal Medical Corp. Pulmonary function measurement apparatus or the like. 261,172, 10-6-81, Cl. D24-17.000.

Loomis, Judith J. Neckwear purse. 261,077, 10-6-81, Cl. D3-52.000.

Lordahl, Var E., to T.S.G. Mfg. Co. Display stand. 261,082, 10-6-81, Cl. D6-114.000.

Maglificid Biellese Fratelli S.p.A.: *See—*
Rolando, Pierluigi, 261,071, Cl. D2-187.000.

Makela, Martin A., to J-Mark, Inc. Combined running board and splash guard. 261,133, 10-6-81, Cl. D12-203.000.

Malinowski, Julius, Jr.: *See—*
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Manmouhong Manufacturing Co.: *See—*
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Mann, Walter J.: *See—*
Rosenblatt, Aaron A.; Mann, Walter J.; and Adkins, James C., 261,109, Cl. D9-384.000.

Mareydt, Ray G.; and Kowalski, Daniel J., to Four Star Corporation. Article carrier stanchion. 261,131, 10-6-81, Cl. D12-157.000.

Mark Industries: *See—*
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., 261,127, Cl. D34-34.000.
Matsui, Hidetoshi. Kinetic sculpture. 261,158, 10-6-81, Cl. D21-102.000.
Maxwell-Muir, Rodney: *See—*
McDonnell, Jessop I.; and Maxwell-Muir, Rodney, 261,089, Cl. D7-101.000.
McDonnell, Jessop I.; and Maxwell-Muir, Rodney. Tenderizer. 261,089, 10-6-81, Cl. D7-101.000.
McFarlane, James S. Shampoo sink. 261,170, 10-6-81, Cl. D23-64.000.
McKinnon, Donald C.: *See—*
Greenlee, Hugh T.; Hess, Roy P.; and McKinnon, Donald C., 261,115, Cl. D10-112.000.
Menard, Gerald J. Rotating multiple skewer assembly. 261,092, 10-6-81, Cl. D7-129.000.
Michalski, Robert J., to Abeta Pet Supply, Inc. Combined cat playground and exerciser. 261,186, 10-6-81, Cl. D30-42.000.
Minolta Camera Kabushiki Kaisha: *See—*
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Brooksby, Brian T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M., 261,144, Cl. D16-11.000.
Brooksby, Brian T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M., 261,149, Cl. D16-43.000.
Myodo, Kenichi, to Shinko Kinzoku Kabushiki Kaisha. Kettle. 261,087, 10-6-81, Cl. D7-66.000.
Nagel, Anita. Soap-dish. 261,081, 10-6-81, Cl. D6-89.000.
Nast, Richard. Transparent storage envelope for a flexible magnetic computer disc. 261,155, 10-6-81, Cl. D19-33.000.
O'Day, David L., to American Hospital Supply Corporation. Medical container hanger. 261,175, 10-6-81, Cl. D24-99.000.
Ohkawa, Hiroshi, to Tomy Kogyo, Co., Inc. Toy bear figurine. 261,161, 10-6-81, Cl. D21-150.000.
Ohkawa, Hiroshi, to Tomy Kogyo Co., Inc. Toy dog figurine. 261,162, 10-6-81, Cl. D21-150.000.
Perego, Giuseppe. Foldable baby stroller. 261,129, 10-6-81, Cl. D12-129.000.
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Perhacs, Leslie, Jr., to Proctor & Associates Company. Sonic signal generator. 261,118, 10-6-81, Cl. D10-121.000.
Peterkin, Stuart M.: *See—*
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Petersen, Christian, to Petersen Manufacturing Co., Inc. Hand tool. 261,096, 10-6-81, Cl. D8-22.000.
Petersen Manufacturing Co., Inc.: *See—*
Petersen, Christian, 261,096, Cl. D8-22.000.
Pettibone, Robert E. Field and winter sports jacket. 261,070, 10-6-81, Cl. D2-185.000.
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QED: *See—*
Rosenblatt, Aaron A.; Mann, Walter J.; and Adkins, James C., 261,109, Cl. D9-384.000.
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., to Mark Industries. Mobile self-powered hydraulic lift. 261,127, 10-6-81, Cl. D34-34.000.
Rapaport, Gerald M. Toy kitchen sink. 261,159, 10-6-81, Cl. D21-122.000.
Rapaport, Gerald M. Toy stove. 261,160, 10-6-81, Cl. D21-122.000.
Reiner, Ralph E. Casing for food grinder. 261,094, 10-6-81, Cl. D7-155.000.
Reinhard, Cheyenne A. Fire escape platform. 261,178, 10-6-81, Cl. D25-62.000.
Repak, Wayne R., to Safe-T-Signal, Inc. Warning flasher or similar article. 261,116, 10-6-81, Cl. D10-114.000.
Revlon, Inc.: *See—*
Schwartz, Ira, 261,105, Cl. D9-353.000.
Rexham Corporation: *See—*
Thresher, Glenn A., 261,154, Cl. D19-4.000.
Rice, Kenneth, Jr., to Allen, Donald B. Skateboard ice blade. 261,168, 10-6-81, Cl. D21-225.000.
Rogers Corporation: *See—*
Kask, Eugene, 261,114, Cl. D10-103.000.
Rolando, Pierluigi, to Maglificid Biellese Fratelli S.p.A. Jacket. 261,071, 10-6-81, Cl. D2-187.000.
Rosenblatt, Aaron A.; Mann, Walter J.; and Adkins, James C., to QED. Bottle. 261,109, 10-6-81, Cl. D9-384.000.
Rotaflex (Great Britain) Limited: *See—*
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Russell, Richard H., to Emhart Industries, Inc. Door closer. 261,099, 10-6-81, Cl. D8-330.000.
Safe-T-Signal, Inc.: *See—*
Repak, Wayne R., 261,116, Cl. D10-114.000.
Saffran, Mortimer; and Turcek, Emil. Bracelet support. 261,123, 10-6-81, Cl. D11-86.000.
Sakai, Masaaki; and Sakow, Toshihiko, to Minolta Camera Kabushiki Kaisha. Electrostatic copier or similar article. 261,146, 10-6-81, Cl. D16-31.000.
Sakow, Toshihiko: *See—*
Sakai, Masaaki; and Sakow, Toshihiko, 261,146, Cl. D16-31.000.
Sands, Gloria J. Comb with artificial flowers and seashells. 261,181, 10-6-81, Cl. D28-32.000.
Schick, George L.: *See—*
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Schwartz, Ira, to Revlon, Inc. Dispensing container. 261,105, 10-6-81, Cl. D9-353.000.
Scott, Janet. Portable back rest. 261,084, 10-6-81, Cl. D6-200.000.
Security Imprinter Corporation: *See—*
Barbour, William P., 261,151, Cl. D18-14.000.
Barbour, William P., 261,152, Cl. D18-14.000.
Segal, William J. Eating utensil. 261,093, 10-6-81, Cl. D7-151.000.
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Smart, J. David: *See—*
Gordon, Donald J.; Johnson, Frank H.; Schick, George L.; and Smart, J. David, 261,125, Cl. D34-24.000.
Snyder, Larry R. Fishing lure. 261,169, 10-6-81, Cl. D22-27.000.
Sony Corporation: *See—*
Ikeda, Tameaki, 261,140, Cl. D14-78.000.
Sotolongo, Thomas J., to AMP Incorporated. Floor outlet housing. 261,101, 10-6-81, Cl. D8-353.000.
Spruill, Mark C.; Hipes, Michael D.; Durtche, Carl J.; and Cullom, Keith D. Combined fireman's hood and face mask. 261,073, 10-6-81, Cl. D2-232.000.
Stiggers, Weldon W. Shell-fish utensil. 261,091, 10-6-81, Cl. D7-106.000.
Stocker, Hans, to Gardisette International AG. Curtain material. 261,187, 10-6-81, Cl. D47-6.00E.
Stocker, Hans, to Gardisette International AG. Design for curtain material. 261,188, 10-6-81, Cl. D47-6.00E.
Stocker, Hans, to Gardisette International AG. Curtain material. 261,192, 10-6-81, Cl. D92-1.00A.
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Lordahl, Var E., 261,082, Cl. D6-114.000.
Takahashi, Teizo; and Toyokuni, Kazuo, to Kubota, Ltd. Agricultural tractor. 261,141, 10-6-81, Cl. D15-23.000.
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Tamplin, Lyle R.: *See—*
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., 261,127, Cl. D34-34.000.
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Terry, Forest L., Jr. Combined guitar and synthesizer sound box, or similar article. 261,150, 10-6-81, Cl. D17-2.000.
Thresher, Glenn A., to Rexham Corporation. Envelope. 261,154, 10-6-81, Cl. D19-4.000.
Tomy Kogyo Co., Inc.: *See—*
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Toyokuni, Kazuo: *See—*
Takahashi, Teizo; and Toyokuni, Kazuo, 261,141, Cl. D15-23.000.
Trend Line Furniture Corporation: *See—*
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Tsang, Ng-Fai A., to Manmouhong Manufacturing Co. All purpose beater. 261,095, 10-6-81, Cl. D7-157.000.



Tsoglin, Georgy S.: *See—*
Akimov, Boris M.; Morozov, Viktor I.; Shalaev, Vitaly I.; Telegin, Viktor V.; Vasiltsov, Alexandr M.; Tsoglin, Georgy S.; and Vasiliev, Vladimir I., 261,088, Cl. D7-77.000.
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Ventura, Frank. Drinking cup. 261,085, 10-6-81, Cl. D7-6.000.
Vetter, Craig W.; Perethian, Charles M.; and Cummings, Kenneth W., to First Champaign Corporation. Motorcycle fairing. 261,132, 10-6-81, Cl. D12-182.000.
Wallace, Dan F.: *See—*
Wallace, Robert S., 261,100, Cl. D8-336.000.
Wallace, Robert S., to Wallace, Dan F. Latch. 261,100, 10-6-81, Cl. D8-336.000.
Wallace, William K.; and Giardino, David A., to Chicago Pneumatic Tool Company. Pneumatic nut runner with torque indicator. 261,097, 10-6-81, Cl. D8-61.000.
Wilson, Robert L., to Chromcraft Corporation. Bar stool. 261,078, 10-6-81, Cl. D6-35.000.
Wilson, Robert L., to Chromcraft Corporation. Chair. 261,080, 10-6-81, Cl. D6-70.000.
Winchell, David A.; and Evans, William M., to Baxter Travenol Laboratories, Inc. Bottle. 261,106, 10-6-81, Cl. D9-369.000.
Wolf, Tobin. Combined kaleidoscope and toy mail box. 261,157, 10-6-81, Cl. D21-60.000.
Worrell, W. Robert: *See—*
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Yamada, Nobuo; Kamikubo, Masayoshi; Chikaishi, Koichi; and Terahata, Junichi, to Rujitsu Ten Limited. Combined automobile cartridge player and radio receiver or the like. 261,136, 10-6-81, Cl. D14-5.000.
Yoshihashi, Yasuo: *See—*
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APPLICANTS TO WHOM

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NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

2 4,292,687
6 4,292,688
12 4,292,689
65 4,292,690
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**CLASS 3**

1.9 4,292,693
1.91 4,292,694
4,292,695

**CLASS 4**

505 4,292,696

**CLASS 5**

18 R 4,292,697
45 4,292,698
413 4,292,700
422 4,292,701
451 4,292,702
468 4,292,703

**CLASS 8**

115.6 4,293,305
471 4,293,306

**CLASS 13**

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**CLASS 15**

104.3 SN 4,292,704
110 4,292,705
341 4,292,706

**CLASS 16**

48.5 4,292,707
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**CLASS 17**

11.1 R 4,292,709
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**CLASS 24**

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30.5 R 4,292,714
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116 AD 4,292,716
148.4 A 4,292,717
149.5 DP 4,292,718
156.4 R 4,292,719
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243.52 4,292,721
402.01 4,292,723
402.21 4,292,722
418 4,292,724
419 R 4,292,725
527.6 4,292,726
566.3 4,292,727
571 4,292,728
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577 C 4,292,730
726 4,292,731
749 4,292,732
766 4,292,733
791 4,292,734
854 4,292,735
884 4,292,736

**CLASS 30**

43.92 4,292,737
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**CLASS 33**

126.4 R 4,292,739
172 E 4,292,740
379 4,292,741

**CLASS 34**

35 4,292,742
65 4,292,743
73 4,292,744
156 4,292,745

**CLASS 36**

83 4,292,746

**CLASS 37**

58 4,292,747

**CLASS 38**

102 4,292,748

**CLASS 40**

308 4,292,749
334 4,292,750
517 4,292,751
576 4,292,752

**CLASS 43**

5 4,292,753

**CLASS 44**

1 R 4,293,312
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7 A 4,293,314

**CLASS 46**

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80 4,292,757
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**CLASS 48**

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118 4,292,772
171 4,292,773
208 4,292,774
220 4,292,775
394 4,292,776
407 4,292,777
486 4,292,779
541 4,292,780
547 4,292,781
696 4,292,782
741 4,292,783

**CLASS 53**

391 4,292,784
399 4,292,785
434 4,292,786
456 4,292,787
500 4,292,788

**CLASS 55**

16 4,293,316
71 4,293,317
85 4,293,318
122 4,293,319
273 4,293,320
357 4,293,321

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13.6 4,292,790
255 4,292,791
330 4,292,792
378 4,292,793
400.16 4,292,794
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24 4,292,797
86 4,292,798
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264 4,292,800

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39.06 4,292,801
204 4,292,802
230 4,292,803
407 4,292,804
450 4,292,805
600 4,292,806
601 4,292,807
673 4,292,808
676 4,292,809
757 4,292,810

**CLASS 62**

17 4,293,322
56 4,292,811
157 4,292,812
158 4,292,813
238.6 4,293,323
243 4,292,814
262 4,292,815
345 4,292,816
457 4,292,817

**CLASS 63**

28 4,292,818

**CLASS 64**

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**CLASS 65**

27 4,293,324
43 4,293,325
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64 4,293,327

**CLASS 66**

8 4,292,820
75.2 4,292,821

**CLASS 68**

5 D 4,292,822

**CLASS 70**

364 R 4,292,823
373 4,292,824

**CLASS 71**

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94 4,293,330
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**CLASS 72**

8 4,292,825
45 4,292,826
46 4,292,827
54 4,292,828
76 4,292,829
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260 4,292,831
365 4,292,832
416 4,292,833
482 4,292,834

**CLASS 73**

1 B 4,292,835
6 4,292,836
17 R 4,292,837
37.7 4,292,838
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115 4,292,840
119 A 4,292,841
155 4,292,842
171 4,292,843
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362.1 4,292,845
427 4,292,846
587 4,292,847
602 4,292,848
643 4,292,849
702 4,292,850
762 4,292,851
827 4,292,852
861.79 4,292,853

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5.34 4,292,854
15.4 4,292,855
63 4,292,856
466 4,292,857
501 R 4,292,858
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665 GA 4,292,860
813 R 4,292,861

**CLASS 75**

99 4,293,332
101 BE 4,293,333
4,293,334
124 4,293,335
4,293,336
232 4,293,337
253 4,293,338

**CLASS 76**

4 4,292,862

**CLASS 81**

184 4,292,863

**CLASS 82**

2.7 4,292,864
36 R 4,292,865
4,292,866
47 4,292,867

**CLASS 83**

13 4,292,868
74 Re.30,757
137 4,292,869
471.2 4,292,870
661 4,292,871
866 4,292,872

**CLASS 84**

1.01 4,292,873
1.03 4,292,874
1.14 4,292,875

**CLASS 86**

31 4,292,877
48 4,292,878

**CLASS 87**

57 4,292,879

**CLASS 89**

1.815 4,292,880
33 CA 4,292,881
36 A 4,292,882

**CLASS 91**

29 4,292,883
445 4,292,884

**CLASS 92**

43 4,292,885
85 B 4,292,886
94 4,292,887

**CLASS 99**

312 4,292,888
533 4,292,889
603 4,292,890

**CLASS 100**

193 4,292,891
218 4,292,892

**CLASS 101**

111 4,292,893
291 4,292,894

**CLASS 102**

275.8 4,292,896
306 4,292,895

**CLASS 104**

172 S 4,292,897

**CLASS 105**

238 R 4,292,898

**CLASS 106**

18.29 4,293,339
74 4,293,340
88 4,293,341
90 4,293,342
99 4,293,343
111 4,293,344
270 4,293,345

**CLASS 108**

51.1 4,292,899
4,292,900
55.1 4,292,901
146 4,292,902
4,292,903

**CLASS 110**

198 4,292,904

**CLASS 112**

121.11 4,292,905
184 4,292,906
236 4,292,907
306 4,292,908

**CLASS 114**

74 R 4,292,909
102 4,292,910
218 4,292,911
219 4,292,912
4,292,913
222 4,292,914
260 4,292,915

**CLASS 116**

205 4,292,916

**CLASS 118**

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33 4,292,918
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425 4,292,920
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658 4,292,923
4,292,924
690 4,292,925

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17 4,292,928
27 4,292,929
51.11 4,292,930
103 4,292,931
109 4,292,932

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114 4,292,933

**CLASS 123**

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193 P 4,292,936
4,292,937
198 F 4,292,938
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335 4,292,939
387 4,292,940
416 4,292,941
418 4,292,942
427 4,292,943
432 4,292,944
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440 4,292,946
445 4,292,947
490 4,292,948
556 4,292,949

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121 4,292,952
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417 4,292,955
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448 4,292,958
451 4,292,957

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1.1 4,292,960
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87 R 4,292,963
92 EB 4,292,964
200.23 4,292,966
202.26 4,292,967
207.21 4,292,968
214 R 4,292,969
214.4 4,292,970
256 4,292,971
260 4,292,965
296 4,292,972
303.1 4,292,973
344 4,292,974
498 4,292,975
656 4,292,976
712 4,292,977
730 4,292,978
743 4,292,979
783 4,292,980

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27 F 4,292,981
30 R 4,292,982

**CLASS 131**

187 4,292,983
345 4,292,984

**CLASS 132**

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73 4,292,987

**CLASS 134**

11 4,293,347
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**CLASS 136**

245 4,293,731
257 4,293,732

**CLASS 137**

68 R 4,292,988
72 4,292,989
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340 4,292,992
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351 4,292,994
384.2 4,292,995
393 4,292,996
454.6 4,292,997
489.5 4,292,998
560 4,292,999
596.13 4,293,001
596.2 4,293,000
625.64 4,293,002
637.4 4,293,003
884 4,293,004

**CLASS 138**

149 4,293,005

**CLASS 139**

102 4,293,006
358 4,293,007

**CLASS 141**

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311 R 4,293,009
392 4,293,010

**CLASS 144**

3 R 4,293,011
193 A 4,293,012
4,293,013
208 B 4,293,014

**CLASS 148**

6.15 R 4,293,349
111 4,293,350

**CLASS 149**

19.2 4,293,351
19.4 4,293,352

**CLASS 150**

52 R 4,293,015

**CLASS 152**

158 4,293,016
339 4,293,017
347 4,293,018
361 R 4,293,019

**CLASS 156**

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73.2 4,293,355
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131 4,293,358
156 4,293,359
230 4,293,360

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264 4,293,362
272 4,293,363
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477 B 4,293,366
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506 4,293,368
521 4,293,369
612 4,293,370
624 4,293,371
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628 4,293,373
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644 4,293,376
656 4,293,377

**CLASS 157**

1.28 4,293,020

**CLASS 160**

178 R 4,293,021

**CLASS 162**

145 4,293,378

**CLASS 164**

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476 4,293,022
479 4,293,023

**CLASS 165**

1 4,293,025
11 4,293,026
12 4,293,027
4,293,028
29 4,293,029
40 4,293,030
95 4,293,031
101 4,293,032
166 4,293,033

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208 4,293,034
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302 4,293,036
312 4,293,037
331 4,293,038
341 4,293,039

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7 4,293,040
39 4,293,041
110 4,293,042
267 4,293,043

**CLASS 173**

93.5 4,293,044
121 4,293,045

**CLASS 174**

67 4,293,733

**CLASS 175**

45 4,293,046
195 4,293,047
340 4,293,048

**CLASS 177**

212 4,293,049

**CLASS 178**

18 4,293,734

**CLASS 179**

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18 GF 4,293,739
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**CLASS 180**

6.26 4,293,050
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219 4,293,052

**CLASS 181**

213 4,293,053

**CLASS 182**

63 4,293,054
106 4,293,055

**CLASS 184**

1 D 4,293,056

**CLASS 185**

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**CLASS 188**

65.1 4,293,058

**CLASS 192**

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67 R 4,293,061

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**CLASS 196**

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779 4,293,064
781 4,293,065
813 4,293,066
851 4,293,067

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19 R 4,293,744
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86.5 4,293,746
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145 4,293,747
148 A 4,293,750
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295 4,293,752
302 4,293,764
315 4,293,753
340 4,293,754

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100 4,293,390
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248 4,293,389

**CLASS 204**

30 R 4,293,391
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98 4,293,394
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**CLASS 206**

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328 4,293,070
503 4,293,071
512 4,293,072
519 4,293,073
572 4,293,074

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120 4,293,403
214 4,293,404

**CLASS 209**

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107 4,293,410
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179 4,293,412
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656 4,293,422
676 4,293,423
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754 4,293,425
759 4,293,426

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40 4,293,075
124 4,293,076

**CLASS 212**

219 4,293,077

**CLASS 215**

247 4,293,078

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10.41 4,293,755
125.12 4,293,758
133 4,293,756
147 4,293,757
202 4,293,759
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269 4,293,761
302 4,293,762
528 4,293,763

**CLASS 220**

306 4,293,079
4,293,080

**CLASS 222**

83 4,293,081
131 4,293,082
133 4,293,083
158 4,293,084
311 4,293,085

**CLASS 225**

1 4,293,086

**CLASS 226**

172 4,293,087

**CLASS 227**

131 4,293,088

**CLASS 228**

215 4,293,089

**CLASS 229**

5.6 4,293,090
27 4,293,091

**CLASS 235**

144 R 4,293,765
462 4,293,766

**CLASS 237**

12.1 4,293,092
19 4,293,093
55 4,293,094

**CLASS 239**

35 4,293,095
419.3 4,293,096

**CLASS 241**

16 4,293,097
19 4,293,098
24 4,293,099

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56.4 4,293,101
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199 4,293,110

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487 4,293,112
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465 4,293,449
503 4,293,450
512 4,293,451
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343.5 4,293,496
345.5 4,293,497
346.75 4,293,498
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439 R 4,293,502
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465 D 4,293,504
983 4,293,505

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**CLASS 264**

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26 4,293,509
40.7 4,293,510
55 4,293,511
58 4,293,512
60 4,293,513
61 4,293,514
118 Re.30,759
120 4,293,515
168 4,293,516
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210.2 4,293,518
272.13 4,293,519
513 4,293,520

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**CLASS 271**

233 4,293,124

**CLASS 272**

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119 4,293,126
133 4,293,127

**CLASS 273**

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73 R 4,293,130
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126 R 4,293,132
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428 4,293,134

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12 4,293,136
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610 4,293,142
615 4,293,143
644 4,293,144
704 4,293,145

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90 4,293,148
111 4,293,149
149 4,293,150
161 4,293,151
229 4,293,152

**CLASS 290**

52 4,293,777

**CLASS 292**

85 4,293,153
144 4,293,154

**CLASS 294**

75 4,293,155
82 R 4,293,156
86 CG 4,293,157

**CLASS 296**

24 C 4,293,158
91 4,293,159
188 4,293,160
213 4,293,161

**CLASS 297**

184 4,293,162

**CLASS 303**

13 4,293,164
93 4,293,165

**CLASS 307**

147 4,293,778
252 C 4,293,779
262 4,293,780
273 4,293,781
350 4,293,782
465 4,293,783

**CLASS 308**

6 C 4,293,166
8.2 4,293,167
72 4,293,168
121 4,293,169
161 4,293,170
188 4,293,171

**CLASS 310**

45 4,293,784
64 4,293,785
157 4,293,786
181 4,293,787
227 4,293,788
239 4,293,789

**CLASS 313**

101 4,293,790
403 4,293,791
4,293,792
497 4,293,793

**CLASS 315**

111.81 4,293,794
200 A 4,293,795
205 4,293,796
209 R 4,293,797
4,293,798
256 4,293,799
350 4,293,800
370 4,293,801
387 4,293,802
397 4,293,803
398 4,293,804

**CLASS 318**

39 4,293,805
439 Re.30,761
673 4,293,806
696 4,293,807

**CLASS 320**

2 4,293,808

**CLASS 322**

28 4,293,810
60 4,293,811

**CLASS 323**

272 4,293,812

**CLASS 324**

117 R 4,293,813
166 4,293,814
254 4,293,815
329 4,293,816

**CLASS 328**

169 4,293,817

**CLASS 329**

50 4,293,818

**CLASS 330**

9 4,293,819
85 4,293,820
126 4,293,821
254 4,293,822
260 4,293,823
301 4,293,824

**CLASS 331**

2 4,293,825
94.5 H 4,293,826
94.5 ML 4,293,827

**CLASS 333**

27 4,293,828
125 4,293,829
161 4,293,830
165 4,293,831
4,293,832
239 4,293,833

**CLASS 335**

76 4,293,834
131 4,293,835

**CLASS 336**

94 4,293,433

**CLASS 337**

290 4,293,836

**CLASS 338**

32 H 4,293,837
308 4,293,838
309 4,293,839

**CLASS 339**

14 P 4,293,172
38 4,293,173
64 M 4,293,174
75 MP 4,293,175
98 4,293,176
99 R 4,293,177
103 R 4,293,178
176 MP 4,293,179
217 R 4,293,180
258 R 4,293,181
275 R 4,293,182

**CLASS 340**

27 AT 4,293,840
44 4,293,841
52 F 4,293,842
4,293,843
52 R 4,293,844
309.3 4,293,845
310 A 4,293,846
332 4,293,847
347 AD 4,293,848
365 S 4,293,849
378.5 4,293,850
384 E 4,293,851
568 4,293,852
611 4,293,853
615 4,293,854
712 4,293,855

**CLASS 343**

5 CF 4,293,856
6.5 R 4,293,857
702 4,293,859
715 4,293,860
731 4,293,858
766 4,293,861
872 4,293,862

**CLASS 346**

75 4,293,863
76 L 4,293,864
140 R 4,293,865
4,293,866
4,293,867

**CLASS 350**

3.77 4,293,183
6.3 4,293,184
18 4,293,185
27 4,293,186
36 4,293,187
96.29 4,293,188
105 4,293,189
241 4,293,190
293 4,293,191
296 4,293,192
350 R 4,293,193



357 4,293,194
358 4,293,195
452 4,293,196
454 4,293,197

**CLASS 351**

13 4,293,198
4,293,199
36 4,293,200
178 4,293,201

**CLASS 354**

5 4,293,202
17 4,293,203
21 4,293,204
23 D 4,293,205
25 4,293,206
4,293,207
29 4,293,208
153 4,293,209
269 4,293,210
298 4,293,211
299 4,293,212

**CLASS 355**

14 R 4,293,213
4,293,214
40 4,293,215
77 4,293,216

**CLASS 356**

37 4,293,217
138 4,293,218
240 4,293,219
316 4,293,220
318 4,293,221
319 4,293,222
352 4,293,223
357 4,293,224
417 4,293,225
443 4,293,226

**CLASS 357**

46 4,293,868

**CLASS 358**

8 4,293,869
10 4,293,870
44 4,293,871
75 4,293,872
4,293,873
172 4,293,874
184 4,293,875
211 4,293,876
213 4,293,877
231 4,293,878

**CLASS 360**

10 4,293,879
4,293,880
60 4,293,881
85 Re.30,762
93 4,293,882
104 4,293,883
121 4,293,884
130.33 4,293,885

**CLASS 361**

71 4,293,886
120 4,293,887
152 4,293,888
212 4,293,889
310 4,293,890
383 4,293,891

**CLASS 362**

17 4,293,892
38 4,293,893
100 4,293,894
147 4,293,895
200 4,293,896
284 4,293,897
291 4,293,898
294 4,293,899
342 4,293,900
346 4,293,901

**CLASS 363**

26 4,293,902
68 4,293,903
86 4,293,904
124 4,293,905
135 4,293,906

**CLASS 364**

200 4,293,907
4,293,908
4,293,909
4,293,910
4,293,941
405 4,293,911
414 4,293,912
426 Re.30,763
474 4,293,913
478 4,293,914
487 Re.30,764
493 4,293,915
571 4,293,916
701 4,293,917
702 4,293,918
716 4,293,919
725 4,293,920
726 4,293,921
757 4,293,922
802 4,293,923
900 4,293,924
4,293,925
4,293,926
4,293,927
4,293,928

**CLASS 365**

2 4,293,929
8 4,293,930
222 4,293,931
4,293,932

**CLASS 366**

11 4,293,227
25 4,293,228
78 4,293,229
101 4,293,230
120 4,293,231

**CLASS 367**

25 4,293,933
27 4,293,934
43 4,293,935
82 4,293,936
4,293,937

**CLASS 368**

72 4,293,938
74 4,293,939
75 4,293,940
280 4,293,942
316 4,293,943

**CLASS 369**

45 4,293,944

**CLASS 370**

17 4,293,945
62 4,293,946
89 4,293,947
90 4,293,948

**CLASS 371**

6 4,293,949
21 4,293,950
43 4,293,951

**CLASS 375**

14 4,293,952
25 4,293,953

**CLASS 376**

159 4,293,379
209 4,293,380
230 4,293,381
283 4,293,385
290 4,293,383
308 4,293,382
391 4,293,384
461 4,293,386

**CLASS 400**

124 4,293,232
144.2 4,293,233
196.1 4,293,234
322 4,293,235
593 4,293,236

**CLASS 405**

39 4,293,237
175 4,293,238
195 4,293,239
4,293,240
213 4,293,241
239 4,293,242
259 4,293,243
4,293,244
272 4,293,245
291 4,293,246
296 4,293,247
300 4,293,248

**CLASS 406**

72 4,293,249
109 4,293,250

**CLASS 408**

59 4,293,251
224 4,293,252
226 4,293,253
229 4,293,254

**CLASS 410**

104 4,293,255

**CLASS 411**

11 4,293,256
4,293,257
30 4,293,258
32 4,293,259
44 4,293,260
85 4,293,261
311 4,293,262
500 4,293,263
542 4,292,876

**CLASS 414**

38 4,293,264
140 4,293,265
411 4,293,266
462 4,293,267
591 4,293,268
686 4,293,269
690 4,293,270
737 4,293,271
744 B 4,293,272

**CLASS 415**

78 4,293,273

**CLASS 416**

51 4,293,274
97 R 4,293,275
134 A 4,293,276
4,293,277
186 R 4,293,278
227 A 4,293,279
237 4,293,280

**CLASS 417**

9 4,293,281
53 4,293,282
172 4,293,283
218 4,293,284
240 4,293,285
253 4,293,286
393 4,293,287
434 4,293,288

**CLASS 418**

84 4,293,289
94 4,293,290
104 4,293,291

**CLASS 422**

62 4,293,521
80 4,293,522
139 4,293,523
169 4,293,524
176 4,293,525
205 4,293,526

**CLASS 423**

6 4,293,527
7 4,293,528
10 4,293,529
18 4,293,530
232 4,293,531
356 4,293,532
449 4,293,533
593 4,293,534
4,293,535

**CLASS 424**

1 4,293,536
4,293,537
4,293,538
19 4,293,539
26 4,293,540
45 4,293,541
47 4,293,542
59 4,293,543
60 4,293,544
92 4,293,545
119 4,293,546
180 4,293,547
242 4,293,548
245 4,293,549
246 4,293,550
249 4,293,551
250 4,293,552
4,293,553
4,293,554
263 4,293,555
267 4,293,556
4,293,557
270 4,293,558
4,293,559
271 4,293,560
273 R 4,293,561
4,293,562
4,293,563
4,293,564
285 4,293,565
300 4,293,569
304 4,293,566
312 4,293,567
330 4,293,568

**CLASS 425**

9 4,293,292
23 4,293,293
112 4,293,294
331 4,293,295
547 4,293,296

**CLASS 426**

3 4,293,570
7 4,293,571
19 4,293,572
43 4,293,573
46 4,293,574
104 4,293,575
4,293,576
244 4,293,577
332 4,293,578
535 4,293,579
565 4,293,580
630 4,293,581
637 4,293,582
657 4,293,583

**CLASS 427**

11 4,293,584
40 4,293,585
68 4,293,586
90 4,293,587
93 4,293,588
4,293,589
4,293,590
97 4,293,591
98 4,293,592
106 4,293,593
107 4,293,594
121 4,293,595
160 4,293,596
186 4,293,597
203 4,293,598
274 4,293,599
385.5 4,293,600

**CLASS 428**

24 4,293,601
28 4,293,602
86 4,293,603
90 4,293,604
126 4,293,605
203 4,293,606
212 4,293,607
220 4,293,608
246 4,293,609
4,293,610
266 4,293,611
281 4,293,612
364 4,293,613
370 4,293,614
412 4,293,615
447 4,293,616
469 4,293,617
551 4,293,618
623 4,293,619
667 4,293,620
678 4,293,621

**CLASS 429**

50 4,293,622
194 4,293,623

**CLASS 430**

5 4,293,624
9 4,293,625
17 4,293,626
39 4,293,627
58 4,293,628
59 4,293,630
64 4,293,629
106 4,293,631
137 4,293,632
152 4,293,633
269 4,293,634
271 4,293,635
281 4,293,636
314 4,293,637
373 4,293,638
393 4,293,639
421 4,293,640
502 4,293,641
534 4,293,642

**CLASS 431**

286 4,293,297

**CLASS 432**

58 4,293,298
234 4,293,299

**CLASS 433**

92 4,293,300
136 4,293,301
173 4,293,302
177 4,293,303

**CLASS 435**

39 4,293,643
55 4,293,644
4,293,645
4,293,646
69 4,293,647
70 4,293,648
118 4,293,649
119 4,293,650
169 4,293,651
172 4,293,652
237 4,293,653
241 4,293,654
316 4,293,655

**CLASS 440**

83 4,293,304

**CLASS 455**

54 4,293,954
276 4,293,955
327 4,293,956

**CLASS 474**

80 Re.30,758

**CLASS 521**

88 4,293,656
121 4,293,657
129 4,293,658

**CLASS 525**

28 4,293,659
68 4,293,660
127 4,293,661
184 4,293,662
187 4,293,663
196 4,293,664
255 4,293,665
284 4,293,666
4,293,667
369 4,293,668
436 4,293,670
452 4,293,669
478 4,293,671
507 4,293,672

**CLASS 526**

88 4,293,673
327 4,293,674

**CLASS 528**

14 4,293,675
15 4,293,676
4,293,677
32 4,293,678
48 4,293,679
67 Re.30,760
4,293,680
115 4,293,681
123 4,293,682
180 4,293,683
185 4,293,684
190 4,293,685
192 4,293,686
346 4,293,687
4,293,688

**CLASS 536**

17 R 4,293,689
24 4,293,690

**CLASS 544**

140 4,293,691
196 4,293,692
221 4,293,693

**CLASS 546**

72 4,293,694
83 4,293,695
4,293,696
121 4,293,697
4,293,699
301 4,293,698
321 4,293,700
335 4,293,701

**CLASS 548**

165 4,293,702
337 4,293,703

**CLASS 556**

442 4,293,704

**CLASS 560**

53 4,293,705
163 4,293,706

**CLASS 562**

472 4,293,707
503 4,293,708
4,293,709
4,293,710
4,293,711
4,293,712

**CLASS 564**

38 4,293,713
249 4,293,714
256 4,293,715
480 4,293,716

**CLASS 568**

485 4,293,717
487 4,293,718
573 4,293,719
575 4,293,720
916 4,293,721

**CLASS 585**

330 4,293,722
407 4,293,723
457 4,293,724
523 4,293,725
4,293,726
526 4,293,727
670 4,293,728
715 4,293,729

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 185 | 261,070 | | 106 | 261,091 | | | 261,112 | D14— | 5 | 261,136 | D21— | 60 | 261,157 | | 62 | 261,178 |
| | 187 | 261,071 | | 129 | 261,092 | | 39 | 261,113 | | 33 | 261,137 | | 102 | 261,158 | D26— | 9 | 261,179 |
| | 230 | 261,072 | | 151 | 261,093 | | 103 | 261,114 | | 53 | 261,139 | | 122 | 261,159 | | 66 | 261,180 |
| | 232 | 261,073 | | 155 | 261,094 | | 112 | 261,115 | | 78 | 261,140 | | | 261,160 | D28— | 32 | 261,181 |
| | 233 | 261,074 | | 157 | 261,095 | | 114 | 261,116 | | 108 | 261,138 | | 150 | 261,161 | D30— | 2 | 261,182 |
| D3— | 41 | 261,075 | D8— | 22 | 261,096 | | 118 | 261,117 | D15— | 23 | 261,141 | | | 261,162 | | | 261,183 |
| | 42 | 261,076 | | 61 | 261,097 | | 121 | 261,118 | | 110 | 261,142 | | | 261,163 | | | 261,184 |
| | 52 | 261,077 | | 70 | 261,098 | D11— | 7 | 261,119 | | 127 | 261,143 | | 158 | 261,164 | | | 261,185 |
| D6— | 35 | 261,078 | | 330 | 261,099 | | 15 | 261,120 | D16— | 11 | 261,144 | | 160 | 261,165 | | 42 | 261,186 |
| | 63 | 261,079 | | 336 | 261,100 | | | 261,121 | | 30 | 261,145 | | | 261,166 | D34— | 24 | 261,125 |
| | 70 | 261,080 | | 353 | 261,101 | | 34 | 261,122 | | 31 | 261,146 | | 220 | 261,167 | | 34 | 261,126 |
| | 89 | 261,081 | | 383 | 261,102 | | 86 | 261,123 | | 32 | 261,147 | | 225 | 261,168 | | | 261,127 |
| | 114 | 261,082 | D9— | 300 | 261,103 | | 160 | 261,124 | | | 261,148 | D22— | 27 | 261,169 | | 45 | 261,193 |
| | 161 | 261,083 | | 329 | 261,104 | D12— | 129 | 261,129 | | 43 | 261,149 | D23— | 64 | 261,170 | | 46 | 261,194 |
| | 200 | 261,084 | | 353 | 261,105 | | 147 | 261,130 | D17— | 2 | 261,150 | | 65 | 261,171 | D47— | 6 E | 261,187 |
| D7— | 6 | 261,085 | | 369 | 261,106 | | 157 | 261,131 | D18— | 14 | 261,151 | D24— | 17 | 261,172 | | | 261,188 |
| | 15 | 261,086 | | 370 | 261,107 | | 182 | 261,132 | | | 261,152 | | 21 | 261,173 | D92— | 1 A | 261,192 |
| | 66 | 261,087 | | | 261,108 | | 203 | 261,133 | | 22 | 261,153 | | 29 | 261,174 | | 1 R | 261,189 |
| | 77 | 261,088 | | 384 | 261,109 | | 300 | 261,128 | D19— | 4 | 261,154 | | 99 | 261,175 | | | 261,190 |
| | 101 | 261,089 | | 432 | 261,110 | D13— | 13 | 261,134 | | 33 | 261,155 | D25— | 11 | 261,176 | | 1 Y | 261,191 |
| | 102 | 261,090 | D10— | 38 | 261,111 | | 30 | 261,135 | | 59 | 261,156 | | 17 | 261,177 | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 47 | 4,772 | | 69 | 4,773 | | | 4,774 | | | | | | | | | |

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8— | 495 | T101,102 | 430— | 598 | T101,103 | 564— | 334 | T101,101 | | | | | | | | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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## PATENTS

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| 2 : | 4,293,578 | | 4,293,107 | | 4,293,917 | | 4,293,323 | | 4,293,403 | | 4,292,994 |
| 6 : | 4,292,840 | | 4,293,113 | | 4,293,928 | | 4,293,405 | | 4,293,413 | | 4,293,158 |
| | 4,293,089 | | 4,293,127 | | 4,293,956 | | 4,293,497 | | 4,293,442 | | 4,293,850 |
| | 4,293,894 | | 4,293,130 | 08 : | 4,293,126 | | 4,293,529 | | 4,293,510 | 20 : | 4,292,783 |
| 9 : | 4,293,109 | | 4,293,132 | | 4,293,231 | | 4,293,613 | | 4,293,536 | | 4,292,913 |
| | 4,293,572 | | 4,293,133 | | 4,293,861 | | 4,293,614 | | 4,293,648 | | 4,293,120 |
| 01 : | 4,292,748 | | 4,293,135 | | 4,293,862 | | 4,293,817 | | 4,293,658 | | 4,293,729 |
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| | 4,292,918 | | 4,293,165 | 09 : | Re.30,757 | | 4,293,921 | | 4,293,689 | 21 : | 4,293,118 |
| | 4,292,954 | | 4,293,178 | | Re.30,764 | 13 : | 4,292,739 | | 4,293,706 | | 4,293,153 |
| | 4,293,216 | | 4,293,181 | | 4,292,717 | | 4,292,822 | | 4,293,722 | | 4,293,170 |
| | 4,293,217 | | 4,293,182 | | 4,292,765 | | 4,292,902 | | 4,293,738 | | 4,293,244 |
| | 4,293,233 | | 4,293,192 | | 4,292,807 | | 4,293,008 | | 4,293,757 | | 4,293,851 |
| 04 : | 4,292,729 | | 4,293,196 | | 4,292,834 | | 4,293,062 | | 4,293,804 | 22 : | 4,292,915 |
| | 4,292,870 | | 4,293,223 | | 4,292,835 | | 4,293,066 | | 4,293,835 | | 4,292,970 |
| | 4,293,175 | | 4,293,267 | | 4,292,905 | | 4,293,069 | | 4,293,874 | | 4,293,239 |
| | 4,293,220 | | 4,293,281 | | 4,293,053 | | 4,293,097 | | 4,293,887 | | 4,293,241 |
| | 4,293,519 | | 4,293,296 | | 4,293,079 | | 4,293,145 | | 4,293,895 | | 4,293,319 |
| | 4,293,562 | | 4,293,314 | | 4,293,154 | | 4,293,293 | 18 : | 4,292,698 | 23 : | 4,293,360 |
| 05 : | 4,292,952 | | 4,293,316 | | 4,293,157 | | 4,293,881 | | 4,292,707 | 24 : | 4,292,753 |
| 06 : | Re.30,762 | | 4,293,352 | | 4,293,174 | 15 : | 4,293,119 | | 4,292,813 | | 4,292,951 |
| | Re.30,763 | | 4,293,365 | | 4,293,186 | 16 : | 4,292,797 | | 4,292,903 | | 4,293,128 |
| | 4,292,689 | | 4,293,366 | | 4,293,315 | | 4,293,015 | | 4,293,004 | | 4,293,222 |
| | 4,292,692 | | 4,293,371 | | 4,293,406 | | 4,293,400 | | 4,293,055 | | 4,293,280 |
| | 4,292,699 | | 4,293,372 | | 4,293,624 | | 4,293,582 | | 4,293,056 | | 4,293,339 |
| | 4,292,702 | | 4,293,401 | | 4,293,692 | 17 : | 4,292,708 | | 4,293,061 | | 4,293,380 |
| | 4,292,704 | | 4,293,425 | | 4,293,746 | | 4,292,719 | | 4,293,065 | | 4,293,390 |
| | 4,292,706 | | 4,293,451 | | 4,293,890 | | 4,292,721 | | 4,293,136 | | 4,293,567 |
| | 4,292,714 | | 4,293,537 | | 4,293,933 | | 4,292,751 | | 4,293,139 | | 4,293,580 |
| | 4,292,722 | | 4,293,561 | | 4,293,946 | | 4,292,756 | | 4,293,355 | | 4,293,584 |
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| | 4,292,784 | | 4,293,619 | | 4,292,761 | | 4,292,789 | | 4,293,483 | | 4,293,734 |
| | 4,292,787 | | 4,293,652 | | 4,293,330 | | 4,292,790 | | 4,293,484 | | 4,293,794 |
| | 4,292,803 | | 4,293,701 | | 4,293,420 | | 4,292,808 | | 4,293,485 | | 4,293,808 |
| | 4,292,806 | | 4,293,732 | | 4,293,473 | | 4,292,833 | | 4,293,486 | | 4,293,899 |
| | 4,292,838 | | 4,293,763 | | 4,293,615 | | 4,292,841 | | 4,293,487 | | 4,293,945 |
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## PLANT PATENTS

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| 13 : | 4,772 | | | | | |

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

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| 10 : | T101,101 | T101,102 | | | | |

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# OFFICIAL GAZETTE

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## UNITED STATES PATENT AND TRADEMARK OFFICE

October 13, 1981

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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,693,629,** Re. S.N. 272,615, Filed June 11, 1981, Cl. 131/5, LIGHTLY PRIZED TOBACCO, James A. Broughton, Owner of Record: *Brown & Williamson Tobacco Corp., Louisville, Ky.,* Attorney or Agent: Charles G. Lamb, Ex. Gp.: 335

**4,109,750,** Re. S.N. 266,715, Filed May 26, 1981, Cl. 181/224, ZENO DUCT SOUND ATTENUATING MEANS, Leslie S. Wirt, Owner of Record: *Lockhead Aircraft Corp., Burbank, Calif.,* Attorney or Agent: Frederic P. Smith, Ex. Gp.: 211

**4,155,878,** Re. S.N. 270,371, Filed June 4, 1981, Cl. 252/423, PROCESS FOR MAKING ACTIVATED CARBON WITH CONTROL OF METAL ION CONCENTRATION IN PHOSPHORIC ACID, Edward D. Tolles, et al., Owner of Record: *Westvaco Corp., New York, N.Y.,* Attorney or Agent: Richard L. Schmalz, et al., Ex. Gp.: 117

**4,181,457,** Re. S.N. 271,322, Filed June 8, 1981, Cl. 408/217, TAPPING TOOL FOR MAKING VIBRATION RESISTANT PREVAILING TORQUE FASTENER, Horace D. Holmes, Owner of Record: *Inventar,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 324

**4,237,165,** Re. S.N. 272,513, Filed June 11, 1981, Cl. 424/308, TREATMENT OF CARBOHYDRATE METABOLISH DISORDERS, Jacques Duhault, Owner of Record: *Science Union et cie Societe Francaise de Recherche Medicale, Suresnes, France,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 125

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**3,091,912,** Reexam. No. 90/000,068, Requested: Sept. 9, 1981, Cl. 57/247, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, Nicholas J. Stoddard, et al., Owner of Record: *Lex Tex Ltd., Inc.,* Attorney or Agent: Howson & Howson, Ex. Gp.: 244, Requester: Glen Raven Mills, Inc., et al., c/o Cushman, Darby & Cushman, Washington, D.C.

**3,449,567,** Reexam. No. 90/000,065, Requested: Sept. 8, 1981, Cl. 250/362, APPARATUS AND PROCESS FOR DETERMINING PARTICLE SIZE BY X-RAY ABSORPTION ANALYSIS, James Peter Olivier, et al., Owner of Record: *Freeport Minerals Co.,* Attorney or Agent: Paul J. Luckern, Ex. Gp.: 252, Requester: Micromeritics Instrument Corp., Norcross, Ga.

### Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Official Gazettes of Feb. 24, 1981, May 26, 1981, Aug. 18, 1981, and Aug. 25, 1981, were assigned, prematurely, to published marks for which the opposition period had not yet run:

| TMOG Feb. 24, 1981 | TMOG May 26, 1981 | TMOG Aug. 18, 1981 | TMOG Aug. 25, 1981 |
|---|---|---|---|
| 1,147,842 | 1,155,713 | 1,165,412 | 1,166,062 |
| | | 1,165,465 | 1,166,299 |
| | | 1,165,588 | 1,166,392 |
| | | 1,165,620 | 1,166,414 |
| | | 1,165,738 | 1,166,454 |
| | | | 1,166,541 |
| | | | 1,166,687 |

Consequently, certificates of registration bearing the above-identified numbers were not issued on the dates indicated, and these registration numbers have been vacated.

Margaret Lawrence,
Sept. 15, 1981. *Assistant Commissioner for Trademarks.*



# PATENT NOTICES

### Certificates of Correction for the Week of Oct. 13, 1981

| | | | |
|---|---|---|---|
| Re. 30,476 | 4,243,091 | 4,265,658 | 4,275,458 |
| D. 259,815 | 4,243,584 | 4,265,817 | 4,275,688 |
| D. 260,031 | 4,243,673 | 4,266,481 | 4,275,953 |
| 3,605,892 | 4,244,033 | 4,266,608 | 4,276,002 |
| 4,011,191 | 4,244,990 | 4,266,642 | 4,276,278 |
| 4,019,015 | 4,245,405 | 4,266,765 | 4,276,325 |
| 4,026,835 | 4,248,039 | 4,266,865 | 4,276,756 |
| 4,043,391 | 4,248,529 | 4,266,878 | 4,276,996 |
| 4,071,959 | 4,248,750 | 4,267,082 | 4,277,216 |
| 4,075,709 | 4,248,980 | 4,267,258 | 4,277,258 |
| 4,100,136 | 4,250,408 | 4,267,334 | 4,277,611 |
| 4,104,732 | 4,251,448 | 4,267,340 | 4,277,826 |
| 4,123,604 | 4,252,786 | 4,267,354 | 4,278,032 |
| 4,124,056 | 4,252,909 | 4,267,385 | 4,278,171 |
| 4,124,679 | 4,253,794 | 4,267,835 | 4,278,176 |
| 4,156,964 | 4,254,037 | 4,267,875 | 4,278,465 |
| 4,164,617 | 4,254,401 | 4,268,451 | 4,278,805 |
| 4,181,168 | 4,254,443 | 4,268,539 | 4,279,902 |
| 4,182,751 | 4,254,612 | 4,268,598 | 4,279,941 |
| 4,196,282 | 4,255,671 | 4,268,686 | 4,280,038 |
| 4,200,849 | 4,255,864 | 4,268,756 | 4,280,990 |
| 4,203,893 | 4,255,876 | 4,269,440 | 4,281,150 |
| 4,210,614 | 4,256,615 | 4,269,707 | 4,281,159 |
| 4,212,118 | 4,257,111 | 4,269,713 | 4,281,164 |
| 4,212,205 | 4,260,062 | 4,269,733 | 4,281,196 |
| 4,218,344 | 4,260,766 | 4,269,917 | 4,281,302 |
| 4,218,609 | 4,261,002 | 4,270,190 | 4,281,429 |
| 4,219,192 | 4,261,185 | 4,270,277 | 4,281,554 |
| 4,226,547 | 4,261,848 | 4,271,426 | 4,281,760 |
| 4,230,430 | 4,261,866 | 4,271,466 | 4,281,971 |
| 4,230,611 | 4,262,232 | 4,272,209 | 4,282,393 |
| 4,230,696 | 4,262,282 | 4,272,698 | 4,282,566 |
| 4,231,676 | 4,262,341 | 4,273,435 | 4,282,601 |
| 4,232,034 | 4,264,344 | 4,273,586 | 4,282,618 |
| 4,235,709 | 4,264,439 | 4,274,071 | 4,282,658 |
| 4,237,068 | 4,264,610 | 4,274,297 | 4,283,146 |
| 4,237,443 | 4,264,921 | 4,274,852 | 4,283,311 |
| 4,239,298 | 4,264,933 | 4,275,376 | 4,283,453 |
| 4,242,150 | 4,265,633 | 4,275,438 | 4,284,942 |

### Disclaimers

Re. 28,682.—*Charles E. Hoey,* Marlton, N.J. DECORATIVE LAMINATE. Patent dated Jan. 13, 1976. Disclaimer filed May 29, 1981, by the assignee, *Rohm & Haas Co.*

Hereby enters this disclaimer to all claims of said patent.

3,163,645.—*George de Stevens* and *Lincoln Harvey Werner,* Summit, N. J. DERIVATIVES OF 3,4-DIHYDRO-2-H-[1,2,4]-BENZOTHIADIAZINE-1, 1-DIOXIDES. Patent dated Dec. 29, 1964. Disclaimer filed June 29, 1981, by the the assignee, *Ciba-Geigy Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,068,488.—*D. Graham Ball,* North Vancouver, Canada. METHOD OF BACKFILLING PIPELINE TRENCHES. Patent dated Jan. 17, 1978. Disclaimer filed July 31, 1981, by the assignee, *Rader Companies, Inc.*

Hereby enters this disclaimer to claims 3 and 6 of said patent.

4,166,415.—*Edwin A. Spanke,* Oak Forest and *Louis F. Carrieri,* La Grange Park, Ill. PRESS HAVING OVERLOAD RESPONSIVE SLIDE SHUT HEIGHT ADJUSTING MECHANISM. Patent dated Sept. 4, 1979. Disclaimer filed July 6, 1981, by the assignee, *Gulf & Western Manufacturing Co.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

4,204,212.—*Arthur R. Sindoris,* Cary, N.C., *Frederick G. Farrar,* Kensington, and *Daniel H. Schaubert,* Silver Spring, Md. CONFORMAL SPIRAL ANTENNA. Patent dated May 20, 1980. Disclaimer filed Aug. 11, 1981, by the assignee, *The United States of America as represented by the Secretary of the Army.*

Hereby enters this disclaimer to claims 1–2 and 4–5 of said patent.

4,272,980.—*Louis F. Carrieri,* La Grange Park, IL. LOAD EQUALIZER FOR PRESS TOOLING. Patent dated June 16, 1981. Disclaimer filed July 6, 1981, by the assignee, *Gulf & Western Manufacturing Co.*

Hereby enters this disclaimer to claims 1, 3, 8 and 17 of said patent.

### Dedications

3,291,947.—*Roswell C. Van Sickle,* Wilkinsburg, Pa. INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY. Patent dated Dec. 13, 1966. Dedication filed July 20, 1981, by the assignee, *Westinghouse Electric Corp.*

Hereby didicates to the Public the remaining term of said patent.

4,270,640.—*David A. Davies,* Leamington SPA, United Kingdom. FRICTION CLUTCH DRIVEN PLATES. Patent dated June 2, 1981. Dedication filed Aug. 31, 1981, by the assignee, *Automative Products Ltd.*

Hereby dedicates to the public the remaining portion of the term of said patent.

### Patents Available for License or Sale

3,748,898. METHOD AND APPARATUS RELATED TO THE TESTING OF HYDRAULIC CIRCUITS. *Neil F. Greenblum, Esq. Sandler & Greenblum,* 1717 K St., N. W., Suite 1101, Washington, D.C. 20006 202-659-0035.

3,961,865. CONVERSION BRACKET FOR WELL PUMP. *Vernon E. Spaulding,* 7021 Grade La., Louisville, Ky. 40213.

4,031,862. ECONOMIZER. *Richard D. Weber, Synnestvedt & Lechner,* 3131 PSFS Bldg. 12, South 12th St., Philadelphia, Pa. 19107.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #11, Los Angeles, Calif. 90045 or Attorney Bernard Kleinke, (312) 332-6930.

4,209,539. DETOXIFICATION OF BOTANICAL FOODSTUFFS. *Thomas F. Banigan and Anthony J. Verbiscar,* Anver Bioscience Design, Inc., 160 E. Montecito Ave., Sierra Madre, Calif. 91024.

4,222,371. SOLAR ENERGY COLLECTOR. *George F. Heath,* 1655 Richard Ave. Sanger, Calif. 92657.

4,225,052. INSULATED FOOD CONTAINER. *Nancie Tector.* Correspondence to: Wagner & Aubel, 135 S. La Salle St., Chicago, Ill., 60603.

4,275,536. WALL ELEMENT FOR A CONSTRUCTION WALL. *Karl H. Vahlbrauk,* Kriegerweg 1, D-3353 Bad Gandersheim, Federal Republic of Germany, Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,275,975. MINE ROOF ANCHOR SYSTEM. *Bennie E. Morgan,* Roof Control, Inc., 411 E. Main St., Morganfield, Ky. 42437

4,270,123. DETECTOR FOR INDICATING A FIRE OR DETECTOR MALFUNCTION. *Neil F. Greenblum, Esq. Sandler & Greenblum,* 1717 K St., N. W. Suite 1101, Washington, D.C. 20006 202-659-0035.

4,231,061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Samuel Freeman,* 13 Birchwood Ct. East, Syosset, N.Y. 11791.

Otis Engineering Corp. is prepared to grant licenses under the following patents upon reasonable terms. Address inquires to: Patent Attorney, Otis Engineering Corp., P.O. Box 34380, Dallas, Tex. 75234, Telephone (214) 323-3882.

4,117,563. THREAD CHASER TOOL FOR CONTIGUOUS STRAIGHT AND TAPERED THREAD RUNS.

4,234,167. AUTOMATIC INHAUL WINCH SYSTEM.

General Electric Co. is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Industrial and Marine Steam Turbine Division, General Electric Co., 1100 Western Ave., Lynn, Ma. 01910.

3,651,662. GEAR TYPE FLEXIBLE COUPLING.

Application for license may be addressed to: Patent Counsel, Mobile Radio Products Department, Mobile Communications Business Division, General Electric Co., Mountain View, Lunchburh, Va. 24502.

4,259,596. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS FILTER.

4,259,597. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS FILTER.

4,259,598. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS TRANSVERSAL FILTER.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,229,811. INTRUSION DETECTION METHOD AND APPARATUS.

Applications for license may be addressed to: Patent Counsel, Mobile Radio Products Department, Mobile Communications Business Division, General Electric Co., Mountain View Rd., Lynchburg, Va. 24502.

4,281,413. MULTICHANNEL RADIO TELEPHONE SYSTEM.

Applications for license under the following patent should be addressed to: Mr. Arnold E. Renner, Division Patent Counsel, Industrial Electronics Systems Division General Electric Co., 1501 Roanoke Blvd., Salem, Va. 24153

4,257,000. APPARATUS FOR CONTROLLING THE LENGTH OF MOVEMENT OF A CONTROLLED MEMBER ALONG A PATH OF REPEATED OPERATING POSITIONS.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,275,559. RETRACTABLE IGNITIER DEVICE FOR GAS TURBINES.

4,277,832. FLUID FLOW CONTROL SYSTEM.

Applicants for license may be addressed to: Patent Counsel, Transportation Systems., Business Division, General Electric Co., 2901 E. Lake Rd., Erie, Pa. 16531.

4,207,778. REINFORCED CROSS PLY COMPOSITE FLYWHEEL AND METHOD FOR MAKING SAME.

4,244,017. THIRD HARMONIC AUXILIARY COMMUTATED INVERTER HAVING SELECTABLE COMMUTATION CAPACITANCE AS A FUNCTION OF LOAD CURRENT.

4,258,302. APPARATUS FOR MAINTAINING SYNCHRONOUS MACHINE DRIVE SYSTEM AT LIGHT OF ZERO MACHINE LOADS.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D-210,895. DESIGN FOR CLOCK OR SIMILAR ARTICLE.

D-217,928. DESIGN FOR FLOOR POLISHER DISPENSER.

D-255,571. DESIGN FOR CITIZEN'S BAND RADIO OR SIMILAR ARTICLE.

D-255,572. DESIGN FOR A CLOCK RADIO OR SIMILAR ARTICLE.

D-248,468. DESIGN FOR CASSETTE TAPE RECORDER.

D-248,754. DESIGN FOR COMBINED CASSETTE TAPE RECORDER AND RADIO.

D-249,865. DESIGN FOR PORTABLE RADIO.

D-250,191. DESIGN FOR PORTABLE RADIO.

D-251,555. DESIGN FOR RADIO AND TAPE PLAYER OR SIMILAR ARTICLE.

D-251,782. DESIGN FOR TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE.

D-251,841. DESIGN FOR CARTRIDGE TAPE PLAYER OR SIMILAR ARTICLE.

D-253,107. DESIGN FOR TAPE PLAYER OR SIMILAR ARTICLE.

D-255,444. DESIGN FOR COMBINED TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE.

4,065,658. ELECTRIC TOASTER CONTROL.

4,166,994. THEROMSTAT WITH POSITIVE OFF POSITION.

4,220,134. TOASTER/OVEN ACCESSORY CONTAINER.

4,278,873. TEMPERATURE-RESPONSIVE CONTROL MEANS.

D-256,013. DESIGN FOR COMBINED CASSETTE TAPE PLAYER AND RADIO.

D-256,122. DESIGN FOR COMBINED RADIO AND WALKIE TALKIE OR SIMILAR ARTICLE.

D-256,123. DESIGN FOR CLOCK RADIO OR SIMILAR ARTICLE.

3,805,375. COMPOSITE INTEGRATED CIRCUITS INCLUDING SEMICONDUCTOR CHIPS MOUNTED ON A COMMON SUBSTRATE WITH CONNECTIONS MADE THROUGH A DIELECTRIC ENCAPSULATOR.



3,816,196. PASSIVATION OF PHOTORESIST MATERIALS USED IN SELECTIVE PLASMA ETCHING.

3,816,198. SELECTIVE PLASMA ETCHING OF ORGANIC MATERIALS EMPLOYING PHOTOLITHOGRAPHIC TECHNIQUES.

3,835,397. DIGITALLY CONTROLLED PHASE SHIFT NETWORK.

3,840,293. ELECTRONICALLY DRIVEN SPIRAL SCAN SYNCHRONOUS TRANSMIT-RECEIVER LASER SYSTEM.

3,840,827. DIODE PHASE SHIFTING NETWORK.

3,853,496. METHOD OF MAKING A METAL INSULATOR SILICON FIELD EFFECT TRANSISTOR (MIS-FET) MEMORY DEVICE AND THE PRODUCT.

3,856,406. HETERODYNE LASER ABSORPTION SPECTROMETER.

3,860,399. LIQUID BLOCKING TECHNIQUE FOR WORKING A MEMBER TO PRECISE OPTICAL TOLERANCES.

3,870,414. METHOD OF SENSING SURFACE DISPLACEMENT ORTHOGONAL TO THE DIRECTION OF OBSERVATION.

3,874,796. METHOD OF SURFACE CONTOURING.

3,879,988. OPTICAL COMPARATOR FOR MEASURING VIBRATION ON A ROTATING OBJECT.

3,904,925. POWER SUPPLY FOR A THERMIONIC EMISSION GAS DISCHARGE LAMP.

3,914,590. SERIAL TWO'S COMPLEMENTER.

3,919,558. HOT SUB-STAGE FOR A SCANNING ELECTRON MICROSCOPE.

3,920,951. LASER ETCHING APPARATUS FOR FORMING PHOTOGRAPHIC IMAGES ON METALLIC SURFACES.

Applications for licenses may be addressed to the Patent Counsel, Electronics Laboratory, General Electric Co., Electronics Park, Bldg. 2, Room 205, Syracuse, N.Y. 13221.

3,493,073. ACOUSTIC HOLOGRAPHIC APPARATUS WITH VISUAL DISPLAY.

3,558,974. LIGHT EMITTING DIODE ARRAY STRUCTURE.

3,559,091. BROADBAND INTERSTAGE COUPLING CIRCUIT.

3,594,795. RADAR SYSTEM.

3,599,104. LOGARITHMIC AMPLIFIER OF EXTENDED DYNAMIC RANGE.

3,614,404. ELECTRONIC CALCULATOR.

3,614,748. HIGH-SPEED MEMORY AND MULTIPLE LEVEL LOGIC NETWORK WITH PULSE SHAPING.

3,615,946. METHOD OF EMBEDDING SEMICONDUCTOR CHIP WITHIN A DIELECTRIC LAYER FLUSH WITH SURFACE.

3,621,354. DC MOTOR CURRENT ACTUATED DIGITAL CONTROL SYSTEM.

3,652,162. COMPLEX DATA PROCESSING SYSTEM EMPLOYING INCOHERENT OPTICS.

3,654,563. ACTIVE FILTER CIRCUIT HAVING NONLINEAR PROPERTIES.

3,655,371. METHOD AND APPARATUS FOR REPRODUCING OPTICAL INFORMATION.

3,679,941. COMPOSITE INTEGRATED CIRCUITS INCLUDING SEMICONDUCTOR CHIPS MOUNTED ON A COMMON SUBSTRATE WITH CONNECTIONS MADE THROUGH A DIELECTRIC ENCAPSULATOR.

3,691,628. METHOD OF FABRICATING COMPOSITE INEGRATED CIRCUITS.

3,710,267. ENVELOPE RATE DEMODULATOR.

3,737,743. HIGH POWER MICROWAVE FIELD EFFECT TRANSISTOR.

3,757,175. COMPOSITE INTEGRATED CIRCUITS WITH COPLANAR CONNECTIONS TO SEMICONDUCTOR CHIPS MOUNTED ON A SINGLE SUBSTRATE.

3,767,308. METHOD AND APPARATUS FOR SENSING SURFACE DISPLACEMENT ORTHOGONAL TO THE LINE OF SIGHT.

3,782,176. APPARATUS FOR MEASURING VIBRATION IN A MOVING OBJECT.

Application for license may be addressed to: General Electric Co., Component Motor Division, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801, Attention: Patent Counsel.

3,261,992. ELECTRICAL LOAD BALANCING CONTROL SYSTEM.

3,881,238. APPARATUS FOR WINDING MAGNETIC CORES AND TREATING LEADS.

3,887,677. PROCESS OF MAKING A DYNAMOELECTRIC MACHINE STRUCTURE BY PRESSURE MOLDING.

4,107,583. DYNAMOELECTRIC MACHINE WINDING ARRANGEMENTS, DYNAMOELECTRIC MACHINES INCORPORATING SAME AND METHODS OF OPERATING SUCH DYNAMOELECTRIC MACHINES.

4,116,410. ADAPTABLE RESILIENT MOTOR MOUNTING.

4,243,967. THERMOSTAT AND METHOD OF OPERATING.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky. 40225.

3,640,264. COMBUSTOR MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER.

3,667,451. GAS-FIRED HEATER MEANS.

3,667,892. CONTROL MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER.

3,670,713. GAS-FIRED HEATER MEANS.

3,850,496. CONNECTOR BLOCK FOR HERMETIC MOTOR COMPRESSOR.

3,995,349. DOOR HANDLE OF A HOUSEHOLD REFRIGERATOR.

4,009,589. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS AND METHOD OF ADJUSTMENT.

4,009,590. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS.

4,009,591. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS.

4,031,715. FLEXIBLE COUPLING ASSEMBLY.

4,084,291. CENTER HINGE FOR TOP-MOUNT TWO DOOR REFRIGERATOR.

4,096,430. METAL-OXIDE-SEMICONDUCTOR VOLTAGE REFERENCE.

4,121,204. BAR GRAPH TYPE TOUCH SWITCH AND DISPLAY DEVICE.

4,138,859. SPLIT HEAT PUMP OUTDOOR FAN ARRANGEMENT.

4,156,350. REFRIGERATION APPARATUS DEMAND DEFROST CONTROL SYSTEM AND METHOD.

4,156,352. COOLING ARRANGEMENT FOR A REFRIGERATOR MACHINERY.

4,157,042. PULLEY DRIVE SYSTEM.

4,256,951. REPETITION RATE POWER CONTROL FOR APPLIANCE USING HIGH CURRENT INRUSH ELEMENTS.

4,261,182. AUTOMATIC ICEMAKER INCLUDING MEANS FOR MINIMIZING THE SUPERCOOLING EFFECT.

4,262,183. COMBINATION MICROWAVE/FORCED CONVECTION OVEN.

4,263,646. MISSED COMMUTATION DETECTOR AND SAFEGUARD ARRANGEMENT.

4,265,089. ICE MAKING APPARATUS AND METHOD.

4,269,035. DEFROST CONTROL.

4,271,861. DISHWASHER FILL LEVEL CONTROL ARRANGEMENT.

4,271,899. HEAT PUMP CONTROL SYSTEM.

4,207,778. REINFORCED CROSS PLY COMPOSITE FLYWHEEL AND METHOD FOR MAKING SAME.

4,244,017. THIRD HARMONIC AUXILIARY COMMUTATED INVERTER HAVING SELECTABLE COMMUTATION CAPACITANCE AS A FUNCTION OF LOAD CURRENT.

4,258,302. APPARATUS FOR MAINTAINING SYNCHRONOUS MACHINE DRIVE SYSTEM AT LIGHT OF ZERO MACHINE LOADS.

4,275,388. PIEZOELECTRIC AUDIBLE ALARM FREQUENCY SELF-CALIBRATION SYSTEM.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,138,606. COOKING APPLIANCE.

4,140,048. TOAST LOAD SELECTOR MECHANISM.

4,216,763. TOASTER/OVEN ACCESSORY PAN WITH HANDLE.

4,278,873. TEMPERATURE RESPONSIVE CONTROL MEANS.

D-235,267. DESIGN FOR EIGHT-TRACK PORTABLE TAPE PLAYER.

D-255,881. DESIGN FOR PORTABLE CASSETTE TAPE RECORDER.

D-236,902. DESIGN FOR PORTABLE CASSETTE TAPE RECORDER WITH AM/FM RECEIVER.

D-254,489. CASSETTE TAPE RECORDER OR SIMILAR ARTICLE.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing 30 Rockefeller Plz., New York, N.Y. 10020.

4,271,129. HEAT RADIATION DEFLECTORS WITHIN AN EFG CRUCIBLE.

4,271,247. COLOR PICTURE TUBE WITH SCREEN HAVING LIGHT ABSORBING AREAS.

4,271,377. SYSTEM FOR COMPENSATING FOR CATHODE VARIATIONS IN DISPLAY DEVICES UTILIZING LINE CATHODES.

4,271,394. AMPLIFIER CIRCUIT.

4,271,422. CMOS SOS WITH NARROW RING SHAPED P SILICON GATE COMMON TO BOTH DEVICES.

4,271,433. SAW FILTER PREAMPLIFIER.

4,271,489. OPTICAL DISC PLAYER SYSTEM.

4,271,532. RECEIVER WITH A CHANNEL SWAPPING APPARATUS.

4,272,045. NUTATION DAMPING IN A DUAL-SPIN SPACECRAFT.

4,272,083. VIDEO DISC PLAYER HAVING RECORD EXTRACTING MECHANISM.

4,272,197. APPARATUS AND METHOD FOR MEASURING THE RATIO OF TWO SIGNALS.

4,272,641. TANDEM JUNCTION AMORPHOUS SILICON SOLAR CELLS.

4,272,726. DIFFERENTIAL FM DETECTOR WITH SERIES TUNED FILTER.

4,272,728. DIFFERENTIAL-INPUT AMPLIFIER CIRCUIT.

4,272,743. METHOD FOR TUNING A FILTER CIRCUIT.

4,272,777. SERVICE SWITCH APPARATUS.

4,272,778. COLOR-DIFFERENCE SIGNAL PROCESSING CIRCUITS.

4,272,785. DEFECT COMPENSATION FOR COLOR TELEVISION.

4,272,786. VIDEO DISC PLAYBACK APPARATUS WITH NON-LINEAR APERTURE CORRECTION.

4,272,881. METHOD FOR MAKING A CLOSED GATE MOS TRANSISTOR WITH SELF-ALIGNED CONTACTS WITH DUAL PASSIVATION LAYER.

4,272,882. METHOD OF LAYING OUT AN INTEGRATED CIRCUIT WITH SPECIFIC ALIGNMENT OF THE COLLECTOR CONTACT WITH THE EMITTER REGION.

4,273,342. PROTECTIVE CARTRIDGE FOR OPTICAL DISCS.

4,273,805. PASSIVATING COMPOSITE FOR A SEMICONDUCTOR DEVICE COMPRISING A SILICON NITRIDE (SI3N4) LAYER AND PHOSPHOSILICATE GLASS (PSG) LAYER.

4,273,822. GLAZING PASTE FOR BONDING A METAL LAYER TO A CERAMIC SUBSTRATE.



4,273,828. BULK GLASS HAVING IMPROVED PROPERTIES.

4,274,014. SWITCHED CURRENT SOURCE FOR CURRENT LIMITING COMPLEMENTARY SYMMETRY INVERTER.

4,276,688. METHOD FOR FORMING BURIED CONTACT COMPLEMENTARY MOS DEVICES.

4,277,695. AMPLIFIER HAVING DEAD ZONE OF CONTROLLABLE WIDTH AND POSITION.

4,277,729. SIMPLIFIED VERTICAL DEFLECTION CIRCUIT.

4,277,793. PHOTODIODE HAVING ENHANCED LONG WAVELENGTH RESPONSE.

4,277,796. SLOW DOWN COLOR PROCESSOR FOR VIDEO DISC MASTERING USING A SPECIAL MODE VIR.

4,277,798. AUTOMATIC KINESCOPE BIASING SYSTEM WITH INCREASED INTERFERENCE IMMUNITY.

4,277,801. COLOR FILTER HAVING VERTICAL COLOR STRIPES WITH A NONINTEGRAL RELATIONSHIP TO CCD PHOTOSENSORS.

4,277,884. METHOD FOR FORMING AN IMPROVED GATE MEMBER UTILIZING SPECIAL MASKING AND OXIDIATION TO ELIMINATE PROJECTING POINTS ON SILICON ISLANDS.

4,278,508. METHOD OF DETECTING A CATHODIC CORROSION SITE ON A METALLIZED SUBSTRATE.

4,278,704. METHOD FOR FORMING AN ELECTRICAL CONTACT TO A SOLAR CELL.

4,278,846. VIDEO DISC LOCKED GROOVE CLEARANCE SYSTEM.

4,278,946. CURRENT SCALING CIRCUITRY.

4,278,977. RANGE DETERMINING SYSTEM.

4,278,992. PCM DETECTOR FOR VIDEO REPRODUCER APPARATUS.

4,279,073. METHOD FOR RELEASING PRINTED WIRING BOARDS FROM PRINTED WIRING BOARD RACKS.

4,279,688. METHOD OF IMPROVING SILICON CRYSTAL PERFECTION IN SILICON ON SAPPHIRE DEVICES.

4,280,023. STYLUS POSITION SENSING APPARATUS FOR VIDEO DISC PLAYER.

4,280,024. SELECTIVELY DAMPED VIDEO DISC STYLUS ASSEMBLY.

4,280,077. CATHODE-RAY TUBE HAVING CORRUGATED SHADOW MASK WITH VARYING WAVEFORM.

4,280,191. QUANTIZING CIRCUITS.

4,280,674. BALLOON WITH DEFLATION PORT.

4,280,941. VIDEO DISCS AND MOLDING COMPOSITIONS THEREFOR.

4,281,270. PRECOATED RESISTIVE LENS STRUCTURE FOR ELECTRON GUN AND METHOD OF FABRICATION.

4,281,278. REDUNDANT BATTERY PROTECTION SYSTEM.

4,281,349. POWER SUPPLY ARRANGEMENT FOR A TUNING SYSTEM.

4,281,349. POWER SUPPLY ARRANGEMENTFIELD-EFFECT TRANSISTOR (IGFET) ON A SIGNAL SOURCE.

4,281,407. SURFACE ACOUSTIC WAVE PICK-UP AND RECORDING DEVICE.

4,274,193. METHOD FOR MAKING A CLOSED GATE MOS TRANSISTOR WITH SELF-ALIGNED CONTACTS.

4,274,294. APPARATUS FOR CONVERTING ROTARY MOTION TO LINEAR MOTION.

4,275,100. VIDEO DISC PROCESSING.

4,275,101. VIDEO DISC LUBRICANTS.

4,275,282. CENTERING SUPPORT FOR A ROTABLE WAFER SUPPORT SUSCEPTOR.

4,275,316. RESETTABLE BISTABLE CIRCUIT.

4,275,347. PRECISION CATHODE CURRENT REGULATOR.

4,275,362. GAIN CONTROLLED AMPLIFIER USING A PIN DIODE.

4,275,366. PHASE SHIFTER.

4,275,416. PCM DETECTOR.

4,275,861. ORIENTATION OF MOMENTUM STABILIZED VEHICLES.

4,276,566. CIRCUIT FOR INHIBITING RADIO FREQUENCY INTERFERENCE IN A TELEVISION RECEIVER.

4,276,592. A-C RECTIFIER CIRCUIT FOR POWERING MONOLITHIC INTEGRATED CIRCUITS.

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| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
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| | Columbus: Ohio State University Libraries | (614) 422-6286 |
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| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
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| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

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## PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director<br>Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-12-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director<br>Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 10-11-79 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director<br>Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 7-09-80 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director<br>Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 1-12-80 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director<br>Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 5-06-80 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director<br>Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 1-07-80 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director<br>Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 1-18-80 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT<br>Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 1-23-80 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director<br>Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 12-07-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director<br>Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-20-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director<br>Industrial Arts; Household, Personal and Fine Arts. | 2-08-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director<br>Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 1-09-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director<br>Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 6-12-79 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director<br>Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 1-30-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director<br>Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 10-22-79 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director<br>Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-19-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

# REISSUES

OCTOBER 13, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

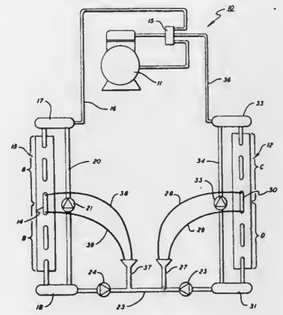
**Re. 30,765**
**HEAT PUMP SYSTEM**

**Rudy C. Bussjager, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.**

**Original No. 4,057,975, dated Nov. 15, 1977, Ser. No. 720,721, Sep. 7, 1976. Application for reissue Nov. 15, 1978, Ser. No. 960,997**

**Int. Cl.**[3] **F25B** *1/00, 13/00;* **F28F** *27/02*

**U.S. Cl. 62—115** **9 Claims**



**1**. In a heat pump system having a compressor, a pair of heat exchangers and means for selectively reversing the flow of refrigerant through the system so that the function of the exchangers is also reversed, the improvement comprising

means for separating each exchanger into a plurality of heat transfer zones, each zone containing a number of flow circuits,

flow control means for routing refrigerant discharged from the compressor through each of the zones of one exchanger in a series flow progression and routing the refrigerant discharged from said one exchanger into the other exchanger simultaneously through each of the zones of said other exchanger whereby flow is parallel through the zones, and

switching means operatively associated with said flow control means for automatically reversing the flow geometry through the exchangers in response to reversing the flow of refrigerant through the system whereby refrigerant flow is parallel through said one exchanger and in series through said other exchanger.

**3**. A heat pump system having a compressor, an indoor coil, an outdoor coil, a reversing valve for delivering refrigerant discharged from the compressor to the indoor coil during heating operations and to the outdoor coil during cooling operations, the method of processing refrigerant through the system including the steps:

separating the indoor and outdoor coils into a plurality of heat transfer zones, each zone having a number of flow circuits passing through the coil associated therewith,

routing the refrigerant delivered from the compressor to the outdoor coil during the cooling operation so that refrigerant flows through each of the heat transfer zones in a series progression,

delivering the refrigerant discharged from the outdoor coil to each of the heat transfer zones of the indoor coil simultaneously so that the refrigerant flows through the zones in a parallel flow,

returning the refrigerant from the indoor coil to the compressor to complete the cycle, and

reversing the flow geometry through the indoor and outdoor coils in response to a change in the systems operation whereby refrigerant flow in series through the zones of the indoor coil and in parallel through the zones of the outdoor coil.

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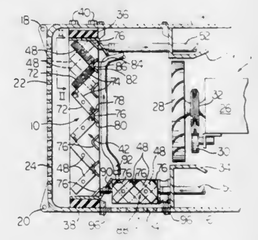
**Re. 30,766**
**MODULAR HEAT EXCHANGER WITH PIVOTAL CORES**

**Erwin J. H. Bentz, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Original No. 4,076,072, dated Feb. 28, 1978, Ser. No. 620,999, Oct. 9, 1975. Application for reissue May 21, 1980, Ser. No. 152,014**

**Int. Cl.**[3] **F28G** *13/00*

**U.S. Cl. 165—41** **19 Claims**



**9**. An internal combustion engine having a heat exchanger with a top tank and a bottom tank, said top tank being connected to said engine for receiving heated coolant, said bottom tank being connected to said engine for returning cooled coolant to said engine, a plurality of cooling cores extending between said top tank and said bottom tank, means for *pivotally* mounting each said cooling core at an angle with respect to each other and at an angle to the plane lying perpendicular to the axis of the engine whereby increased cooling core surface is exposed to oncoming air passing through said heat exchanger.

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**Re. 30,767**
**METHOD USING LIGNOSULFONATES FOR HIGH-TEMPERATURE PLUGGING**

**Betty J. Felber; Dwight L. Dauben, and Richard E. Marrs, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Original No. 4,074,757, dated Feb. 21, 1978, Ser. No. 795,341, May 9, 1977. Continuation of Ser. No. 710,963, Aug. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,849, Jul. 3, 1975, abandoned. Application for reissue Oct. 15, 1979, Ser. No. 85,071**

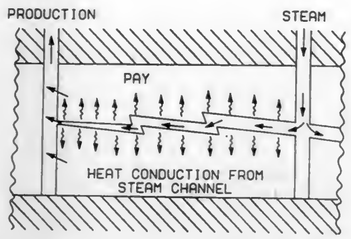
**Int. Cl.**[3] **E21B** *33/138, 43/24*

**U.S. Cl. 166—261** **25 Claims**

*13. A method for treating an underground zone having a temperature in excess of about 250° F. which comprises:*

*introducing into said zone an aqueous gel-forming solution of a water-soluble lignosulfonate, wherein said solution comprises*

*at least about 2.5 weight percent reducing sugars based on the weight of said water-soluble lignosulfonate and*




*maintaining said gel-forming solution in said zone until said gel-forming solution is converted to a gel.*

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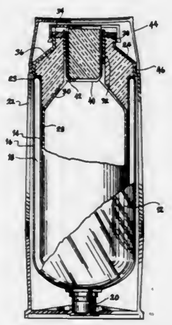
**Re. 30,768**
**VACUUM INSULATED BOTTLE**

**Carl Bramming, deceased, late of Nashville, Tenn.; by Clara B. Bramming, heir, Plainfield, Ind.; by Kenneth R. Bramming, heir, Nashville, Tenn., and by Beverley B. Wheeler, heir, Plainfield, Ind., assignors to Aladdin Industries, Incorporated, Chicago, Ill.**

**Original No. 3,910,441, dated Oct. 7, 1975, Ser. No. 446,695, Feb. 28, 1974. Application for reissue Nov. 16, 1976, Ser. No. 742,224**

**Int. Cl.³ A47J *41/02***

**U.S. Cl. 215—13 R** **14 Claims**



*12. An insulated bottle for containing foodstuffs or the like comprising an outer case, a liner received within said outer case and spaced therefrom for a major portion of the depth of said liner, said liner having an outer configuration of substantially cylindrical shape and terminating at one end thereof in a constricted neck and defining a cavity adapted to receive foodstuffs or the like, a vacuum filler having a generally cylindrical configuration and an opening at one end thereof interposed between said outer case and the cylindrical portion of said liner, the upper end of said vacuum filler terminating contiguous to the juncture between said liner cylindrical portion and its neck, a body of insulating material received between a portion of said outer case and said neck, said body of insulating material having a configuration conforming generally in shape to said neck and terminating contiguous to the juncture of said neck and said liner cylindrical portion, said body of insulating material being formed with a recess therein for receiving and supporting the upper end of said vacuum filler.*

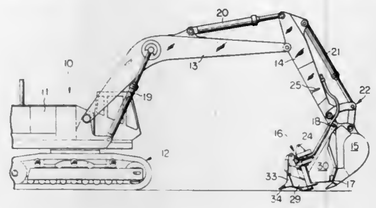
**Re. 30,769**
**MOUNTING ARRANGEMENT FOR IMPACT ROCK-BREAKER**

**Delwin E. Cobb, Peoria; Jerry D. Fidler, East Peoria, both of Ill.; Nathan Gutman, Simsbury, Conn.; Richard E. Livesay, Peoria, Ill.; Gerald P. Simmons, Washington, Ill., and Orrin A. Stemler, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Original No. 3,915,501, dated Oct. 28, 1975, Ser. No. 526,280, Nov. 22, 1974. Application for reissue Aug. 29, 1979, Ser. No. 70,934**

**Int. Cl.³ E02F *3/96***

**U.S. Cl. 299—67** **29 Claims**



1. Material-fracturing apparatus for mounting adjacent the bucket of an excavator having a boom and a stick, said apparatus comprising:

a housing having a fracturing shank supported by and extending therefrom and means for applying impact blows to said shank for breaking hardened materials;

bracket means extending from *and pivotally mounted to* said housing for pivotal connection to the stick of [an] *the* excavator adjacent the bucket of said excavator;

*an actuatable hydraulic cylinder pivotally connected to said housing and to said bracket means at locations sufficient for controllably, pivotally moving said housing relative to said bracket means for relative angular adjustment about an axis extending at substantially a right angle to the pivotal connection of said housing to said stick;*

first latch means for latching said housing means to said bucket for manipulation of said fracturing device into operative position by manipulation of said bucket; and

second latch means for latching said housing to said stick to permit free operation of said bucket.

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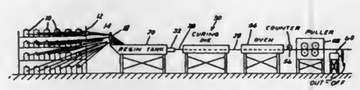
**Re. 30,770**
**METHOD FOR FABRICATING IMPROVED FIBER REINFORCED PLASTIC RODS HAVING A SMOOTH SURFACE**

**Samuel M. Shobert, Mishawaka, and Elson B. Fish, Lakeville, both of Ind., assignors to Plas/Steel Products, Inc., Walkerton, Ind.**

**Original No. 4,154,634, dated May 15, 1979, Ser. No. 835,825, Sep. 22, 1977. Application for reissue Apr. 21, 1980, Ser. No. 142,456**

**Int. Cl.³ B32B *31/04***

**U.S. Cl. 156—180** **17 Claims**




*14. The method of fabricating a solidified bundle of fibrous strands in a body of resinous material comprising the steps of;*

*(a) impregnating all of a plurality of fibrous strands with a liquid heat-hardenable resin,*

*(b) collecting all of said impregnated strands into a resin wetted bundle and unidirectionally intermittently pulling said bundle through an elongated closed hollow die device thereby providing alternate pulling and dwell, said die device being filled with said bundle during pulling and said bundle being fully impregnated prior to entry into said die device, said intermittent pulling being in substantially equal length increments, said dwell being for substantially equal time increments,*

*(c) heating said bundle while within said die device to solidify said resin, said pulling, heating and dwell of said bundle being so controlled that*

*(i) resin in the bundle which emerges from the die device is fully solidified and the resin in the bundle at the point of entry into the die device is not solidified,*

*(ii) the surface of the emerging bundle corresponds to the polish of the surface of said die device,*

*(iii) is substantially devoid of imperfections due to resin build-up within said die device, and*

*(iv) the emerging bundle is devoid of internal fractures.*



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**Re. 30,771**
**METHOD OF PROTECTING THE HULLS OF MARINE VESSELS FROM FOULING**

**Klaus Zondek, Cinco de Abril 4534, Santiago, Chile**

**Reissued No. Re. 29,072, dated Dec. 14, 1976, Ser. No. 611,633, Sep. 9, 1975.**

**Original No. 3,761,334, dated Sep. 25, 1973, Ser. No. 191,233, Oct. 21, 1971. Application for reissue Jul. 9, 1979, Ser. No. 55,607**

**Int. Cl.³ E04B *2/00*; B31F *1/00*; B21D *35/00*; B63B *3/00***

**U.S. Cl. 156—196** **13 Claims**

1. A method of protecting **from marine growth** the contoured hull of a marine vessel **[[**from marine growth**]] having a clean, non-conductive, smooth, hard surface,** which comprises providing a metal foil of anti-fouling metal in strip form, **coating one face of said foil with a layer of pressure-sensitive adhesive** and progressively rolling said **coated** foil strip into conforming pressure contact **directly** with said hull **surface with successive strips of said foil overlapping and** with **[[**a**]] said** layer of **pressure sensitive** adhesive between said foil strip and the hull surface **and between overlapping portions of said foil strips**, to adhesively bond said foil throughout its area to the exterior surface of said contoured hull below the water line **and to bond adjacent strips of foil to one another,** said foil being sufficiently thin to be easily applied and sufficiently thick to provide protection against fouling for a period of from two to five years.

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**Re. 30,772**
**AMIDE-MODIFIED URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS AND COATING COMPOSITIONS AND METHODS OF MAKING SAME**

**Charles B. Friedlander, Glenshaw; Gerald W. Gruber, Wexford, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Original No. 4,153,776, dated May 8, 1979, Ser. No. 890,895, Mar. 28, 1978. Application for reissue Jun. 2, 1980, Ser. No. 155,711**

**Int. Cl.³ C08G *18/38***

**U.S. Cl. 525—421** **40 Claims**

1. Addition polymerizable compound having [at least] one *or two* amide [group] *groups*, at least [one] *three* urethane [group] *groups* and at least one [ethylenically unsaturated functional] *acrylate or methacrylate* group comprising the reaction product of [the] components [of] *comprising:*

(a) an amide-containing compound [having] *which contains one or two amide groups and* at least one NCO-reactive hydroxy functional group;

(b) a polyisocyanate *which is a diisocyanate or a triisocyanate;* [and]

(c) a polyfunctional compound [containing at least one functional group reactive with an isocyanato group of said polyisocyanate and] which [polyfunctional compound] provides at least one [ethylenically unsaturated functional] *acrylate or methacrylate* group in said reaction product, *said polyfunctional compound being a hydroxy-containing ester of acrylic acid or a hydroxy-containing ester of methacrylic acid; and*

*(d) polyol selected from the group consisting of polyester polyol and polyether polyol.*

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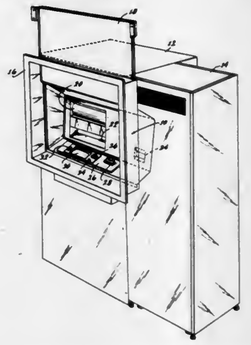
**Re. 30,773**
**TRANSACTION TERMINAL**

**Paul F. Glaser, Culver City, and Richard J. Orford, Hermosa Beach, both of Calif., assignors to Transaction Technology, Inc., Los Angeles, Calif.**

**Original No. 4,134,537, dated Jan. 16, 1979, Ser. No. 790,764, Apr. 25, 1977. Application for reissue Nov. 5, 1979, Ser. No. 91,509**

**Int. Cl.³ G06F *15/30*; G07F *7/08***

**U.S. Cl. 235—379** **74 Claims**



1. A terminal for providing for the performance of transactions by a user on a step by step basis, including,

a visual display *formed by an electronic display* for displaying to the user at specific steps in a transaction instructional text to the user for the performance by the user to advance the transaction on a step by step basis *and with this electronic display electronically programmable for modifying the instructional test,*

a plurality of function selectors located adjacent the visual display at a position corresponding to the location of particular instructional text on the visual display for selection in the successive steps of individual ones of the function selectors in the plurality to advance the transaction sequentially through the successive steps,

the visual display including at particular ones of the steps in transaction instructional text providing for a selection between individual ones of the function selectors in the plurality to advance the transaction to the next steps,

means coupled to the function selectors for enabling, at the particular ones of the steps, only the individual ones of the function selectors capable of being selected at such steps, and

means responsive to the selection, from the individual ones of the function selectors at each of the particular steps, of a particular one of such function selectors for providing for the performance of individual transaction in accordance with such selection.

# PLANT PATENTS

## GRANTED OCTOBER 13, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,775**

### GAZANIA PLANT

**Paul C. Enright, 11615 Riverside Dr., Lakeside, Calif. 92040**

**Filed Jul. 28, 1980, Ser. No. 173,183**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of Gazania plant substantially as herein described, characterized particularly as to novelty by its unique flower and varying leaf form.

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**4,776**

### AFRICAN VIOLET PLANT

**Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany**

**Filed Jul. 25, 1980, Ser. No. 172,395**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—69** **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Texas, as described and illustrated, and particularly characterized by its vigorous and very uniform growth habit, dark green, shiny leaves, upright stems each of which carries 7–12 flowers, and by its large blue frilled flowers which are long lasting and non-dropping.

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**4,777**

### AFRICAN VIOLET PLANT

**Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany**

**Filed Jul. 25, 1980, Ser. No. 172,396**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—69** **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name South Carolina, as described and illustrated, and particularly characterized by its vigorous growth habit; intensive green leaves; strong upright flower stems; large star-shaped white flowers, with wavy petal edges, and by its floriferous corolla, which is positioned well above the leaves.

# PATENTS

## GRANTED OCT. 13, 1981

### ERRATA

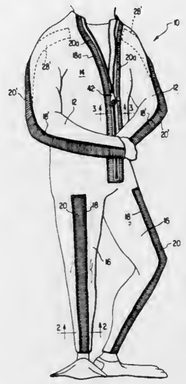
| For CLASS | See PATENT NO. |
|---|---|
| 411-345 | 4,294,156 |
| 411-185 | 4,294,300 |
| 501-129 | 4,294,618 |
| 376-404 | 4,294,658 |
| 376-442 | 4,294,660 |
| 376-363 | 4,294,661 |
| 219-061 | 4,294,662 |
| 361-318 | 4,294,715 |
| 424-049 | 4,294,894 |

# PATENTS

GRANTED OCTOBER 13, 1981

## GENERAL AND MECHANICAL

**4,293,957**
**WET SUIT**
**Joel D. Melarvie, Box 1977, 304 E. Rosser, Bismarck, N. Dak. 58501**
**Filed Jan. 25, 1980, Ser. No. 115,355**
**Int. Cl.³ A62B** *17/00*
**U.S. Cl. 2—2.1 R** **12 Claims**



**1**. A wet suit for use under water, or the like, comprising a tight form fitting garment of waterproof material having a slit in at least one portion thereof, said slit being closed by a piece of elastic fabric secured to both edges of the slit and a flap of watertight material secured to one edge of the slit and overlapping the other edge of the slit by a substantial amount, whereby said garment is stretchable in the area of the slit while said flap seals against entry of water.

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**4,293,958**
**HEAD GEAR**
**Christian W. Zauner, 4139 SW. Archer Rd., Gainesville, Fla. 32608**
**Filed May 27, 1980, Ser. No. 153,048**
**Int. Cl.³ A61F** *9/04*
**U.S. Cl. 2—12** **8 Claims**

**1**. An article of apparel of the type to be worn on the head, said article comprising: support means including at least in part a band means, said band means having a substantially circular configuration and disposable in surrounding relation to a portion of the head of the wearer; visor means attached to said support means and including a pouch means, a substantially flat visor support means mountable on the interior of said pouch means, said pouch means disposed relative to said band means to extend outwardly therefrom when said visor support means is mounted on the interior of said pouch means, whereby said visor means is positioned to offer shade to a predetermined portion of the wearer's head, said pouch means and said band means are formed from a substantially flexible moisture absorbent material, said pouch means being disposed in a folded over relation to itself and in at least partially surrounding relation to a predetermined length of said band means, upon absence of said visor support means from the interior of said pouch means, said predetermined length substantially equal to the transverse dimension of said visor means, whereby said band means is disposed so as to substantially function as perspiration absorbing band when mounted on the head of a wearer.

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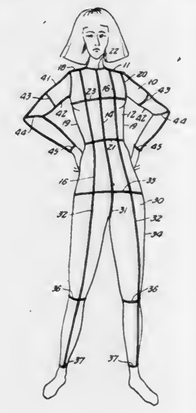
**4,293,959**
**STRETCH KNIT BODY SUIT WITH PADDED AREAS**
**Debbie A. Gioello, 237 Van Cortlandt Park Ave., Yonkers, N.Y. 10705**
**Filed Dec. 26, 1979, Ser. No. 106,496**
**Int. Cl.³ A41B** *17/02;* **D06C** *14/00;* **A41H** *1/00*
**U.S. Cl. 2—243 B** **2 Claims**



**1**. As a new article of manufacture, a stretch body suit used for the forming of a precision garment pattern corresponding to the figure of a wearer, said suit consisting substantially of knitted material and having a plurality of elongated padded areas on the outer surface thereof, said padded areas being stretchable along the principal axis thereof with said body suit, said padded areas being adapted to receive pins for retaining panels in position upon the suit while worn, while shielding the wearer from penetration of said pins; said padded areas defining a plurality of horizontally disposed lines encircling the wearer at the neck, shoulders, bust, waist, hips, knees, ankles, biceps, elbows and wrists; said padded areas defining a plurality of vertical lines at the armscyes, center front, center back, and sides of the torso, and the inner and outer sides of the arms and legs of said bodysuit.

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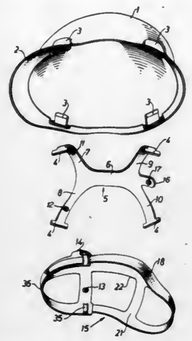
**4,293,960**
**HEADGEAR**
**Tore G. Palmaer, S-330, 30 Gnosjö, Sweden**
**Filed May 22, 1979, Ser. No. 41,540**
**Claims priority, application Sweden, May 30, 1978, 7806254**
**Int. Cl.³ A42B** *3/02*
**U.S. Cl. 2—416** **7 Claims**

**1**. Protective headgear for mounting within a helmet, comprising an impact-absorbing crash element having means thereon for releasable attachment to cooperable means carried by a helmet shell whereby said crash element is mountable to extend within the helmet shell in spaced relation thereto, said crash element also having means thereon for adjustably and releasably attaching same in spaced superposed relation to a helmet lining; and a helmet lining which comprises a first

curved section adapted to cover the nape of the neck and a second curved section adapted to cover the forehead, said first curved section including a first transverse strip arranged to form side pieces in the lining when assembled and three flaps arranged in sequence along the length of said transverse strip, the two outer ones of the flaps being arranged to be secured to the middle one of the flaps to form a domed configuration



conforming generally to the skull; the helmet lining further comprises a connection piece into which the middle flap continues; and said second curved section including a second transverse strip with three flaps arranged along the length of the strip, the middle one of the flaps being connected with the connection piece, there being attachment element to secure the two other flaps of the second part to its middle flap.

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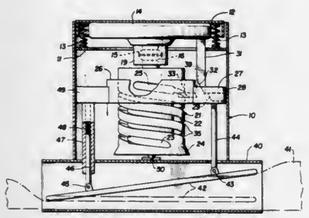
**4,293,961**

## PULSATILE FLOW CARDIOPULMONARY BYPASS PUMP

**Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703**

**Filed Mar. 26, 1980, Ser. No. 134,089**
**Int. Cl.³ A61F *1/00*; A61B *19/00*; F04B *43/00***
**U.S. Cl. 3—1.7** **6 Claims**



1. A pulsatile flow pumping mechanism particularly adapted to operate a cardiopulmonary bypass device comprising a rotary spinner having a spiral groove including a partial retainer wall and entrance and exit groove portions of increased width and progressively decreasing depth beyond the terminals of the partial retainer wall, power drive means connected with the spinner to rotate it in one direction, a ring follower housing surrounding the spinner and operatively coupled with said bypass device and adapted to traverse the spinner axially of the spinner and being held against rotation with the spinner, a holding magnet on the ring follower housing radially outwardly of the spinner, a magnetically attractable groove rider mounted for movement radially of the spinner within a passage of the ring follower housing which is in alignment with said magnet, camming surface means on the spinner near one end thereof including the exit groove portion of the spinner engageable with said rider to displace the rider radially outwardly into held engagement with said magnet with the rider radially beyond the periphery of the spinner, and stationary cam means near the opposite end of the spinner and radially outwardly of the periphery of the spinner to strip said rider from the holding magnet and move it into said entrance groove portion.

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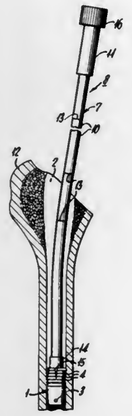
**4,293,962**

## BONE PLUG INSERTING SYSTEM

**Robert L. Fuson, Warsaw, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.**

**Filed Feb. 14, 1980, Ser. No. 121,560**
**Int. Cl.³ A61F *1/00, 1/24***
**U.S. Cl. 3—1.9** **9 Claims**



1. A device for plugging the medullary canal comprising the combination of:

(a) a means for plugging the medullary canal made of a biologically compatible material, and wherein said plugging means has a proximal and a distal end and is round in cross-section and tapered from a larger diameter at the proximal end of the plug to a smaller diameter at the distal end of the plug, and wherein the proximal portion of the plugging means has tooth-like steps in which the diameter decreases in a series of steps, each perpendicular to the length of the plugging means and then tapering back out toward the distal end and approaching the original diameter, but with the outer diameter of each successive step being slightly less in diameter than the previous step as the steps progress from the proximal end toward the distal end of the plugging means, and wherein each step is a continuous ring about the plug, and;

(b) a means for inserting the plugging means into the canal; and

(c) a means associated with said plugging means and inserting means for engaging and disengaging the plugging means from the inserting means.

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**4,293,963**

## UNRESTRAINED ELBOW PROSTHESIS

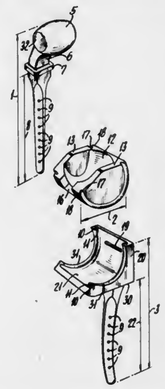
**Barry L. Gold, and Richard C. Bolesky, both of Warsaw, Ind., assignors to Zimmer USA, Inc., Warsaw, Ind.**

**Filed Feb. 14, 1980, Ser. No. 121,559**
**Int. Cl.³ A61F *1/03***
**U.S. Cl. 3—1.91** **4 Claims**

1. An unrestrained elbow prosthesis comprised of the combination of:

(a) a humeral component formed of a bio-compatible metal alloy having an elongated stem with a substantially cylindrical articulating surface on the distal end of said stem and a supporting collar outwardly extending from the stem and located toward the distal end of the stem, but proximal to the substantially cylindrical articulating surface and separated from the cylindrical surface by a neck portion, said substantially cylindrical surface being convex such that the diameter of the midportion of the cylindrical shape is greater than the flat circular ends of the cylindrical shape; and

(b) an ulnar component consisting of a bio-compatible metal alloy retainer, and a bio-compatible non-metal bearing and an engaging means for attaching said non-metal bearing to the metal retainer and wherein the retainer has an elongated stem and an enlarged metal base portion attached to the proximal end of said elongated stem by a widened base support portion, said stem having a side which spreads into a first rectangular shaped flat plane with a second substantially rectangular plane projecting upward at a 90 degree angle from the first rectangular plane, each of said planes having some thickness so as to create said metal base portion with two parallel retaining walls separated by a retaining platform wherein each retaining wall, as well as the retaining platform, has an L-shaped outer configuration and a C-shaped inner configuration for supporting the non-metal bearing attached by the engaging means to the metal base, said non-metal bearing having a cylindrical



outer bearing surface for mating with the C-shaped retaining platform, an inner concave substantially cylindrical articulating bearing surface, for mating with or receiving the said substantially convex articulating surface of the humeral component, and two parallel side walls between which both of said inner and outer bearing surfaces are disposed, and wherein the engaging means for attaching said non-metal bearing to the metal retainer of the ulnar component includes a first pair of circular ribs and a first pair of circular grooves on the metal base with one circular rib and one circular groove being disposed on the inner side of each of said parallel retaining walls, and wherein the retaining platform is cylindrical and contains a longitudinal protuberance and wherein the engaging means also includes a second pair of circular ribs and a second pair of circular grooves on the non-metal bearing with one circular rib and one circular groove being disposed on the outer surface of each of said parallel side walls, and wherein the outer cylindrical surface of the non-metal bearing contains a longitudinal indentation, and said engaging means is adapted such that the first pair of circular grooves slidably receives the second pair of circular ribs and the second pair of circular grooves slidably receives the first pair of circular ribs whereby engagement of the non-metal bearing into the metal retainer is achieved by circular rotation of the bearing while the pairs of grooves and ribs are engaged, and whereby further forced circular rotation allows the longitudinal protuberance on the metal retaining platform to engage the corresponding longitudinal indentation on the outer cylindrical surface of the non-metal bearing to engage and subsequently lock the bearing into place on the metal retainer.

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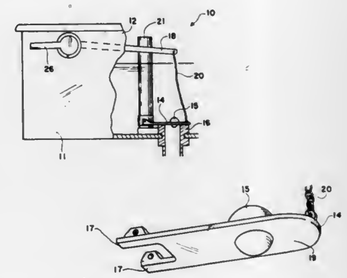
**4,293,964**

## DESIGN FOR FLUSH TANK CONTROL USING NON-BUOYANT FLAPPER VALVE

**Rudolph T. Riedel, 7198 Sugarbin St., Orlando, Fla. 32807**

**Filed Sep. 2, 1980, Ser. No. 183,287**
**Int. Cl.³ E03D *1/34***
**U.S. Cl. 4—378** **1 Claim**



1. A flush arrangement for preventing the utilization of an unnecessary amount of water in the flushing of a toilet of the type having a water storage tank and a handle movable to bring about a lifting of a water release device from its seat to accomplish a controlled flushing of the toilet, and water release device being a pivotally mounted non-buoyant, one piece solid rubber flapper valve, said flapper valve including a generally flat member having a sealing portion, an integral generally ball-shaped portion disposed centrally on said seating portion and surrounded thereby, said ball shaped portion being of solid construction utilizing no air pocket to render it buoyant, with a greater proprotion of said ball shaped portion being above said flat member than below it, means connecting a portion of said flapper valve to said handle so that handle manipulation brings about a pivotal upward movement of said non-buoyant flapper valve away from its seat, thus permitting a controlled flow of water from said tank, said flapper valve, because of its non-buoyance and weight of said ball-shaped portion returns to its seat the moment said handle is released, such that the flow of water from the tank will be instantly shut off by the substantially flat sealing portion of said flapper valve.

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**4,293,965**

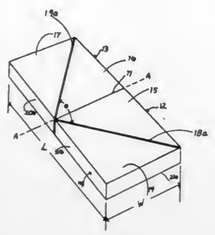
## UNITARY FURNITURE ELEMENT

**Margaret C. Hrubec, 220 E. 27th St., Apt. 17, New York, N.Y. 10016**

**Filed Jun. 2, 1980, Ser. No. 155,437**
**Int. Cl.³ A47C *27/14, 17/04***
**U.S. Cl. 5—465** **6 Claims**

1. A unitary furniture element comprising a segmented cushion member of uniform thickness having in plan view a rectangular shape with a length of twice its width, with a center line of the cushion member dividing same into two square portions in plan view, the cushion member being segmented into four isosceles right triangular sections arranged such that the two sections bounding the center line coextensively abut along their corresponding legs and the two sections in each square portion coextensively abut one another along their hypotenuses such that the respective lines of abutment of the sections in the square portions intersect at right angles, the sections

being hingedly joined such that on one rectangular face of the cushion member the two sections bounding the center line are hingedly joined in the plane of the one rectangular face and on the other rectangular face, the two sections in each square



portion are hingedly joined in the plane of the other rectangular face, whereby the segmented cushion member may be pivotally folded at its hinged joints to assume multiple furniture configurations.

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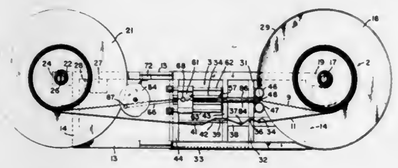
**4,293,966**
**LEAFCUTTER BEE LARVAE EXTRACTING METHOD AND DEVICE**
**LeRoy J. Weiderrich, North Havre, Mont., assignor to Pollination Technics, Inc., Havre, Mont.**
**Filed Oct. 9, 1979, Ser. No. 82,991**
**Int. Cl.³ A01K** *51/00*
**U.S. Cl. 6—12 R** **19 Claims**



**1**. Apparatus for cleaning a bee hive which includes a spirally wound strip, the surface thereof having bee larvae adhered thereto comprising in combination:
means to unwind said strip,
extractor means operatively associated with said unwinding means for scraping the surface of said strip in a direction transverse to the direction of unwinding of said strip to remove the larvae therefrom, and
control means for operating said extractor means to scrape the surface of an unwound portion of said strip.

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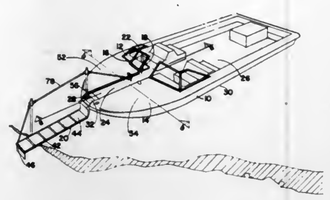
**4,293,967**
**PIVOTAL DECK RAMP**
**Thomas M. Ord, Rte. 1, Box 174 D, Vaughn, Wash. 98394**
**Filed Apr. 30, 1979, Ser. No. 34,635**
**Int. Cl.³ B63B** *17/00*
**U.S. Cl. 9—1.6** **10 Claims**

**1**. A deck ramp for the disembarking of passengers from boats comprising:
a first ramp section;
a means of attaching the ramp to a boat whereby the first ramp may be pivoted about the means of attachment;
a second ramp section;
a hinge which attaches the second ramp section to the first ramp section wherein when the first ramp section is placed in the closed position, the second ramp section is capable of positioning itself beneath the first ramp section, and when the first ramp section is in the open position, the second ramp is capable of pivoting as an extension of the first ramp section.
a first rail affixed to the first ramp section;
a hinge affixed to the inner hull of the boat;
a second rail affixed to the hinge; and



a line affixed to the first rail and affixed to the second rail such that when the deck ramp is placed in the open position the line pivots the second rail about the hinge affixed to the boat to an approximate vertical position.

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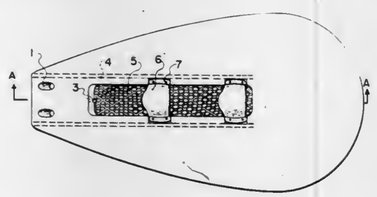
**4,293,968**
**INTERCONNECTED WATER SKIS**
**Elliott M. Levine, 393 Kingston Crescent, Winnipeg, Manitoba, Canada**
**Filed Nov. 6, 1978, Ser. No. 958,157**
**Claims priority, application United Kingdom, Nov. 11, 1977, 47063/77**
**Int. Cl.³ A63C** *5/00, 9/00, 11/00, 15/00*
**U.S. Cl. 9—310 A** **6 Claims**



**1**. A pair of buoyant water ski components or the like and means incorporated thereto connect said components in spaced and parallel relationship with one another to form a platform, and foot engaging means on the upper surface of each of said components, said connecting means including a connector member and means detachably securing said connector member by one end thereof to one of said skis and by the other end thereof to the other of said skis intermediate the ends of said skis, and approximately midway along the length of said skis, said connector member being in the form of a torsion bar whereby said skis are each movable independently in a fore and aft vertical pitching movement, within limits, around the axis of said connector member, due to the torsional characteristics of said connector, the connector means at the ends of said connector member including further means for maintaining the parallelism of said skis and facilitating horizontal plane rigidity of said skis.

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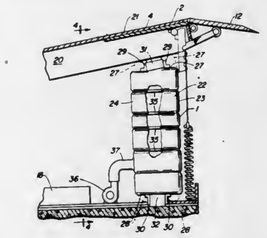
**4,293,969**
**INFLATABLE SEAL**
**Sylvan J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa**
**Filed Dec. 26, 1979, Ser. No. 107,034**
**Int. Cl.³ E01D** *1/00*
**U.S. Cl. 14—71.1** **12 Claims**

**10**. In an adjustable dockboard for spanning the gap between a loading dock and the bed of a carrier in loading or unloading



position in front of the dock, the dockboard embodying a stationary mounting structure, a ramp having front and rear portions, with the rear portion hingedly connected to said mounting structure so that the ramp can swing up and down around a horizontal axis between a raised position wherein it is disposed at a forwardly opening acute angle to the horizontal above the floor of the loading dock and a lowered position wherein it is disposed in horizontally extending position wherein it is substantially flush with said floor of said loading dock, and said mounting structure including a depression in said loading dock, said depression embodying two oppositely disposed side walls, between which said ramp is disposed when it is disposed in said lowered position, a rear wall and an open front, and wherein the bottom of said ramp comprises a plurality of elongated beams extending between the front and rear edges thereof in substantially parallel spaced relation to each other, the combination of



a. means disposed between said beams at said front portion of said ramp for closing the spaces therebetween,
b. an inflatable member.
c. means securing the top of said inflatable member to the bottom of said beams across substantially the full width of said front portion of said ramp,
d. means securing the bottom of said inflatable member to the bottom of said depression across substantially the full width of said depression between said side walls thereof,
e. said inflatable member being movable upwardly and downwardly by said ramp between said raised and lowered positions of the latter, and
f. means for inflating said inflatable member, when said ramp is disposed in said raised position, to thereby yieldingly urge said inflatable member into sealing engagement with said side walls substantially throughout the height of the latter.

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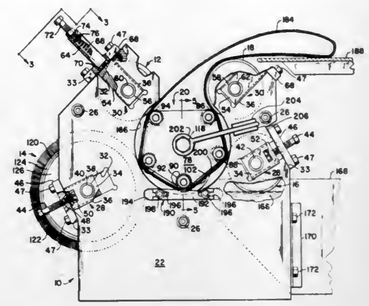
**4,293,970**
**BELT CLEANING APPARATUS**
**Robert C. Bencene, Rte. 4, Jonesboro, Tenn. 37650, and Charles A. Granger, #3 Matson Ct., Johnson City, Tenn. 37601**
**Filed Jun. 28, 1979, Ser. No. 52,852**
**Int. Cl.³ A46B** *13/02*
**U.S. Cl. 15—21 D** **10 Claims**

**1**. A cleaning apparatus for a continuous belt, comprising a base having elongated belt supporting mandrel means rotatably mounted thereon, said mandrel means having a plurality of belt engaging peripheral portions spaced from the rotational axis thereof, drive roll means for said continuous belt rotatably mounted on said base and having its rotational axis substantially parallel to the rotational axis of said mandrel means, belt cleaning means adjacent the periphery of said mandrel means and adapted to engage said belt, and a first one of said peripheral portions of said mandrel means being movable substantially parallelly into close juxtaposition to the periphery of said



drive roll means upon rotative movement of said mandrel means.

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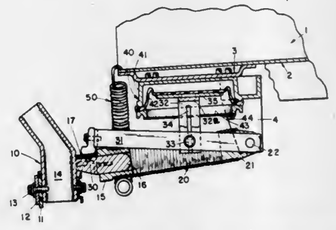
**4,293,971**
**FLOOR TREATING MACHINE WITH SQUEEGEE**
**Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.**
**Filed Jun. 19, 1979, Ser. No. 49,884**
**Int. Cl.³ A47L** *9/02*
**U.S. Cl. 15—98** **30 Claims**



**1**. A floor treating machine, with a squeegee operably connected thereto for selective engagement or disengagement with the surface being treated, in which the improvement comprises: spring means, capable of flexing spring action in at least a side to side direction laterally of the direction of travel of the machine, secured at one end to said machine and at the other end to said squeegee, said squeegee being free of connection to said machine through a rigid linkage whereby it is free to shift laterally side to side not only relative to said machine but also relative to the normal longitudinal axis of said spring means through said flexing action of said spring means thereby allowing said squeegee to deflect out of the way of obstacles and not get hung up on corners or the like.

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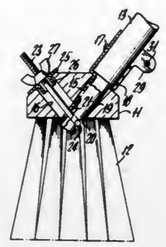
**4,293,972**
**HANDLE ATTACHING MEANS FOR BROOMS AND THE LIKE**
**Francis Pomares, 124 Russell St., White Plains, N.Y. 10606**
**Filed Oct. 26, 1979, Ser. No. 88,649**
**Int. Cl.³ A46B** *15/00;* **F16B** *35/06*
**U.S. Cl. 15—145** **6 Claims**

**1**. A handle attachment for push brooms and the like having an elongated head with at least two angularly disposed openings positioned transversely of the head comprising tubular handle attaching means having an enlarged handle receiving and holding portion and a shank portion of smaller cross sectional area than and extending from said enlarged portion, the

end of said shank portion having a pair of diametrically disposed and aligned openings, and an elongated bolt extending through said pair of openings, said bolt having a head portion engaging said shank portion to prevent rotation of said bolt and



a cooperating nut, whereby insertion of said shank portion in one of said angularly disposed openings with said bolt extending through said aligned shank openings and the other angularly disposed opening and held in position by said nut secures said handle attaching means in position.

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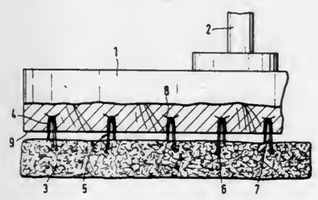
**4,293,973**

**FLOOR CLEANING DEVICE**

**Ernst Schär, Stallikonerstrasse 73, 8903 Birmensdorf, Switzerland**

**Filed Oct. 22, 1979, Ser. No. 87,105**
**Int. Cl.³ A47L *11/14***
**U.S. Cl. 15—230.17** **12 Claims**



1. A floor cleaning device of the kind having a holding plate from the lower face of which there projects a multiplicity of bristles distributed over the lower face, at least some of which have beaded ends for carrying along a cleaning pad, having the improvement which consists in that:

said holding plate has a number of bores, open at the bottom, in each of which at least one bristle is held which is bent over to provide legs of different length and is secured by means of a loop passing through the bend of each bristle in said bore, said legs diverging outwardly from the bore in which the bristle is secured;

the longer leg of at least one bristle in each bore is beaded at its end, and

a multiplicity of said bristle-equipped bores is distributed over the lower face of the holding plate and both the shorter leg and longer leg of each bristle of said bores projects on the lower face of the holding plate.

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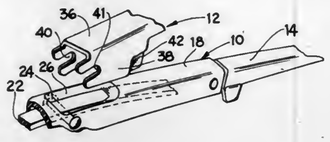
**4,293,974**

**ARM TO BLADE CONNECTOR**

**Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.**

**Filed May 19, 1980, Ser. No. 151,127**
**Int. Cl.³ B60S *1/40***
**U.S. Cl. 15—250.32** **7 Claims**

1. A connector assembly for connecting a windshield wiper arm and a windshield wiper blade, said arm having a free end U-shaped in cross section, forming depending ears, a slot in each of said depending ears, said slot being open at the free end of said arm tip, said wiper blade having a channel-shaped central portion with depending side walls connected by a web at the upper edge of said side walls, elongate longitudinally extending aperture means extending over a central portion of



said web for receiving said depending ears and a cross pin exposed to said aperture means for receiving said slots; characterized in that a strike is disposed intermediate the side walls exposed to said aperture means, detent means are positioned on said ears disposed for engagement with said strike, said ears include shoulder means positioned to engage an abutting part of said blade for limiting longitudinal movement of the blade relative to the arm when in operative position.

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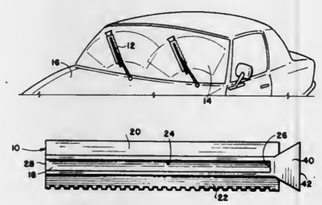
**4,293,975**

**ATTACHMENT FOR WINDSHIELD WIPER BLADES**

**Bobby J. Ainsworth, P.O. Box 182, Achille, Okla. 74720**

**Filed Jan. 14, 1980, Ser. No. 111,534**
**Int. Cl.³ B60S *1/04***
**U.S. Cl. 15—250.41** **4 Claims**



1. An attachment for vehicle windshield wiper blades and comprising an elongated body having a slot extending longitudinally along one side thereof for receiving a wiper blade therein, scraper means provided on the opposite side edges of the body and extending longitudinally therealong to provide a scraping of the windshield during operation of the wiper blades, and transversely extending scraper means provided on one end of the body for manual scraping of the windshield for facilitating the scraping action of the longitudinal scraper means, wherein the transverse scraping edge comprises an angularly and outwardly extending flange, and ascraping edge provided at the outer end of the flange extending transversely with respect to the longitudinal axis of the body.

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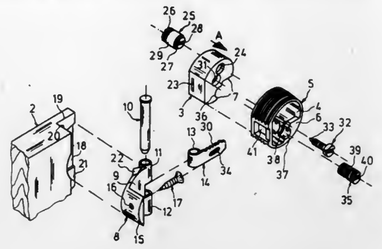
**4,293,976**

**CABINET HINGE**

**Willi Pittasch, and Johannes Dalbert, both of Herford, Fed. Rep. of Germany, assignors to Firma Richard Heinze, Fed. Rep. of Germany**

**Division of Ser. No. 844,118, Oct. 20, 1977, Pat. No. 4,159,557.**
**This application Mar. 8, 1979, Ser. No. 18,456**
**Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647776; Oct. 23, 1976, 2648095**
**Int. Cl.³ E05D *5/02, 7/04***
**U.S. Cl. 16—129** **14 Claims**

1. A hinge for articulated connection of two surfaced components, said hinge comprising first and second hinge parts, said first hinge part comprising an outer anchoring sleeve operable to secure said first hinge part in a recess in a first of said components and an inner body disposed in said sleeve, and said second hinge part comprising means operable to secure said second hinge part to a second of said components and a pivotally mounted hinge arm, one edge of said hinge arm defining a rack, said outer sleeve of said first hinge part having a first opening operable to receive said inner body for selective positioning along a first axis which axis is perpendicular to the



surface of said first components and a second opening operable to permit communication of said hinge arm and said inner body along a second axis which axis is parallel to the surface of said first component, said first hinge part having means operable to position said inner body along said first axis and said inner body having pinion operable to receive and engage said hinge arm for selective positioning along said second axis and means operable to position said hinge arm in said inner body along said second axis.

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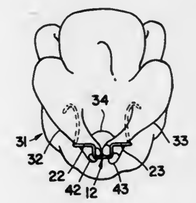
**4,293,977**

**POULTRY TRUSSING DEVICE**

**Anthony J. Volk, 173 E. Syracuse St., and Henry J. Volk, P.O. Box 1484, both of Turlock, Calif. 95380**

**Filed Dec. 3, 1979, Ser. No. 99,470**
**Int. Cl.³ A22B *5/00*; A22C *21/00***
**U.S. Cl. 17—11** **8 Claims**



1. An improved poultry trussing device formed of a thin elongated strip of rigid but resilient material having a central U-shaped section having a substantially straight bottom portion with substantially parallel extensions of the ends thereof with aligned shoulders extending therefrom substantially perpendicularly thereto and legs depending from said shoulders with hooked ends.

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**4,293,978**

**POULTRY HEAD PULLING APPARATUS**

**David M. McDonald, Kansas City, Kans., and Donald J. Scheler, Kansas City, Mo., assignors to Simon-Johnson, Inc., Kansas City, Mo.**

**Filed Oct. 1, 1979, Ser. No. 81,008**
**Int. Cl.³ A22C *21/00***
**U.S. Cl. 17—12** **2 Claims**

1. For use with an arcuate section of an overhead conveyor having means for uninterrupted horizontal advancement of a continuous train of birds pendulously suspended by their legs in a head down position, apparatus for processing said birds as they are advanced, said apparatus including:

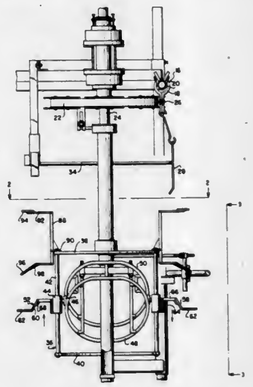
a rotor beneath the conveyor at said section mounted for rotation about an upright axis in timed relationship to said conveyor;

stationary guide means for maintaining the bodies of the birds confined to an arcuate path of travel spaced radially outwardly from said axis;

means attached to said rotor and rotatable therewith for separately capturing the head of each suspended bird as the birds are advanced;

means attached to said rotor and rotatable therewith for separately capturing the necks of each suspended bird as the birds are advanced, and having means for holding the bodies of the birds against descent as the birds are advanced,

each of said head capturing means having means for holding the neck skin of the captured head in a taut condition as the birds are advanced; and



means for progressively and separately lowering said head capturing means with respect to the rotor as the latter rotates until the heads are separated from neck skins adjacent their heads and until the heads pull the trachea, esophagus and crop from within the birds through their necks,

each head capturing means being provided with means for holding the heads oriented to point their beaks inwardly toward said axis,

with means for tilting the heads upwardly and inwardly toward said axis as the head capturing means is lowered during rotation thereof,

with means about which the head is tilted across a line extending transversely of the throat adjacent the larynx for pinching the esophagus against the roof of the mouth and

with an essentially V-shaped loop having a bight, a pair of legs diverging downwardly and outwardly from said bight and a horizontal arm extending outwardly from one of the legs.

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**4,293,979**

**FORMING PRESS FOR SAUSAGE AND THE LIKE**

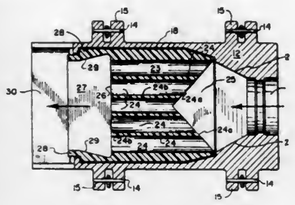
**Gabriel A. Colosimo, and Ernest Colosimo, both of 9009 W. 2700 South, Magna, Utah 84044**

**Division of Ser. No. 830,838, Sep. 6, 1977, Pat. No. 4,148,598.**
**This application Oct. 13, 1978, Ser. No. 951,028**
**Int. Cl.³ A22C *11/00, 7/00***
**U.S. Cl. 17—32** **2 Claims**

1. A food forming press comprising

a press body having upper and lower body halves;

means for clamping said body halves together in mating relationship to form a cavity open at each end;
an inlet opening to the cavity of the press body;
means for coupling the inlet opening of the press body to a discharge outlet of a meat grinder;
walls at the inlet opening of the press body angularly interconnecting the inlet opening and the cavity of the press;
an extrusion die formed to fit within the cavity of the two body halves of the press and containing a plurality of die passages therethrough, each said die passage being open to opposite ends of said cavity, said extrusion die comprising a housing containing a plurality of elongated extrusion passages;



an inwardly converging V-shaped common inlet to the extrusion passages at the inlet opening of the press whereby said inlets of the extrusion passages have sharp, angled edges therearound, the ends of the passages at the opposite end of the extrusion die being formed flush with one another, said housing having a lower surface extending beyond the flush ends, and sidewalls; and
gradually converging inner surfaces of the said sidewalls of the die extending beyond the flush ends of the extrusion passages to slightly compress foodstuffs ejected from the passages.

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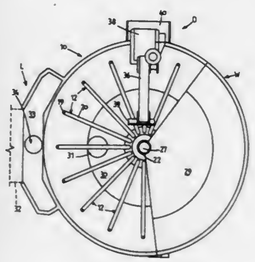
**4,293,980**
**METHOD FOR WASHING ANIMAL CASINGS**
**Roderick O. Ward, Havelock North, New Zealand, assignor to W & R Fletcher (N.Z.) Limited, Wellington, New Zealand**
**Filed Jun. 18, 1979, Ser. No. 49,804**
**Claims priority, application New Zealand, Jun. 30, 1978, 187739**
**Int. Cl.³ A22B** *5/18*
**U.S. Cl. 17—51** **11 Claims**



1. A method of mechanically washing an animal casing such as a bung, said method comprising the steps of
(a) placing the casing on an elongate support element so that said element extends through the interior of the casing, said element including means defining duct means for washing liquid and outlet means for the discharge of such liquid in the interior of the casing,
(b) causing washing liquid to issue under pressure from said outlet means thereby to wash the interior of the casing, and
(c) directing said washing liquid in the form of jets at an angle to the interior surface of the casing to rotate the casing around said element.

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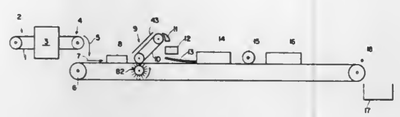
**4,293,981**
**CRAB BUTCHERING MACHINE**
**Charles M. Smith, Cordova, Ak.**
**Filed Sep. 24, 1979, Ser. No. 78,036**
**Int. Cl.³ A22C** *29/02*
**U.S. Cl. 17—71** **32 Claims**



1. A cleaning machine for crabs having a body, gills, viscera in a body cavity, legs, tail, carapace, and pincers, comprising:
first endless conveyor means having a plurality of crab body engaging abutments spaced along its length for positively driving crabs along a conveying path in a conveying direction with their eyes facing in the conveying direction and their carapaces facing away from said conveyor means;
second endless conveyor means having a plurality of rigid projections;
means for mounting said second conveyor means for movement in a projection path substantially co-planar with said first conveying means so that said projection path intersects the conveying path of said first conveyor means;
means for driving said second conveyor means so that said abutments and said projections respectively in said conveying path and projection path have their movement timed with respect to each other so that a crab engaged by said abutments and being driven along said conveying path will have its carapace's leading edge struck by one of said projections of said second conveyor means to break said carapace away from the crab body, drive the carapace in a pivoting relationship with respect to the tail end of the carapace backward and away from said conveying path as the crab body moves in the conveying direction.

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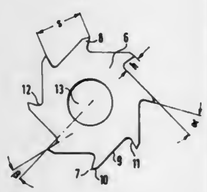
**4,293,982**
**TOOL FOR OPENING UP FIBER BALES**
**Herr J. Marx, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany**
**Filed Mar. 24, 1980, Ser. No. 133,398**
**Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917122**
**Int. Cl.³ D01G** *7/06*
**U.S. Cl. 19—80 A** **10 Claims**



1. A tool for opening up fiber bales, comprising a shaft adapted to be driven in rotation about an axis; and a plurality



of axially spaced blades coaxially mounted on said shaft for rotation therewith and each having a periphery provided with projecting sawteeth adapted to engage the fiber of a fiber bale, each of said sawteeth being bounded by two flanks which include between themselves an angle of 20°–70° and the circumferential spacing between the tips of successive fronts of said sawteeth being between 60–180 mm.

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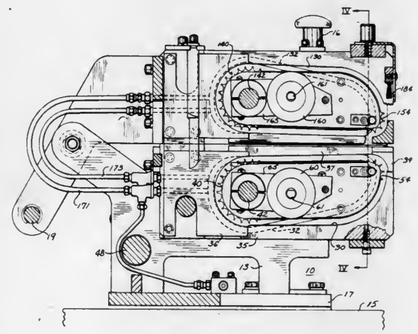
**4,293,983**
**HIGH SPEED GILL BOX**
**George S. Van Deusen, and Joseph F. Ogrinc, both of Gastonia, N.C., assignors to The Warner & Swasey Company, Cleveland, Ohio**
**Filed Sep. 19, 1979, Ser. No. 77,079**
**Int. Cl.³ D01G** *19/10*
**U.S. Cl. 19—127** **11 Claims**



1. A high speed gill box having a drafting zone through which textile sliver is drawn comprising:
a plurality of faller bars each having a plurality of pins extending therefrom and an integral crank arm formed on one end thereof;
path means for constraining movement of said plurality of faller bars to a defined path along which the faller bars can move;
a drive sprocket disposed at one end of the drafting zone for engaging some of said plurality of faller bars and pushing others of said plurality of faller bars along the defined path;
an idler sprocket disposed at the opposite end of the drafting zone for assisting in guiding movement of the faller bars from the drafting zone;
cam track means for receiving the crank arm of said plurality of faller bars to control orientation of the faller bars as they are pushed along the path;
a crowder roll disposed to contact said faller bars moving along the defined path to urge them into engagement with said drive sprocket; and, wherein,
the integral crank arm extends from one end only of each faller bar; and,
the integral crank arm extends from opposite ends of adjacent faller bars constrained by said path means.

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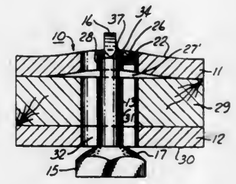
**4,293,984**
**SPRING TENSION FASTENER**
**John Kaufmann, Jr., 3716 Woodrow Ave., Pittsburgh, Pa. 15227, assignor to John Kaufmann, Jr., Pittsburgh, Pa.**
**Continuation of Ser. No. 885,512, Mar. 13, 1978, abandoned.**
**This application Oct. 30, 1979, Ser. No. 89,756**
**Int. Cl.³ A44B** *17/00*
**U.S. Cl. 24—221 R** **1 Claim**

1. A spring tension fastener for tightly securing together in face-to-face relationship at least a pair of plate members substantial thickness fixed relative to each other, one of said plate members being formed of spring material and being arched to form a gap between it and the opposing plate member when the arched plate member of spring material is in a relaxed state, the opposing plate member being substantially flat, both of said plate members being provided with through openings which are elongated and which are in registration with each other, the face of the arched plate member formed of spring material away from the opposing flat plate member being provided with ramp surfaces at diametrically opposed locations and being further provided at diametrically opposed locations between the ramp surfaces with locking recesses, the common axis longitudinally across the locking recesses being at right angles to the major axis of said elongated openings, and a rigid pin fastener element including a straight shank adapted to pass through said registering openings of the plate members and having a turnable head with a rounded interior end face and



wrench flats on one end of the shank of a size unable to pass through said openings and bearing against the face of the flat plate member distant from the arched plate member and also having an elongated fastener head at the other end of the shank extending transversely and equidistantly beyond opposite sides of said shank, the fastener head having a side profile and an end profile approximating the configuration of the elongated openings and being sized to pass therethrough axially of the registering openings, said fastener head having diametrically oppositely disposed flat cam faces on its interior side adapted to rotationally pass over said ramp surfaces and drop into said locking recesses with the fastener head then being arranged across the major axis of said elongated openings, the arched plate member of spring material then exerting tension on said rigid pin fastener element.

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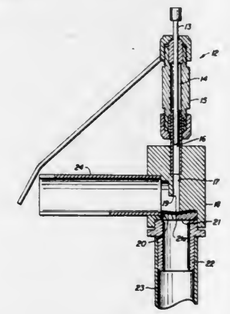
**4,293,985**
**METHOD AND APPARATUS FOR MAKING BOUNCE CRIMPED YARN**
**Philip C. Feffer, Silver Springs, Md., assignor to Chevron Research Company, San Francisco, Calif.**
**Filed Jan. 7, 1980, Ser. No. 110,050**
**Int. Cl.³ D02G** *1/16*
**U.S. Cl. 28—254** **9 Claims**



1. A process for manufacturing a bounce crimped multifilament thermoplastic yarn having improved fiber-fiber coherency which comprises the steps of:

(a) supplying a drawn multi-filament thermoplastic yarn to an enclosed texturizer chambered bounce crimper comprising a texturizing chamber, a yarn entrance passage, a lateral yarn exit passage, a fluid inlet passage, a fluid exhaust passage axially aligned with said yarn entrance passage and a foraminous surface covering said fluid exhaust passage, and supplying a compressible heated fluid to said texturizing chamber with sufficient force to draw said yarn into said texturizing chamber and hurl it against said foraminous surface with sufficient force to axially compress said yarn and rebound and discharge said yarn from said bounce crimper through said yarn exit and whereby the bulk of said fluid passes through said foraminous surface and said fluid exhaust passage;

(b) obstructing a portion of said fluid exhaust passage to substantially prevent the occurrence of filament loops and filament entanglement in said discharged crimped yarn; and

(c) supplying the discharged crimp yarn to a fluid vortex interlacer, without substantially increasing the tension on said crimped yarn, wherein said crimped yarn is fluid interlaced to yield a bounced crimped yarn having improved fiber-fiber coherency.

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**4,293,986**

## METHOD OF MAKING A QUARTZ CRYSTAL OSCILLATOR

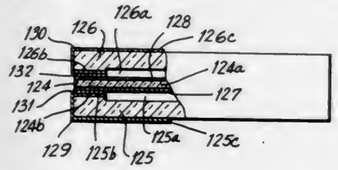
**Masatoshi Kobayashi; George Shimakawa; Yukio Hara, all of Nagano; Hiroyuki Fujii, Suwa, all of Japan, and Kabushiki Kaisha Seikosha, 03, Suwa, both of Japan, assignors to Matsushima Kogo Kabushiki Kaisha, Toyko**

**Filed Dec. 5, 1978, Ser. No. 966,688**

**Claims priority, application Japan, Dec. 5, 1977, 52-145863; Dec. 5, 1977, 52-145864**

**Int. Cl.³ H01L** *41/22*

**U.S. Cl. 29—25.35** **3 Claims**




1. A method for manufacturing a quartz crystal oscillator package having a high internal vacuum, said package comprising a quartz crystal vibrator with a frame, a pair of housing elements having peripheral surfaces, said peripheral surfaces being shaped to register one to the other, a hermetic seal at the periphery of said oscillator package, comprising the steps of:

(a) coating said peripheral surfaces with a metal film;

(b) coating at least one of said metal films with a gas free material capable of forming an alloy with said metal film, said alloy forming coating being produced on said at least one said metal film at an ambient pressure less than $10^{-2}$ torr, whereby gas is eliminated from said alloy forming coating during step (b);

(c) positioning said coated housing elements in an opposed position, said coatings being opposed one to the other, said crystal vibrator with a frame being enclosed within said opposed housing elements;

(d) drawing a high vacuum over the elements of said quartz crystal oscillator package and within said housing elements;

(e) applying heat under said high vacuum to fuse said alloy forming coating with said metal film to form an alloy whereby said housing elements are rigidly and hermetically joined together and said package has said high internal vacuum within said joined housing elements.

**4,293,987**

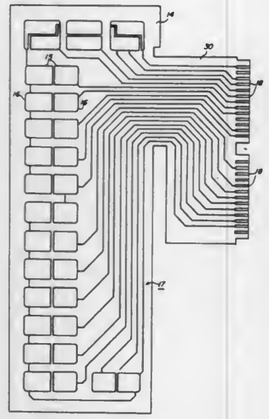
## METHOD OF FABRICATING CAPACITIVE TOUCH SWITCH PANEL

**Tom L. Gottbreht, Plano, and Glen C. Shepherd, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 105,802, Dec. 20, 1979, which is a continuation of Ser. No. 887,387, Mar. 16, 1978. This application Dec. 21, 1979, Ser. No. 106,294**

**Int. Cl.³ H01G** *4/30;* **H01H** *9/26*

**U.S. Cl. 29—25.42** **32 Claims**




1. A method of fabricating a capacitive touch switch panel comprising the steps of:

(a) forming conductive touch pads on one major surface of a rigid dielectric panel;

(b) forming pairs of spaced-apart conductive pads and conductive leads extending to said conductive pads on one of two opposite major surfaces of a flexible synthetic resin sheet; and

(c) bonding the second of the said two opposite surfaces of said flexible synthetic resin sheet to the opposite major surface of said rigid dielectric panel with each of said pairs of conductive pads in registered alignment with a respective one of said conductive touch pads.

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**4,293,988**

## CONTROLLED DEFLECTION ROLL

**Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland**

**Filed Apr. 28, 1980, Ser. No. 144,772**

**Claims priority, application Switzerland, May 15, 1979, 4499/79**

**Int. Cl.³ B21B** *13/02*

**U.S. Cl. 29—116 AD** **6 Claims**

1. A controlled deflection roll comprising:

a stationary roll support;

a rotatable roll shell;

means for mounting said rotatable roll shell for rotation about said stationary roll support;

at least one pressure element for supporting the rotatable roll shell upon said stationary roll support;

said pressure element being provided with bearing surface means upon which there bears said roll shell, during operation of said controlled deflection roll, with the aid of a liquid film;

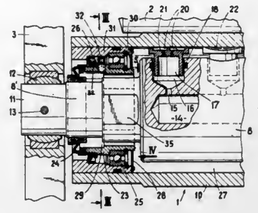
said roll shell having opposed ends;

said means for rotatably mounting said roll shell comprising bearing means arranged at the opposed ends of said roll shell;



seal means for sealing the opposed ends of said roll shell towards the outside;

said roll shell and said stationary roll support forming therebetween an intermediate chamber;




a throttle disk provided with throttle openings arranged at the side of each related one of said bearing means confronting said intermediate chamber between said roll support and said roll shell; and

outflow means for the withdrawal of the liquid arranged between the bearing means and said seal means.

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**4,293,989**

## GLUE ROLLER FOR LABELLING MACHINE

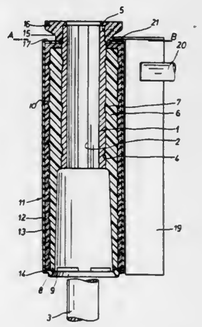
**Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth, Donau, Fed. Rep. of Germany**

**Filed Jun. 11, 1979, Ser. No. 47,501**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 282561**

**Int. Cl.³ B21B** *31/08*

**U.S. Cl. 29—130** **9 Claims**




1. Glue roller for labeling machines, with a metal hub for rotationally fixed mounting on a drive shaft, a tubelike support body fixed on the hub and with an elastic sleeve, having a cylindrical outer surface, seated on the support body, the hub and the support body being provided with interengaging recesses and projections, characterized in that the support body (6) is formed by a first moulded part of foam material having sealed boundary zones, which is foamed directly onto the hub (1), that the elastic sleeve (11) is formed by a second moulded part of elastic foam material with sealed boundary zones (13), which is foamed directly on the support body (6), that the foam material of the support body (6) has a lower elasticity than the foam material of the sleeve (11), and that the support body (6) and the elastic sleeve (11) are provided with interengaging projections (10) and recesses (12) which extend parallel to the axis of the roller.

**4,293,990**

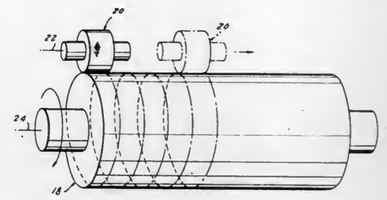
## METHOD OF MAKING EMBOSSING ROLL FOR PRODUCING PAPER TOWELS

**Stephen F. Pollock, Palatka, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.**

**Division of Ser. No. 842,161, Oct. 14, 1977, Pat. No. 4,181,068. This application Oct. 18, 1979, Ser. No. 86,079**

**Int. Cl.³ B21M** *1/14*

**U.S. Cl. 29—148.4 D** **2 Claims**




1. The method of producing an embossing roll which includes, the steps of, producing an embossing tool which has a cylindrical surface bearing a continuous spiral pattern of identical embossing designs, rotating an unembossed roll about a first axis at a predetermined peripheral rate, rotating said engraving tool about a second axis which is parallel with said first axis and with said axes being so spaced that said engraving tool mates with the surface of said unembossed roll, and moving said engraving tool axially at a rate relative to said peripheral rate so that it moves the axial dimension of said design patterns during each complete rotation of said unembossed roll whereby a continuous spiral embossing design is produced on said unembossed roll.

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**4,293,991**

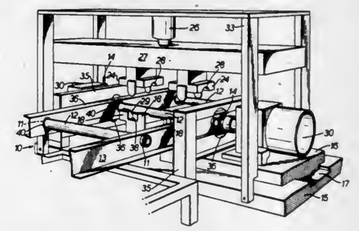
## APPARATUS FOR ASSEMBLING LADDER-TYPE FRAMES

**William Bailey, P.O. Box 73, Acacia Ridge 4110, Qld., Australia**

**Filed Sep. 17, 1979, Ser. No. 76,086**

**Int. Cl.³ B23P** *11/00*

**U.S. Cl. 29—243.52** **19 Claims**




1. Apparatus for assembling frames of the type having transverse members extending between side members and connected thereto at each end by a compression joint, said apparatus including a main support frame for supporting a pair of connection-forming assemblies, each adapted to co-operate with an end of said transverse member adjacent a respective said side member, each said connection-forming assembly including compressing means located on the outside of said side member and adapted to co-operate with an anvil assembly located on the inside of said side member, said anvil assembly having two co-operating parts provided with complimentary recesses to receive said transverse members, one said part being fixed to a base plate slidably mounted on said support frame for movement in the direction parallel to said transverse members and wherein said compressing means is mounted on

said base plate and movable with respect thereto whereby said anvil assembly and compressing means are movable towards one another and across said support frame to co-operate with the respective said end to form said compression joint.

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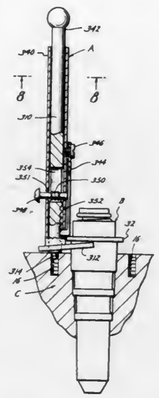
**4,293,992**
**DIESEL FUEL INJECTOR TOOL**
**James E. Webb, 13809 Hershie, Houston, Tex. 77015**
**Filed Sep. 17, 1979, Ser. No. 76,149**
**Int. Cl.³ B23P** *19/04*
**U.S. Cl. 29—267** **1 Claim**



1. A tool for removing fuel injectors from diesel engines comprising:
an elongated member having a first end and a second end;
an injector engaging member fixedly mounted to a tube adapted for receiving the elongated member, said elongated member being movably mounted inside of the tube;
said injector engaging member engageable with the injector between a collar formed on the injector and the diesel engine for prying the injector from the diesel engine;
said first end of the elongated member being engageable with the diesel engine and having a locating means mounted thereon for holding said elongated member in a fixed relationship to the injector;
a pawl on said tube which engages a recess on said elongated member to move said elongated member relative to the injector engaging member for maintaining contact of the injector engaging member with the fuel injector as the fuel injector is pryed loose from the diesel engine.

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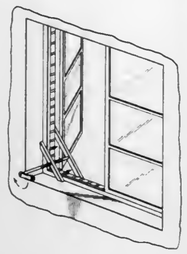
**4,293,993**
**TOOL FOR REMOVING CASEMENT WINDOW FROM BUILDING**
**James A. Baker, P.O. Box 71, Dunkirk, Md. 20754**
**Filed May 16, 1979, Ser. No. 39,379**
**Int. Cl.³ B26B** *27/14*
**U.S. Cl. 29—278** **4 Claims**

1. A tool for removing a casement window from the wall of a building, said casement window comprising a first frame containing the glass of said casement window, said first frame being contained in said wall by a second frame embedded in said wall, said tool comprising:
a first bar for bearing on the exterior vertical portion of the wall and on the vertical portion of the sill of the window adjacent to a selected corner of the window;
a second bar for bearing on interior portions of said first frame of said selected corner of said casement window, said second bar being shorter than said first bar, and said second bar having bevelled ends for bearing on vertical and horizontal portions of said first frame adjacent to said selected corner of said window;
a threaded rod connecting said first and second bars for controllably applying a force to pull said first and second bars together to move the corner of said first frame corresponding to said selected corner of said casement window past said embedded second frame towards the exterior of said building;
said first and second bars and said threaded rod comprising means for advancing said threaded rod within a selected one of said first and second bars upon rotation of said threaded



rod, and for preventing the advancement while allowing the rotation of the threaded rod within the other of said first and second bars upon said rotation of said threaded rod, and for allowing at least one of said bars to rotate in a direction towards said threaded rod during said removal of said casement window; and
no-mar means mounted at each said end of said second bar for protecting the interior portions of said wall and sill adjacent to said selected corner of said casement window while said tool operates to move said second frame through said first frame.

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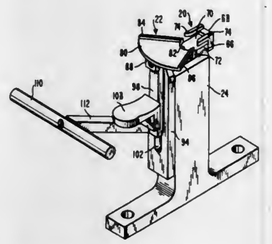
**4,293,994**
**SLIDERING METHOD AND APPARATUS**
**George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.**
**Filed Aug. 30, 1979, Ser. No. 70,940**
**Int. Cl.³ B23P** *19/04;* **B21D** *53/50*
**U.S. Cl. 29—409** **11 Claims**



1. A method of installing a slider on a pair of slide fastener stringers having respective end sections which are separated, the method comprising the steps of
positioning a slider on a support having a slider holding mechanism,
raising a stringer guiding means which has an upper surface and a pair of converging flanges in front of the slider so that the inner surfaces of said converging flanges are aligned with and adjacent to respective inner surfaces of diverging ends of slider flanges;
placing inner portions of the end slide fastener stringer sections, including sections of coupling element trains with respective slider flange engaging means of the slide fastener stringers, on the upper surface of the stringer guiding means;
engaging the slider flange engaging means of the end slide fastener stringer sections with the inner surfaces of the respective guiding means flanges;
simultaneously advancing the end slide fastener stringer sections along the guiding means flanges while maintaining engagement of the slider flange engaging means with the respective guiding means flanges to simultaneously insert the end slide fastener stringer sections into the slider and to interlock the trains of coupling elements on such end slide fastener stringer sections by means of the slider,
lowering the stringer guiding means, and
removing the slider and stringers from the support.



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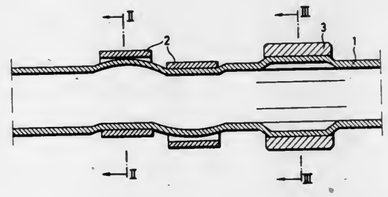
**4,293,995**
**METHOD OF MAKING CAMSHAFT FOR RECIPROCABLE PISTON ENGINES**
**Friedrich Jordan, Kürten, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany**
**Continuation of Ser. No. 898,818, Apr. 21, 1978, abandoned, which is a continuation of Ser. No. 733,071, Oct. 18, 1975, abandoned. This application Oct. 5, 1979, Ser. No. 82,017**
**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546802**
**Int. Cl.³ B23P** *17/00*
**U.S. Cl. 29—421 R** **2 Claims**



1. A method of making a camshaft having cam and bearing ring members on a hollow shaft with the cam ring members laterally offset relative to the axis of the shaft, which includes placing cam and bearing ring members on the tubular shaft, mounting said members on said tubular shaft in dies to preserve their shape, each of said ring members having in the inner wall thereof at least one recess means extending substantially the length of the member, and expanding said tubular member into said ring members and into said recess means to secure said ring members to said shaft with the cam ring members laterally offset relative to the axis of the shaft.

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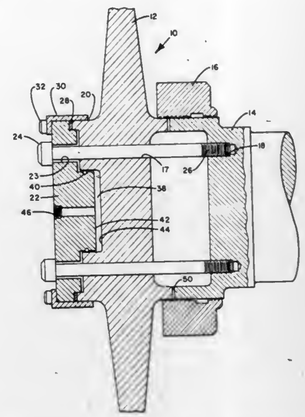
**4,293,996**
**METHOD FOR SECURING A WHEEL TO A ROTATABLE SHAFT**
**Carl H. Geary, Jr., Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.**
**Filed Oct. 27, 1978, Ser. No. 955,428**
**Int. Cl.³ B23P** *11/02*
**U.S. Cl. 29—446** **3 Claims**

1. A method of securing a wheel member to a rotatable shaft comprising the steps of:
positioning the wheel member between a piston member and one end of the shaft, with the piston member extending into a chamber defined by the wheel member;
passing a plurality of bolts through aligned apertures defined by the piston member and wheel member and into holes defined by the shaft;
securing a first end of each bolt to the shaft;
attaching a second end of each bolt to the piston member;
delivering a pressurized fluid into the chamber defined by the wheel member to move the piston member relative to the wheel member and form a space therebetween;
stretching the bolts as a result of the movement of the piston member attached thereto; and



placing a spacing member in the space formed between the wheel member and the piston member to place a compressive force on the wheel member for positively securing the wheel member to the shaft.

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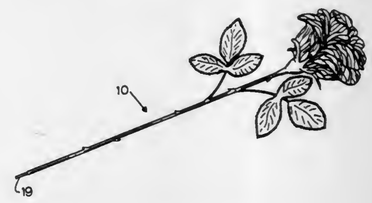
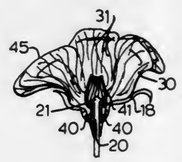
**4,293,997**
**METHOD FOR MANUFACTURE OF ARTIFICIAL FLOWERS**
**Bobby L. Lee, 5, Mok Cheong St., ground floor, block C, Kowloon, Hong Kong**
**Division of Ser. No. 925,705, Jul. 18, 1978, which is a continuation-in-part of Ser. No. 790,016, Apr. 22, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 94,174**
**Int. Cl.³ B23P** *11/02*
**U.S. Cl. 29—450** **11 Claims**





7. A method for making artificial flowers, comprising:
molding around a reinforcing wire core, as one single inte-

gral plastic unit, a stem with side petioles and flower calyx and attachment means surrounded by said calyx,

securing pre-cut artificial leaves to said petioles, and

attaching a preassembled artificial flower to said attachment means.

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**4,293,998**

## AUTOMATIC APPARATUS FOR INSERTING ELECTRIC COMPONENTS

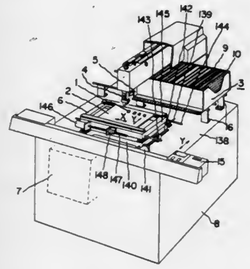
**Hidetoshi Kawa, Ibaraki; Kazuhiro Mori, Katano; Yoshihiko Misawa, Katano, and Hiroshi Nakagawa, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,378**

**Claims priority, application Japan, Aug. 31, 1978, 53-107130**

**Int. Cl.³ H05K** *13/04*

**U.S. Cl. 29—564.1** **6 Claims**



1. In an automatic apparatus for inserting electric components into a circuit board, the electric components having a plurality of lead wires which are arranged in two rows in approximately the same direction, the improvement comprising a taking-out chuck unit provided with a pair of forming levers for spreading apart the tip ends of said lead wires in two rows and retaining said lead wires, a driving source for moving the taking-out chuck unit from a component taking-out position, an insertion chuck unit for receiving and retaining the electric components from said taking-out chuck unit delivered by the driving source thereby to insert the electric components into said circuit board, and a component feed portion for sequentially feeding said electric components to the components taking-out position of said taking-out chuck unit.

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**4,293,999**

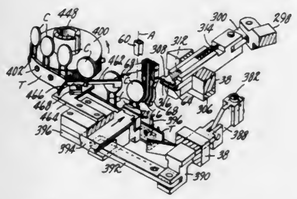
## RADIAL LEAD INSERTING MACHINE

**Daniel W. Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Farmington, Conn.**

**Filed Oct. 31, 1978, Ser. No. 956,436**

**Int. Cl.³ H05K** *3/32*

**U.S. Cl. 29—564.6** **19 Claims**



1. In a machine for inserting the leads of radial-lead type components into a circuit board, a driver cyclically reciprocable toward and from the board, means for feeding successive tape-mounted components into registration with the path of the driver, a pusher operable by the driver yieldingly to accommodate different body shapes and sizes of the components and to urge the leads of each component endwise into the board, cooperative fingers movable to grip and guide the leads of each component while it is acted on by the pusher, and cooperative knives for separating each component from the tape and shearing the leads to be inserted by the pusher while they are under the control of the fingers, means for shifting that portion of the tape holding the excess lead portions out of the path of the component to be inserted and the closed fingers guiding its leads; and means to actuate the fingers and knives in sequence in response to movement of the driver.

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**4,294,000**

## MACHINE FOR INSERTING ELECTRONIC COMPONENTS

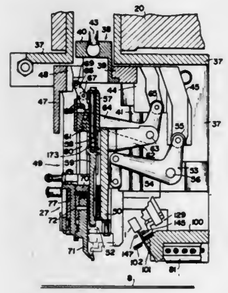
**Tetsuo Takahashi; Yoshinobu Taguchi; Kotaro Harigane; Tetsuro Ito, and Akihiro Kato, all of Tokyo, Japan, assignors to Tokyo Denki Kogaku Kogyo Kabushiki Kaisha, Japan**

**Filed Apr. 27, 1979, Ser. No. 34,014**

**Claims priority, application Japan, May 2, 1978, 53-53161**

**Int. Cl.³ H05K** *3/32, 13/02*

**U.S. Cl. 29—564.6** **15 Claims**



1. In a machine for processing and inserting parallel lead electronic components from an electronic component web carrier into lead receiving openings in a printed circuit board, insert means for receiving an electronic component at a predetermined position and inserting the electronic component into the printed circuit board, said insert means including an insert sub-assembly having

a frame;

first slider means slidably mounted on the frame;

driving means mounted on said frame for driving the first slider means;

second slider means slidably mounted on said frame and cooperating with movement of said first slider means, said second slider means including lead inserting and guiding means for holding and guiding the electronic component and push bar means for displacing the electronic component from the predetermined position to an inserted position under the control of the lead inserting and guiding means;

intermittent drive means;

feed means mounted on said frame and driven by the intermittent drive means for feeding the electronic component web carrier intermittently, pitch by pitch, said feed means including a feed member for receiving and feeding said electronic component web carrier while maintaining electronic components of said electronic component web carrier substantially vertically and a holding member for holding the electronic components in an oblique orientation to the vertical direction;

cutting means for separating one electronic component from said electronic component web carrier fed by the feed means while the electronic component is being held by said holding member in an oblique orientation; and

transfer means including reciprocating means for producing reciprocative movements between the cutting means and said lead inserting and guiding means, and electronic component holding means for holding a lead of the electronic component to be separated by said cutting means while the electronic component is being held by said holding member in an oblique orientation and transferring said electronic component to said lead inserting and guiding means after said electronic component has been separated by said cutting means whereupon the transferred electronic component is situated in a substantially vertical orientation.



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**4,294,001**

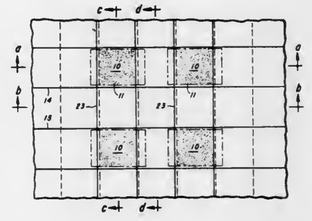
## METHOD OF MAKING IMPLANT PROGRAMMABLE METAL GATE MOS READ ONLY MEMORY

**Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jan. 8, 1979, Ser. No. 1,571**

**Int. Cl.³ H01L** *21/425*

**U.S. Cl. 29—571** **10 Claims**



1. A method of making a read-only-memory comprising the steps of: forming a plurality of insulated gate field effect transistors in a face of a semiconductor body, each of the transistors having a source, a drain and a polysilicon gate, the transistors being in a regular pattern to provide an array of memory cells; applying a plurality of parallel polysilicon strips each including a plurality of said gates extending along said face with a metal layer over each strip except over the gates so the polysilicon of each gate is not covered by metal; and thereafter programming the array of memory cells by masked ion implant penetrating through the gates of selected ones but not all of the field effect transistors.

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**4,294,002**

## MAKING A SHORT-CHANNEL FET

**Chakrapani G. Jambotkar, Hopewell Junction, and Paul P. Wang, Kingston, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed May 21, 1979, Ser. No. 41,023**

**Int. Cl.³ H01L** *21/26*

**U.S. Cl. 29—571** **8 Claims**

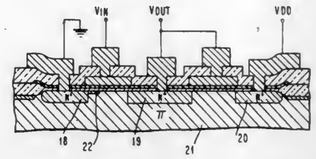
1. A method for forming a field effect transistor which comprises:

(a) ion-implanting an impurity of one conductivity type into two areas on a major face of a second conductivity type substrate of substantially low conductivity to a first depth to form two closed, spaced regions of one conductivity type to function as the source and drain of the field effect transistor;

(b) ion implanting an impurity of the second conductivity type into a third area including at least a portion of the first of said two areas and a portion of the area between the two regions to a second depth which is only a small fraction of the first depth to form a third region of the said second conductivity type adjacent to the first of the said two regions but spaced from the second of the two said regions to function as the effective channel of the field effect transistor;

(c) forming a gate for the field effect transistor insulated from the said low conductivity substrate over the third region; and

(d) forming electrical contacts to the said two closed spaced regions and the said gate to provide connections to the field effect transistor.



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**4,294,003**

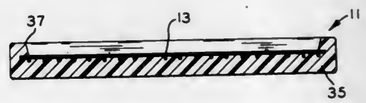
## INSULATED RADIANT HEATING PANEL

**Don A. Coverstone, Larwill, Ind., assignor to Lyall Electric, Inc., Albion, Ind.**

**Filed Dec. 13, 1979, Ser. No. 103,190**

**Int. Cl.³ H05B** *3/00*

**U.S. Cl. 29—611** **9 Claims**



1. The method of forming a radiant heating panel comprising the steps of:

selecting a relatively flat metal heat-radiating plate having a first generally planar surface for forming a front surface of the panel;

adhering an electrically insulated sheet heating element to a second generally planar surface of the metal plate opposite the first surface;

embedding the metal plate and adhering heating element in a flowable material to cover the heating element and the plate edges about substantially the entire periphery of the plate while leaving the plate front surface substantially material free; and

solidifying the flowable material to form an electrically and thermally insulating frame for supporting the plate and heating element.

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**4,294,004**

## METHOD OF ASSEMBLING A SWITCH AND TERMINAL ASSEMBLY

**James P. Frank, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 671,965, Mar. 30, 1976, Pat. No. 4,095,073.**

**This application Mar. 6, 1978, Ser. No. 884,097**

**Int. Cl.³ H01H** *11/00, 11/04, 9/12*

**U.S. Cl. 29—622** **31 Claims**

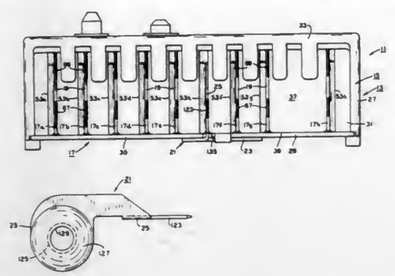
1. A method of assembling a switch and terminal assembly having a casing including a pair of casing members, a switch means accommodating chamber within the casing, a plurality of terminals respectively having electrical connector sections, and a ground device having a ground connection section and another section, the method comprising the steps of:

disposing the terminals in one of the casing members with the electrical connection sections of the terminals exposed

beyond the casing and arranged generally in row formation therealong;

positioning the other of the casing members with respect to the one casing member and the terminals so as to generally enclose the chamber within the casing and retain the terminals against displacement therefrom; and thereafter

disposing the ground connection section of the grounding



device generally in the row formation with the electrical connection sections of the terminals and inserting the another section of the grounding device from exteriorly of the enclosed casing through one of the one and other casing members into releasable gripping engagement with the other of the one and other casing members so as to at least in part oppose the separation thereof and the displacement of the grounding device from the casing.

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**4,294,005**

## METHOD OF FORMING CATHODIC ELECTRODE STRUCTURE FOR A SODIUM SULFUR CELL

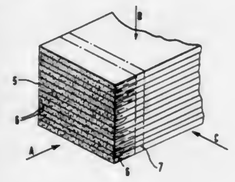
**Michael P. J. Brennan, Helsby, England, assignor to Chloride Silent Power Limited, London, England**

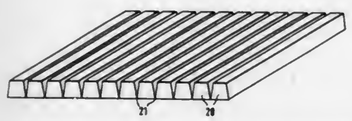
**Continuation-in-part of Ser. No. 861,924, Dec. 19, 1977, Pat. No. 4,176,447. This application May 23, 1979, Ser. No. 41,380**

**Claims priority, application United Kingdom, Dec. 20, 1976, 53197/76; Australia, Feb. 6, 1979, 43990/79; India, Feb. 6, 1979, 87/DEL/79; South Africa, Feb. 6, 1979, 79/0504; European Pat. Off., Feb. 13, 1979, 7930214.8; Japan, Feb. 13, 1979, 54-15371; United Kingdom, Feb. 13, 1979, 04968/79**

**Int. Cl.³ H01M *4/04***

**U.S. Cl. 29—623.5** **5 Claims**





1. In the manufacture of a sodium sulphur cell, a method of forming a cathodic electrode structure comprising the steps of forming a compressible block of electronically conductive fibrous material which is chemically resistant to a hot cathodic reactant containing sulphur/polysulphides, the fibres in the block predominantly extending parallel to a given plane in the block and being randomly oriented in said plane, cutting the block in a plurality of planes normal to said one plane to form at least one sheet in which substantially all of the fibres have a component of direction normal to the plane of the sheet, compressing the sheet in a direction normal to the plane of the sheet in a series of regions defined by parallel strips of the sheet surface to form a series of parallel grooves with sloping sides defining segments of trapezoidal section between the compressed regions with fibres lying normal to the parallel surfaces of the trapezoids between the compressed regions, impregnating the fibrous sheet, either before compression or during compression, with the cathodic reactant at a temperature such that the cathodic reactant is liquid, and cooling the impregnated shape to solidify the reactant.

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**4,294,006**

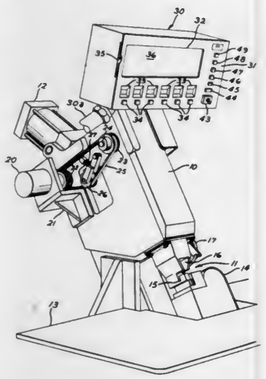
## AUTOMATIC CONTROL FOR WIRE CRIMPING MACHINE

**Eugene C. Bair, and Willard C. Hopkins, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.**

**Filed Oct. 18, 1979, Ser. No. 86,000**

**Int. Cl.³ H01R *43/04*; B23P *21/00***

**U.S. Cl. 29—701** **17 Claims**



1. Automatic control apparatus for wire crimping equipment adapted to make, during a crimp cycle having one or more crimp steps, electrical interconnections with one or more magnet wire segments extending from windings supported on the core of a dynamoelectric machine, the equipment having a crimp height setting mechanism which is substantially infinitely variable over a predetermined range of maximum and minimum height limits, the control apparatus comprising:

first input means for establishing the number of crimp steps to be performed and for generating a signal representative of each step;

second input means for establishing any desired crimp height setting, within said range of maximum and minimum limits, for each crimp step to be performed and for generating a signal representative thereof;

means operative in response to the first and second input means during each crimp step for actuating the crimp height setting mechanism to the setting established for that step;

and crimp actuating means for initiating a crimp operation at each crimp step after the crimp height mechanism has been properly positioned to the corresponding crimp height setting.



**4,294,007**

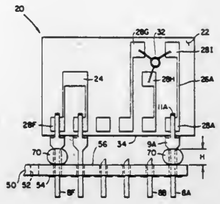
## METHOD OF MOUNTING THICK FILM HYBRID CIRCUITS IN PRINTED CIRCUIT BOARDS

**Paul R. Ellis, Jr., Alburquerque, N. Mex., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.**

**Division of Ser. No. 417, Jan. 2, 1979, Pat. No. 4,257,668. This application Dec. 31, 1979, Ser. No. 108,624**

**Int. Cl.³ H05K *3/36***

**U.S. Cl. 29—830** **7 Claims**



1. In a method of fabricating an electrical circuit assembly including a hybrid circuit having flexible terminal leads that depend from a substrate and extend through holes in a mother board and are soldered to conductive traces on the board, the improvement comprising the steps of:

inserting at least a pair of leads into apertures extending through associated fracturable beads that are relatively non-porous for spacing the substrate and portions of the leads above the board during soldering of leads to traces,

fracturing the beads following soldering of the board, and

removing bead parts from leads so that the leaded substrate may be tilted generally about the line intersection of planes containing surfaces of the substrate and the board.

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**4,294,008**

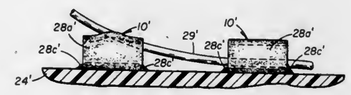
## METHODS OF MANUFACTURING AND SECURING TUBULAR WIRE-RETAINING ANCHORS TO CIRCUIT BOARDS

**Frank J. Pollack, Naperville, Ill., assignor to Western Electric Company, Inc., New York, N.Y.**

**Filed Jun. 27, 1979, Ser. No. 52,655**

**Int. Cl.³ H05K *3/20***

**U.S. Cl. 29—831** **7 Claims**



1. A method of forming discrete circuit wiring on a circuit board including securing a tubular-shaped anchor having an outer wall surface of continuously arcuate profile in the circumferential direction, and adapted to retain an elongated element therewithin, on a circuit board, comprising the steps of:

applying a viscous portion of adhesive on the surface of said circuit board at a desired anchor location, said viscous portion comprising the second part of a two-part adhesive, with the first part being initially applied at least to a portion of the outer arcuate wall surface of said anchor, and being of a type that readily dries as a non-tacky coating at ambient temperature, and which requires no protective covering prior to said anchor being brought into contact with the second part adhesive portion;

positioning said tubular anchor in said second part adhesive portion such that a solidified adhesive bond is formed on opposite sides of the contact juncture between a portion of the arcuate wall surface of said anchor and said circuit board, at which time the second part adhesive portion rapidly solidifies to form a fillet-shaped bond between said anchor and circuit board;

threading a section of at least one elongated element, in the form of a wire, through said anchor so as to secure the threaded section of wire to said circuit board, and

connecting opposite ends of said wire to spaced conductive sites on said board.

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**4,294,009**

## METHOD OF MANUFACTURING A HYBRID INTEGRATED CIRCUIT

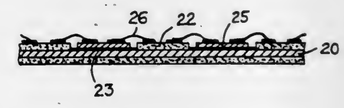
**Renee Quintin, Houdan, and Claude M. Villemant, Paris, both of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France**

**Filed Jun. 28, 1979, Ser. No. 52,932**

**Claims priority, application France, Jun. 29, 1978, 78 19509**

**Int. Cl.³ H05K *3/32***

**U.S. Cl. 29—832** **8 Claims**



1. A method of manufacturing a hybrid integrated circuit having on a substrate passive components, such as resistors and capacitors deposited in the form of thin or thick films, and active components, such as diodes, transistors and monolithic integrated circuits, connected together by means of an interconnection network, comprising the steps of:

(a) selecting a steel plate of a size corresponding to the circuit to be manufactured;

(b) preparing the surfaces of the steel plate to receive a coat of enamel which can be bonded to and vitrified on steel;

(c) masking selected areas of the plate by the local application of a coat of thermally decomposable or volatilizable material;

(d) coating the surfaces of the plate and mask with an even layer of an enamel composition which can be vitrified on steel;

(e) drying the enamel coating while leaving the masking intact;

(f) removing the dried enamel deposited over the masking;

(g) thermally treating the plate in order to bond the dried enamel coating on the steel, and for volatilizing or burning the masking material on the masked areas, thus forming a dielectric enamel layer, and baring of the masked areas;

(h) forming on selected portions of the bared areas of the plate a solderable and electrically conducting metallic film;

(i) forming passive components and an interconnection network on the continuous layer of dielectric enamel using techniques of depositing inks or pastes followed by baking;

(j) fixing monolithic integrated circuits to the previously metallized areas of the plate, and;

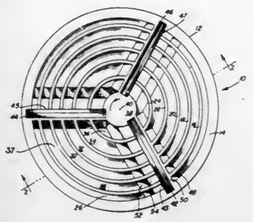
(k) electrically connecting the monolithic circuits to the interconnection network by means of metallic conductors.

**4,294,010**

## ROTATABLE SAFETY RAZOR AND BLADE CARTRIDGE THEREFOR

**Evan N. Chen, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed May 23, 1980, Ser. No. 152,901**
**Int. Cl.³ B26B *19/14***
**U.S. Cl. 30—42** **19 Claims**



1. A rotatable safety razor cartridge comprising:
a circular blade supporting member;
a plurality of arcuate grooves concentrically formed in said supporting member about a central axis, said grooves forming a plurality of concentric skin-engaging lands;
at least one razor blade connected to said supporting member and extending through said plurality of grooves and lands with a cutting edge positioned for engaging the skin of a user; and
means for engaging said supporting member with a rotary drive mechanism.

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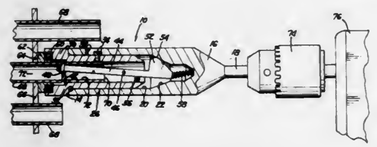
**4,294,011**

## TUBE CUTTER

**Wendell J. Kemme, Redlands, Calif., assignor to T/Drill, Inc., Ann Arbor, Mich.**

**Filed Jun. 18, 1979, Ser. No. 49,398**
**Int. Cl.³ B23D *21/06*; B26B *27/00***
**U.S. Cl. 30—106** **4 Claims**



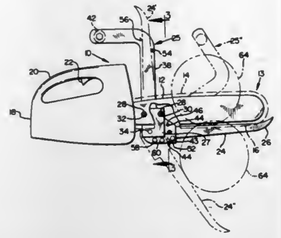
1. A cutter apparatus for cutting tubes a fixed distance outward from a support wall, said cutter apparatus comprising:
a cylindrical housing having an open end, an interior cam surface, and a closed end;
connecting means located on said closed end of said housing for receipt of drive means for rotating said housing;
a hollow tubular coupling having one end slidably mounted within said open end of said housing and the other end having a central bore to closely receive one of said tubes, said coupling being slidably movable between a first position and a second position relative to said housing;
an elongated arm pivotally mounted on said coupling within said coupling and said housing;
a cutter wheel attached to one end of said arm;
a cam follower on said arm engageable with said cam surface such that relative sliding movement between said housing and said coupling pivots said arm; and
a removable bushing connected to said coupling to provide the selective attachment of variable length bushings for positioning said cutter wheel a predetermined fixed distance from said support wall.

**4,294,012**

## CHAIN SAW ANTI-PINCH GUARD ARM

**Donald D. Lanz, 15702 S. Neibur Rd., Oregon City, Oreg. 97045**

**Filed Mar. 25, 1980, Ser. No. 133,915**
**Int. Cl.³ B27B *17/00***
**U.S. Cl. 30—378** **20 Claims**



1. In combination with a chain saw having an outwardly projecting blade mounting a saw chain having a working stretch, an antipinch guard attachment comprising:
(a) a stiff arm of substantial strength;
(b) pivotal mounting means mounting on one end of the arm on the saw adjacent to the base of the blade in a plane substantially parallel to the plane of the blade, the arm thereby being pivotal between an initial angular position wherein it extends divergently to the working stretch of the saw chain and a second angular position wherein it is adjacent and substantially aligned with the working stretch of the saw chain; and
(c) elongated handle means attached to the arm for adjustment angularly relative thereto and for pivotal movement therewith.

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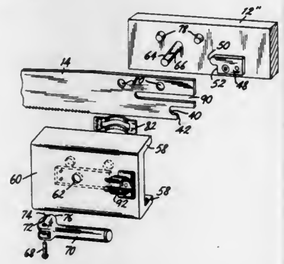
**4,294,013**

## PORTABLE HACKSAW

**Adrian H. Krieg, Woodbridge, Conn., assignor to Widder Corporation, Naugatuck, Conn.**

**Filed Feb. 25, 1980, Ser. No. 124,448**
**Int. Cl.³ B27B *11/00***
**U.S. Cl. 30—392** **15 Claims**



3. In a hacksaw having a body, a motor and a shaft connected to the motor for reciprocating motion, the combination of a blade connected to the shaft, said blade having a haft with a rear surface, said rear surface being cut away, the cut away portion being defined by a line continuing in the long direction of said blade which line at the terminal end of its travel defines a female recess and a wall generally parallel to and spaced inwardly from the rear surface of said haft, cooperating means on said shaft for abutting said recess and said wall in supporting relationship, and means for securing said blade and shaft together.

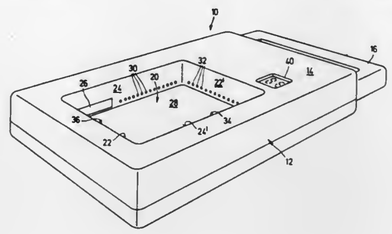


**4,294,014**

## APPARATUS FOR DETERMINING THE SHOE SIZE CORRESPONDING TO A FOOT

**Dieter Baumann, Leun-Stockhausen, Fed. Rep. of Germany, and Pierre Bidegain, Pau, France, assignors to Bidegain S.A., Pau, France**

**Filed Mar. 27, 1980, Ser. No. 134,633**
**Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2912038**
**Int. Cl.³ A43D *1/02***
**U.S. Cl. 33—3 C** **38 Claims**



1. In an apparatus for determining the shoe size corresponding to a foot, said apparatus being of the type having a foot holding device, at least one transmitting unit which radiates spatially bunched signals to a receiving unit opposite the foot holding device, the transmitting unit being subdivided into radiating basic elements and the receiving unit into basic elements responding to the signals, pairs of respective radiating and responding basic elements being in opposed, spaced relationship with basic elements of the same type being arranged side by side in the direction of successive, spaced measuring raster points, the improvement comprising:
the extension of said basic elements in the direction of successive measuring raster points being no greater than the spacing of adjacent measuring raster points; and
at least within adjacent pairs of basic elements, the two basic elements defining each of said pairs being in one to one correlation with each other regarding the signals to be transmitted.

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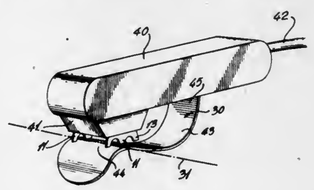
**4,294,015**

## EXTENSOMETER

**Gilbert Drouin, L'Acadie, and Jacques Sibille, Beloeil, both of Canada, assignors to Ecole Polytechnique, Quebec, Canada**

**Filed Dec. 27, 1979, Ser. No. 107,574**
**Int. Cl.³ G01B *7/16***
**U.S. Cl. 33—174 D** **9 Claims**



1. An extensometer for detecting deformation of a biological elongatable member to be stretched, said extensometer comprising:
a support base;
a pair of spaced-apart flexible plates;
a strain gauge secured to each of said flexible plates for measuring deflection of said flexible plates, from the normal plane of said flexible plates;
said flexible plates each further comprising a free end and an opposed end, said opposed end secured to said support base;
said free end further comprising gripping means for engagement in a surface portion of said elongatable member; and
clamping means for applying a force perpendicular to said elongatable member positioned opposite said gripping means of said pair of flexible plates to cause said gripping means to positively engage in said surface portion of said elongatable member, said clamping means being secured to said support base for maintaining said support base substantially stationary with respect to said elongatable member such that elongation of said elongatable member is detected by flexion of said flexible plates.

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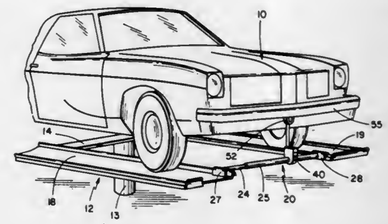
**4,294,016**

## AUTOMOBILE HEIGHT GAUGE

**Edward D. Wilkerson, P.O. Box 755 South Ct., Normandy Beach, N.J. 08739**

**Continuation of Ser. No. 731,061, Oct. 8, 1976, abandoned, which is a continuation of Ser. No. 573,816, May 2, 1975, abandoned. This application Aug. 16, 1977, Ser. No. 825,023**
**Int. Cl.³ G01B *3/02***
**U.S. Cl. 33—180 AT** **2 Claims**



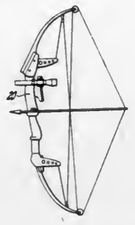
1. In a height gauge for measuring the vertical distance between a vehicle tire support tread and certain selectable parts of a vehicle, and in which the vehicle may be either ground supported or it may be lift supported by a lift which has a pair of separated tire tread engaging supports with each support formed with an upwardly projecting tire guide element, and in which the gauge has an elongated horizontal bar member, a measuring tape cartridge frame mounted for movement along said bar member, coiled tape means in said frame, a magnet carried by the end of said tape means and window means in said frame positioned so that the numerical calibration reads directly the distance from the end of the magnet to the vehicle tire support tread, the improvement comprising a fitting fixed to each end of said bar member and each individually adapted to fit over a guide element or to rest on any vehicle ground support surface, each of said fittings being U-shaped in configuration with at least one leg of the U-shaped fitting being engageable with a vehicle ground support surface or with the tire tread engaging support surface of the lift so that the height gauge measures height from the vehicle tire support tread as a reference and in which the fittings are formed with sufficient clearance so that the bight portion of each does not engage an associated lift tire guide element, and in which both legs of each fitting extend below the elongated horizontal bar member.

**4,294,017**

## ARCHERY SIGHTING DEVICE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

**Robert J. Byrnes, 4366 Genesee Rd., and Bruce R. Byrnes, 937 N. Monroe St., Apt. 4, both of Lapeer, Mich. 48446**

**Continuation-in-part of Ser. No. 935,667, Sep. 19, 1978. This application Mar. 31, 1980, Ser. No. 135,654**
**Int. Cl.³ F41G** *1/46*
**U.S. Cl. 33—265** **5 Claims**



1. An archery sighting device comprising:
a mounting bracket;
first means for affixing said mounting bracket to the midsection of an archery bow;
a curved elongated support member directly rigidly affixed along a portion of the length thereof to said mounting bracket such that the curve thereof is concave relative to the archer when said mounting bracket is affixed to said archery bow;
said curved support member having a radius of curvature which is substantially proportional to the draw length of the archer;
said curved support member being affixed to said mounting bracket such that the lower end of said curved support member extends freely;
an optical sight housing member slidably mounted on said curved support member and slidably movable along the length of said curved support member;
an optical sight mounted within said optical sight housing member such that the longitudinal axis of said optical sight extends substantially transversely to the longitudinal axis of said curved support member;
second means for selectively securing said optical sight housing member at any desired position along the length of said curved support member;
third means operatively cooperating with said second means, said curved support member, and said optical sight housing member for defining detent positions of said optical sight housing member at selectively-predetermined locations along the length of said curved support member;
said curved support member being provided with a dovetail portion along the length thereof;
said optical sight housing member being provided with a dovetail mating portion received by said dovetail portion of said curved support member to permit said housing member to be slidably moved along the length of said curved support member;
said second means comprising a locking screw member extending through said optical sight housing member and adapted to secure said optical sight housing at a predetermined position along the length of said curved support member when said locking screw member is rotated to a locked position; and
wherein said third means comprises:
at least one detent positioning block provided with a detent tooth and adapted to be slidably received within said dovetail portion of said curved support member;
fastening means for selectively securing said detent positioning block at any desired fixed position within said dovetail portion of said curved support member;
a spring-biased lever operatively disposed within said optical sight housing member, said lever including a detent projection portion; and
said lever being selectively movable between a first position wherein said detent projection is in locking engagement with said detent tooth of said detent positioning block, and a second position wherein said detent projection is disengaged from said detent tooth of said detent positioning block.

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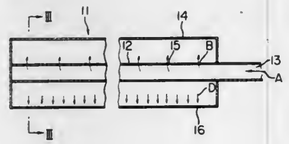
**4,294,018**

## MATERIAL FEED PIPE FOR USE IN BELT-SYSTEM CONTINUOUS VACUUM DRIER

**Eitaro Kumazawa, Sayama; Yukihiro Saiki, Oaza-Hidaka, and Yozo Ishioka, Higashi-Kurume, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan**

**Filed Apr. 9, 1980, Ser. No. 138,812**
**Claims priority, application Japan, Jul. 25, 1979, 54-94731**
**Int. Cl.³ F26B** *15/10*
**U.S. Cl. 34—56** **2 Claims**



1. A material feed pipe for use in a belt-system continuous vacuum drier and oriented above a belt movably mounted within a vacuum drying chamber, comprising: an inner tube member having one end thereof provided with an inlet for material and the other end closed; an outer tube member coaxial with said inner tube and having its two ends closed and encircling said inner tube member and being radially spaced therefrom; a plurality of first nozzle openings provided in an upper part of said inner tube member and oriented at a fixed pitch along the axial length thereof, said first nozzle openings being so devised as to have a larger diameter in regular succession from the inlet end to the opposite end of said inner tube member; and a plurality of second nozzle openings provided in a lower part of said outer tube member and at a fixed pitch along the axial length thereof and having a fixed diameter.

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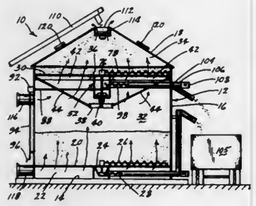
**4,294,019**

## GRAIN DRYING APPARATUS

**Vernon H. Seitmann, Laurel, Iowa 50141**

**Filed May 7, 1979, Ser. No. 36,382**
**Int. Cl.³ F26B** *9/02*
**U.S. Cl. 34—65** **16 Claims**



1. An apparatus for drying grain comprising,
a grain bin having a bottom surface, sidewall and top wall,
a perforated cooling floor supported in said bin in spaced relation from said bottom surface to define an ambient air supply chamber between said bottom surface and cooling floor,
a perforated drying floor supported in said bin and spaced substantially above said cooling floor to define a cooling chamber between said cooling floor and drying floor and a drying chamber between said drying floor and top wall,
said top wall having an opening for the introduction of grain into said drying chamber and said drying floor having an opening therethrough,
a grain hopper supported below said drying floor in communication with said drying floor opening,
a grain discharge conveyor having one end in communication with said hopper and the other end extended outwardly through said sidewall,
said hopper including a gate means adapted to confine grain within said hopper when closed and adapted to permit grain to fall from the hopper into the cooling chamber when opened,
a sweep auger positioned on said drying floor and operative to traverse said drying floor for conveying grain to said hopper through said drying floor opening,
a grain spreader means positioned below said gate means for distributing grain generally uniformly about said cooling chamber, and
a single power means for operating said sweep auger and said grain spreader means.



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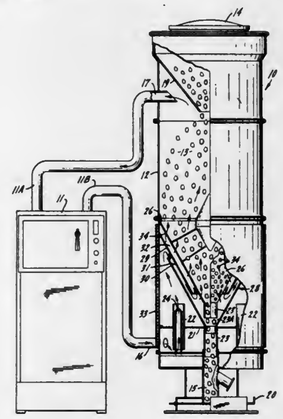
**4,294,020**

## PLENUM DRYING HOPPER WITH INTEGRAL HEATERS

**Arthur J. Evans, Northville, Mich., assignor to Whitlock, Inc., Farmington, Mich.**

**Filed May 9, 1980, Ser. No. 148,517**
**Int. Cl.³ F26B** *17/14*
**U.S. Cl. 34—168** **4 Claims**



1. A plenum drying hopper for reducing the moisture content of granular material, comprising:
a housing enclosing a plenum chamber and including an upper material inlet for introducing a flow of granular material into the plenum chamber and a lower material outlet for discharging the granular material from the plenum chamber;
a perforate diffuser cone, at the bottom of the plenum chamber, for directing the flow of granular material from the plenum chamber into the material outlet, the perforations in the diffuser cone being large enough to permit ready passage of gas therethrough and small enough to preclude passage of all but the finest particles of the granular material;
a gas inlet, extending into the housing below the diffuser cone, for introducing dry gas into the plenum chamber through the diffuser cone;
a gas outlet, extending from the upper portion of the housing, for discharging gas from the housing after contact with the granular material flowing through the plenum chamber;
a separator barrier positioned between the gas inlet and the diffuser cone;
a plurality of gas passages extending through the separator barrier;
a plurality of heaters, one in each gas passage, for heating gas flowing from the gas inlet through such passages toward the diffuser cone; and
deflection shield means, mounted in the lower portion of the housing, between the heaters and the diffuser cone, for deflecting heated gas along a labyrinthine path from the heaters into the plenum chamber through the diffuser cone, shielding the diffuser cone from the heaters to prevent radiant heat from reaching the diffuser cone and deflecting any fine particles of the granular material that pass through the diffuser cone into the material outlet.

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**4,294,021**

## METHOD AND APPARATUS FOR CURING OF ARTICLES

**James O. Turnbull; John C. Barker, both of Cowansville, and Arthur J. Knight, Bromont, all of Canada, assignors to J. J. Barker Company Limited, Cowansville, Canada**

**Filed Apr. 5, 1979, Ser. No. 27,914**
**Int. Cl.³ F26B** *15/12*
**U.S. Cl. 34—224** **6 Claims**



1. An apparatus for curing wet resin coated articles comprising:
a curing chamber, said chamber having a longitudinal direction between inlet and exit openings, said chamber substantially horizontal and hermetically sealed with the exception of said openings;
conveyor means for transporting said articles through said chamber, said conveyor means passing into the inlet opening and out of the exit opening;
at least one supply duct extending parallel to the direction of travel of articles on said conveyor;
a plurality of distribution members, said distribution members extending transversely with respect to the direction of travel of articles on said conveyor means, said distribution members in fluid communication with said supply ducts, said distribution members including a plurality of jet forming nozzles thereon;
vaporous curing agent withdrawal means, associated with said chamber and located between a midpoint of said chamber and said exit opening, for withdrawing a vaporous curing agent from said chamber;
said jet forming nozzles when said supply duct is supplied with a vaporous curing agent, providing a jet of vaporous curing agent forming an acute angle to the vertical, said jet having a component towards said withdrawal means, said nozzles in combination with said vaporous curing agent withdrawal means comprising the sole means for inducing a dynamic flow over the articles to be cured towards said withdrawal means and away from said openings; and
means for recirculating the vaporous curing agent passing into said withdrawal means through said supply duct.

**4,294,022**

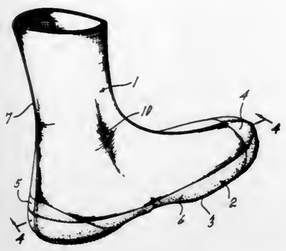
## BOOTS FOR AQUATIC ACTIVITIES

**Andre Stockli, 2086 Prieur St.; Fernando Castaneda, 7838 Casgrain St., both of Montreal, Quebec, and Jean-Louis Stockli, 3112 Gerard St., Fabreville, Quebec, all of Canada**

**Continuation of Ser. No. 922,070, Jul. 5, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,214**

**Int. Cl.³ A43B** *1/02, 1/10*

**U.S. Cl. 36—4** **9 Claims**



1. A boot useful in aquatic activities, particularly in underwater diving, comprising a sock made of a cellular elastomeric material and including an insole and an upper; an outsole assembly consisting substantially of a non-cellular rubber composition covering the insole and the adjacent part of the upper all around the insole, said outsole assembly being vulcanized in situ and adhering to the sock.

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**4,294,023**

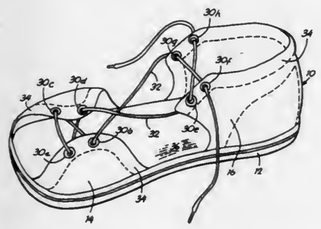
## ATHLETIC FOOTWEAR FOR NON-CONTACT OR LIGHT CONTACT SPORTS

**Samuel E. Banford, 5226 Akron St., Philadelphia, Pa. 19124**

**Filed Aug. 16, 1979, Ser. No. 67,198**

**Int. Cl.³ A43B** *3/12, 11/00*

**U.S. Cl. 36—11.5** **4 Claims**



1. An athletic shoe characterized by members which are in contact with and which reinforce the wearer's foot at points of maximum flexibility only and which athletic shoe is otherwise unrestricting as to the wearer's foot, comprising first means to protect the sole of the wearer's foot from direct contact with a playing surface, said first means comprising a readily yieldable elastic sole portion member extending essentially the entire length and width of the wearer's foot and conforming to the natural configuration of the sole of said foot; second and third means independently attached to said first means, said second means further comprising two generally tabular shaped members configured to restrainedly encompass the wearer around the ankle and remain in close restraining relationship therewith to thereby reinforce and protect the maximum stress points of the wearer's ankle whereby said first and second means acting in conjunction with one another to minimize any shifting of the heel of the wearer relative to said first means while permitting the wearer to move the ankle in a manner which is independent of and unconstrained by said third means, and said third means further comprising two generally tabular shaped members configured to restrainedly encompass the wearer only above the ball of the foot and remain in close restraining relationship therewith so as to thereby reinforce and protect said ball of the foot whereby said first and third means acting in conjunction with one another permit the wearer's foot to flex across the ball portion thereof in a manner which is independent of and unconstrained by said second means while precluding the foot from shifting forward relative to said first means.

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**4,294,024**

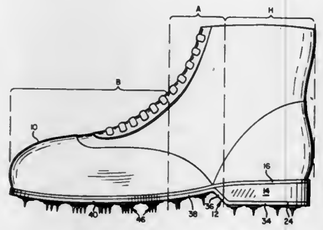
## SOLE FOR LOGGING BOOT

**Joseph J. Nab, 265 Orange St., Ashland, Oreg. 97520**

**Filed Sep. 27, 1978, Ser. No. 946,342**

**Int. Cl.³ A43B** *3/00;* **A43C** *15/00*

**U.S. Cl. 36—113** **17 Claims**



1. A work boot suitable for use on uneven surfaces comprising:

a boot upper having a lasting margin and including ball-receiving, arch-receiving and heel-receiving portions;

a rigid heel wedge secured beneath the heel-receiving portion of the upper;

an outersole of resilient sheet material, the outersole including:

a. a heel portion secured beneath the heel wedge,

b. a ball portion secured beneath the ball-receiving portion of the upper, and

c. an arch portion secured beneath the arch-receiving portion of the upper; and

a plurality of metal calk means located in each portion of the outersole, a part of each calk means being imbedded in the resilient sheet material;

a number of the calk means located in the ball portion of the outersole being in lateral rows consecutively including:

a. a first row, near the wearer's toes, containing at least one calk means, and

b. multiple, additional rows each containing at least three calk means, the rows being spaced apart a sufficient distance that an uninterrupted, substantially straight, flexible band of the resilient sheet material extends transversely across the entire width of the outersole, substantially parallel to a line through the metatarsal phalangeal joints of the wearer's foot, between the imbedded parts of the calk means of adjacent rows so that the outersole is longitudinally flexible along an axis which is normal to the bands in a region defined by the rows to urge the wearer's foot to move orthopedically correctly.

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**4,294,025**

## SOLE ATTACHMENT FOR FACILITATING WALKING

**Andre Keller, Vira, Switzerland, assignor to Roll & Go AG, Stansstad, Switzerland**

**Filed Feb. 19, 1980, Ser. No. 121,993**

**Int. Cl.³ A43B** *5/00*

**U.S. Cl. 36—132** **14 Claims**

1. A sole attachment for footwear having a footwear sole and serving for facilitating walking, especially for use with ski boots, comprising:

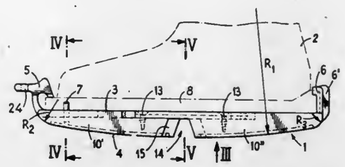
a plate member having an upper surface intended to be applied to the sole of the footwear;

means provided for said plate member for forming a lower tread surface domed in the direction of the sole of the footwear;

attachment devices for securing the plate member at the footwear;

said plate member having opposed ends;

said attachment devices comprising a respective holder element provided at each end of the plate member;



each said holder element engaging over the sole of the footwear;

at least one of the holder elements being formed of one-piece with the plate member;

at least one of the holder elements being structured to be elastically movable between an effectual position for securing the plate member to the footwear and out of such effectual position into an ineffectual position; and

said plate member having an upper surface provided with at least one fixation means intended to be introduced into related recess means provided at the sole of the footwear.

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**4,294,026**

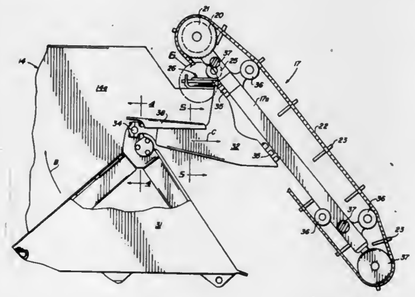
## ELEVATING EARTH SCRAPER

**James A. Welch, Black Canyon City, Ariz., assignor to Sanner Contracting Co., Phoenix, Ariz.**

**Filed May 15, 1980, Ser. No. 150,153**

**Int. Cl.³ E02F** *1/00, 9/24*

**U.S. Cl. 37—8** **3 Claims**



1. In an earth moving machine for removing topsoil and transporting said soil to another location for unloading and distribution, said earth moving machine including,

a frame,

a primary mover for said earth moving machine mounted in said frame,

a bowl pivotally carried by said frame and having two generally vertical parallel side walls and a scraping edge at the mouth of said bowl for removing topsoil from the ground,

elevator means positioned at said mouth of said bowl to carry said soil from said scraping edge upwardly into said bowl,

ejector floor means movably secured in the bottom of said bowl to upwardly open and release topsoil carried therein,

a pair of ejector floor group members for supporting said ejector floor means, each fixed to and pivotally carried by a respective said bowl wall,

a pair of elevator linkage group members, each adjacent to a respective said bowl wall and interconnecting said elevator means and a respective said ejector floor group member,

the improved elevator linkage group members, said elevator linkage group members being shaped, contoured and dimensioned to generally prevent particles of said soil from lodging between said elevator linkage group members and said respective bowl walls.

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**4,294,027**

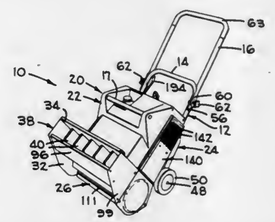
## LIGHT WEIGHT SNOW THROWER

**Merle L. Edwards, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.**

**Filed Feb. 26, 1980, Ser. No. 125,000**

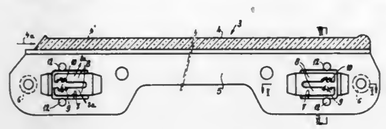
**Int. Cl.³ E01H** *5/00*

**U.S. Cl. 37—43 R** **9 Claims**



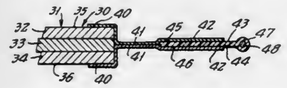
1. A light weight compact snow thrower having an engine; a transversely extending chute; and a transverse impeller driven by the engine: the improvement which comprises means defining a light weight metal frame for supporting the engine and chute; a lower transversely extending handle bar included in said metal frame; an upper handle bar support included in said frame means and extending upwardly and rearwardly relative to the engine; an upper handle bar having a transverse gripping portion; adjustment means releasably securing said upper handle bar to said handle bar support for height adjustment and also for folding the upper handle bar between an operative position extending rearwardly of said engine and a storage position wherein said transverse gripping portion extends forwardly of said engine; a non-metallic engine housing; said engine housing including a lower cover secured to said frame, an upper cover removably secured to said frame and said lower cover, said lower handle bar having an exposed intermediate gripping portion and having end portions projecting within said upper cover, means defining two access openings in said upper cover adjacent said end portions, connector means for removably connecting said end portions to portions of said metal frame enclosed within said housing, and plug means for closing said two access openings after said lower handle bar has been connected to said frame means for minimizing vandalism to said engine.

**4,294,028**
## SUSPENSION-TYPE FILE FOLDER
**Jean R. A. Reymond, Grenoble, France, assignor to Etablissements F. Nicollet & Cie Societe Anonyme, Echirolle, France**
**Filed Jan. 9, 1980, Ser. No. 110,800**
**Claims priority, application France, Jan. 11, 1979, 79 01181**
**Int. Cl.³ B42F *21/00*; A47B *63/00*; B42F *15/00***
**U.S. Cl. 40—359** **5 Claims**



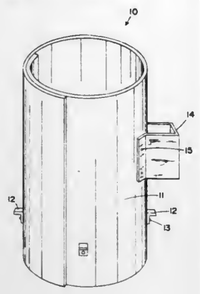
1. A suspension-file folder comprising:
a pair of leaves hingedly interconnected at their bottoms and formed with a pair of horizontal edges and a pair of vertical edges;
suspension rods formed along the upper edges of said leaves and having laterally projecting formations adapted to suspend the folder from a pair of rails; and
an indicating tab fixed to one of said leaves along one of said edges, said indicating tab being molded in a single piece from a transparent synthetic resin material and comprising:
an elongated tubular portion extending along said one of said edges and adapted to receive an identifying label for said folder,
a plate formed unitarily with said tubular portion and overlying a face of one of said leaves, said plate being provided with at least one opening, and
a pair of arms disposed in said opening and molded unitarily with said plate at one end of each arm while having free ends disposed in said opening and deflectable in planes parallel to said plate, said free ends of said arms being formed with mutually confronting recesses forming a seat for a male member carried by an adjacent folder whereby said arms form a pincer defining a female member for connecting folders together.

**4,294,029**
## PIVOTALLY MOUNTED PHOTO ALBUM PAGE
**Sheldon Holson, Wilton, Conn., assignor to The Holson Company, Wilton, Conn.**
**Filed Jun. 19, 1980, Ser. No. 161,213**
**Int. Cl.³ B42F *17/00***
**U.S. Cl. 40—388** **2 Claims**



1. In a pivotally mounted photo album page of a type including a planar page element having a rectilinear edge, and means for engaging said edge forming a hinged interconnection with a binder, said means including a wire segment lying in the plane of said page element having free ends projecting laterally of said page element, the improvement in said last-mentioned means comprising: a generally planar channel forming element including a body of extruded synthetic resinous material having first and second opposed surfaces and a rectilinear hollow beaded edge defining a cylindrical channel therein, said wire being disposed in said channel to be frictionally retained thereby; and first and second adhesive tape strips, each strip interconnecting a surface of said page element with a surface of the body.

**4,294,030**
## ICE HOLE HEATER
**James W. Stewart, 1104 Norton, St. Paul, Minn. 55117**
**Filed May 1, 1980, Ser. No. 145,427**
**Int. Cl.³ F23B *3/00***
**U.S. Cl. 43—4** **1 Claim**



1. An ice fishing device operable for fishing therethrough comprising:
a cylindrical sleeve having a top and a bottom, said cylindrical sleeve having a pair of ends that overlap each other to define a cylindrical shape having an interior surface and an exterior surface, said cylindrical sleeve made from a resilient material so that radial compression of said cylindrical sleeve produces a force to restore said cylindrical sleeve to its original shape, said cylindrical sleeve having an unobstructed passage therethrough to permit one to pull a fish therethrough without displacing said cylindrical sleeve;
ice gripping members located adjacent but spaced from the bottom of said cylindrical sleeve, said ice gripping members coacting with said cylindrical sleeve to permit a user to position the bottom of said ice fishing device in a hole in the ice; and
a heat chamber attached to exterior surface of said cylindrical sleeve so that when said cylindrical device is positioned in the ice said heat chamber is remotely located from a fishing line to permit heat transfer from said heat chamber to said cylindrical sleeve to prevent freezing of water located in the hole in the ice, said heat chamber also acting as a source of heat for warming a user's hands, said heat chamber being disposed above the ice gripping members and intermediate the ends of the cylindrical sleeve.

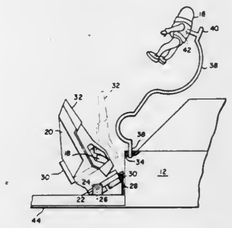
**4,294,031**
## HOOK-STRAND CONNECTING
**Joseph T. Manno, Star Rte., Kane, Pa. 16735**
**Continuation-in-part of Ser. No. 933,503, Aug. 14, 1978, Pat. No. 4,209,933. This application Jan. 18, 1980, Ser. No. 113,379**
**Int. Cl.³ A01K *83/00***
**U.S. Cl. 43—43.16** **10 Claims**

1. An integral structure for ready attachment to a strand, said structure consisting essentially of:
a first end forming a hook;
a second end forming a strand receiving portion;
a middle portion between said first and second ends; and
a generally T-shaped projection means formed from said middle portion for friction wrapping of a strand to said structure, said projection means consisting of a cross portion of the T spaced from and generally parallel to said middle portion, and a leg portion of the T interconnecting said cross portion to said middle portion, said leg portion being relatively short compared to the thickness of a strand to be received thereby so that a strand may be wrapped around said leg portion one or more times and be

tightly frictionally engaged by both said middle portion and said cross portion.



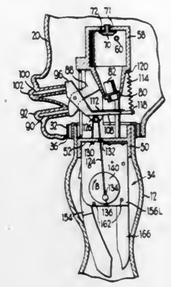
**4,294,032**
## TOY SIMULATED ROCKET PROPELLED AIRCRAFT SYSTEM
**Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.**
**Filed Jan. 22, 1980, Ser. No. 114,279**
**Int. Cl.³ A63H *33/00***
**U.S. Cl. 46—1 R** **10 Claims**



1. A toy simulated rocket propelled aircraft system comprising in combination:
a mother aircraft having a fuselage and an opening leading therein;
a rocket mounted on the rear end of said mother aircraft for propelling it;
cover means for said fuselage opening movable between open and closed positions;
first mounting means in said fuselage;
second mounting means on said cover means when said cover means are in said closed position; and
a miniature rocket propelled aircraft selectively releasably mountable on said first and second mounting means.

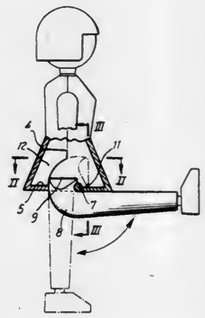
**4,294,033**
## ANIMATED TALKING DOLL
**Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.**
**Filed Feb. 9, 1979, Ser. No. 10,936**
**Int. Cl.³ A63H *5/00, 11/00, 2/28***
**U.S. Cl. 46—118** **2 Claims**

1. An animated talking doll, comprising:
a doll body having a head and a movable mouth defined thereon;
sounding means within the doll body including means responsive to the passage of air for generating an audible sound;
a manually operable air pump within said body communicating with said sounding means;
manually operable means within said body for manipulating said mouth including a pivotal member and a reducing gear train, said pivotal member operatively connected to said reducing gear train, said gear train including means for converting a single pivotal movement of said member into at least two opening and two closing movements of said mouth; and



a scissors mechanism operatively connected to open and close said mouth, said scissors mechanism connected to said gear train and including an extension arranged to control the air flow through said sounding means.

**4,294,034**
## ARTICULATED FIGURE TOY
**Jorge Magria-Deulofeu, and Jose Magria-Deulofeu, both of 157, Carretera del Medio, Hospitalet Barcelona, Spain**
**Filed Oct. 11, 1979, Ser. No. 83,962**
**Claims priority, application Spain, Nov. 21, 1978, 239583**
**Int. Cl.³ A63H *3/46, 3/20*; E05D *1/04***
**U.S. Cl. 46—161** **5 Claims**



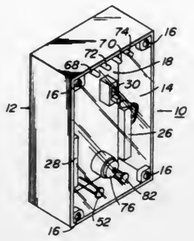
1. A figure toy comprising:
a body portion having a chamber therein adjacent a wall of said body;
at least one opening through said wall into said chamber, one edge of said opening defining a cylindrical bead a portion of which extends into said chamber;
a simulated limb having an end portion extending through said opening and having a cylindrical recess in one side thereof pivotally embracing said bead; and
the cross sectional size and shape of said end portion of said limb in the region of said recess being substantially the same as the size and shape of said opening, stop means on said limb, in said chamber and on the same side of said limb as said recess arranged to abut the inner surface of said wall and thereby limit pivotal movement of said limb about said bead in one direction in a position substantially perpendicular to said wall.

**4,294,035**

## DEVICE WITH VISUAL AND AUDIO OUTPUT

**David I. Klein, Columbia, Md., assignor to George Eng, Rockville, Md., a part interest**

**Filed Mar. 21, 1980, Ser. No. 131,945**
**Int. Cl.³ A63H *33/26***
**U.S. Cl. 46—227** **13 Claims**



1. An amusement device comprising:
(a) integrated circuit means having first and second oscillator circuits contained therein for producing output signals at predetermined first and second frequencies respectively;
(b) power means coupled to said integrated circuit means for activating said first and second oscillator circuits;
(c) visual output means coupled to an output terminal of said first oscillator circuit for producing visual output responsive to said first frequency;
(d) first frequency control means coupled to said first oscillator circuit for modulating said first frequency output of said first oscillator circuit;
(e) audio output means coupled to an output terminal of said second oscillator circuit for producing an audio output responsive to said second frequency;
(f) second frequency control means coupled to said second oscillator circuit for modulating said second frequency output of said second oscillator circuit;
(g) coupling means between said first frequency control means and a reset terminal of said second oscillator circuit for providing a synchronous visual output and audio output; and,
(h) an enclosed housing within which said integrated circuit means, said power means, said visual output means, said first and second frequency control means, said audio output means and said coupling means are contained and secured thereto.

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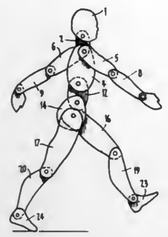
**4,294,036**

## FIGURE FOR ARRANGEMENT ON MAGNETICALLY ATTRACTIVE SURFACE

**David W. Wion, Glen Waverley, Australia, assignor to Magmate Australia Proprietary Limited, Glen Waverleg, Australia**

**Filed Aug. 20, 1979, Ser. No. 68,001**
**Claims priority, application Australia, Aug. 24, 1978, PD5647**
**Int. Cl.³ A63H *33/26***
**U.S. Cl. 46—242** **7 Claims**

1. An articulated figure comprising a body component and a plurality of limb components pivotally attached to the body component, characterised in that at least said limb components are formed from flexible magnetic material, the flexibility of said magnetic material being such that the maximum possible surface to surface contact can be achieved between at least said limb components and a flat magnetically attractive surface by virtue of the magnetic attraction between said limb components and said magnetically attractive surface, said limb components therefore being held in any articulated position by said magnetic attraction, said limb components being attached to freely pivot relative to said body component by means of rivets



passing with clearance through holes in said body component and said limb components.

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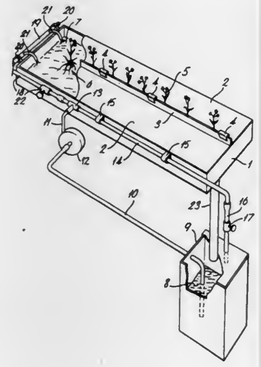
**4,294,037**

## PRODUCTION OF MYCORRHIZAL FUNGI

**Barbara Mosse, Harpenden, England, and John P. Thompson, Toowoomba, Australia, assignors to National Research Development Corporation, England**

**Filed Feb. 13, 1980, Ser. No. 121,171**
**Int. Cl.³ A01G *31/00***
**U.S. Cl. 47—59** **23 Claims**



1. A process for the production of vesicular-arbuscular (VA) mycorrhizal fungi by growing a VA mycorrhizal fungus on plant roots wherein the invention comprises effecting said growth in nutrient film culture.

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**4,294,038**

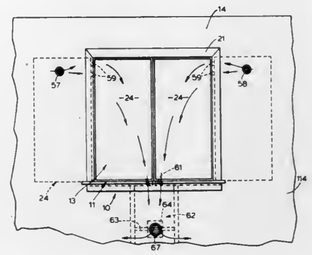
## SOLAR PANEL WINDOW UNIT

**James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055**

**Continuation of Ser. No. 828,437, Aug. 29, 1977, abandoned.**
**This application May 16, 1979, Ser. No. 39,448**
**Int. Cl.³ E05C *7/02***
**U.S. Cl. 49—63** **8 Claims**

1. For use in combination with a window unit in a wall of a building including a window frame and glass panel means mounted in said window frame, a shutter unit, comprising:
first and second parallel extending track means having a spacing therebetween at least equal to the height dimension of said window unit, said track means being located on the inside of said buidling relative to said window unit and extending parallel to the plane of said glass panel means;
laminate insulative shield means mounted in said track means for movement between positions at the side of said window unit and in front thereof, to block off the entirety of said glass panel means to the inside of said building, said laminate insulative shield means including a frame movably supported on said track means and having an outside facing imperforate heat absorptive surface layer facing said glass panel and an insulation material layer mounted on the inside facing portion of said heat absorptive surface layer remote from said glass panel in said frame, said insulative material having little resistance against breakage when forces are applied in directions perpendicular to the plane thereof, said imperforate surface providing a protective barrier from the outside and a rigidification of





said insulative material against the effects caused by forces applied from the outside in directions perpendicular to the plane thereof;
seal means for effecting a seal around the periphery of said glass panel means and between said window unit and said insulative shield means to define a sealed chamber therebetween when said insulative shield means is in the blocking position; and
openable and closeable passageway means into and out of said sealed chamber defined between said glass panel means and said laminate insulative shield means when in the blocking position to facilitate the flow of fluid through said chamber.

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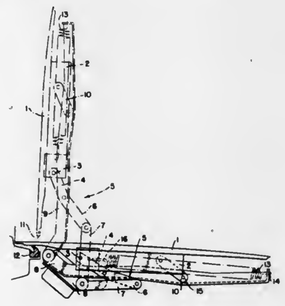
**4,294,039**

## PIVOTAL CONNECTION FOR HOODS AND COVERS IN MOTOR VEHICLES

**Walter Dalheimer, and Olaf Kuus, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Sep. 6, 1979, Ser. No. 72,912**
**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841092**
**Int. Cl.³ E05D *15/40***
**U.S. Cl. 49—248** **8 Claims**



1. A pivotal connection for hoods or covers of motor vehicles which includes a lever means arranged between a bracket formed on the vehicle and the hood or cover, and a control means for controlling a positioning of an edge of the hood or cover which is nearest the pivot axis of the pivotal connection, characterized in that a track means is provided for supporting the hood or cover, the lever means includes a support arm having a first end rotatably mounted on the bracket and a second end connected with the track means, a two-armed guide lever means is pivotally mounted on the support arm and has a first arm a free end thereof which is pivotally connected to the track means, and a link means having a first end pivotally connected to the support arm and a second end pivotally connected to the track means at a position spaced from the pivotal connection of the first arm with the track means, the first arm, the track means, the link means, and a section of the support arm located between the first arm and the link means forming a four-bar linkage, and in that the control means includes a lever having a first end pivotally mounted at a free end of a second arm of the guide lever means and a second end pivotally connected to the bracket whereby, upon an opening of the hood or cover, the four-bar linkage undergoes a reversal such that an edge of the hood or cover nearest the pivot axis of the pivotal connection is first raised upwardly.

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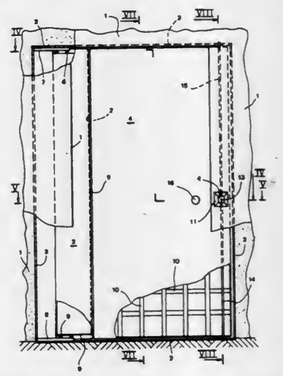
**4,294,040**

## SAFETY DOOR FOR BUILDINGS AND ROOMS

**Bianca M. Crotti, Via Archirola, 125, Modena, Italy**

**Filed Oct. 1, 1979, Ser. No. 80,921**
**Claims priority, application Italy, Sep. 29, 1978, 40125 A/78**
**Int. Cl.³ E05D *15/58***
**U.S. Cl. 49—254** **13 Claims**



1. A safety door assembly for buildings and rooms in general, the assembly comprising fixed works (**1**); a door including two main transversely sliding parts (**3**, **4**), one of said parts being a supporting column (**3**) of given width and the other of said parts being a door body (**4**) which is much wider than said given width of said column; hinge means (**5**) between a first edge of said column and a first edge of said door body for supporting said door body for movement about an axis defined by said hinge means; a first recess (**17**) in said fixed works along a side thereof into which said supporting column substantially disappears during opening, said hinge means remaining outside said first recess during opening; a second recess (**37**) in said fixed works opposite said first recess; lock means including operating means installed in said door body in vicinity of an edge thereof opposite said hinge means, said lock means substantially disappearing into said second recess during closing; respective openings (**11**, **12**) on opposite side of said fixed works opening into said second recess for allowing access to said operating means of said lock means from inside and outside when said door body is in said second recess while preventing access to said lock means; respective grooves (**9**) along

upper and lower edges of said supporting column (3); respective fixed guide (6, 7) adjacent said grooves (9); and rolling, or sliding means (8) received in said grooves and movable therein.

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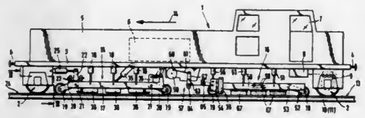
**4,294,041**

## MOBILE MACHINES FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

**Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Division of Ser. No. 968,264, Dec. 11, 1978. This application Jun. 2, 1980, Ser. No. 155,559**
**Claims priority, application Austria, Dec. 30, 1977, 9451/77**
**Int. Cl.³ E01B *31/12***
**U.S. Cl. 51—5 C** **4 Claims**



1. A mobile machine mounted on a track for advancement therealong, the track having two rails including heads, for removing irregularities from the surfaces of the rail heads to a predetermined depth, which comprises

(a) a machine frame,

(b) a tool carrier rigidly resistant to bending and vertically adjustably mounted on the machine frame and arranged thereon for vertical and lateral guidance without play along a respective one of the track rails,

(c) a cutter head on the tool carrier, the cutter head having

(1) a cutting tool capable of machining the surface of the head of the respective track rail continuously upon advance of the tool carrier along the track rail,

(d) a hydraulic jack unit linking the tool carrier to the machine frame for vertically adjusting the tool carrier and subjecting the tool carrier to a vertically directed loading force sufficient to obtain the predetermined machining depth,

(e) an additional tool carrier and a rail grinding tool on the additional tool carrier, and

(f) drive means for imparting to the additional tool carrier a working movement in the direction of the track additional to that simultaneously imparted to it by the advancement of the machine.

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**4,294,042**

## APPARATUS AND METHOD FOR GRINDING A HELICAL SURFACE ON A FLAT BLADE

**Robert W. Davenport, Golden; Eugene L. Moore, Lakewood, and Ronald L. Goodman, Woodland Park, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.**

**Filed Sep. 5, 1979, Ser. No. 72,740**
**Int. Cl.³ B24B *3/40, 3/42***
**U.S. Cl. 51—54** **22 Claims**

1. Apparatus for grinding a helical cutting surface on a flat cutting blade, comprising:

a stationary support,

an arbor for mounting said blade, said arbor being rotatably mounted on said support about an axis of rotation, said arbor having at least two mutually perpendicular planar surfaces which are disposed oblique to said axis of rotation;

means for mounting said blade on one of said planar surfaces,

an adjustable cam plate mounted on the other of said planar surfaces,

means for adjusting all points along the lower surface of said cam plate such that said lower surface is equidistant from said axis of rotation,

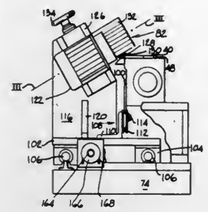
a carriage mounted on said support for reciprocation along a plane parallel to said axis of rotation,

a cam follower for contacting said lower surface,

means for mounting said cam follower on said carriage,

means for grinding said blade, and

means for mounting said grinding means on said carriage such that said grinding means may be reciprocated along a plane parallel to said axis of rotation,



whereby when said carriage and said grinding means are reciprocated, said cam follower contacts the lower surface of said cam plate, said arbor is oscillated about its axis of rotation and a helical cutting surface is ground into said blade.

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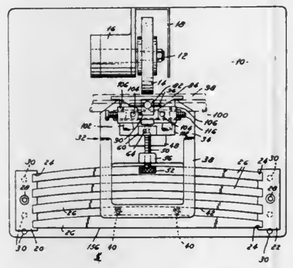
**4,294,043**

## ICE SKATE SHARPENER

**Glenn Sakcriska, 1714 Abbott, Ann Arbor, Mich. 48103**

**Division of Ser. No. 869,696, Jan. 16, 1978, Pat. No. 4,172,343, which is a continuation-in-part of Ser. No. 745,362, Nov. 26, 1976, Pat. No. 4,069,620. This application Aug. 27, 1979, Ser. No. 70,408**
**Int. Cl.³ B24B *9/04***
**U.S. Cl. 51—100 R** **11 Claims**



1. In a scale for use in conjunction with ice skate blade sharpening and contouring, there being an equivalent center location on the ice skate blade to be sharpened and contoured, the improvement characterized by,

a generally oblong scale for determining the equivalent center location on the ice skate blade comprising,

a zero mark on the scale to be placed adjacent the front of the blade, a first set of separately identifiable marks on the scale for identifying the length of a particular blade, a second set of separately identifiable marks on the scale indicating said equivalent center locations, each mark of the second set paired to a mark in the first set and located from the mark in the first set a specified percentage of the distance between the mark in the first set and the zero mark.

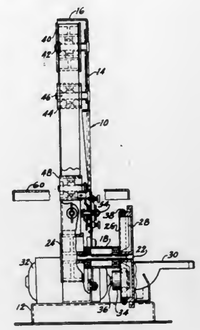


**4,294,044**

## TRACKING MECHANISM FOR A BELT TYPE SANDER

**John M. Hansen, Dover Township, Racine County, Wis., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Jun. 2, 1980, Ser. No. 155,284**
**Int. Cl.³ B24B *21/18***
**U.S. Cl. 51—135 BT** **5 Claims**



1. In a belt sanding machine having a frame, drive and idler pulleys mounted for rotation in spaced relationship on said frame and an endless sanding belt extending over said pulleys, an arm having one end pivotally mounted on said frame and carrying an idler drum mounted for rotation on the other end thereof, said arm being tiltable about a longitudinal center line extending through its axis of rotation and the axis of rotation of said idler drum and having a normal position in which the axis of rotation of said idler drum is parallel with the axis of said pulleys, said idler drum being arranged to engage and tension said sanding belt at points between said pulleys when said arm is swung to either of two angularly spaced positions, belt tracking means for adjustably tilting the axis of rotation of said idler drum from its normal position comprising spring means acting to tilt said arm in one direction from its normal position and separate screw threaded means on said frame positioned so as to engage said arm and to adjustably oppose the tilting of said arm in said one direction when said arm is in either of its said two positions.

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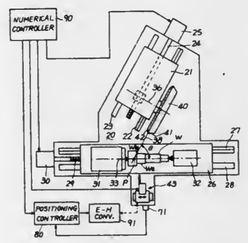
**4,294,045**

## GRINDING MACHINE WITH A SIZING DEVICE

**Minoru Enomoto, Ohbu; Takao Yoneda, Toyoake, and Yoshiyuki Takeuchi, Gamagouri, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Jan. 23, 1980, Ser. No. 114,646**
**Claims priority, application Japan, Jan. 30, 1979, 54-9502**
**Int. Cl.³ B24B *49/02***
**U.S. Cl. 51—165.71** **6 Claims**




1. A grinding machine for simultaneously grinding with a grinding wheel a cylindrical surface and a shoulder side surface perpendicular thereto of a workpiece, comprising:

a bed;

work support means slidable on said bed, for carrying said workpiece for rotation about an axis extending in the sliding direction of said work support means;

a wheel support carrying said grinding wheel and slidable on said bed for movement along a straight path extending at an acute angle to the rotational axis of said workpiece;

first and second feed means connected to said work support means and said wheel support for moving the same on said bed, respectively;

a sizing device having feeler means engageable with said cylindrical surface of said workpiece for measuring the diameter of said cylindrical surface;

guide means for slidably guiding said sizing device in a direction parallel to the rotational axis of said workpiece;

third feed means connected to said sizing device for moving the same along said guide means; and

a positioning controller connected to said third feed means for controlling the same and including

first calculation circuit means responsive to first input data indicative of a desired finish diameter of said cylindrical surface for calculating a cotangent component at said acute angle of said desired finish diameter,

second calculation circuit means responsive to said first calculation circuit means and second input data indicative of a first distance spaced from said shoulder side surface for adding said cotangent component and said second input data to thereby obtain command data indicative of a second distance from an intersection at which the rotational axis of said workpiece intersects a line extending through the juncture between first and second surfaces of said grinding wheel in parallel relation with said straight path, said first and second surfaces of said grinding wheel corresponding, respectively, to said cylindrical and shoulder side surfaces of said workpiece, and

control means responsive to said second calculation circuit means for controlling said third feed means to position said feeler means at a position which is spaced said second distance from said intersection.

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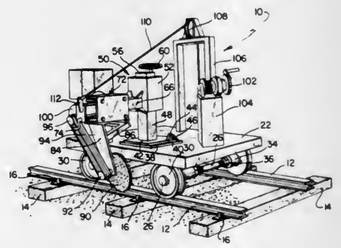
**4,294,046**

## TRAVELING TOOL CARRIER FOR SEVERING RAILWAY SPIKES

**Luigi Damiano, 135 Farm St., Providence, R.I. 02908**

**Filed Mar. 26, 1980, Ser. No. 133,976**
**Int. Cl.³ B24B *23/00***
**U.S. Cl. 51—170 R** **10 Claims**



1. A traveling tool carrier for severing heads of railway spikes prior to removal or replacement of railway rails, comprising a platform having front and rear wheels mounted on the underside thereof for rolling engagment with said rails, a support mounted on said platform, a vertical adjustment assembly mounted on said support, a horizontal adjustment assembly secured to said vertical adjustment assembly for vertical movement therewith, a saw support assembly mounted on said horizontal adjustment assembly for movement therewith, a rotating saw suspended from said saw support assembly and disposed such that the plane thereof is inclined to the vertical,

wherein said saw is angularly engageable with said spike heads upon traveling movement of said platform, means mounted on said vertical and horizontal assemblies for vertically and horizontally adjusting said saw support assembly and the saw suspended therefrom in the angular operative position thereof, and means mounted on said platform for rotating said saw for severing the heads of said spikes as said platform is moved over said rails.

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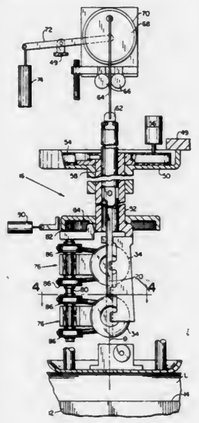
**4,294,047**

## METHOD OF SHARPENING LATERAL EDGES AND END EDGES OF A BLADE DURING RECIPROCATION THEREOF

**David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.**

**Filed Jan. 14, 1980, Ser. No. 111,527**
**Int. Cl.³ B24B** *1/00, 3/36*
**U.S. Cl. 51—327** **7 Claims**



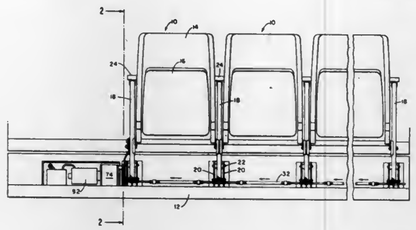
1. A method for sharpening the cutting edges of a reciprocating blade on a sheet material cutting apparatus, the blade being supported for generally vertical reciprocating movement relative to a generally horizontal sheet material supporting surface and having a generally vertically extending leading cutting edge and a lower cutting edge intersecting the leading cutting edge and extending downwardly therefrom and in the direction of the blade trailing edge, the apparatus having a cutting region proximate the sheet material supporting surface and a blade sharpening region above the cutting region, and at least one blade sharpening wheel supported within the cutting region, said method comprising the steps of elevating the blade from the cutting region to the blade sharpen region, reciprocating the blade within the sharpening region, biasing the one sharpening wheel toward the blade and into sharpening engagement with the leading cutting edge of the blade and maintaining the one sharpening wheel in sharpening engagement with the leading cutting edge as the blade moves upwardly from a lower limit toward an upper limit within the sharpening region, and moving the one sharpening wheel under the leading edge of the blade and in sharpening engagement with the lower cutting edge of the blade as the blade approaches and moves to the upper limit of its travel within the sharpening region.

**4,294,048**

## APPARATUS FOR SUPPORTING PIVOTALLY MOUNTED SEATS

**David L. Sutter, Kennebunkport, Me., assignor to Hussey Manufacturing Co., Inc., North Berwick, Me.**

**Filed Feb. 4, 1980, Ser. No. 118,393**
**Int. Cl.³ E04H** *3/12;* **A47C** *1/12*
**U.S. Cl. 52—9** **12 Claims**



1. Apparatus for supporting an extended row of adjoining seats to pivot on a base in unison between an upright and a collapsed position comprising:

(a) means for applying pivotal force to each seat which is substantially equal and opposite to the pivotal force on the seat of the weight of the seat in any position between and including the upright and collapsed positions, and

(b) releasable means for locking the row of seats respectively in the upright and collapsed positions.

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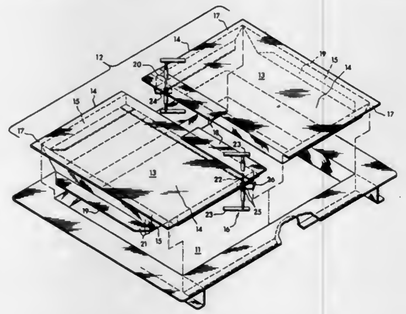
**4,294,049**

## QUICK OPENING INTERNAL MANWAY FOR TOWERS

**Dick K. Young, and Kenneth E. Sumner, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio**

**Continuation of Ser. No. 6,604, Jan. 16, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 117,159**
**Int. Cl.³ E02D** *29/14*
**U.S. Cl. 52—20** **2 Claims**



1. An improved quick opening internal manway cover for selectively opening and closing a manway, said manway having an edge disposed therearound, said improved manway cover comprising:

opposing identical panels for selectively opening and closing one-half of said manway, said panels being opposing and non-connected to each other when closed in said manway, each of said panels comprising:

(a) a cover piece for covering approximately one-half of said manway, said cover having means extending therefrom for overlying a portion of the top of said manway edge,

(b) means extending downward from said cover piece for positioning said panel in said manway against said manway edge,

(c) means connected to said positioning means on said cover piece opposite the side where said panel abuts the opposing panel for extending under said manway edge,

(d) means connected to the top surface of said cover piece for overlying a portion of the top surface of the top of the cover piece of said opposing panel when said panels are in said closed position, and

(e) means operatively connected through said cover piece near where the aforesaid overlying means is connected to said cover piece for releasably locking said panel to said manway edge when said panel is in said closed position, said locking means being capable of being operated from either side of said panel,

and

said improved cover being capable of being opened and closed on either side of said cover in said manway by operation of said locking means to fully release either one of said panels for removal and then by removing the remaining panel from said manway.



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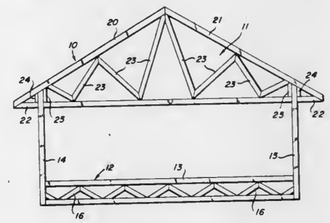
**4,294,050**

## TRUSS-FRAMED BUILDING STRUCTURES

**Arnold Kandel, P.O. Box 416, Fairfax, Va. 22030**

**Filed Jan. 24, 1980, Ser. No. 114,747**
**Int. Cl.³ E04B** *7/02*
**U.S. Cl. 52—93** **4 Claims**



1. A roof truss made of unitized wooden frame elements comprising a pair of centrally interconnected upper chords which provide the upper sloped surfaces of a roof, said upper chords being joined near their outer ends by a horizontal lower chord which is discontinuous near each end thereof, and vertical risers interconnecting said lower chord on both sides of each discontinuity with said upper chord to form post-receiving pockets near each end of said lower chord, said post-receiving pockets being backed up by a prenailed gusset on one side of said truss.

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**4,294,051**

## MODULAR BUILDING SYSTEM

**William J. Hughes, Jr., 2100 College Dr., Baton Rouge, La. 70808**

**Filed May 21, 1979, Ser. No. 40,878**
**Int. Cl.³ E04C** *1/08, 1/28*
**U.S. Cl. 52—98** **5 Claims**

1. A building having an exterior wall structure which comprises:

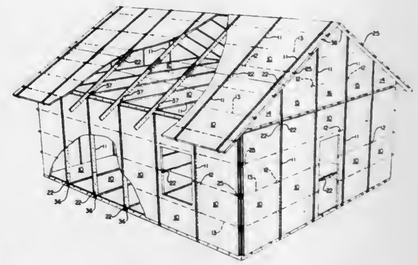
(a) a series of like panels and sub-divisions thereof, each of which has a plurality of defined internal horizontal passages with said passages of adjacent panels being in alignment; said panels capable of being subdivided along any line normal to said passages to provide a subdivided panel having an edge configuration identical to the edge of the uncut panel;

(b) fins positioned between adjacent panels, said fins being constructed of material having greater shear strength than said panels and having openings therein in alignment with said passages;

(c) load transferring members positioned in a plurality of said openings in said fins, each of said members extending partially into said aligned passages of said panels on each side of a fin; and

(d) integrating means positioned in and extending through a plurality of said aligned passages and openings of said panels and fins respectively, each of said integrating means extending continuously through a plurality of said panels and fins and being anchored at each end thereof and maintained in state of tension so as to maintain said panels and fins under compression in the horizontal direction;

said building also having a ceiling and roof each of which



comprises at least one row of panels with fins positioned between adjacent panels, said panels and fins being alike and interchangeable with said panels and fins of said wall structure and being held in assembled relation by a plurality of integrating means passing through aligned passages and openings in said panels and fins respectively, each of said integrating means being maintained in a state of tension and secured at opposite ends of said ceiling and roof respectively so as to maintain said panels and fins under compression, load transferring members positioned in a plurality of the openings in said fins and extending partially into said passages of the adjacent panels each of said fins having a width in excess of the thickness of said panels such that a portion of each of said fins extends beyond the surface of the panels, and auxiliary strengthening members secured to said portions of a plurality of said fins so as to augment the strength of the fins.

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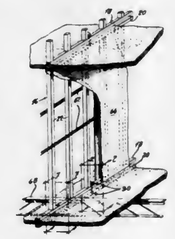
**4,294,052**

## PREFABRICATED LOAD BEARING STRUCTURE

**Aaron Blauer, 386 Strathcona Dr., Town of Mount Royal, Quebec, Canada**

**Filed Nov. 19, 1979, Ser. No. 95,400**
**Int. Cl.³ E04H** *1/00*
**U.S. Cl. 52—236.5** **11 Claims**



1. A multi-storey building having a foundation and a roof, the building comprising a plurality of poured concrete floors,

the poured concrete floors being separated by parallel walls, each wall comprising a row of a plurality of prefabricated panels made up of structural tubular members, the panels extending from one floor to a next adjacent floor, each panel having parallel upper and lower chords, each wall being in vertical alignment with corresponding wall situated on vertically adjacent floors, each vertically adjacent wall being interconnected by high-tensile strength fasteners rigidly interconnecting the upper chord of each panel to an adjacent lower chord of a vertically adjacent panel, each fastener having a length at least greater than the combined thickness of the upper and lower chords of vertically adjacent panels and the floor therebetween, the rows of vertically interconnected prefabricated panels providing effective continuous lightweight bearing walls extending from the foundation of the building to the roof thereof, the bearing walls supporting loads imposed on the building and providing stiffness to the building.

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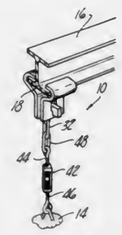
**4,294,053**

## MOBILE HOME ANCHOR

**Rosario Lopes, 19266 Berden, Harper Woods, Mich. 48225**

**Filed Jun. 5, 1978, Ser. No. 912,321**
**Int. Cl.³ E02D** *27/00*
**U.S. Cl. 52—295** **7 Claims**



1. In combination with a mobile home having an underframe with an I-beam and said mobile home being mounted above a base, an anchor for detachably securing said I-beam to said base comprising:

a pair of spaced clamping elements, each clamping element having an upper flange engaging portion and a downwardly depending portion, each downwardly depending portion having an aperture formed therethrough;

elongated connecting means extending from between the downwardly depending portions of the clamping elements and to said base, said connecting means having an aperture at its upper end;

means for securing the lower end of the connecting means to the base;

means for attaching the upper end of the connecting means to the clamping elements, said attaching means comprising a clevis having a central leg and two end legs, the central leg of said clevis being positioned through the apertures in said clamping elements and in the upper end of the connecting means so that the clevis and legs face downwardly and extend along the outside faces of the clamping element downwardly depending portions below said apertures; and

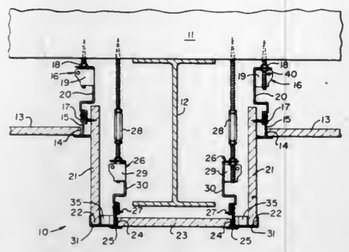
means for tensioning said elongated connecting means to thereby hold said clevis to said clamping elements and so that said clevis prevents separation of said downwardly depending portions and thus separation of said clamping elements.

**4,294,054**

## SOFFIT SYSTEM FOR SUSPENDED CEILING

**Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Aug. 9, 1979, Ser. No. 65,398**
**Int. Cl.³ E04B** *5/52*
**U.S. Cl. 52—484** **1 Claim**



1. A suspended ceiling boxed around a projection depending from ceiling joists, said suspended ceiling comprising in combination:

a plurality of suspension brackets depending from the ceiling and terminating at the bottom thereof in inverted-T runners;

a plurality of ceiling tiles resting on the inverted-T runners;

at least one U-shaped channel resting on an inverted-T runner adjacent to the projection depending from the ceiling and having a vertically disposed ceiling tile resting therein, and means for holding the ceiling tile against the side of the U-shaped channel member.

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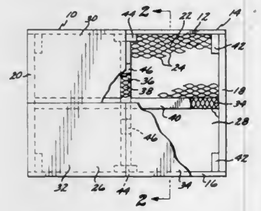
**4,294,055**

## HONEYCOMB OVERHEAD DOOR

**Donald D. Andresen, 10380 W. Whitesbridge Ave., Fresno, Calif. 93706**

**Continuation of Ser. No. 479,643, Jun. 17, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,325**
**Int. Cl.³ E05C** *2/32*
**U.S. Cl. 52—795** **5 Claims**



1. A panel construction useful for doors which are supported at side bearing points and are supported thereby in an overhead, horizontal position which comprises:

a plurality of cores formed of a honeycomb structure defined by a plurality of parallel strips of sheet material, each formed into a sinuous path and bonded to immediately adjacent strips at its outwardly bowed extremities, said core being aligned with said strips extending across the width of said door;

said cores being interspaced by internal spline members, each spline member being formed of a core of said honeycomb structure;

upper and lower cross frame members;

covering sheets extending over the opposite sides of said honeycomb core; and,



foamed adhesive material on the interior surfaces of said covering sheets and drawn up on said strips of sheet material, forming a continuous fillet at the juncture of the edges of said strips and said covering sheets, thereby bonding said sheets to the edges of said strips of said core of honeycomb structure.

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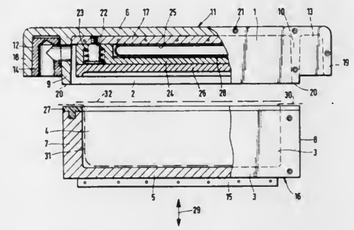
**4,294,056**

## VACUUM PACKAGING MACHINE

**Ralf Paulsen, Kapellenweg 1, Buchenberg; Max Sontheim, An der Steig 17, Wiggensbach, and Christoph Ullmann, Falkenweg 17, Kempten, all of Fed. Rep. of Germany**

**Filed Oct. 1, 1979, Ser. No. 80,924**
**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843166; Aug. 8, 1979, 2932098**
**Int. Cl.³ B65B** *31/02, 43/08, 47/10*
**U.S. Cl. 53—86** **6 Claims**



1. A vacuum packaging machine comprising chambers for forming a packaging foil from at least two foils and means for evacuating and sealing the packages, each chamber comprising an upper and a lower part, which parts are movable relative to one another and, in an operative position in which they are pressed together, clamp marginal portions of the foils therebetween, each chamber part having a hollow recess in its central region formed by a plate portion and four walls arranged in a rectangle, said walls depending from said plate portion of said upper part and upstanding from said plate portion of said lower part to form a single chamber when pressed together, wherein at least one of said chamber parts is made from a preformed length of material having an appropriate cross-sectional profile to provide two opposite walls integral with said plate, and the other two walls are formed by covers attached to said integral walls and plate.

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**4,294,057**

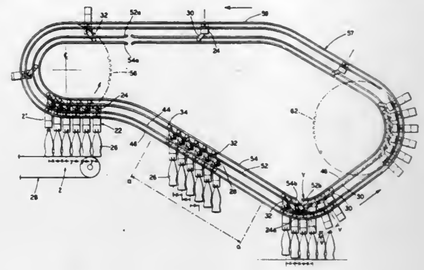
## CASE PACKER APPARATUS INCLUDING VELOCITY COMPENSATOR ASSEMBLY

**Michael E. Winiasz, and James M. Long, both of Lorain, Ohio, assignors to A-T-O, Inc., Willoughby, Ohio**

**Continuation-in-part of Ser. No. 895,815, Apr. 12, 1978, Pat. No. 4,199,291. This application Apr. 21, 1980, Ser. No. 141,774**
**Int. Cl.³ B65B** *21/12*
**U.S. Cl. 53—244** **7 Claims**

1. In a case packer apparatus including a frame, a driven conveyor for moving empty cases through a fixed course having a horizontal section, said cases being moved at a fixed speed in said horizontal section, and a driven conveyor means having a fixed, closed orbit positioned in a vertical plane above said conveyor horizontal section, said conveyor means being driven at a greater speed than said fixed speed, a drive sprocket and a guide sprocket for said driven conveyor means, article gripper means, and carrier bars for said article gripper means operatively connected to and movable with said conveyor means, a driven article supply conveyor positioned below said driven sprocket, a pair of control arms for each said carrier bar individually fixedly secured to different ends of said carrier bar, to form carrier bar units,

said driven conveyor means having a course extending downwardly towards said horizontal section at an acute angle thereto and then upwardly from an inflection area or zone at an acute angle thereto, said inflection area being the area of transfer of an article in relation to said driven conveyor and said conveyor means, and characterized by pairs of longitudinally spaced first guide means and second guide means on said frame to engage one of said control arms and control the angular relationship of said carrier bars and gripper fingers to the axis of said conveyor means



as the carrier bar units are descending towards and into said inflection area and to engage the other of said control arms as its carrier bar moves away from said inflection area, said guide means each having an entrance end and an exit end, and said guide means operatively extending around the orbit of said driven conveyor means and being varied in spaced from such orbit to vary the positions of said gripper means in relation to a vertical axis.

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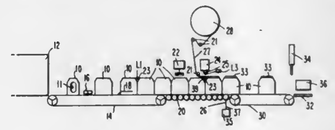
**4,294,058**

## CONTAINER PACKAGE AND ITS MANUFACTURE

**Jürgen G. Rensner, Philadelphia, Pa., assignor to Pepsico, Inc., Purchase, N.Y.**

**Continuation of Ser. No. 812,327, Jul. 1, 1977, abandoned, which is a division of Ser. No. 697,578, Jun. 18, 1976, Pat. No. 4,078,659. This application Apr. 3, 1979, Ser. No. 26,772**
**Int. Cl.³ B65B** *61/14*
**U.S. Cl. 53—413** **26 Claims**



1. A method of attaching thermoplastic film handles to adjacent packages of articles tightly wrapped in thermoplastic film, said packages having an upper surface, said method comprising the steps of:

(a) providing a weakened portion in the upper surfaces of said thermoplastic film for opening said packages:

(b) contacting thermoplastic handle film tacked to said thermoplastic wrapping at a first side at a location below the level of said weakened portion of a first said package, with a second location on said thermoplastic wrapping on an opposite side of said first package;

(c) heating said handle film in contact with said opposite side of said first package to tack said handle film to said first package thermoplastic wrapping at the location of said contact, while leaving an area of the handle film adjacent the tack at least partially untacked;

(d) contacting another portion of said thermoplastic handle film with a first location on said thermoplastic wrapping on a first side at a location below the level of said weakened portion of a second said package;

(e) heating said handle film in contact with the thermoplastic wrapping on said first side of said second package to tack said handle film to said second package thermoplastic wrapping at the location of said contact, while leaving an area of the handle film adjacent the tack at least partially untacked;
(f) severing said handle film between said tacks on said opposite side of said first package and said first side of said second package;
(g) repeating steps (b) through (f) with respect to a location on said second package opposite to said first side thereof, and with respect to subsequent said packages to which said handle film is attached; and
(h) heating said adjacent areas of the tacked portions of said thermoplastic handle film to increase the attachment of said handle film to said packages.

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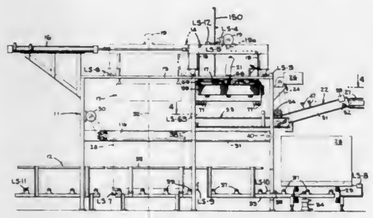
**4,294,059**
**BIN FILLING APPARATUS AND METHOD**
**Robert E. Stilwell, and David E. Westerling, both of Riverside, Calif., assignors to FMC Corporation, San Jose, Calif.**
**Filed Feb. 22, 1980, Ser. No. 123,606**
**Int. Cl.³ B65B** *35/38, 35/52, 1/16*
**U.S. Cl. 53—448** **26 Claims**



**19**. Apparatus for receiving generally rounded articles from an article supply source and for spreading the articles laterally in a close-packed array over a predetermined width wherein the outlet from the supply source is substantially narrower than the predetermined width, said apparatus comprising an inclined spreading conveyor with means mounting an elevated end adjacent to the narrow supply source outlet, means for intermittently driving said spreading conveyor to advance toward said elevated end whereby articles collecting thereon while said spreading conveyor is stationary tend to spread transversely at the lower end thereof while said spreading conveyor is being driven.

**22**. A method of filling loose articles of produce of generally rounded configuration and of random sizes and shapes, such as apples, into a bin, said method comprising the steps of assembling a layer of said articles on a generally flat surface in a closely packed and randomly oriented array where said articles are in abutting engagement with each other throughout the layer, moving a vacuum head with a plurality of depending vacuum pickup cups over and onto said layer to cause the cups to grip substantially all of the articles in the layer within the confines of the vacuum head, there being substantially more vacuum cups on said vacuum head than articles to be gripped, moving the vacuum head over and into said bin, removing the vacuum from the cups to release the layer of articles in the bin directly adjacent to the previously loaded layer of articles or to the bottom of the bin, and repeating the aforesaid steps until the bin is filled to the desired level, wherein the step of assembling the layer of articles comprises randomly receiving the articles from a supply conveyor having a width substantially narrower than said layer, and causing the articles to gravitate over an intermediate conveyor between said supply conveyor and the assembling area, which intermediate conveyor is driven in a direction opposite to the direction of movement of the articles to cause the articles to uniformly spread to the width of the layer to be picked up in the assembling area.

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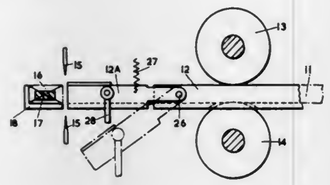
**4,294,060**
**SWEET FORMING AND WRAPPING MACHINE**
**Arthur V. Naylor, Seacroft, and John K. Spencer, Gainsborough, both of England, assignors to Baker Perkins Holdings Limited, Peterborough, England**
**Continuation-in-part of Ser. No. 877,290, Feb. 13, 1978, abandoned. This application Apr. 17, 1979, Ser. No. 30,837**
**Claims priority, application United Kingdom, Feb. 18, 1977, 6822/77**
**Int. Cl.³ B65B** *57/02*
**U.S. Cl. 53—506** **3 Claims**



**1**. In a sweet-forming and wrapping machine comprising a wrapping mechanism, a feed channel for feeding a rope of candy in a normal path of travel towards the wrapping mechanism, feed rollers for advancing the rope along said feed channel, cutting means for severing sweets in succession from the leading end of the rope, means for transferring the sweets in succession into the wrapping mechanism, means for feeding wrappers in succession into the path of travel of the sweets so that each sweet enters the wrapping mechanism with a wrapper partially folded about it drive means for driving said machine, a detector for sensing the feed of the wrappers and a machine stopping switch operable instantaneously by said detector to stop said machine drive in response to detection of a failure in the wrapper feed, the improvement which consists in the provision, in a machine capable of running at such a high speed that the wrapping mechanism overruns an amount sufficient to complete wrapping of partially wrapped sweets following the stopping of said machine drive by said stopping switch, of means responsive instantaneously to operation of said machine stopping switch by said detector to immediately divert said rope out of its normal path of travel and away from said cutting means, notwithstanding the overrun of said wrapping mechanism following the stopping of said machine drive.

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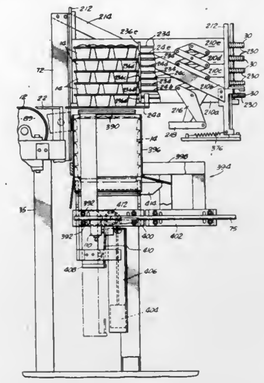
**4,294,061**
**COMESTIBLE PACKAGING APPARATUS**
**John P. Lekas, 5316 E. Exeter Blvd., Phoenix, Ariz. 85019**
**Filed Sep. 13, 1978, Ser. No. 942,126**
**Int. Cl.³ B65B** *35/50*
**U.S. Cl. 53—536** **5 Claims**

**1**. Apparatus for automatically packing trays of comestibles having
conveyance means for incrementally supplying a plurality of trays
shelf means for receiving the trays, said shelf means including a plurality of individually extendable shelves, said shelves having retraction means,
feed comb means for transferring the trays from the conveyance means to said shelves of said shelf means
alignment means for incrementally moving said shelf means to sequentially align at least some of said plurality of shelves with said conveyance means to receive a tray
reset arm means for individually extending at least some of said plurality of shelves to receive a tray, said retraction means on said shelves causing at least some of said shelves



to retract as soon as said reset arm means stops causing each of said plurality of shelves to be individually extended, thereby causing the trays to stack, and



cycloidal cam means for causing said conveyance means, said feed comb means, said alignment means and said reset arm means to cooperate in synchronism.

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**4,294,062**
**SENSING BAR**
**Shaun A. Seymour, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.**
**Filed Mar. 27, 1980, Ser. No. 134,721**
**Int. Cl.³ A01F** *12/10*
**U.S. Cl. 56—102** **12 Claims**

**1**. In an infeed housing for a harvesting and threshing machine attachable on a first end to a harvesting attachment and on a second end to the harvesting and threshing machine effective to receive from the harvesting attachment crop material collected from a field and convey it into the harvesting and threshing machine for processing having:
(a) a frame with a bottom surface, an upper surface and two opposing sides thereby defining a flow passage for crop material as it is conveyed to the machine;
(b) conveying means moveably mounted to the infeed housing to convey crop material from the harvesting attachment to the machine and cooperative with the bottom surface to thereby define a predetermined path of travel within the flow path, said conveying means including a front guide drum mounted above said path of travel of said crop material adjacent said first end of said infeed housing for deflecting material entering said first end downwardly toward said bottom surface;
(c) object removal means moveably connected to the infeed housing intermediate the first end and the second end effective to remove non-frangible objects from the predetermined path of travel;
(d) non-frangible object detecting means connectable to the object removal means and mountable to the infeed housing; and
(e) sensing means for sensing non-frangible objects fastened to the bottom surface adjacent the first end between the two opposing sides positioned along the predetermined path of travel and connectable to the object detecting means, the sensing means having a first portion adapted to contact a non-frangible object within said crop material flow path and direct the non-frangible object upwardly toward said guide drum and a second portion adapted to contact non-frangible objects deflected downwardly by said guide drum and to guide the non-frangible object toward the object removal means, the contact with the sensing means by the object further being effective to permit the object detecting means to selectively actuate the object removal means to eject the object from the infeed housing.

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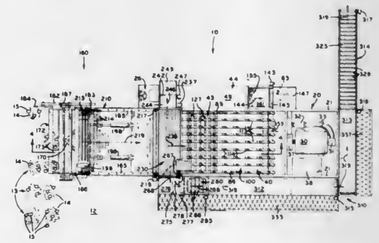
**4,294,063**
**HARVESTER AND METHOD FOR HARVESTING GREEN TOMATOES**
**George Bianchi, P.O. Box 190, Merced, Calif. 95341**
**Filed Feb. 7, 1980, Ser. No. 119,308**
**Int. Cl.³ A01D** *17/08*
**U.S. Cl. 56—16.4** **10 Claims**



**1**. A harvester for green tomatoes growing on vines in a row comprising:
A. a frame;
B. means supporting the frame for travel along such a row;
C. means on the frame for severing vines in the row from the ground as the frame travels along the row;
D. an aqueous bath mounted on the frame;
E. means mounted on the frame above the bath adapted to receive vines with tomatoes thereon from the severing means and to shake tomatoes from the severed vines into the bath while excluding the vines from the bath and discarding the same;
F. means on the frame for removing tomatoes from the bath; and
G. means on the frame for drying surface moisture from the tomatoes removed from the bath, in which the bath comprises a tank having a dividing wall separating the tank into a tomato washing compartment and a water cleaning compartment interconnected in a closed circuit, a pump for circulating water in the closed circuit from the tomato washing compartment to the water cleaning compartment and return in a predetermined direction of flow in each compartment, a straining conveyor mounted in the tomato washing compartment and upwardly inclined from the tank at a position in the predetermined direction of flow therein to strain tomatoes from the bath and to elevate them from the tank and a sieving conveyor mounted in the water cleaning compartment and upwardly inclined from the tank at a position in the predetermined direction of flow therein to sieve debris from the bath and to elevate it from the tank.

**4,294,064**

## METHOD OF AND A DEVICE FOR BALANCING A CHANGING LOAD OF A STRIP ROLL ORBITING ABOUT AN AXIS IN A STRIP WINDING MACHINE

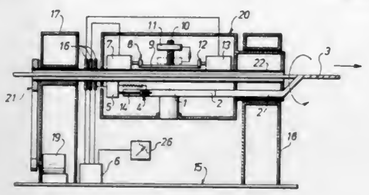
**Günther Schmitz, Odenthal, and Hans Kierdorf, Cologne, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk, Cologne, Fed. Rep. of Germany**

**Filed Jan. 25, 1980, Ser. No. 115,288**

**Claims priority, application Fed. Rep. of Germany, Jan. 1, 1979, 2903807**

**Int. Cl.³ B65H** *81/06*

**U.S. Cl. 57—3** **14 Claims**



6. A strip winding machine, including a stationary frame, a winding head rotating about a first axis, at least one head disk supported in said winding head for rotation about a second axis which is perpendicular to said first axis and being adapted for carrying a strip roll, comprising a device for balancing the changing load of said strip roll, the device including a counterbalancing weight displaceable about a third axis extending perpendicularly to said first axis opposite said second axis; means for measuring the change of the diameter of the strip roll during the winding operation and for producing control signals corresponding to the measured change; and drive means for said counterbalancing weight controlled by said control signals.

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**4,294,065**

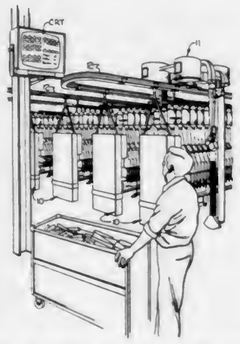
## METHOD AND APPARATUS FOR FACILITATING MAINTENANCE OF SPINNING MACHINE INFORMATION SYSTEM

**John E. Lane, Littleton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.**

**Continuation-in-part of Ser. No. 900,267, Apr. 26, 1978, Pat. No. 4,194,349. This application Sep. 24, 1979, Ser. No. 77,931**

**Int. Cl.³ D01H** *13/32;* **G06F** *11/32;* **H04Q** *9/00*

**U.S. Cl. 57—265** **10 Claims**



1. In apparatus for displaying information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein each machine has instrumentalities from which strand material issues and by which strand material is formed into packages during winding thereof, and detectors on each machine for signalling occurrences of events characteristic of certain operating conditions of the machines, and wherein the apparatus has a data system with distributed processors responsive to the detectors on each machine for determining said certain operating conditions of each machine of the group of machines, and display means responsive to the processors for visually displaying such certain operating conditions, the improvement in the data system which facilitates maintenance thereof and comprises:

malfunction detection circuit means operatively connected with the distributed processors for identifying malfunctions of defined portions of the data system, and

output means operatively connected with said malfunction detection circuit means and responsive thereto for effecting display of information characteristic of the nature and location of malfunctions.

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**4,294,066**

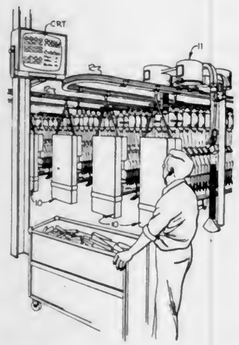
## METHOD AND APPARATUS FOR DISPLAYING SPECIFIC SPINNING MACHINE OPERATING CONDITIONS

**John E. Lane, Littleton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.**

**Continuation-in-part of Ser. No. 900,267, Apr. 26, 1978, Pat. No. 4,194,349. This application Sep. 24, 1979, Ser. No. 77,931**

**Int. Cl.³ D01H** *13/32;* **G06F** *11/32;* **H04Q** *9/00*

**U.S. Cl. 57—265** **16 Claims**



1. In apparatus for displaying information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein each machine has instrumentalities from which strand material issues and by which strand material is formed into packages during winding thereof, and detectors on each machine for signalling occurrences of events characteristic of certain operating conditions of the machines, and wherein the apparatus has at least one traveling unit supported for travel along a predetermined path for traversing one or more of the machines, and detectors mounted on the traveling unit for monitoring ends of strand material normally being formed by a traversed machine, and further wherein the apparatus has a data system responsive to the detectors on each machine and on the traveling unit for determining said operating conditions of each machine of the traversed group of machines, the improvement in the data system which comprises:

input means for entering a request for display of information characteristic of a selected individual operating condition of a selected individual spinning machine, and

output means for displaying requested information in response to entry of a request through said input means.



**4,294,067**

## METHOD AND APPARATUS FOR DOFFING AND DONNING BOBBINS IN A SPINNING MACHINE

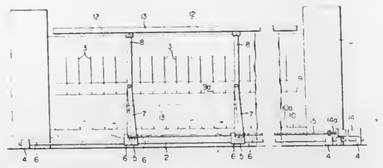
**Shuji Takahisa, Toyota; Osamu Suzuki, Ohbu, and Michio Shibano, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan**

**Filed Jan. 22, 1980, Ser. No. 114,361**

**Claims priority, application Japan, Jan. 25, 1979, 54-8023**

**Int. Cl.³ D01H** *9/08, 9/02*

**U.S. Cl. 57—274** **7 Claims**



1. An apparatus for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, said apparatus comprising:

bobbin conveying means extending along the side of the spinning machine;

means disposed between the succession of spindles and said bobbin conveying means and along the side of the spinning machine for temporarily receiving the bobbins;

a tiltable and vertically movable doffing bar extending along the side of the spinning machine;

a succession of bobbin holders supported by said doffing bar so as to be arranged at the same intervals as the spindles;

means for tilting and means for vertically moving said doffing bar so that said bobbin holders supported by said doffing bar can operate on the spindles, said bobbin temporary receiving means and said bobbin conveying means;

said tilting means including a first piston and cylinder assembly with a reciprocating piston rod, and a mechanism connected between said piston rod and said doffing bar for converting reciprocating movement of said piston rod to tilting movement of said doffing bar between opposite end positions and an intermediate position;

means for maintaining said doffing bar at said intermediate position whereat said bobbin holders can operate on the bobbins on said bobbin temporary receiving means, said maintaining means including an engaging member mounted on a portion of said converting mechanism, and a second piston and cylinder assembly having a stop selectively movable into a path, along which said engaging member is moved by said first piston and cylinder assembly, to allow said engaging member to pressure contact with said stop, thereby stopping said doffing bar at said intermediate position; and

means for supplying fluid into said first piston and cylinder assembly so as to cause said engaging member to be disengaged from said stop in the path of said engaging member before said stop is moved out of the path of said engaging member in order to release said doffing bar from said intermediate position.

4. A method for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, the spinning machine including a bobbin doffing and donning apparatus, said method comprising:

projecting a stop into a path along which an engaging member, mounted on a portion of a power transmission mechanism structurally associating a doffing bar with a piston and cylinder assembly for tilting said doffing bar, is moved by said piston and cylinder assembly to allow said engaging member to pressure contact against said stop, thereby stopping said doffing bar at an intermediate inclined position in which said doffing bar operates on a refuge support;

releasing said doffing bar from said intermediate inclined position by temporarily supplying fluid into said piston and cylinder assembly so as to move said engaging member in a direction in which it disengages from said stop; and

thereafter moving said stop out of the path of said engaging member.

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**4,294,068**

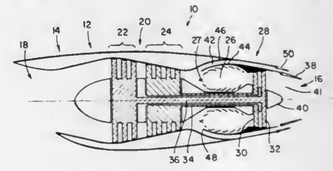
## SUPERSONIC JET ENGINE AND METHOD OF OPERATING THE SAME

**Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Mar. 27, 1978, Ser. No. 890,364**

**Int. Cl.³ F02K** *3/02*

**U.S. Cl. 60—204** **30 Claims**



1. A supersonic jet engine adapted to cruise at supersonic speeds at a relatively high efficiency, to operate with turbine inlet temperatures of at least 2500° F. for high power operation, and to cruise subsonically with a relatively low specific fuel consumption, said engine comprising:

a. a housing structure having an upstream inlet end to receive intake air, and a downstream exhaust end to discharge jet exhaust,

b. an air inlet arranged to receive intake air at subsonic velocity and also to receive intake air at supersonic velocities and reduce said air to subsonic velocity,

c. a compressor mounted in said housing rearwardly of said inlet and arranged to compress air flowing into said inlet, said compressor having an inlet end and an outlet end arranged to operate between a maximum compression ratio and a minimum compression ratio,

d. means defining a combustion chamber mounted in said housing downstream of said compressor to receive compressed air therefrom,

e. fuel injection and ignition means in said combustion chamber arranged to burn fuel in air flow from the compressor and provide a gaseous flow from said combustion chamber,

f. a turbine mounted in said housing rearwardly of said combustion chamber and arranged to receive said gaseous flow from the combustion chamber at temperatures at least as high as 2500° F. and also at lower temperatures, said turbine being operatively connected to said compressor to drive said compressor, said turbine having a predetermined cross-sectional nozzle area through which said gaseous flow passes to pass rearwardly through a primary exhaust passageway,

g. a variable area exhaust nozzle to receive gaseous flow from said turbine and exhaust said flow to produce a thrust,

h. turbine bypass means to receive flow from a location downstream of said compressor as bypass flow, and to direct said bypass flow along a path bypassing said turbine, and exhaust said bypass flow from said engine to produce a thrust,

i. bypass valve means to control the amount of flow bypassed into said turbine bypass means,

j. engine control means operatively connected to said fuel injection and ignition means, to said bypass valve means

and to said exhaust nozzle, in a manner to control the amount of fuel directed to said fuel injection and ignition means, to control said bypass valve means in a manner to control the amount of bypass flow through said turbine bypass means, and to control the discharge area through said exhaust nozzle,

k. said turbine being matched to said compressor in a manner that with said engine operating at subsonic cruise velocity, with said compressor operating at maximum compression ratio, with said bypass valve means positioned so that there is substantially no flow through said turbine bypass means, and with fuel flow being adequate to create thrust to match airplane drag at said subsonic cruise velocity, the turbine has a flow area sized to allow gaseous flow therethrough at the speed of sound in said gaseous flow,

l. said engine control means being arranged to set said bypass valve means at a more open position at higher engine thrust settings where higher temperatures are created in said combustion chamber, and to set said bypass valve means at a more closed position at lower engine thrust settings where lower temperatures are created in said combustion chamber, in a manner that there is substantially constant corrected gaseous flow into said turbine, said corrected flow being measured according to the formula:

$$(W\sqrt{\theta+}/\delta+)=\text{corrected flow}$$

where:

W = Total mass flow rate in lbs. per second

$\theta+$ = Observed temperature (absolute) divider by standard temperature (518.67° R)

$\delta+$ = Observed pressure divided by standard pressure (2116.22 lbs./sq. ft.)

whereby during subsonic cruise said engine can operate at a relatively low specific fuel consumption with high compression ratio and low combustion exit temperature, in a condition where said valve bypass means is at a substantially closed position, during high power acceleration mode said engine can operate at high combustion exit temperatures in a condition where said valve bypass means is in a more open position to maintain constant corrected flow through said turbine to satisfy the turbine requirements, and during supersonic cruise mode the engine can operate efficiency at relatively high combustion exit temperatures.

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**4,294,069**

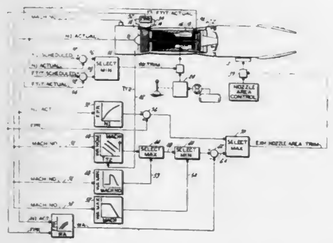
## EXHAUST NOZZLE CONTROL AND CORE ENGINE FUEL CONTROL FOR TURBOFAN ENGINE

**Vann T. Camp, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Apr. 26, 1978, Ser. No. 900,384**

**Int. Cl.[2] F02K *11/00*; F02C *9/04***

**U.S. Cl. 60—238** **2 Claims**



1. A system for optimizing thrust of a gas turbine engine for powering aircraft having a variable area exhaust nozzle while maintaining airflow through the engine within its stable limits, and having independent fuel control means and independent nozzle area control means comprising:

means responsive to rotational speed of said engine for generating a signal for a desired engine pressure ratio,

means responsive to actual pressure ratio for producing a signal indicative of the error between the actual pressure ratio and desired pressure ratio signal,

nozzle area actuator means controlled by said independent nozzle area control responding to said error to further adjust the area of the exhaust nozzle,

means for maintaining the proper amount of airflow in the engine and its inlet to achieve stable engine operations including,

means for selecting the maximum value of a desired airflow signal generated as a function of Mach No. and engine inlet temperature and a minimum inlet airflow schedule generated as a function of Mach No. for producing a first output signal,

means for selecting the minimum value of said first output signal and a maximum inlet airflow schedule generated as a function of Mach No. for producing a second output signal,

means for measuring the airflow in said engine for producing an airflow signal,

means summing said second output signal and said airflow signal for producing an error for further adjusting said exhaust nozzle area,

a maximum selector for selecting the higher value of said error of said pressure ratio signal and said error of said airflow signal,

and means for trimming the independent fuel control means as a function of the difference between a scheduled engine rotational speed and the actual engine rotational speed.

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**4,294,070**

## MASTER CYLINDER ASSEMBLIES

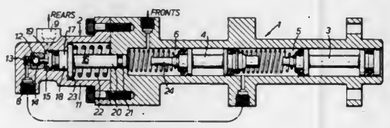
**Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Oct. 29, 1979, Ser. No. 89,103**

**Claims priority, application United Kingdom, Nov. 2, 1978, 42910/78**

**Int. Cl.[3] B60T *17/22***

**U.S. Cl. 60—534** **10 Claims**




1. A master cylinder assembly for a vehicle braking system having two pressure circuits, comprising a master cylinder, two pistons working in said cylinder and defining two separate pressure chambers, one chamber being arranged for connection to one of said pressure circuits, and a control valve means fast with the master cylinder, said control valve means having an inlet for connection to the other of said chambers and an outlet for connection to the other of said pressure circuits, a normally-open valve for controlling communication between said inlet and said outlet, and an auxiliary piston assembly movable to open and close said valve, wherein the auxiliary piston assembly has two portions, one portion being subjected to the pressure at said outlet of said valve arrangement and the other portion being subjected to the pressure of said one chamber of said master cylinder and being engageable by an adjacent one of said pistons of the master cylinder, in the event of failure of pressure in said one pressure circuit, whereby said piston assembly is moved to a position in which said valve is held open.



**4,294,071**

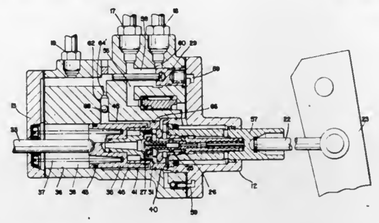
## HYDRAULIC BOOSTER TRAVEL RATIO CHECK VALVE

**Kenneth D. Jensen, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Dec. 12, 1979, Ser. No. 102,883**

**Int. Cl.[3] B60T *13/00, 11/20***

**U.S. Cl. 60—547 A** **16 Claims**



1. A hydraulic booster comprising:

a housing having an input end and an output end, the housing having a housing inlet, a housing outlet and a low pressure outlet;

a control valve means, within the housing, having an inlet valve and an exhaust valve;

an input means through the input end, the input means being operatively connected to the control valve means;

a gain valve means in communication with a passage from the housing inlet to the housing outlet, at a gain valve gap;

a power piston chamber on the output end side of the inlet valve of the control valve means, the power piston chamber connected through the inlet valve to the passage from the housing inlet to the gain valve gap;

power piston slidingly located with a power piston bore in the housing between the power piston chamber and the output end;

a slave piston slidingly located within a slave piston bore in the housing between the power piston and the output end;

an output means from the output end operatively connected to the slave piston;

a ratio chamber within the housing between the slave piston and power piston, there being a passage between the ratio chamber and the low pressure outlet;

a check valve means disposed in the passage between the ratio chamber and the low pressure outlet and designed to allow fluid, under pressure, to flow through the passage in only one direction towards the ratio chamber, the check valve being designed to prevent the loss of fluid from the ratio chamber when the power piston moves in the direction of the output means.

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**4,294,072**

## MASTER CYLINDER AND RESERVOIR ASSEMBLIES

**Derek J. Flynn, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England**

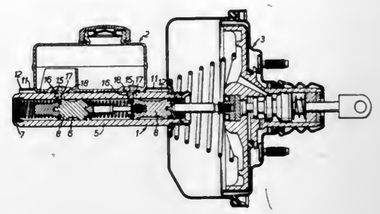
**Filed Sep. 28, 1979, Ser. No. 80,065**

**Claims priority, application United Kingdom, Oct. 4, 1978, 39336/78**

**Int. Cl.[3] B60T *11/26***

**U.S. Cl. 60—585** **4 Claims**

1. A master cylinder and reservoir assembly comprising an elongate master cylinder having a longitudinal axis and longitudinally extending recesses thereon, a reservoir having cooperating projections complementary to said recesses, said projections and recesses being so arranged as to permit interconnection of said reservoir and master cylinder by relative sliding movement in a direction generally parallel to said longitudinal axis of said master cylinder, said projections being formed on a foot portion of the reservoir, said foot portion having an aperture therethrough which cooperates with an aperture in the master cylinder wall to create a flow path between the reservoir and master cylinder, said foot portion having an extension and a downwardly extending lug on said extension engageable with a complementary hole in said master cylinder to locate



and retain said reservoir in a desired predetermined position on said master cylinder.

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**4,294,073**

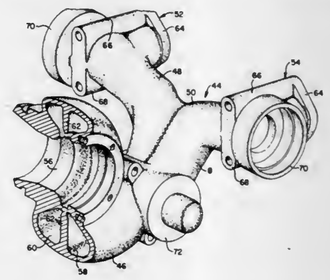
## INTEGRAL TURBINE HOUSING AND EXHAUST COLLECTOR SECTION

**Joseph J. Neff, Zionsville, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.**

**Filed Oct. 5, 1979, Ser. No. 82,284**

**Int. Cl.[3] F02B *37/00***

**U.S. Cl. 60—597** **20 Claims**



1. A turbine housing for use on a multi-cylinder internal combustion engine having plural exhaust ports formed in the engine head/block assembly generally aligned from front to rear and a multi-branch exhaust manifold having a forward branch connected with at least one forward exhaust port for directing exhaust gases generally rearwardly and a rearward branch connected with at least one rearward exhaust port for directing exhaust gases generally forwardly, the rearward and forward branches terminating short of at least a pair of centrally located exhaust ports, wherein said turbine housing comprises:

(a) a volute section containing a central opening for receiving a rotatable turbine wheel having a rotational axis coincident with the central axis of the central opening and parallel to the first and second axis of the forward and rearward branches when the turbine housing is operatively mounted on the internal combustion engine and containing a pair of substantially isolated, side-by-side volute passages communicating with said central opening for receiving exhaust gases supplied by the forward and rearward branches, respectively, and for delivering exhaust gases to the turbine wheel substantially 360° around the periphery thereof, each said volute passage having an outermost wall which intersects a plane perpendicular to the central axis of the central opening to define a curved line beginning at the commencement point of each said volute passage and continuing around said central axis at

a radial distance from the central axis of the central opening which continually decreases;

(b) exhaust collecting means for receiving exhaust gases from the forward branch and one of the central exhaust ports to form a first exhaust stream having a central axis passing through a first joinder point and for receiving exhaust gases from the rearward branch and another one of the central ports to form a second exhaust stream having a central axis passing through a second joinder point; and

(c) exhaust stream guide means integrally formed with said volute section and said exhaust collecting means for respectively directing said first and second exhaust gas streams into said pair of volute passages along a pair of aerodynamically efficient paths extending from said first and second joinder points to said first and second commencement points, said exhaust stream guide means including first and second guide passages which respectively extend between said first and second joinder points and said first and second commencement points to define said pair of aerodynamically efficient paths, each said guide passage having a central axis curved at each point along the entire length thereof such that said first and second exhaust gas streams upon passing said first and second joinder points move in continuously curving fashion until reaching the turbine wheel.

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**4,294,074**

## DRIVE ASSEMBLY, ESPECIALLY FOR MOTOR VEHICLES

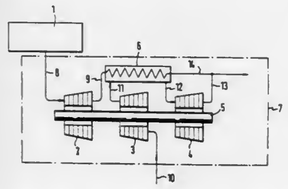
**Helmut Striebich, Karlsruhe, Fed. Rep. of Germany, assignor to Dr. Ing. h.c. F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 22, 1978, Ser. No. 972,211**

**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2757236**

**Int. Cl.³ F01K *23/10*; F02C *1/04***

**U.S. Cl. 60—616** **9 Claims**



1. A drive assembly, especially for motor vehicles, of the type comprising an internal combustion engine and an exhaust gas turbine unit including an exhaust gas turbine driven by the exhaust gases of the internal combustion engine, a compressor, and a secondary turbine, interconnected with each other, the improvement comprising means for utilizing both the kinetic energy and the heat energy of the exhaust gases of the internal combustion engine by a thermal work process superimposed in said exhaust gas turbine, wherein said means for utilizing comprises said exhaust gas turbine having hollow blade means fluidicly communicating with said compressor and secondary turbine for passing a working medium compressed by the compressor therethrough to said secondary turbine with said medium being in heat exchange relationship with the exhaust gases while in said hollow blade means, and expanding in the secondary turbine and releasing power, and wherein said exhaust turbine unit further comprises:

a housing and a hollow rotatable shaft supported therein,

said compressor and turbines being mounted upon said shaft within said housing,

an exhaust gas line being connected to a first inlet of said housing,

said first inlet communicating the exhaust gases with the interior of said shaft through at least one aperture formed therein,

first outlet means for the discharge of said exhaust gases from said shaft and housing, and

working medium passage means for passing said working medium into said compressor, from said compressor to secondary turbine in heat transfer relationship with said exhaust gases and out of said housing.

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**4,294,075**

## SINGLE STAGE RANKINE AND CYCLE POWER PLANT

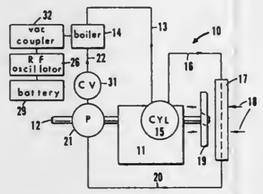
**Joseph J. Closs, 36 Jade cres., Brampton, Ontario, Canada**

**Filed Oct. 17, 1979, Ser. No. 85,533**

**Claims priority, application Canada, Dec. 7, 1976, 267281**

**Int. Cl.³ F01K *25/00***

**U.S. Cl. 60—671** **4 Claims**




1. An improved Rankine cycle power plant of the freon gas energy type and comprising a Rankine engine having a gas energy inlet line and an exhaust line and a power output shaft for said engine;

a freon boiler having an upper cathode grade and a lower end element spaced therefrom, said anode being substantially immersed in liquid freon in said boiler, and gaseous energy inlet line of said engine communicating to said boiler above the liquid freon level therein; a radio frequency oscillator and a battery source energizing same and means communicating radio frequency energy from said oscillator to said cathode and anode; an air communicating heat exchanger adapted to conduct exhaust gases from said exhaust line for liquification of said gases in said heat exchanger; a liquid pump driven by said power output shaft and delivering liquified gases from said heat exchanger to said boiler at the pressure of said boiler at least; and a fan driven by said power output shaft adapted to draw ambient air through said heat exchanger.

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**4,294,076**

## ABSORPTION REFRIGERATING SYSTEM

**Kazuhiro Yoshii, Gunma, Japan, assignor to Sanyo Electric Co. Ltd., Moriguchi and Tokyo Sanyo Electric, Ora, both of, Japan**

**Filed May 20, 1980, Ser. No. 151,610**

**Claims priority, application Japan, May 30, 1979, 54-67630; Feb. 20, 1980, 55-20979**

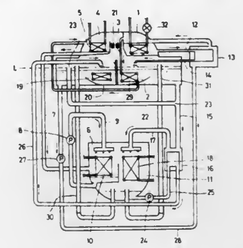
**Int. Cl.³ F25B *27/00, 15/00***

**U.S. Cl. 62—235.1** **4 Claims**

1. In an absorption refrigerating system which comprises a main generator constituted by a high temperature generator to evaporate and separate a refrigerant from an absorbent with vapor, high temperature water, combustion gas or the like being utilized as a heat source, and a low temperature generator to separate a refrigerant from the absorbent with the refrigerant evaporated in said high temperature generator being utilized as a heat source; an auxiliary generator to separate a refrigerant from the absorbent with solar heat or low temperature level warm water such as warm waste water being utilized as a heat source; a condenser; an evaporator; an absorber or others; and in which said devices above-mentioned are connected by refrigerant lines and absorbent lines to form the circulation cycles of the refrigerant and the absorbent,

the improvements characterized in that said auxiliary generator and said low temperature generator are separately housed in a common housing such that a same level pressure is applied to said auxiliary generator and said low temperature generator and such that the absorbents in said auxiliary generator and said low temperature generator are not mixed with each other, and in that there is disposed an absorbent line for connecting said absorber to said auxiliary generator and there is also disposed an absorbent pump at the absorbent line for connecting said auxiliary generator to said main generator, whereby when a double-effect operation is performed with said low temperature generator operated, said absorbent pump is adapted to be operated, and when a single-effect operation is performed with said low temperature generator stopped operating, said absorbent pump is adapted to be stopped operating.





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**4,294,077**

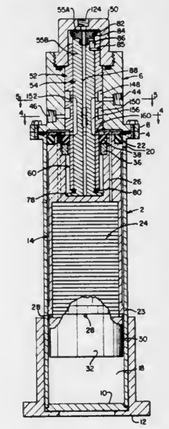
## CRYOGENIC REFRIGERATOR WITH DUAL CONTROL VALVES

**Domenico S. Sarcia, Carlisle, Mass., assignor to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.**

**Filed Oct. 29, 1979, Ser. No. 89,271**

**Int. Cl.³ F25B *9/00***

**U.S. Cl. 62—6** **35 Claims**



1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigeration fluid is circulated in a fluid flow path between said first chamber and said second chamber by the movement of said displacer means controlled through the introduction of high-pressure fluid and the discharge of low-pressure fluid, the improvement which comprises in combination:

valve support means connected to said enclosure;

a valve supported by said valve support means, said valve having a high-pressure inlet port, a low-pressure outlet port, and a bi-directionally movable valve member having first and second passages arranged so as to alternately connect said inlet and outlet ports to said first chamber according to the position of said valve member;

a third variable volume chamber defined in part by said displacer means; and

means for transmitting a fluid between said third variable volume chamber and a selected high pressure source or a selected low pressure source independently of the mode of fluid flow determined by the connections made by said valve member between said inlet and outlet ports and said first chamber.

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**4,294,078**

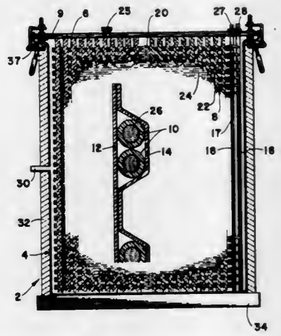
## METHOD AND SYSTEM FOR THE COMPACT STORAGE OF HEAT AND COOLNESS BY PHASE CHANGE MATERIALS

**Calvin D. MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.**

**Continuation-in-part of Ser. No. 790,919, Apr. 26, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,984**

**Int. Cl.³ F28D *21/00*; F25B *23/00***

**U.S. Cl. 62—59** **36 Claims**



7. The method of storing thermal energy and withdrawing it at a later time comprising the steps of:

A. providing a plastic open-top container;

B. uniformly spacing a grid of small diameter plastic tubes within and substantially throughout said container;

C. arranging said tubes to give multiple parallel circuits with opposite direction of flow in adjoining tubes;

D. connecting said tubes to supply and return headers;

E. substantially filling said container and surrounding said tubes with a phase change material in its liquid state while leaving a region in the top of said container which is free of said phase change material for accommodating the expansion and contraction of said material during its change of state;

F. connecting said headers through pumping and heat exchange means;

G. recirculating a liquid through said tubes at a temperature below the phase change temperature causing the phase change material to solidify; and

H. alternately adding heat energy to and withdrawing heat energy from the recirculating liquid causing said material to melt and solidify simultaneously throughout the mass of said phase change material, whereby heat of fusion will be stored simultaneously throughout the phase change material during solidification and then released to the recircu-

lating liquid simultaneously throughout the phase change material during melting.

36. The method for freezing ice solid in a vertical cylindrical plastic tank without creating lateral expansion forces in the tank for cooling storage for use in air conditioning a building using electrical energy at "off peak" rates including the steps of:

uniformly spacing a grid of small diameter spaced flexible plastic tubes within and substantially throughout the tank in the main lower portion of said tank;

arranging said tubes to give multiple parallel circuits with opposite direction of liquid flow in adjoining tubes;

connecting said tubes to supply and return headers;

filling said tank with water in the main lower portion of said tank while leaving the top portion of the tank free of water to accommodate expansion as the water is frozen into solid ice in the tank;

connecting said headers through electrically energized pumping and refrigeration means located outside of said tank and arranged for refrigerating anti-freeze liquid;

electrically energizing said pumping and heat exchange means during "off peak" hours of a 24 hour day for recirculating the anti-freeze liquid through said tubes at a temperature below the freezing point of water for causing the water in said plastic tank to freeze to solid ice around all of said adjoining tubes uniformly throughout the whole volume of water in said tank during said "off peak" hours;

said freezing of the water to solid ice around all of said adjoining tubes throughout the whole volume of water in said tank squeezing the extra water volume upwardly due to expansion of the freezing ice and thereby preventing rupture of the plastic tank as the whole volume of water freezes to solid ice;

during daylight hours when air conditioning is desired in the building recirculating the anti-freeze liquid through said tubes embedded in said solid ice and through second heat exchange means;

blowing building air past said second heat exchange means for cooling the building air by transferring heat energy from the building air into said recirculating liquid and for transferring heat energy from said recirculating liquid into the ice in said tank;

thereby providing air conditioning in the building while avoiding the use of electrical energy during hours of "peak" rates, and

thereby advantageously avoiding rupture of the tank even though the water is frozen solid therein.

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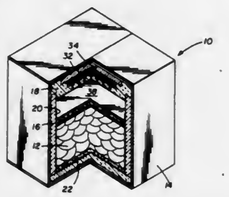
**4,294,079**

## INSULATED CONTAINER AND PROCESS FOR SHIPPING PERISHABLES

**Ernest J. Benson, Berkeley Heights, N.J., assignor to Better Agricultural Goals Corporation, Dallas, Tex.**

**Filed Mar. 12, 1980, Ser. No. 129,565**
**Int. Cl.³ B65B *63/08*; F25D *3/08***
**U.S. Cl. 62—60** **20 Claims**



1. A process for packing perishables for shipment, comprising the steps of:

(a) chilling the perishables to a desired predetermined unfrozen temperature;

(b) placing the prechilled perishables on an absorbent pad within an insulated box;

(c) covering the prechilled perishables with a layer of ice;

(d) placing a wet pad on the layer of ice;

(e) closing the top end of said box with a lid positioned in spaced relationship with said wet pad in order to define a head space therebetween; and

(f) connecting a compartment containing subliming expendable refrigerant in fluid communication with the head space of said box so that sublimated refrigerant can refrigerate said box and substantially freeze said wet pad, thereby maintaining the perishables in chilled but unfrozen condition during shipment.

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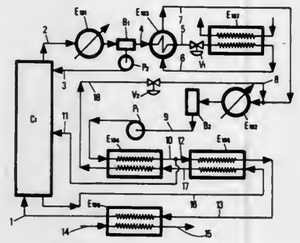
**4,294,080**

## DESORPTION STEP IN ABSORPTION HEAT PUMPS AND REFRIGERATORS

**Georges Cohen, Le Pecq, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Dec. 11, 1979, Ser. No. 102,489**
**Claims priority, application France, Dec. 11, 1978, 78 35010**
**Int. Cl.³ F25B *15/00***
**U.S. Cl. 62—101** **18 Claims**



1. An improved process for operating an absorption heat pump or an absorption refrigerator, the improvement comprising the steps of:

(a) directly contacting a solute vapor phase (V") with a liquid phase (L') and a liquid phase (L") in an absorption zone, the liquid phases (L') and (L") being solvents for the solute vapor phase (V"), thereby recovering a solution (S);

(b) dividing the recovered solution (S) into a first portion ($S_1$) and a second portion ($S_2$), supplying said first portion ($S_1$) of the solution (S) to an indirect contact heat exchange zone and indirectly contacting said portion ($S_1$) with an external heating fluid in said indirect contact heat exchange zone, thereby recovering a vapor phase (V'), and a residual liquid phase (L'), separating said vapor phase (V') from said residual liquid phase (L') and feeding back said liquid phase (L') to step (a);

(c) directly contacting, in counter-current contact, the vapor phase (V') from step (b) with said second portion ($S_2$) of the solution (S) in a desorption zone, thereby recovering separately a vapor phase (V) and a liquid phase (L") and feeding back said liquid phase (L") to step (a);

(d) passing the vapor phase (V) from step (c) through a condensation zone, externally cooling the vapor phase (V) in said condensation zone with an external cooling fluid and recovering a condensed phase (C); and

(e) passing said condensed phase (C) through an evaporation zone, externally heating said evaporation zone with an external heating fluid to vaporize at least a portion of said condensed phase (C), recovering a vapor phase (V") therefrom, and feeding back said vapor phase (V") to step (a).

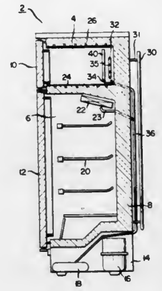


**4,294,081**

## FREEZING REFRIGERATOR

**Akio Mitani; Moriyoshi Sakamoto, both of Yokohama, and Hiroaki Murasaki, Ibaraki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Apr. 27, 1979, Ser. No. 33,978**
**Int. Cl.³ F25D *21/02*; F25B *5/00***
**U.S. Cl. 62—140** **8 Claims**



1. A freezing refrigerator comprising:

a freezing chamber for storing an object to be frozen, said freezing chamber defined by contiguous top, bottom, side and rear walls and including an opening for taking the object in or out of said chamber;

a freezing chamber door member provided at the opening which is opened or closed when the object is taken in or out of said freezing chamber and for intimately closing said freezing chamber when said door member is closed;

a first cooling means which is provided at the periphery around the top, bottom and side walls of said freezing chamber to cool said freezing chamber;

a second cooling means which is disposed close to the rear wall of said freezing chamber;

a shield which is disposed between said second cooling means and said door and close to said second cooling means and is made of a heat insulative material, said shield substantially open around its periphery;

a heating means for melting frost attached to said second cooling means; and

coolant supply means for supplying a coolant to said first and second cooling means to produce a temperature differential therebetween such that the surface temperature of said second cooling means is lower than that of said first cooling means;

wherein said shield defines a defrost region between said shield and said rear wall, said defrost region communicating with the rest of said freezing chamber around the periphery of said shield, whereby frost deposited on the first cooling means is migrated by air convection past said shield towards said second cooling means in said defrost region.

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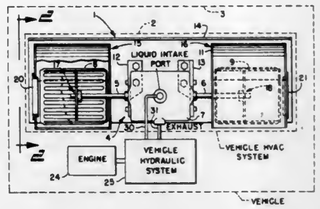
**4,294,082**

## HYDRAULIC BLOWER SYSTEM FOR VEHICLES

**Patrick L. Gerboth, Concord Township, Lake County, and Charles W. Thompson, Willoughby, both of Ohio, assignors to SGM Co., Inc., Mentor, Ohio**

**Filed Mar. 13, 1979, Ser. No. 20,075**
**Int. Cl.³ B60H *3/04***
**U.S. Cl. 62—244** **6 Claims**

1. For a vehicle including a hydraulic system for operating hydraulic equipment associated with the vehicle, and a prime mover for driving the hydraulic system to provide work thereto, the improvement comprising hydraulic blower means for blowing air in the vehicle to circulate air therein, and means for coupling hydraulic fluid of the hydraulic system to said hydraulic blower means to operate said hydraulic blower means to blow air in the vehicle; said hydraulic blower means including a hydraulic motor having an output shaft on one side of said hydraulic motor and another output shaft on an opposite side of said hydraulic motor and blower means for blowing air, said output shafts being commonly rotated, said blower means including a separate squirrel cage blower mounted on each of said output shafts, and blower housing means about said squirrel cage blowers for at least partly covering said squirrel cage blowers; the vehicle including an air conditioning system having a condenser with a condenser coil, said hydraulic blower means being mounted with respect to the condenser to circulate air over the condenser coil; said output shafts providing the sole support for said squirrel cage blowers; said blower housing means having inlet means and outlet means for air flow with respect thereto; and further comprising blower system housing means for supporting said hydraulic motor and said blower housing means in the vehicle.

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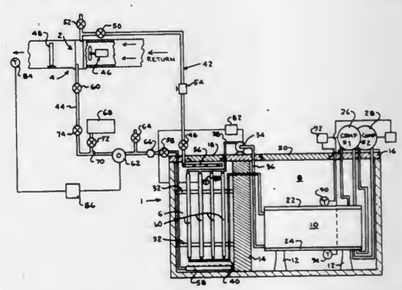
**4,294,083**

## AIR CONDITIONING SYSTEM

**Barton King, 19415 W. Indies La., Tequesta, Fla. 33458**

**Filed Apr. 7, 1980, Ser. No. 137,870**
**Int. Cl.³ F25D *17/02***
**U.S. Cl. 62—434** **9 Claims**




1. An air conditioning system having a freeze tank, a first coolant tank positioned within said freeze tank, means for freezing a liquid in said freeze tank around said first coolant tank and cooling a liquid in the first coolant tank to a desired temperature, a second coolant tank, heat absorber plates being positioned within said second coolant tank, means connecting said first coolant tank to said heat absorber plates for pumping a cooled liquid in the first coolant tank through said heat absorber plates and back into said first coolant tank, an evaporator coil, means connecting said second coolant tank to said evaporator coil for pumping a cooled liquid in the second coolant tank through said evaporator coil and back into said second coolant tank.

**4,294,084**

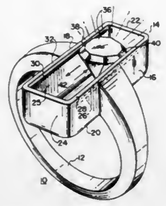
## ARTICLE OF JEWELRY WITH RECIPROCALLY MOVABLE GEM

**Lester M. Lampert, 2304 Greenview Rd., Northbrook, Ill. 60048**

**Filed Aug. 19, 1976, Ser. No. 715,987**

**Int. Cl.³ A44C** *9/00, 17/02*

**U.S. Cl. 63—15** **9 Claims**



9. An article of jewelry comprising a setting and at least one stone carried in said setting wherein the setting comprises guide means slidably holding said stone, said stone having a top side and a bottom side and being adapted to move in said guide means upon random tilting of said setting while being constrained by said guide means to movement in a linear path with said top side maintained uppermost in said setting.

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**4,294,085**

## FLAT BED KNITTING MACHINES

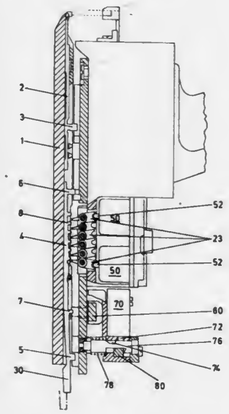
**Johann G. Traütner, Creussen, Fed. Rep. of Germany, assignor to Bentley Alemannia Limited, Great Britain**

**Filed Oct. 2, 1979, Ser. No. 81,113**

**Claims priority, application United Kingdom, Oct. 3, 1978, 39031/78**

**Int. Cl.³ D04B** *7/00*

**U.S. Cl. 66—75.1** **25 Claims**



1. Flat bed knitting machines having a pair of needle beds, tricks in said needle beds, needles and jacks in the respective tricks and having associated operating butts extending outwards of the tricks, said needle operating butts being non-rotatable, a cam carriage, means for sliding said cam carriage across said needle beds, cam means including clearing cam means and stitch cam means on said cam carriage defining for said needle operating butts in each direction of carriage movement a collecting track, a knitting track and a tucking track, a first bank of actuators for selectively engaging said jacks to cause selected needle operating butts to be raised lengthwise of the tricks from the collecting track for passing through the knitting track by means of said clearing cam means and said stitch cam means, a second bank of actuators spaced in trickwise alignment with said clearing cam means and housing on either side thereof cam means for raising the needle operating butts from the collecting track lengthwise of the tricks on the trailing side of said clearing cam means for passing through the tucking track by means of said stitch cam means in each direction of carriage movement.

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**4,294,086**

## LATCH NEEDLE FOR KNITTING MACHINES

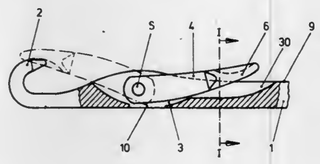
**Harald Mayer, and Hardo Berentzen, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt, Fed. Rep. of Germany**

**Filed Mar. 17, 1978, Ser. No. 887,587**

**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714607**

**Int. Cl.³ D04B** *35/04*

**U.S. Cl. 66—121** **1 Claim**



1. A latch needle for knitting or like machines comprising:
an elongated needle shank having an upper edge and a lower edge, and a hook at at least one end thereof and a longitudinally-extending slot formed therein flanked by a pair of opposed faces, and a latch pivotably mounted in said slot and having a spine with a widened wedge-like, rounded portion, said needle shank having a supporting portion for the widened, rounded portion of the spine of the latch at the faces of said shank flanking said longitudinal slot and said supporting portion being recessed relative to the upper edge of said needle shank, said longitudinal slot having a short recessed portion defined by a curved base wall containing an aperture leading to the lower edge of said needle shank and a further portion adjacent to said short portion which defines a channel characterized by an initial substantially rectilinear base wall and a further curved base wall which merges with said upper edge of the needle shank, said supporting portion of said needle shank for said widened, rounded portion of the spine of the latch being located over the substantially rectilinear base wall region of said further portion and said channel of said further portion being deeper than half the height of said needle shank in said substantially rectilinear base wall region and projecting in length beyond the end of said latch when in its rearward open position displaced away from its associated hook.



**4,294,087**

## ENZYMATIC METHOD FOR HAIR RECOVERY WITH CONCURRENT OPENING OF HIDE STRUCTURE

**Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany**

**Filed Apr. 2, 1980, Ser. No. 136,678**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917376**

**Int. Cl.³ C14C** *1/06*

**U.S. Cl. 69—21** **13 Claims**

1. A method for the recovery of hair from an animal hide and for a concurrent opening of the hide structure using a proteolytic enzyme, which method comprises first pretreating the hide, free of preservative salt, in the acid pH region with a material cleaving disulfide bridges and then, without a previous softening, concurrently loosening hair and opening the hide structure by treating said hide with a protease, effective in the alkaline region, at a pH value of about 11 to about 13.

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**4,294,088**

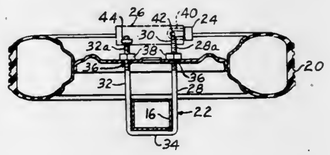
## SECURITY DEVICE FOR SPARE TIRES

**Rolla W. Barr, 16300 Fontaine Dr., Chesterfield, Mo. 63017**

**Filed Oct. 16, 1978, Ser. No. 951,757**

**Int. Cl.³ B60R** *43/00, 43/02;* **E05B** *67/38, 73/00*

**U.S. Cl. 70—56** **4 Claims**



1. A security device for spare tires comprising:
a housing having first means for receiving a shackle portion of an associated padlock, and second means for receiving a first portion of an associated member to be secured by the padlock, said first means being a relief adjacent one end of the housing and said second means being a relief opposite the first relief and adjacent the one end;
shackle-securing means connected to the housing adjacent the one end;
third means for receiving a second portion of the associated member, said third means being a relief adjacent another end of the housing opposite the one end; and
means for manual access to the shackle, said means being an opening formed in the housing between the opposite ends.

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**4,294,089**

## LATCHBOLT RIM LOCK

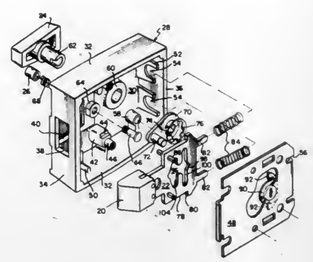
**Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.**

**Filed Nov. 30, 1978, Ser. No. 965,185**

**Int. Cl.³ E05B** *55/00*

**U.S. Cl. 70—150** **16 Claims**

1. A rim lock, comprising
a case having a front wall and side and end walls,
a latchbolt including a head and a draw plate, slidably mounted in the case for movement between a projected locking position and a retracted unlocked position, said draw plate having laterally spaced spring seats at its rear end,
said case having two laterally spaced spring seats formed in its rear end wall, a spring mounted between each spring seat and the rear end of the draw plate and biasing the bolt forward to projected position,
said draw plate having a cam opening therein ahead of said spring seats defining a forwardly presented cam surface, a crank rotatably mounted in the front wall between the positions of the spaced springs, and having a forwardly



offset crank pin engaged in said cam opening and movable against the cam surface to move the bolt to retracted position.

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**4,294,090**

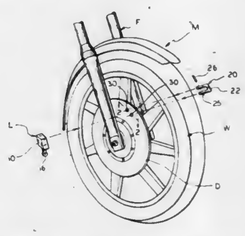
## CYCLE LOCK ARRANGEMENT

**Romain Metzger, 1310 Roscoe, Chicago, Ill. 60657**

**Filed Aug. 17, 1979, Ser. No. 67,350**

**Int. Cl.³ B62H** *5/08, 5/18;* **E05B** *67/06, 71/00*

**U.S. Cl. 70—226** **9 Claims**



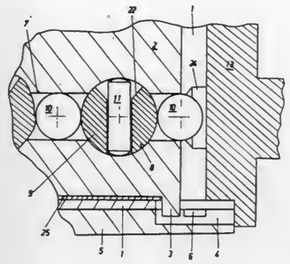
1. In a locking device for a cycle having a fork, a wheel mounted in the fork, and a brake disc, with opening means extending therethrough, secured to said wheel outboardly thereof, the combination of:
(a) a housing member including a body having a cavity therein, open at only one side thereof, and adapted to have said one side mounted against an outboard surface of said disc adajcent said opening means;
(b) a retaining member including:
(i) an inboard portion adapted to be mounted against an inboard surface of said disc adjacent said opening means;
(ii) an integral outboard portion adapted to extend from said inboard portion, through said opening means and into said housing member cavity;
(c) said housing member also including a lock element mounted for movement within said cavity into and out of engagement with the outboard portion of said retaining member to keep said disc snugly positioned between opposed surfaces of said retaining member inboard portion and said housing member body;
(d) means for moving said lock element into and out of engagement with said retaining member outboard portion.

**4,294,091**

## CONTROL DEVICE FOR CYLINDER LOCKS

**Kurt Prunbauer, Herzogenburg, Austria, assignor to Evva Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft, Vienna, Austria**

**Filed Feb. 16, 1979, Ser. No. 12,895**
**Claims priority, application Austria, Feb. 20, 1978, 1222/78**
**Int. Cl.³ E05B *9/04, 47/00***
**U.S. Cl. 70—276** **5 Claims**



1. A control device, particularly for use in a magnetic cylinder lock, comprising, a housing defining a cylindrical passage, a cylindrical plug disposed in said passage for a rotational and axial movement relative to said housing; arresting means operable between said plug and said housing for blocking the rotational movement in one axial position of said plug and for unblocking the rotational movement in another axial position thereof; said plug having a radial extension and said housing defining an axial groove in engagement with said extension and an annular groove communicating with said axial groove to guide said extension in said other axial position; said plug including at least one longitudinal boring, a plurality of rotary members arranged respectively for rotation about an axis transverse to said longitudinal boring and each defining a diametrical boring which at one angular position of the rotary member is in alignment with said longitudinal boring, a plurality of arresting elements arranged in said longitudinal and diametrical borings over the entire length of said passage in the housing, and biasing means normally urging said plug into said one axial position.

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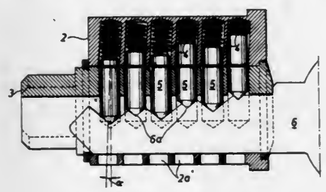
**4,294,092**

## CYLINDER LOCK HAVING SPRING-ACTUATED PINS

**Ake T. L. Häggström, Lycksele, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden**

**Filed Feb. 13, 1980, Ser. No. 120,961**
**Claims priority, application Sweden, Feb. 13, 1979, 7901266**
**Int. Cl.³ E05B *27/04***
**U.S. Cl. 70—364 A** **4 Claims**



1. A cylinder lock, comprising: a cylinder housing (2), a cylindrical body (3) mounted in said housing for rotation through at least 180° when a correct key is inserted into said lock, said housing and said cylindrical body individually defining a first parallel set and a second parallel set of communicating bores, and a plurality of spring-actuated pins individually accommodated within said first and second sets of bores, each pin comprising at least two parts and inner ends of said pins cooperating with a bit of the key, at least one of said sets of bores being inclined relative to a normal to the axis of the cylinder housing to partially axially offset the first and second sets of bores subsequent to rotating the cylindrical body through 180° and prevent the pin parts within the cylindrical body from falling out.

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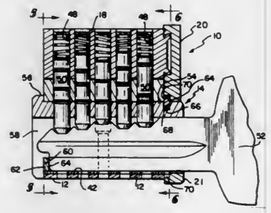
**4,294,093**

## PIN TUMBLER LOCK WITH PULL-RESISTANT KEY PLUG

**Walter E. Best; William R. Foshee, and Max L. Flack, all of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.**

**Filed Jun. 14, 1979, Ser. No. 48,531**
**Int. Cl.³ E05B *27/00***
**U.S. Cl. 70—369** **14 Claims**



1. A pin tumbler lock, comprising
lock body means forming a key plug bore extending between front and rear faces and forming pin tumbler bores intersecting therewith,
a key plug having a cylindrical portion received in said plug bore and containing an axial key slot and pin tumbler bores alignable with those of the body means,
a peripheral flange on said plug integral with said cylindrical portion and disposed in thrust transmitting overlapping relation with the rear of the lock body means so as to oppose forward movement of the key plug,
a circumferential groove in the key plug adjacent its front end and a retainer ring engaged in said groove and disposed in axially engaging relation with the front of the lock body so as to oppose rearward movement of the plug,
said ring having a key-pass opening therein and interengaging the plug so as to be held with its said opening in alignment with the key slot of the key plug.

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**4,294,094**

## METHOD FOR AUTOMATICALLY CONTROLLING WIDTH OF SLAB DURING HOT ROUGH-ROLLING THEREOF

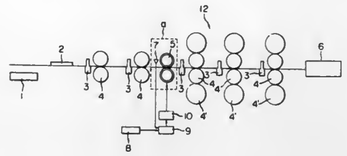
**Masaru Okado, Tokyo, and Takashi Ariizumi, Yokohama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 31, 1980, Ser. No. 117,272**
**Claims priority, application Japan, Feb. 24, 1979, 54-20213**
**Int. Cl.³ B21B *1/04, 27/02, 37/00***
**U.S. Cl. 72—16** **10 Claims**

1. A method for automatically controlling the width of a slab during hot rough-rolling thereof, which comprises:
arranging a pair of horizontal broadening rolls each having at least one annular projection in a hot roughing mill train comprising a plurality of roll stands each having a pair of vertical rolls and a pair of horizontal rolls;
calculating an amount of roll gap correction of said pair of broadening rolls on the basis of variations in the width of said slab during hot rough-rolling by said hot roughing mill, at the entry of said pair of broadening rolls; and,



controlling the roll gap of said gap of broadening rolls in response to said amount of roll gap correction;
thereby automatically controlling the width of said slab



during hot rough-rolling thereof to a prescribed value in accordance with the finishing width of a steel strip, and at the same time, automatically correcting variations in the width of said slab during hot rough-rolling thereof.

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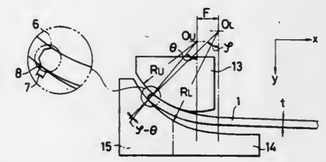
**4,294,095**

## PROCESS FOR FABRICATING HEAVY WALL TO PIPE

**Tsuyoshi Kawano; Matsuo Usuda, and Toshio Hirokawa, all of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Nov. 23, 1979, Ser. No. 97,043**
**Claims priority, application Japan, Nov. 22, 1978, 53-143325; Feb. 23, 1979, 54-19750**
**Int. Cl.³ B21D *5/00***
**U.S. Cl. 72—51** **10 Claims**



1. A process of fabricating flat steel plate into heavy wall UO pipe by crimping, U-ing and O-ing, wherein the U-ing operation comprises:
using a collapsible U-ing punch comprising a center block carrying paired side punches on both sides and a bottom punch at the bottom thereof; and
obtaining the desired butt edge gap in the O-shaped workpiece by decreasing the ratio of the U-ing punch height to the U-ing punch width when the gap is smaller than the desired butt edge gap, and increasing said ratio when the gap is larger than the desired butt edge gap.

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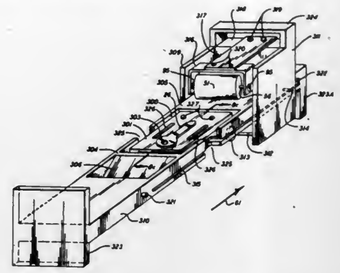
**4,294,096**

## METHOD AND APPARATUS FOR MAKING A SECONDARY KEY FOR A LOCK MECHANISM

**Joseph B. Heimann, 502 Marlbrook La., Lansdale, Pa. 19446**

**Division of Ser. No. 790,824, Apr. 25, 1977, Pat. No. 4,143,582.**
**This application Dec. 11, 1978, Ser. No. 968,198**
**Int. Cl.³ B21D *33/00***
**U.S. Cl. 72—60** **9 Claims**

1. Apparatus for recording information relating to a primary key in order to be able to make a secondary key comprising:
(a) a frame of essentially rectangular shape to accommodate the largest key to be recorded;
(b) a support member for supporting said frame in a fixed position, said support member including a rectangular slot of dimensions sized to fit said frame, said slot being of a depth equal to or greater than the height of said frame whereby a key may be placed on the portion of said support member within the area enclosed by said rectangular slot, said portion being coplanar with the rest of said support member;
(c) a piece of metallic foil secured between at least two sides of said frame, said frame with said foil placed over the rectangular portion of said support member enclosed by said rectangular slot, whereby the primary key may be placed under said foil for recording the impression of said primary key in said foil;



(d) an elastic roller mounted on a shaft for applying pressure between said metallic foil and key to press said key and metallic foil together such that the metallic foil is forced into and around indentations on said key, thereby making a recording in said foil;
(e) means to support said shaft for rolling motion over said metallic foil; and
(f) means in said support member for guiding said roller over said foil.

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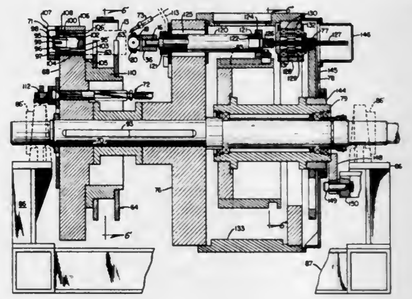
**4,294,097**

## BOTTOM ROLL-FORMING METHOD AND APPARATUS AND RESULTANT CAN END CONFIGURATION

**Laszlo A. Gombas, Rte. 7, Box 555Q, Evergreen, Colo. 80439**

**Division of Ser. No. 931,124, Aug. 4, 1978, Pat. No. 4,199,073.**
**This application Apr. 8, 1980, Ser. No. 138,855**
**Int. Cl.³ B21D *17/04***
**U.S. Cl. 72—94** **23 Claims**



1. The method of roll forming the end wall of a generally cylindrical receptacle composed of a ductile material which is open at one end and is provided with an end wall at the opposite end, the method comprising the steps of retaining each receptacle in succession in a fixed position with the exterior of the unitary end wall in facing relation to the end of a yieldable support and advancing at least one bearing surface axially through the interior of the receptacle into engagement with the end wall and rotating the bearing surface while continuously advancing same in an axial direction whereby to force the end wall into engagement with the yieldable support to roll-form an axially directed, annular rib in the end wall while forcing

the end wall to assume a generally dome-shaped configuration as it is forced against the yieldable member.

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**4,294,098**

## APPARATUS FOR MANUFACTURING STEEL SPRING LEAVES

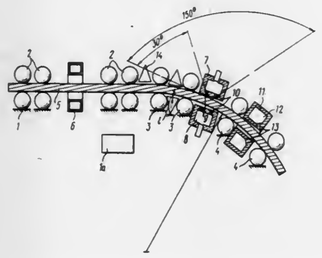
**Viktor P. Egorov, Vostryakovsky proezd, 11, korpus 1, kv. 226; Viktor A. Ognevsky, Sumskoi proezd, 15, korpus 2, kv. 279; Anatoly G. Orlovsky, Avtozavodskaya ulitsa, 7, kv. 81; Grigory A. Ostrovsky, Raketny bulvar, 10, kv. 47; Alexandr M. Ryskind, Kirovogradskaya ulitsa, 24, korpus 1, kv. 161; Anatoly L. Stepin, Birjulevskaya ulitsa, 5, korpus 2, kv. 347; Oleg F. Trofimov, Chusovskaya ulitsa, 11, korpus 8, kv. 92, and Isaak N. Shklyarov, Velozavodskaya ulitsa, 9, kv. 24, all of Moscow, U.S.S.R.**

**Division of Ser. No. 824,211, Aug. 9, 1977, Pat. No. 4,193,824. This application Apr. 26, 1979, Ser. No. 33,520**

**Claims priority, application U.S.S.R., Aug. 18, 1976, 2385501; Aug. 18, 1976, 2385502**

**Int. Cl.³ B21D** *5/14*

**U.S. Cl. 72—128** **1 Claim**



1. An apparatus for manufacturing spring leaves comprising: a support adapted to mount, live entry guide rollers; an induction heating coil, said coil being arranged intermediate said live entry guide rollers and connected to a power source; bending rollers set in pairs for accommodating therebetween a spring leaf; stops disposed between said live entry guide rollers and said bending rollers, as well as between the neighboring pairs of said bending rollers and spaced from the surface of each spring leaf passing in between said rollers, at a distance of from 0.0001 to 0.00005 of a specified radius of curvature of each spring leaf; a first cooler connected to a fluid source; exit guide rollers; an additional induction heating coil and cooler, both being arranged between said exit guide rollers and intended for surface hardening of spring leaves; an induction heating coil of said additional induction heating coil and cooler, being connected to a power source; a cooler of said additional induction heating coil and cooler, being connected to a fluid source; said first cooler, said additional induction heating coil and cooler and said exit guide rollers all being arranged along a circular arc having a radius equal to a specified radius of curvature of a spring leaf; a fluid source; and a means for actuating said live entry guide rollers.

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**4,294,099**

## ROLLING MILL TRAIN

**Alfons Spaude, Dusseldorf, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

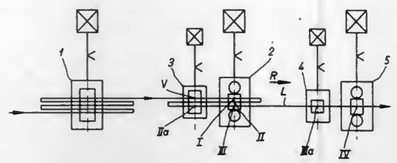
**Filed Oct. 10, 1979, Ser. No. 83,264**

**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844433**

**Int. Cl.³ B21B** *1/12*

**U.S. Cl. 72—234** **8 Claims**

1. A method of rolling, comprising the sequential steps of:
(a) passing material through a reversing pre-rolling stand;
(b) passing the material through an edging stand a first time;
(c) passing the material through a reversing universal rolling stand;
(d) passing the material back through the reversing universal rolling stand;
(e) passing the material through the edging stand a second



time with the reduction caliber roll of the edging stand adjusted from their position in step (b);
(f) passing the material back through the edging stand a third time with the reduction caliber roll of the edging stand adjusted from their position in step (e); and
(g) passing the material once again through the reversing universal rolling stand.

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**4,294,100**

## METHOD OF MANUFACTURING A SEAMLESS OUTER SLEEVE FOR A BALL BEARING

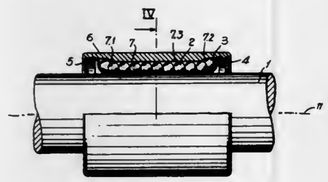
**Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Horst M. Ernst, Eltingshausen, and Toni Schulz, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany**

**Filed Jul. 11, 1979, Ser. No. 56,738**

**Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831148**

**Int. Cl.³ B21D** *53/10*

**U.S. Cl. 72—340** **8 Claims**



1. In a method of manufacturing a seamless outer sleeve for a ball bearing from a hollow cylindrical tube of predetermined outer diameter and uniform wall thickness to have radially inwardly projecting race sections parallel to the tube's central axis for the load-carrying balls of the ball bearing with inclined race transition sections at each end of each load-bearing section, the method steps comprising (a) forming only said axial race sections by deformation to a depth d radially inward of said outer diameter, and (b) cutting away the outer circumference of the sleeve by the amount of the forming depth d of the race sections thereby forming at each end of each load-bearing section a ramp having thickness less than that of said load-bearing sections.



**4,294,101**

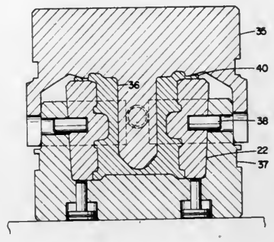
## METHOD OF MAKING SINGLE OR DOUBLE FLANGED TRACK TRACTOR ROLLER FOR OFF-HIGHWAY EQUIPMENT

**Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142**

**Filed Jan. 12, 1979, Ser. No. 2,851**

**Int. Cl.³ B21D** *22/00;* **B21K** *1/28*

**U.S. Cl. 72—356** **29 Claims**



1. A method of closed die forging to form a flanged cylindrical metal part having at least two exterior cylindrical flanges and a cylindrical cavity, which comprises the steps of:
A. busting and preforming a heated billet to a cylindrical shape having one end and an axially opposite other end;
B. thereafter inserting the billet and a split ring outwardly thereof into a set of dies, said ring having an interior conformation with at least one interior cylindrical groove to form a first flange;
C. mating and supporting said ring within a first one of said dies to effectively close one end of said ring;
D. closing the other end of said ring with the other die to forge said billet; and
E. thereafter removing the split ring and billet together from said first-mentioned dies and placing the split ring and billet into a set of finishing dies, which finish forms the flanges and the cylindrical cavity, thereby displacing metal from the center of the billet into the flanges while forming the cylindrical cavity.

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**4,294,102**

## DEVICE FOR BENDING AND HARDENING BAR MATERIAL

**Lothar Lückert, Hagen-Emst; Christoph Pohl, Witten; Carl-Erich Proll, Hagen, and Paul Steffes, Gevelsberg, all of Fed. Rep. of Germany, assignors to Proll & Lohmann Betriebs GmbH, Hagen, Fed. Rep. of Germany**

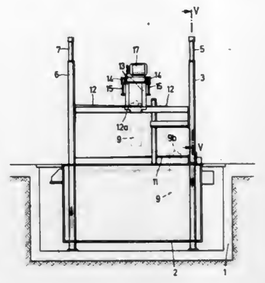
**Filed Mar. 27, 1980, Ser. No. 134,611**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912364**

**Int. Cl.³ B21D** *37/04*

**U.S. Cl. 72—413** **5 Claims**

1. In a device for the bending and/or distortion-free hardening of bar material, particularly leaf springs, having a plurality of frame-shaped tools each of which comprises an upper part and a lower part, the tools, upon closing, bending a heated workpiece and lowering the workpiece in clamped condition into a treatment tank, the tools being moved vertically in a portal for the bending and lowering and being discharged from the portal in a lowest position thereof and being transported by means of guide rails of a transport device through the treatment tank before the tools are grasped by a lift portal and raised into a position above the treatment tank, in which latter position the tools are opened, the workpiece is removed and the opened tools are transferred into a ready position, the improvement comprising
upper guide rail means for returning opened tools including a movable part of the length of said upper guide rail means, said movable part corresponds at least to the axial depth of a tool, said movable part defining a normal position relative to the remainder of said upper guide rail means, said movable part being movable out of said normal position,
changing means for being moved with said tool,



means comprising rail sections arranged on said changing means and for replacing said movable part of said upper guide rail means.

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**4,294,103**

## OVERLOAD SAFETY DEVICE IN HYDRAULIC FORMING PRESSES, IN PARTICULAR SHEET METAL FORM DRAWING PRESSES

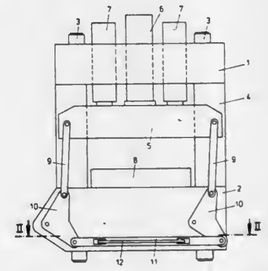
**Willi Funck, Meerbusch; Roland Verheyen, Krefeld, and Heinz Schedler, Heidesheim, all of Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed May 1, 1980, Ser. No. 145,495**

**Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919012**

**Int. Cl.³ B21J** *9/20*

**U.S. Cl. 72—453.14** **9 Claims**



1. A safety device against overload in a hydraulic forming press in particular for shaping sheet metal, said press comprising:
(A) A table beam with a press table attached thereto, an opposing beam spaced therefrom, and end supports spacing said beams each provided with tension members;
(B) A travelling beam guided at said opposing beam provided with at least one pressure cylinder to exert at said table a pressing force opposed by said tension members,
(C) at least one parallel linkage comprising
(a) a connecting rod pivoted at one end to one end of the travelling beam
(b) an angle lever pivoted at the end of an upper arm thereof to the other end of said connecting rod
(c) a like connecting rod pivoted at one end to the other end of the travelling beam
(d) a like angle lever, with its included angle facing the

same direction as the first, and similarly pivoted at the end of an upper arm thereof to the other end of the like connecting rod

(e) a transverse connecting rod pivoted at both ends one to each lower arm of said angle levers:

said safety device comprising an operating rod fixed to lie along at least one of said connecting rods in such a way as to move with the small changes in longitudinal dimension of said one connecting rod due to tensile or compressive strain arising from unsymmetrical press loading, and switch means operable by said movements of said one rod to actuate an overload indication.

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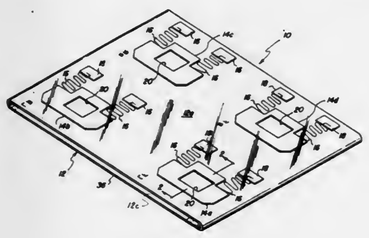
**4,294,104**

## FRICTION DRIVE FORCE MEASUREMENT FIXTURE

**Robert M. Peffer, Penfield, and Charles H. Braun, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 30, 1979, Ser. No. 89,687**
**Int. Cl.³ G01N *19/02***
**U.S. Cl. 73—9** **7 Claims**



1. Fixture for measuring the driving force of a friction drive apparatus, said fixture comprising:

a first member having a first surface including means for locating said first member in juxtaposition with said friction drive apparatus;

a reaction member movably supported on said first member such that when said first member is in juxtaposition with the friction drive apparatus said reaction member is in engagement with the friction drive apparatus and movable relative to said first surface in response to the driving force of the friction drive apparatus, said reaction member including reference means for indicating the relative position of said reaction member and said first surface; and

means mounted on said first member for urging said reaction member toward a rest position on said first surface, the magnitude of force applied by said urging means being porportional to the displacement of said reaction member from said rest position by the driving force, whereby the position of said reference means relative to said first surface indicates the magnitude of the driving force on said reaction member.

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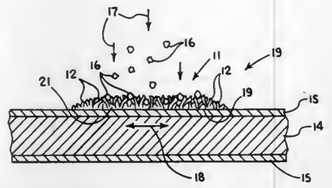
**4,294,105**

## MASS SENSING ELEMENT

**Arnold J. Kelly, Princeton Junction, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Apr. 8, 1980, Ser. No. 138,412**
**Int. Cl.³ G01N *22/00***
**U.S. Cl. 73—28** **26 Claims**

1. An apparatus used for sensing the mass of incident particles impinging thereupon, comprising a piezoelectric crystal coated over at least a surface portion thereof with a plurality of substantially rigid whiskers having a generally perpendicular attitude with respect to said crystal surface and forming a mat-like mass upon said crystal so as to entrap or otherwise



retain said incident particles while said piezoelectric crystal is caused to vibrate.

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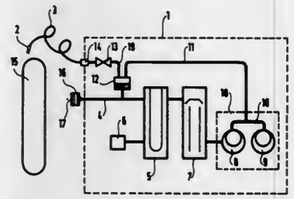
**4,294,106**

## LEAK DETECTOR

**Roland Gevaud, Argonay, and Jacques Tallon, Annecy, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France**

**Filed Mar. 17, 1980, Ser. No. 131,121**
**Claims priority, application France, Mar. 28, 1979, 79 07788**
**Int. Cl.³ G01M *3/20***
**U.S. Cl. 73—40.7** **5 Claims**



1. A leak detector of the type that detects helium, the detector comprising a sniffer connected via a flexible hose to an inlet duct which is itself connected via a nitrogen trap and a molecular diffusion pump to a main vacuum pump whose inlet is connected to the molecular diffusion pump and whose outlet exhausts into the atmosphere, the nitrogen trap being further connected to helium measuring means; the improvement comprising:

firstly providing the main vacuum pump in the form of a two stage pump having a low pressure stage connected to pump from the molecular diffusion pump and to exhaust, via a link duct, into a high pressure stage which itself exhausts to the atmosphere; and

secondly providing a bleeder arrangement connecting the flexible hose both to the inlet duct and to an auxiliary duct which leads to said link duct between the pump stages to pump air and any leaking helium along the flexible hose at a speed greater than that which is attainable when the hose is directly connected only to the inlet duct, the bleeder arrangement ensuring that a proportion of the gas pumped in through the sniffer is fed via the inlet duct and the nitrogen trap to the helium measuring means.

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**4,294,107**

## SELF-PURGING PROBE FOR LOW PRESSURE LEAK DETECTION

**L. Irwin Walle, 1537 Greenlea Dr., Clearwater, Fla. 33515**

**Filed May 19, 1980, Ser. No. 150,933**
**Int. Cl.³ G01M *3/32***
**U.S. Cl. 73—49.2** **7 Claims**

1. A fluid pressure purging adapter connected between a fluid test pressure source, a fluid pressure gauge and a fluid container undergoing a pressure test, for rapidly purging fluid pressure from said pressure gauge when said container is disconnected from the adapter, comprising:

a fluid pressure inlet chamber connected to said fluid test pressure source;

a fluid pressure outlet chamber selectively connected to either said container under test or to an ambient fluid pressure;

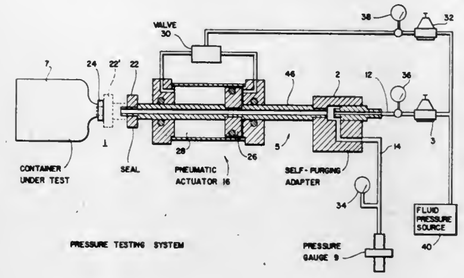
a high velocity fluid chamber connected between said fluid pressure inlet chamber and said fluid pressure outlet chamber, for conducting the testing fluid from said inlet chamber to said outlet chamber at a minimum velocity when said container is connected to said outlet chamber and for conducting the testing fluid from said inlet chamber to said outlet chamber at a maximum velocity when said container is disconnected from said outlet chamber;

a pressure gauge channel connected to said fluid pressure gauge, having an orifice opening into said high velocity fluid chamber;

said high velocity fluid chamber having a fluid pressure substantially equal to the fluid pressure in said pressure gauge channel when said testing fluid therein has said minimum velocity and said high velocity fluid chamber having a fluid pressure substantially lower than the fluid pressure in said pressure gauge channel when said testing fluid therein has said maximum velocity;

whereby said fluid pressure is rapidly purged from said pressure gauge when said container is disconnected.



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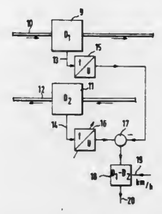
**4,294,108**

## DEVICE FOR MEASURING THE FUEL CONSUMPTION OF A VEHICLE

**Wolfgang Sauerschell, and Karl-Heinz Werkmann, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Schwalbach, Fed. Rep. of Germany**

**Filed Dec. 21, 1979, Ser. No. 105,932**
**Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905304**
**Int. Cl.³ G01F *9/02***
**U.S. Cl. 73—119 A** **3 Claims**



1. A device for measuring the fuel consumption of a vehicle, with means for measuring the fuel flow in a forward flow line, and means for measuring the fuel return flow in a return flow line, having means for detecting the difference between these flows and for the calculation of the fuel consumption, characterized in that, for the measurement of the fuel forward flow and of the fuel return flow, respectively, a turbine flowmeter is connected in each of the forward flow line and the return flow line and photoelectric means is positioned to scan the rotation of each for the generation of an electrical value corresponding to the forward flow or return flow, and that means for gauging are provided in one of said means for measuring the fuel flow in said forward flow line and in said means for measuring the fuel return flow in said return flow line to adjust the measurement in said one means to correspond with the measurement in said other means, for obtaining identical electrical values at operative fuel consumption and at the same forward fuel flow and return fuel flow.

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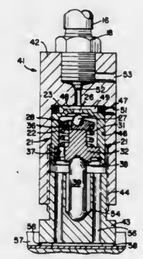
**4,294,109**

## TEST APPARATUS FOR HYDRAULIC VALVE

**Lester L. Peters, and John W. Black, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.**

**Filed Dec. 19, 1979, Ser. No. 105,290**
**Int. Cl.³ G01M *15/00, 19/00***
**U.S. Cl. 73—119 A** **7 Claims**



1. Apparatus for use in testing a hydraulic assembly, the assembly including a cup-shaped part having a bottom wall, a generally cylindrical wall, and an orifice formed in the bottom wall thereof, a valve member within said cylindrical wall on one side of the orifice, a spring urging the valve member toward the bottom wall to close the orifice, and a spider positioned within the cylindrical wall and supporting the spring, the spider further being connected to the part, said apparatus comprising a housing having a bore formed therein that is adapted to receive the assembly, said housing including seal means adapted to engage the outer surface of said assembly and form a sealed chamber on the outer side of the bottom wall around the orifice, means on said housing for connecting said chamber to receive a fluid under pressure from a variable fluid pressure supply, and link means connected to said housing and adapted to engage the spider for supporting the assembly against said pressure in a manner that simulates actual operating conditions, said cup-shaped part being supported against said pressure only by said connection with said spider.

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**4,294,110**

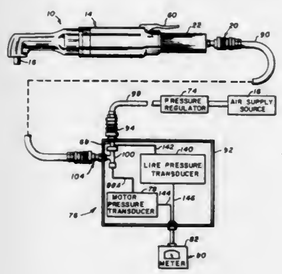
## TORQUE MEASURING SYSTEM FOR AN AIR TOOL

**Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.**

**Filed Nov. 13, 1979, Ser. No. 93,111**
**Int. Cl.³ G01L *3/00***
**U.S. Cl. 73—862.23** **4 Claims**

1. In an air tool for setting threaded fasteners to a desired torque and having a rotary air motor adapted to be energized to accelerate a rotary output of the motor to a predetermined free-running no-load speed and which decelerates in response to increased fastener resistance at a rate proportional to the rate of rise in motor air pressure caused by an increase in

torque applied by the rotary output of the tool in setting a fastener, a torque measuring system comprising a torque indicator located in external remote relation to the air tool, tubing having one end serving as a probe located within the air tool for sensing motor air pressure, an air supply hose connected to the air tool, the tubing extending through an air supply passageway in the air tool and into the air supply hose to the torque indicator for delivering a motor air pressure signal to the torque indicator for sensing and indicating torque applied to a fastener by the rotary output of the tool, the torque indicator including a junction box having a pressure transducer mounted therein and air signal tubing connected thereto, the junction box including conduit therein connected to a supply of compressed air, a first quick-disconnect coupling between the air supply hose and the air tool for supplying air under pressure to said air supply passageway, the first coupling including a socket attached to one of the hose and air tool members and a complementary plug attached to the other of said members, the socket and plug having complementary internal connectors coupled to the tubing in the hose and air tool members of their respective socket and plug components, the internal connectors of the socket and plug being engageable in registered relation with one another for communicating the



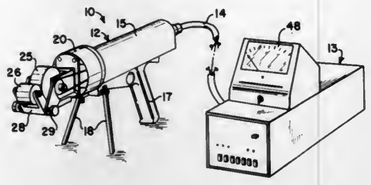

tubing in the air tool with the tubing in the air supply hose simultaneously upon connecting the socket and plug for establishing the supply air connection between the supply air hose and the air tool, the socket and plug and their internal connectors serving to simultaneously disconnect the supply air and the motor pressure signal air between the air supply hose and the air tool upon disconnecting said first coupling, and a second quick-disconnect coupling between the air supply hose and the junction box, the second coupling including a socket attached to one of the hose and box members and a complementary plug attached to the other of the said members, the socket and plug having complementary internal connectors coupled to the tubing in the hose and box members of their respective socket and plug components, the internal connectors of the socket and plug being engageable in registered relation with one another for communicating the tubing in the hose with the tubing in the junction box simultaneously upon connecting the socket and plug for establishing the supply air connection between the supply conduit of the junction box and the air hose, the socket and plug and their internal connectors serving to simultaneously disconnect the supply air and the motor pressure signal air to the pressure transducer upon disconnecting said second coupling between the air hose and junction box.

**4,294,111**

## PORTABLE FLUID INK TACK TESTER

**Wyman C. Rutledge; J. Robert Graves, both of Chillicothe, and William G. Cassill, McArthur, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio**

**Filed Feb. 6, 1980, Ser. No. 119,052**
**Int. Cl.³ G01N** *19/04*
**U.S. Cl. 73—150 R** **4 Claims**



1. A portable fluid ink tack tester comprising:
(a) a manually portable frame having a longitudinal axis,
(b) first and second rolls,
(c) mounting means rotatably mounting said rolls on parallel axes of rotation on said frame and in rolling contact, with a predetermined pressure therebetween, and positioned with at least one of said rolls supported and extending outwardly from said frame to expose the surface thereof for contacting an ink coated surface and receiving an ink sample therefrom,
(d) rotating means including a drive shaft for controllably rotating said first roll at a predetermined speed,
(e) a rotating strain gauge mounted on said drive shaft for measuring the force supplied to said first roll by said rotating means, and
(f) means for displaying said measured force.

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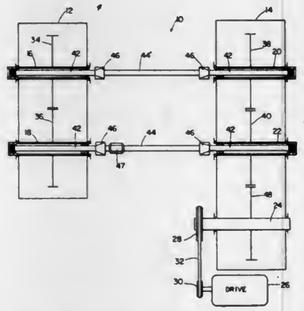
**4,294,112**

## CLOSED TORQUE TEST MACHINE

**Ronald D. Moore, Lexington Park, and John W. Hall, Lusby, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 16, 1980, Ser. No. 150,381**
**Int. Cl.³ G01M** *13/02*
**U.S. Cl. 73—162** **14 Claims**




1. Apparatus for testing mating splined parts under rotational torque load and axial misalignments comprising:
a first pair of rotatably connected shafts;
a second pair of rotatably connected shafts;
means generally coextensive with and interconnecting the shaft pairs to define a four-square arrangement;
means for inducing a locked-in static torque in the arrangement;



at least one of the shafts carrying one splined part to be tested;
said interconnecting means carrying another splined part to be tested in mating torque load engagement with the first mentioned splined part;
means driving the arrangement and;
means for selectively positioning the splined part carried by the shaft out of concentricity with respect to the axis of shaft rotation;
whereby upon rotation of the arrangement the mating splined parts are torque tested under load and selected axial misalignment.

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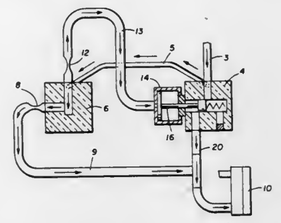
**4,294,113**

## ANTI-SURGE SYSTEM FOR GASES AND OTHER MEDIA

**Kenneth J. Sprott, Whitinsville, and George M. Herterick, Westborough, both of Mass., assignors to Dresser Industries, Inc., Dallas, Tex.**

**Filed Feb. 4, 1980, Ser. No. 118,263**
**Int. Cl.³ G01F** *15/10*
**U.S. Cl. 73—199** **7 Claims**



1. A device for preventing high pressure surges in fluidic material delivery systems to metering and measuring instruments comprising means for flowing the fluidic material to a normally closed pilot operated valve, means for diverting flow therefrom through a restrictor directly to said instruments, means for diverting flow therefrom through a restrictor to the pilot of the pilot valve to produce a time delay in total delivery of the fluidic material to the instruments.

5. A method for preventing high pressure surges in fluidic material delivery systems to metering and measuring instruments comprising flowing the fluidic material to a normally closed pilot operated valve, diverting flow therefrom through a restrictor directly to said instruments, further diverting flow therefrom through a restrictor to the pilot of the pilot valve to produce a time delay in total delivery of the fluidic material to the instruments.

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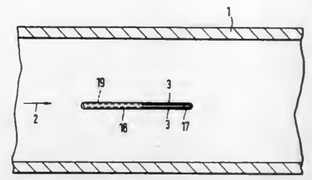
**4,294,114**

## APPARATUS FOR THE MEASUREMENT OF THE MASS OF A FLOWING MEDIUM

**Heinz Lauterbach, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Nov. 20, 1979, Ser. No. 96,113**
**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1979, 2900210**
**Int. Cl.³ G01F** *1/68*
**U.S. Cl. 73—204** **3 Claims**

1. In an apparatus for measuring the mass of an air induced mass into an internal combustion engine, having at least one temperature-dependent resistor disposed in the flow of the medium, the temperature-dependent resistor including: a carrier; and a resistor film disposed on the carrier and in the flow of the medium, the temperature and/or resistance of the resistor film being governed by the mass of the flowing medium, and serving as the basis for the generation of a manipulated variable which is a standard for the mass of the flowing medium, the improvement comprising:
a preceding body having approximately the same cross-section as that of the carrier,
said carrier extending longitudinally in the direction of the flow of the medium at least a portion of said resistor film disposed along said longitudinal direction, and
said preceding body being aligned with the carrier directly



upstream thereof in the direction of the flow of the medium, and having a length in the direction of the flow of the medium such that a particular boundary layer state prevails about the temperature-dependent resistor and the heat-transfer coefficient of the resistor film is influenced by the preceding body in accordance with the mass of the flowing medium.

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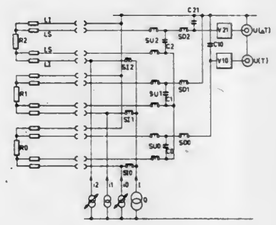
**4,294,115**

## MEASURING DEVICE FOR PRACTICALLY SIMULTANEOUS ΔT AND T MEASUREMENT

**Herwig Labüs, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany**

**Filed Mar. 17, 1980, Ser. No. 130,849**
**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910608**
**Int. Cl.³ G01K** *7/16*
**U.S. Cl. 73—342** **3 Claims**



1. A measuring device, for the practically simultaneous measurement of a temperature difference and an absolute temperature, comprising:
two temperature precision resistors for the two temperatures, and a reference resistor, one of said precision resistors being associated with said absolute temperature, and said resistors being connected in parallel;
a common constant power source;
current supply lines respectively connected with said resistors and said power source;
time switches respectively provided in said current supply lines and with the aid of which power can be successively applied to said resistors from said power source with equal current pulses during specified time intervals;
three capacitors respectively provided in parallel to said resistors;
sense lines and differential switches respectively connected with said resistors and capacitors, said capacitors being sequentially chargeable, with the aid of a time window switching during time intervals lying within said current

pulse time intervals, over said sense lines and said differential switches, to the pulse voltages which fall at said resistors; and

switches for the transfer, within a subsequent time interval, to a fourth capacitor, of the voltage difference between the other precision resistor and said precision resistor associated with said absolute temperature, and to a fifth capacitor, of the voltage difference between said precision resistor associated with said absolute temperature and said reference resistor, said fourth and fifth capacitors being grounded on one side, and said voltage values being a measure for said temperature difference and said absolute temperature.

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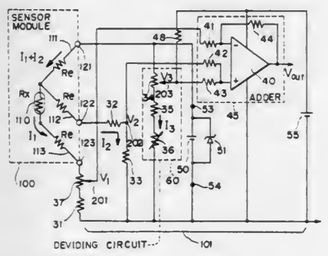
**4,294,116**

## TEMPERATURE DETECTING CIRCUIT

**Keizo Yamamura, Nagaokakyo, and Yasuo Ohashi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Mar. 14, 1980, Ser. No. 130,435**
**Int. Cl.³ G01K *7/20***
**U.S. Cl. 73—362 AR** **6 Claims**




1. A temperature detecting circuit comprising

a three-wire temperature sensor module including a first, a second and a third terminal, a temperature responsive resistance, a first cable lead connected across said first terminal and one end of said temperature responsive resistance, a second cable lead connected across said second terminal and said one terminal of the temperature responsive resistance, and a third cable lead connected across said third terminal and the other end of said temperature responsive resistance,

a first and a second power terminal across which a reference voltage is supplied,

said first terminal being connected to said first power terminal,

a first resistance connected across said third terminal and said second power terminal,

a second and a third resistance connected in series across said second terminal and said second power terminal,

the respective resistance values of said first, second and third resistances being such that a current flowing through said second cable lead is substantially equal to that of said third cable lead,

a potential devider being connected across said first and second power terminals and having a movable contact, and

a summing amplifying means for summing a first voltage appearing at a junction between said third terminal and said first resistance, a second voltage appearing at a junction between said second and third resistances and a third voltage appearing on said movable contact of the potential divider and for generating an output signal,

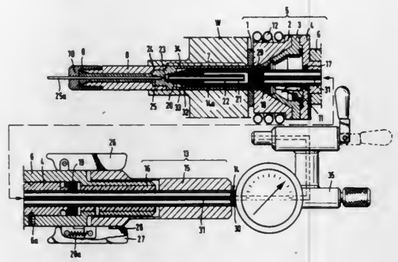
said potential devider being designed so that a variation of said third voltage can be rendered equal to a variation of said first voltage corresponding to the resistance value of said temperature responsive resistance sensing a temperature.

**4,294,117**

## SAMPLE CHARGER FOR A GAS CHROMATOGRAPH

**Hansueli Buser, Arlesheim, and Peter E. Jordi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jan. 28, 1980, Ser. No. 116,139**
**Claims priority, application Switzerland, Feb. 8, 1979, 1243/79**
**Int. Cl.³ G01N *31/08***
**U.S. Cl. 73—864.85** **12 Claims**



1. A sample charger for introducing a test sample into a separating column of a gas chromatograph, comprising in combination:

a tubular charging chamber for receiving a tubular container for the test sample;

connection means at one end of said charging chamber for placing the interior thereof into communication with the separating column of a gas chromatograph;

at least one inlet adjacent said one end of said charging chamber for the admission of a carrier gas thereinto;

a lock disposed adjacent the end of said charging chamber remote from said connection means, said lock including a lock gate operable to open or close said chamber to atmosphere;

a sample holder for introducing the tubular sample container from outside through said open lock gate and into said charging chamber, said sample holder including an open-ended insertion tube for lengthwise insertion into said charging chamber;

receiving means disposed at said one end of said charging chamber for receiving the leading end of said insertion tube in sealing engagement therewith and for placing the interior of said insertion tube in communication with the separating column of the gas chromatograph through said connection means;

holding means disposed at said leading end of said insertion tube for releasably holding the forward end of said tubular sample container within said insertion tube, said leading end of said insertion tube being sealed by the sample container held therein;

a passage between the inner wall of said insertion tube and the outer wall of said sample container held in said insertion tube for flow of carrier gas into the open end of said sample container remote from said holding means;

at least one inlet adjacent said leading end of said sample holder for the admission of carrier gas from said charging chamber into said passage; and

releasable means for holding said insertion tube in sealing engagement with said one end of said charging chamber.

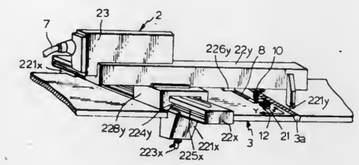


**4,294,118**

## FULLY AUTOMATIC ULTRASONIC FLAW DETECTION APPARATUS

**Toshio Shiraiwa; Hisao Yamaguchi, and Shigeaki Matsumoto, all of Amagasaki, Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 29, 1979, Ser. No. 89,277**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—620** **8 Claims**



1. A fully automatic ultrasonic flaw detection apparatus comprising:

a probe for transmitting and receiving ultrasonic waves in a testpiece;

a probe holder having said probe mounted thereon;

a probe scanner connected to said probe holder having a first motor for moving said probe holder back and forth on a first line parallel to the surface of the testpiece and parallel to the area which is to be tested for flaws, and a second motor for moving said probe holder back and forth on a second line perpendicular to said first line and parallel to the surface of the testpiece;

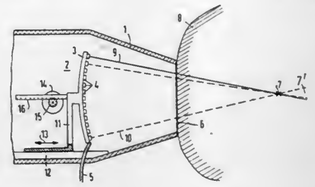
an information processing unit connected to said probe scanner and said ultrasonic transmitting and receiving apparatus having a memory means and a display means (a) for generating drive signals for application to said motors of said probe scanner for moving said probe holder according to a predetermined repeating rough scanning pattern in one direction along a first line, then along a second line for a short distance and then along another first line in the opposite direction, (b) for storing in said memory means flaw detection data indicative of the position of said probe when said probe receives ultrasonic waves from the testpiece and the amplitude of said received ultrasonic waves is indicative of a flaw, (c) for determining the position and characteristics of flaws in the testpiece from said stored flaw detection data, (d) for generating drive signals for application to said motors of said probe scanner for moving said probe holder according to a predetermined repeating fine scanning pattern in the vicinity of the position of each flaw if any flaw position is determined, said pattern being in one direction along a second line, then along a first line for a short distance and then along another second line in the opposite direction; and (e) for displaying the position and characteristics of each such determined flaw on said display means.

**4,294,119**

## ULTRASONIC APPLICATOR FOR ULTRASONIC SCANNING OF BODIES

**Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Division of Ser. No. 694,608, Jun. 10, 1976, Pat. No. 4,163,394.**
**This application May 17, 1979, Ser. No. 39,951**
**Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529112**
**The portion of the term of this patent subsequent to Aug. 7, 1996, has been disclaimed.**
**Int. Cl.³ A61B *10/00***
**U.S. Cl. 73—625** **12 Claims**



7. Apparatus for scanning internal body regions accessible through narrow acoustic apertures, which comprises:

ultrasonic scanning means for sequentially directing converging ultrasonic beams along beam paths converging toward substantially a common point of convergence at a narrow acoustic aperture within the body such that the beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and

means for predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture,

said ultrasonic scanning means comprising a housing having window means for transmitting the converging ultrasonic beams, each beam path within the housing having a length which is large in comparison to the distance of the point of convergence from the window means.

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**4,294,120**

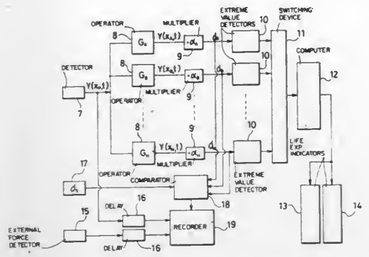
## TORSIONAL VIBRATION MONITORING APPARATUS FOR ROTATING SHAFT SYSTEM

**Ichiji Shima; Tatsuo Yamamoto; Shigeru Yoshibayashi; Hiroshi Teshima, all c/o The Kansai Electric Power Co., Inc., Technical Research Center of 2, Ichinotsubo 1-chome, Wakaoji, Amagasaki City, Osaka; Akio Hizume, 8-11, Naka-machi, 1-chome, Setagaya-ku, Tokyo; Tetsuo Iki, 1998-5, Yokoo-machi, Nagasaki City, Nagasaki Pref.; Takashi Yamamoto, 347, Motomurago, Tokitsu-cho, Nishisonogi-gun, Nagasaki Pref.; Kyozo Kanamori, 16-10, Shiraiwa-cho, Isahaya City, Nagasaki Pref., and Shigeho Tanaka, 39-27, Hokuyo-machi, Nagasaki City, Nagasaki Pref., all of Japan**

**Filed Jun. 8, 1979, Ser. No. 46,913**
**Claims priority, application Japan, Jun. 8, 1978, 53-69048**
**Int. Cl.³ G01N *29/04*; G01H *1/10***
**U.S. Cl. 73—650** **3 Claims**

1. A torsional vibration monitoring apparatus for a rotating shaft system in which the torsional vibration of the rotating shaft system is monitored by estimating torsional vibration at arbitrary positions $x_j$ of the rotating shaft system from torsional vibration detected at a certain position $x_p$ of the rotating shaft system on the basis of the facts that a torsional vibration $Y(x,t)$ produced in a rotating shaft system is an accumulation of modal vibrations $Y_i(x,t)$ and that each modal vibration is a product of a vibration mode type $g_i(x)$ and a vibration mode

component $h_i(t)$, comprising a detector for detecting the torsional vibration at the certain position $x_p$ of the rotating shaft system and an operator having a transfer characteristic for



converting the torsional vibration detected at the certain position $x_p$ into the torsional vibration at the arbitrary position $x_j$ of the rotating shaft system.

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**4,294,121**

**POSITION MEASURING SYSTEM**

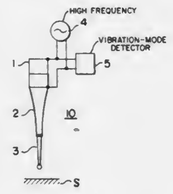
**Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan**

**Filed May 11, 1979, Ser. No. 38,174**

**Claims priority, application Japan, Jun. 6, 1978, 53-77591[U]; Aug. 5, 1978, 53-95976; Aug. 5, 1978, 53-108225[U]; Dec. 22, 1978, 53-162352**

**Int. Cl.³ G01M** *7/00*

**U.S. Cl. 73—662** **29 Claims**



28. A device for detecting a contact of a solid surface with a contact sensing probe on an elongated stylus assembly having a stylus in a position measuring system, said device comprising:

support means for carrying said stylus assembly to advance said probe towards said solid surface;

vibration means for imparting a small vibration to said stylus in the axial direction thereof to reciprocate repetitively said probe toward and away from said solid surface with an amplitude of 0.1 and 10 micrometers; and

response means responsive to a modification in the mode of vibration of said stylus upon said probe establishing a predetermined contact or proximity relationship with said solid surface for producing an output signal.

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**4,294,122**

**FASTENER INCORPORATING ULTRASONIC TRANSDUCER**

**James C. Couchman, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.**

**Filed Jul. 12, 1979, Ser. No. 57,059**

**Int. Cl.³ F16B** *31/02;* **G01N** *24/00*

**U.S. Cl. 73—761** **29 Claims**

27. A fastener, comprising:

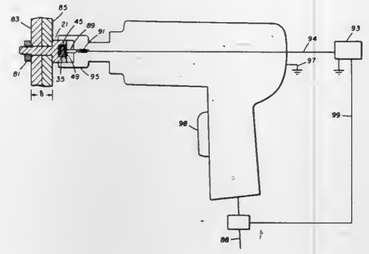
a shank having a head at one end and threads formed at the other end,

a shallow opening formed in one end only of said fastener,

an acoustic transducer located in said opening and permanently secured therein with said transducer being acoustically coupled to said fastener,

said transducer being located in said opening such that it may be used for pulse-echo measurements wherein said transducer is pulsed, a transducer signal is generated which travels from said transducer through said fastener to the end of said fastener opposite said opening and back to said transducer at least once,

the distance between said transducer and said end of said



fastener opposite said opening being equal to a major portion of the length of said fastener such that when said signal is generated, it will travel through the entire gripping length of said fastener, including the portion of said shank next to said head, when traveling between said transducer and said end of said fastener opposite said opening,

said fastener being formed of metal with the portion of said fastener between said opening and said end of said fastener opposite said opening being of solid metal throughout.

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**4,294,123**

**TURBINE METER**

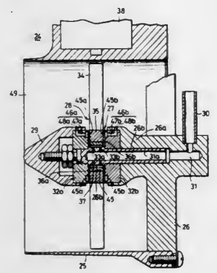
**Hiroyuki Amemori, and Masao Yamada, both of Kawasaki, Japan, assignors to Tokico Ltd., Kawasaki, Japan**

**Filed Nov. 20, 1979, Ser. No. 96,186**

**Claims priority, application Japan, Nov. 22, 1978, 53-144885**

**Int. Cl.³ G01F** *1/115*

**U.S. Cl. 73—861.92** **5 Claims**



1. A turbine meter comprising: an axle member supported by a support member within a conduit through which a fluid to be measured is passed and having a small-diameter axle part and an annular recess formed around said small diameter axle part between a pair of opposed faces; a longitudinal flow passage formed in said axle member; a plurality of discharge holes formed in said axle member to communicatively connect the annular recess and the flow passage, said discharge holes comprising a first discharge hole formed in said small-diameter part, and a second discharge hole having one end thereof open into said passage and the other end thereof open into one of said opposed faces; a supply pipe inserted into said conduit



through the wall thereof, functioning to supply a pressurized fluid from a pressurized fluid source disposed outside of said conduit to said flow passage in said axle member; a vane wheel comprising, a hub disposed around said axle member and within said annular recess with minute gaps therebetween, being adapted to rotate in a substantially noncontacting state relative to said small-diameter axle part, a plurality of vanes implantedly fixed at their respective root parts to said hub, said vane wheel being rotated by a portion of said fluid to be measured and flowing through said conduit; and at least one discharge passage opening at one end thereof at one of said pair of opposed faces for communication with said annular recess and at the other end thereof, into said conduit through which said fluid to be measured is passed at a position separate from said vanes of said vane wheel, one end of at least one discharge passage opening in the inner periphery of said opposed faces, and the pressurized fluid which has been discharged from said discharge holes into said annular recess being discharged by way of said discharge passage to said conduit through which said fluid to be measured is passed at a position separated from said vanes.

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**4,294,124**

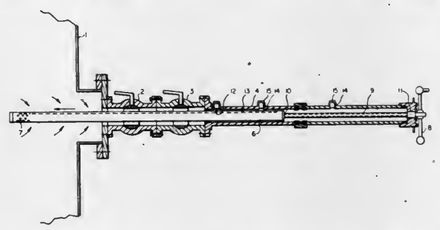
**APPARATUS FOR EXTRACTION OF MATERIALS FROM OPERATING PRESSURIZED VESSELS**

**George V. Kalwaitis, Gulf Breeze, Fla., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed Apr. 10, 1980, Ser. No. 139,073**

**Int. Cl.³ G01N** *1/10*

**U.S. Cl. 73—863.85** **8 Claims**



1. A sampling apparatus for withdrawing and collecting samples from an operating pressure vessel without disturbing a reaction in said pressure vessel and while maintaining physical conditions of said sample, which apparatus comprises:

(a) a pressure vessel having an aperture;

(b) a first valve attached to said vessel and aligned with said aperture;

(c) a first tube having a sealed end and an open end;

(d) a second valve attached to said open end of said first tube and removably attached to said first valve;

(e) a second tube coaxially oriented within said first tube, said second tube having a perforated end for receiving a sample from said vessel; and

(f) means for sliding said perforated end of said second tube in and out of said second valve, said first valve, and said pressure vessel.

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**4,294,125**

**PIPETTE CONTROLLER WITH GRADUATE READING PLUNGER AND LEVER ASSEMBLY FOR GRAVITY DRAINAGE**

**Tsao-Piao Lee, No. 89-1, Chang Chun Rd. 2nd Floor, Taipei, Taiwan**

**Filed Apr. 24, 1980, Ser. No. 143,270**

**Int. Cl.³ B01L** *3/02*

**U.S. Cl. 73—864.15** **6 Claims**

1. A pipette controller comprising:

a cylinder;

a piston disposed in said cylinder;

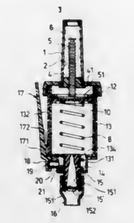
a threaded rod operatively coupled to said piston;

a spring arranged in said cylinder between the bottom thereof and said piston for biasing said piston to a predetermined position;

a cylinder cap having a hole therein, said cap being coupled to said cylinder;

a graduate reading plunger in thread engagement with said threaded rod and disposed through said hold in said cylinder cap;

sealing means including a port for receiving the end of a pipette, the sealing means being disposed at the bottom of the cylinder for sealing the end of the pipette to the con-



troller and placing the interior of the pipette in communication with a chamber defined by the piston and cylinder, said cylinder having a port for communicating with the atmosphere via a channel;

an operable lever assembly adapted to selectively close the port of said channel, said operable lever assembly including a lever arm including a pair of lugs and a seal pad for selectively sealing said channel, a member having a pair of claws for engaging the lugs of said lever arm and projection means for providing a fulcrum for said lever arm, said controller providing natural drainage when the end of the lever arm remote from said pair of lugs is biased toward said cylinder.

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**4,294,126**

**SAMPLE FEEDING DEVICE**

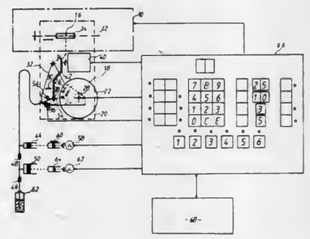
**Toma Tomoff; Wolfgang Chlosta, both of Überlingen; Heinz Henninger, Owingen; Rolf Tamm, Salem, and Klaus Grossmann, Owingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany**

**Filed Dec. 12, 1979, Ser. No. 102,704**

**Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900066**

**Int. Cl.³ G01N** *35/04, 35/06*

**U.S. Cl. 73—864.21** **9 Claims**



1. Sample feeding device for automatically feeding samples into a graphite tube atomizer provided with a sample inlet opening, comprising:

a turntable adapted to accommodate a circular array of liquid vessels, said turntable including a turntable position

sensor connected to said turntable, which sensor supplies a turntable position signal to a control device;

a turntable servomotor for driving said turntable, said turntable being arranged to be rotated by said turntable servomotor into positions determined by the program of said control device only and monitored by said turntable position signal;

a carrier, pivotably movable relative to an instrument base plate, is arranged to carry said turntable and said turntable servomotor, said carrier being arranged to be displaced by a separate carrier servomotor, said carrier having a carrier position sensor affixed thereto for applying a carrier position signal to said control device;

an intake tube movable between a first position and a second position by means of an intake tube servomotor, said intake tube, in its first position, dipping with one end into a respective liquid vessel located in an operative position, and, in its second position, extending with said one end into said sample inlet opening of said graphite tube atomizer;

a control device, adapted to control said intake tube servomotor, said turntable servomotor and said carrier servomotor in accordance with a certain program such that liquids from different liquid vessels are sucked into said intake tube and are discharged into said graphite tube atomizer and that in one position of said carrier said further liquid vessel is located below said intake tube when said intake tube is in its first position.

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**4,294,127**

## AUTOMATIC SAMPLE FEEDER FOR FLAMELESS ATOMIC ABSORPTION SPECTROMETER

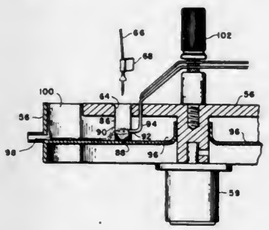
**Toma Tomoff, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany**

**Filed May 29, 1980, Ser. No. 154,208**

**Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924124**

**Int. Cl.³ G01N** *35/06*

**U.S. Cl. 73—864.21** **4 Claims**



1. In combination with an atomic absorption spectrometer having a heatable sample atomizer with an aperture for receiving an injected liquid sample, an automatic sample feeding apparatus comprising:

a rotatable turntable having therein a plurality of fluid containing vessels;

an intake tube having a first end movable between a first position at said turntable and a second position at the aperture of the sample atomizer;

pumping means connected with the second end of said intake tube, said pumping means for drawing in and injecting fluids from said first end of said intake tube; and

control means coupled to said turntable, said first end of said intake tube, and to said pumping means for respectively positioning a selected one of said vessels on said turntable under said first intake tube end, dipping said first end into said selected vessel, drawing a fluid sample therefrom, transferring said first end to said second position at said sample aperture, and injecting said fluid sample therein;

the improvement comprising:

said fluid containing vessels are overflow vessels having at least one fluid overflow aperture in the wall thereof;

an input conduit couples each of said overflow vessels with a source of fluid; and

an annular drain channel is positioned under said turntable, said drain channel forming a housing for said turntable and providing a waste fluid outlet for fluids from said overflow vessels.

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**4,294,128**

## DEVICE FOR ERECTING AND STABILIZING A GYRO VERTICAL

**Peter Giesenberg, Uhldingen-Mühlhofen, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Überlingen, Fed. Rep. of Germany**

**Filed Jan. 23, 1979, Ser. No. 6,079**

**Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838740**

**Int. Cl.³ G01C** *19/50*

**U.S. Cl. 74—5.44** **16 Claims**

1. Device for erecting and stabilizing of a gyro vertical, comprising a disc arranged on the gyro housing and perpendicular to the gyro axis, said disc being driven in the same sense as the gyro rotor but at a reduced rate as compared thereto, and having at least one guideway, in which a mass is movably guided, the guideway being arranged such that the disc with the mass is balanced with respect to the gyro axis, when the mass abuts the rear end, with respect to the rotary movement, of the guideway, and that the movement of the mass in the guideway causes an erecting torque, when the gyro spin axis deviates from the vertical direction observed,

characterized in

that the guideway (**40,42;90,92;130,132**) is generally S-shaped and extends from one end (**82,84;106,108**) located near the edge of the disc (**14;88;128**) around the gyro spin axis (**16**) to an end (**60,62;110,112**) located near the gyro spin axis (**16**).

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**4,294,129**

## CONTROL LEVER OF ELECTRICAL STARTER

**Alfred B. Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France**

**Filed Mar. 19, 1979, Ser. No. 24,212**

**Claims priority, application France, Jul. 29, 1977, 77 24135**

**Int. Cl.³ F02N** *11/00*

**U.S. Cl. 74—7 A** **4 Claims**

1. A control lever assembly for a starter for an internal combustion engine, the assembly being supported in a starter casing and the lever having one end cooperating with the core of a starter solenoid and having a second end actuating a starter gear, the assembly comprising:

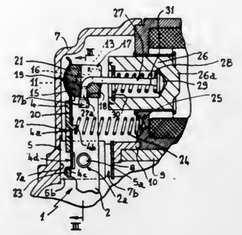
(a) an elongated lever arm extending between said two ends and comprising two flat arm portions disposed normal to said pivot means and joined together by a web portion extending transversely therebetween;

(b) the casing having internal depressions disposed transversely of the lever intermediate its ends;

(c) pivot means located in and extending across said depressions and pivotally supporting the lever in the casing; and



said pivot means comprising two rivet members each having a head shaped to fit into a depression in the casing and each having a cylindrical body portion extending through a pivot hole in an arm portion;



(d) said one end of said lever having an arcuate member located thereat; and

(e) rod means pivotally connected to the lever at said arcuate member and extending toward and coupled to said core to pivot the lever when the solenoid is actuated.

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**4,294,130**

## TRANSMISSION FOR TRACTOR

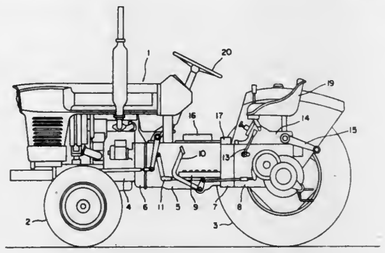
**Hiroyuki Kisaka, Sennan; Makoto Sagata, Kaizuka; Masayoshi Miyahara, and Morimitsu Katayama, both of Sakai, all of Japan, assignors to Kubota Ltd., Japan**

**Filed Apr. 5, 1978, Ser. No. 893,757**

**Claims priority, application Japan, Apr. 27, 1977, 52-51031**

**Int. Cl.³ F16H** *37/00*

**U.S. Cl. 74—15.4** **9 Claims**



1. A transmission for a tractor, comprising:

a main shaft to receive engine power;

a travelling speed change shaft disposed in parallel with said main shaft;

a PTO speed change shaft disposed in parallel with said two shafts;

a first travelling speed change means of a hydraulic clutch type mounted on said travelling speed change shaft and having travelling speed change input gears;

a PTO speed change means of a mechanical clutch type mounted on said PTO speed change shaft and having plural PTO speed change gears;

a plurality of power transmission gears fixed on said main shaft for transmitting power to said travelling speed change input gears and said PTO speed change gears with at least one of said power transmission gears serving as a dual-purpose transmission gear to transmit power not only to one of said travelling speed change input gears but also to one of said PTO speed change gears;

a second travelling speed change means of a hydraulic clutch type connected to a rear end of said main shaft and having travelling speed change output gears, said second travelling speed change means being so constructed that, in response to power input from said main shaft, a clutch function thereof is performed prior to a speed change function thereof; and

a plurality of travelling speed change gears fixed on said travelling speed change shaft and engaged with said travelling speed change output gears of said second travelling speed change means.

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**4,294,131**

## TRACTOR TRAVELLING SYSTEM TRANSMISSION MECHANISM

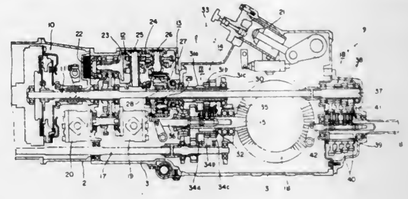
**Yoshinobu Murayama, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan**

**Filed May 26, 1978, Ser. No. 909,790**

**Claims priority, application Japan, Nov. 10, 1977, 52-135811**

**Int. Cl.³ F16H** *37/00, 37/06*

**U.S. Cl. 74—15.4** **4 Claims**



1. A tractor transmission comprising

a transmission case (**3**) extending longitudinally of a tractor body,

a main shaft (**11**) extending longitudinally in the transmission case (**3**) and operatively connected to an engine (**1**),

friction type stepless transmission means (**12**) disposed above said main shaft (**11**) and in a front position within the transmission case (**3**) and interlocked with the main shaft (**11**),

a planet reduction gearing (**13**) mounted on the main shaft (**11**) and rearwardly of the friction type stepless transmission means (**12**) and including a first component element (**28**) interlocked with the main shaft (**11**), a second component element (**27**) interlocked with the stepless transmission means (**12**) and a third component element (**29**) in engagement with the first and second component component elements (**28, 27**), a forward/reverse changeover gearing (**14**) disposed beneath the main shaft (**11**) and rearwardly of the planet reduction gearing (**13**) and operatively connected to the third component element (**29**),

a differential gearing (**16**) disposed in a rear and lower position within the transmission case (**3**) and interlocked with the forward/reverse changeover gearing (**14**),

hydraulic means (**21**) disposed in a rear and upper position within the transmission case (**3**), and

a power-take-off shaft (**8**) disposed in a rear end position of the transmission case (**3**) and operatively connected to the main shaft (**11**), whereby a space is defined beneath said main shaft (**11**) and in a front position within said transmission case (**3**), said space housing a hydraulic pump (**19**) connected to said main shaft (**11**) for actuating said hydraulic means (**21**).

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**4,294,132**

## CYLINDRICAL GEAR WITH HELICAL TEETH

**Zbigniew Matusz, Warsaw, Poland, assignor to Fabryka Obrabiarek Precyzyjnych "Ponar-Bruszkow", Pruszkow, Poland**

**Filed Sep. 25, 1978, Ser. No. 946,208**

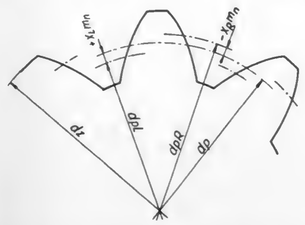
**Claims priority, application Poland, Sep. 29, 1977, 201127**

**Int. Cl.³ F16H** *55/08*

**U.S. Cl. 74—462** **3 Claims**

1. A cylindrical gear wheel comprising helical teeth having

left and right hand sides with different pitch diameters ($d_L$ and $d_R$), different angles of helix inclination ($\beta_{OL}$ and $\beta_{OR}$), different nominal diameters ($d_Z$) and different profile face angles




($xm_n$) within at least a range of normal tooth module ($m_n$) varying from 2 up to 6 mm as the angular difference of inclination ($2\Delta\beta$) between the left hand ($\beta_{OL}$) and right hand ($\beta_{OR}$) sides varies within the range of 30' and 3°.

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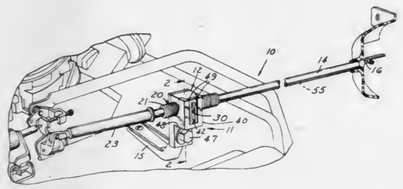
**4,294,133**

**BOWDEN CABLE RETAINER AND ADJUSTER**

**John J. Hurley, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 24, 1979, Ser. No. 78,130**
**Int. Cl.³ F16C *1/06***
**U.S. Cl. 74—501 P** **9 Claims**




1. A Bowden cable and an adjustable connector assembly for securing and positioning a Bowden cable with respect to a support member, said adjustable connector assembly including:

a grooved sleeve means attached to said Bowden cable, said grooved sleeve means being generally elongated along the axis of said Bowden cable and having circumferential grooves spaced along the Bowden cable axis;

a mounting assembly means for attaching said grooved sleeve means to the support member, said mounting assembly means including a clip means and an adjuster means for securing therebetween said grooved sleeve means;

said clip means and said adjuster means being adapted to mate laterally to said sleeve means and including a first connector means and a second connector means, respectively, for releasably attaching said clip means to said adjuster means sufficiently snugly so as to securely, longitudinally position said mounting assembly means with respect to said grooved fitting;

said first connector means having an inclined, ratchet like protrusion and said second connector means having a slotted, flexible finger for receiving said protrusion;

said clip means including ridges for mating with said grooves thereby providing a means to secure the longitudinal position of said mounting assembly means and said sleeve means;

said adjuster means including an opening for passing a securing member, such as a screw, for attaching said adjuster means to the support member; and

said first connector means including a concave arc portion with said ridges positioned thereon to mate with the grooved exterior surface of said sleeve means, and a first leg extending down from an end of said concave portion, an interior surface of said first leg including said ridges and an exterior surface of said first leg including said protrusion.

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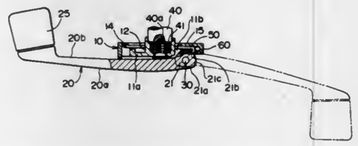
**4,294,134**

**ACTUATING HANDLE MEANS**

**Keiji Mori, and Kyoichi Kurimoto, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Jun. 22, 1979, Ser. No. 51,233**
**Claims priority, application Japan, Jun. 23, 1978, 53/76074**
**Int. Cl.³ G05G *1/00***
**U.S. Cl. 74—547** **7 Claims**




1. Foldable actuating handle means for vehicles which comprises base plate means adapted to be engaged with actuating shaft means to rotate therewith, actuating handle lever means provided with an actuating knob and having one end pivotably connected with said base plate means at a position remote from said actuating knob for movement between extended and folded positions, resilient spring means mounted on said base plate means and having one end constrained by said base plate means at a position diametrically opposite to the position where the actuating handle lever means is pivotally mounted on the base plate means, the resilient spring means having its other end adapted to resiliently bias the one end of the actuating handle lever means, said actuating handle lever means being formed at said one end with a pair of spaced seat surfaces which are adapted to be operatively engaged with said other end of the resilient spring means in the extended and folded positions, respectively, said spring means being deflected from its free position when its other end is operatively engaged with either of said spring seat surfaces, said actuating handle lever means being further formed with an intermediate projection between said spring seat surfaces so that the spring means is overridden when the actuating handle means is moved between the extended and folded positions.

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**4,294,135**

**TURBOMACHINE BALANCE CORRECTION SYSTEM**

**Robert P. Tameo, Peabody, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 12, 1979, Ser. No. 4,248**
**Int. Cl.³ F16F *15/22***
**U.S. Cl. 74—573 R** **12 Claims**

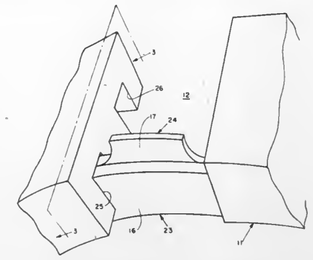
1. A balancing system comprising in combination:

a rotor rotatable about an axis;

at least a pair of balancing rings mounted for rotation with said rotor, each of said balancing rings is provided with a radially extending tab; and



a plurality of axial retention locations positioned on said rotor in the form of axial slots parallel the axis, said tabs of




said balancing rings are oriented in selected axial retention locations for providing balance correction.

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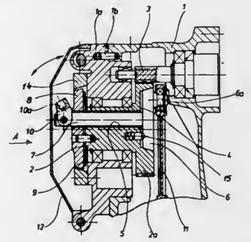
**4,294,136**

**CRANK GEAR WITH ADJUSTABLE CRANK RADIUS FOR MOTOR DRIVEN WORKING IMPLEMENTS**

**Martin Greppmair, München-Lerchenau, and Wittloff Grünwald, Pielenhofen, both of Fed. Rep. of Germany, assignors to Wacker Werke GmbH & Co. KG, Munich, Fed. Rep. of Germany**

**Filed Jan. 2, 1979, Ser. No. 485**
**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758989**
**Int. Cl.³ F16C *3/04***
**U.S. Cl. 74—600** **9 Claims**




1. A crank gear with adjustable crank radius for motor driven beating, working implements, especially tamping implements, jack hammers and hammer drills which includes: a housing, a crank shaft rotatably journalled in said housing, said crank shaft having a first end section and an axially oppositely located second end section, a crank disc connected to said first end section for rotation therewith and having an outer periphery provided with teeth, driving gear means meshing with said teeth and drivingly connectable to a prime mover for rotating said crank disc, a rotatable member associated with said crank disc and operable to move into a first position for engagement with said crank disc and also operable to move into a second position for disengagement from said crank disc, a crank pin mounted on said rotatable member for connection to a connecting rod, said rotatable member having an axis of rotation eccentrically arranged with regard to the axis of rotation of said crank disc, and control means associated with said second end section and operatively connected to said rotatable member for selectively moving the same into said first position or into said second position, said control means including spring means urging said rotatable member into said first position, that end face of said crank disc which faces away from said second end section being provided with a truncated cone-shaped recess the extension of which has the extension of its axis eccentrically located with regard to the longitudinal axis of said crank shaft, and said rotatable member being in the form of a truncated cone-shaped clamping disc conforming in shape to said truncated cone-shaped recess.

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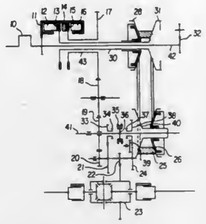
**4,294,137**

**TRANSMISSION WITH VARIATOR**

**Jean Piret, Bougival, and Michel Jallas, Garches, both of France, assignors to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France**

**Filed Mar. 16, 1979, Ser. No. 21,171**
**Claims priority, application France, Mar. 16, 1978, 78 07643**
**Int. Cl.³ F16H *37/06***
**U.S. Cl. 74—665 G** **7 Claims**




1. An automotive vehicle transmission having both variable transmission ratios and constant transmission ratios, said transmission being coupled to an automobile engine and comprising:

a variator providing a predetermined range of variable transmission ratios and including a primary shaft driven by said engine, a plurality of driving sheaves carried by said primary shaft, a plurality of driven sheaves, and a secondary shaft supporting said driven sheaves; and

a constant ratio direct drive located between said engine and said variator and providing a constant transmission ratio different from said predetermined range of variable transmission ratios;

wherein the engagement of said constant ratio direct drive releases said variator and the engagement of said variator releases said constant ratio direct drive,

whereby said transmission provides an increased range of ratios for a given size variator.

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**4,294,138**

**TWO STAGE TRANSMISSION HUB FOR A BICYCLE**

**Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan**

**Filed Jul. 19, 1979, Ser. No. 58,735**
**Claims priority, application Japan, Jul. 21, 1978, 53-101296[U]; Jan. 30, 1979, 54-1125[U]**
**Int. Cl.³ F16H *3/44*; F16D *41/02***
**U.S. Cl. 74—750 B** **4 Claims**

1. A two stage transmission hub for a bicycle, comprising;

(a) a hub shaft;

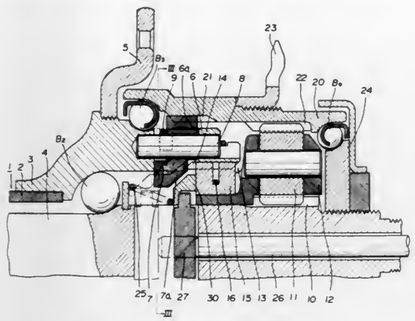
(b) a hub body rotatably supported to said hub shaft, said hub body being provided at both axial ends thereof with hub end portions having flanges respectively, one of said hub end portions having a cylindrical extension extending axially outwardly of one of said flanges, said cylindrical extension supporting at a substantially intermediate portion thereof freely rising and falling transmitting pawls;

(c) a sun gear provided at the outer periphery of said hub shaft at a position axially outwardly of said cylindrical extension;

(d) a gear frame having planetary pinions in mesh with said sun gear, said gear frame being supported rotatably to said hub shaft and being positioned axially outwardly of said cylindrical extension and arranged axially in series thereto;

(e) a unidirectional rotary transmission mechanism for transmitting one-directional rotation of said gear frame to said cylindrical extension;

(f) a cylindrical driving member covering the outer peripheries of said cylindrical extension and gear frame, said driving member being provided at the inner periphery of an axially inside portion thereof with ratchet teeth in mesh with said transmitting pawls, at the inner periphery of an axially outside portion thereof with inner teeth in mesh



with said planetary pinions, and at the outer periphery thereof with at least one sprocket;

(g) a pair of first and second bearing means for rotatably supporting said driving member, said first bearing means being provided on said cylindrical extension, said second bearing means being provided on said hub shaft; and

(h) a control member for controlling said transmitting pawls to cause their engagement with and disengagement from said ratchet teeth, said control member being supported to said hub shaft so as to be axially movable.

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**4,294,139**

**DRIVE FOR A MACHINE COMPRISING VARIABLE-STROKE RECIPROCATING PISTONS**

**Peter T. J. Bex, and George A. A. Asselman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 30, 1979, Ser. No. 99,182**

**Claims priority, application Netherlands, Jan. 5, 1979, 7900076**

**Int. Cl.³ F16H** *35/08;* **F01B** *13/04*

**U.S. Cl. 74—839** **6 Claims**

6. A drive for a machine having variable-stroke reciprocating pistons, comprising:

a shaft having an axis, said shaft being rotatably journalled in the machine;

a plate, mounted on the shaft so that the plate cannot rotate with respect to the shaft around the shaft axis, said plate being mounted on the shaft so that the angle between the plate and the shaft axis can be varied, by pivoting the plate around a plate axis, and so that the plate is movable along the direction of the shaft axis;

at least one piston comprising a piston rod having a piston rod head, said piston rod head having a side which faces the plate comprising a spherical surface; and

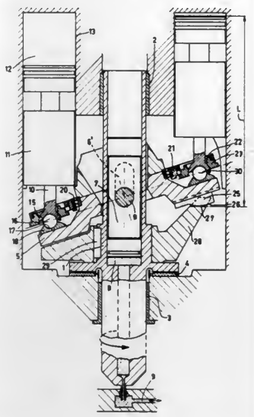
means for slideably coupling the splerical surface of the piston rod head to the plate;

CHARACTERIZED IN THAT

the plate has a side which is remote from the piston rod, said side comprising a cam having a cam surface;

the drive further comprises a structural member, rigidly coupled to the shaft, for supporting the cam via the cam surface;

said cam has a cross section which passes through said cam surface and which is substantially at least a portion of a circle having an axis which is parallel to the plate axis, the axis of said circle passing through the center of curvature



of said spherical surface of the piston rod head when the piston rod is situated opposite the cam.

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**4,294,140**

**HYDRAULIC TORQUE CONVERTER CONTROL SYSTEM**

**Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jan. 23, 1979, Ser. No. 5,892**

**Claims priority, application Japan, Sep. 4, 1978, 53-107529**

**Int. Cl.³ B60K** *41/10;* **F16H** *47/00;* **F16D** *33/00*

**U.S. Cl. 74—868** **4 Claims**

1. A hydraulic control system for a vehicular automatic transmission including fluid operable units and a torque converter with a lock-up clutch, comprising:

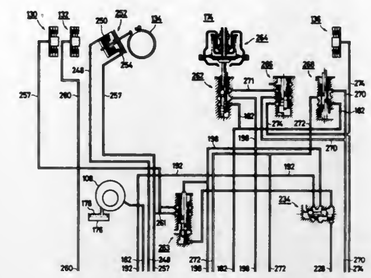
a source of first pressurized fluid adapted to be used for operating the fluid operable units;

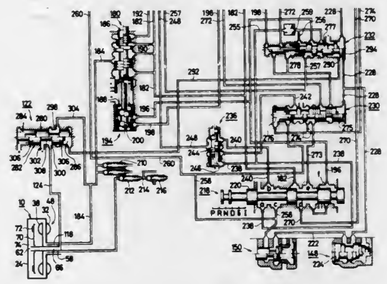
a source of second pressurized fluid that is indicative of the vehicle speed;

a lock-up control valve communicating with the torque converter and including a single control chamber and a valve member exclusively movable in response to pressure within said control chamber, said valve member being movable between a lock-up position in which the lock-up clutch is engaged and a release position in which the lock-up clutch is disengaged;

and

a shift valve communicating with said source of first pressurized fluid and with at least one of the fluid operable units, said shift valve including a chamber having a first port communicating with said source of second pressurized fluid, a second port communicating with said control chamber of said lock-up control valve and a port for drainage, said shift valve including a valve member movable between a low speed position in which said second port communicates only with said port for drainage and a





high speed position in which said second port communicates only with said first port.

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**4,294,141**

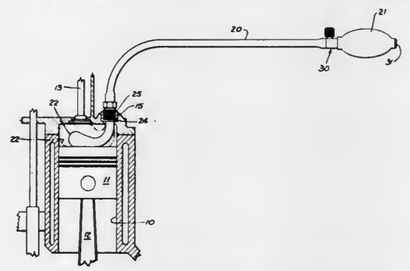
**TOOL AND METHOD FOR HOLDING AUTOMOTIVE VALVES CLOSED DURING SERVICING**

**Ronald J. Miller, 4681 Lake Ave., Blasdell, N.Y. 14219**

**Filed Oct. 30, 1979, Ser. No. 89,406**

**Int. Cl.³ B25B** *11/00;* **B23P** *19/00*

**U.S. Cl. 81—3 R** **7 Claims**



1. An automotive tool for engagement with overhead valves to retain them in seated positions while working on the valve associated structure which is external of the automotive combustion chamber to prevent valves from falling into said chamber when released from such structure, said tool comprising an elongate tubular member having an inflatable balloon at one end thereof adapted to be projected through a spark plug opening into the combustion chamber, said balloon being of such form as to substantially fully occupy said chamber upon inflation thereof, means at the other end of said tubular member for supplying air pressure to said balloon through said tubular member and control valve means for selectively connecting said air pressure means to said balloon for inflating the latter to bear upwardly against the valves and for subsequently venting the tool to deflate the same and withdraw the balloon, and means for connecting the tool to the spark plug opening.

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**4,294,142**

**AUTOMATIC SCREWDRIVER**

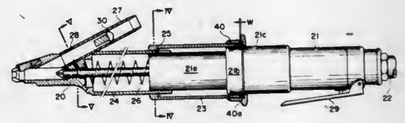
**Syunji Sugahara, Osaka, and Takao Morimoto, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Jan. 10, 1980, Ser. No. 111,073**

**Claims priority, application Japan, Jan. 20, 1979, 54-5005**

**Int. Cl.³ B25B** *23/06*

**U.S. Cl. 81—57.37** **3 Claims**



1. An automatic screwdriver having a power unit, comprising: a first cylindrical member having a bore extending therethrough, a hand grip portion, a guide portion and a contacting surface portion between said hand grip and guide portions, a hand-operated lever pivotally mounted on said hand grip portion; a screw driving bit adapted to be rotatably driven by said power unit under the control of said hand-operated lever; a second cylindrical member mounted to telescope over said guide portion; means for biasing said second cylindrical member away from said first cylindrical member; a feeder tube connected at one end to a front end of said second cylindrical member at an angle thereto for feeding a bolt or the like to the front end of said second cylindrical member; a third cylindrical member extending over said guide portion and movably mounted on said second member and having a contacting surface engageable with the contacting surface of said contacting surface portion; manually operable means for providing pressure contact between said contacting surfaces to couple said first and second cylindrical members together, said manually operable means being operable to decouple said contacting surfaces to allow said second cylindrical member to rotate manually to a desired angular position with respect to said first cylindrical member; and means for coupling said second and third cylindrical members to provide unitary rotation about their axes when said first and second cylindrical members are decoupled from one another and to allow said second cylindrical member to telescope with respect to said third cylindrical member.

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**4,294,143**

**METHOD AND APPARATUS FOR CUTTING INTO SEGMENTS A CONTINUOUSLY MOVING WEB OF RIGID INSULATION**

**Abraham Lieberman, 4555 Bonavista Ave., Apt. 31, Montreal, Quebec, Canada (H3W 2C7)**

**Filed Oct. 23, 1979, Ser. No. 87,499**

**Int. Cl.³ B26D** *1/18, 1/24, 1/56*

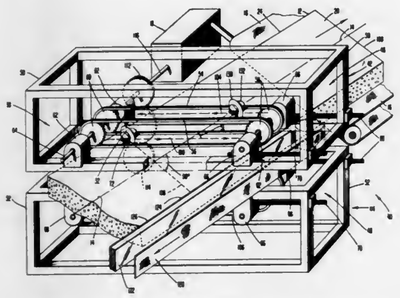
**U.S. Cl. 83—37** **28 Claims**

8. Apparatus for transversely cutting into predetermined lengths, a continuous strip-like web, the web being conveyed along its longitudinal axis, the apparatus comprising:

(a) means for simultaneously engaging and cutting into the moving web at both major web surfaces, said means including at least one pair of cooperating first and second blades;

(b) means for simultaneously tranporting said blade pair transversely across the web and longitudinally in the direction of conveyance of the web, said transporting means including

(1) first travelling carriage means positioned adjacent one major surface of the web and oriented to traverse the web along a first carriage path disposed at a first angle to the longitudinal axis of the web, said first travelling carriage means carrying said first blade;
(2) second travelling carriage means positioned adjacent the other major surface of the web and oriented to traverse the web along a second carriage path disposed at a second angle to the longitudinal axis of the web, said second travelling carriage means carrying said second blade;
(3) means for synchronizing the speed of said first travelling carriage means with the speed of said second travelling carriage means wherein said first blade cooperates with second blade to provide mutually opposing forces biasing the web against the cutting action of each



of said cooperating blades for completely severing the web through its thickness; and
(c) means associated with said transporting means for aligning each blade of said blade pair such that the plane of the respective blade is perpendicular to the longitudinal axis of the web, wherein said transporting means includes first and second stationary frame means positioned adjacent the opposite major web surfaces, and wherein said first and second travelling carriage means include, respectively, first and second endless belt means supported in said respective frame means to span the web along respective ones of said first and second carriage paths, and wherein said aligning means includes a plurality of assemblies for holding the individual blades of said blade pair, said blade-holder assemblies being attached to the respective ones of said first and second endless belt means.

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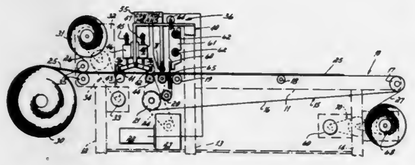
**4,294,144**
**APPARATUS FOR CUTTING SHEET MOLDING COMPOUND**
**Richard H. Hayes, Tallmadge, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio**
**Filed Nov. 7, 1979, Ser. No. 91,968**
**Int. Cl.³ B26D *5/02, 9/00***
**U.S. Cl. 83—71** **4 Claims**



1. Apparatus for cutting sheet molding compound carried on a liner comprising,
a conveyor for carrying compound and liner,
a plurality of transversely adjustable slitting knives engageable with said compound to form longitudinal slits in said compound to form strips of selectively variable width,
a transversely movable knife engageable with said compound to cut said strips into preselected lengths,
means for separating said liner from said compound upstream of said transverse knife and returning it to said compound downstream of said knife,
anvil means against which said knife presses said compound to cut the same, said anvil means being located between said liner and compound,
means for detecting the longitudinal distance of movement of said compound,
and means for automatically operating said knife after a preselected length of compound passes under it.

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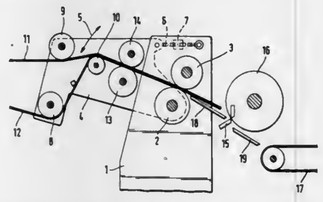
**4,294,145**
**MACHINE FOR THE CROSSCUTTING OF A WEB CONVEYED AS A MULTI-PLY WEB**
**Jakob Bödewein, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany**
**Filed Apr. 10, 1980, Ser. No. 138,775**
**Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917582**
**Int. Cl.³ B26D *1/62***
**U.S. Cl. 83—302** **5 Claims**



1. A machine for the crosscutting of a multi-ply web, comprising: a crosscutter; means preceding the crosscutter in the direction of web travel for guiding the plies of the web; means disposed between the web guiding means and the crosscutter for feeding the multi-ply web to the crosscutter comprising a pair of rolls; and means for compensating for the differences in sheet lengths of the various plies cut by the crosscutter comprising means mounting the web guiding means for pivotable movement as a unit about the axis of one of the two rolls of the feeding means and means for fixing the web guiding means in a selected position in the path of motion thereof.

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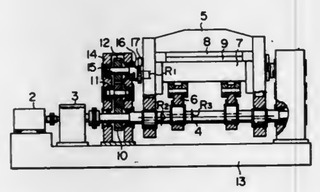
**4,294,146**
**OSCILLATION TYPE FLYING SHEAR**
**Yukio Ohtake, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**
**Filed Apr. 1, 1980, Ser. No. 136,248**
**Claims priority, application Japan, Dec. 3, 1979, 54-155670**
**Int. Cl.³ B26D *1/56***
**U.S. Cl. 83—316** **5 Claims**



1. An oscillation type flying shear comprising:
a main crank shaft driven by drive means;



a frame pivotally supported by a first eccentric portion of said main crank shaft;
an upper cutting blade secured to said frame;
a lower cutting blade holder pivotally secured to a second eccentric portion of said main crank shaft and slidably attached to said frame;
a lower cutting blade secured to said lower cutting blade holder;
gearing for transmitting the rotational force of said drive means to an oscillating crank; and
a link for transmitting the eccentric movement of said oscillating crank to said frame as a pivotal movement; the improvement comprising means for adjusting the gear meshing position of gears of said gearing.

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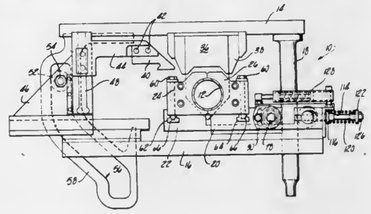
**4,294,147**
**TUBE CUTTING APPARATUS**
**John J. Borzym, 4820 Schoolbell La., Birmingham, Mich. 48010**
**Filed Feb. 7, 1980, Ser. No. 119,241**
**Int. Cl.³ B23D *21/00***
**U.S. Cl. 83—382** **24 Claims**



1. Apparatus for clamping a workpiece, comprising:
a pair of opposed, complemental die jaws;
first and second slide means respectively mounting said die jaws for sliding movement toward and away from each other between an open release position and a closed clamping position;
first and second cam followers; and
means for respectively mounting said first and second cam followers on said first and second slide means, including means for allowing selective adjustment of the distance between said die jaws,
said adjustment means including
(1) selectively rotatable eccentric shaft means on said first slide means for rotatably mounting said first cam follower on said first slide means, said eccentric shaft means being operative upon rotation thereof to shift the position of said first cam follower whereby to adjust the distance between said die jaws, and
(2) means coupled with said eccentric shaft means for locking said eccentric shaft means in a selected rotational position thereof corresponding to a desired adjustment of said distance between said die jaws.

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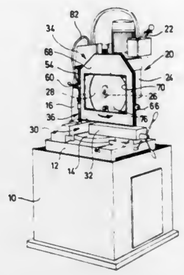
**4,294,148**
**GUARDS FOR CIRCULAR SAW BLADES OF CIRCULAR SAWING MACHINES**
**Karl Drixler, Nürtingen-Neckarhausen, Fed. Rep. of Germany, assignor to Chr. Eisele Maschinenfabrik GmbH. & Co. KG, Fed. Rep. of Germany**
**Filed Dec. 10, 1979, Ser. No. 102,122**
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 7837368[U]**
**Int. Cl.³ B27B *5/29***
**U.S. Cl. 83—397** **9 Claims**

1. A guard for the circular saw blade of a circular sawing machine whose sawing unit has a horizontally supported saw spindle and is disposed on a frame of the machine so as to be vertically movable, the guard being arranged to cover the circular saw blade from above and at least partially on an accessible end face thereof and on the circumferential portion of an operating side, the guard forming a housing arranged to be mounted on the machine frame so as to be fixed relative to the circular saw blade with the latter in an upper starting position, said housing being open at its bottom only and, with said saw blade in its upper starting position, said housing completely accommodating the circular saw blade, a downwardly extended elongate opening being disposed in a side wall of the housing to accommodate the saw spindle and being associated with a covering element arranged to move between a covering



position, in which the covering element covers at least one region having disposed therein the circumference of the circular saw blade and being associated with the part of the elongate opening disposed beneath the saw spindle when the circular saw blade is in the upper starting position, and a released position, the covering element operating toward said released position and progressively exposing the said part of the elongate opening when feed motion of the circular saw blade is performed, the saw spindle traveling within the elongate opening during such feed motion.

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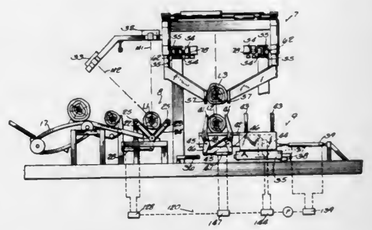
**4,294,149**
**APPARATUS FOR MEASURING AND ORIENTING LOGS FOR SAWING**
**Lars J. Olsson, Linkoping, Sweden, assignor to Saab-Scania AB, Jonkoping, Sweden**
**Continuation-in-part of Ser. No. 856,130, Dec. 1, 1977, abandoned. This application Aug. 23, 1979, Ser. No. 68,904**
**Int. Cl.³ B27B *15/04, 29/04, 1/00*; B56G *47/90***
**U.S. Cl. 83—435.1** **12 Claims**



1. Apparatus comprising a feed mechanism by which a log is fed to a cutting machine in horizontal substantially lengthwise translatory motion parallel to a vertical cutting plane through the cutting machine, said feed mechanism comprising carriage means constrained to move horizontally in opposite directions parallel to the cutting plane and two pairs of jaws on the carriage means, projecting downwardly to a level beneath the carriage means, for gripping opposite sides of a log to constrain the log to move with the carriage means, said apparatus being characterized by:
A. measuring station means defining a reference plane that is

spaced a distance to one side of said cutting plane, said measuring station means comprising

(1) a pair of supporting devices that are movable to and from an operative position in which the supporting devices can cooperate to cradle a log near opposite ends thereof and substantially confine the log to rotation, with the log at a measuring level below said level of the jaws of the feed mechanism and its length substantially horizontal, and with the log approximately in lengthwise symmetry to said reference plane, and

(2) means for moving said supporting devices between their said operative position and an inoperative position in which the supporting devices are below said measuring level;

B. transfer mechanism comprising

(1) a transfer carriage constrained to horizontal motion transversely to said planes, through said distance,

(2) a pair of elevators on said transfer carriage constrained to move through said distance with the transfer carriage but movable up and down relative to the transfer carriage, and

(3) a pair of gripping elements on each elevator, the gripping elements of each pair being swingable toward and from one another and cooperable with their elevator to pass under a log supported by said supporting devices and grip the log, to thus provide for transfer of the log from the supporting devices to the transfer mechanism, with the log in a rotational orientation established for it at the measuring station and in a lateral orientation established for it by the gripping elements;

C. actuating means on the carriage means of the feed mechanism, reacting between the two jaws of each pair thereof, for converging the jaws in any positions transversely of the cutting plane in which the jaws establish themselves when they converge upon a log to grip it; and

D. means on the carriage means for adjustably shifting each of said pairs of jaws laterally to enable a log supported by the feed mechanism to be established in a desired lateral position and orientation relative to the cutting plane.

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**4,294,150**

**SAWING OR CUTTING MACHINE**

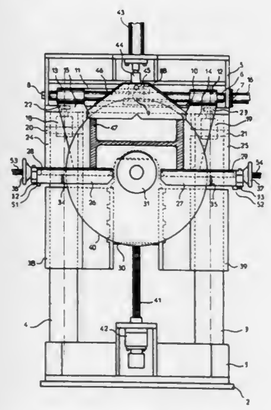
**Jean Vierstraete, 83, rue Victor Hugo a, Oignies (Pas-de-Calais), France**

**Filed Jun. 27, 1979, Ser. No. 52,494**

**Claims priority, application France, Jun. 27, 1978, 78 19834**

**Int. Cl.³ B23D *47/04, 47/08***

**U.S. Cl. 83—453** **8 Claims**



1. A sawing machine capable of straight or bias cutting comprising a frame having a pair of vertically extending members spaced from one another, a motor having a horizontal shaft and a rotary saw having a saw blade mounted on said shaft, means for mounting said motor on said frame and for moving it vertically of said frame, means for supporting a workpiece comprising two generally horizontal cross-bars extending toward one another from said vertical members of said frame, inner ends of said cross-bars being spaced from one another to leave room for said motor and saw, each of said cross-bars comprising two parallel members which are spaced apart to receive said saw blade between them, means for centering said workpiece on said supporting means and means engaging said workpiece from above for holding it down on said supporting means, said motor and saw being movable upwardly to cut a workpiece supported by said supporting means, centered by said centering means and held down by said hold-down means.

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**4,294,151**

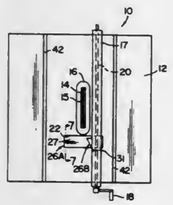
**ANTI-KICK BACK DEVICE**

**Julian Lemus, 5614 River Shore Dr., Tampa, Fla. 33603**

**Filed Nov. 23, 1979, Ser. No. 96,926**

**Int. Cl.³ B27B *5/22***

**U.S. Cl. 83—477.2** **4 Claims**



1. In a bench power saw having a work table with a rotary cutting blade projecting above the plane of the table, and a guide fence extending vertically from the table and being adjustably positionable on the table parallel to said blade for establishing the width of a cut, the table and fence establishing a workpiece path, the provision of a means for preventing the unintentional reverse drive of a workpiece as the cut is completed, comprising:

a surface of the guide fence having a recess opening prior to the blade position and adjacent thereto;

a blocking member housed in said opening;

said blocking member located in said workpiece path and having a cam surface on the side thereof opposite the blade;

means for mounting said blocking member for movement about a substantially vertical axis between a fully retracted position within said opening and a projected position wherein said cam surface extends from said opening in an outwardly angular direction towards said blade; and

means for urging said blocking means to the projected position, whereby a workpiece directed toward the blade in the workpiece path will cam down the blocking member and proceed to the cutting position, and after the workpiece has passed over the blocking member, but before being fully severed, the blocking member will return to the projected position to prevent reverse travel of the workpiece.

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**4,294,152**

**FILM PUNCH**

**Donald E. Land, 10000-½ E. 56th St., Raytown, Mo. 64133**

**Filed May 16, 1979, Ser. No. 39,668**

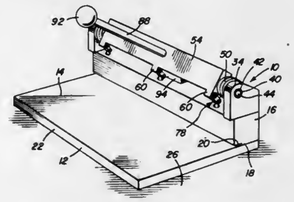
**Int. Cl.³ B26D *5/08, 5/18***

**U.S. Cl. 83—588** **2 Claims**

1. A sheet punching apparatus including a sheet supporting base defining a sheet supporting surface, an elongated support member mounted on said base and including a longitudinal central portion and opposite end portions, said support member projecting outwardly from said surface and including spacer means for spacing said support member from said base



to define an open elongated sheet marginal edge receiving slot between said support member and said base extending along said support member and opening, laterally, across said surface, a pair of aligned support blocks removably supported from said opposite end portions of said support member outwardly from said surface and spaced along said slot, elongated shaft means including an elongated central head portion and opposite end portions extending between and removably journaled from said support blocks, a pair of coiled torsion springs disposed about said opposite end portions of said shaft means and operatively connected between said shaft means and said support blocks, said support member defining a plurality of sleeve bores formed therein and spaced therealong and disposed generally normal to said surface and opening into said slot, a plurality of bearing sleeves removably received in said bores above said slot, a plurality of generally parallel elongated punch members reciprocal in said sleeves and including first and second ends, said base defining a plurality of die bores formed therein aligned with said sleeve bores, a plurality of die sleeves disposed in said die bores, said central elongated head portion including crank arm portions spaced therealong regis-



tered with said sleeve bores, a plurality of elongated generally parallel connecting link structures pivotally connected at one set of corresponding ends thereof to said crank arm portions, and at the other set of corresponding ends to the first ends of said punch members, said longitudinal central portion of said support member including an abutment block supported therefrom, said head portion and abutment block including coacting abuttingly engageable portions defining first and second limit positions of oscillation of said head portion and shaft means relative to said base, said punch members, connecting link structures and crank arms being substantially aligned in one limit position of oscillation of said head portion with the second ends of said punch members disposed within said die sleeves, said head and crank arm portions being angularly displaced generally 35° from said first limit position when said head portion is disposed in the second limit position with said second ends of said punch members retracted across said slot and into said bearing sleeves, said springs yieldingly biasing said head portion to said second limit position, said head portion including a laterally outwardly projecting operating arm disposed at generally 90° relative to said crank arm portions.

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**4,294,153**

**METHOD OF SYNTHESIZING MUSICAL TONES**

**Yasuhiro Mitsuhashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Sep. 20, 1979, Ser. No. 77,341**

**Claims priority, application Japan, Sep. 26, 1978, 53/118398**

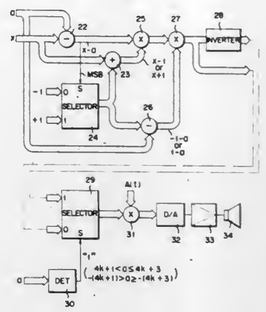
**Int. Cl.³ G10H *1/043***

**U.S. Cl. 84—1.01** **7 Claims**

1. A method of synthesizing a musical tone comprising the steps of:

periodically producing a fundamental signal which can be represented as a waveform crossing an axis representing zero amplitude, the fundamental signal having first, second and third zero crossing points (i.e., the points at which said waveform crosses said zero amplitude axis) at a phase within one cycle period of the fundamental signal, said first and third zero crossing points being a starting point and a terminating point of the waveform in one cycle period respectively, said second zero crossing point being an intermediate transitional point of the waveform in one cycle period from one side to the other of the zero amplitude axis;

periodically producing a modulation signal; and



modulating the phase of said second zero crossing point of said fundamental signal with said modulation signal without modulating the phases of said first and third points to thereby determine the frequency spectrum of the resulting signal to produce a synthesized musical tone.

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**4,294,154**

**MUSIC TONE GENERATING SYSTEM**

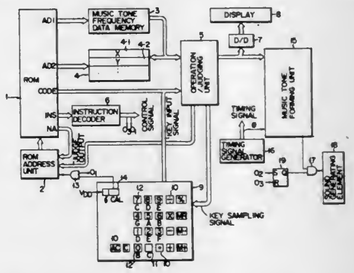
**Hidetaka Fujisawa, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,911**

**Claims priority, application Japan, Dec. 27, 1978, 53-161881**

**Int. Cl.³ G10H *1/00, -5/00***

**U.S. Cl. 84—1.01** **7 Claims**



1. A music tone generating system comprising:

key input means including entry keys and function keys for inputting data, said keys having at least a corresponding relation to a plurality of music tones;

display data memory means for storing data to be displayed;

key input data processing means connected between said key input means and said display data memory means for executing a key input processing operation in accordance with a key operation by said key input means and for delivering data to be displayed as an output to the display data memory means;

display means coupled to said display data memory means and having a plurality of display digits for displaying the data to be displayed which is stored in said display data memory means;

a sound producing element for producing a sound corresponding to a music tone;

music tone signal producing means for delivering a frequency signal corresponding to each of a plurality of music tones to said sound producing element in accordance with the operation of the keys of said key input means which have a corresponding relation to music tones;

detecting means for detecting that at said display means the display data is displayed over all the display digit positions thereof; and

control means coupled to said detecting means for suppressing an output corresponding to the display data at said key input data processing means according to the result of detection of said detecting means when the keys having the corresponding relation to the music tones are operated and for causing said music tone producing means to deliver said frequency signal as an output to said sound producing element.

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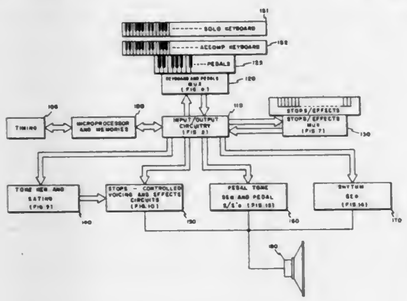
**4,294,155**

## ELECTRONIC MUSICAL INSTRUMENT

**James Turner, Stamford, Conn., assignor to CBS Inc., New York, N.Y.**

**Filed Jan. 17, 1980, Ser. No. 112,895**
**Int. Cl.³ G10H *1/24, 1/36, 5/00***
**U.S. Cl. 84—1.01** **76 Claims**




1. An electronic musical instrument, comprising:

at least one keyboard having a plurality of octaves of keys;

a digital processor;

random access memory means coupled to said digital processor;

key sampling means, controlled by said digital processor, for sampling, during successive time intervals, the statuses of said keys, said key sampling means forming, during each time interval, a set of digital words, each word having a plurality of bits that respectively represent the key statuses of the different octaves of a note of the chromatic scale;

music generating means coupled to said digital processor;

said digital processor being operative to store the statuses of said keys in said random access memory means and to read out key-representative signals from said random access memory means to said music generating means.

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**4,294,156**

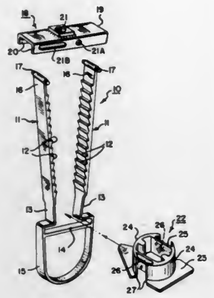
## HIGH STRENGTH ANCHOR ASSEMBLY FOR FASTENER

**Thomas W. McSherry, Floral Park, and Nathaniel H. Garfield, Harrison, both of N.Y., assignors to Mechanical Plastics Corporation, Pleasantville, N.Y.**

**Filed Oct. 6, 1978, Ser. No. 949,006**
**Int. Cl.³ F16B *21/00, 13/06***
**U.S. Cl. 411—345** **6 Claims**

1. In an anchor assembly for retaining an elongated fastener member within an opening defined by a wall portion having at least one concealed side, of the type comprising (1) at least two elongated leg members each having a long dimension and a major transverse dimension, (2) means for connecting a pair of adjacent end portions of said leg members, (3) an apertured anchor member coupled to said legs at the opposite end portions thereof, and (4) a collar member secured to said legs for sandwiching said wall portion between said collar and said anchor member, the improvement wherein:

said anchor member comprises a channel member having a pair of flanges each defining a pair of coupling apertures; and



each of said legs comprises a substantially straight portion having disposed at the end thereof a coupling stud aligned along said major transverse dimension with each of said coupling studs engaging each of said pair of flanges of said anchor member through said coupling apertures,

each of said legs being pivotable in a common plane about an axis of rotation which is coincident with the longitudinal axis of the coupling stud.

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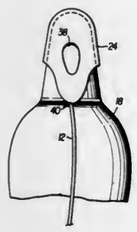
**4,294,157**

## PROJECTILE DEPLOYED CABLE WEAPONS SYSTEM

**Charles M. Stancil, Springfield, Va., assignor to Stahan Corporation, Springfield, Va.**

**Filed May 1, 1979, Ser. No. 34,989**
**Int. Cl.³ F41F *1/00***
**U.S. Cl. 89—1 G** **15 Claims**



1. An assemblage for deploying an amount of cable to defeat a helicopter rotor system, the assemblage comprising:

(a) a first wall member defining a first cavity for receiving a projectile,

(b) a projectile situated with respect to the first cavity so as to be at least temporarily received therein,

(c) a second wall member joined to the first member and defining at least a second cavity for receiving an amount of cable,

(d) an amount of cable situated within the second cavity, and

(e) an inelastically deformable patch attached to the cable and situated over an opening in the first wall member so as to intercept said projectile and conformably engage the leading tip of said projectile when deployed.

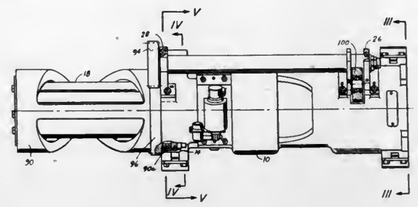


**4,294,158**

## GUN BOLT CONTROL MECHANISM

**Raymond A. Patenaude, Burlington; Thomas W. Cozzy, South Burlington, and Stephen J. Bullis, Colchester, all of Vt., assignors to General Electric Company, Burlington, Vt.**

**Filed Jan. 8, 1979, Ser. No. 2,037**
**Int. Cl.³ F41D *7/04***
**U.S. Cl. 89—12** **5 Claims**



1. An automatic gun including:

a housing;

a rotor journaled for rotation on a longitudinal axis relative to said housing;

a plurality of gun bolts carried by and journaled for reciprocation in said rotor, each gun bolt having a respective cycle of operation;

a first cam means coupled to and driving in reciprocation each of said gun bolts during a first portion of the respective cycle of operation of each of said gun bolts; and

a second cam means coupled to and driving in reciprocation each of said gun bolts during a second portion of said respective cycle of operation of each of said gun bolts.

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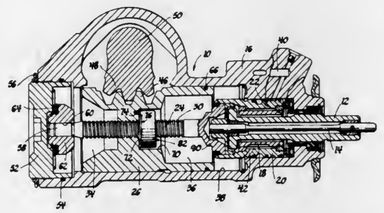
**4,294,159**

## THREAD DELASHER IN VEHICLE STEERING GEAR

**Paul O. Wendler, Saginaw, and Clarence E. Welsh, Merrill, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 21, 1979, Ser. No. 77,855**
**Int. Cl.³ F15B *9/10***
**U.S. Cl. 91—375 A** **3 Claims**



1. A power steering gear comprising a housing, an input member mounted for turning movement in said housing and extending from one end thereof, an output member operatively mounted for turning movement in said housing and extending outwardly therefrom, piston means mounted for longitudinal sliding movement in said housing and cooperating therewith to provide first and second expandable and contractible fluid chambers in said housing, passage means for supplying and exhausting pressure fluid from said chambers, rotatable worm means extending axially through said piston means and threadedly connected thereto, gear means operatively interconnecting said piston means and said output member so that movement of said piston means will produce movement of said output means, lock nut means threaded on said worm means, spring means interposed between said lock nut means and said piston means and operatively connected therebetween to provide rotational restraint to said lock nut means with respect to said piston means while providing an axial force urging said piston means and said lock nut means in opposite axial directions to thereby load opposing flanks of the threads of a threaded connection between said worm means and said piston means and between said worm means and said lock nut means to thereby reduce lost motion in the threaded connections.

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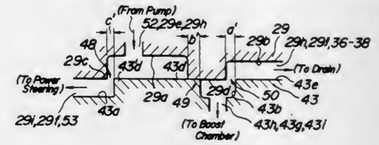
**4,294,160**

## OIL PRESSURE BOOSTER

**Yasufumi Ideta; George Takeda, both of Tokyo, and Shoei Watanabe, Koganei, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Feb. 11, 1980, Ser. No. 120,652**
**Claims priority, application Japan, Feb. 14, 1979, 54-15015**
**Int. Cl.³ F15B *9/10***
**U.S. Cl. 91—378** **3 Claims**




1. An oil pressure booster comprising a booster body with an inlet port, an outlet port, and a drain port; a power piston fitted in said booster body; a spool fitted in said power piston and operatively connected to a brake pedal; a throttle valve, a return path valve and a control valve defined between said power piston and said spool so as to close and open in response to movement of said spool; and a boost chamber defined in said booster body and normally communicating with said drain port through said return path valve; said throttle valve throttling flow of operating oil supplied from said inlet port in response to depression of the brake pedal so as to generate an oil pressure upstream of said throttle valve, said control valve selectively allowing passage of said oil pressure to said boost chamber for causing said power piston to follow the movement of said spool in a depressing direction of the brake pedal, wherein in response to movement of said spool in said depressing direction of the brake pedal, said throttle valve is closed at first and then said return path valve is closed and thereafter said control valve starts to open.

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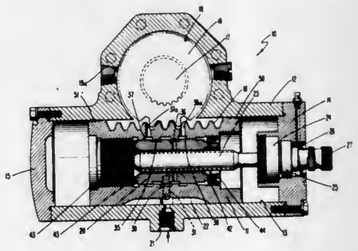
**4,294,161**

## POWER STEERING GEAR WITH OIL FILLED CAPILLARY BALANCING SLOTS

**Peter H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331**

**Filed Dec. 29, 1978, Ser. No. 974,347**
**Int. Cl.³ F15B *11/08***
**U.S. Cl. 91—422** **10 Claims**



1. An improved piston and cylinder combination of a hydraulic power steering gear comprising a housing defining a

cylinder, a piston slidably mounted within the cylinder; a slot formed in at least one of said piston or cylinder at the sliding interface and open only at said interface, and means to feed pressurized hydraulic fluid adjacent the ends of said cylinder to actuate said piston and to said slot to balance and cushion the piston, said slot having a depth of approximately between 0.001 and 0.0025 inch thereby being sufficiently shallow to set up high capillary attraction of the fluid molecules within the slot, whereby the fluid is trapped within the slot and leakage is prevented.

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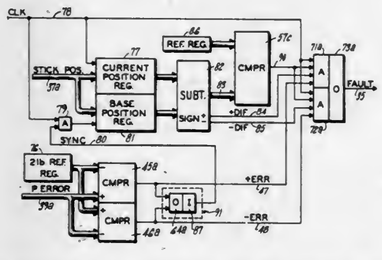
**4,294,162**

## FORCE FEEL ACTUATOR FAULT DETECTION WITH DIRECTIONAL THRESHOLD

**Donald W. Fowler, West Haven, and Douglas H. Clelford, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Jul. 23, 1979, Ser. No. 60,093**
**Int. Cl.³ F15B** *13/14, 13/16*
**U.S. Cl. 91—434** **4 Claims**




1. An improved fault detector for a force feel system having an hydraulic actuator responsive to the difference in pressure of hydraulic fluid applied to opposite ends thereof through a turn-on valve to apply force in either of two directions to the control stick of an aircraft, the fault detector including:

means for providing a desired force signal indicative of the force desired to be applied to the control stick by the actuator;

means for providing an actual force signal indicative of the force applied by the actuator to the control stick;

error means responsive to said desired force signal and said actual force signal for providing force error signals indicative of the magnitude and direction of the difference between the desired force and the actual force applied by said actuator;

position means for providing control stick position signals indicative of the position of said control stick; and

signal processing means connected to said position means and said error means, and responsive to the amount and direction of control stick motion, which occurs directly subsequent to said error means generating a signal indicative of an excessive force in either of said directions, for providing a fault signal to close said turn-on valve in response to excessive stick motion in the same direction as the direction of excessive force;

in which the improvement in said signal processing means comprises means continually responsive to current ones of said control stick position signals for registering the control stick position indicated by said signals in response to said error means providing signals indicative of excessive force in either direction, to provide base position signals, for comparing said control stick position signals with said base position signals, for providing a first signal in response to said base position signals exceeding said current position signals by a threshold magnitude, for providing a second signal in response to said current position signals exceeding said base position signals by a threshold magnitude, and for generating said fault signal in response to said error means providing signals indicative of excessive force in a first direction concurrently with said first signal or in response to said error means providing signals indicative of excessive force in a second direction concurrently with said second signal.

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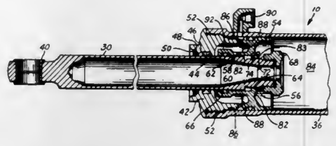
**4,294,163**

## NON ADJUSTABLE HYDRAULIC CYLINDER

**Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Oct. 29, 1979, Ser. No. 88,943**
**Int. Cl.³ F01B** *7/20;* **F16J** *1/10*
**U.S. Cl. 92—52** **4 Claims**



1. A dual acting hydraulic actuator primarily for the actuation of aircraft landing gear including:

a hydraulic cylinder having first and second ports for flowing fluid in and out thereof, a first end having a gland therein, and a second end having an attachment fitting;

a rod having first and second end portions and a central cylindrical portion of predetermined diameter therebetween, said first end portion having a rod end thereon and said central cylindrical portion being positioned to slide through said gland; and

a piston mounted to said second end portion of said rod for limited sliding movement a predetermined distance with respect thereto and sliding movement in said hydraulic cylinder in response to fluid pressure applied through said first and second ports, said piston including first and second abutment surfaces, said rod second end portion having first and second abutment surfaces positioned to engage said first and second abutment surfaces of said piston, said first and second abutment surfaces of said piston being closer together than said first and second abutment surfaces of said rod second end portion so that said predetermined distance of relative movement between said piston and said rod is defined by the difference therebetween, said rod second end portion also including an end cylindrical portion between said first and second abutment surfaces thereof, said end cylindrical portion having a diameter which is less than the diameter of said central cylindrical portion, and said piston further including first and second interior cylindrical surfaces which slide on said central cylindrical portion and said end cylindrical portion of said rod respectively, said piston and said rod defining a damping chamber between said first and second interior cylindrical surfaces, and at least one damping orifice establishing a flow path between said damping chamber and one of said ports.

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**4,294,164**

## PISTON FOR USE IN PNEUMATICALLY OPERATED PISTON-CYLINDER APPARATUS

**Kurt Stoll, Lenzhalde 72, 7300 Esslingen, N., Fed. Rep. of Germany**

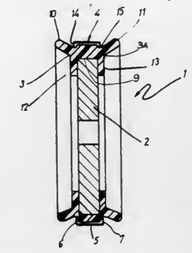
**Filed Dec. 4, 1979, Ser. No. 100,068**
**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 7836994[U]**
**Int. Cl.³ F16J** *9/08*
**U.S. Cl. 92—243** **4 Claims**

1. A piston for operating cylinders which are to be operated utilizing compressed air, comprising:

a rigid cylindrical core member adapted to be connected to a piston rod;

an annular sealing ring of elastic material mounted around and completely enclosing the peripheral edge of said core, said sealing ring having a pair of radially inwardly and axially spaced flange parts tightly engaging opposite axially facing sides of said core, said sealing ring further having a central web member integrally connecting the radially outer extremity of said flange parts and tightly engaging the radial periphery of said core, said sealing ring further having a pair of annular sealing lips integrally connected at the juncture between each flange part and said central web member and at a location spaced radially inwardly from the radially outermost extremity of said central web member to thereby define first and second





radially outwardly opening, axially spaced recesses, each of said sealing lips being outwardly inclined relative to the axially facing sides of said core and terminating at a location whereat the diameter is of greater dimension than the diameter of said central web member; and

a resilient annular guide ring having a generally channel-shaped cross section having a central bight portion and a pair of axially spaced legs, each of said axially spaced legs being received in a respective one of said first and second recesses to thereby prevent said guide ring from moving axially relative to said sealing ring, said guide ring being slotted to facilitate an installation of said guide ring on said sealing ring.

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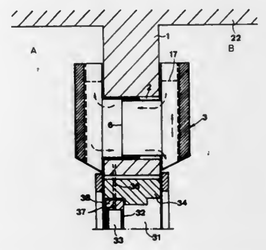
**4,294,165**

## ARRANGEMENT TO COUNTERACT OR PREVENT SPREADING OF FIRE OR SMOKE

**Knut Bergdahl, Kvartsgrand 4, S-852 52 Sundsvall, Sweden**

**Filed May 4, 1979, Ser. No. 35,824**
**Claims priority, application Sweden, May 8, 1978, 0519/78**
**Int. Cl.³ F16K** *9/00*
**U.S. Cl. 98—1** **5 Claims**



3. An arrangement to counteract or prevent the spreading of fire or smoke comprising means for defining a partition between two chambers of a static structure, means for defining an aperture in said partition for normally placing said two chambers in fluid communication with each other, means for normally maintaining said aperture open while being operative to close said aperture in response to the detection of fire or smoke, said last-mentioned means including a drain trap-like conduit portion through which air can normally flow to pass through said aperture between said two chambers, means for detecting a predetermined level of smoke or temperature, means for responding to said detecting means for filling and closing said drain trap-like conduit portion with a noncombustible fluid thereby closing communication between said two chambers through said aperture, means defining a door aperture in said partition, a hollow door movable between a first position at which said door aperture is open and a second position at which said door aperture is closed, means for conducting a noncombustible fluid through said door aperture defining means and into said hollow door when the latter is in its second position, second means for detecting a predetermined level of smoke or temperature, and means responsive to said second detecting means for effecting the conducting of fluid through said conducting means.

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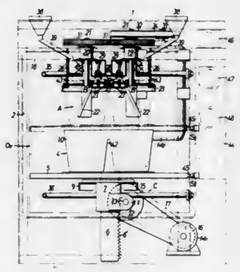
**4,294,166**

## APPARATUS FOR MIXING AND BAKING OF BREAD

**Shigeo Takeuchi, 2-banchi, Kiba-cho, Minato-ku, Nagoya-shi, Aichi-ken, Japan**

**Division of Ser. No. 933,116, Aug. 9, 1978, Pat. No. 4,234,605.**
**This application Jun. 6, 1980, Ser. No. 157,189**
**Claims priority, application Japan, Aug. 19, 1977, 52/99833**
**Int. Cl.³ B01F** *7/24;* **A47J** *27/00*
**U.S. Cl. 99—348** **6 Claims**



1. An apparatus for making bread which comprises a casing frame, an oven accommodated in said casing frame, a combined trough and baking-pan unit removably mounted in said oven, a water tank accommodated in said oven, oven heater means effective to heat water as held in said water tank to the same temperature as that of the oven interior, means for directing the water heated in said water tank into said combined trough and baking-pan unit, an agitating device in said oven having an agitator element, and lift means operable to move said combined trough and baking-pan unit and said agitating device vertically relative to each other thereby to place the agitator element of said agitating device into and out of said combined trough and baking-pan unit.

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**4,294,167**

## METHOD OF APPARATUS FOR CANNING FOOD PRODUCTS

**Max P. Beauvais, 46 Southridge West, Tiburon, Calif. 94920, and Raymond E. Camezon, 623 Tunbridge Rd., Danville, Calif. 94526**

**Filed Dec. 26, 1979, Ser. No. 107,425**
**Int. Cl.³ A47J** *27/08*
**U.S. Cl. 99—369** **6 Claims**

1. Apparatus for canning food products, comprising

a container having a removable lid capable of forming an air-tight seal against the open upper extremity of said container under the influence of a lower than ambient pressure within said container;

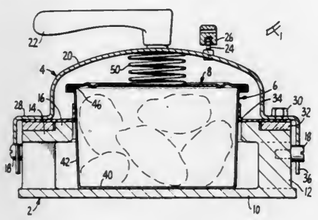
a pressure cover for covering the upper portions of said container and including

pressure sealing means for forming a pressure-tight engagement with portions of the sides of said container, whereby the combination of the pressure cover and the container so covered forms a completely enclosed pressure vessel;

means for resiliently urging said container lid downwardly against said upper extremity of said container;

pressure control means for limiting the maximum pressure differential between ambient and the pressure within said combined pressure cover and container to a predetermined level;

a base member; and



means for releasably connecting and restraining movement of said pressure cover relative to said base member, whereby a container and lid enclosing a food product, positioned and held by the base, may be engaged by the pressure cover and its sealing means when heat is applied from a heating unit to the containers, with the cover connected to the base assembly, for limiting pressure within the combined container and cover to the predetermined level to sterilize the food product, with subsequent cooling of the container causing the pressure within the container to be less than ambient to effect an air-tight seal between the lid and the container upper extremity.

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**4,294,168**

**INSERTABLE ARTICLE FOR ALTERING THE CURE RATE AND CHEMICAL COMPOSITION OF AN OBJECT**

**Walden K. Redhead, 3831 E. McGilvra St., Seattle, Wash. 98112**

**Filed Jul. 10, 1980, Ser. No. 167,773**

**Int. Cl.³ A23B *4/02*; A23L *1/22***

**U.S. Cl. 99—494** **7 Claims**

1. An insertable article for altering the cure rate and chemical composition of an object comprising in combination:

an elongate shaft,

recess means along the length of said shaft provided with support areas for carrying chemicals therein,

said shaft having one pointed terminus for facile insertion into the object,

said support areas and recess means communicating without said shaft whereby chemicals disposed therein gradually leach out into the object wherein said recess means comprise a spiral groove (**5**) running the length of said shaft around said shaft and wherein said support areas comprise pockets (**4**) along side edges of said groove, above and below, and having openings (**6**) facing said groove and wherein said pockets have a circular configuration in section with an open arc area facing said groove and a shoulder extending to edge portion of said groove, and linear with an outer periphery of said shaft to protect against displacement of the chemicals upon insertion, removal, or rotation of said shaft, and wherein said support area are coextensive with said groove and similarly follow a spiral path.

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**4,294,169**

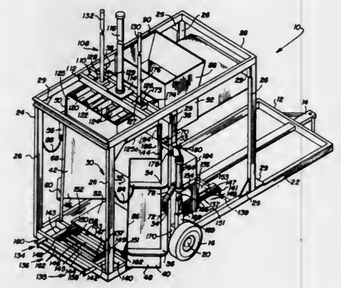
**COTTON MODULE COMPACTER**

**Charles D. Baird, P.O. Box 976, Coleman, Tex. 76834**

**Filed Feb. 4, 1980, Ser. No. 117,826**

**Int. Cl.³ B30B *15/30***

**U.S. Cl. 100—48** **41 Claims**



1. A seed cotton compacter for field use comprising in combination;

a frame;

a vertical compaction chamber mounted to said frame and including door means pivotal about a vertical axis between open and closed positions;

tamper means mounted to said frame above said compaction chamber and vertically reciprocal for tamping seed cotton in said compaction chamber into a compact module with said door means in said closed position, said door means in said open position permitting horizontal discharge of said compact module; and

said door means comprising a pair of L-shaped doors forming in said closed position left, and right and rear generally vertical walls of said compaction chamber, said doors forming said left, right and rear walls of said compaction chamber being tapered outwardly and rearwardly from top to bottom, each door being pivotally mounted to said frame at its forwrd vertical edge and extending rearwardly to define a respective right or left sidewall, and then inwardly to define part of the rear wall and meet the facing edge of the other door.



**4,294,170**

**ROLL FEED DEVICE FOR FEEDING MATERIAL TO A PRESS**

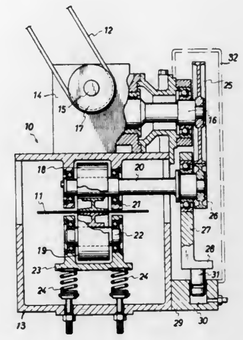
**Yuu Takahashi, Hachioji, Japan, assignor to Aida Engineering, Ltd., Sagamihara, Japan**

**Filed Jan. 24, 1980, Ser. No. 116,602**

**Claims priority, application Japan, Feb. 1, 1979, 54-10778[U]**

**Int. Cl.³ B30B *15/30***

**U.S. Cl. 100—216** **2 Claims**



1. A roll feed device for feeding a material to a press in a predetermined timed relationship to the operation of the press, said device comprising a pair of feed rolls between which the material is fed, one being an idle roll and the other being a driven roll, a drive shaft on said driven roll, an intermittent rotating mechanism operably associated with the drive of the press and having an output shaft, friction disk means easily removably mounted on said shafts and having the peripheral edges in frictional engagement with each other for driving said drive shaft from said output shaft and pressure means for urging the peripheral edges of said disk means into contact with each other, whereby an infinite number of feeding pitches can be provided by replacing the disks with other size disks.

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**4,294,171**

**EXPLOSIVES PACKAGE FOR COUPLED CAST PRIMER COMPOSITIONS**

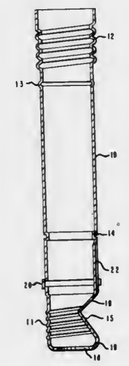
**Gilles H. Ducharme, North Bay, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 21, 1979, Ser. No. 77,543**

**Claims priority, application Canada, Sep. 21, 1978, 311787**

**Int. Cl.³ C06B *11/00***

**U.S. Cl. 102—317** **12 Claims**



1. A container for explosives adapted for interconnection with like containers to form a column, comprising a thin-walled elongated substantially cylindrical plastic tube open at both ends, said tube being provided with

(a) a male coupling at one end of the tube;

(b) a female coupling at the other end of the tube adapted to couple and retain a male coupling at the end of a like container;

(c) a circumferential groove inside the tube adapted to retain a closure disc within the tube adjacent the female coupling, between the male and female coupling;

(d) a circumferential ring seat extending into the tube and adapted to form a liquid-tight joint with a piston during casting of a high explosive into the tube, said ring seat being positioned between the circumferential groove and the male coupling; and

(e) a hole in the wall of the tube, adapted to receive and retain a thin-walled capwell thimble entirely between the ring seat and the end of the container having the male coupling.

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**4,294,172**

**PROJECTILE WITH RECOVERABLE DETONATOR**

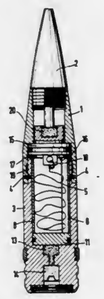
**Willi Rauschert, Altensittenbach; Gerald Rieger; Erich Bock, both of Nuremberg, and Alfred Eckel, Treuchtlingen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany**

**Filed May 29, 1979, Ser. No. 43,133**

**Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824203**

**Int. Cl.³ F42B *11/22***

**U.S. Cl. 102—473** **6 Claims**



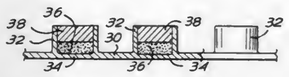
1. Projectile including a detonator (**2**) recoverable to provide function control, wherein an aerodynamic brake arrangement (**5**) located interiorly of the projectile body (**3**) is mounted on a projectile upper portion (**1**) supporting the detonator (**2**) and which is fastened to the projectile body (**3**), and a piston (**11**) is supported within the projectile body (**3**) which propels the projectile upper portion (**1**) out of the projectile body (**3**) at the ignition of apropellant charge (**13**), characterized in that the projectile body is formed by a projectile shell (**3**), the propellant charge (**13**) is arranged in the projectile shell (**3**) at the side of the piston (**11**) facing away from the projectile upper portion (**1**), and the piston (**11**) impacts against and the projectile upper portion (**1**) through half-shells (**8**) which extend about the brake arrangement (**5**), ram means being arranged in said projectile upper portion said ram means having a limited path of movement, and said brake means being fastened thereto; a further ejector charge in said upper portion being located against the side of said ram means opposite the projectile shell (**3**), and said ejector charge being detonated by said detonator (**2**).

**4,294,173**

## AMMUNITION FOR A TOY WEAPON

**Giampiero Ferri, Via Stoppani 38, Florence, Italy**

**Filed Jun. 4, 1979, Ser. No. 44,904**
**Claims priority, application Italy, Jun. 7, 1978, 9492 A/78**
**Int. Cl.³ F42B *4/02***
**U.S. Cl. 102—281** **1 Claim**



1. A process for the production of ammunition for toy-weapons, said process comprising the steps of forming a support having a plurality of seats for explosive charges, by injection moulding a plastics material, depositing explosive charges in said seats, arranging the support with the explosive charges in a second injection mould, and forming, in said second mould, a separate cover for each said seat using a plastics material which is fused to the seat, said covers being injected simultaneously, but separately.

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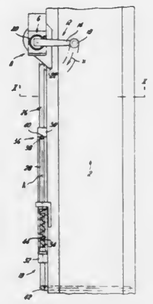
**4,294,174**

## VEHICLE SYSTEM WITH SPEED-RESPONSIVE STOP

**Gerhard H. Todt, Alling-Biburg, Fed. Rep. of Germany, assignor to Buro Patent A.G., Glarus, Switzerland**

**Filed Mar. 24, 1980, Ser. No. 132,767**
**Claims priority, application Switzerland, Mar. 23, 1979, 2753/79**
**Int. Cl.³ B61B *7/8, 7/00***
**U.S. Cl. 104—250** **10 Claims**



1. A mechanical stop mechanism for a vehicle system having a track defining a vehicle path and at least one vehicle displaceable along said path, said mechanism comprising:

an arm pivotally mounted alongside said path at an axis transverse thereto and adapted to extend into said path for engagement by said vehicle whereby said arm is swung by said vehicle about said axis at an angular velocity determined by the speed of said vehicle;

a centrifugal clutch having an output element, said clutch being connected to said arm and having a threshold velocity for clutch engagement whereby said output element of said clutch is rotatably entrained by said arm upon the angular velocity thereof exceeding said threshold velocity;

a restoring spring connected to said arm for biasing same into a position wherein said arm extends into said path; and

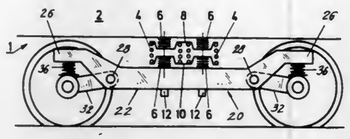
a stop member triggered upon movement of said output element into a position wherein said stop member engages said vehicle and holds the same along said path.

**4,294,175**

## SWIVEL-TRUCK SPRING SYSTEM FOR RAILROAD USE

**Gabor Harsy, Neuhausen, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Switzerland**

**Filed Apr. 2, 1979, Ser. No. 26,405**
**Claims priority, application Switzerland, Apr. 10, 1978, 3819/78**
**Int. Cl.³ B61F *3/08, 5/30***
**U.S. Cl. 105—199 R** **25 Claims**



1. A swivel truck spring system for a railroad car, or the like, comprising:

a truck, including a frame and rotatable wheels supported on said frame;

first and second spring means arranged in series between said truck frame and the body of the railroad car, with said first spring means being adapted for absorbing vertical load forces and with said second spring means being adapted for absorbing lateral load forces;

said first and said second spring means being laterally spaced apart and being near each other, thereby to take up both vertical and lateral forces, while minimizing the height of the combined structure of said first and said second spring means;

a pair of normally spaced apart spring washers for each set of said first and said second spring means; said spring washers extending laterally between said truck frame and the body of the railroad car, or the like; said first spring means being between said spring washers and said second spring means comprising one second spring between the uppermost said washer and the car body and another second spring between the lowermost said washer and said truck frame.

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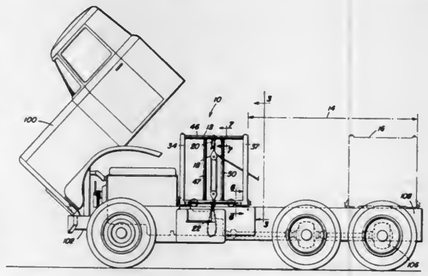
**4,294,176**

## PORTABLE HOIST FRAME

**Albert C. Brooks, 2023 W. Lexington St., Baltimore, Md. 21223**

**Filed Apr. 4, 1979, Ser. No. 26,815**
**Int. Cl.³ B61D *17/00***
**U.S. Cl. 105—363** **10 Claims**



1. An easily assembled and dis-assembled portable hoist frame comprising:

a first end frame means, said first end frame means having a top and bottom and side members;

a second end frame means, said second end frame means being similar to said first end frame means and spaced therefrom;

a first horizontal frame means, said first horizontal frame means having a vertically inclined strut member, said first horizontal frame means being connected to said first and second end frame means at both the top and at the bottom of said first and second end frame means;

a second horizontal frame means, said second horizontal frame means having a vertically inclined strut member connected to said first horizontal frame means, said second horizontal frame means being connected to said first and second end frame means at the bottom of said first and second end frame means;

a plurality of wheel-like means, said plurality of wheel-like means being attached to said first and second horizontal frame means to provide positioning flexibility to said portable hoist frame in a first direction of movement; and

a plurality of clip means, said plurality of clip means being attached to said first and second end frame means to secure said portable hoist frame against a movement in a second direction of movement perpendicular to said first direction of movement when being positioned on said wheel-like means.



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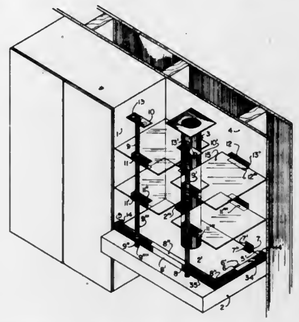
**4,294,177**

## SUPPORT BRACKET AND OPEN SHELVING ASSEMBLY

**James A. Nicholson, 10600 Van Stralen Way, Rancho Cordova, Calif. 95670**

**Filed Nov. 14, 1977, Ser. No. 851,299**
**Int. Cl.³ A47B *37/00***
**U.S. Cl. 108—42** **5 Claims**



1. In combination with a wall cabinet, a back wall and a ceiling, a ventilator hood and a standing exhaust pipe; a support bracket and open shelving assembly wherein said assembly consist of an elongated first bracket and a second bracket with both said bracket having upper and lower base extensions and with said extensions opposingly spaced apart on said first and second brackets and, with said brackets in attachment with said upper and lower base extensions of both said brackets facing inwardly of each other to form a right angle facing primary bracket with said bracket having attachment means at each end of said primary bracket and on the lower base extension, also alternate attaching means; two elongated vertical posts in attachment with the said first bracket with said posts substantially square in cross section and in attachment with said first bracket by one corner of said vertical posts in a spaced apart relationship and with each said post having ceiling attaching means at their top ends also, alternate attaching means of said vertical posts to said first bracket; a plurality of shelving support brackets having upper and lower spaced apart extensions comprising two basic sets of brackets, a first set is attachable to the said vertical posts and, a second set which has attachable means to a back wall, two alternate shelf support means; a plurality of dampener devices affixed inwardly of the aforesaid shelf support brackets to include, one alternate mode of shelf support also, a plurality of chatter pads for association with the said dampener devices and said shelf support brackets; a plurality of preferably transparent rectangular shelving in association with said brackets and components within said brackets and, two stabilizer anchorage means.

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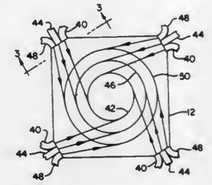
**4,294,178**

## TANGENTIAL FIRING SYSTEM

**Richard W. Borio, Somers, and Arun K. Mehta, Windsor Locks, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Jul. 12, 1979, Ser. No. 57,049**
**Int. Cl.³ F23D *1/00***
**U.S. Cl. 110—347** **2 Claims**



1. The method of operating a furnace having four walls, a first set and second set of nozzle means, with each set having nozzle means located in each of the four corners of the furnace, the method of operation comprising introducing pulverized coal and primary air into the furnace through the first set of nozzle means in such a manner that the streams of coal and primary air are directed tangentially to a first imaginary, substantially horizontal, circle in the center of the furnace, introducing secondary air into the furnace through the second set of nozzle means in such a manner that the stream of secondary air are directed tangentially to a second imaginary circle spaced from, concentric with, and surrounding the first imaginary circle, in order to reduce $NO_x$ in the exhaust gases, and also maintain an oxidizing atmosphere adjacent the furnace walls, thus reducing slagging and corrosion of the furnace walls.

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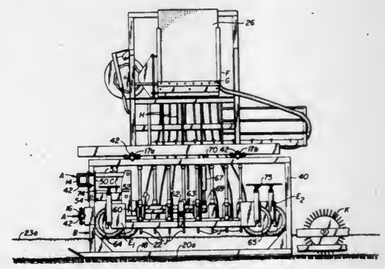
**4,294,179**

## DIBBLE TUBE SOIL PLUG PLANTER

**David W. Cayton; Errol C. Armstrong, and Angus B. MacKenzie, all of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.**

**Filed Aug. 1, 1979, Ser. No. 62,667**
**Int. Cl.³ A01C *11/02, 5/04***
**U.S. Cl. 111—3** **3 Claims**



1. Apparatus for the transplant of plant containing plugs from trays into a field having elevated seed beds contained between paired furrows, said apparatus comprising: a transport frame having first and second ground support members for passage within said furrows, said furrows having at least one plant bed defined between said furrows; at least one planting chassis suspended from said transport frame; a plug extractor

supported on said transport frame; said plug extractor including means for registering columns of plant containing plugs from a vertically supported and adjustable rigid carrying tray mounted on a horizontally adjustable support frame, said tray having rows and columns of plant containing plugs for extraction from said tray; said rigid carrying tray forming the sole support for said plugs; plug extractors, including ejectors, for contacting a group of plugs in a column of plugs from one side of said tray to cause the horizontal discharge of plugs to a plurality of plug receiving stations on the opposite side of said tray; a member defining said plurality of plug receiving stations, each station registered to said tray at a position of extraction of said plugs; said member juxtaposed to said tray to receive said plugs upon extraction; means for moving said member to register said plug receiving stations to plug receiving tubes; dibble planters for said tubes; a plug receiving tube extending from each plug receiving station to and towards one dibble planter mechanism at least two of said dibble planters being aligned with the direction of travel of said apparatus; air supply means for each said plug receiving tube; said chassis including a registry means for each tube; a dibble planter at each said registry means, each said dibble planter including a first solid sectioned cylinder for penetration into the ground to define within said ground a ground aperture the size and volume of said plug; a second hollow sectioned cylinder reciprocal about the first cylinder for receiving interiorly said first cylinder to hold the ground adjacent to said first cylinder; said registry means including horizontal sliding means for vertical registry of said tube to said second hollow sectioned cylinder when said first cylinder is withdrawn to permit air assisted gravity discharge of plugs within said tubes into the ground aperture in said ground whereby when said second cylinders are retracted, said plug resides in said ground.

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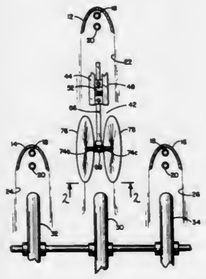
**4,294,180**

## GRAIN DRILL WITH DEVICE FOR PREVENTING UNDESIRED BACKFILLING OF FRONT FURROW BY REAR FURROW OPENERS

**Waldo H. Pust, Savage, Mont. 59262**

**Filed Oct. 31, 1979, Ser. No. 89,911**
**Int. Cl.³ A01C** *5/00*
**U.S. Cl. 111—52** **12 Claims**



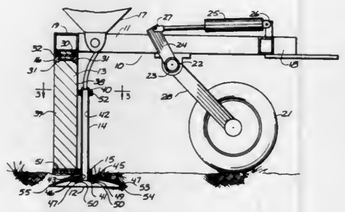
1. A method of planting seed comprising the steps of forming a front furrow, depositing seed in said front furrow, concurrently forming a rear furrow offset to one side of said front furrow, said step of forming said rear furrow displacing or shifting soil from said rear furrow in the direction of said front furrow, depositing seed in said rear furrow, preventing the soil displaced or shifted from said rear furrow as it is formed from entering said front furrow by employing disc means for deflecting soil displaced or shifted from said rear furrow, thereby preventing undesired backfilling of said front furrow, and covering the seed in said front furrow with some of the soil forming said front furrow.

**4,294,181**

## SUBSOIL AGRICULTURAL IMPLEMENT WITH ROTATABLE DISC

**Franklin Smith, Potlatch, Id.**

**Continuation-in-part of Ser. No. 950,124, Oct. 10, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,805**
**Int. Cl.³ A01C** *7/20;* **A01B** *33/06*
**U.S. Cl. 111—87** **8 Claims**



1. A subsurface agricultural implement comprising:
a framework;
a circular cultivator disc having oppositely facing upper and lower surfaces joined at a peripheral edge formed about a central disc axis;
an elongated rigid disc support having an upright forward edge and an upright rearward edge, and an upper end mounted to the framework;
an upright delivery tube fixed to the cultivator disc at a lower tube end and extending upwardly therefrom centered and preceding the forward edge of the disc support to an upper tube end, said delivery tube being centered along the disc axis as a coaxial extension thereof;
bearing means on said disc support mounting the delivery tube to the disc support for rotation of the delivery tube about the central disc axis, said bearing means comprising first and second coaxial rotational bearings mounted to the disc support at two axial spaced locations with an exposed section of the tube between said bearings, one of which is located on said disc support elevationally adjacent said disc at said lower tube end;
an open bore extending through the delivery tube from its upper end to its lower tube end;
said disc including a central opening formed therein in alignment with the open bore;
means on said framework for lowering the disc to an elevation below the soil surface;
means for causing rotation of the disc and delivery tube about the central disc axis in response to forward movement of the framework while the disc is elevationally below the ground surface;
means on said framework for directing a flowable material to the open bore at the upper tube end; and
trash clearing means on the delivery tube for preventing buildup of trash against the disc support as it is moved along the ground;
a pivot bracket and pin joining an upper end of the disc support to the framework for transverse pivotal movement about a longitudinal axis; and
spring means interconnecting the disc support and said framework for normally urging the disc support toward an upright position.

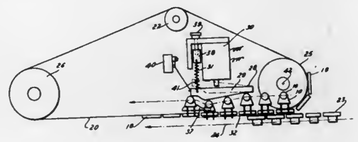


**4,294,182**

## DEVICE FOR APPLYING THREAD STAPLES TO FOLDED SHEETS

**Winfried Böttcher, and Kurt Germer, both of Leipzig, German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.**

**Continuation-in-part of Ser. No. 72,294, Sep. 4, 1979. This application Sep. 13, 1979, Ser. No. 75,000**
**Claims priority, application German Democratic Rep., Sep. 4, 1978, 207622**
**Int. Cl.³ B42B** *1/02*
**U.S. Cl. 112—21** **6 Claims**



1. A device for applying thread staples to folded sheets, comprising means for feeding said sheets in a plane; an endless chain having a section travelling in said plane in the feeding direction of the sheets; a plurality of thread feeding plates attached to said chain and each carrying a length of the thread corresponding to a staple to be formed; a pair of needles supported on each plate and guided for a reciprocating movement relative to said threads and said sheet; and stationary cam means operable to impart said reciprocating movement to said needles during the travel of said chain.

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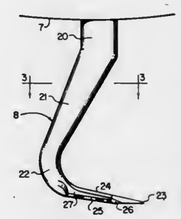
**4,294,183**

## CUTTER CONFIGURATION FOR EFFICIENT ICE DISAGGREGATION AND CLEARING

**George W. Morgan, San Jose, Calif., assignor to Suncor Inc., Toronto, Canada**

**Filed Apr. 14, 1980, Ser. No. 139,960**
**Int. Cl.³ B63B** *35/12*
**U.S. Cl. 114—42** **4 Claims**



4. An ice engaging tooth structure adapted to be affixed to and carried by a rotatable ice disaggregating drum, said tooth structure including:
(A) a base portion extending outwardly from the peripheral surface of said drum;
(B) an intermediate portion effecting a continuation of said tooth structure from said base portion, said intermediate portion being angled rearwardly with respect to the direction of drum rotation during ice disaggregating operations;
(C) a forwardly sweeping arcuate portion effecting a continuation of said tooth structure from said intermediate portion; and
(D) an ice engaging portion effecting a continuation of said tooth structure from said arcuate portion, said ice engaging portion comprising:
(i) an inverted skate element oriented along the centerline of said ice engaging portion, said inverted skate element having an edge generally facing the peripheral surface of said drum;
(ii) wing-like projections extending outwardly, respectively, on first and second sides of said inverted skate element and oriented generally parallel to the axis of said drum, said wing-like projections terminating at their forward ends in ice engaging chisel-like leading edges; and
(iii) a centrally disposed pick element generally aligned with said inverted skate element and extending forwardly beyond said chisel-like leading edges of said wing-like projections.

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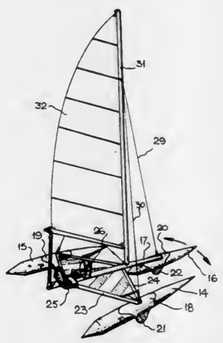
**4,294,184**

## MULTI-HULL STEERING SYSTEM

**Bernd Heinrich, Flat 27, 40 Spofforth St.,. Cremorne, N.S.W., Australia (2090)**

**Filed Apr. 6, 1979, Ser. No. 27,821**
**Claims priority, application Australia, Apr. 11, 1978, PD3976**
**Int. Cl.³ B63B** *1/00*
**U.S. Cl. 114—61** **6 Claims**



1. A multi-hull craft steering system comprising:
a frame member;
a plurality of hulls each constructed from flexible envelopes pneumatically inflated to obtain buoyancy, said hulls being supported by a trunion mounted to said frame member, each of said trunions having a hollow body enveloping one of said flexible envelopes near a mid-region of said envelopes, the upper surface of each of said hollow bodies extending longitudinally to a greater extent than the remainder of said bodies, wherein one of said hulls is a middle steering hull pivotally mounted for controlled angular variation in azimuth, said middle hull located ahead of the remaining hulls to at least an extent sufficient to permit rotation of said middle hull to avoid interference with the bows of the remaining hulls during such angular variation whereby said craft is steered;
said outer hulls having a variable track therebetween, whereby said hulls are selectivley locatable in a discrete number of locations;
a locking means for maintaining said hulls at one of said locations; and
means for angularly rotating the outer hulls away from the longitudinal axis of said craft about a hinge means connected to said frame from a first working position to a second stowed position, said stowed position permitting transportation and storage of said craft.

**4,294,185**

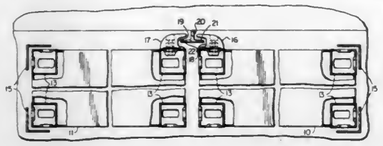
## SYSTEM FOR SECURING CONTAINERS IN A SHIP'S HOLD

**Immo R. Nordstrom, P.O. Box 305, Fair Haven, N.J. 07701, and Johannes A. Bak, Prunuslaan 41, Dordrecht, Netherlands**

**Continuation-in-part of Ser. No. 830,500, Sep. 6, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,767**

**Int. Cl.³ B63B** *25/08*

**U.S. Cl. 114—75** **20 Claims**



1. An apparatus for securing containers in a storage or cargo cell in a ship's hold wherein the containers are of substantially equal length and the storage cell is greater in length than the combined lengths of two such containers, the storage cell having a bottom wall and vertical side and end walls, and wherein each of the containers is of a type having corner pieces as a structural part of the container, each said corner piece having an elongated side opening therein, the apparatus comprising

guide means structurally attached to a vertical side wall of the storage cell for guiding the containers

said guide means having elongated flange portions extending vertically upwardly from a location adjacent the bottom wall thereof;

first and second guide hooks;

and means for detachably mounting each of said guide hooks in an opening in a corner piece of each of the containers on the same side as, and at the end closest to, the other container,

each of said guide hooks having a recess portion directed toward the other guide hook,

whereby said hooks lie on opposite sides of, and partially enclose, said flange portions of said guide means.

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**4,294,186**

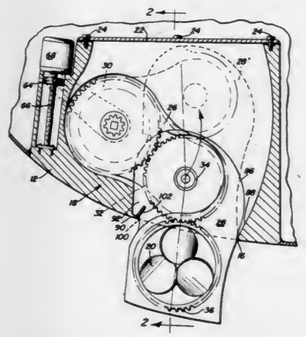
## RETRACTABLE BOW THRUSTER

**Gerald S. Wardell, 2249 SW. 68th Ter., Miramar, Fla. 33023**

**Filed Jan. 25, 1980, Ser. No. 117,219**

**Int. Cl.³ B63H** *25/42*

**U.S. Cl. 114—151** **14 Claims**



1. A retractable thruster for use in providing lateral thrust for steering a vessel, comprising:

a main housing;

a first gear housing disposed within said main housing;

a drive gear mounted for rotation within said first gear housing, said first gear housing having mounting means for providing a pivotal connection to said main housing, said pivotal connection allowing said first gear housing to pivot about the axis of rotation of said drive gear;

a propeller;

drive means connected between said drive gear and said propeller for causing rotation of said propeller upon rotation of said drive gear; and

connection means operatively connecting said propeller to said first gear housing for causing said propeller to move up and down within said housing upon pivotal movement of said first gear housing.

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**4,294,187**

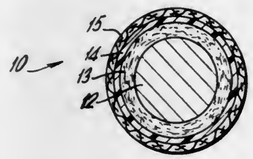
## APPLICATOR FOR DIRECT ROLL COATING

**Ozzie Fogle, Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.**

**Continuation of Ser. No. 900,819, Apr. 27, 1978, abandoned. This application Jun. 5, 1980, Ser. No. 156,818**

**Int. Cl.³ B05C** *1/00*

**U.S. Cl. 118—244** **7 Claims**



1. An apparatus for continuous direct roll coating of textured panels or sheet-like members comprising in combination: a roll applicator; means for continuously applying coating material to said applicator, and means for continuously bringing the panels into contact with said applicator, said applicator including a central core; a relatively thick layer of soft, fibrous, compressible and pliable material having a web construction held together by a binding adhesive, said fibrous layer being disposed over said core enabling said applicator to follow contoured surfaces; a very thin protective tube member disposed around said layer of fibrous web material to prevent coating material from penetrating said fibrous web material, said tube member being of an impervious material; and a very thin layer of woven fabric material disposed over said protective tube member, said layer of woven fabric material absorbing a coating for application by said applicator, said means for continuously applying coating material to said applicator including a reservoir for containing the coating material, a first roller partially immersed in said reservoir, a second roller immediately adjacent said first roller and engaged therewith, said second roller also being immediately adjacent to and engaged with said applicator, and means for rotating said first and second rollers and said applicator such that said first roller and said applicator rotate in the same direction, and said second roller rotates in the opposite direction to that of said first roller and applicator.

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**4,294,188**

## HYDRAULICALLY OPERATED ACCESS EQUIPMENT

**Denis H. Ashworth, Dudley, England, assignor to Simon Engineering Dudley Limited, West Midlands, England**

**Continuation of Ser. No. 824,822, Aug. 15, 1977, abandoned. This application Sep. 24, 1979, Ser. No. 78,183**

**Claims priority, application United Kingdom, Aug. 21, 1976, 34923/76**

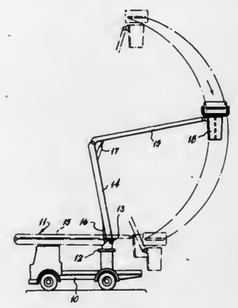
**Int. Cl.³ B05C** *5/00*

**U.S. Cl. 118—305** **8 Claims**

1. Hydraulically operated access equipment comprising a supporting structure such as a vehicle, a boom structure, a turntable rotatable about a vertical axis on said supporting



structure and on which at least a part of said boom structure is pivotally mounted for movement about a horizontal axis. hydraulic actuating means for said boom structure whereby the boom structure may be moved about its horizontal pivot between a generally horizontal stowed position on said supporting structure and an elevated position wherein its outermost end is raised above said supporting structure, a frame or housing mounted on said boom structure at the outermost end thereof, treatment means carried by said frame or housing for cleaning or applying a coating to an adjacent surface, means in said hydraulic actuating means effective to swing said boom structure to cause said treatment means to traverse said surface in substantially vertical arc paths, surface-engaging means on



said frame or housing adapted to maintain said frame or housing at a fixed distance from said surface when the equipment is in use and as said boom structure is moved to cause said treatment means to traverse said surface, and means for imparting a continuous rotational drive to said vertical axis turntable during movement of said treatment means in said paths whereby to continuously bias said boom structure and frame or housing means toward said surface to thereby positively cause said surface-engaging means to be maintained in contact with said surface during all operational movement of said treatment means in said paths, said means for imparting a continuous rotational drive to said vertical axis turntable further comprising means to permit the means for imparting the rotational drive to slip during operation.

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**4,294,189**

## APPARATUS FOR COATING WIRES WITH PAINT

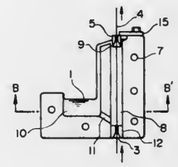
**Hiroshi Ashida, and Fumitake Takahashi, both of Nagoya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Feb. 27, 1980, Ser. No. 125,053**

**Claims priority, application Japan, Mar. 19, 1979, 54-31999**

**Int. Cl.³ B05C** *3/12*

**U.S. Cl. 118—603** **5 Claims**



1. An apparatus for coating wires with paint comprising: at least one chamber for holding paint to be applied to said wires and adapted for said wires to pass therethrough, a discharge outlet being provided in each said chamber for allowing said paint to be discharged from an upper portion of each chamber; a coating die disposed in said upper portion of each said chamber; paint pool holding means for receiving discharged paint from said aperture of each said chamber, said paint pool holding means being provided externally of, and laterally displaced from said chambers and below said paint dies, and said paint pool being in fluid communication with a lower portion of each said chamber, and wherein the cross-sectional area of each said chamber is sufficiently small such that the temperature gradient of the paint within each chamber is minimized.

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**4,294,190**

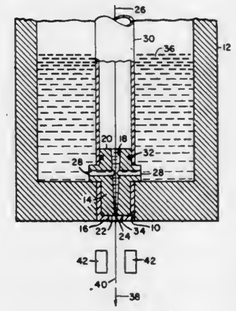
## METHOD OF COATING OPTICAL WAVEGUIDE FILAMENTS AND COATING DIE

**James W. Ohls, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 46,232, Jun. 7, 1979, Pat. No. 4,246,299. This application Mar. 20, 1980, Ser. No. 132,259**

**Int. Cl.³ B05C** *3/12*

**U.S. Cl. 118—620** **11 Claims**



1. An apparatus for coating an optical waveguide filament comprising

a reservoir for containing a quantity of coating material, the bottom thereof defining an aperture,

a die body disposed within said aperture in said reservoir, said die body defining an at least partly tapered central longitudinal aperture extending from the top surface thereof to the bottom surface thereof,

means intermediate said top surface and said bottom surface of said die body communicating between said central longitudinal aperture and the interior of said reservoir for flowing said coating material into said central longitudinal aperture and for maintaining the level of said coating material in said central longitudinal aperture at a point intermediate said top and bottom surfaces of said die body but not above said top surface when said filament is passed through said central longitudinal aperture and said coating material contained therein, and

means extending past said top surface of said die body for shielding said top surface from the interior of said reservoir.

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**4,294,191**

## SPRAY BOOTH

**Ingemar Lööf, Fabriksgatan 6, S-560 10 Skillingaryd, Sweden**

**Filed Dec. 6, 1979, Ser. No. 100,750**

**Claims priority, application Sweden, Dec. 6, 1978, 7812532**

**Int. Cl.³ B05C** *15/00*

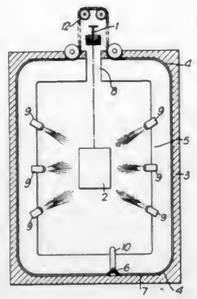
**U.S. Cl. 118—634** **11 Claims**

1. A spray booth comprising:

a housing having an internal surface and at least one opening for introducing an object to be spray-covered by a spray material,

said housing having opposed first and second ends and first and second guide means disposed at such ends,

an inlet device movable within said housing and having an inlet opening facing said internal surface of said housing for receiving spray material which has not adhered to said object, said inlet device including first and second end portions



which are guided by said first and second guide means, and

drive means operably connected to said first and second end portions for moving said inlet device along said internal surface.

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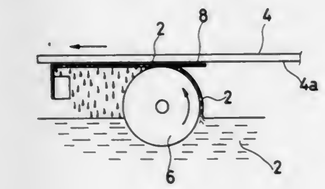
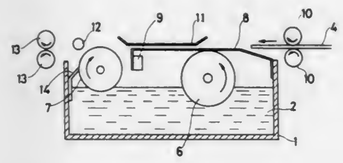
**4,294,192**

## LIQUID ELECTROSTATIC IMAGE DEVELOPING SYSTEM EMPLOYS MESH DEVELOPMENT ELECTRODE

**Syunzi Nakai, Moriguchi, and Motokazu Nakao, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed May 28, 1980, Ser. No. 154,016**
**Claims priority, application Japan, May 30, 1979, 54-67632**
**Int. Cl.³ G03G *15/10***
**U.S. Cl. 118—650** **7 Claims**





1. A liquid development system for developing an electrostatic latent image formed on a copy paper through the use of a developer liquid, said liquid development system comprising in combination:

a mesh shaped development electrode disposed in the traveling path of a copy paper above a developer liquid reservoir;

a liquid developer supplying means for supplying the developer liquid from said reservoir to said mesh shaped development electrode; and

a copy paper feed means for transferring said copy paper above said mesh shaped development electrode in a manner that the front surface of said copy paper, on which said electrostatic latent image is formed, makes contact with or is positioned in close proximity to said mesh shaped development electrode.

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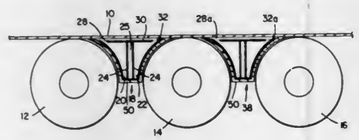
**4,294,193**

## APPARATUS FOR VAPOR COATING A MOVING GLASS SUBSTRATE

**Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138**

**Division of Ser. No. 884,432, Mar. 8, 1978, Pat. No. 4,206,252, which is a continuation-in-part of Ser. No. 784,542, Apr. 4, 1977, Pat. No. 4,187,336. This application Dec. 14, 1979, Ser. No. 103,519**
**Int. Cl.³ B05C *5/02***
**U.S. Cl. 118—718** **6 Claims**



1. In an apparatus for forming a continuous coating of progressively changing composition on heated glass over the length of a processing path through which said glass passes said apparatus comprising, in addition to means to support said glass and means to move it continuously along said processing path,

the improvement wherein there is provided a reaction zone the interior surfaces of which are formed primarily by said moving glass and a heat-transfer-medium moderated, temperature-controlled wall opposed to said glass said zone having, at one end thereof, a part means at a first station to introduce and distribute a gaseous reaction mixture comprising reactants which form reaction products that deposit on said glass at different rates, a gas flow path within said reaction zone wherein said gaseous reaction mixture flows along said glass surface, and said temperature controlled wall to port means at a second station at the opposite end of said zone to remove residual gaseous reaction mixture, wherein

said second station being relatively positioned along said reaction zone with respect to said first station that said heated glass wall of said reaction zone forms means to provide sufficient energy to said gaseous reaction mixture to achieve a substantial difference in composition deposited on said glass between the reaction gas mixture composition, as it passes between said first station and second station and wherein said temperature-controlled wall is maintained at a temperature low enough to avoid deposits of reaction products thereon.

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**4,294,194**

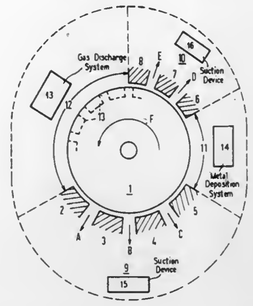
## DEVICE FOR COATING OBJECTS

**Reinhard Behn; Hermann Heywang, both of Munich, and Horst Pachonik, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 31, 1979, Ser. No. 89,857**
**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848480**
**Int. Cl.³ C23C *13/00***
**U.S. Cl. 118—719** **8 Claims**

1. A device for coating carriers with alternating different coatings in a different vacuum, comprising: at least first and second vacuum chambers separated from one another by first and second vacuum air locks; transport means for transporting the carriers to be coated in only one moving direction from the first air lock through the first vacuum chamber to the second air lock and back towards the first air lock through the second vacuum chamber; means for coating the carriers arranged on the transport means in each of the vacuum chambers; each of





the air locks having jaws arranged directly adjacent the transport means and which form a relatively narrow gap therewith; suction means for drawing off residual gas between jaws of each of the air locks; and the first air lock, located in front of the first vacuum chamber in the direction of movement, having a lower residual gas pressure and having longer diffusion paths than the second air lock following the first vacuum chamber in the direction of movement.

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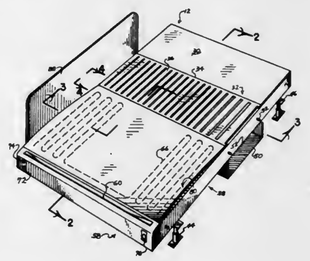
**4,294,195**

## HOG FARROWING MODULE

**Joseph H. Rodenberg, 8290 N. Kenwood, Indianapolis, Ind. 46260, and Richard K. Gilcrest, 5613 Skyridge Dr., Indianapolis, Ind. 46250**

**Continuation of Ser. No. 801,625, May 31, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,507**
**Int. Cl.³ A01K *1/00***
**U.S. Cl. 119—20** **1 Claim**



1. A modular base comprising:

a floor serving as a top for said base;

said floor having an opening toward one end thereof extending completely across the width thereof;

manure passing grate means retained by said base for covering said opening;

trough means connected to said base and disposed under said grate means for receiving waste disposed therethrough;

drinking water drain means attached to said base at the end thereof away from said opening, said drain means being connected to a tube running under said floor, with said tube emptying into said trough means;

heating means embedded in said floor and maintaining a desired floor temperature;

said floor having a crown profile formed therein as viewed in side elevation, with said crown formed between said trough means and said drain means, said crown extending laterally throughout the entire width of said floor; and

a plurality of screw jacks attached to said base for tilting said base at a desired slope of said trough means, and wherein said modular base is moveable as a unit and locateable on any flat surface by means of said screw jacks.

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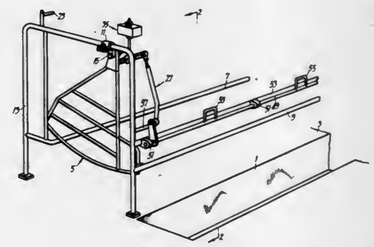
**4,294,196**

## GATE ASSEMBLY

**Owen M. Larsen, Box 68, Mitta Roadside, Tallangatta, Victoria 3700, Australia**

**Filed Feb. 14, 1980, Ser. No. 121,556**
**Claims priority, application Australia, Feb. 15, 1979, PD7702**
**Int. Cl.³ A01K *1/00***
**U.S. Cl. 119—27** **5 Claims**



1. A gate assembly for a milking parlor or like animal enclosure including,

a barrier pivotally mounted about a substantially horizontal elevated axis from a support for movement between an open position in which it allows exit of an animal from the enclosure, and a closed position in which it prevents such exit,

operating means for said barrier and a lever arrangement connecting said operating means to the barrier providing locking means tending to hold the barrier open against the action of gravity.

said locking means providing a past dead centre locking action,

said lever arrangement including an extension arm on said barrier,

an angled arm pivotally attached to the extension arm,

a bell crank arm pivotally connected to the angled arm and to a rotatable shaft attached to said support, and

said operating means connected to said rotatable shaft for rotating the shaft and said crank arm for opening and closing said barrier.

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**4,294,197**

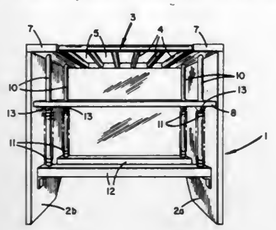
## HAYBOX

**Cornelis Snel, Atlasdreef 53, 3561 Ac Utrecht, and Albert Kuus, Korhoenlaan 41, 3721 Eb Bilthoven, both of Netherlands**

**Filed Jul. 9, 1979, Ser. No. 55,959**
**Int. Cl.³ A01K *5/00***
**U.S. Cl. 119—60** **13 Claims**

1. Haybox for the feeding of horses comprising interconnected walls defining a box, a rack positioned on an upper part of the box, and a movable plate forming a bottom of the box and being movable between lowered and raised positions within said box for supporting hay, guide bars extending within said box parallel to said wall, said movable plate being provided with at least two spaced apart perforations through which said guide bars extend, pressure springs fitted on said guide bars on the underside of the movable plate for exerting

upwards pressure, spherical type means positioned at least in part between said springs and said movable plate for transferring spring force to said movable plate, said spherical type means having a larger diameter than that of the perforations,



the diameter of the guide bars extending through the movable plate being smaller than the diameter of the perforations in the movable plate to allow the latter to carry out a tilting movement with respect to walls of the box.

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**4,294,198**

## HEATING BOILER FOR LIQUID OR GASEOUS FUELS

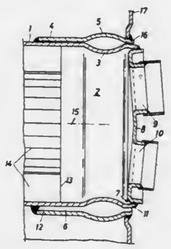
**Hans Viessmann, Im Hain, 3559 Battenberg, Eder, Fed. Rep. of Germany**

**Filed Jan. 31, 1979, Ser. No. 7,886**

**Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804780; Dec. 27, 1978, 2856061**

**Int. Cl.³ F22B *7/00***

**U.S. Cl. 122—136 R** **3 Claims**



1. A heating boiler comprising a water jacket including front and rear walls, fuel flues, tube and sleeve means, said tube means extending through said walls and enclosing said flues and defining a combustion chamber and a collecting chamber, one of said means, in the vicinity of said collecting chamber, encircling the other of said means and defining an annular gap therewith, at least one of said means having a bulge adjacent said gap to increase the size of the gap between said means, and closure means on one of the first said means to obturate said collecting chamber, said rear wall having a thermally conductive connection with said one means which encircles said other means.

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**4,294,199**

## STEAM GENERATING MAGNETOHYDRODYNAMIC DIFFUSER

**Scott L. Darling, Tariffville, and Carl R. Bozzuto, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Oct. 26, 1979, Ser. No. 88,731**

**Int. Cl.³ F22B *21/30***

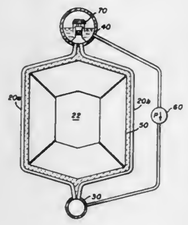
**U.S. Cl. 122—276** **1 Claim**

1. A steam generating diffuser comprising:

a. a horizontally orientated, longitudinally elongated upper collection header;

b. a horizontally orientated, longitudinally elongated lower distribution header positioned beneath said upper header;

c. a plurality of heat exchange tube pairs disposed side by side in vertical planes to form an open-ended divergent duct disposed about a vertical axis, the tubes of each pair extending vertically upward from said lower header, thence diverging by extending outwardly and upwardly at an acute angie with the horizontal to form the floor of said duct, thence extending substantially vertically upward to form the side walls of said duct, thence converging by extending upwardly and inwardly at an acute angle with the horizontal to form the roof of said duct, and thence extending substantially vertically upward to said upper header, each tube thereby providing a continuously upwardly directed fluid flowpath between said lower and said upper headers;



d. a refractory lining laid up around the inner surface of said divergent duct so as to protect the heat exchange tubes forming said divergent duct from hot gases passing therethrough;

e. means for circulating water from said lower header through the heat exchange tubes forming said duct to said upper header whereby a portion of the water is vaporized to steam when passing through said heat exchange tubes; and

f said upper collection header further comprises a water and steam drum having internal means for separating the steam from the water collecting therein.

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**4,294,200**

## VARIABLE PRESSURE VAPOR GENERATOR UTILIZING CROSSOVER CIRCUITRY FOR THE FURNACE BOUNDARY WALL FLUID FLOW TUBES

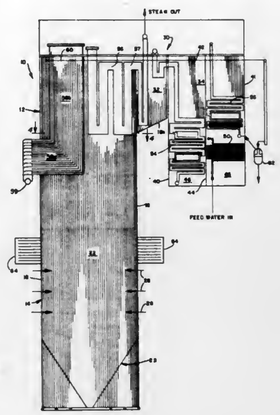
**Walter P. Gorzegno, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.**

**Filed Dec. 6, 1979, Ser. No. 100,770**

**Int. Cl.³ F22B *27/04***

**U.S. Cl. 122—406 S** **6 Claims**

1. A vapor generator comprising an enclosure defined in part by a front wall, a rear wall and two sidewalls, each of said walls comprising a plurality of interconnected tubes; burner means associated with either said front wall, said rear wall or both; each of said sidewalls having a plurality of sections; means for passing fluid initially through the entire length of at least one of said sidewall sections and then through said front wall, said rear wall and the other sidewall sections; and cross-over means associated with said front wall, said rear wall and said other sidewall sections for transferring said fluid from one



area of said front wall, said rear wall and said other sidewall sections to another area thereof.

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**4,294,201**

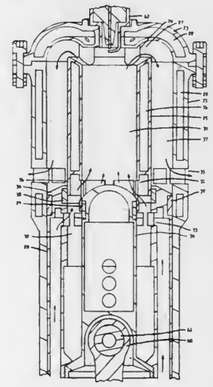
## INTERNAL COMBUSTION ENGINES

**Robert V. Swartz, 2528 Westford Way, Mountain View, Calif. 94040**

**Filed Feb. 5, 1979, Ser. No. 9,490**

**Int. Cl.³ F02B *33/04*; F01L *11/00*; F02B *25/12***

**U.S. Cl. 123—73 R** **3 Claims**



1. An internal combustion engine of the character described comprising in combination a cylinder having adjoined at opposite ends a cylinder-head and a crankcase, a piston reciprocable in said cylinder, a scavenging-pump formed by cooperation of said piston and said crankcase, an annular recess in the head of said piston, the portion of the piston-head surrounded by said recess being referred to as a plunger, a stationary concentric sleeve suspended from said cylinder-head with transverse gas-passage-means interposed between said sleeve and said cylinder-head, a plain working-chamber formed by cooperation of said plunger with the internal cylindrical surface of said sleeve, said sleeve having a sliding fit in said recess, an annular working-chamber formed by cooperation of said piston with said cylinder and the external cylindrical surface of said sleeve, exhaust-porting in said cylinder adapted to be uncovered by said piston completing its power-stroke toward said crankcase, transfer-porting in outer wall of said recess adapted to be uncovered by the outer surface of said sleeve as said piston completes its power-stroke, whereby said recess is placed in communication with said crankcase, transfer-porting in said sleeve adapted to be uncovered by said plunger as said piston completes its power-stroke, whereby said recess communicates with said plain working-chamber, the arrangement being such that when said piston ends its power-stroke a scavenging-path is established from said crankcase into said recess, thence through said plain working-chamber, thence in various radially-outward directions through said transverse gas-passage-means, thence through said annular working-chamber to said exhaust-porting.

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**4,294,202**

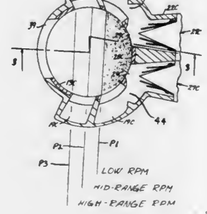
## FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

**Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.**

**Continuation-in-part of Ser. No. 941,596, Sep. 12, 1978, Pat. No. 4,202,298, which is a continuation-in-part of Ser. No. 859,476, Dec. 12, 1977, Pat. No. 4,143,626, and a continuation-in-part of Ser. No. 839,180, Oct. 4, 1977, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, which is a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned. This application Mar. 24, 1980, Ser. No. 133,098**

**Int. Cl.³ F02B *33/04***

**U.S. Cl. 123—73 PP** **7 Claims**




5. A variable speed, two-cycle, internal combustion engine comprising a crankcase and a cylinder having a combustion chamber, a piston working in the cylinder, a fuel chamber below the piston, port means providing communication with said fuel chamber, an intake tract in fluid communication with said port means, reed valve means disposed in the intake tract for controlling the flow of fluid through the intake tract, at least two transfer ports communicating with the combustion chamber above the piston when the piston is in bottom dead center position, transfer passages formed in the cylinder and respectively communicating with the transfer ports and with said fuel chamber for conveying fluid from the fuel chamber to the transfer ports, and fuel flow passage means interconnecting the transfer passages in a region above the piston when the piston is in bottom dead center position.

7. A variable speed, two-cycle crankcase compression, internal combustion engine, comprising: engine housing structure including a cylinder and a crankcase, a piston mounted for reciprocation in the cylinder between top and bottom dead center positions, a fuel intake chamber for receiving fuel from a supply source, reed valve means for controlling the flow of fluid through the intake chamber in a path directed substantially radially toward the bottom dead center position of the piston, and passage means formed in the engine housing struc-

ture and communicating with the intake chamber downstream of the reed valve means, the passage means including porting in the engine housing structure at least a part of which is in the cylinder wall in the bottom dead center position of the piston and provides for substantially direct flow of fuel substantially radially of the cylinder from the reed valve means into the space below the level of the lower edge of the piston at the side presented toward the porting when the piston rises substantially above the bottom dead center position, said porting being dimensioned and positioned axially of the cylinder so that a substantial part thereof extends below the level of the lower edge of the piston at the side presented toward the porting when the piston is in bottom dead center position and so that a substantial part of said porting is open to the crankcase throughout the stroke of the piston, and the passage means further including at least one portion communicating with the fuel intake chamber throughout the piston stroke and having porting through the cylinder wall above the piston in bottom dead center position and being extended through the housing structure and opening into the crankcase below the piston throughout the piston stroke.

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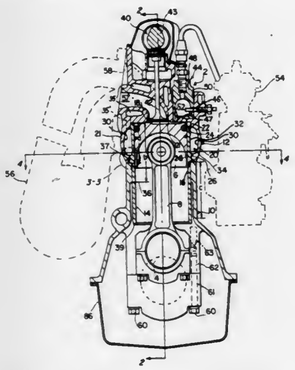
**4,294,203**

## INTERNAL COMBUSTION ENGINE WITH INTEGRAL UPPER CYLINDER SECTION AND HEAD

**Philip E. Jones, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.**

**Filed Sep. 10, 1979, Ser. No. 74,065**
**Int. Cl.³ F02F *7/00, 1/10;* F02B *75/18***
**U.S. Cl. 123—195 R** **21 Claims**



**14**. In an internal combustion engine having a crankshaft, at least one reciprocating piston connected with the crankshaft and a cylinder cavity within which the reciprocating piston moves between upper and lower limits of travel, the combination comprising

(a) an integral head and upper cylinder section assembly containing a recess shaped to form a first portion of the cylinder cavity, said upper assembly being formed of cast iron;

(b) an integral crankcase and lower cylinder section assembly containing the remaining portion of the cylinder cavity, said lower assembly being formed of metallic material distinct from cast iron;

(c) connection means for connecting said upper and lower assemblies along a joinder zone;

(d) liner means disposed within said cylinder cavity portions for guiding the reciprocating movement of the piston within the cylinder cavity, said liner means including an exterior surface spaced from the interior surface of said upper assembly recess to form a coolant cavity shaped to bring coolant into direct contact with no more than 40 percent of the total axial length of said liner means;

(e) combustion gas seal means for sealing the upper end portion of said liner means to form a combustion chamber; and

(f) coolant seal means disposed adjacent said joinder zone for forming a coolant cavity seal between said liner means and at least one of said upper and lower cylinder section assemblies to cause coolant to contact directly said liner means substantially only along the portion of the liner received within said upper cylinder section assembly.

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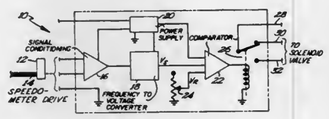
**4,294,204**

## VEHICLE SPEED LIMITING DEVICE

**Erwin E. Hurner, 2605 S. Rivershore Dr., Moorhead, Minn. 56560**

**Filed Jun. 18, 1979, Ser. No. 49,307**
**Int. Cl.³ F02B *77/00***
**U.S. Cl. 123—198 DB** **5 Claims**




**1**. A Vehicle Speed Limiting Device for use with diesel vehicles having fuel injection systems, said speed limiting device comprising:

means for measuring the speed of said vehicle;

means for comparing the output of said vehicle speed measuring means to a predetermined speed; and

means responsive to said comparing means for interrupting of fuel flow through said injection system when said vehicle speed exceeds said predetermined speed, said interrupting means comprising a valve having an inlet and selectable first and second outlets, said injection system having a fuel pump and injector nozzles, said fuel pump having an inlet and an outlet, said valve inlet being connected to said pump outlet, said valve first outlet being connected to said injector nozzles and said valve second outlet being connected to said pump inlet and said injector nozzles, said second outlet directing a minimal amount of fuel to said nozzles and a great majority of the fuel to said pump inlet, said minimal amount having a pressure of at least 18 p.s.i.

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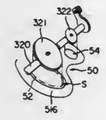
**4,294,205**

## INTERNAL COMBUSTION ENGINE

**Masahiko Iiyama, Tokyo; Tsugio Sanka, Wako, and Kenji Naito, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 48,468, Jun. 14, 1979, abandoned. This application Nov. 20, 1980, Ser. No. 208,841**
**Claims priority, application Japan, Jun. 15, 1978, 53-72421; Jun. 15, 1978, 53-72422; Jun. 15, 1978, 53-72424**
**Int. Cl.³ F02B *19/10***
**U.S. Cl. 123—274** **7 Claims**



**1**. In a multi-cylinder internal combustion engine having, for each cylinder provided with a reciprocal piston therein, a main combustion chamber defined above the piston and a sub-combustion chamber defined above said main combustion chamber and communicating with the latter through a torch nozzle, a carburetor having a main intake passage and a sub-intake passage for supplying a comparatively lean mixture and a comparatively rich mixture to said main and sub-combustion chambers, respectively, said carburetor comprising a single throttle valve shaft extending across said main and sub-intake passages, a main throttle valve and a sub-throttle valve disposed in said main and sub-intake passages, respectively, said main and sub-throttle valves being attached to said single throttle valve shaft, one of said main and sub-throttle valves having an outside diameter smaller than the inside diameter of the associated intake passage so that the ratio of the open areas of said main and sub-intake passages is not constant as said throttle valve shaft is operated.



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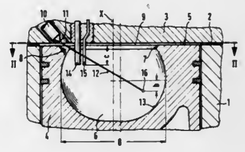
**4,294,206**

## COMBUSTION METHOD AND DEVICE FOR PRACTICING SAME

**Alfred Urlaub, and Franz Chmela, both of Nuremberg, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 779,754, Mar. 21, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,761**
**Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611624**
**Int. Cl.³ F02B *19/08, 19/16***
**U.S. Cl. 123—276** **8 Claims**



**1**. An air compressing internal combustion engine having ignition means which includes in combination: a cylinder, a cylinder head sealingly connected to said cylinder, a piston reciprocably arranged in said cylinder and provided with a combustion chamber open toward said cylinder head with the inner contour of said combustion chamber being that of a body of revolution, injection nozzle means arranged in said cylinder head and having a nozzle opening directed toward said combustion chamber so that the major portion of the fuel jet injected by said injection nozzle hits the wall of said combustion chamber, and ignition means so arranged in the region of said injection nozzle that at the top dead center position of said piston said ignition means extend into said combustion chamber near said injection nozzle opening both between the pass of the fuel jet ignited already when injected through said nozzle into said combustion chamber on one hand and then said combustion chamber wall on the other hand, the area of impingement of the fuel jet on the combustion chamber wall being located in the lower section of said combustion chamber, the combustion chamber being formed as a spherical combusion chamber having a flattened bottom and a constricted throat.

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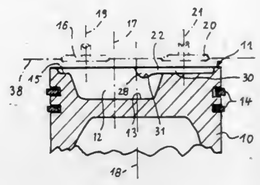
**4,294,207**

## EXTERNALLY IGNITED, FOUR-CYCLE, PISTON-TYPE INTERNAL COMBUSTION ENGINE

**Michael G. May, Bel Air, Ch-1180 Rolle, Switzerland**

**Filed Apr. 25, 1980, Ser. No. 143,586**
**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934644**
**Int. Cl.³ F02B *3/00, 23/00***
**U.S. Cl. 123—279** **34 Claims**



**1**. An externally ignited, four-cycle internal combustion engine comprising a gas supply channel having an inlet valve, at least one cylinder having a head, a piston in said cylinder having a top defining with said cylinder a combustion chamber, overhead gas exchange valves having plates provided with end faces, said piston top being provided with a depression having a guide groove provided with a mouth communicating therewith, vortex producing means including a circumferential wall with said mouth in which a vortex flow of gas and air mixture to be combusted is generated rotating in a path approximately parallel to said piston top, the volume of said combustion chamber available in the top dead center position of said piston is primarily embodied by said depression in said piston top, the central longitudinal axis of said depression being provided at a distance from the longitudinal axis of said piston approximately parallel to it, the central longitudinally axis of said depression being disposed at a location between the vicinity of a connecting line of the centers of the end faces on the combustion chamber side of said valve plates within a distance from this connecting line of less than 10% of the diameter of said piston and said longitudinal axis of said depression being at a smaller or no distance from the center of one valve front face than from the center of the other valve front face, one valve front face being located at least substantially above and respectively opposite said depressions, an indentation being provided in said piston top opposite said other valve plate, said indentation having at least the diameter of said valve plate and into which the valve plate protrudes in the top dead center position of said piston, and said indentation in the top of the piston and in the cylinder head including said other valve plate being extended toward a broad and flat guide groove leading approximately tangentially into said depression of said piston, so that the vortex flow rotating in a path approximately parallel to said piston top about the central longitudinal axis of said depression is be effected by means of the gas and air mixture flowing out of said guide groove into said depression toward the end of the compression stroke, and that the average depth of said guide groove at its discharge point is substantially smaller than the depth of said depression.

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**4,294,208**

## ATOMIZING SHOCK WAVE PRECOMBUSTOR

**William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

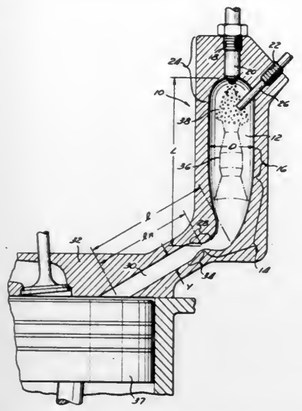
**Filed Mar. 31, 1980, Ser. No. 135,389**
**Int. Cl.³ F02B *19/14***
**U.S. Cl. 123—285** **14 Claims**

**1**. A precombustor for use in diesel engines, comprising:

a precombustion chamber;

a fuel spray nozzle port through which a fuel spray nozzle may be incorporated into said precombustion chamber;

a port for an ignition means adjacent to said spray nozzle port; and



a supersonic DeLaval nozzle integrally incorporated into said precombustion chamber opposite said spray nozzle, for enhancing the injection of air into said precombustion chamber.

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**4,294,209**

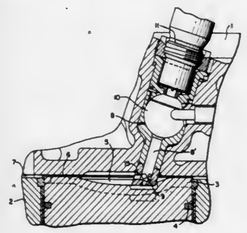
**INTERNAL COMBUSTION ENGINE**

**Erwin Eisele, Stuttgart; Hans-Peter Charzinski, Waiblingen, and Klaus Binder, Deizisau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 901,772, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 715,540, Aug. 18, 1976, abandoned. This application Apr. 16, 1979, Ser. No. 30,545**

**Int. Cl.³ F02B** *3/00*

**U.S. Cl. 123—293** **10 Claims**



1. An internal combustion engine comprising a plurality of pistons disposed in cylinders, a cylinder head, a main combustion space means, recess means provided in the respective pistons for forming at least a part of the main combustion space means, an auxiliary chamber means eccentrically provided in the cylinder head, and an injection nozzle means operatively associated with the auxiliary chamber means, several discharge openings provided in said auxiliary chamber means for discharging into the main combustion space means, the direction and cross section of the discharge openings being matched to a main combustion space-air volume component of a main combustion space-air volume to be impinged upon by a jet passing through the respective discharge openings, characterized in that the discharge openings have a cross section which is substantially proportional to the main combustion space-air volume component of the main combustion space-air volume disposed in front of and impinged upon by a jet passing through the respective discharge openings when the piston is at a position having a crankshaft angle corresponding to a center point of an area under a full-load heat-release curve for the combustion process, and in that the discharge openings are substantially directed toward a center of gravity of the respective main combustion space-air volume component of the main combustion space-air volume.

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**4,294,210**

**DISTRIBUTOR-TYPE INJECTOR PUMP, FOR MULTI-CYLINDER COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINES**

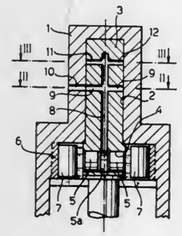
**Cesare Bassoli; Giorgio Cornetti, and Francesco Lovisolo, all of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy**

**Filed Feb. 6, 1979, Ser. No. 9,619**

**Claims priority, application Italy, Feb. 15, 1978, 67315 A/78**

**Int. Cl.³ F02M** *45/02*

**U.S. Cl. 123—300** **1 Claim**



1. A fuel injection pump for a multi-cylinder compression-ignition internal combustion engine of the direct-injection type, said pump comprising:

a pump body having an internal cylindrical cavity and a compression chamber,

means for the introduction of fuel in the said compression chamber,

piston means slidable within the body for compressing fuel in the said compression chamber,

means defining a number of delivery apertures in the wall of the cylindrical cavity of the body for communication with each of the cylinders of the engine,

a rotary distributor member located in the said cylindrical cavity, said distributor member being rotatable by drive transmitted from the engine in use of the pump to effect one complete revolution in said cavity in each cycle of the engine,

two distinct fuel passage means, formed in said rotary distributor member and each having an inlet end permanently communicating with the compression chamber and an outlet end in the external surface of the distributor member, the outlet ends of the said passage means being situated in two areas angularly separated from each other such that they come intermittently into communication, upon rotation of the distributor member, with successive said apertures to effect, in correspondence with each fuel delivery stroke of the said piston means, two injections of fuel into two different cylinders of the engine, so that the pump delivers to each cylinder of the engine in each cycle thereof a principal injection of fuel substantially at the end of the compression stroke in said cylinder, preceded by a pre-injection of fuel,

means sensitive to the engine rotational speed for advancing the start of the delivery stroke of the piston means upon increase in the engine rotational speed, wherein the angle between the outlet ends of the said two fuel passage means is such that when the engine rotational speed is lower than a threshold value substantially equal to half the maximum speed of rotation of the engine, only one of said two fuel passage means communicates with one of said delivery apertures during each fuel delivery stroke of said piston means, whereby only the principal injection is delivered to each cylinder of the engine in each cycle thereof when the rotational speed of the engine is lower than said threshold value.



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**4,294,211**

**METHOD AND APPARATUS FOR CORRECTING THE FUEL QUANTITY IN AN INTERNAL COMBUSTION ENGINE**

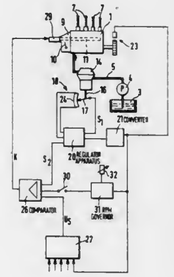
**Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 22, 1979, Ser. No. 14,197**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807924**

**Int. Cl.³ F02M** *59/20*

**U.S. Cl. 123—379** **22 Claims**



1. A method for the correction of a fuel quantity apportioned to an internal combustion engine in accordance with the deviation of the same from a desired value having a fuel injection apparatus which has a control device having an apparatus for the arbitrary and/or regulatable adjustment of the fuel injection quantity per injection step characterized by the steps of measuring the fuel quantity delivered per unit of time to the fuel injection apparatus as a first control value, converting said first control value with consideration of the rpm into a second control value in accordance with the quantity of fuel injected per injection step, comparing said second control value with a desired value which is variable in accordance with at least one operational parameter, and generating a correction value in accordance with the deviation of said second control value from the desired value for the purpose of adjusting the control device of the injection apparatus.

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**4,294,212**

**AIR-FUEL RATIO CONTROL METHOD AND APPARATUS OF AN INTERNAL COMBUSTION ENGINE**

**Kenji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Apr. 11, 1978, Ser. No. 895,524**

**Claims priority, application Japan, Sep. 12, 1977, 52-108889**

**Int. Cl.³ F01N** *3/15*

**U.S. Cl. 123—440** **9 Claims**

1. An air-fuel ratio control method for adjusting the amount of fuel permitted to flow into an internal combustion engine in accordance with engine condition signals comprising the steps of:

detecting engine operating conditions;

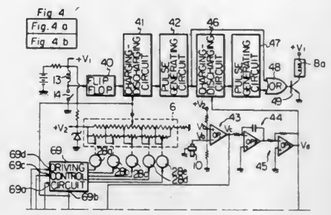
generating said engine condition signals from said detected engine operating conditions, said engine condition signals being related to said detected engine operating conditions in accordance with predetermined functional relationships;

adjusting the amount of fuel permitted to flow into said engine in accordance with said engine condition signals;

sensing the concentration of a predetermined exhaust gas component in the exhaust gas of said engine and generating a detected component concentration signal;

producing an air-fuel ratio correction signal by integrating said detected component concentration signal with respect to time;

compensating the adjusted amount of fuel permitted to flow into said engine by said engine condition signals in accordance with said air-fuel correction signal;



generating a signal corresponding to a mean value of said air-fuel ratio correction signal;

adjusting at least one of said functional relationships in accordance with said generated mean value signal; and,

repeating the above sequence of steps so that the said means value signal continuously approaches a predetermined value equivalent to the value of the air-fuel ratio correction signal when the compensated amount of fuel supplied in accordance with the air-fuel ratio correction signal becomes zero.

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**4,294,213**

**FUEL SUPPLYING DEVICE FOR USE IN FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE**

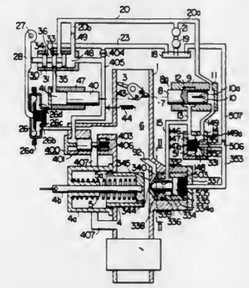
**Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi, all of Toyota; Junzo Uozumi, Nagoya; Tsuneo Ando, Chiryu; Yuzo Takeuchi, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Aisan Industry Co., Ltd., Ohbu and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Jul. 10, 1979, Ser. No. 56,310**

**Claims priority, application Japan, Nov. 30, 1978, 53-147148**

**Int. Cl.³ F02M** *39/00*

**U.S. Cl. 123—454** **8 Claims**



1. In a fuel supplying device for a fuel injection type internal combustion engine, comprising:

(a) an air horn,

(b) a throttle valve disposed in said air horn,

(c) an air valve disposed in said air horn upstream of said throttle valve,

(d) a fuel metering device operatively connected to said air valve,
(e) fuel supplying means adapted to supply fuel at a predetermined fuel pressure to said fuel metering device,
(f) a fuel tank,
(g) an injector arranged to discharge the fuel metered by said fuel metering device into said air horn in the vicinity of said throttle valve, and
(h) a constant differential pressure valve arranged to maintain a predetermined differential pressure across said fuel metering device, and including a diaphragm type valve arranged to sense and amplify differential pressure across said fuel metering device, and a variable orifice type flow control device provided in said injector and arranged to operate in response to the differential pressure sensed and amplified by said diaphragm type valve,

the improvement wherein said diaphragm type valve comprises a first chamber into which the metered fuel downstream of said fuel metering device is introduced, a second chamber into which the supplied fuel upstream of said fuel metering device is introduced, a diaphragm by which said first and second chambers are separated from each other, a first spring disposed in said first chamber and arranged to bias said diaphragm toward said second chamber, and a nozzle disposed in said second chamber and provided at its end confronting said diaphragm with an introduction port and at its other end with a fuel relief port through which fuel returns to said fuel tank through a fixed orifice, while said variable orifice type flow control device comprises a metered fuel chamber into which the metered fuel is introduced, a pilot chamber into which the relieved fuel through said relief port upstream of said fixed orifice is introduced, a movable piston by which said chambers are separated from each other, a piston rod unitary with said movable piston, a second spring disposed in said metered fuel chamber and arranged to bias said movable piston toward said pilot chamber, a third spring disposed in said pilot chamber and arranged to bias said movable piston toward said metered fuel chamber, and a variable orifice actuated by said piston rod.

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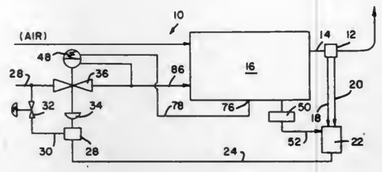
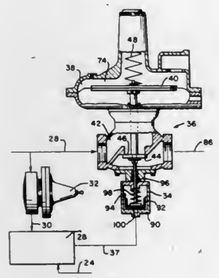
**4,294,214**
**ENGINE COMBUSTION CONTROL SYSTEM**
**Edwin S. Treible, Ringoes; Joseph A. Dopkin, Hopewell, both of N.J., and Raymond N. Alford, Coopers Plains, N.Y., assignors to Ingersoll-Rand Co., Princeton, N.J.**
**Division of Ser. No. 96,426, Nov. 21, 1979, Pat. No. 4,263,883. This application Oct. 20, 1980, Ser. No. 198,531**
**Int. Cl.³ F02B** *75/10, 3/02;* **F02D** *1/00;* **F16K** *17/34*
**U.S. Cl. 123—458** **7 Claims**

1. An improved combustion control system for an engine having an exhaust conduit and fuel and air inlet lines, comprising temperature and oxygen sensor means, for interpositioning in the engine exhaust conduit, for: (a) admitting engine exhaust gases thereinto, and (b) for emitting electrical signals representative of or analogous to both engine exhaust temperatures and engine exhaust oxygen content; signal comparator/controller means, coupled to said sensor means, for emitting discrete, unitary electrical signals derivative of said temperature and oxygen-content signals; and fuel-regulating means, for interpositioning in said fuel inlet line, coupled to said comparator/controller means and responsive to said discrete, unitary signals for regulating fuel conduct through said fuel inlet line; wherein the improvement comprises:




transducer means comprised by said fuel regulating means for transforming said unitary, electrical signals into analogous fluid pressures.

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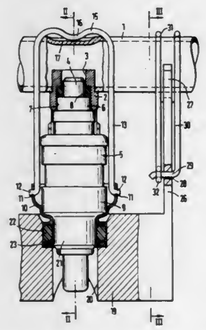
**4,294,215**
**FUEL INJECTION SYSTEM**
**Waldmar Hans, Bamberg; Rudolf Sauer, Renningen; Otto Glöckler, Benningen; Ulrich Steinbrenner, Stuttgart; Dieter Günther, Murr, and Manfred Lembke, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**
**Filed Jul. 31, 1979, Ser. No. 62,598**
**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908095**
**Int. Cl.³ F02M** *55/02;* **B05B** *1/14*
**U.S. Cl. 123—470** **10 Claims**



1. A fuel injection system for internal combustion engines including a common fuel distributor line in which:
said common distributor line includes a plurality of apertures therein;
a plurality of sockets one each inserted in each of said apertures in said distributor line;



a plurality of injection valves each including a body portion, an input end and an output end;
said inlet end of each valve inserted into one each of said sockets;
means between said injection input end of each of said valves and said sockets for sealing against leakage of fuel;
said output end of each of said injection valves forming a nozzle element which can be sealably inserted into an appropriate opening correlated with an opening in an intake pipe of an internal combustion engine;
separate support means, each separate support means supported by said body of one each of said injection valves;
a support bracket member supported by each of said support means including a portion extending from said support means to said fuel distributor line, and
each of said bracket portions extending to said distributor line includes grasping means for grasping said distributor line;
whereby each of said injection valves are secured to said fuel distributor line in a tight leak-free condition.

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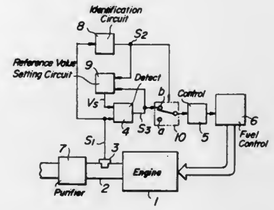
**4,294,216**
**AIR FUEL RATIO CONTROLLING DEVICE**
**Toshimi Abo, and Akio Hosaka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**
**Filed Dec. 7, 1979, Ser. No. 101,551**
**Claims priority, application Japan, Dec. 8, 1978, 53-151011**
**Int. Cl.³ F02B** *3/08;* **F02M** *7/12*
**U.S. Cl. 123—489** **3 Claims**




1. An air fuel ratio controlling device comprising an exhaust gas sensor for detecting composition and concentration of exhaust gas of an engine, and a means for delivering a deviation signal based on a deviation between an output of said exhaust gas sensor and a reference value, the air fuel ratio of mixed gas to be supplied to the engine is feedback controlled by a control signal based on said deviation signal and the reference value is varied to match with condition of the output of the exhaust gas sensor, an improvement lies in that the device comprising a means for switching outer supply current to the exhaust gas sensor when an output voltage of the exhaust gas sensor during supply of a current of a first predetermined value becomes less than a certain predetermined value to a second predetermined value smaller than said first predetermined value and for starting feedback control from such time, and a means for previously setting an intermediate value lying between an expected value $V''_x$ of the output voltage of the exhaust gas sensor when the mixed gas is too rich and an expected value $V''_y$ of the same is too lean at a time of switching from said first predetermined value to said second predetermined value under the situation of too rich or too lean mixed gas and applying said intermediate value as an initial value of said reference value.

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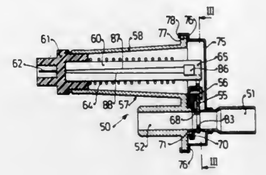
**4,294,217**
**ELECTRICALLY CONTROLLED FUEL INJECTION APPARATUS**
**Otto Glöckler, Renningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**
**Continuation of Ser. No. 966,232, Dec. 4, 1978, abandoned. This application Sep. 21, 1980, Ser. No. 196,501**
**Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803266**
**Int. Cl.³ F02M** *23/10*
**U.S. Cl. 123—491** **9 Claims**




1. An electrically controlled fuel injection apparatus for internal combustion engines comprising at least one electromagnetic injection valve which is controlled by an electronic control apparatus, a throttle valve in an intake manifold, one supplementary air valve disposed laterally within a housing and arranged to supply supplemental air so that the supplemental air bypasses said throttle valve in the intake manifold, said supplementary air valve having a movable valve member actuatable against a return force, an actuating means operating in dependence on temperature for actuating said movable valve member, an electrical heating device attached to at least a portion of said actuating means operating in dependence on temperature and capable of being switched ON in the presence of ignition impulses, a temperature-sensitive element secured on said actuating means within the supplementary air valve housing responsive to prevailing temperature within said supplementary air valve housing and the temperature of said actuating means and connected electrically with the electronic control apparatus to influence the fuel injection quantity.

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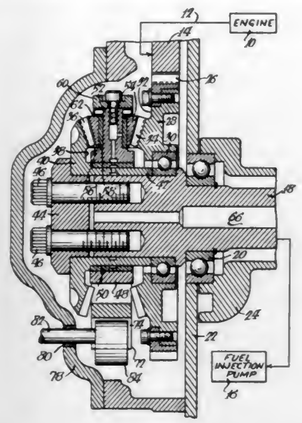
**4,294,218**
**DIFFERENTIAL TIMING ALTERING MECHANISM FOR FUEL INJECTORS**
**Dennis M. King, Peoria Heights, and Ronald D. Richardson, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**
**Filed Oct. 26, 1978, Ser. No. 955,082**
**Int. Cl.³ F02M** *59/20*
**U.S. Cl. 123—502** **2 Claims**

1. A power plant comprising:
an internal combustion engine having a rotary output;
a fuel injection pump having a rotary input adapted to be driven by said rotary output in timed relation thereto;
means interconnecting said input and output comprising first and second bevel gears mounted, in spaced relation, for rotation about a common axis, the facing sides of said bevel gears having facing teeth in aligned relationship, one of said bevel gears being connected to said input and the other of said bevel gears being connected to said output, at least one pinion gear disposed in the space between said bevel gears and having teeth in engagement with the teeth of both said bevel gears, a carrier disposed between said bevel gears and mounted for rotation about said common axis, said carrier further journalling said pinion gear for rotation about an axis between said bevel gears and extending generally radially of said common axis, and selectively operable means connected to said carrier for bidirectionally moving the same to shift said third gear to selectively alter the phasing between said engine and said fuel pump; and

said selectively operable means including a shaft mounted for rotation about a fixed axis spaced from, but generally parallel to said common axis, an eccentric mounted on said




shaft, a pair of spaced surfaces on said carrier partially surrounding said eccentric, and a motor affixed to said shaft to rotate the same.

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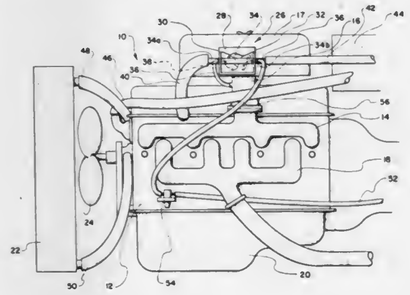
**4,294,219**
**FUEL HEATING SYSTEM FOR AN ENGINE**
**Bryant T. Rowe, P.O. Box 605, Louisburg, N.C. 27549**
**Filed Aug. 27, 1979, Ser. No. 70,017**
**Int. Cl.³ F02M *31/00***
**U.S. Cl. 123—557** **1 Claim**



1. A device and system for improving the performance and fuel economy of an engine of the type having a radiator cooling system and a fuel pump for directing fuel to the carburetor, said device and system comprising: a generally elongated fuel chamber having a longitudinal axis and a pair of end walls and a connecting surrounding wall structure extending between said end walls that define a closed fuel chamber therein; fuel inlet port means formed off center in one end wall of said fuel chamber and communicatively connected to receive fuel being pumped by said fuel pump; fuel outlet port means formed off center in said other end wall of said fuel chamber and communicatively connected to a line leading to said carburetor for delivering fuel thereto and wherein said fuel inlet and outlet port means are disposed on opposite sides of said longitudinal axis of said fuel chamber; a heating line operatively connected to said radiator cooling system and extending generally centrally through said fuel chamber for heating fuel contained therein, said heating line including inlet and outlet ends formed generally centrally within opposite end walls of said fuel chamber in general parallel alignment with said fuel inlet and outlet means; said fuel inlet port means being formed in the same end wall of said fuel chamber as said outlet end of said heating line while said fuel outlet port means is formed in the opposite end wall of said fuel chamber generally adjacent said inlet end of said heating line; said inlet end of said heating line being operatively connected within said radiator cooling system to a hot water line leaving said engine such that fuel entering said fuel chamber enters the side thereof where hot water enters; and means for varying the resulting heated liquid-vapor state of fuel passing through said chamber and wherein said means for varying the resulting state of the fuel is provided for by the relative disposition of said heating line and said fuel inlet and outlet port means formed about the end walls of said fuel chamber in that by rotating said fuel chamber about said longitudinal axis of said fuel chamber and the axis of said heating line, said fuel outlet port means may be elevated with respect to said fuel inlet means and accordingly the liquid-vapor state of the existing fuel may be varied and adjusted accordingly.

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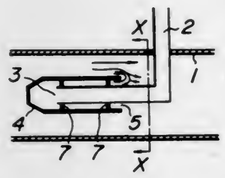
**4,294,220**
**INTAKE PORT MEANS FOR EXTRACTING ENGINE EXHAUST GAS FOR RECIRCULATION**
**Seishi Yasuhara, Yokosuka, and Eiichi Ohnishi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**
**Filed Jan. 14, 1980, Ser. No. 111,555**
**Claims priority, application Japan, Jan. 17, 1979, 54/4411[U]**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—568** **10 Claims**




1. An intake port means for extracting engine exhaust gas for recirculation in an internal combustion engine having an exhaust gas recirculation (EGR) system, comprising an intake port means formed of an EGR pipe and having an extracting aperture placed in a stream of the engine exhaust gas, and a cover having a closed end lying on the upstream side of said aperture while having an open end facing the downstream side of said aperture in such a manner that the engine exhaust gas is extracted through trailing portion of the open end of the cover.

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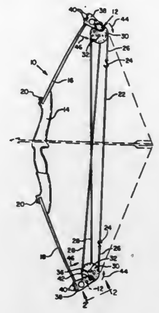
**4,294,221**
**DEVICE FOR RETAINING A COMPOUND BOW IN A PARTIALLY DRAWN CONDITION**
**LeRoy J. Bryant, 2704 SE. 170th Ave., Portland, Oreg. 97236**
**Filed May 3, 1979, Ser. No. 15,062**
**Int. Cl.³ F41B *5/00***
**U.S. Cl. 124—23 R** **11 Claims**

1. In a compound bow having a pair of flexible limbs and a pair of eccentric wheels, one of said pair of eccentric wheels being associated with each of said limbs, and the axes of rotation of the eccentric wheels being parallel to one another and extending transversely of the direction of flexure of said limbs, a pair of cables, each of said cables having an end and being wrapped around one of said eccentric wheels, attachment means connecting said end of each said cable to a respective end of a bowstring, and means for preventing slippage of each cable relative to the respective eccentric wheel around which it is wrapped, the improvement comprising:



(a) unidirectional motion-limiting and retention means interconnected with one of said eccentric wheels for allowing said one of said eccentric wheels to rotate substantially only in a first direction until it has rotated a predetermined angular distance in said first direction; and



(b) release means for deactivating said retention means and allowing free rotation of said one of said eccentric wheels after it has rotated through said predetermined angular distance in said first direction.

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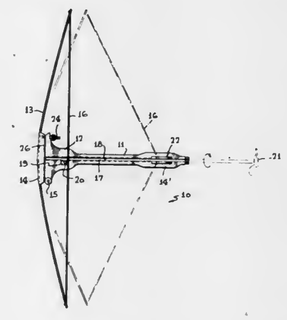
**4,294,222**
**PISTON TYPE CROSSBOW**
**Henry F. Pelsue, 8421 Foothill Blvd., Sunland, Calif. 91040**
**Filed Dec. 31, 1979, Ser. No. 108,636**
**Int. Cl.³ F41B *5/00***
**U.S. Cl. 124—25** **8 Claims**



1. A crossbow comprising:
an elongated stock having a pistol grip integrally formed on one end thereof;
a flexible bow carried on the opposite end of said stock from its end having said pistol grip;
hinge means interconnecting said bow at its mid-section to said stock so that said bow has a storage position lying parallel to the longitudinal axis of said stock and an operable position lying laterally across the longitudinal axis of said stock;
latch means releasably connecting said bow to said stock adapted to secure said bow to said stock in said operable position;
said bow having a string extending between the opposite ends of said bow;
a cocking mechanism carried on said stock operable to draw said string into a taut condition;
a trigger means operably carried on said stock for releasing said bow string;
said cocking mechanism includes a rotatable rod with respect to said stock having a catch selectively engagable with said bow string for drawing said bow string taut;
said cocking mechanism further includes said stock having a longitudinal slot rotatably carrying said rod;
a finger grip carried on the rear end of said rod with said catch carried on the opposite end thereof; and
a recess formed in said stock coextensive with said slot adapted to receive said catch when said rod is rotated so as to not interfere with said bow string during release of said bow string by said trigger mechanism.

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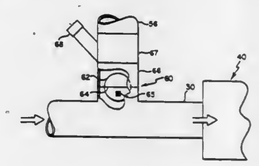
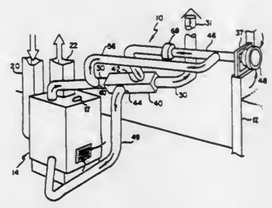
**4,294,223**
**BI-LOOP HEAT RECOVERY SYSTEM FOR AN OIL FIRED FURNACE**
**Albert Montague, 1689 Blue Jay Lane, Cherry Hill, N.J. 08003**
**Continuation-in-part of Ser. No. 7,412, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 838,749, Oct. 3, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,086**
**Int. Cl.³ F24H *3/00*; F23L *3/00*; F24B *7/00***
**U.S. Cl. 126—112** **5 Claims**





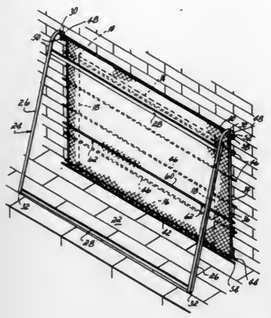
1. In a furnace located in an enclosure, the furnace having a burner, a blower coupled to the burner, an exhaust duct to convey products of combustion from the furnace to a stack, said exhaust duct having a barometric draft regulator, an improved system comprising:
(a) heat exchange means which can be quickly and easily coupled to the exhaust duct to provide a first zone to carry the products of combustion, and a second zone in heat flow communication with the first zone to carry a stream of air;
(b) first conduit means which can be quickly and easily coupled to provide gas flow communication between a point outside the enclosure and the second zone of said heat exchange means;
(c) second conduit means which can be quickly and easily coupled to provide gas flow communication between said point outside the enclosure and the barometric draft regulator; and
(d) third conduit means which can be quickly and easily coupled to provide gas flow communication between the second zone of said heat exchange means and the blower whereby air for combustion in the burner is supplied from said point outside the enclosure, and air is supplied to the barometric draft regulator from the same point outside the enclosure.

**4,294,224**

## FIREPLACE SCREEN AND SHIELD ASSEMBLY

**Walter C. Luther, Sr., Rte. 8, Box 267, Lake City, Fla. 32055**

**Filed Sep. 4, 1979, Ser. No. 72,123**
**Int. Cl.³ F23L *5/02***
**U.S. Cl. 126—135** **5 Claims**



1. A fire screen and shield apparatus for use with a fireplace including a hearth, a generally vertical wall having an opening having a top, a bottom, and connecting side edges, said apparatus comprising in combination:

a generally rectangular frame including a pair of side members and top and bottom cross members interconnecting said side members defining an opening at least as large as said fireplace opening, said frame being adapted to lean against said vertical wall with the base of said side members resting on said hearth at a position removed from said wall and the upper ends of said side members resting against said wall at a position at or above said top of said opening,

a curtain formed of a fireproof fabric of a height and width at least as great as said opening for completely shielding said fireplace opening, said curtain including a transverse rod at the upper end thereof, a transverse rod at the lower end thereof, and a plurality of stiffening rods extending transversely of the curtain at spaced intervals therebetween, the opposite ends of said rods projecting laterally beyond the vertical side edges of said curtain,

a metal screen of a height and width at least as great as said fireplace opening for preventing sparks from being projected from said fireplace beyond said screen, said screen including a transverse support rod at the upper end thereof,

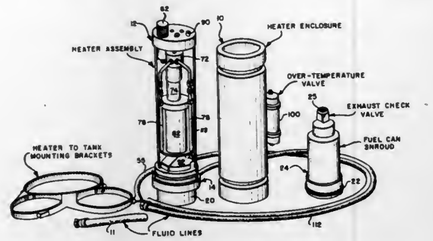
said frame including support means at the upper ends of said side members, said support means being adapted to receive the projecting ends of the top rod of said curtain to mount and support said curtain and to receive the projecting ends of said stiffening rods and said bottom rod such that said rods may be selectively disposed therein for selectively positioning the bottom rod and thereby the lower end of said curtain between a closed position wherein the bottom rod rests on the hearth, an open positon wherein the bottom rod and stiffening rods are received in said support means, and a draft position wherein said bottom rod is raised off said hearth for permitting draft along the fireplace floor and for preventing smoke from entering the room through the fireplace opening, and to receive said screen support rod to mount and support said screen at least when said curtain is in its open position.

**4,294,225**

## DIVER HEATER SYSTEM

**Kenneth E. Mayo, Nashua, N.H., assignor to Energy Systems Corporation, Nashua, N.H.**

**Filed May 22, 1979, Ser. No. 41,537**
**Int. Cl.³ A61F *7/06***
**U.S. Cl. 126—204** **6 Claims**



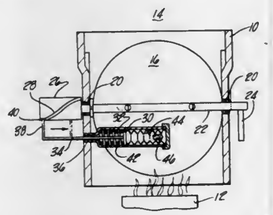

1. A heater for warming the body of a diver while under water comprising a housing, having a fluid inlet, a combustion chamber, means for supplying air and means for supplying fuel to said chamber of combustion therein, and means for exhausting the products of combustion, a fluid heat exchanger arranged in association with said combustion chamber, a pump for circulating fluid through said heat exchanger to be heated, electric motor means for operating said pump, and thermoelectric means mounted in association with said combustion chamber for converting a portion of said heat to electrical energy and means for passing said electrical energy to said motor to operate said pump, said pump having means for passing the heated fluid to the diver said means for supplying said fuel comprises a fuel storage canister removably securable to said housing in combination with the exhaust means from said combustion chamber to cause said fuel storage canister to be heated by said exhaust.

**4,294,226**

## AUTOMATIC FURNACE VENT DAMPER CONTROL

**Emanuel Feinberg, 24316 Martha Washington, Southfield, Mich. 48075**

**Filed Jan. 21, 1980, Ser. No. 113,992**
**Int. Cl.³ F23L *3/00***
**U.S. Cl. 126—286** **9 Claims**



1. A temperature responsive damper system for use with a burner having a vent for combustion gases, comprising: a rotatable damper shaft supported in the vent to extend transversely across the vent; a planar damper fixed to the shaft so as to extend in a closed position transversely to the vent and block passage of air through the vent when the shaft is in a first rotational position and to extend in an open position parallel to the longitudinal axis of the vent to allow gas passage through the vent when the shaft is in a second rotational position; a fluid reservoir supported in the vent between the damper and the burner so that the reservoir experiences a temperature which depends upon the state of operation of the burner; a fluid contained in the reservoir having a liquid state when the reservoir temperature is that obtained when the burner is not in operation and a gaseous state when the reservoir temperature is that obtained when the burner is in operation; a linear actuator supported for movement between a first position and a second position; a cam mechanism fixed to the damper shaft and connected to the linear actuator so that the damper is in an open position when said actuator is in a first position and the damper is in a closed position when the actuator is in the second position; and means for moving the actuator from its first position to the second position upon transition of the fluid within the reservoir from a liquid to a gas as a result of an increase in temperature in the reservoir resulting from the burner going into operation, and from its second position to its first position upon transition of the fluid from a gas to a liquid as a result of a decrease in the temperature of the reservoir resulting from the burner going out of operation; whereby said damper assumes its open position when the burner is in operation and its closed position when the burner is not in operation.

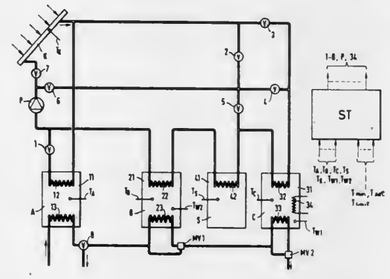


**4,294,227**

## APPARATUS FOR HEATING WATER BY SOLAR HEAT

**Ursula Kreibich, Riehen, and Rolf Schmid, Gelterkinden, both of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.**

**Filed Jun. 11, 1979, Ser. No. 47,548**
**Claims priority, application Switzerland, Jun. 16, 1978, 6581/78; Aug. 29, 1978, 9114/78**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—400** **18 Claims**




1. Apparatus for heating water by solar energy, comprising a solar collector, a latent-heat storage means, first and second heat exchangers, and a service-water outlet side, the first exchanger operating at a lower temperature than the second, each of said heat exchangers comprising a container having a first heat exchange material therein, a first conduit passing through said container for conveying a second heat exchange material in indirect heat exchange with said first heat exchange material and a second conduit passing through said container conveying a third heat exchange material in indirect heat exchange with said first heat exchange material, storage means the second conduit of each heat exchanger being connected in series on the service water outlet side, means coupling the heat exchangers to the and collector to form three circuits, the first containing the collector and the first heat exchanger, the second containing the collector, the storage means and the second heat exchanger, and the third containing the storage means and the second heat exchanger, a circulating means in each circuit, and

a plurality of sensors to sense the temperature of the circulating medium in the collector, the operating temperatures of the two heat exchangers and the temperature of the storage means, and a control circuit responsive to said sensors to,

activiate the first circuit if the collector temperature is higher than the operating temperature of the first heat exchanger and lower than that of the second heat exchanger,

activate the second circuit if the collector temperature is higher than the operating temperature of the second heat exchanger, and

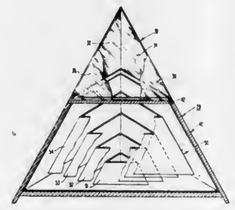
activate the third circuit if the collector temperature is lower than the operating temperature of the first heat exchanger and if the temperature of the storage means is simultaneously higher than the operating temperature of the second heat exchanger.

**4,294,228**

## SOLAR HEATING AND SUBTERRANEAN COOLING

**Robert Kruger, 412 N. Burnt Mill Rd., Ashland, N.J. 08003, and William J. Miller, Chalet Apartments, Tusc.-A, Pine Hill, N.J. 08021**

**Filed Nov. 9, 1978, Ser. No. 959,123**
**Int. Cl.³ F24J *3/02;* F24H *9/08;* E04B *1/74***
**U.S. Cl. 126—430** **24 Claims**



1. A solar heating system for a structure comprising:

at least one transparent portion; at least one heat conducting chamber for heating a fluid medium contained within said chamber by means of solar energy admitted to said chamber through said transparent portion, said heat conducting chamber further comprising a plurality of heat conducting elements disposed within said chamber; and a fluid medium distribution means associated with said chamber for receiving the heated fluid from said chamber and distributing it to utilization areas, said structure and said transparent portion are both pyramidal in shape, said transparent portion comprising at least one corner of said structure, said transparent portion comprises the apex portion of said structure, said plurality of heat conducting elements comprises a plurality of different size heat conducting boxes disposed in a nesting array, each box having at least three side walls.

**4,294,229**

## THERMOSIPHONING MODULE FOR ENVIRONMENTALLY DRIVEN HEATING AND COOLING SYSTEM

**Timothy Maloney, Mountain Falls, Va., assignor to One Design, Inc., Mountain Falls, Va.**

**Continuation-in-part of Ser. No. 941,735, Sep. 12, 1978. This application Sep. 13, 1978, Ser. No. 942,133**
**Int. Cl.³ F24J *3/02;* F16K *31/18***
**U.S. Cl. 126—434** **19 Claims**

1. A thermosiphoning module for an environmentally driven heating and cooling system utilizing a heat-transfer liquid, said module comprising:

a hollow body defining a liquid-tight interior space;

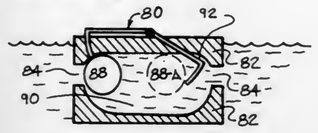
a partition arranged within the hollow body for dividing the interior of the hollow body into an outer compartment and an inner compartment;

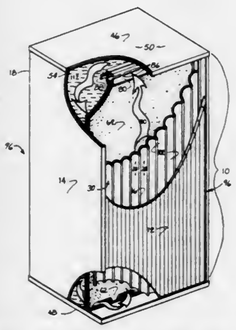
a first upper opening adjacent the top of the hollow body defining a liquid flow passageway past the partition intercommunicating the inner and outer compartments;

a second lower opening adjacent the bottom of the hollow

body defining a liquid flow passageway past the partition intercommunicating the inner and outer compartments;

a check valve disposed in one said openings for restricting liquid flow to one direction in a loop defined by the inner and outer compartments and the upper and lower openings, said check valve including a generally tubular shaped housing having an internal chamber, two generally opposed series of slots extending through said tubular housing, each series including a plurality of slots, said series defining inlet and outlet ports to said internal chamber, respectively, and a buoyant rod-like member disposed with in said chamber for controlling the flow of liquid through said valve by selectively blocking one of said inlet and said outlet ports; and



port means into said hollow body, for filling the body with said heat-transfer liquid for flow along said loop.

19. A reversible check valve for a liquid flow system comprising:

a generally tubular shaped housing having an internal chamber; two generally opposed series of slots extending through said housing, each series including a plurality of slots, said series defining inlet and outlet ports to said internal chamber and a rod-like member buoyant in said liquid, disposed within said chamber for controlling the flow of liquid through said valve by selectively blocking one of said inlet and outlet ports.

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**4,294,230**

**SOLAR ENERGY COLLECTION PANEL AND METHOD**

**Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840**

**Filed Jun. 25, 1979, Ser. No. 51,869**

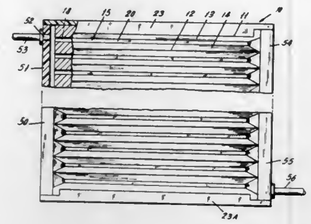
**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—438** **11 Claims**

1. A solar energy unit comprising an integral unitary metal panel structure having a front face adapted to receive solar energy, said unitary panel structure containing a plurality of closely spaced parallel cavities formed therein and extending inwardly of said front face of said panel structure, said cavities having side wall portions which converge inwardly toward each other, each of said cavities having a bottom wall portion joining said side wall portions together,

said side wall portions of said cavities of said unitary panel structure being highly reflective of sunlight directed against the face of said panel structure containing said cavities and being angled to reflect such sunlight between said converging wall portions toward the bottom of each cavity,

the bottom wall portion of each of said cavities having a sunlight absorbing material to permit sunlight which is directed into the cavities and reflected off the side wall portions of the cavities to be absorbed by said bottom wall portions, whereby concentrated heat of the absorbed sunlight will be conducted from the locations where the energy is absorbed through bottom portions of the panel structure,



a plurality of parallel fluid conduits underlying said bottom portions and coextensive with said cavities and formed integral within and extending through said unitary panel structure and containing heat transfer fluid in closely spaced heat transfer relationship with respective bottom portions of said panel structure which are directly aligned with said cavities therein,

said conduits containing heat transfer fluid adapted to receive heat transferred thereto through said bottom wall portions of said cavities of said panel structure and being aligned with respective of said cavities.

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**4,294,231**

**HEAT INSULATOR**

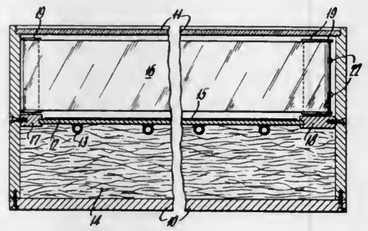
**Marcel J. E. Golay, 1095 Lutry, Vd, Switzerland**

**Continuation of Ser. No. 833,253, Sep. 14, 1977, abandoned, which is a continuation of Ser. No. 591,694, Jun. 30, 1975, Pat. No. 4,084,574. This application Jun. 22, 1979, Ser. No. 51,162**

**The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—441** **6 Claims**



1. Radiant heat absorbing apparatus comprising a housing having at least one clear side, radiatlon absorbing means in said housing comprising a radiation absorbing surface facing said clear side, a radiation transparent plate closing said clear side of the housing and a plurality of ribbon-like elements of relatively low thermal conductivity insulating material spaced apart a distance not exceeding about 1 centimeter and positioned substantially normal to, between and spaced from said radiation absorbing surface and said transparent plate to restrict circulation of gas between said surface and said plate and minimize loss of heat through convection while introducing negligible heat bypass between said surface and said plate.

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**4,294,232**

**SOLAR COLLECTOR**

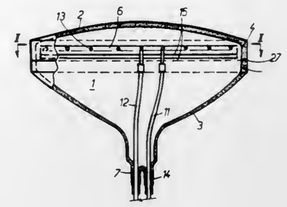
**Jean-Louis Boy-Marcotte, Orsay; Henri D. M. Junot, Paris; Richard J. A. M. Grossin, Rueil-Malmaison, and Philippe J. M. R. Chevalier, Garancieres, all of France, assignors to Bertin & Cie, Plaisir, France**

**Filed Dec. 10, 1979, Ser. No. 101,575**

**Claims priority, application France, Dec. 8, 1978, 78 34553**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—443** **8 Claims**



1. A solar energy absorber unit of the evacuated flat-plate collector type, comprising the combination of:

a gastight enclosure designed for long-duration maintenance inside thereof of a high-order vacuum, said enclosure being made up of two opposite half-shells of glass which are glass-welded to each other all along their mating peripheries to form together an integral all-glass, airtight envelope having a generally flattened front-side window designed for exposure to the sun and a corresponding rear-side closure opposite said front-side window,

a solar-radiation flat-plate collector suspended inside said enclosure by a light-weight low-conduction suspension secured to the wall of said envelope, to thereby stretch out behind said front-side window in non-conductive thermal relationship with said wall, at least the sun-exposed front-side face of said flat-plate collector bearing a selective coating adapted to increase solar radiation absorption and reduce infrared emission, and

a radiant screen formed of sheet material having low infrared emissivity, and in spaced relationship between said flat-plate collector and said rear-side closure, adjacent and generally parallel to the non sun-exposed rear-side face of said flat-plate collector to minimize radiation losses thereof and said solar screen being supported from said flat plate collector and out of physical contact with said rear side closure.

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**4,294,233**

**SLACK ABSORBING DEVICE FOR AN ENDOSCOPE**

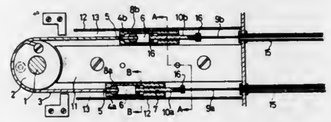
**Nagashige Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan**

**Filed Apr. 5, 1979, Ser. No. 27,418**

**Claims priority, application Japan, Apr. 12, 1978, 53/47865[U]**

**Int. Cl.³ A61B** *1/00*

**U.S. Cl. 128—4** **7 Claims**



1. An endoscope having a distal and a proximal end, a manual operating section adjacent the proximal end and a bending section adjacent the distal end, a plurality of elongated passageways in said manual operating section extending lengthwise of said endoscope, a plurality of slack absorbing members, one said member being mounted for slidable movement in each said passageway, said slack absorbing members being connected to said operating section such that they are movable along the length of said endoscope within said passageways as said operating section is operated, each of said slack absorbing members being elongated in the direction of said movement and having a centrally located elongated groove extending in the direction of said movement, said groove having a threaded portion, at least two twisted wires each having two ends, one end of each wire being connected to said bending section and the other ends of said wires being connected to different ones of said slack absorbing members such that when said manual operating section is operated said wires are moved in such a way that said bending section bends, said wires having threaded rods connected to said other ends whereby said threaded rods are moved together with said wires at least when said wires are pulled towards said manual operating section, said passageways being partially defined by a removable cover member, said threaded rods being provided with an end piece, each threaded groove having an open portion extending for at least the length of said threaded portion such that when said cover member is removed each of said threaded rods are engageable with a respective threaded groove by positioning said threaded rods above said threaded grooves and lowering said rods into said grooves, said cover member and said end pieces being positioned and sized such that they prevent removal of said rods from said grooves.

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**4,294,234**

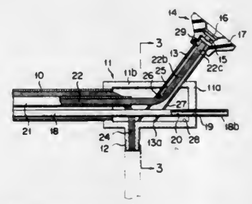
**ENDOSCOPE**

**Kazumasa Matsuo, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jun. 22, 1979, Ser. No. 51,034**

**Int. Cl.³ A61B** *1/00*

**U.S. Cl. 128—6** **5 Claims**



1. An endoscope comprising:

an elongated rigid sheath to be inserted into a body cavity, said sheath having a base end and a distal end;

a control section housing having a side wall and an end wall connected to the base end of the sheath;

a rigid channel tube inserted within the sheath along the length of the sheath to permit an instrument such as catheter to be inserted therein, said channel tube having a base end extended into the housing and a distal end opened at the distal end of the sheath;

an insertion hole formed in the side wall of said control section housing;

an extension guide having an outer free end and an inserted end slantwise inserted into the housing through the insertion hole;

an eyepiece fitted over the outer free end of the extension guide;

an optical fiber bundle having a straight portion disposed in the sheath, a distal end extended in the distal end of the sheath, a base end portion bent relative to the straight portion, and a base end, said bundle being made rigidly in

the glass rodlike form over substantially the whole length; and

opening means mounted on the inserted end of the extension guide for introducing the base end portion of the fiber bundle into the insertion guide, so that said base end of the fiber bundle is optically coupled to the eyepiece, said opening means comprising an elongated cut out formed in said extension guide along the axial direction thereof and opened at the inserted end of the extension guide.

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**4,294,235**

## LARYNGOSCOPE

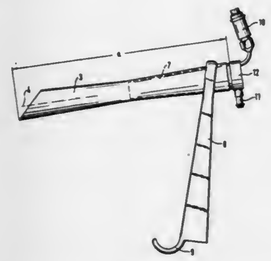
**Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany**

**Filed Nov. 13, 1978, Ser. No. 959,703**

**Claims priority, application Fed. Rep. of Germany, Nov. 27, 1977, 2751990**

**Int. Cl.³ A61B** *1/06, 1/26*

**U.S. Cl. 128—11** **3 Claims**



1. An injection breathing laryngoscope comprising: a laryngoscope tube having a proximal and a distal end, an axis, and an inner wall defining an axial passage from end to end, an insert tube having a proximal and a distal end, an axis, an inner wall defining an axial passage from end to end, and an outer wall so proportioned and arranged as rotatably to fit in said inner wall of said laryngoscope tube entering the proximal end of said laryngoscope tube, and having an axial length substantially shorter than that of the laryngoscope tube so that its distal end lies within said laryngoscope tube and substantially spaced from the distal end of said laryngoscope tube; fiber optics means and a breathing gas tube inside the insert tube passage and attached to said insert tube and terminating at said distal end of said insert tube, said inner wall of said laryngoscope tube and said outer wall of said insert tube having matching conical axially extending locking tapers, whereby said tubes can be rotated relative to one another with said tubes axially spaced apart, and locked in an adjusted position by pressing them axially together, and in which said laryngoscope tube flares outwardly from a medial location to its distal end.

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**4,294,236**

## FOOT EXERCISER

**Steven R. Hofstein, North Brunswick, N.J., assignor to World Medical Marketing Corporation, New York, N.Y.**

**Division of Ser. No. 85,330, Oct. 29, 1979. This application Jan. 14, 1980, Ser. No. 111,876**

**The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.**

**Int. Cl.³ A61H** *1/02*

**U.S. Cl. 128—25 B** **2 Claims**

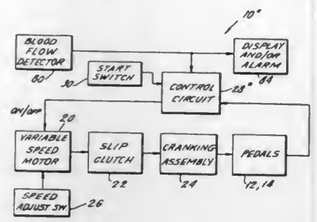
1. A foot exercising device, comprising:

a pair of foot pedals;

motor means for reciprocating said foot pedals;

blood flow detector means for detecting the flow of blood through a leg of a patient using said foot exercising device;

control means for controlling the operation of said motor means as a function of the blood flow through said patient as detected by said blood flow detector means, said control means causing the said motor means to vary the reciprocation frequency of said pedals as a function of said blood flow signal; and




display means responsive to said blood flow signal for providing a visual indication of said blood flow.

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**4,294,237**

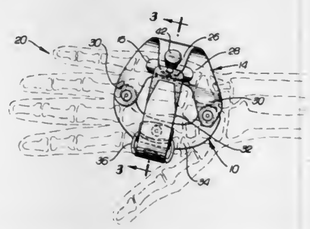
## SPLINT FOR REDUCING FRACTURES OF THE METACARPALS

**Calvin H. Frazier, 1808 Verdugo Blvd., Glendale, Calif. 91208**

**Filed Dec. 26, 1979, Ser. No. 107,025**

**Int. Cl.³ A61F** *5/10*

**U.S. Cl. 128—77** **9 Claims**



1. An apparatus for reducing a fracture of the metacarpal comprising:

a generally rigid foundation having a reducing portion overlying the dorsum of the hand adjacent at least one metacarpal of said hand, said reducing portion being generally coplanar to said dorsum, and a support portion whose longitudinal cross section has a curved shape that is shaped complementary to the ulnar side of said hand, said support portion extending from said dorsum around said ulnar side of said hand and terminating in a support end, said support end being generally coplanar to the palm of said hand and having a width that exceeds the width of said reducing portion;

means for securing said foundation to said hand, said means being adjustable to compensate for variations in sizes of hands; and

means for reducing the apex of said fracture, said means comprising a threaded shaft mounting at an upper end an adjusting knob and an aperture in said reducing portion of said foundation adapted to receive said shaft connected to said reducing portion and mounting at a lower end adjacent said hand a pressure distributing plate, said means adapted for adjustable advancement of said plate from a first position adjacent said reducing portion to at least one other position further below said reducing end.



**4,294,238**

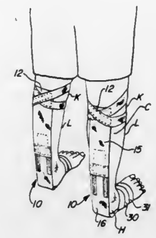
## LOWER LIMB MUSCLE AID DEVICE

**Thomas J. Woodford, Benton Harbor, Mich., assignor to Stephen C. Small, Benton Harbor, Mich., a part interest**

**Filed Sep. 21, 1979, Ser. No. 77,600**

**Int. Cl.³ A61F** *3/00*

**U.S. Cl. 128—80 G** **10 Claims**



1. A device for assisting and relaxing a user's leg muscles in and after physical activities such as jogging, said device comprising:

a strap member having a top end, a bottom end, and an elastic midportion having a width substantially the width of a user's heel;

a first securing means extending from said top end and defining means for releasably encircling the user's leg adjacent the knee for securing said top end of the strap member thereto; and

a second securing means extending from said bottom end and defining means for releasably encircling the user's foot for securing said bottom end of the strap member thereto with said midportion stretchably retained against the calf of the user's leg and said bottom end extending around the user's heel and underlying the arch of the user's foot for providing a supportive force on the user's leg during a physical activity such as jogging.

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**4,294,239**

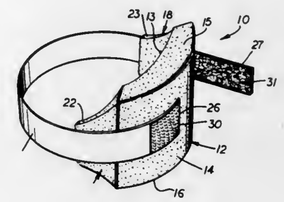
## STEADY SUPPORT ABDOMINAL SPLINT

**W. Wayne Oram, 2108 Chambwood Dr., Charlotte, N.C. 28205; Nora L. Oram, 525 Manhasset Rd., Charlotte, N.C. 28209, and Robert W. Boris, 405 Bluegrass Dr., Morristown, Tenn. 37814**

**Filed Apr. 6, 1979, Ser. No. 27,766**

**Int. Cl.³ A61F** *5/24, 5/28, 5/30*

**U.S. Cl. 128—96** **2 Claims**



1. A splint supporting the front abdomen of a human body and directing pressure to localized regions of the abdomen of a human body, comprising a molded pad of resilient material formed in an approximate U-shape with a front portion of substantially uniform thickness and height and including top edge, bottom edge, convex outer surface, concave body facing surface, and opposite end portions, said end portions being curved with respect to said front portion to extend partially about the sides of the abdomen of the human body, said front portion merging into said end portions and each end portion symmetrically diminished in height and the outer surface of each end portion tapered toward its body facing surface whereby the thickness of each end portion is diminished, said body facing surface being of a width sufficient to span the width of the human body across the abdomen and said pad being of a height sufficient to approximately cover the abdominal area of the body without extending over the thorax and formed in a size and shape along said body facing surface for conforming to the shape of the front abdominal area of the human body, the material of said pad having a density of between 2.5 and 3.5 pounds per cubic foot and a load bearing (ILD) of a twenty-five percent load deflection value at between 25 and 35 pounds, strap means for extending from said end portions and about the abdomen to urge said pad in constant contact with the abdomen to apply approximately uniform support pressure to the abdomen, said end portions being of a height at least as wide as said strap means, said pad being fabricated of material sufficiently flexible to permit a force applied externally to the pad to transmit localized pressure through the pad to the abdomen, whereby the pad is held by the strap against the abdomen and the wearer can press inwardly with his hand against the outside surface of the pad when coughing to apply additional pressure to a localized area of the abdomen.

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**4,294,240**

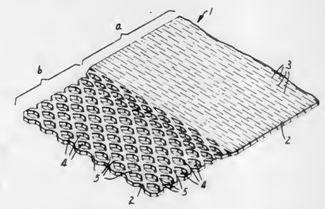
## PERFORATED CLOSED CELL PADDING MATERIAL

**Gary A. Thill, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Continuation of Ser. No. 815,857, Jul. 14, 1977, abandoned. This application Aug. 17, 1979, Ser. No. 67,394**

**Int. Cl.³ A61L** *15/00*

**U.S. Cl. 128—156** **8 Claims**



1. A combination for rendering a portion of the body relatively immobile, said combination comprising an orthopedic device which renders the portion of the body relatively immobile and a padding material, said padding material consisting essentially of a closed cell polymeric foam, said foam being water repellent at least to the extent that water penetrates the foam with difficulty, said padding material being conformable, being resiliently compressible, containing perforations capable of passing perspiration from human skin therethrough and being elastic in the longitudinal direction.

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**4,294,241**

## COLLAGEN SKIN DRESSING

**Teruo Miyata, No. 314, 3-6-29, Shimoochiai, Shinjuku-ku, Tokyo, Japan**

**Continuation-in-part of Ser. No. 805,003, Jun. 9, 1977, abandoned. This application Oct. 19, 1979, Ser. No. 86,547**

**Int. Cl.³ A61L** *15/00*

**U.S. Cl. 128—156** **8 Claims**

5. A method for the preparation of a collagen skin dressing in sheet from whose upper and lower surfaces possess differing porosity characteristics which comprises the steps of:

(a) treating a source of collagen with a proteolytic enzyme to form a telopeptide-poor, monomolecularly dispersed atelocollagen extract,

(b) precipitating atelocollagen from the extract,
(c) purifying the precipitated atelocollagen by redissolving and reprecipitation,
(d) converting the extracted, purified atelocollagen to a gel,
(e) extruding the atelocollagen gel through a circular extrusion nozzle in a coagulation bath,
(f) recovering atelocollagen in tubular form from the coagulation bath,
(g) slitting the tubular collagen longitudinally to form a collagen sheet therefrom,
(h) cross-linking the longitudinal sheet,
(i) partially air-drying the cross-linked sheet, and
(j) freeze-drying the partially air-dried sheet whereby the upper surface of said sheet becomes more concentrated in atelocollagen content with the lower surface thereof.

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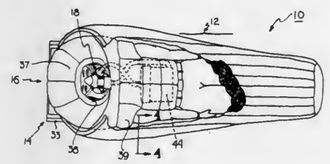
**4,294,242**
**SURVIVAL SYSTEM**
**Kenneth W. Cowans, Encino, Calif., assignor to Kinergetics, Inc., Tarzana, Calif.**
**Filed Mar. 31, 1980, Ser. No. 135,979**
**Int. Cl.³ A62B** *7/10*
**U.S. Cl. 128—201.13** **13 Claims**



1. A passive system for reducing the thermal energy losses of a person in a confined cold hyperbaric environment, comprising:
insulative means for encompassing the person at all but the face region, the insulative means having at least four inches of conductive path length and comprising interior fibrous insulation providing minimal interior convection currents;
carbon dioxide scrubber means disposed within the insulative means and coupled to receive expiratory flows from the person, such that the heat and moisture in the expiratory flows together with the encompassing insulative means establish an efficient exothermic reaction contributing heat to the person; and
regenerator means coupled to receive expiratory flow from the scrubber means and communicating with the environment to provide inspiratory flows from said scrubber means therethrough to the person, the regenerator means being configured to couple expiratory flows to the environment while storing heat and moisture contained therein, and to give up the heat and moisture to inspiratory flows.

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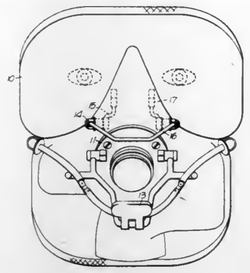
**4,294,243**
**RESPIRATORS**
**John Ernsting, Fleet; Thomas R. Morgan, Farnborough; Leonard F. W. Palmer, Aldershot; Alfred J. Rivers, Church Crookham, all of England, and Stephen M. Robson, RAF St. Athan, Wales, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**
**Filed Dec. 8, 1978, Ser. No. 967,122**
**Int. Cl.³ A62B** *7/00*
**U.S. Cl. 128—201.18** **8 Claims**

1. An oro-nasal respirator, comprising:
a. a visor;
b. a mask carried by said visor, said mask having a shape adapted to cover the nose and mouth of the wearer;
c. means for providing respiratory gas to the wearer through said mask;
d. means attached to said mask for selectively occluding the wearer's nose; said last mentioned means including a pair of spaced apart pivots penetrating through said mask in



the nasal region thereof; yoke arms extending radially from said pivots on the inside of said mask; a handle secured to said pivots on the outside of said mask; said handle operable to rotate said pivots and cause said yoke arms to turn into the sides of the wearer's nose.

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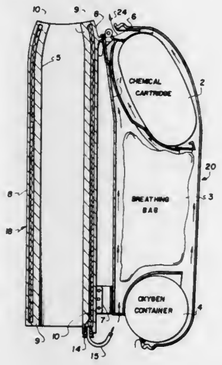
**4,294,244**
**RESPIRATOR WITH A COOLING DEVICE**
**Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**
**Filed Jan. 28, 1980, Ser. No. 115,877**
**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903920**
**Int. Cl.³ A62B** *7/08*
**U.S. Cl. 128—202.26** **1 Claim**




1. In combination with a respirator of the type having a carrying frame, a chemical cartridge mounted to the carrying frame for binding carbon dioxide or forming oxygen or both, a breathing bag mounted to the frame and an oxygen supply container mounted to the frame, means for communicating said cartridge, breathing bag and supply container such that exhaled gas from a user is recirculated therethrough for rebreathing, wherein the frame includes ducting means for passing a cooling gas flow over the oxygen container, the breathing bag and the cartridge, a vest adapted to be worn by a person comprising an outer wall of flexible material, an inner wall of flexible material spaced from the outer wall to define a spacing therebetween, a coolant medium comprising dry ice which sublimates to create carbon dioxide coolant gas mounted in said spacing, means for mounting the respirator adjacent of said vest, and further comprising means for discharging said carbon dioxide coolant gas from said spacing to said ducting means for passing the coolant gas to effect a coolant flow over the oxygen container, the breathing bag and the chemical cartridge.



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**4,294,245**
**PERIOPERATIVE APPLICATION OF ELECTRONIC PAIN CONTROL IN COMBINATION WITH ANESTHETIC AGENTS**
**Joseph G. Bussey, Austell, Ga., assignor to Stimtech, Inc., Minneapolis, Minn.**
**Filed Mar. 24, 1980, Ser. No. 133,211**
**Int. Cl.³ A61N** *1/30*
**U.S. Cl. 128—207.21** **7 Claims**

1. An improved method of preparing a patient for surgery, and for alleviating sensation of a patient during surgery, wherein the improvement comprises applying transcutaneous electrical nerve stimulation at least one point proximal to the site of incision, administering an anesthetic agent, and proceeding with surgery with the patient under the combined synergistic influence of said simulator and said agent.

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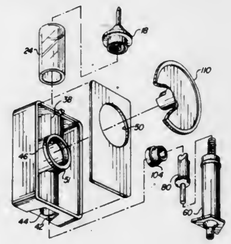
**4,294,246**
**FLOW CONTROL DEVICE FOR ADMINISTRATION OF INTRAVENOUS FLUIDS**
**Jerry L. Aslanian, Phoenix, and Jody L. Numbers, Scottsdale, both of Ariz., assignors to Master Medical Corporation, Phoenix, Ariz.**
**Filed Jan. 22, 1979, Ser. No. 5,313**
**Int. Cl.³ A61M** *5/00*
**U.S. Cl. 128—214 E** **4 Claims**



1. A metering device for accurately setting flow rates in an IV system including a source of IV or parenteral fluid, said valve comprising:
(a) a housing;
(b) a fluid passageway within said housing;
(c) a valve seat in said passageway having a valving surface;
(d) a cylindrical metering member axially moveable relative to said valve seat, said metering member including a cam follower and said member further defining a flow passage in the wall surface having a cross-sectional area which varies axially along at least a section of said flow passage;
(e) actuating cam means having a generally spiral cam surface cooperable with said cam follower;
(f) biasing means urging said metering member into engagement with said cam surface in a direction to reduce flow; and
(g) dial means moveable relative to said housing for imparting rotational movement to said actuating cam means whereby said cam surface axially displaces said member relative to said valving seat surface to progressively regulate flow from a closed to a purge position with flow metering occurring along said portion of said flow passage which varies in cross-sectional area.

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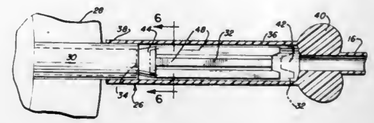
**4,294,247**
**FRANGIBLE, RESEALABLE CLOSURE FOR A FLEXIBLE TUBE**
**Garry L. Carter, Palatine; Daniel B. Granzow, Arlington Heights, and Edward L. Bayham, Mundelein, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**
**Continuation of Ser. No. 818,357, Jul. 25, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,395**
**Int. Cl.³ A61M** *5/00*
**U.S. Cl. 128—214 D** **11 Claims**



1. In a flexible tube, valve means which comprises: a tubular portion having a closed end; an elongated, generally rigid member carried on the exterior of said closed end and positioned within said flexible tube; and frangible means to permit the opening of said closed end by manual manipulation of said elongated member from outside of the flexible tube, to separate said elongated member from the tubular portion and to open said closed end, said elongated rigid member being adapted to fit in sealing relation within said tubular portion after said opening to permit resealing of the valve.

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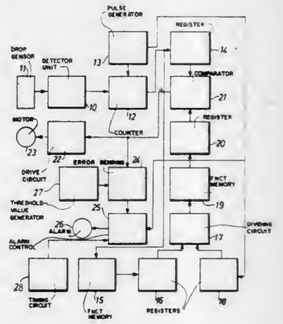
**4,294,248**
**DEVICE FOR AUTOMATICALLY CONTROLLING THE INFUSION LIQUID FLOW IN AN INFUSION APPARATUS**
**Nuno R. M. de Figueiredo, Högstigen 5, 182 74 Stocksund, Sweden**
**Filed Oct. 16, 1979, Ser. No. 85,281**
**Claims priority, application Sweden, Oct. 19, 1978, 7810917**
**Int. Cl.³ A61M** *5/6*
**U.S. Cl. 128—214 E** **7 Claims**



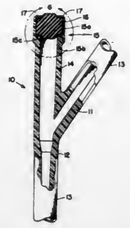

1. A device for automatically controlling infusion liquid flow in an infusion apparatus comprising first means for successively adjusting the actual value of said flow towards a desired value of said flow, second means for successively adjusting said desired value of the flow, and third means for successively calculating the value of the instantaneously remaining portion of a preselected total infusion liquid volume intended for infusion during a given total time, said second means being responsive to said third means.

**4,294,249**

## SWAGE-MOLDED INJECTION SITE

**Neil J. Sheehan, Berkeley, and Melvin H. Norman, Oakland, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.**

**Filed Oct. 18, 1979, Ser. No. 85,841**
**Int. Cl.³ A61M 5/00**
**U.S. Cl. 128—214 G** **7 Claims**



1. An injection site, comprising in combination:

a. a self-sealing, puncturable member of resilient material, said puncturable member being a generally cylindrical body having a top surface on which is centrally located a flat, smooth surfaced raised projection, and

b. a generally tubular, plastic housing wherein said puncturable member is compressibly confined, said housing having a top receptor portion whose inside diameter is greater than the inside diameter of the remaining portion of the housing so as to provide a ledge on which said puncturable member rests, the top receptor portion having a swage-molded top edge which extends over at least a portion of the top surface of said puncturable member, said swagemolded top edge being below the flat surface of said raised projection.

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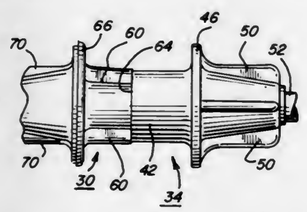
**4,294,250**

## LUER LOCK CONNECTION DEVICE

**T. Michael Dennehey, Arlington Heights, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Dec. 7, 1979, Ser. No. 101,246**
**Int. Cl.³ A61M 3/00**
**U.S. Cl. 128—247** **12 Claims**



1. A luer lock connection device which comprises: a cooperating male luer lock connector and a female luer lock connector;

said male luer lock connector having a central tubular portion defining an axial bore with at least a portion of said central tubular portion being enclosed by an outer sheath having a generally circular cross-sectional configuration;

said outer sheath having internal connecting means for cooperating with external connecting means of said female luer lock connector;

said female luer lock connector comprising a main tubular member for receiving said central tubular portion and having said external connecting means for cooperating with the internal connecting means of said male luer connector's outer sheath; and

said main tubular member of said female luer connector having visual indicating means which is positioned to indicate that the male and female connectors are assembled properly for use when said outer sheath and said visual indicating means are in a predetermined relationship.

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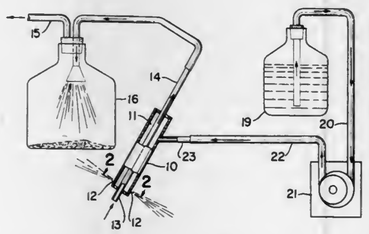
**4,294,251**

## METHOD OF SUCTION LAVAGE

**A. Seth Greenwald, 2235 Tudor Dr.; Jack M. Geiger, 2713 Hampshire Rd., both of Cleveland Heights, Ohio 44106; Nathaniel C. Narten, 3732 Northhampton Rd., Cleveland Heights, Ohio 44121; Derek S. Porritt, 3263 Granger Rd., Medina, Ohio 44256; Steven P. Combs, 404 DuPont Way, Dayton, Ohio 45433, and John J. Brems, 1591 Grace Ave., Lakewood, Ohio 44107**

**Continuation of Ser. No. 952,195, Oct. 17, 1978, abandoned.**
**This application Jul. 21, 1980, Ser. No. 170,596**
**Int. Cl.³ A61M 1/00**
**U.S. Cl. 128—276** **3 Claims**



1. A suction lavage method to improve the bond strength of a prosthetic fixation, such as an implant, with reamed cancellous bone, comprising:

A. applying a pulsatile water jet operating in an air environment to reamed cancellous bone;

B. applying suction contiguously with the water jet at a greater suction capacity than the water jet flow;

C. pulsing said water jet at about 2100 pulses per minute;

D. pressure cementing an implant into the cancellous bone which results in a 20 percent greater penetration of cement into the trabecular interstices of the cancellous bone and greatly improves the bond strength between the implant and the bone.

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**4,294,252**

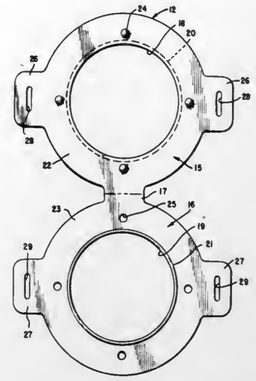
## OSTOMY DEVICE

**Eystein Einset, 1916 Sunset Dr., St. Joseph, Mich. 49085**

**Filed Nov. 5, 1979, Ser. No. 91,338**
**Int. Cl.³ A61F 5/44**
**U.S. Cl. 128—283** **11 Claims**

1. In an ostomy device having a drainage sleeve provided with a flexible connecting neck defining an inlet opening, improved retaining means for use in retaining the sleeve neck to a user's body in alignment with a stoma therein for collecting material draining outwardly through the stoma, said retaining means comprising:

a one-piece gasket having a first inner clamp half provided with a first drain opening, a second outer clamp half provided with a second drain opening, a hinge comprising portions of said clamp halves connecting the clamp halves for selective spaced disposition and facially overlying clamping disposition with said drain openings aligned, cooperating means on said clamp halves for sealingly securing said sleeve neck between said clamp halves in said clamping disposition with said neck passed through said second drain opening of the outer clamp half and outturned between said clamp halves with said inlet opening aligned with said first drain opening of the inner clamp half, and at least two different types of releasable interlock means for releasably interlocking said clamp halves in said clamping disposition; and



means for preventing disengagement of said interlock means when the device is being retained to the user's body.

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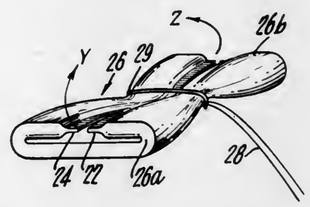
**4,294,253**

## TAMPON WITH A NON-WOVEN WRAP

**Axel Friese, Wuppertal, Fed. Rep. of Germany, assignor to Carl Hahn, G.m.b.H., Dusseldorf, Fed. Rep. of Germany**

**Filed Dec. 3, 1979, Ser. No. 99,771**
**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855179**
**Int. Cl.³ A61F 13/20**
**U.S. Cl. 128—285** **1 Claim**



1. An absorbent body suitable for compressing into a catamential tampon comprising:

a flat cushion of absorbent material enveloped by a liquid permeable cover and having a top face,

said cushion extending in a longitudinal direction and consisting of three longitudinally successive sections; namely, a front section defined by a front edge and a front fold line, a central section defined by said front fold line and a rear fold line, and a rear section defined by said rear fold line and a rear edge;

said front and rear sections being folded onto the top face of said central section about said front and rear fold lines, respectively, with said front and rear edges facing one another;

a withdrawal cord fastened longitudinally around said folded cushion and dividing said cushion therewith into two lateral sections;

the two lateral sections being folded toward each other about said withdrawal cord with the folded front and rear sections facing each other;

said absorbent body further provided with a reinforcing strip of material sandwiched between the absorbent material and the liquid permeable cover at the area of the cushion underlying the withdrawal cord.

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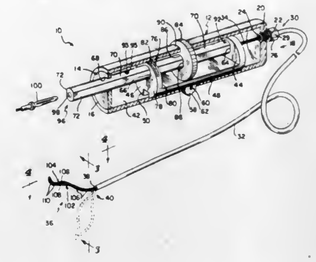
**4,294,254**

## SURGICAL APPARATUS

**Dale L. Chamness, 621 Pleasant Ridge Rd., Bloomington, Ind. 47401**

**Continuation-in-part of Ser. No. 858,712, Dec. 8, 1977, Pat. No. 4,256,113. This application Oct. 19, 1979, Ser. No. 86,588**
**Int. Cl.³ A61B 17/00**
**U.S. Cl. 128—303.14** **14 Claims**



1. An apparatus including a sheath having proximal and distal ends, a member disposed within the sheath and movable longitudinally therein, the movable member having proximal and distal ends, and a surgical instrument operable by movement of the distal end of the movable member with respect to the distal end of the sheath, an operating assembly comprising first means for moving the movable member longitudinally with respect to the sheath, second means for rotating the movable member within the sheath, and a body for supporting the first and second means, the body including a portion for fixed attachment of the proximal end of the sheath thereto, said portion of the body further defining an aperture through which the proximal end of the movable member movably extends, the proximal end of the movable member being coupled to the first and second means for movement thereby, the first means including a slide supported in the body for movement longitudinally thereof, the body including means defining an interior and the slide including means shaped to slide in the interior and a driven portion, the first means further including a first thumbwheel rotatably mounted in the body, the first thumbwheel providing a driving portion to engage the driven portion, the first means further including means for providing a braking force on the first thumbwheel, manipulation of the first thumbwheel overcoming the braking force on the first thumbwheel to cause movement of the slide.

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**4,294,255**

## INTRALUMINAL ANASTOMOSIS

**Andre Geroc, 1823 Lee Rd., Cleveland Heights, Ohio 44118**

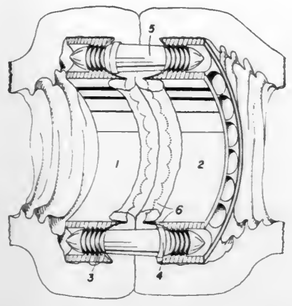
**Continuation of Ser. No. 890,914, Apr. 17, 1978, abandoned.**
**This application Feb. 19, 1980, Ser. No. 106,926**
**Int. Cl.³ A61B 17/04**
**U.S. Cl. 128—334 C** **7 Claims**

1. Anastomosis devices for intraluminal, end-to-end connection of the severed ends of an intestine or other tubular organ, the devices including a pair of mating, ring-shaped, clamping members, each of the members comprising:

(a) a circumferential, laterally extending, sharpened rim, the rim being located adjacent a radially innermost portion of the member;

(b) a second, laterally extending rim, the second rim extending outwardly of the member on the same side as the sharpened rim but to a lesser extent than the sharpened rim, the second rim being located adjacent a radially outermost portion of the member;

(c) a groove located intermediate the sharpened rim and the second rim; and




(d) means for connecting the members together, the connecting means being in the region of the groove.

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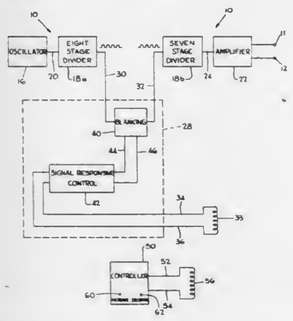
**4,294,256**

## RATE CONTROLLED DIGITAL PACEMAKER

**Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031**

**Filed Jul. 16, 1979, Ser. No. 57,745**
**Int. Cl.³ A61N *1/36***
**U.S. Cl. 128—419 PT** **11 Claims**




1. In combination with a cardiac pacer comprising electrode means adapted to be operatively connected to a patient's heart for applying stimulating pulses thereto, a source providing an output train of electrical pulses having a constant frequency and including oscillator means providing a train of output pulses at a relatively high frequency and means for converting said high frequency pulses to pulses having a lower frequency suitable for heart stimulation comprising a first component including a plurality of frequency divider stages having an output and having an input connected to said oscillator output and a second component including a plurality of frequency divider stages having an input and an output, and coupling means connected to the output of said second component of said frequency converting means for coupling said lower frequency pulses to said electrode means;

(a) pulse rate control means connected in series between said output of said first component of said frequency converting means and said input of said second component of said frequency converting means, said pulse rate control means comprising means for providing a path for said train of pulses from the output of said first component to the input of said second component of said frequency converting means, blanking pulse generating means having an input and an output and connected in synchronized relation to said output of said first frequency converting means for generating blanking pulses of a number determined by signal conditions at said input of said generating means during each time interval of said train of pulses and in synchronism with said train of pulses, and means for connecting the output of said blanking pulse generating means in controlling relation to said path providing means for preventing transmission of those pulses in the train which coincide in time with said number of blanking pulses to change the rate of stimulating pulses coupled to said electrode means for application to the heart by an amount determined by the number of blanking pulses;

(b) command signal responsive control means connected to said pulse rate control means for controlling the number of blanking pulses to be applied to said train of pulses in said path, said command signal responsive control means including means connected to said input of said blanking pulse generating means and responsive only to a first command signal for causing said blanking pulse generating means to increase the number of blanking pulses generated during each time interval of said train of pulses by an amount determined by said first command signal to decrease the rate of stimulating pulses applied to the heart and means connected to said input of said blanking pulse generating means and responsive only to a second command signal for causing said blanking pulse generating means to decrease the number of blanking pulses generated during each time interval of said train of pulses by an amount determined by said second command signal to increase the rate of stimulating pulses applied to the heart; and

(c) auxiliary control means adapted to receive at least two instruction inputs at a location physically separate from said cardiac pacer and operatively coupled to said command signal responsive means for generating said first and second command signals to change the rate of stimulating pulses applied by said electrode means to the heart, said auxiliary control means including means responsive to one of said instruction inputs for generating said first command signal having a given characteristic and means responsive to the other of said instruction inputs for generating said second command signal having a different characteristic.

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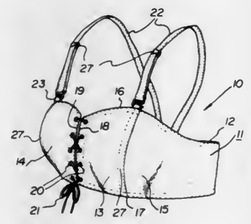
**4,294,257**

## HALTER TOP FOR SPORTS SUIT

**Linda Rennhofer, c/o Ronald M. Lieberman, Suite 201, 2 Gloucester St., Toronto, Ontario, Canada (M4Y 1L5)**

**Filed May 15, 1979, Ser. No. 39,298**
**Claims priority, application Canada, Apr. 24, 1979, 326248**
**Int. Cl.³ A41C *3/00*; A41D *5/00*; A47K *13/00***
**U.S. Cl. 128—495** **12 Claims**




1. A halter top formed of substantially non-stretchable material for a sports outfit for females comprising the combination of:

(a) a body encircling portion constituted by a discontinuous panel having a pair of free lateral edges and cooperating means at said free lateral edges to hold said free lateral edges together, said body encircling portion being provided with



(i) a pair of discrete, separated breast-receiving and supporting cups, each said cup including a vertical seam therein bisecting said cup, the preselected variable but permanent location of said vertical seam thereby providing preselected different cup sizes, the top edge of said breast-receiving and supporting cup being so curved as to follow the natural incline of said breasts, the lower edge of said breast-receiving and supporting cups being so curved as to fit below the breasts, and

(ii) means constituted mainly by said cooperating means for adjustably interconnecting said free lateral edges with a predetermined spacing therebetween while thus simultaneously separating one said breast cup from its adjacent said breast cup;

(b) means for adjustably securing said halter top to the upper chest portion of a female body;

whereby, in use, the breasts are held firmly yet comfortably against the body, with the breast being urged towards each other and inwardly towards the body.

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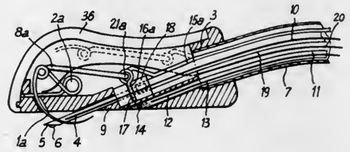
**4,294,258**

## MEASURING HEAD ENABLING THE PRODUCTION OF PHYSIOLOGICAL MEASUREMENT SIGNALS DESIGNED TO BE POSITIONED ON OR IN CORPOREAL PARTS

**Claude Bernard, Le Plessis-Robinson, France, assignor to Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France**

**Filed Mar. 19, 1979, Ser. No. 21,779**
**Claims priority, application France, Mar. 23, 1978, 78 08428**
**Int. Cl.³ A61B *5/00, 5/04***
**U.S. Cl. 128—635** **32 Claims**




1. A measuring head adapted to be positioned on or in corporeal parts of a living body, said head comprising:

an insulating body,

said insulating body having a first electrode means which is sensitive to electrical activity of said corporeal parts, an electrical lead operatively connected to and extending from said first electrode means,

said insulating body also having a second electrode means which is sensitive to an ionic or physical activity of said corporeal parts, an electrical lead operatively connected to and extending from said second electrode means,

an elongated sheath means being connected to and extending from said insulating body, said electrical leads extending from the insulating body along said sheath means,

said insulating body having a claw means movable between a retracted position within said insulating body and an extended position out of said insulating body whereat it is positioned to enter the corporeal parts, to thereby secure the measuring head to the corporeal parts,

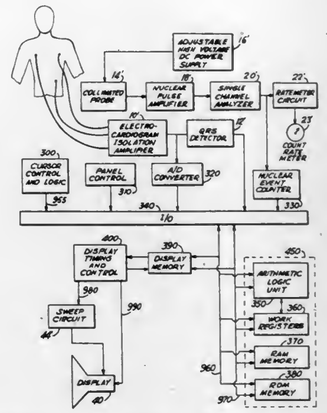
control means for moving the claw means between said retracted and extended positions such that in the said extended position the claw means has entered the corporeal parts while said first and second electrode means simultaneously engage the corporeal parts.

**4,294,259**

## METHOD AND APPARATUS FOR CHARACTERIZING BLOOD FLOW THROUGH THE HEART

**Thomas Picunko, Bronxville, N.Y.; Henry H. Kramer, Mahwah, N.J.; Naim G. Dam, Bayside, and Robert I. Gray, Irvington, both of N.Y., assignors to Bios Inc., Valhalla, N.Y.**

**Filed Nov. 25, 1977, Ser. No. 854,537**
**Int. Cl.³ A61B *5/02***
**U.S. Cl. 128—653** **18 Claims**




1. Apparatus for characterizing blood flow through a heart for analysis of individual cardiac cycles comprising:

a nuclear detector probe responsive to the radioactive output of a radioactive trace introduced into a patient's blood stream to provide an output indicating the amount of radioactivity at a selected location of the heart blood pool,

a time base generator to provide a time base that is divided into successive time intervals,

a counter of said detector output,

a memory to store counts from said counter over each of said time intervals,

a programmable computer responding to said counts of certain of said time intervals to compute the value of a predetermined parameter of the patient's blood flow simultanous with each cardiac cycle being detected,

a display of said value of said predetermined parameter substantially simultaneous with the computation thereof,

said computer calculations and said display being substantially simultaneous with the production of said detector output signal and changing in response to changes of said detector output signal.

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**4,294,260**

## CYSTOURETHROGRAPHIC EXAMINATION CHAIN

**William M. Veatch, Olympia, Wash., assignor to Olympia Radiological Associates, Olympia, Wash.**

**Filed Jun. 18, 1979, Ser. No. 49,503**
**Int. Cl.³ A61B *6/00***
**U.S. Cl. 128—654** **2 Claims**

1. A flexible insert for cystourethrographic examination, comprising:

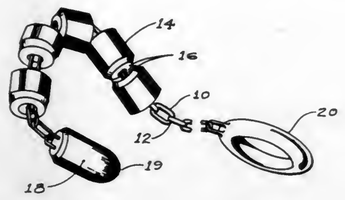
an elongated continuous radio opaque flexible tensioning member having a plurality of interconnected rigid chain links,

a forward stop fastened to an end of the tensioning member and having a smoothly contoured continuous forward end,

a rearward stop fastened to the tensioning member, and

a plurality of radio opaque bead members having axially opposite flat ends slidably mounted on the chain links between said forward and rearward stops whereby press-

ing the bead members forward against the forward stop will push the flat ends of the beads together to rigidify the




insert so that the forward stop can be pushed into the urethra and bladder of a patient.

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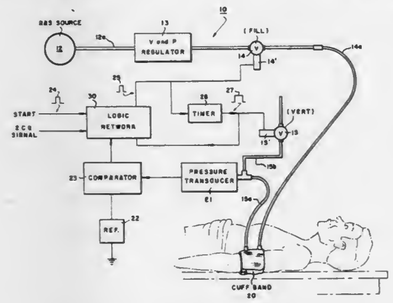
**4,294,261**

## LOGIC-CONTROLLED OCCLUSIVE CUFF SYSTEM

**Joseph T. Baker, League City; George W. Hoffler, Seabrook, and William N. Hursta, League City, all of Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.**

**Filed Jun. 1, 1976, Ser. No. 691,647**
**Int. Cl.³ A61B** *5/02*
**U.S. Cl. 128—691** **4 Claims**




1. A cuff system for occulding venous return from a limb, comprising:

a pressure cuff;

a source of pressurized gas;

means including a solenoid-operated fill valve for selectively coupling said gas source with said cuff, said fill valve being opened in response to a high level energizing electrical fill signal which energizes the solenoid associated with said fill valve and being closed in response to the application of a low level electrical signal to said solenoid-operated fill valve;

regulator means for controlling the pressure and volume of gas flowing from said source when coupled to said cuff;

means including a solenoid-operated vent valve for venting said cuff to the ambient atmosphere, said vent valve being closed in response to application of a low level electrical signal which deenergizes the solenoid associated with said vent valve and said vent valve being opened in response to application of a high level electrical signal which energizes the vent solenoid;

means for supplying a high level energizing electrical fill signal to said solenoid-operated fill valve to open said fill valve and maintain the fill valve in open condition whereby the cuff receives gas from said pressurized source;

means including a timer means instantly operative in response to said fill signal for producing a low level deenergizing close vent signal for a predetermined period of time and applying said low level close vent signal to said vent valve to close said vent valve through said time period;

a pressure transducer fluidly coupled with said cuff, said transducer measuring the fluid pressure in said cuff and generating a transducer output electrical voltage signal proportional to said pressure;

a source of reference voltage;

means operatively associated with said pressure transducer and said reference voltage source for terminating said high level energizing electrical fill signal and applying a second low level electrical signal to said solenoid-operated fill valve to close said fill valve when the ratio between said transducer electrical output voltage signal and said reference voltage signal reaches a predetermined value whereby said cuff is in a pressure holding condition while the vent remains closed; and

means responsive to the termination of said low level deenergizing close vent signal at the end of said time period to energize said solenoid-operated vent valve to open condition and thereby depressurize said cuff; said system further comprising:

an AND gate,

a pressure latch,

a start latch,

each one of said latches having a set, reset, and output terminals, the output of said pressure latch being coupled to one input of said AND gate, the output of said start latch being coupled to the other input of said AND gate,

means coupling the output of said start latch to the input of said timer and to the reset terminal of said pressure latch,

means coupling the output of said timer to the reset terminal of said start latch,

means coupling the output of said AND gate to said fill valve; and

said system adapted to start a pressurization cycle upon the application of a start signal to the set terminal of said start latch.

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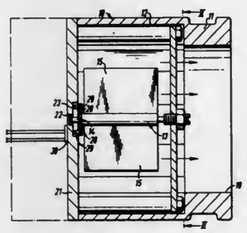
**4,294,262**

## APPARATUS FOR MONITORING RESPIRATORY PERFORMANCE

**Garnet M. E. Williams, Edmonton, and James E. L. Hollis, Portsmouth, both of England, assignors to Ferraris Development and Engineering Company Limited, London, England**

**Filed May 30, 1979, Ser. No. 43,772**
**Claims priority, application United Kingdom, May 31, 1978, 25443/78**
**Int. Cl.³ A61B** *5/08*
**U.S. Cl. 128—726** **6 Claims**



1. Respiratory performance monitoring apparatus comprising means forming a chamber having a wall formed by a non-magnetizable material and ports whereby respiratory gas flow to be monitored when the apparatus is being used is passed through said chamber, and a pneumatic-to-electric transducer adapted to actuate an electronic readout unit, the transducer including a rotor mounted rotatably within said chamber so as to be driven by respiratory gas flow through said chamber, at least one rare earth magnet mounted on said rotor, and a sensitive Hall effect sensor mounted outside the chamber on the opposite side of said wall in close proximity to the path of rotation of said at least one magnet within said chamber whereby an output indicative of rotation of the rotor can be derived from output signals emitted by said Hall effect sensor, the Hall effect sensor and the non-magnetizable material of said wall being able to withstand temperatures of the order to which the apparatus is subjected for sterilization purposes.



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**4,294,263**

## SYSTEM FOR DETECTING PROBE DISLODGEMENT

**Benjamin L. Hochman, Doylestown, Pa., assignor to Air Shields, Inc., Hatboro, Pa.**

**Continuation-in-part of Ser. No. 858,401, Dec. 7, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,253**
**Int. Cl.³ A61B** *5/00*
**U.S. Cl. 128—736** **23 Claims**

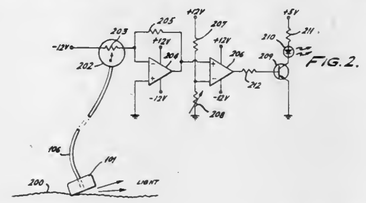


FIG. 2.

1. Apparatus for sensing skin contact probe dislodgement, comprising:

(a) housing means defining a skin contact surface for said probe;

(b) photoreceptive means located on said skin contact surface of said housing means;

(c) alarm means energized by reception by said photoreceptive means of light, said light having an intensity exceeding a predetermined level, said alarm means being placed a distance away from said housing means; and

(d) photo transmitting means extending out from said housing means for connecting said photoreceptive means and said distant light receptive alarm means.

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**4,294,264**

## CERVIX-TO-RECTUM MEASURING DEVICE IN A RADIATION APPLICATOR FOR USE IN THE TREATMENT OF CERVICAL CANCER

**David R. Fischell, Ithaca, N.Y., and Jeffrey C. Mazique, Mt. Rainier, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Continuation of Ser. No. 672,209, Mar. 31, 1976, abandoned. This application May 12, 1977, Ser. No. 796,258**
**Int. Cl.³ A61B** *5/10*
**U.S. Cl. 128—778** **1 Claim**

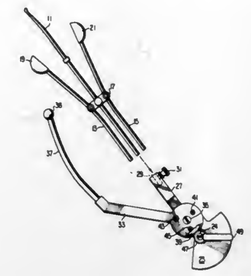
1. A device for use with a radiation applicator comprising:

a handle,

a single probe pivotably connected to said handle and insertable in a rectum,

means on said handle for coupling said handle to the applicator, and

means on said handle responsive to the displacement of said probe when inserted into a rectum relative to the applicator when inserted into an uterine cervix for indicating the distance between said cervix and rectum.



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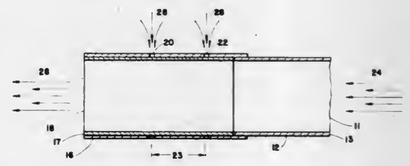
**4,294,265**

## FILTER CIGARETTE WITH INLET VENT ZONES

**Allen J. Kassman, Richmond, and Willard A. Geiszler, Jr., Chesterfield, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.**

**Filed Apr. 4, 1980, Ser. No. 137,159**
**Int. Cl.³ A24D** *1/04, 3/04*
**U.S. Cl. 131—366** **9 Claims**




1. A mouthpiece affording coordinated control of the RTD, dilution and TPM of a cigarette, comprising:

a. a filter medium the outer surface of which is essentially air impervious;

b. inlet vents in said filter medium for admitting outside air for dilution, said inlet vents being in at least two groups, one group located closer to the tobacco end of said mouthpiece and separated from the other group by a distance by a distance effective to increase RTD large enough to be percieved by a smoker without appreciably decreasing dilution and the total particulate matter.

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**4,294,266**

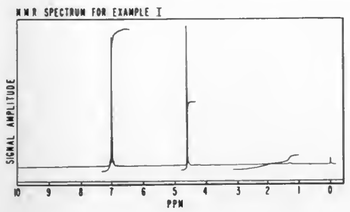
## BENZODIOXANONES AND ORGANOLEPTIC USES THEREOF

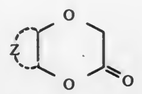
**Mark A. Sprecker, Sea Bright; John B. Hall, Rumson, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Division of Ser. No. 75,071, Sep. 13, 1979, Pat. No. 4,241,097. This application May 2, 1980, Ser. No. 145,985**
**Int. Cl.³ A24B** *3/12*
**U.S. Cl. 131—277** **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking

tobacco an organoleptic property augmenting or enhancing quantity of a cyclic chemical compound having the structure:



wherein Z is benzo or cyclohexano.

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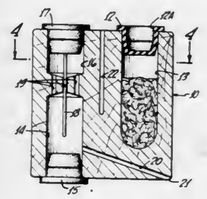
**4,294,267**
**POCKET PIPE**
**Ronald C. Glymph, 11914 Wilmington Ave., Los Angeles, Calif. 90059**
**Filed Jun. 27, 1977, Ser. No. 810,636**
**Int. Cl.³ A24F** *3/02, 7/00, 5/10, 5/12*
**U.S. Cl. 131—330** **4 Claims**



1. A smoking pipe comprising:
a unitary body;
first and second chambers in said body each communicating with an exterior surface of said body with an intervening portion of said body between said first and second chambers, said first chamber adapted to receive burning materials for smoking and said second chamber adapted to receive smoke and resin from said first chamber;
at least one aperture in said intervening portion communicating with each of said first and second chambers;
a channel in said body communicating with said second chamber and the exterior of said body to form a mouthpiece for said pipe;
a third chamber in said body communicating with an exterior surface of said body and separated from said first and second chambers, said third chamber providing means for storage of smoking materials;
removable caps for each of said chambers, at least one of said caps having a tine dependent therefrom for cleaning said aperture in said intervening portion;
said caps having a portion which engages the outer edge of its respective chamber to form a snug fit and a main body which extends from said snugly fitted portion into its chamber when its outer portion is in a snugly fitted relationship; and
at least one of said main bodies of said caps having a hollow portion therein for transferring smoking materials.

**4,294,268**
**PEDICURE EASEL**
**John V. Kitrell, 4639 Holdrege, Lincoln, Nebr. 68503**
**Filed May 13, 1980, Ser. No. 149,320**
**Int. Cl.³ A45D** *29/00*
**U.S. Cl. 132—73** **9 Claims**

1. A pedicure easel, comprising,
a supporting means comprising first and second support means,
said first support means having a pair of ends,
one end of said first support means being adapted to be placed on a horizontal supporting surface,
said second support means having a pair of ends,
said second support means being secured, adjacent one end thereof, to said first support means adjacent the said other end thereof,
the other end of said second support means being adapted to be removably secured to a toilet bowl,
and a foot supporting plate mounted on said supporting means.

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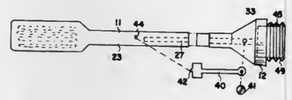
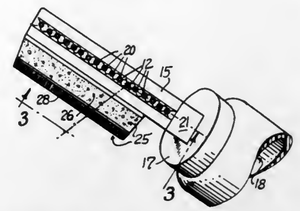
**4,294,269**
**COMPACT TOOTHBRUSH KIT**
**Albert D. Kyte, P.O. Box 2523, Pensacola, Fla. 32503**
**Filed Jan. 31, 1977, Ser. No. 764,354**
**Int. Cl.³ A45D** *44/18*
**U.S. Cl. 132—84 B** **3 Claims**



1. A toothbrush assembly which may be disassembled to fit into a container, comprising
a shank unit fitted at a first end with bristles and shaped at a second end to detachably engage a first cap,
a tubular housing threadably attachable at a first end to said first cap and fitted with an internal chamber open at one end of the housing of a size to contain a tube of dentifrice, and
a second cap threadably attachable to a second end of said housing, said second cap fitted with a chamber of a size to contain a reel of dental floss, said second cap formed with a through hole to permit a length of dental floss to extend through said second cap, in which
a member formed with a projecting cutting edge section, for cutting of dental floss, is externally mounted to the assembled housing, said member and cutting edge section being located within the confines of an open external recess in said assembled housing.



**4,294,270**
**HAIR TREATING FLUID APPLICATOR**
**Loretta L. Cochran, 807 Corvallis Dr., Sunnyvale, Calif. 94087**
**Filed Sep. 19, 1977, Ser. No. 834,188**
**Int. Cl.³ A45D** *24/22*
**U.S. Cl. 132—112** **6 Claims**



1. An applicator for depositing and distributing a fluid onto the hair of a human being comprising:
(a) a fluid supply reservoir having an open end;
(b) a cap portion attached to said open end of said supply reservoir, said cap portion having a passage formed therethrough for communication with the interior of said supply reservoir;
(c) a fountain comb including a backbone secured to said cap portion and having a manifold passage in communication with the passage formed through said cap portion;
(d) A plurality of comb teeth extending in parallel relation to one another from the backbone of said comb and each having a passage formed lengthwise therethrough for communication with the manifold passage in said backbone;
(e) a bumper sponge on said backbone of said comb for absorbing and mopping excess fluid from the scalp and hair under treatment, said bumper sponge being disposed on one side of said backbone of said comb displaced in the vicinity of 90° degrees from the side of said backbone of said comb from which said comb teeth project and having an outer surface opposite the surface thereof on said backbone of said comb; and
(f) a brush on said outer surface of said sponge for spreading the fluid relative to strands and curls of hair under treatment, said brush having bristles extending laterally outward from the outer surface of said sponge for combined action with said sponge in spreading and distributing the fluid over hair under treatment.

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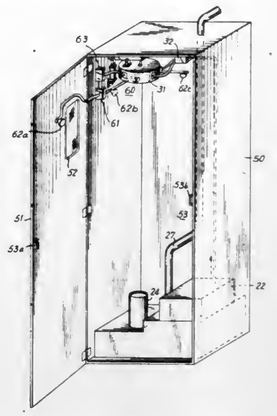
**4,294,271**
**APPARATUS FOR REMOVING DEPOSITED MATTER FROM A DIFFUSION TUBE**
**Josef Intrater, Englewood Cliffs, N.J.; Gene Bertholdo, New York, N.Y., and Janet Intrater, Englewood Cliffs, N.J., assignors to Dexon, Inc., Minneapolis, Minn.**
**Filed Nov. 30, 1979, Ser. No. 98,756**
**Int. Cl.³ B08B** *3/02, 9/02*
**U.S. Cl. 134—113** **28 Claims**

18. A spray head device for use in cleaning a diffusion tube of matter deposited therewithin comprising:
a body portion;
sealing means for sealably contacting an opening at one end of said tube;
spraying means for spraying a reagent against the inside surface of said tube;
means for providing a flow of said reagent to said spraying means; and
means to prevent said reagent sprayed by said spraying means from forming channels in said deposited matter, said means to prevent including spray nozzles for spraying



the reagent circumferentially and longitudinally along the inside surface of said tube at said opening.

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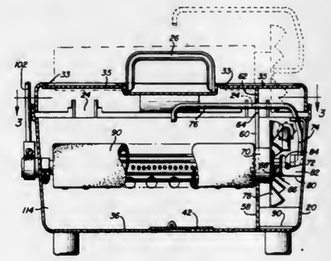
**4,294,272**
**APPARATUS FOR WASHING, RINSING AND SPIN DRYING PAINT ROLLERS**
**William C. Klaiber, 601 York Rd., Fayetteville, N.C. 28303**
**Filed Oct. 11, 1979, Ser. No. 83,613**
**Int. Cl.³ B08B** *3/02*
**U.S. Cl. 134—138** **12 Claims**



1. A paint roller cleaner including a receptacle for receiving a paint roller therein, elongated horizontal roller support means journalled within said receptacle for rotation about an axis extending longitudinally of said roller support means, said roller support means being adapted to have a paint roller sleeve lengthwise telescoped thereover for support therefrom and rotation therewith, an elongated horizontal water discharge manifold supported within said housing in horizontally laterally spaced relation relative to said roller support means, said manifold including water outlet jet discharge means spaced therealong and opening outwardly along one side of said manifold toward said roller support means, means operative to selectively supply water under pressure to the interior of said manifold, drive means, independent of said manifold water jet discharge means, operative to drive said roller support means, said receptacle including water outlet means operative to drain collected water in said receptacle from within the latter on one side of said roller support means down to a predetermined level spaced slightly below said axis of rotation of said roller support means, said drive means being operative to drive said roller support means in a direction of rotation of said roller

with the lower periphery of said roller support means being advanced toward the other side of said roller support means.

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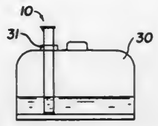
**4,294,273**
**FLUID PROPORTIONING DEVICE**
**Gary J. Isberg, P.O. Box 491, Trail, British Columbia, Canada**
**Filed Jun. 18, 1979, Ser. No. 50,024**
**Int. Cl.³ B65D *87/00***
**U.S. Cl. 137—1** **2 Claims**




1. A method of proportioning oil and gasoline in a fuel tank comprising the steps of inserting into the partially filled fuel tank a tube having a volumetric capacity related to the volumetric capacity of the fuel tank by a ratio directly proportional to a prescribed ratio for mixing the gasoline and oil, admitting into and retaining within the tube a level of fuel equal to the level remaining in the fuel tank, removing the tube from the tank, adding oil to the tube to fill said tube to a predetermined level, and pouring the contents of the tube into the fuel tank before filling said tank with gasoline.

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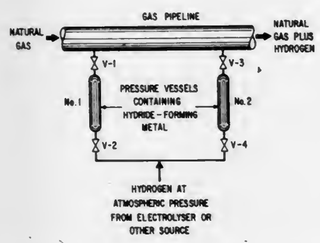
**4,294,274**
**HYDROGEN INJECTION INTO GAS PIPELINES AND OTHER PRESSURIZED CONTAINERS**
**Rodney L. LeRoy, Pointe Claire, Canada, assignor to Noranda Mines Limited and The Electrolyser Corporation Ltd., both of Toronto, Canada**
**Filed Jul. 17, 1979, Ser. No. 58,306**
**Claims priority, application United Kingdom, Jul. 17, 1978, 30090/78**
**Int. Cl.³ F17D *1/02***
**U.S. Cl. 137—7** **8 Claims**




1. A method of introducing a proportion of hydrogen into a gas pipeline or other pressurized gas container, said method comprising feeding hydrogen into the container from a pressure source lower than the pressure of the gas in the container through a barrier freely permeable to hydrogen but impermeable to the gas in the container until the hydrogen partial pressure in the container becomes equal to the hydrogen pressure which is applied to the barrier.

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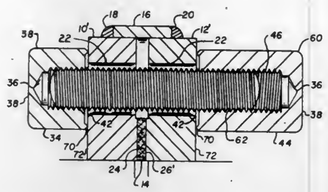
**4,294,275**
**FLANGED JOINT SEALING NUT**
**Mirrel L. Totman, McPherson, Kans., assignor to Totman Seal Nut, Inc., McPherson, Kans.**
**Filed Apr. 13, 1979, Ser. No. 29,679**
**Int. Cl.³ F16L *55/18*; F17D *3/00***
**U.S. Cl. 137—15** **4 Claims**



4. An improved method of sealing a leaking flanged pipe joint comprising the steps of:
- sealing the outer circumferential gap between the two adjacent flanges of the joint;
- replacing the original bolts and nuts, one at a time, with a bolt and two closed-end nuts, the nuts having a means for sealing between the nuts and the flanges; and
- threading the sealing nuts onto the bolt until both nuts contact the flanges, then tightening each nut until fully tightened, thus lastingly and positively sealing each nut to its adjacent flange;
- in which the improvement comprises:
- using full size sealing nuts and bolts equal in diameter to the original nuts and bolts, and locating the sealing area on the face of the flange near perimeter of the nut and away from rim of bolt hole.

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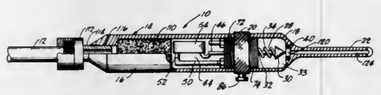
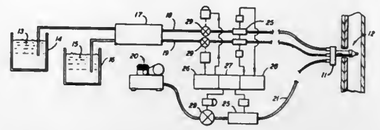
**4,294,276**
**WATER SENSITIVE PROBE VALVE FOR USE WITH A GAS LEAK DETECTOR**
**Loren C. Harrison, 8607 Danby Ave., Whittier, Calif. 90606**
**Filed Dec. 26, 1979, Ser. No. 107,151**
**Int. Cl.³ F16K *13/04***
**U.S. Cl. 137—67** **13 Claims**



1. An improved water sensitive probe valve comprising:
(a) a body defining an interior gas passage for the passage of gas through the probe valve;
(b) a coupling of the body and detachable from the balance thereof;
(c) a valve mounted on the coupling for closing the gas passage in a closed position of the valve, the valve being capable of translation along a path with respect to the coupling, the valve having a first finger extending radially of its path of translation;
(d) an anchor mounted on the coupling and defining a second finger extending radially of the path of translation of the valve;
(e) the first and second fingers defining mounting means for a water soluble link that keeps the valve in an open position;
(f) biasing means for urging the valve into the closed position and applying tension to the water soluble link;
(g) a gas probe mounted on the body; and
(h) means for coupling the interior gas passage to a gas detector downstream of the valve.



**4,294,277**
**FLOW CONTROL APPARATUS**
**Philip C. Szeliga, Utica, N.Y., assignor to Foam Controls, Inc., New Hartford, N.Y.**
**Filed Jul. 9, 1980, Ser. No. 167,127**
**Int. Cl.³ G05D *7/06, 11/13***
**U.S. Cl. 137—101.19** **11 Claims**



1. A fluid control apparatus of the type wherein a plurality of fluids are delivered by means of a like number of lines to a mixing device, said apparatus including
- a sensing means positioned in each line for developing a rate signal that is indicative of the flow passing through said line,
- a comparator means operatively connected to each of the sensing means for comparing the rate signal of said sensing means with a selected rate and producing an upper control signal when the sensed rate is above the selected rate and a lower control signal when the sensed rate is below the selected rate,
- a control valve means contained in each of said lines that is responsive to said comparator means for increasing the flow rate in the line when a lower control signal is generated by said comparator means and for decreasing the flow rate when the upper control signal is generated by said comparator means, and
- circuit means for monitoring the rate signals developed by each sensing means and for inhibiting the comparator means in the event all the rate signals fall simultaneously below a predetermined rate.

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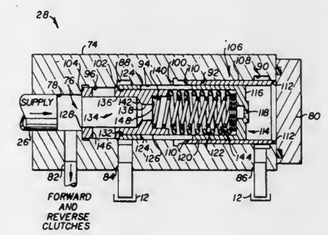
**4,294,278**
**PRESSURE MODULATING VALVE**
**William W. Blake, Kewanee, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**
**PCT No. PCT/US79/01129, § 371 Date Dec. 14, 1979, § 102(e) Date Dec. 14, 1979, PCT Pub. No. WO81/01733, PCT Pub. Date Jun. 25, 1981**
**PCT Filed Dec. 14, 1979, Ser. No. 110,712**
**Int. Cl.³ F16K *11/10***
**U.S. Cl. 137—115** **15 Claims**




1. In a modulating valve (28) having an axial passage (76), with a first end portion (96) and a second end portion (92), the improvement comprising:
- a relief valve spool (128) mounted in said axial passage (76) adjacent the first end portion (96);
- a load piston (114) mounted in said axial passage (76) adjacent the second end portion (92);
- resilient means (144) for interconnecting said spool (128) and said load piston (114);
- a pressure operated check valve means (106) for selectively relieving the pressure in said second end portion (92), which check valve means (106) is slidably mounted about said load piston (114);
- means (124) for communicating the first end piston (96) with the second end portion (92); and
- means (118) for communicating the pressure operated check valve means (106) with the first end portion (92).

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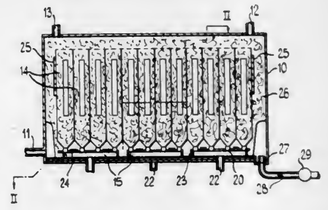
**4,294,279**
**FUEL TANKS**
**Harold W. G. Wyeth, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**
**Filed May 31, 1979, Ser. No. 44,160**
**Claims priority, application United Kingdom, May 31, 1978, 24761/78**
**Int. Cl.³ B64D *37/08***
**U.S. Cl. 137—264** **27 Claims**



1. A tank for liquid fuel and containing
- a plurality of cells for containing fuel and each extending substantially from the floor of the tank to the ceiling thereof,
- collection means, in the bottom of said tank, for collecting fuel from said cells and supplying it to at least one common tank outlet,
- plug and socket means for mounting and detaining said cells in said tank and connecting said cells to said collection means, and
- non-return valves preventing fluid flow from said collection means into said cells,
- each of said cells being distinct and individually detachable from said tank and comprising an envelope of impermeable flexible material surrounding a resilient fire protective reticulated structure, said envelope being open at a top end thereof and having an outlet at the bottom thereof, and there being an ullage between the top of said cells and the roof of said tank, said ullage being substantially filled with at least one fire protective reticulated structure.

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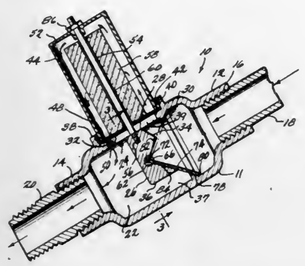
**4,294,280**
**APPARATUS FOR PRODUCING AND DISPENSING DETERGENT SOLUTIONS**
**Milton D. Tom, R-1, Norwich, Ohio 43767**
**Filed Jul. 10, 1979, Ser. No. 56,309**
**Int. Cl.³ B05B *7/00***
**U.S. Cl. 137—268** **7 Claims**

1. A device for selectively supplying a cleansing solution to a liquid conduit comprising:
- a body having an interior chamber, inlet means for passing a liquid into said chamber, outlet means for discharging the liquid from said chamber, first aperture means in said body, and second aperture means in said body spaced from said first aperture means, housing means for a cleansing material, said housing means having an open end removably mounted on said body so as to completely surround said first and second aperture means.
- said chamber having valve support means therein, a flap

valve movably carried by said valve support means so as to be movable between a first position, wherein liquid from said inlet means passes through said chamber to said outlet means, and a second position wherein liquid passes from said inlet means into a portion of said chamber and then through said first aperture means into said housing means, through said second aperture means back into said chamber and then to said outlet means, said second aperture means being disposed downstream of said valve support means and said flap valve so as to be in flow communication with said outlet means through said chamber when said flap valve is in either said first or second positions so that any liquid in said housing means will drain from said housing when said housing is located vertically above said chamber and said outlet means.



said valve support means including first wall means defining a first flow path and a portion of said chamber adjacent said first aperture means for directing liquid through said first aperture means into said housing means, and said valve support means including second wall means defining a second flow path in a portion of said chamber remote from said first aperture means and first flow path for directing liquid through said chamber to said outlet means.

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**4,294,281**

**RELIEF VALVE**

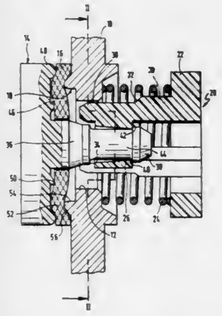
**Theodor Gerdes, Langenfeld, Fed. Rep. of Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Fed. Rep. of Germany**

**Filed Dec. 10, 1979, Ser. No. 101,543**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855290**

**Int. Cl.³ F16K** *15/02*

**U.S. Cl. 137—541** **6 Claims**



1. A relief valve having a wall with a valve aperture therethrough, a valve disc disposed on one side of the wall and adapted to cover the valve aperture, a sealing washer disposed on the valve disc for cooperation with a valve seat surrounding the valve aperture, a holding element moveably connected with the valve disc on the opposite side of said wall therefrom and extending into said valve aperture, a compression spring connected between the wall and a ring about the outer end of the holding element, said holding element having a hub extending into the valve aperture with radially projecting and axially extending parallel ribs circumferentially spaced about the exterior of said hub and formed integrally with said ring, said holding element at said ribs having a smaller diameter than the inside diameter of the valve aperture, and said valve disc and holding element being connected by a head, characterized by

said hub having a central axial opening therethrough of circular cross-section enlarging conically toward the valve disc,

said valve disc being comprised of an inelastic material having a valve stem extending from the disc into the opening of said hub with a diameter of the stem being equal to the smallest diameter of said hub opening and having a head on the stem with a greater diameter than the smallest diameter of said head opening for extension therethrough to bear upon the outer end of the hub.

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**4,294,282**

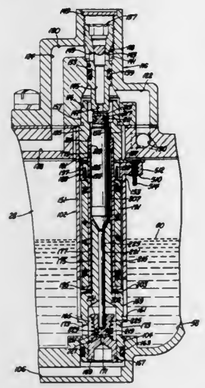
**APPARATUS AND SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE**

**Ralph P. McCabe, Troy, and Keith D. Marsh, St. Clair Shores, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.**

**Filed Jul. 27, 1979, Ser. No. 61,428**

**Int. Cl.³ F16K** *31/06, 11/14*

**U.S. Cl. 137—595** **17 Claims**



1. A valving assembly for variably restricting fluid flow through first and second spaced flow orifice means, comprising housing means, said housing means comprising a first end member, a second end member, said first end member having a first portion for operative connection to associated structure, said second end member having a first portion for operative connection to associated structure, solenoid motor means, said solenoid motor means comprising axially extending spool means, said spool means comprising a generally centrally disposed tubular portion, a solenoid field winding carried by said spool means, axially extending armature means reciprocatingly situated in said tubular portion, a first opening formed through said first end member for permitting the free axial movement of said armature means therethrough, a second opening formed through said second end member for permitting the free axial movement of said armature means therethrough, a first valve member operatively connected to a first axial end of said armature means as to be effective to be juxtaposed to said first flow orifice means, a second valve member operatively connected to a second axial end of said armature means opposite to said first axial end as to be effective to be juxtaposed to said second flow orifice means, said first and second valve members moving in unison with said armature means, resilient means effective for applying to said armature means only that resilient force tending to move said first valve member toward said first flow orifice means and said second valve member away from said second flow orifice means, and sleeve-like bushing means, said bushing means being carried within said first opening of said first end member and effective for slidably receiving said armature means.



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**4,294,283**

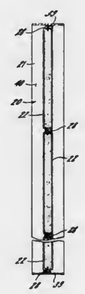
**WEDGE SEALED DAMPER**

**Harry J. Scharres, 10 Gilbert Ave., Clarendon Hills, Ill. 60514**

**Continuation-in-part of Ser. No. 854,591, Nov. 25, 1977, abandoned. This application Nov. 19, 1979, Ser. No. 95,295**

**Int. Cl.³ F16K** *11/14*

**U.S. Cl. 137—601** **6 Claims**



1. A damper assembly comprising, in combination, a generally rectangular frame member including side, top and bottom members, a plurality of damper blades supported at opposite ends in the side member of the frame for limited rotative movement about axes extending longitudinally and substantially along the center line of the blades, a resilient sealing strip supported in each side frame member, the outer surfaces of said sealing strips being convex and extending beyond the interior surfaces of said side frame members, portions of each end of said blades being individually angled to be generally tangential to said convex surface of said sealing strip as said blade approaches the closed position, each of said angled blade end portions wedging against said sealing strip to create a seal when said blades move into the closed position, and said assembly further comprising two washers at each blade end to reduce friction between the ends of said blades and said resilient strips at the rotative axes of said blades.

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**4,294,284**

**FAIL-SAFE, NON-PRESSURE LOCKING GATE VALVE**

**David P. Herd, Kingwood, Tex., assignor to Smith International, Inc., Newport Beach, Calif.**

**Filed Nov. 13, 1979, Ser. No. 93,612**

**Int. Cl.³ F16K** *31/122, 3/00*

**U.S. Cl. 137—613** **2 Claims**

1. A gate valve for operation on a submerged flowline comprising:

a valve housing having a valve chamber, a flow way intersecting said valve chamber, and a stem bore extending from said valve chamber;

a bonnet disposed on said valve housing having an actuator chamber and a bore extending from said actuator chamber into said valve chamber;

a closure member disposed on said valve housing having a bore extension coaxial with said stem bore;

a gate disposed in said valve chamber movable between an open position and a closed position, said gate having gate segments connected to first and second attached stems, said first stem extending through said bonnet bore and into said actuator chamber and said second attached stem extending into said stem bore;

a piston connected to said first attached stem and disposed in said actuator chamber for urging said gate between said open and closed positions;

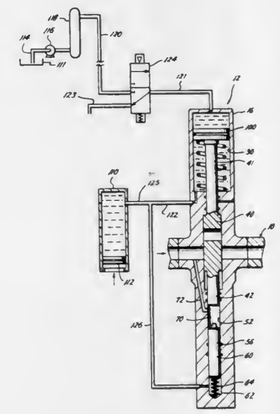
biasing means disposed in said actuator chamber engaging said piston for urging said gate from said open position to said closed position;

a detached stem disposed in said stem bore and extending into said bore extension and movable into engagement with said second attached stem;

seals around said first attached stem, around said second attached stem, and around said detached stem;

spring means disposed in said bore extension and engaging said detached stem;

port means extending from said flow way to said stem bore between said second attached stem and one end of said detached stem;



first means for supplying hydraulic fluid pressure and ambient sea pressure to one side of said piston, said first means applying a force on said piston to move said gate from said closed position to said open position where upon internal valve fluid is displaced from said stem bore through said port means as said second attached stem decreases the fluid volume in said stem bore and said second attached stem engages said detached stem to compress said spring means; and

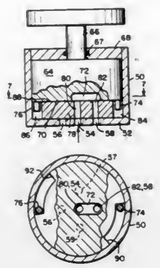
second means for supplying ambient sea pressure to the other end of said detached stem in said bore extension and to the other side of said piston for applying an equivalent opposing force to the ambient sea pressure on said piston, said biasing means applying force to said piston to urge said gate from said open position to said closed position where upon the upstream line pressure assists said biasing means when the upstream line pressure is greater than ambient sea pressure and said detached stem engages said second attached stem when ambient sea pressure is greater than the upstream line pressure, said spring means urging said detached stem toward said second attached stem to overcome the frictional forces of said seals around said detached stem.

**4,294,285**

## MULTI-PORT VALVE

**Larry J. Joslyn, 720 Wilkinson Rd., Macedon, N.Y. 14502**

**Filed Dec. 14, 1978, Ser. No. 969,534**
**Int. Cl.³ F17D** *3/01*
**U.S. Cl. 137—625.11** **5 Claims**



1. A multi-port valve comprising:

(a) a valve housing having an end wall containing at least three fluid outlets and a fluid inlet and said fluid outlets all being spaced apart from each other and being located equi-distant from said fluid inlet;

(b) a cylindrical, rotatably movable valve body positioned in said valve housing, said valve body containing a fluid inlet and a fluid outlet located in one end face thereof and being spaced apart from each other and being in fluid communication with each other, said fluid inlet of said valve body being located on the rotational axis of said valve body; and said fluid inlet of said valve housing also being located on rotational axis of said valve body;

(c) a rotatably movable flow control disc positioned in said housing and located intermediate said one end face of said valve body and said end wall of said valve housing and being in fluid tight contact with said end face and end wall, respectively, and being axially aligned with said cylindrical rotatably movable valve body, said flow control disc including an inlet fluid passage and an outlet fluid passage extending therethrough, said fluid passages being spaced apart from each other the same distance said fluid inlet of said valve housing is spaced apart from each of said fluid outlets of said valve housing, said fluid inlet passage being located on the rotational axis of said valve body and of said flow control disc and being in-line with and in fluid communication with both said fluid inlet of said valve housing and said fluid inlet of said valve body at all relative rotational positions of said valve body and said flow control disc;

(d) means connected to said rotatably movable valve body for rotating said valve body relative to said valve housing and relative to said flow control disc, said valve body and said flow control disc cooperating with each other such that said body can move relative to said disc between a first position wherein said body fluid outlet is in fluid communication with said disc outlet passage, and a second position wherein said body fluid outlet is sealed from said disc outlet passage; and

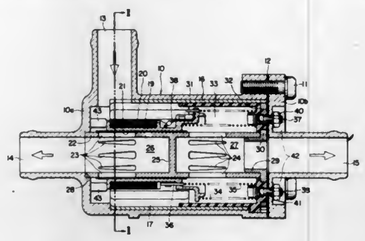
(e) drive means cooperatively interengageable between said valve body and said flow control disc, after said valve body has moved to said second position, for rotatably moving said flow control disc together as a unit with said valve body and relative to said housing, as rotation of said valve body is continued, whereby said fluid outlet passage of said flow control disc can be placed in registry with a selected one of said housing fluid outlets, and the flow of fluid therefrom is accomplished only after said valve body is moved, relative to said disc, back to said first position to place said valve body fluid outlet, said disc outlet and said selected housing outlet into registry.

**4,294,286**

## ELECTROMAGNETICALLY OPERABLE FLUID FLOW CONTROL VALVE MECHANISM

**Takeharu Ohumi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed May 16, 1979, Ser. No. 39,592**
**Claims priority, application Japan, May 16, 1978, 53-58108**
**Int. Cl.³ F16K** *11/07, 31/08*
**U.S. Cl. 137—625.48** **4 Claims**



1. A control valve mechanism comprising a casing having therewithin a valve means, said valve means comprising a linearly movable valve member, an electric motor means comprising a field and an armature to move linearly and operatively connected to the valve member, the electric motor means having a coil of electrically insulated wire surrounding the armature, and the field comprising a pair of arcuate permanent magnets disposed to form a circle surrounding the armature with a magnetic field across the coil, one inlet port, a first outlet port, a second outlet port, a first fluid path connecting the inlet port and the first outlet port, a second fluid path connecting the inlet port and the second outlet port, said valve means being commonly located on both of said fluid paths to control fluid communication therethrough, and spring means normally urging the valve member to a position in which the first fluid path is closed while the second fluid path is opened, the spring means comprising a pair of diametrically different coiled springs in concentric and electrically insulated relation with each other, said springs being respectively connected to both ends of said coil of wire of the armature to provide electric conductive means, wherein said valve means further comprises a tubular guide member, the valve member having a sliding fit on the tubular guide member, and the armature of the electric motor means being of tubular form and firmly surrounding the valve member to move together as a unit.

**4,294,287**

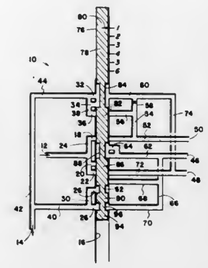
## SHIFTING VALVE

**William C. Boswell, 420 E. 2nd, Tulsa, Okla. 74120**

**Continuation of Ser. No. 945,398, Sep. 25, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 111,902**
**Int. Cl.³ F15B** *13/06*
**U.S. Cl. 137—625.69** **7 Claims**

2. A shifting valve for a multiple position transmission having multiple modes of operation and comprising valve body means having a pressure fluid inlet and a pressure fluid outlet provided therein, both said fluid inlet and fluid outlet being in communication with a pressure fluid source to provide for circulation of pressure fluid to and from the pressure fluid source through the valve, a bore provided in the valve body means and in communication with the fluid inlet and fluid outlet, a unitary shifting element slidably disposed within said bore and movable between definite preselected positions therein, a first multi-passageway array provided in said valve body means providing said communication between the fluid inlet and the bore for directing the pressure fluid into the bore, second and third multi-passageway arrays provided in said valve body means providing said communication between the bore and the fluid outlet for discharging pressure fluid from the bore, a plurality of independently isolated actuator outlets provided in the valve body means, each of said actuator outlets being in operable communication with the transmission for actuation thereof upon pressurization of the actuator outlets, a plurality of multi-passageway arrays provided in the valve body means interconnecting each actuator outlet with the bore whereby the pressure fluid may be selectively directed to and withdrawn from each actuator outlet upon the selective positioning of the shifting element within the bore, said shifting element being provided with a plurality of spaced lands and recesses on the outer periphery thereof cooperating with the





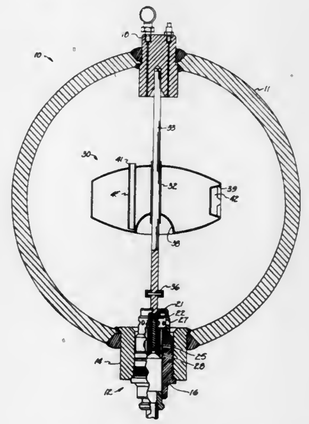
bore and the multi-passageway arrays for opening and closing the arrays whereby pressure fluid is directed to the actuator outlets in a manner providing a single operational mode for the transmission at a time and for withdrawing the pressure fluid from the actuator outlets which are not pressurized, said shifting element being movable to said definite preselected positions therefor for connecting each actuator outlet with the fluid inlet for pressurization of each actuator outlet in two separate preselected positions of the shifting element, each different pressurization of each independent actuator outlet providing pressure fluid to the transmission to produce differing modes of operation therefor.

**4,294,288**

## ACCUMULATOR WITH FLOAT ORIENTING MEANS

**Rajam R. Murthy, Houston, Tex., assignor to Koomey, Inc., Houston, Tex.**

**Filed Feb. 25, 1980, Ser. No. 124,136**
**Int. Cl.³ F16L** *55/04*
**U.S. Cl. 138—30** **5 Claims**



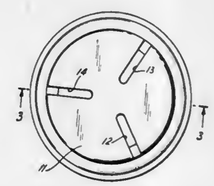
1. In a guided-float accumulator comprising a vessel in the shape of a sphere or cylinder adapted to contain high fluid pressures, a mouth at the bottom of the vessel, fluid outlet means associated with the mouth for connection of the vessel and its content to a hydraulic system such as used in an oil well blowout preventer, a normally open shut-off valve associated with the mouth in series with the fluid outlet means, and a vented float movable in the vessel along transversely centered normally vertically extending guide means according to the level of the liquid fill within the vessel to thereby close off the shut-off valve and prevent the escape of pressurized gas from the ullage space of the vessel into the hydraulic system proper as the liquid fill within the vessel approaches exhaustion, the improvement which comprises provision of a vent outlet for the float and a ballast weight for the float with the vent outlet and ballast weight on opposite sides of the center of said normally vertically extending guide means, said float being mounted for free turning around said center whereby whatever the degree of liquid fill of the vessel, sidewise tilting of the vessel so as to move the normally vertically extending guide means toward a horizontal position will be accompanied by rotation of the vent outlet to the then-high side of said center of said normally vertically extending guide means to keep the vent outlet above the liquid fill and maintain the float directly vented to the ullage space of the vessel.

**4,294,289**

## FLOW CONTROL DEVICE

**Armin O. Fischer, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.**

**Filed Jan. 24, 1980, Ser. No. 114,818**
**Int. Cl.³ F15D** *1/02*
**U.S. Cl. 138—44** **2 Claims**



1. A flow restrictor comprising a disc having a recessed downstream side and a boss formed on the upstream side thereof to form a rim, the upstream surface of said boss being flat, said boss having at least one slot formed therein, the upstream opening of said slot having a respective width that is substantially smaller than the length of said opening, said width being very narrow to prevent foreign matter from entering said slot, said slot having sides within the device, said slot having an aperture formed therein to permit fluid communication between said upstream and downstream disc sides, said aperture at said downstream side being at no point narrower than the narrowest portion of said upstream slot width, and the upstream side of the slot having leading edges that are substantially longer than those of said aperture due to a portion of the slot being obstructed by said rim.

**4,294,290**

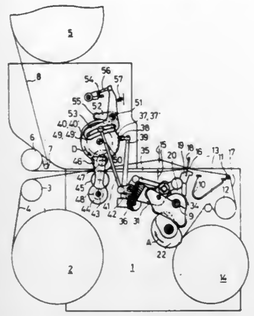
## PROCESS AND LOOM FOR THE PRODUCTION OF PILE FABRICS

**Erhard Freisler, Bubikon, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland**

**Filed Jun. 20, 1979, Ser. No. 50,167**
**Claims priority, application Switzerland, Jun. 30, 1978, 7153/78**
**Int. Cl.³ D03D** *39/22, 49/06*
**U.S. Cl. 139—26** **21 Claims**

1. A process of producing pile fabric with pile or terry loops

of constant height, on a loom having a pile-warp beam, a ground-warp beam and a batten the stroke of which in operation is shortened periodically from the value corresponding to a full beating-up of the batten by a value for partial beatings



referred to as the pre-beating distance, characterized by the fact that during the weaving process the pre-beating distance is decreased or increased upon variations in the tension of the pile warp.

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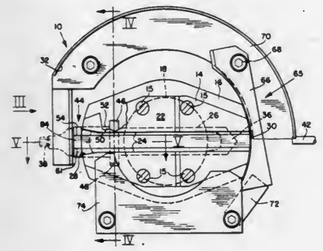
**4,294,291**

## SHUTTLE RETAINING APPARATUS

**Philip A. Nims, Charlotte, and Roger K. Bollinger, Gastonia, both of N.C., assignors to Crompton & Knowles Corporation, New York, N.Y.**

**Filed May 15, 1980, Ser. No. 150,273**
**Int. Cl.³ D03D *47/24***
**U.S. Cl. 139—438** **9 Claims**



1. Shuttle control apparatus for looms having a shuttle box rotatable 180° from a first position for allowing the shuttle to be picked out of the shuttle box, means for checking the shuttle when it enters the shuttle box, means for positioning the shuttle within the shuttle box to a predetermined picking position when the shuttle box is in its first position and means for picking the shuttle when the shuttle box is in its second position, said shuttle control apparatus comprising:

(a) means for guiding the shuttle as it moves from the first position to the second position to maintain the shuttle in said predetermined picking position within the shuttle box;

(b) a shuttle brake normally disposed in a non-braking mode and operable to a braking mode for engaging the shuttle and maintaining the shuttle in the predetermined picking position; and

(c) brake actuating means for operating the shuttle brake to the braking mode when the shuttle box is in its second position, said actuating means being effective to cause the shuttle brake to apply a braking force to the shuttle which is sufficient to maintain the shuttle in said predetermined picking position and insufficient to prevent the shuttle from being picked.

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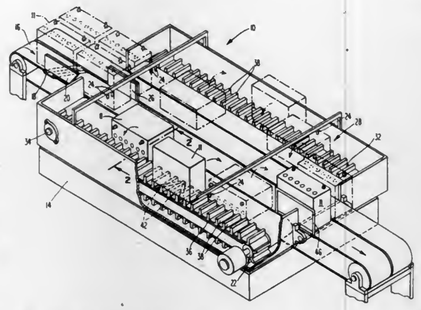
**4,294,292**

## TUMBLE DUMPER

**William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.**

**Filed Nov. 1, 1979, Ser. No. 90,477**
**Int. Cl.³ B65B *21/08***
**U.S. Cl. 141—1** **22 Claims**



9. The method of actively removing electrolyte from lead-acid storage batteries having filling holes defined in a top surface thereof comprising:

(a) carrying the batteries into an automatic apparatus;

(b) inverting said batteries over a receiver tank;

(c) jostling the batteries so that all of the electrolyte therein is actively removed; and

(d) righting the batteries so that they may be carried out of the machine for further processing.

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**4,294,293**

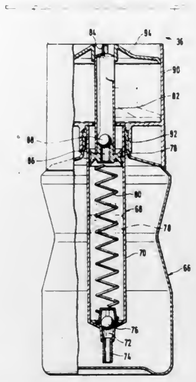
## METHOD OF MIXING COSMETIC MULTI-COMPONENT PREPARATIONS AND SET OF APPARATUS FOR THE PRACTICE OF THE METHOD

**Heribert Lorenz, Gross-Bieberau, and Jürgen Tennigkeit, Seeheim, both of Fed. Rep. of Germany, assignors to Goldwell GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany**

**Filed Jun. 22, 1979, Ser. No. 51,035**
**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827610**
**Int. Cl.³ B01F *15/02*; B65B *3/10***
**U.S. Cl. 141—100** **21 Claims**

1. A set of apparatus comprising:

a first supply container for a liquid first preparation component and having a dispensing orifice, a piston pump adapted to be inserted into said dispensing orifice and having a piston, and a plunger connected to said piston, a spring biasing said piston to an outer position of maximum stroke volume in which said plunger protrudes from said first supply container by the length of the piston stroke and adapted to be displaced by pressure on said plunger against the action of said spring towards the interior of said first container by the length of the piston stroke, said piston pump also having a suction connection adapted to be immersed in the preparation component when contained in the supply container and also having a discharge connection, a mixing container for receiving and mixing of a multi-component preparation and having a self-closing bottom valve and a pedestal, said discharge connection adapted to be sealingly connected to said self-closing bottom valve, a guiding housing open at the top, annularly surrounding the plunger and adapted to be disposed on said first supply container, the free cross-section of said guide housing conforming to the outer cross-sectional dimensions of said pedestal and guiding the pedestal upon the depression of the plunger, such that the discharge connection of the pump is adapted to be aligned with the bottom valve of the mixing container, a pressure container, a second supply container being disposed in said pressure container and being volume-variable and adapted to be filled with an additional paste or liquid preparation component, an external dispensing valve in communication with said second supply container, the capacity of said second supply container being smaller than the capacity of the pressure container, the space remaining between the second supply container and the inside walls of the pressure container being filled with a propellant under pressure, said dispensing valve being adapted to be sealingly connected to the bottom valve of said mixing container.



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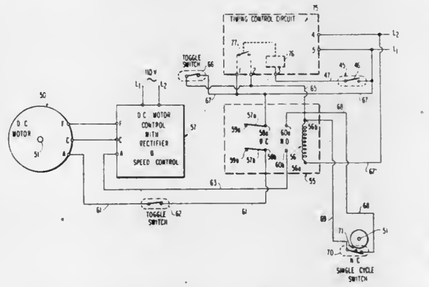
**4,294,294**

## CONTROL SYSTEM FOR FILLING MACHINE

**Richard N. Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.**

**Filed Feb. 7, 1980, Ser. No. 119,317**
**Int. Cl.³ B65B *43/56***
**U.S. Cl. 141—179** **9 Claims**



1. A control system for a filling machine having filling means operatively connected with nozzle means for simultaneously filling a number of containers corresponding to the number of nozzle means at the filling station, support means for the nozzle means operable to lower and raise the nozzle means into and out of the containers in timed relationship to the filling operation during a given cycle, and control means for controlling the operation of the filling machine including means for actuating the filling means to cause discharge of the product to be filled while the nozzle means are in the containers, means for selectively lowering and raising the nozzle support means in timed relationship to the operation of the filling machine, indexing means with star-wheel means for indexing a predetermined number of containers to be filled at the same time during a given cycle of operation, means for stopping the star-wheel means after a predetermined number of containers are indexed for a given filling operation, and release means for releasing the stop means after completion of a filling operation to permit the filled containers to be removed from the filling station and to permit a predetermined number of containers to be brought to the filling station before the star-wheel means is again stopped by said stop means, characterized by further means operated by movement of the star-wheel means after release thereof by said release means for taking over control of the operation of the filling machine until said star-wheel means again reaches a position thereof indicative of the arrival at the filling station of the predetermined number of containers to be filled during the next cycle of operation.

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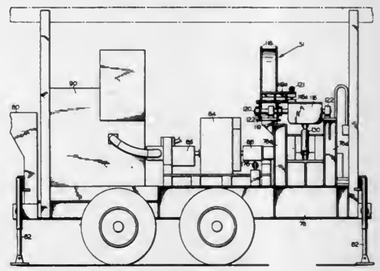
**4,294,295**

## APPARATUS FOR CUTTING AND SPLITTING FIREWOOD

**C. Howard Olin, Tigard, Oreg., assignor to Bloomfield Farms, Inc., Los Altos, Calif.**

**Filed Sep. 25, 1978, Ser. No. 945,464**
**Int. Cl.³ B27L *7/00***
**U.S. Cl. 144—3 K** **14 Claims**



1. Firewood splitting apparatus, comprising:

(a) a frame,

(b) block splitter means on the frame,

(c) ram means on the frame arranged for axial movement toward and away from the splitter means for moving a block toward the splitter means, and

(d) block centering means on the frame comprising upper and lower centering pans arranged to receive a block between them and movable vertically to position the block between the splitter means and the ram means.

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**4,294,296**

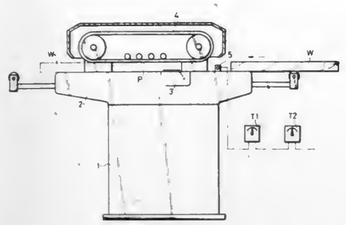
## CARPENTER PLANER

**Hirotsuga Onda, Seki, Japan, assignor to Onda Ironworks Company, Limited, Gifu, Japan**

**Filed Sep. 21, 1979, Ser. No. 78,312**
**Int. Cl.³ B27C *1/12***
**U.S. Cl. 144—120** **6 Claims**

1. A carpenter planer comprising a planer base, a stock feeding table provided on the planer base, a stock feeding unit connected to and situated above the stock feeding table and spaced therefrom, said stock feeding unit having an endless belt and a reversible motor for rotating the endless belt back and forth, a planer blade situated in the stock feeding table and slightly projecting therefrom, detecting means for detecting passage of stock moved on the stock feeding table by the endless belt of the stock feeding unit, and timing means actu-

ated by said detecting means, said timing means controlling the motor so that after the stock is completely passed over the



planer blade, the motor is stopped and then the motor is reversely actuated to return the stock to a first position.

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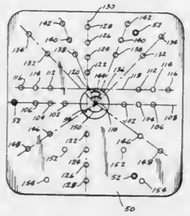
**4,294,297**

## ROUTER GUIDE APPARATUS AND METHOD

**Vincent C. Kieffer, 411 Highland Dr., Gretna, Nebr. 68028**

**Filed Apr. 11, 1979, Ser. No. 28,985**
**Int. Cl.³ B27C** *5/10*
**U.S. Cl. 144—134 D** **18 Claims**



1. An apparatus for guiding a router relative to a guide surface on a workpiece, said router having a rotatable bit protruding from the underside thereof, comprising,

a pair of guide pins,

means for securing the guide pins to the underside of said router at positions spaced apart from one another and radially spaced from the bit,

said guide pins protruding from the underside of said router for continuous engagement with said guide surface as the router is advanced along the workpiece,

said means for securing the guide pins comprising a subbase plate having a tool opening and a plurality of guide pin openings adapted to receive said guide pins and means for securing said subbase plate to the underside of the router with said tool opening positioned for protrusion of said bit through the center thereof,

said guide pin openings including a plurality of pairs of guide pin holes aligned along a line disposed in nonintersecting relation to the center of said tool opening, the holes of each pair being equidistant from the point of intersection of said line and another line perpendicular thereto and passing through the center of said tool opening.

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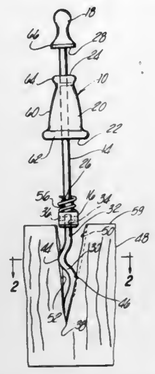
**4,294,298**

## IMPACT CUTTING TOOL

**Otho M. Otte, Jr., 719 Avenue "A", Apt. 705 ID, Springfield, Mich. 49017**

**Filed Mar. 1, 1979, Ser. No. 16,392**
**Int. Cl.³ B27L** *7/00*
**U.S. Cl. 144—193 C** **12 Claims**

1. An impact tool for splitting logs comprising; an elongated guide member, a primary anvil formed at one end of said guide member, a hammer element mounted on said guide member for sliding movement on said guide member and having an impact surface engageable with said anvil, a tool supported from said anvil and extending generally axially of said guide member, said tool including a curved cutting edge in spaced relation of said anvil, wedge means formed by said tool between said anvil



and said cutting edge to engage wood and widen the split initiated by said cutting edge, said wedge means being formed by a tool portion disposed to one side of the axis of said guide member and having a guide surface conforming to the shape of said curved cutting edge and operable to engage and be guided by the wood path cut by said cutting edge.

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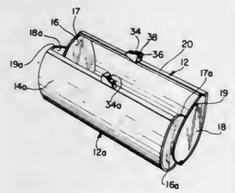
**4,294,299**

## HANDBAG CONSTRUCTION

**Mac Dorsen, Scarsdale, and Philip A. Saltzman, Brooklyn, both of N.Y., assignors to Stupell Industries, Ltd., Johnston, R.I.**

**Filed Feb. 12, 1980, Ser. No. 120,936**
**Int. Cl.³ A45C** *3/06*
**U.S. Cl. 150—28 R** **9 Claims**



1. A case adapted for movement between open and closed positions, such as a handbag and the like, comprising a pair of identically configured shells, each said shell including an open inwardly concave body having first and second opposed parallel upright end walls inwardly extending therefrom and further terminating in upper and lower edges extending between said end walls, each of said end walls having a face essentially corresponding in planar configuration to that of the end configuration of the case when disposed in its closed position, said lower edges including inwardly extending hinge means defining a longitudinal hinge line, said shells adapted for connection with each other along said hinge line with said concave shell bodies opposed and pivotable away from and towards each other about said hinge line between said open and closed case positions, respectively, with the first end wall of one shell and the second end wall of the other shell overlapped in slidable, generally face to face contacting relationship with the first end wall of said one shell disposed inwardly of the second end wall of the other shell at one end of the case and the second end wall of said one shell disposed outwardly of the first end wall of the other shell at the other case end.

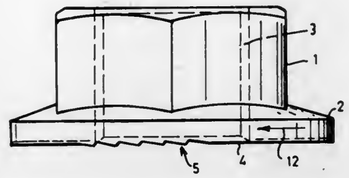


**4,294,300**

## SELF-LOCKING FASTENER

**Johannes E. Bouwman, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands**

**Filed Jan. 9, 1979, Ser. No. 2,229**
**Claims priority, application Netherlands, Jan. 13, 1978, 7800432**
**Int. Cl.³ F16B** *39/282*
**U.S. Cl. 411—185** **5 Claims**



1. A self-locking threaded fastener having a planar rigid bearing surface with a plurality of elongated teeth thereon, characterized in that the teeth are located in a plurality of groups, in that the teeth in each group extend parallel with each other and to a tangent to the threads of the fastener, in that the height of the teeth are the same over the entire length of the teeth and in that the teeth extend above said bearing surface with the roots of the teeth being disposed below said surface.

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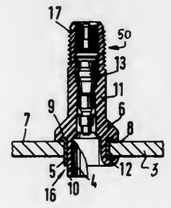
**4,294,301**

## VALVE CONSTRUCTION FOR TUBELESS TIRE

**Sepp Lutz, Giengen, Fed. Rep. of Germany, assignor to Alligator Ventilfabrik GmbH, Fed. Rep. of Germany**

**Continuation of Ser. No. 819,991, Jul. 28, 1977, abandoned. This application Jan. 2, 1980, Ser. No. 109,073**
**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634153**
**Int. Cl.³ B60C** *29/00*
**U.S. Cl. 152—427** **5 Claims**



1. A valve for the bore in a tire rim of a tubeless tire comprising:

a tubular metal valve body having a passage communicating with the interior of the tubeless tire;

a valve core movable in the passage to block a flow of air therethrough out of the interior of the tubeless tire;

said valve body having, a rim surface engagement flange extending radially outwardly of the rim bore and bearing on one side of the rim adjacent the rim bore for fixing said valve body in one direction in the rim bore, a deformable tubular portion permanently deformed from an axial position to a radially outwardly extending position and bearing on an opposite side of the rim adjacent the bore to fix the valve body in an opposite direction, and a sleeve extending through the bore and connecting said deformed tubular portion and said engagement flange, the spacing between said flange and said deformed tubular portion being approximately equal to the length of the rim bore;

said deformed tubular portion comprising an initially annular tubular portion extending axially with a remainder of said valve body which is deformed downwardly against an outer surface of the rim adjacent the rim bore; and

a soft material lining the outer diameter of which is initially approximately equal in diameter to the diameter of the rim bore, disposed and compressed between the rim bore and said valve body sleeve for establishing an air-tight seal between said valve body and the rim, ends of said soft material lining at opposite ends of the rim bore being bent over by said flange and said deformed tubular portion and pressed into engagement with the one and the opposite side of the rim adjacent the rim bore.

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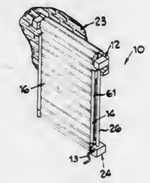
**4,294,302**

## SHUTTER AND AWNING DEVICE

**Cyril T. Ricke, Sr., Itasca, Ill., assignor to Security Shutter Corp., Venice, Fla.**

**Continuation of Ser. No. 528,482, Nov. 29, 1974, abandoned, which is a continuation of Ser. No. 313,563, Dec. 13, 1972, abandoned. This application Aug. 14, 1980, Ser. No. 178,038**
**The portion of the term of this patent subsequent to Aug. 13, 1993, has been disclaimed.**
**Int. Cl.³ E06B** *9/08*
**U.S. Cl. 160—133** **10 Claims**



1. A protective shutter device for an opening in a wall or the like comprising an articulated curtain made of a plurality of identical interlocked elongated rigid slats each assembled hingedly relative to an adjoining slat and each having a rod-like integral projection extending along an edge thereof and a socket-like integral portion extending along the other edge thereof whereby said plurality of slats are assembled together by sliding the rod-like projection along an edge of a slat through the socket-like edge portion of another slat, a pair of guide frame members each mounted on one side of said articulated curtain and having a groove slidably receiving an end of each of said slats, and a drive mechanism for raising and lowering said articulated curtain, said drive mechanism comprising a shaft having an axis of rotation disposed substantially parallel to the longitudinal axis of said slats, means rotatably supporting said shaft at the top of said opening, at least a pair of lugs mounted on said shaft and extending radially from said shaft, means attaching one of said slats disposed at an end of said articulated curtain to one of said lugs whereby rotation of said shaft in one direction causes said articulated curtain to be raised and said slats to be wound around said shaft in spaced apart relationship from said shaft, gear drive means driving said shaft in said one direction for raising said articulated curtain and in an opposite direction for lowering said articulated curtain, and gear drive locking means for controllably locking said gear drive means against rotation when not in operation for raising and lowering said articulated curtain.

**4,294,303**

## SAND CORE PATTERN AND METHOD OF FORMING A SAND MOLD

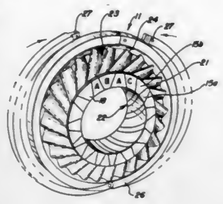
**Edward E. Flesburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US80/00268, § 371 Date Mar. 13, 1980, § 102(e) Date Mar. 13, 1980, Pub. No. WO81/02536, Pub. Date Sep. 17, 1981**

**PCT Filed Mar. 13, 1980, Ser. No. 195,719**

**Int. Cl.³ B22C *7/00, 9/02***

**U.S. Cl. 164—44** **30 Claims**



1. A reusable pattern (**11**) for forming a sand mold for casting a one-piece wheel (**10**) having a radially inner, annular shell (**12**), a coaxial radially outer, annular blade support (**13**) and a plurality of angled blades (**14**) extending in a spaced annular array (**22**) between said shell and blade support to define a fluid flow deflector, said pattern comprising:

a plurality of segments (**15**) each having a first end portion (**18**) defining a segmentally annular portion of the profile of the shell, and a second end portion (**21**) defining the profile of a single blade;

means (**25**) for supporting the segments in an annular array (**22**) to cause said segments to define cumulatively a pattern structure corresponding to the annular shell configuration and the blade of said wheel; and

a removable outer ring (**26**) encircling said array of segments to define a pattern (**11**) for the blade support (**13**).

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**4,294,304**

## ELECTROMAGNETIC CENTRIFUGING INDUCTOR FOR ROTATING A MOLTEN METAL ABOUT ITS CASTING AXIS

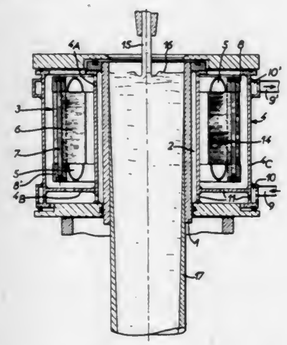
**Jean Delassus, Montmorency, France, assignor to CEM - Compagnie Electro-Mecanique, Paris, France**

**Filed May 31, 1977, Ser. No. 802,128**

**Claims priority, application France, Jun. 14, 1976, 76 17919**

**Int. Cl.³ B22D *27/02***

**U.S. Cl. 164—504** **2 Claims**



1. Apparatus for producing rotation of a molten metal body about its axis while it is being cast to create a centrifuging effect comprising a casting conduit, an annular tank filled with a fluid coolant surrounding said casting conduit, an annular electromagnetic centrifuging inductor structure mounted within said tank, said inductor structure comprising an annular core body of a magnetic material provided with six uniformly circumferentially spaced teeth projecting in a radially inward direction towards a center coincident with the casting axis, arcuate coils mounted respectively on each of said teeth for energization from a three-phase a.c. source, there being two coils provided for each phase which are mounted on two diametrically opposite teeth and are electrically connected such that their generated magnetic fluxes are additive and bi-polar.

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**4,294,305**

## ROLL GAP MEASURING DEVICE FOR CONTINUOUS CASTING MACHINE

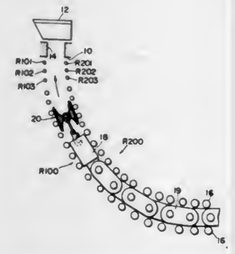
**Kenichi Oda, Tokyo, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan**

**Continuation of Ser. No. 954,437, Oct. 25, 1978, abandoned.**

**This application Mar. 14, 1980, Ser. No. 130,465**

**Int. Cl.³ B22D *11/00, 2/00***

**U.S. Cl. 164—150** **8 Claims**



1. A roll gap measuring device for continuous casting machines wherein said measuring device comprises:

guide means travelling between facing rolls of the continuous casting machine, said guide means comprising a pair of opposing skids and leaf springs coupled to said skids biasing said skids in contact with facing rolls;

at least one leaf coupling said guide means to a dummy bar head;

a pair of measuring elements supported by said guide means relatively movable and both of which having outer end surfaces each formed into a circular arc, the distance between the central points of outer end surfaces of each pair of measuring elements is a preset value approximately equal to a gap between the facing rolls;

biasing means for biasing said measuring element in the direction separating from each other so as to bring them into contact with the outer peripheries of separate rolls, respectively; and

a transducer for measuring the displacement of said measuring elements, whereby said roll gap measuring device, travelling between said rolls, measures the gaps.

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**4,294,306**

## WITHDRAWAL ROLL UNIT FOR HORIZONTAL CONTINUOUS BILLET CASTING MACHINES

**Alexandr D. Berenov, ulitsa Krasnykh Bortsov, 7-a, kv. 18; Vladislav P. Krainev, ulitsa Lunacharskogo, 210-a, kv. 24; Midkhat M. Mansurov, ulitsa Izbiratelei, 7, kv. 23; Vitaly M. Niskovskikh, ulitsa Kultury, 8, kv. 8, and Evgeny L. Silin, ulitsa Kultury, 22, kv. 9, all of Sverdlovsk, U.S.S.R.**

**Filed Sep. 14, 1979, Ser. No. 75,712**

**Int. Cl.³ B22D *11/00, 29/00; B65G 13/11***

**U.S. Cl. 164—448** **2 Claims**

1. A roll unit for withdrawing billets from a horizontal continuous billet casting machine comprising:

a cage rotatable about an axis of a billet being withdrawn;

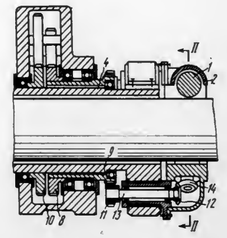


means operative during withdrawal of a billet for associated with said cage and being rotating said cage about said axis;

a plurality of withdrawal rolls having coplanar axes of rotation located in a plane perpendicular to said billet axis;

means associated with said rollers for driving said rollers;

a plurality of housings, each of said housings at least partially encompassing and rotatably supporting ends of one of said withdrawal rolls;



means associated with said cage and housings for connecting corresponding first ends of each of said housings to said cage; and

means comprising an elastic element associated with each of said housings for connecting confronting ends of said housings in series one to another to form a closed system about the axis of the billet.

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**4,294,307**

## SUPPORTING AND GUIDING STAND ARRANGEMENT TO BE USED IN A BOW-TYPE CONTINUOUS CASTING PLANT

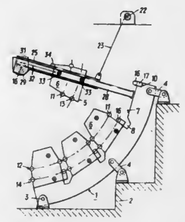
**Horst Wiesinger, and Werner Scheurecker, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria**

**Filed Feb. 4, 1980, Ser. No. 118,657**

**Claims priority, application Austria, Mar. 8, 1979, 1762/79**

**Int. Cl.³ B22D *11/128***

**U.S. Cl. 164—448** **7 Claims**



1. In a supporting and guiding stand arrangement to be used in a bow-type continuous casting plant and of the type including a carrying frame, a plurality of exchangeable supporting segments arranged along a circular arc and supported on said carrying frame, and strand guiding means with an outer guideway and an inner guideway arranged opposite each other and formed by rollers arranged at a distance from one another, which rollers are mounted in said supporting segments, a pivoting lever including means for seizing and extracting individual supporting segments mounted in the center of said circular arc, the length of said pivoting lever being shorter than the radial distance from the center to the supporting segments, the improvement which comprises telescopically extendable and retractable guide rails provided on said pivoting lever, means for moving said guide rails to and from a position adjacent said strand guiding means whereby said guide rails are disposed for engaging a supporting segment in a fork-like manner after having been extended and thus moved into the strand guiding means, counter guides being fastened on the supporting segment, said counter guides coming into engagement with said guide rails during their extension, said seizing and extracting means adapted to seize the respective supporting segment and move it along said guide rails from its installed position to its extracted position.

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**4,294,308**

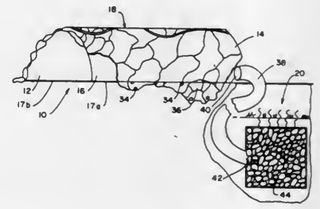
## METHOD AND ASSEMBLY FOR CAMOUFLAGING AT LEAST ONE BUILDING

**Joseph Spanier, and Florence Spanier, both of 27 Indian Rock Ct., San Anselmo, Calif. 94960**

**Filed Feb. 9, 1979, Ser. No. 10,889**

**Int. Cl.³ F24H *3/00*; B64F *1/00***

**U.S. Cl. 165—1** **7 Claims**



1. In a technique for camouflaging a building containing a heat generating apparatus therein, an arrangement for preventing discovery of said building as a result of the heat generated by said apparatus, said arrangement comprising means including a passageway for diverting said heat from said apparatus within said building to a remote location, said passageway extending from said building to said remote location, at least a substantial section of said passageway being thermally insulated sufficient to prevent heat within said passageway section generated by said apparatus from being detected above ground level.

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**4,294,309**

## METHOD OF CONTROLLING THE HEATING OF A CHAMBER AND A CONTROLLED CHAMBER-HEATING INSTALLATION

**Pierre Godard, Tremblay les Gonesse, and Michel Billot, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France**

**Filed Nov. 5, 1979, Ser. No. 91,100**

**Claims priority, application France, Nov. 16, 1978, 78 32373**

**Int. Cl.³ F24D *11/00***

**U.S. Cl. 165—18** **3 Claims**

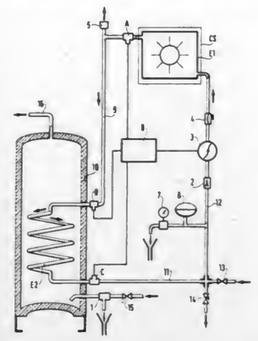
1. A method for controlling the heating of at least one heat storage chamber by means of a heat-conveying fluid, the method comprising:

providing a fluid circuit which includes a heat source, a heat storage chamber and controllable means for ensuring the circulation of a heat-conveying fluid from the heat source and through the heat storage chamber;

sensing the temperature $t_A$ of the heat-conveying fluid at its outlet from the heat source, the temperature $t_B$ of the heat-conveying fluid at its inlet to the heat storage chamber, and the temperature $t_C$ of the heat-conveying fluid at its outlet from the heat storage chamber; and

controlling said controllable means to ensure that the heat-conveying fluid circulates from the heat source and through the heat storage chamber when $t_A$ is greater than $t_B + Dt$, and that the fluid stops circulating, at least

through the heat storage chamber, when $t_A$ is less than $t_B+Dt$, where Dt is a temperature offset having a value



which varies inversely with the value of the difference $t_B-t_C$.

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**4,294,310**

## METHOD FOR CHARGING AND DISCHARGING A LATENT-HEAT STORAGE MEDIUM AND HEAT STORAGE

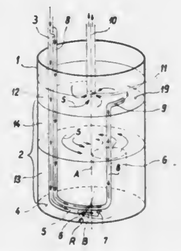
**Heinz Reusch, Höxter, and Robert Kreikenbohm, Stadtoldendorf, both of Fed. Rep. of Germany, assignors to Stiebel Eltron GmbH & Co. KG, Holzmindel, Fed. Rep. of Germany**

**Filed Oct. 6, 1978, Ser. No. 949,026**

**Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745492; Jul. 17, 1978, 2831325**

**Int. Cl.³ F28D** *21/00*

**U.S. Cl. 165—104.13** **7 Claims**



1. Heat storage unit for charging and discharging a latent-heat storage medium by a heat carrier liquid not miscible with it and flowing through the storage medium from the bottom upwardly and collecting on top, comprising: a latent-heat storage medium accommodated in a container, conduit means carrying heat carrier liquid and discharging at the bottom into the container, said container comprising a cylinder with a vertical axis, said conduit means having an exit nozzle located outside the axial center of said container and with an exit direction substantially in a horizontal direction and substantially perpendicular to the radius of the container, said conduit means conducting said heat carrier liquid and charging and discharging said container, the heat carrier liquid being introduced in such a direction and through such an entry cross section into said storage medium that in the melt of the storage medium a flow with a horizontal flow component is built up and the melt is set into a rotary motion by the horizontal flow component, rotary motion of the melt being set by the flowing motion of said heat carrier liquid, at least two conduits being provided with exit nozzles, and a sheet metal deflector arranged ahead of said exit nozzles.

**4,294,311**

## METHOD OF AND ARRANGEMENT FOR THE SEASONAL STORAGE AND USE OF HOT WATER PRODUCED IN PARTICULAR BY ELECTRICAL POWER-GENERATING THERMAL AND NUCLEAR STATIONS

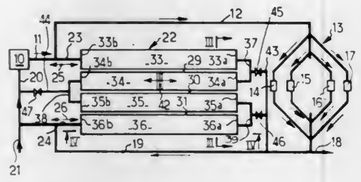
**Louis H. D. Denis, Puteaux-Bellini; Abel J. H. Bedue, Versailles, and Jacques Malherbaud, Chatou, all of France, assignors to Compagnie Francaise d'Etudes et de Construction Technip, Rueil-Malmaison, France**

**Division of Ser. No. 668,000, Mar. 18, 1976, Pat. No. 4,159,736. This application Oct. 20, 1978, Ser. No. 952,944**

**Claims priority, application France, Mar. 20, 1975, 75 08747; Jun. 19, 1975, 75 19253; Aug. 27, 1975, 75 26419**

**Int. Cl.³ F28D** *13/00;* **F24H** *7/00*

**U.S. Cl. 165—104.14** **32 Claims**



1. A large-capacity tank for seasonal storage of hot water, produced for example by electric power generating thermal and nuclear stations, and for their seasonal use, for example for the heating of buildings, comprising:

a basin of large surface area;

partition walls provided in said basin dividing said basin into a plurality of distinct elongated storage zones, each elongated storage zone having two separated ends;

first means coupled to one end of each of said elongated storage zones for supplying and recovering hot water stored in said elongated storage zones;

second means coupled to the other end of each of said elongated storage zones for supplying and recovering cold water stored in said elongated storage zones; and

means coupled to said first and second means for controlling the flows of water such that an instantaneous supply of hot water at one end of one of said elongated storage zones is balanced by a corresponding drawing off of cold water at the other end of another of said elongated storage zones, and such that an instantaneous drawing off of hot water at one end of said one elongated storage zone is balanced by a corresponding supply of cold water at the other end of said another elongated storage zone, said one and another elongated storage zones providing together a substantially constant body of storage water.

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**4,294,312**

## TUBE-BUNDLE HEAT EXCHANGER FOR COOLING A MEDIUM HAVING A HIGH INLET TEMPERATURE

**Wolfgang Kehrer, and Helmut Lachmann, both of Berlin, Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany**

**Filed Apr. 18, 1980, Ser. No. 141,327**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945844**

**Int. Cl.³ F28F** *9/22*

**U.S. Cl. 165—134 R** **4 Claims**

1. A tube-bundle heat exchanger, for cooling a medium having a high inlet temperature, which comprises:

a shell having an inlet, inlet chamber, and outlet for said medium to be cooled, an inlet and outlet for cooling medium, and a reversing chamber, for medium to be cooled, at that end of said shell remote from said inlet chamber;

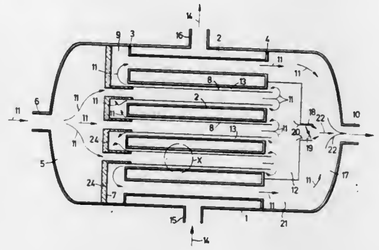


an inlet tube bottom and an outlet tube bottom supported at least in part by said shell;

a plurality of tubes, the ends of which are respectively fastened to and connect said inlet and outlet tube bottoms, said medium to be cooled flowing through said tubes;

an intermediate tube bottom supported at least in part by said shell and located in said inlet chamber in such a way as to form an intermediate chamber between said inlet tube bottom and said intermediate tube bottom; and

insert tubes respectively connected to said intermediate tube bottom and located concentrically in at least some of said tubes and projecting out on both sides from respective tubes, those ends of said insert tubes remote from said inlet chamber being sealingly covered by said reversing chamber, said insert tubes being spaced from respective tubes to



form annular spaces therebetween, said annular spaces, toward said inlet chamber, opening into said intermediate chamber, and, in the opposite direction, opening into said reversing chamber;

only those tubes located in a concentric circle with respect to the cross section of said shell including insert tubes, and said shell including an outlet chamber, for cooled-off medium, which concentrically surrounds said reversing chamber in such a way that an annular chamber of circular cross section is formed around said reversing chamber between it and said shell, those tubes present in said annular chamber externally of said reversing chamber not including insert tubes and having a direct connection between said intermediate chamber and said outlet chamber with said outlet for cooled-off medium.

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**4,294,313**

## KICKOVER TOOL

**Harry E. Schwegman, deceased, late of Dallas County, Tex. (by M. J. Whitfield for First National Bank in Dallas, executor), assignor to Otis Engineering Corporation, Dallas, Tex.**

**Continuation-in-part of Ser. No. 384,520, Aug. 1, 1973, abandoned. This application Jul. 24, 1974, Ser. No. 490,557**

**Int. Cl.³ E21B** *43/12*

**U.S. Cl. 166—117.5** **74 Claims**

1. A kickover tool for installing a device in the side pocket of a side pocket mandrel in a well tubing having a shoulder therein, comprising:

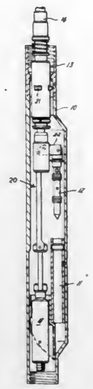
an elongated body;

actuator means arranged in telescopic relationship with said body and movable longitudinally relative thereto;

pivot arm means carried by one and positively connected to the other of said body and said actuator means and movable from a retracted position of longitudinal alignment with said body to an extended position laterally outwardly of said body upon relative longitudinal movement between said body and said actuator means;

releasable latching means initially engageable with said actuator means and said body means for preventing relative longitudinal movement between said body and said actuator means; and

means on said body operatively associated with said releasable latching means and engageable with a shoulder in said tubing for moving said releasable latching means to a



position permitting longitudinal movement of said actuator means relative to said body upon relative upward movement of said kickover tool in said tubing.

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**4,294,314**

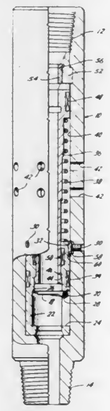
## INSIDE BLOWOUT PREVENTER WELL TOOL

**Tosh Miyagishima; Joseph Puntar, and Raymond Wieveg, all of Los Angeles, Calif., assignors to Hydril Company, Los Angeles, Calif.**

**Filed Dec. 31, 1979, Ser. No. 108,384**

**Int. Cl.³ E21B** *43/00;* **F16K** *31/63*

**U.S. Cl. 166—318** **4 Claims**



1. An inside blowout preventer well tool, comprising:

an elongated body threaded at both ends for securing in a conduit when desired and including an axial opening extending through said body;

a flapper pivotally mounted on a side of said axial opening movable between a lower-open position and an upper-closed position;

a downwardly-facing valve seat around the opening, the flapper engaging the seat in a flow sealing relationship in the upper-closed position for blocking fluid flow;

spring means for urging the flapper toward the seat, a piston movably disposed in said opening between an upper position where the lower end of the piston is above the valve

seat and a lower position where the piston operably engages the flapper and holds it in the lower-open position;
urging means for normally urging the piston toward its upper position;
said piston being arranged pressure responsive in order that when the internal pressure of drilling mud normally circulating through the opening is greater by a predetermined amount than pressure outside the body the pressure differential will overcome the force of the urging means and move the piston to the lower position, said piston responsive to fluid pressure outside said body for moving said piston to its upper position when the pressure differential is reduced by a predetermined amount;
a hollow cage rigidly mounted in said axial opening, said flapper being pivotally mounted on said cage and the valve seat being formed around the inner surface of the cage.
an outer surface of the cage includes an upwardly-facing shoulder and the inner wall of the body includes a groove coextensive with the shoulder, and a retaining ring in the groove engaging the upper side of the groove and the shoulder for restraining upward movement of the cage, relative to the body; and
the ring is split and the groove is at least as deep as the width of the ring so that at least a portion of the cage can be inserted below the groove without contacting the ring, a plurality of set screws moving the ring inwardly against the cage to engage the shoulder.

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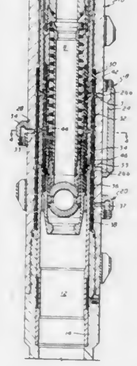
**4,294,315**

## LANDING NIPPLE

**John H. Yonker; Ernest P. Fisher, Jr., both of Carrollton, Tex., and David Bills, Baldrack, England, assignors to Otis Engineering Corporation, Dallas, Tex.**

**Filed Nov. 13, 1978, Ser. No. 960,169**
**Int. Cl.³ E21B *43/12*; F16K *3/00***
**U.S. Cl. 166—322** **12 Claims**



1. A landing nipple adapted to be made up in a tubing string comprising:
a tubular member having a bore extending axially therethrough adapted for receiving a flow control device in said bore,
said tubular member having exterior means for receiving balance and control pressure fluids and means for communicating said fluids from the said exterior to the interior thereof,
said means for communicating control pressure fluid being separated from well fluid pressure conducted through said tubing string by said means for communicating balance pressure fluid and seals therebetween, and
additional seal means between said balance pressure fluid communicating means and said well fluid pressure conducted through said tubing string, whereby failure of said additional seal means causes said well fluid pressure to invade said balance pressure fluid communicating means rather than said control pressure communicating means.

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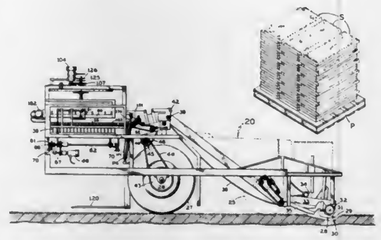
**4,294,316**

## SOD CUTTING AND STACKING MACHINE

**Victor H. Hedley, 5050 SW. 70th Ave., Ft. Lauderdale, Fla. 33314, and Walter A. Olson, 510 Grapefruit St., (Apt. 4B), Sebring, Fla. 33870**

**Filed Apr. 25, 1980, Ser. No. 143,788**
**Int. Cl.³ A01B *45/04***
**U.S. Cl. 172—20** **21 Claims**



1. In a sod cutting machine having;
means for peeling parallel strips of sod from the ground simultaneously;
means providing a horizontal support in the machine;
means for conveying the strips of sod upward from the ground to said horizontal support means;
means for cutting the strips of sod transversely into pieces which are deposited on said horizontal support means;
transfer means for picking the pieces of sod off said horizontal support means and carrying said pieces to a stacking location at one side of said support means;
and means for actuating said transfer means to release the sod pieces to drop by gravity into respective stacks when said transfer means is at said stacking location;
the improvement which comprises:
means for controlling said transfer means to maintain the same orientation of the sod pieces during successive operations of said transfer means;
and means for periodically varying the timing of the release of sod pieces during different operations of said transfer means to thereby produce a lateral overlap between neighboring stacks of sod pieces.

21. In a sod cutting machine having:
means for peeling parallel strips of sod from the ground simultaneously;
means providing a horizontal support in the machine;
conveyor belt means extending upward and rearward from said peeling means, and driving means for moving said conveyor belt means to convey the strips of sod upward and rearward from the ground;
cutting means located between the rear end of said conveyor belt means and said horizontal support means for cutting the strips of sod transversely into pieces which are deposited on said support means;
transfer means for picking the pieces of sod off said horizontal support means and carrying said pieces to a stacking location at one side of said support means;
and means for actuating said transfer means to release the sod pieces to drop by gravity into respective stacks when said transfer means is at said stacking location;
the improvement which comprises:
means for holding said strips of sod on said conveyor belt means at the latter's rear end and preventing said strips of sod from continuing to move onto said horizontal support means while said cutting means cuts the sod into pieces;
and wherein:
said horizontal support means comprises a plurality of horizontal rollers extending transversely of the machine and spaced apart longitudinally of the machine;
and said transfer means includes a vertically reciprocable horizontal platform below said rollers and vertical fingers extending up from said platform between the rollers to engage the sod pieces from below and lift them off the rollers when said platform is raised, said platform being operatively coupled to said cutting means to cause the latter to cut the strips of sod when the platform is raised.



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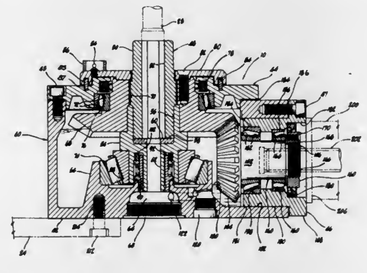
**4,294,317**

## DRILLHEAD UNIT

**Michael J. Amoroso, Marion, Ill., assignor to M.A.T. Industries, Inc., West Frankford, Ill.**

**Filed Oct. 16, 1978, Ser. No. 951,747**
**Int. Cl.³ E21C *7/02***
**U.S. Cl. 173—57** **7 Claims**



1. A drillhead unit for transmitting power from a motor to a hollow drill bit, the unit comprising:
(a) a housing including an inner passage portion,
(b) a gear assembly received by the housing and having a longitudinal axis of rotation, said assembly including:
(1) a shaft having an outer bit-receiving end, and an inner end disposed within the housing remote from said outer end and including an annular transverse bearing face disposed inwardly of the shaft outside diameter, and an axial passage extending between said outer and inner ends and connected to the inner passage portion of the housing, and
(2) a gear disposed between said inner and outer ends of the shaft and connected to said shaft for rotation therewith,
(c) means for mounting the gear assembly to the housing including:
(1) bearing means operatively disposed in coaxial relation between the gear assembly and the housing, and
(2) pressure sealing means disposed between the gear assembly and the housing for separating at least the bearing means from the inner passage portion of the housing, said sealing means including:
(1) a coaxial element non-rotatively attached to the housing and including a transverse bearing face spaced from the transverse bearing face of the shaft, and
(2) a longitudinal resilient seal mounted between said spaced transverse bearing surfaces within the housing,
(d) a pinion assembly received by the housing and having an axis of rotation disposed transversely of the axis of rotation of the gear assembly, said pinion assembly including:
(1) a shaft having an outer end connected to the motor and an inner end remote from said outer end, and
(2) a pinion disposed at the inner end of said shaft and connected to said shaft for rotation therewith said pinion being engageable with the gear of said gear assembly in drive relation thereto,
(e) means for mounting the pinion assembly to the housing including:
(1) bearing means operatively disposed in coaxial relation between the pinion assembly and the housing.

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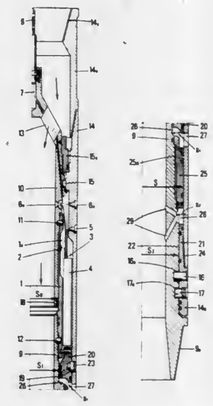
**4,294,318**

## DEVICE FOR MEASURING THE STRESSES APPLIED IN USE TO THE DOWNHOLE ASSEMBLY OF A DRILL PIPE

**Robert Desbrandes, Sevres, and Pierre Grolet, Orgerus, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Oct. 19, 1979, Ser. No. 86,607**
**Claims priority, application France, Oct. 19, 1978, 78 30026**
**Int. Cl.³ E21B *47/00***
**U.S. Cl. 175—321** **3 Claims**



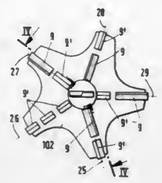
1. A new device for measuring the stresses applied to the downhole assembly of a drill pipe, said device comprising measuring means operatively associated with at least one resilient member interconnecting two adjacent conduits which can respectively be coupled to an upper and to a lower part of said downhole assembly, a sleeve integral with one of said conduits and for protecting said resilient member against external radial pressure, wherein said conduits have substantially the same diameter at their adjacent ends, and wherein said sleeve and one of said conduits form the lateral walls of an annular space which houses at least one intermediate annular piston, said annular space limited by two annular elements forming the end walls thereof, said annular elements being integral with a first of said lateral walls, and slidable along the second of said walls, while said annular piston is integral with the second lateral wall and is slidable along said first wall, said piston separating two annular chambers, one of which communicates with the space outside the downhole assembly of the drill string, and the other communicating with the inner space of said downhole assembly, the operative annular cross-sections of said chambers on both sides of said piston being selected, in dependence on the values of the internal diameter of said annular space at the respective levels of the end walls thereof, so as to substantially nullify any axial load resulting from a pressure difference between the inner and the outer space of the downhole assembly of the drill pipe.

**4,294,319**

## CUTTER HEAD FOR ROTARY PERCUSSION DRILLS

**Karlheinz Guergen, Elsterkamp 3, 2110 Buchholz, Nordheide, Fed. Rep. of Germany**

**Filed Apr. 25, 1979, Ser. No. 33,305**
**Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821248; Sep. 25, 1978, 2841679**
**Int. Cl.³ E21B** *9/02*
**U.S. Cl. 175—389** **5 Claims**



1. A rotary percussion drill bit comprising a drill stem having a pilot cutter at one end thereof, and a detachable main cutter head surrounding said drill stem shank and set back from the leading edge of said pilot cutter, said cutter head comprising a plurality of main cutter elements having their cutting edges arranged along outwardly extending main radial cutter lines, characterized in that said main cutter head is provided with both milling and hammering/chipping cutters along each of said main radial cutter lines, said cutter elements are spaced along said radial cutter lines with small gaps between adjacent cutters the gaps between the cutters of one radial cutter line are bridged by cutters arranged along another radial cutter line following said one radial cutter line in the direction of rotation of the cutter head.

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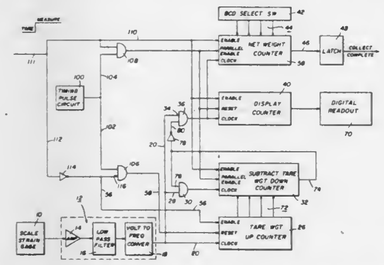
**4,294,320**

## METHOD AND APPARATUS FOR WEIGHING MATERIAL BEING COLLECTED

**Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Mar. 6, 1980, Ser. No. 127,734**
**Int. Cl.³ G01G** *13/00, 23/14*
**U.S. Cl. 177—1** **23 Claims**



1. A process for weighing material being collected, which comprises the steps of:
sensing the tare weight of the weight and collection apparatus;
sensing the weight of the material being collected;
providing pulses in frequency proportion to the weight sensed;
counting the tare weight pulses;
storing the tare weight count;
setting a net weight counter with a predetermined count corresponding to the maximum weight to be collected;
providing a measure weight signal to reverse the tare weight count;
inhibiting the net weight counter until the tare weight count reversal has been completed;
thereafter operating the net weight counter to count the sensed weight pulses; and
providing a completion signal when the predetermined count has been removed from the net weight counter.

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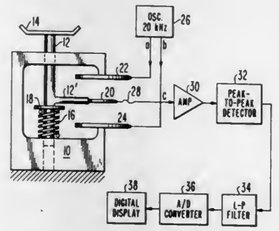
**4,294,321**

## POSITION SENSING AND DISPLAY MEANS

**Harold A. Wittlinger, Pennington, and Carmine P. Salerno, Avenel, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Feb. 27, 1980, Ser. No. 125,118**
**Int. Cl.³ G01G** *3/14;* **G01R** *27/26;* **H01G** *7/00*
**U.S. Cl. 177—210 FP** **11 Claims**



1. The combination comprising:
two stationary spaced conductive members;
an electronic oscillator supplying an oscillation of one phase to one of said two members and an oscillation of the opposite phase to the other of the two members;
a movable conductive member having a position between said two stationary members dependent on the magnitude of a physical characteristic being measured; and
an amplitude detector means having an input directly connected to said movable conductive member and producing an output in accordance with the difference in the amplitudes of the oscillations of opposite phases coupled from the two stationary members to the one movable member.

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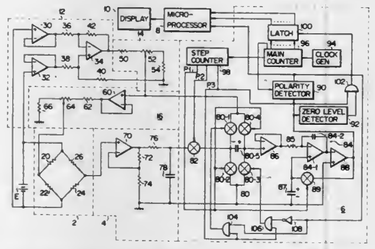
**4,294,322**

## ELECTRONIC WEIGHT MEASURING DEVICE

**Yoshihisa Nishiyama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan**

**Filed May 9, 1980, Ser. No. 148,499**
**Claims priority, application Japan, May 15, 1979, 59-489**
**Int. Cl.³ G01G** *3/14*
**U.S. Cl. 177—210 R** **11 Claims**



1. An electronic weight measuring device comprising:



a power source (E) having first and second power source terminals;
a reference power source terminal;
a load cell (2) coupled between said first and second power source terminals for producing between first and second output terminals an output voltage signal corresponding to a weight of load within a given weight measuring range;
a voltage generating circuit (12) coupled between said first and second power source terminals for generating an output voltage between the output terminal thereof and said reference power source terminal, the output voltage of said voltage generating circuit (12) being varied according to a voltage applied between said first and second power source terminals;
first bias means including a first potentiometer (52) having a movable terminal and two terminals respectively coupled to said reference power source terminal and to an output terminal of said voltage generating circuit;
second bias means including a second potentiometer (64) having two terminals respectively coupled to the movable terminal of said first potentiometer and said reference power source terminal, and a movable terminal coupled to the first output terminal of said load cell;
a signal processor circuit coupled to the second output terminal of said load cell and to the movable terminal of said first potentiometer and producing in response to an output signal from said first bias means an output signal corresponding to the output signal from said load cell within a range corresponding to said given weight measuring range and defined by positive and negative values;
analog-digital converter means coupled to said signal processor circuit to convert the output signal from said signal processor circuit into a digital signal; and
a digital processor unit coupled to said analog-digital converter means to produce an output signal representing a weight to be measured in response to an output signal from said analog-digital converter means.

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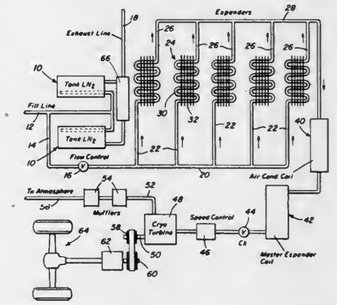
**4,294,323**

## CRYOGENIC POWERED VEHICLE

**Harold L. Boese, Galveston, Tex., assignor to Cryogenics Unlimited, Galveston, Tex.**

**Filed Sep. 13, 1979, Ser. No. 75,235**
**Int. Cl.³ B60K** *3/02*
**U.S. Cl. 180—54 B** **2 Claims**



1. A cryogenic powered vehicle comprising insulated supply tank means for cryogenic liquid, a supply manifold communicated with the supply tank means, a one-way valve between the manifold and supply tank means, a plurality of heat absorbing expansion assemblies each having an inlet communicated directly with the supply manifold, a discharge manifold, each heat absorbing expansion assembly having an outlet communicating directly with the discharge manifold, a master expansion assembly communicating with the discharge manifold, a pressurized gas driven motor communicated with the master expansion assembly for imparting driving force to an output shaft, means communicating with the motor to discharge expanded gas to atmosphere and means directly and mechanically connecting the output shaft of the motor to the drive train of a vehicle, each of the heat absorbing expansion assemblies including a serpentine tube through which cryogenic fluid passes, heat exchange fins secured to the tube and baffle means in the tube to provide a spiral flow path to the fluid material to assure heat exchange contact between the material and the tube for absorbing heat from ambient air, said supply tank means including a pair of tanks for liquid nitrogen having a filler line extending to the lower portion thereof, an exhaust line communicated with each of the gaseous upper portions of the tanks, an exhaust expansion assembly connected with the exhaust lines from the tanks and an opened exhaust pipe connected to the exhaust expansion assembly for bleeding gaseous portions of the cryogenic fluid from upper portions of the tanks during refill thereby enabling the tanks to be completely refilled with liquid nitrogen.

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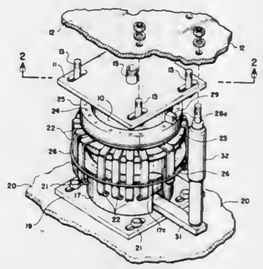
**4,294,324**

## CAB SUSPENSION AND RESTRAINING DEVICE

**Charles A. Kimball, and Marc L. Sullivan, both of Salt Lake County, Utah, assignors to Time Commercial Financing Corporation, Salt Lake City, Utah**

**Filed Dec. 3, 1979, Ser. No. 99,467**
**Int. Cl.³ B62D** *23/00*
**U.S. Cl. 180—89.14** **10 Claims**



1. A cab suspension and restraining device for securing a tiltable automotive truck cab to the truck chassis, comprising a housing shell adapted to be secured to either the cab or the chassis; an air spring secured within said shell and having a bearing block extending beyond the shell; a second housing shell of larger diameter than the first and adapted to be secured to either the cab or the chassis in opposition to the first housing shell and to receive the said bearing block of the air spring as well as a portion of the first shell in the telescoped relationship; hydraulically operated restraining means for holding the two housing shells in their said telescoped relationship so as to substantially prevent relative lateral movement but to allow limited relative axial movement of the two during travel of the vehicle and to allow complete separation of the two when in unrestraining position; means for operating the restraining means; and means for operatively connecting the air spring to a source of pressurized air.

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**4,294,325**

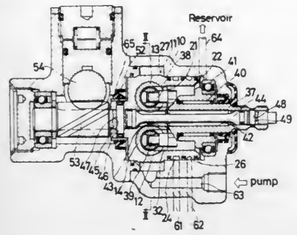
## POWER ASSISTED STEERING SYSTEM FOR VEHICLES

**Yoshihiko Nomura, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Jun. 6, 1979, Ser. No. 45,887**
**Claims priority, application Japan, Jun. 12, 1978, 53-80291[U]**
**Int. Cl.³ B62D** *5/08*
**U.S. Cl. 180—148** **2 Claims**

1. A power assisted steering system for vehicles comprising

a steering shaft adapted to be rotated by a steering wheel, rack means adapted to be connected to steering link means, pinion means engaged with said rack means, a torsion rod operatively connected to said pinion means and said steering shaft means at opposite ends thereof, said torsion rod and said pinion means being of integral one-piece construction with the diameter of said rod being substantially smaller than that of said pinion




means, a valve body separate from said pinion means, means connecting said valve body to the end of said torsion rod operatively connected to said pinion means, hydraulic servomotor means operatively connected to said rack means and control valve means operatively connected to said steering shaft means and associated with said valve body for controlling the actuation of said hydraulic servomotor in accordance with the rotation of said steering shaft means.

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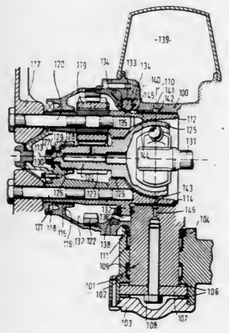
**4,294,326**

## WHEEL SUPPORT ASSEMBLY

**Timothy S. Fry, Dunchurch, England, assignor to GKN Group Services Limited, England**

**Filed Nov. 14, 1979, Ser. No. 94,023**
**Claims priority, application Denmark, Nov. 15, 1978, 5073/78**
**Int. Cl.³ F16H *3/44***
**U.S. Cl. 180—255** **5 Claims**



1. A motor vehicle support assembly, comprising a casing connected to a suspension component of the vehicle, a stub axle connected to a road wheel of the vehicle; at least one thin walled bearing liner within the casing receiving the stub axle with a bearing clearance; a thrust plate carried by the axle; thrust washer means carried by the casing and engaging the thrust plate for constraining relative axial movement between the axle and casing; a reservoir for lubricant above said bearing liners; means for delivering lubricant from said reservoir to said bearing liners; and means for returning lubricant to said reservoir upon rotation of said axle;

said means for returning lubricant to said reservoir comprising said thrust plate; means defining an annular groove in which said thrust plate is received, said groove having a radial clearance from said thrust plate over a lower part of the periphery thereof; means defining a sump in said casing and means for supplying lubricant from said sump to said clearance part of said groove; and means defining a passage from an upper part of said groove to said reservoir, whereby rotation of said thrust plate impels lubricant from said groove to said reservoir by way of said passage.

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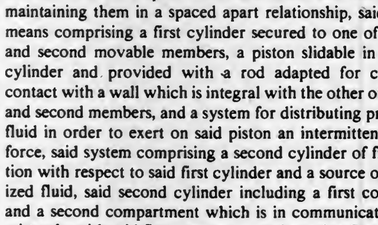
**4,294,327**

## SAFETY INTERLOCK FOR MACHINE AND ENGINE WITH MAGNETO IGNITION

**William A. Howard, Troy Township, Geauga County, Ohio, assignor to Delta Systems, Inc., Twinsburg, Ohio**

**Filed Dec. 15, 1978, Ser. No. 969,871**
**Int. Cl.³ B60K *23/00***
**U.S. Cl. 180—273** **7 Claims**




1. In a vehicle driven through a transmission to a traction drive by an internal combustion engine that has a magneto ignition system and that has a seat occupied by a driver, a seat-operated switch that is closed when the seat is occupied and a transmission-operated switch that is open when the transmission is engaged, an electrical circuit connected between said swtiches and across a primary winding of the magneto ignition, said circuit including means for selectively shorting the primary winding when the engine is not running and the transmission-operated switch is open, and means for shorting the primary winding when the engine is running and both the seat-operated switch and the transmission-operated switch are open.

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**4,294,328**

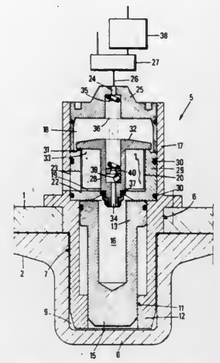
## DEVICE FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM BY IMPLOSION

**Jacques Cholet, L'Etang la Ville; Pierre Magneville, Vernouillet, and Jean Cassand, Royan, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Sep. 18, 1979, Ser. No. 76,646**
**Claims priority, application France, Sep. 18, 1978, 78 26882**
**Int. Cl.³ G01V *1/38***
**U.S. Cl. 181—120** **8 Claims**

1. A device for emitting acoustic waves in a water medium by implosion, comprising first and second members movable with respect to each other from a spaced apart position to a position of closeness, said first and second movable members being interconnected at their periphery by at least one flexible membrane which defines therewith a tight enclosure of variable volume, moving means for moving said first and second movable members apart from each other and intermittently maintaining them in a spaced apart relationship, said moving means comprising a first cylinder secured to one of said first and second movable members, a piston slidable in said first cylinder and provided with a rod adapted for coming in contact with a wall which is integral with the other of said first and second members, and a system for distributing pressurized fluid in order to exert on said piston an intermittent pushing force, said system comprising a second cylinder of fixed position with respect to said first cylinder and a source of pressurized fluid, said second cylinder including a first component, and a second compartment which is in communication intermittently with said first compartment through a first aperture, with said first cylinder through a second aperture, and permanently in communication with an external medium through at least one third aperture, and said distribution system comprising a valve having a valve rod of smaller section than that of the valve head and movable from a first position wherein the valve head and the end of said valve rod respectively close substantially tightly said first and said second apertures of said second compartment and a second position where said first and





second apertures are opened, a channel being provided throughout said valve and in a direction parallel to its longitudinal axis, for feeding with pressurized fluid said first cylinder, intermittent feeding means for intermittently feeding with pressurized fluid the interior of said first compartment of said second cylinder and maintaining means for maintaining intermittently the pressurized fluid in said first cylinder.

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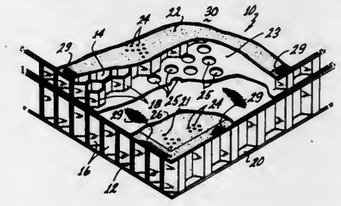
**4,294,329**

## DOUBLE LAYER ATTENUATION PANEL WITH TWO LAYERS OF LINEAR TYPE MATERIAL

**Philip M. Rose, Chula Vista, and Frank J. Riel, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.**

**Filed Dec. 17, 1979, Ser. No. 103,913**
**Int. Cl.³ E04B *1/82*; F01N *1/24***
**U.S. Cl. 181—222** **8 Claims**



1. A double layer acoustical honeycomb sandwich panel having structural strength for use in the severe environment in and around high velocity fluid flow paths associated with aircraft gas turbine engines comprising:

first and second honeycomb cores having a multiplicity of endwise directed cells with walls of thin sheet material disposed transversely to the panel;

an impervious facing of thin sheet material;

first, second and third facings of perforated thin sheet material; and

first and second thin sheets of porous fibrous material;

said impervious facing of this sheet material is adhesively bonded to one end wise cell face of said first honeycomb core;

said first perforated facing of thin sheet material is adhesively bonded to said first honeycomb core on the surface opposite said impervious facing of this sheet material;

said first thin sheet of porous fibrous material is adhesively bonded to the other surface of said first perforated facing of thin sheet material;

said third facing of perforated thin sheet material is adhesively bonded between one end wise cell surface of said second honeycomb core and to the other surface of said first thin sheet of porous fibrous material;

said second perforated facing of thin sheet material is adhesively bonded to the opposite surface of said second honeycomb core;

said second thin sheet of porous fibrous material is adhesively bonded to the opposite surface of said second perforated facing of this sheet material whereby a smooth outer surface is presented to a high velocity fluid flow.

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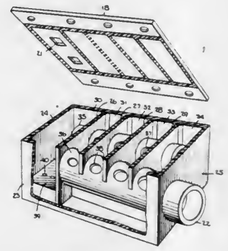
**4,294,330**

## MUFFLERS FOR PERCUSSIVE PNEUMATIC MACHINES

**Stanley L. Baldwin, Winnipeg; Vernon Hampton, Thompson, and Tony F. W. Embleton, Ottawa, all of Canada, assignors to Inco Limited, Toronto, Canada**

**Filed Jan. 21, 1980, Ser. No. 113,742**
**Claims priority, application Canada, Feb. 13, 1979, 321357**
**Int. Cl.³ F01N *1/08, 1/02***
**U.S. Cl. 181—230** **8 Claims**



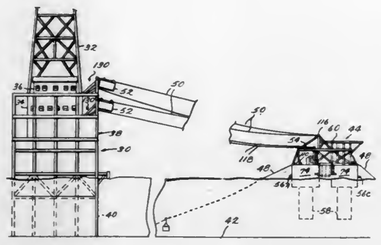
1. A muffler for a pneumatic impact device operating at a frequency below about 60 Hertz comprising a housing adapted to receive and discharge exhaust gas from said impact device and made of an elastic, high damping, hydrophobic material, a gas entrance chamber in said housing communicating with a Helmholtz resonator tuned to a frequency in the range of about 500 to 2,500 Hertz, a gas transport conduit exiting from said gas entrance chamber at an abrupt angle from the direction of gas entrance into said chamber, a plurality of first ports in the walls of said gas transport conduit, said first ports having a total cross-sectional area at least equal to the cross-sectional area of said gas transport conduit, a gas discharge conduit closed at its inner end and having a plurality of second ports in the walls thereof, a plurality of mutually isolated gas transport chambers each in communication with at least one of said first ports and at least one of said second ports, each of said gas transport chambers having a cross-sectional area substantially greater than the cross-sectional area of said first and second ports in communication therewith, the gas path in said transport chamber being at an abrupt angle from both the direction of flow in said gas transport conduit and in said gas discharge conduit.

**4,294,331**

## METHOD AND SYSTEM FOR ESCAPING FROM AN OFFSHORE DRILLING PLATFORM

**Ronald H. Reynoir; Robert A. Flautt, both of New Orleans, La., and Clyde M. Leavitt, Ocean Springs, Miss., assignors to The Reynoir Company, New Orleans, La.**

**Filed Dec. 12, 1979, Ser. No. 102,934**
**Int. Cl.³ A62B *1/02*; B63C *9/02***
**U.S. Cl. 182—10** **17 Claims**



1. In a system for escaping from an offshore drilling or production platform, or the like, in emergency situations which includes an offshore platform in operative position substantially fixed relative to the marine bottom at an offshore location for engaging in hazardous operations involving combustible and explosive fluids entrapped in the marine bottom, a floating haven fixedly anchored near but at a safe distance from the platform, at least one cableway unsupported between its ends attached to and extending above water between the platform and the haven with the cableway inclining downwardly from the platform to the haven, and a personnel carrier suspended from and movable along the cableway for transferring personnel from the platform to the haven, the improvement wherein the haven comprises:

at least one upright buoyant cylinder;

means for ballasting and deballasting said cylinder;

means defining an enlarged watertight compartment mounted to the upper end of said cylinder with the top of said compartment forming a weather deck, said cylinder and said compartment-defining means together forming a structure ballastable to float with said compartment partly submerged for increased stability.

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**4,294,332**

## SCAFFOLD WITH GEAR DRIVE

**Delbert L. Ready, P.O. Box 19462, Houston, Tex. 77024**

**Filed Apr. 13, 1979, Ser. No. 29,601**
**Int. Cl.³ E04G *1/20***
**U.S. Cl. 182—141** **16 Claims**

1. A scaffolding unit comprising:

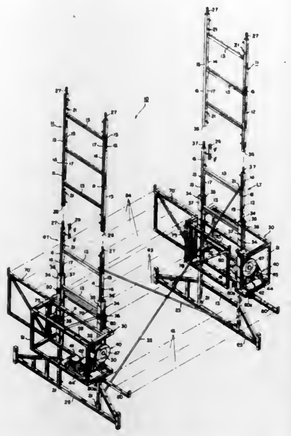
at least two towers each having a front and a back and each tower having a pair of rails, each rail having a linear gear rack facing the front of each tower;

bracing means for rigidly interconnecting said two rails;

cross-bracing members coupled to the rails of opposite towers for maintaining said towers in back-to-back and spaced relationship;

a platform-supporting carriage having a frame outwardly extending from the front of each tower, a pair of laterally-spaced upright shoes on said frame, each shoe having a U-shaped cross section adapted to movably embrace a rail, each shoe defining an opening facing the front of each tower, said shoes having open sides which face each other; and

bi-directional drive means on said frame for moving said carriage up and down on said towers, said drive



means having pinion gears meshable with the racks of said rails through said openings in said shoes.

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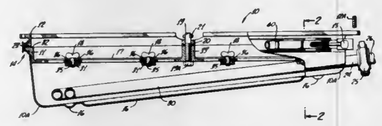
**4,294,333**

## OIL PAN ADAPTOR FOR INTERNAL COMBUSTION ENGINES

**Barry S. Little, Mission Viejo, Calif.**

**Filed Jul. 20, 1978, Ser. No. 926,285**
**Int. Cl.³ F02F *7/00*; F16N *31/00***
**U.S. Cl. 184—106** **9 Claims**



1. Lubricating apparatus comprising:

pan means for containing a lubricant;

adaptor means having a first surface for attachment to a device to be lubricated;

flange means fastened to said pan means and positioned to connect said adaptor means to said pan means;

quick release clamp means for securing said flange means to a second surface of said adaptor means; and

said flange means comprising a collar-like device having a lip which is engaged by said clamp means, said collar-like device including shoulders for securing means thereto, and embossments for establishing securing means relative to said adaptor means.

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**4,294,334**

## AXLE HOUSING SUB-ASSEMBLY

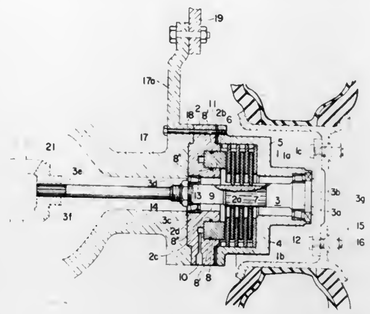
**Akibumi Shinoda, and Masao Nakane, both of Handa, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Jun. 5, 1979, Ser. No. 45,814**
**Claims priority, application Japan, Jun. 15, 1978, 53-83144[U]**
**Int. Cl.³ B60T *1/06*; F16D *55/36***
**U.S. Cl. 188—18 A** **7 Claims**

1. A disc brake system sub-assembly for use in a heavy load vehicle comprising; an axle shaft having a spline portion on one end thereof, a differential gear attached to said axle shaft at said spline portion, an axle housing having a through-hole, bearing



means fixed at one end of said through-hole, for rotatably supporting said axle shaft, a plurality of rotary disc plates engaging said axle shaft for rotation therewith, said rotary disc plates axially movable within said through-hole of said axle housing, a plurality of stationary disc plates disposed in said axle housing for axial movement within said through-hole, said stationary disc plates being arranged alternately with said



rotary disc plates, piston means adapted to close the other end of said through-hole, said piston means urging said stationary disc plates against said rotary disc plates when actuated and, means for joining said axle housing and said piston means as a unit, said sub-assembly further comprising further bearing means fixed in said piston means for rotatably supporting said axle shaft at the other end of said through-hole.

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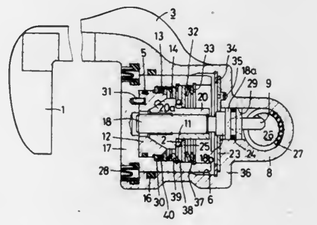
**4,294,335**

## DEVICE FOR AUTOMATICALLY ADJUSTING A BRAKING CLEARANCE FOR A DISC BRAKE

**Toshifumi Maehara, Chichibu, Japan, assignor to Akebono Brake Industry Co., Ltd., Japan**

**Filed Oct. 5, 1979, Ser. No. 82,292**
**Claims priority, application Japan, Oct. 13, 1978, 53-139606[U]**
**Int. Cl.³ F16D *65/56***
**U.S. Cl. 188—71.9** **6 Claims**



1. A device for automatically adjusting a braking clearance for a disc brake in which a friction pad is placed in frictional engagement with a disc rotor by a hydraulically-operated main piston, said device comprising:

an adjusting bolt slidable relative to an end wall of a cylinder in which said main piston is fitted, said adjusting bolt having one end which extends into a liquid chamber of the cylinder;

stop means for controlling movement of said adjusting bolt in a direction apart from the disc rotor;

an adjusting nut threaded on said adjusting bolt with a predetermined thread clearance;

first spring means retained between said main piston and said adjusting nut for transmitting to said adjusting nut the movement of said main piston in a direction toward the disc rotor;

a stepped piston slidably mounted within an inner periphery of said main piston, said stepped piston being subjected to a force in a direction away from the disc rotor by fluid pressure in said liquid chamber;

limit means for preventing rotation of said stepped piston in said main piston;

a frictional surface defined by each of said stepped piston and said adjusting nut and adapted for engagement with each other; and

second spring means disposed between said main piston and said stepped piston and adapted for biasing said stepped piston in a direction releasing engagement between said frictional surfaces, whereby in response to a given fluid pressure in said liquid chamber said stepped piston moves against said second spring means to engage said frictional surfaces and impede rotation of said adjusting nut.

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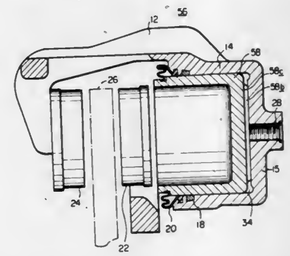
**4,294,336**

## DISC BRAKE

**Kazuaki Shimizu, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Mar. 15, 1979, Ser. No. 20,624**
**Claims priority, application Japan, Mar. 30, 1978, 53-37122**
**Int. Cl.³ F16D *65/20***
**U.S. Cl. 188—72.4** **7 Claims**



1. A disc brake comprising a cylinder means with opposed ends one of which is open and the other of which is closed, said cylinder means being formed at an inner surface of the closed end thereof with an annular groove which is located at the periphery of a circular bottom of said cylinder, cylindrical piston means slidably and sealingly disposed in said cylinder means to define in said cylinder means between said piston means and said closed end of said cylinder means an operating chamber into which an operating fluid is fed through a fluid inlet port formed in said closed end of said cylinder means, a first braking pad directly actuated by said piston means, a second braking pad actuated by said cylinder means through a calliper which is integral with said cylinder means, and a braking disc disposed between said first and second braking pads at the peripheral portion thereof, so that when a predetermined amount of operating fluid is introduced into said operating chamber to cause said piston means and said closed ends to be moved in opposite directions, said first and second braking pads are moved toward the opposed faces of said braking disc and finally brought into contact with the faces to grip said braking disc, wherein one of said cylinder means and said cylindrical piston means is integrally formed at its one end adjacent said closed end of said cylinder means with a groove which is arranged to communicate with both said annular groove and said fluid inlet port when said piston means is in contact with said closed end of said cylinder means.

**4,294,337**

## BRAKING SYSTEM FOR A TRANSPORT CAR FOR TRANSPORTING FILES

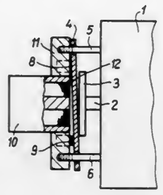
**Edelbert Wiechert, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Sep. 13, 1979, Ser. No. 74,990**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842558**

**Int. Cl.³ B61H** *5/00*

**U.S. Cl. 188—171** **4 Claims**



1. A braking system for a transport car for transporting files or goods of similar weight running on profile rails with traveling rollers, equipped with a drive motor fed via wiper contacts of current paths designed on the profile rails, said braking system comprising a brake disc secured to the motor shaft for rotation therewith, and a counter disc aligned for engagement with the brake disc, a spring device for urging the counter disc toward the braking disc to establish a braking condition, an electromagnet coupled with said counter disc and energizable for withdrawing the counter disc from the brake disc against the force of the spring device to release the braking condition, characterized in that the spring device (**7, 8, 9**) is of unsymmetrical force configuration such that, upon initiation of energization of the electromagnet in a first phase of the withdrawal of the counter disc (**4**), the counter disc (**4**) is more strongly withdrawn in the area of lower spring forces.

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**4,294,338**

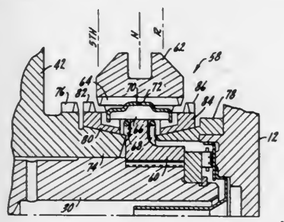
## TRANSMISSION SHIFT CONTROL APPARATUS WITH COUNTERSHAFT BRAKE

**John P. Simmons, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Nov. 9, 1979, Ser. No. 92,886**

**Int. Cl.³ B60K** *41/28, 41/24;* **F16H** *3/38*

**U.S. Cl. 192—4 A** **16 Claims**



1. Apparatus comprising a ground member, a shaft rotatable relative to said member, a sleeve rotatable with and slidable relative to said shaft, said sleeve defining a spline, at least one thrust-transmitting strut in break-away connection with said sleeve for rotational and sliding movement therewith, and a blocker ring in rotational lost-motion connection with said strut adjacent said member, said blocker ring defining blocker teeth rotatable into and out of alignment with said spline, said sleeve being slidable for sliding said strut into thrust-transmitting engagement with said blocker ring such that said blocker ring establishes frictional braking contact with said member and said blocker teeth rotate out of alignment with said spline, said blocker teeth being rotatable into alignment with said spline upon braking of said shaft such that said sleeve is further slidable to release said break-away connection and thereby release said shaft for further rotation.

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**4,294,339**

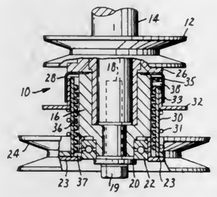
## CLUTCH ASSEMBLY

**Bruce A. Granger, Prior Lake, and David S. Klis, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.**

**Filed Dec. 21, 1979, Ser. No. 106,234**

**Int. Cl.³ F16D** *67/02, 13/08, 13/12*

**U.S. Cl. 192—12 BA** **3 Claims**



1. An improved clutch assembly of the type having a driven hub, a rotatable member, clutch means for selectively driving the rotatable member from the driven hub, wherein the clutch means comprises a coiled spring secured to the rotatable member and surrounding the hub and having a first configuration in which the spring engages the hub to drive the rotatable member and a second configuration in which the spring disengages the hub to stop driving the rotatable member, and movable means secured by a first connecting means to the spring for placing the spring into its second configuration, wherein the improvement comprises:

safety means for connecting the spring to the movable means for continued operation of the clutch means in the event the first connecting means fails.

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**4,294,340**

## OVERLOAD CLUTCH

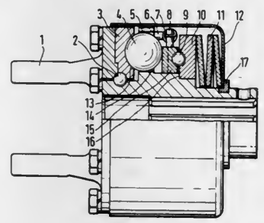
**Dieter Kunze, Siegburg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Siegburg, Fed. Rep. of Germany**

**Filed Nov. 21, 1979, Ser. No. 96,425**

**Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853293**

**Int. Cl.³ F16D** *7/02, 43/20*

**U.S. Cl. 192—56 R** **11 Claims**



1. An overrunning clutch comprising: a driving member; a driven member; clutch engagement members; aperture means extending through one of said driving and driven members and having said engagement members operably supported therein; first recess means formed in the other of said driving and driven members; control ring means having second recess means formed therein and adapted to be angularly moved between a first position where said engagement members are out of angular alignment with said second recess means, and a second position where said second recess means are brought into angular alignment with said engagement members; said engagement members being located between said control ring means and said other of said driving and driven members; axial spring means urging said control ring means against said engagement members, and urging said engagement members against said other of said driving and driven members; and circumferential spring means urging said control ring means toward said first position; said engagement members being held in torque transmitting engagement within said first recess means where said clutch is operated to transmit torque below a predetermined nominal value; said control ring means being moved against said circumferential spring means from said first position to said second position when said clutch is operated above said predetermined nominal value thereby to effect disengagement of said engagement members with said first recess means to bring said clutch into an overrunning condition.



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**4,294,341**

## GEAR RATIO SELECTION APPARATUS

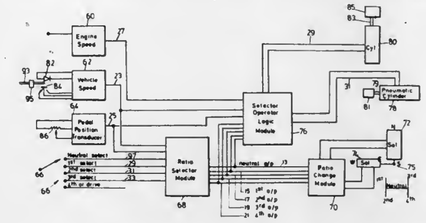
**Petrus H. Swart, Bank Colliery, House No. 1A, Middelburg District, Transvaal, South Africa**

**Filed Feb. 9, 1979, Ser. No. 10,794**

**Claims priority, application South Africa, Feb. 15, 1978, 78/0885; Jun. 13, 1978, 78/3385**

**Int. Cl.³ B60K** *41/28*

**U.S. Cl. 192—0.073** **14 Claims**



1. Gear ratio selector apparatus for use on a vehicle which has a manual shift gearbox with a gear changing mechanism and a manually operable clutch, the apparatus comprising: means for generating a first signal which is dependent on the vehicle speed, means for generating a second signal which is dependent on the vehicle's throttle position, means responsive to the first and second signals for generating gear ratio selection signals, means responsive to the gear ratio selection signals for disengaging the vehicle's clutch and acting directly on said gear changing mechanism to select a desired gear, means for deactivating the apparatus so that the manual shift gearbox can be operated manually, and means responsive to at least the first signal for controlling the engine speed during gear changes.

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**4,294,342**

## CENTRIFUGAL CLUTCH CONSTRUCTION

**Richard C. St. John, North Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio**

**Continuation-in-part of Ser. No. 928,850, Jul. 28, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,502**

**Int. Cl.³ F16D** *23/10*

**U.S. Cl. 192—105 CD** **14 Claims**

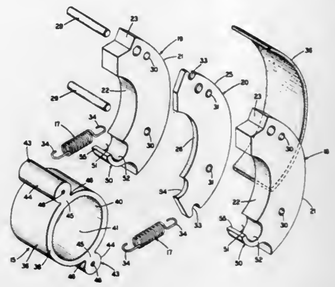
1. An improved centrifugal clutch construction including:

(a) a driven clutch member;

(b) pivot collar means adapted to be mounted on a drive shaft for rotation with said drive shaft, the collar means having a cylindrical-shaped sleeve formed with a bore and a pair of diametrically opposed cylindrical-shaped projection means mounted externally on the sleeve and extending along the parallel with the axis of said sleeve, with the imaginary outer circumferences of the projection means lying in abutting or overlapping relationship with respect to the imaginary outer circumference of the sleeve at the mounting location therebetween when viewed in transverse cross section;

(c) a pair of clutch shoe means, each shoe means being pivotally mounted on a respective one of the pair of projection means for pivotal movement outwardly toward and against the driven clutch member under the influence of centrifugal force from retracted to extended positions; and

(d) discontinuous opening means formed in an end of each of the clutch shoe means for receiving the projection means therein to pivotally mount the shoe means on said projection means, said opening means having a partial circular cross-sectional configuration of greater than 180° and less than 360° complementary to the cross-sectional configuration of the projection means.



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**4,294,343**

## FRICTION CLUTCH FOR MOTOR VEHICLES

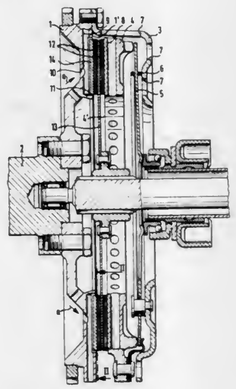
**Walter Reh, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Feb. 26, 1979, Ser. No. 15,152**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808019**

**Int. Cl.³ F16D** *13/72*

**U.S. Cl. 192—113 A** **6 Claims**



1. A friction clutch for a motor vehicle, comprising a flywheel disk means having an end face acting predominantly as a friction surface, said end face being provided with a steel

insert, a clutch cover means rigidly connected with the flywheel disk means, said clutch cover means having a plurality of openings and surrounding a pressure ring means and at least one spring, said spring being supported, on the one hand, at the clutch cover means and, on the other, forcing the pressure ring means against the steel insert of the friction surface of said flywheel disk means in the engaged condition of the clutch by way of a friction disk, said flywheel disk means being provided with a plurality of substantially uniformly distributed and outwardly extending aperture means each having a through-opening on the side of the engine and a through-opening on the side of the friction surface of said flywheel disk means, said engine side through-opening extending outwardly from the engine side toward the friction surface side and said friction surface side through-opening being in the form of a substantially longitudinal slot whereby air may be drawn in from the engine side and conducted to the friction surface side of said flywheel disk means in the manner of a radial blower, said substantially longitudinal slot partially accepting said steel insert and being so designed that the steel insert can be subjected to the flow of cooling air on all sides at least when said clutch disengaged.

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**4,294,344**

## APPARATUS FOR POSITIONING ARTICLES BETWEEN THE CARRIERS OF A DRAG CONVEYOR, SAID ARTICLES BEING FED IN A CONTINUOUS CLOSED ROW

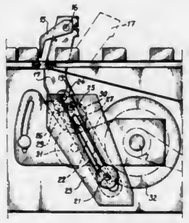
**Johannes D. van Maanen, Berkel en Rodenrijs, Netherlands, assignor to Tevopharm-Schiedam B.V., Netherlands**

**Filed Sep. 20, 1979, Ser. No. 77,375**

**Claims priority, application Netherlands, Sep. 21, 1978, 7809612**

**Int. Cl.³ B65G *47/31***

**U.S. Cl. 198—461** **3 Claims**



1. Apparatus for positioning articles between the carriers of a drag conveyor, said articles being fed in a continuous closed row, comprising a first conveyor belt or conveyor-belt system, capable of receiving the articles at one end and a second conveyor belt or conveyor-belt system disposed in line with the first conveyor belt, said second belt being arranged to move at a speed which is greater than the speed of the first conveyor belt and to transfer the articles to the drag conveyor, characterized in that at the transition point between the first conveyor belt and the second conveyor belt a stop means is provided, said stop means being provided on an arm, said arm being mounted for a pivotal movement about a pivot point and a sliding movement along said point, said arm being connected to a crank means through a link means, said link means at one end being pivotably connected to the arm and at its other end being connected to said crank means and intermediate said ends being pivotably connected to a rocker element mounted for a pivotal movement about a fixed point, the movement of said stop means being synchronized with respect to the movement of the drag conveyor, said stop means being movable in a endless path, said path comprising a first portion extending essentially parallel to the first conveyor belt in the direction of travel, a second portion directed backwards and away from the conveyor belt and a third portion directed again towards the conveyor belt, such that during operation, in the first path portion the stop means moves along with and at a distance in front of an article which is advanced by said first conveyor belt, then in the second path portion said stop means moves away from said article and past said article to the rear and subsequently, in the third path portion, said stop means returns to its starting point behind the article then being moved along faster by the second conveyor belt and in front of the next article still lying on the first conveyor belt.

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**4,294,345**

## UNIVERSAL JOINT-LINK CHAIN

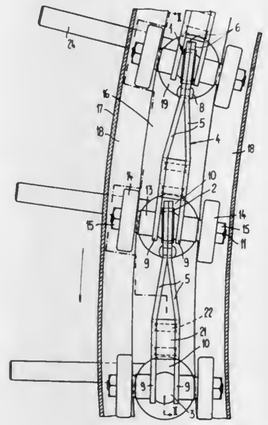
**Hans-Ulrich Stauber, Grüt, and Jürg Eberle, Hinwil, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland**

**Continuation of Ser. No. 703,834, Jul. 9, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,027**

**Claims priority, application Switzerland, Jul. 28, 1975, 9810/75**

**Int. Cl.³ B65G *17/32***

**U.S. Cl. 198—683** **4 Claims**



1. A universal joint-link chain comprising a plurality of chain links, each chain link having opposed ends, one end of each chain link being provided with a hinge body and the opposite end with a hinge socket, the hinge socket of one chain link receiving the hinge body of the neighboring chain lnk, each hinge socket and each hinge body being formed as an equatorial spherical segment, each chain link including a connection element engaging with the hinge bodies, said hinge body being wider than the hinge sockets, a shaft for mounting each hinge body, said shaft having opposed ends, travelling wheels provided at the opposed ends of the shaft, a substantially C-shaped guide channel which is downwardly open, said guide channel having spaced apart confronting flanges and a rear channel wall oppositely spaced from said flanges, a guide wheel arranged at the region of the travelling wheels, said guide wheel having an axis extending essentially perpendicular to its related connection element and through the center of the associated spherical segment, said confronting flanges serving as tracks for the travelling wheels and for guiding therebetween the guide wheels, said rear channel wall serving as a track for one of the travelling wheels when the chain carries a load, support means carried by each chain link, said support means including means for the attachment of a conveyed material, said attachment means of the support means comprising a lateral offloading attachment element, said offloading attachment element extending substantially parallel to and in vertically spaced relationship from the axis of the shaft and further extending laterally from the underside of the guide channel and transversely to the direction of movement of the chain, said lateral



offloading attachment element, when loaded by said conveyed material, exerting a moment upon the travelling wheels such that one travelling wheel at an end of the shaft bears against its related flange while the other travelling wheel at the other end of the shaft bears against the rear channel wall to provide a stable position for the universal joint-link chain.

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**4,294,346**

## BALER FEEDER MECHANISM

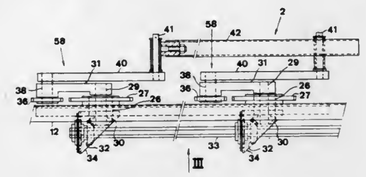
**Frans J. G. C. Decoene, Zedelgem; Etienne R. O. C. Hommez, Oostende, and Adrianus Naaktgeboren, Zedelgem, all of Belgium, assignors to Sperry Corporation, New Holland, Pa.**

**Filed Sep. 19, 1979, Ser. No. 77,253**

**Claims priority, application United Kingdom, Sep. 30, 1978, 38836/78**

**Int. Cl.³ B65G *25/02***

**U.S. Cl. 198—740** **8 Claims**



1. A baler having a drive shaft and a plurality of housing walls adjacent a feed mechanism comprising:

a feed bar carrying a plurality of tines; and

means for driving the feed bar in an elliptical path, said means including a first shaft having a first crank connected at one end thereof, said first crank rotatably supporting first and second gears, said first gear being a reversing gear intermeshing with a stationary gear and said second gear, said stationary gear supported by one of said walls, a second shaft supporting said second gear at one end thereof and a second crank at another end thereof, said second crank connected to said feed bar.

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**4,294,347**

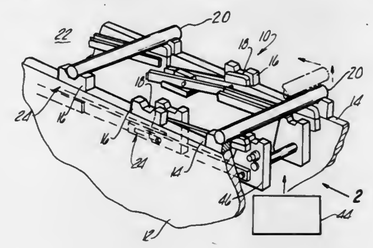
## AUTOMATIC ACCUMULATING LIFT AND CARRY TRANSFER MECHANISM

**James L. Furlette, and Donald A. Stadler, both of 1101 Copper Ave., Fenton, Mich. 48430**

**Filed Feb. 21, 1979, Ser. No. 13,458**

**Int. Cl.³ B65G *23/02, 43/08***

**U.S. Cl. 198—751** **13 Claims**



1. A mechanical automatic accumulating transfer mechanism comprising:

an elongated frame, said frame comprising a plurality of work support members secured to and spaced longitudinally along said frame and on each lateral side thereof, said support members on opposite lateral sides of the frame being in alignment with each other and forming a work station along the frame adapted to receive and support a workpiece;

a carriage assembly and means for longitudinally slidably mounting said carriage assembly to said frame between a forward and a retracted position and means for vertically slidably mounting said carriage assembly to said frame between an upper and a lower position;

means for moving said carriage assembly between said upper and said lower position;

means for longitudinally reciprocally moving said carriage assembly in a forward direction with said carriage assembly in said upper position, and for moving said carriage in the reverse direction with said carriage assembly in its lower position;

a plurality of lifting members pivotally secured to said carriage assembly at longitudinally spaced intervals therealong so that at least one lifting member is associated with each work station, said lifting members being pivotal between an upper workpiece engaging position and a lower workpiece clearing position whereby with said lifting members in their work engaging position, said lifting members lift and carry a workpiece from the support members at their associated work station and to the next forward work station;

knockdown means for pivoting said lifting members to their workpiece clearing position prior to the rearward longitudinal travel of said carriage assembly;

means for detecting the absence of a workpiece at a work station;

means responsive to said detecting means for actuating the lifting member associated with the vacant work station from the workpiece clearing position and to the workpiece engaging position during rearward longitudinal travel of the carriage assembly;

means for pivoting all lifting members rearwardly of a lifting member actuated by said actuating means from their workpiece clearing position and to their workpiece engaging position; and

said carriage assembly further comprising an upper part and a lower part, said upper part being vertically slidably mounted to said frame, means for longitudinally slidably mounting said upper part to said lower part and said lifting members being pivotally mounted to said upper part.

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**4,294,348**

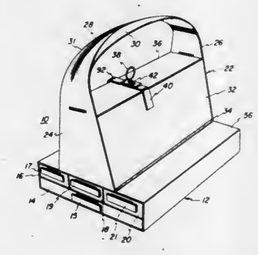
## CARRYING CASE FOR ARTIST'S MATERIALS

**Jeanne D. Hastings, Old Stone School House, Middle Rd., Lake George, N.Y. 12845**

**Filed Mar. 24, 1980, Ser. No. 133,529**

**Int. Cl.³ B65D *71/00*; A45C *13/18***

**U.S. Cl. 206—1.7** **10 Claims**



1. A paint box for storing and transporting artist's materials, said paint box comprising

a base storage section having an upper flat surface and having a plurality of drawers slidably arranged to open at one end,

a main body storage section mounted on said base and comprising a front end located on the same side as said one

end, a back end opposite said front end, a top connected between said front end and said back end, a first dropping side attached by a hinging means to said base on one side of said body and spaced inwardly from one side of said base to permit said first side to rest flat upon said base or to stand substantially upright enclosing a first opening bounded by said front end, said top and said back end, and a second dropping side attached by a hinging means to said base on the side opposite to said one side and spaced inwardly from the side opposite said one side of said base to permit said second side to rest flat upon said base or to stand substantially upright enclosing a second opening, opposite said first opening, bounded by said front end, said top and said back end.

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**4,294,349**

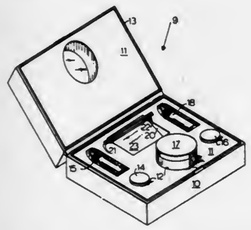
## KIT FOR REPAIR OF PORCELAIN DENTAL PROSTHESES

**Robert L. Ibsen, and William R. Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.**

**Division of Ser. No. 926,943, Jul. 21, 1978, Pat. No. 4,256,603, which is a division of Ser. No. 787,754, Apr. 15, 1977, Pat. No. 4,117,595. This application Jun. 11, 1980, Ser. No. 158,487**

**Int. Cl.³ B65D** *81/32*

**U.S. Cl. 206—63.5** **13 Claims**



**1**. A kit for the repair of damaged or fractured porcelain dental prosthesis comprising

a box,

a priming agent,

a bonding agent to adhere a restorative agent to porcelain and metal,

a pigmented masking restorative agent for said metal base,

a white powder restorative agent,

a resin for mixture with each said restorative agent to bond said masking agent and said white powder in turn, to said bonding agent,

each of said agents and said resin being disposed in separate containers within said box.

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**4,294,350**

## SHOWER PARTY NAME PLATE AND FAVOR

**Margaret J. Haase; Meredith Hasse, both of 140-25 Donizetti Pl., Apt. 25E, and Joan Halle, 140-25 Donizetti Pl., Apt. 25F, all of Bronx, N.Y. 10475**

**Filed Feb. 28, 1980, Ser. No. 125,327**

**Int. Cl.³ B65D** *77/00*

**U.S. Cl. 206—216** **1 Claim**

**1**. A party nameplate and favor comprising, a bag made of a flexible mesh fabric that is easily collapsible, said bag designed to hold candy and the like; a nameplate of cardboard affixed to said bag, said nameplate comprising a shape having a handle portion and a decorative portion affixed to said handle portion, said handle portion having a spur for engagement with said mesh bag; said handle portion and said decorative portion being arranged in an overlap formation such that the overlapping portions of each are attached to each other and a portion of the overlapped portion of said handle portion having said spur thereon, that portion of said handle portion comprising said spur being free from permanent bonding with said decorative portion; means for tying said handle portion to said bag at that portion of said handle portion remote from the overlapping portion thereof, said means for tying also serving to close off said bag after the candy and the like have been inserted

therein; said spur of said handle portion being inserted through the mesh of said bag after said means for tying has secured the candy and the like therein, whereby the nameplate is held erect for easy viewing and whereby the candy and the like is stored in a visual display to serve as a party favor.

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**4,294,351**

## CONTAINERS

**Jeffery J. Cheetham, 5 Brunsdon St., Bayswater, Victoria, Australia (3153)**

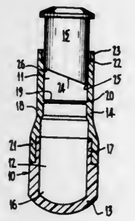
**Continuation of Ser. No. 774,950, Mar. 7, 1977, Pat. No. 4,167,228. This application Jul. 17, 1979, Ser. No. 58,260**

**Claims priority, application Australia, May 5, 1976, PC5817; Oct. 18, 1976, PC7760**

**The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclosed.**

**Int. Cl.³ B65D** *25/08*

**U.S. Cl. 206—222** **7 Claims**



**1**. A container comprising means defining a chamber separated into first and second compartments, the first compartment being arranged to contain a first component of a composition and the second compartment being arranged to contain a second component of the composition, said means defining the chamber comprising a wall means having a closed end and an open end, a partition extending across the wall means, and a plunger slidingly and sealingly located in the open end of the wall means, said plunger having an inner end surface spaced from the partition, the inner surface of the plunger being inclined at an acute angle to the partition and having a leading edge and a trailing edge movable along said wall means during a depression stroke of the plunger, at least the major portion of the interior surface of said wall means over which the leading and trailing edges of said inner surface of said plunger move during its depression stroke defining a chamber portion of substantially uniform lateral dimensions on both sides of said partition, said first compartment being defined by part of the wall means, said partition and the inner surface of said plunger, and the second compartment being defined by the closed end of the wall means and the partition, whereby upon the plunger being depressed the leading edge of the inner surface first separates a corresponding portion of the margin of the partition from the wall means, and then the partition is hinged toward the second compartment by progressive contact with the inner surface and corresponding progressive separation of the margin of the partition from the wall means, the stroke of the plunger being limited so as to leave an unseparated portion of the margin of the partition.



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**4,294,352**

## CATASTROPHIC-EXPOSURE EMERGENCY KIT

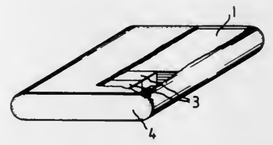
**Rudolf Fitzke, Mariannenplatz 2, 1000 Berlin 36, Fed. Rep. of Germany**

**Filed May 28, 1980, Ser. No. 154,090**

**Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922507**

**Int. Cl.³ B65D** *85/18, 85/56, 81/00*

**U.S. Cl. 206—223** **2 Claims**



**1**. A conveniently transportable emergency kit for use in adverse environmental conditions, comprising:

a pouch dimensioned to receive the head of a user and composed of a synthetic resin foil having a gold metallic outer surface and a silver metallic inner surface;

folded rectangular sheet of synthetic resin foil received in said pouch and dimensioned to wrap around the body of a user, said foil being composed of synthetic resin and having a silver metallized surface adapted to reflect body heat back to the user and a gold metallized surface adapted to be readily detected by the rescuer; and

a supply of vitamins capable of sustaining life in the absence of other sustenance for an extended period received in said pouch.

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**4,294,353**

## SIDE CONNECTED CIGARETTE HALF-PACKS

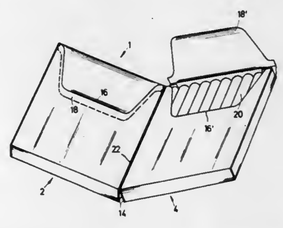
**Heinz H. Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany**

**Filed Jan. 16, 1980, Ser. No. 112,491**

**Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 7901873[U]**

**Int. Cl.³ B65D** *85/10*

**U.S. Cl. 206—273** **8 Claims**



**1**. A pack for enclosing a pair of cigarette groups, comprising two partial packs connected together via a fold line and made from a one-piece blank, each said partial pack being provided with a rear wall having a closing flap attached thereto by means of an intermediate cover wall, and a front wall having a cut-out portion adapted for the insertion of said closing flap therebehind, wherein said rear wall and said frontal wall of each partial package are connected to one another by a bottom wall, said frontal walls facing one another when said pack is folded so as to be closed, and wherein said fold line defines a center line of a center bridge extending between said partial packs, said center bridge, when folded along said fold line, extending between the planes of said rear walls and said frontal walls.

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**4,294,354**

## PACKAGING CASE

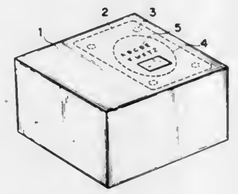
**Shoji Ariga, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan**

**Filed Dec. 10, 1979, Ser. No. 102,078**

**Claims priority, application Japan, Dec. 15, 1978, 53-172497[U]**

**Int. Cl.³ B65D** *85/00;* **H01R** *43/00*

**U.S. Cl. 206—335** **3 Claims**



**1**. A packaging case, comprising: a plurality of walls defining a container for containing an article which is adapted to be flush-mounted on a mounting structure by fastening means, said article having a centrally located, projecting, back portion; at least one of said walls having depicted thereon the outlines of (1) an outer, first pattern having the shape of the perimeter of the zone within which the article is to be flush-mounted on the mounting structure, (2) a second pattern of holes disposed inside said first pattern and substantially corresponding to the locations of the fastening means for fastening the article on the mounting structure and (3) a third pattern of an opening centrally disposed inside said first pattern, spaced from said second pattern and substantially corresponding to the shape of the perimeter of the hole to be cut in the mounting structure for receiving the projecting back portion of the article, said third pattern having marked thereon instructions for mounting the article on the mounting structure, said first pattern being detachable from the remainder of said container so as to be useable as a template for marking the location at which the article is to be mounted on the mounting structure, said second and third patterns being detachable from said first pattern so as to be useable for marking the locations of said holes and said opening, respectively, on the mounting structure.

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**4,294,355**

## CARTRIDGE FOR HEMOSTATIC CLIPS

**Stephen J. Jewusiak, Denville; Howard Beroff, Bridgewater, and Michael Schuler, Edison, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.**

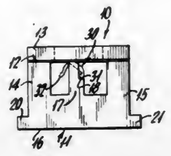
**Filed Dec. 6, 1979, Ser. No. 100,778**

**Int. Cl.³ B65D** *85/24*

**U.S. Cl. 206—339** **22 Claims**

**1**. A cartridge for holding a plurality of plastic ligating clips, each clip having one leg terminating in a hook-like head member adapted to engage and retain the free end of the other leg of the clip when the clip is closed by pivoting about an integral hinge section, comprising a body member having a base and two side walls forming an elongated channel

a central rail extending from the base of said channel along the length thereof parallel to and spaced from said side walls
said rail having a step on one side thereof forming a ledge extending along the length of said rail



a plurality of uniformly spaced notches along the top of said rail angled toward said ledge
and means for holding one leg of a clip in position on said rail with the head of the clip on said ledge and the leg of said clip resting on the angled surface of said notch.

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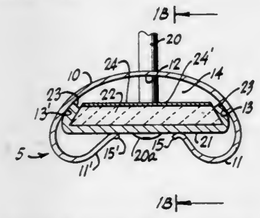
**4,294,356**
**DENTAL MIRROR PROTECTOR CASE**
**Herbert Abramowitz, 143-19 25th Ave., Whitestone, N.Y. 11357**
**Filed Apr. 21, 1980, Ser. No. 141,994**
**Int. Cl.[3] A45C *11/00*; B65D *85/38***
**U.S. Cl. 206—368** **12 Claims**



1. A mirror protector case comprising in combination: a mirror cover means for protecting a mirror reflective surface against contact with exterior objects and against contact with an interior surface of the mirror cover means, said mirror cover means including a cover structure having an interior-space surface of concave shape formed as a centrally positioned recess positioned between spaced-apart mirror-contact surfaces, and said mirror cover means further including spring structure mounted on said cover structure and positioned to exert biasing pressure against a rearward wall of a mirror such that mirror bezel structure on each of opposite sides of and adjacent to reflective mirror structure, is pressed against said spaced-apart mirror-contact surfaces, said recess being sufficiently concave that exposed mirror reflective surface is devoid of contact with and is spaced from said interior surface when mirror bezel structure is pressed against the spaced-apart mirror-contact surfaces.

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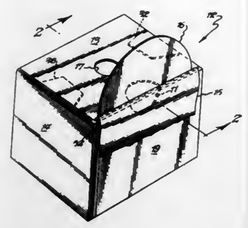
**4,294,357**
**POP UP ABRASIVE DISC DISPENSER**
**John H. Stevens, Germantown, Tenn., and Bruce A. Reidel, East Amherst, N.Y., assignors to Kennecott Corporation, Stamford, Conn.**
**Filed Jan. 10, 1980, Ser. No. 110,878**
**Int. Cl.[3] B65D *85/67, 85/672***
**U.S. Cl. 206—409** **21 Claims**

1. A device for shipping, storage, protection and dispensing of abrasive discs comprising,
a rectangular box having a bottom, a front wall, a back wall, two side walls and a top closure member connected with each other to define a container, said top closure means hingedly connected to the back wall of said container,
a flap hingedly connected to the portion of said top closure adjacent said front wall and extending into said container adjacent to the front wall of said container,
a roll, comprising abrasive discs, said discs having an abrasive surface and an adhesive surface releasably adhered on



said adhesive surface to a continuous flexible backing, said roll being rolled such that the abrasive surface of said discs faces toward the center of said roll, arranged such that the outer end of said roll extends between said flap and said front wall.

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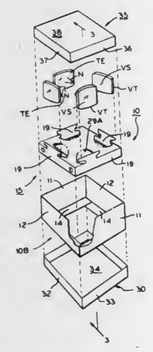
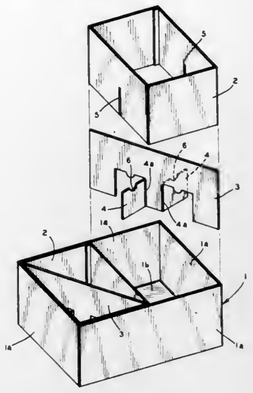
**4,294,358**
**PACKAGE FOR VIDEO TUBES**
**James F. Nauheimer, Chicago, and Steven J. Benzschawel, Carol Stream, both of Ill., assignors to Container Corporation of America, Chicago, Ill.**
**Filed Apr. 14, 1980, Ser. No. 140,301**
**Int. Cl.[3] B65D *85/42***
**U.S. Cl. 206—419** **3 Claims**



1. In a package for a plurality of necked articles of commerce, such as video tube envelopes having a viewing screen at one end and a neck at the other end:
(a) a walled tube of rectangular cross-section having inturned flanges along the bottoms of the walls of said tube;
(b) a platform of rectangular cross-section nesting within said walled tube and including a platform panel having flaps extending downward against said flanges to maintain said platform in spaced relationship to said flanges;
(c) protective and support means formed in said platform panel for said tube envelopes comprising at least one cutout panel in said platform panel, one portion of which is foldable with respect to said platform panel and downward against an inturned flange to brace against said inturned flange and form a support for a tube envelope.



**4,294,359**
**RESHIPPER CARTON FOR FINISHED OR UNFINISHED TV BULBS**
**Michael R. Berkel, Circleville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**
**Filed Jan. 28, 1980, Ser. No. 116,332**
**Int. Cl.[3] B65D *85/42***
**U.S. Cl. 206—422** **15 Claims**



1. A carton for a pair of TV bulbs or funnels having a large rectangular end tapering down to an integral neck tubulation, comprising:
1. a corrugated box having a bottom and four vertical side walls disposed in rectangular relationship;
2. a vertical corruguated partition extending diagonally between two corners of said side walls, thereby dividing the box space into two equal compartments of triangular configuration;
3. a pair of integral flaps respectively formed in said partition and swung horizontally outwardly from opposite sides of said partition to respectively traverse said compartments and contact opposed side walls of said box; and
4. means on each said flap for engaging the neck tubulation portion of a TV bulb or funnel inserted in the respective compartment to secure same for shipment.

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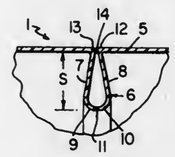
**4,294,360**
**STERILE ARTICLE CONTAINER WITH STERILE OPENING EDGE PORTIONS**
**Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407**
**Filed Aug. 13, 1979, Ser. No. 65,924**
**Int. Cl.[3] B65D *75/58, 77/38***
**U.S. Cl. 206—438** **9 Claims**



1. A container for a sterile article, said container comprising a tube of material inpenetratable to contaminants, a pair of adjacent portions of said tube extending into the interior of said tube, a seal joining the outermost ends of said portions about the periphery of each thereof, said seal being inpenetrable to contaminants forming a contamination barrier whereby both surfaces of each said portion lie within said tube inside such barrier, and said seal being separable upon manual forces applied to said container at the ends thereof in a direction which moves said ends apart, the innermost ends of said portions being separable without tearing said tube at other than said innermost ends by continued application of said forces whereby said container is opened providing edges about the openings formed by said innermost ends of said portions with the surfaces of said portions on both sides of said edges being those surfaces retained inside of said contamination barrier prior to opening said container.

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**4,294,361**
**PUSH AND PEEL BLISTER STRIP PACKAGES**
**Herman Margulies, South Orange, and Richard H. Kaufman, Ridgewood, both of N.J., assignors to Sterling Drug, Inc., New York, N.Y.**
**Continuation-in-part of Ser. No. 28,399, Apr. 9, 1979, abandoned. This application Dec. 26, 1979, Ser. No. 106,850**
**Int. Cl.[3] B65D *83/04, 85/56, 75/36, 75/58***
**U.S. Cl. 206—532** **17 Claims**

1. A blister strip package comprising a pair of heat sealable co-extensive sheets one of which is provided with a first cavity or row of spaced first cavities for containing a product to be dispensed, and a second cavity or row of second cavities each of which is laterally aligned with a corresponding first cavity and spaced therefrom, said sheets being heat sealed to one another except in the areas defined by the first and second cavities;
the other of said sheets overlying both said first and second cavities and covering the same;
said second cavities being adapted to being pushed inwards to an inverted state in order to disrupt the sheet covering said second cavities thereby providing a pull tab formed by the sheet covering said second cavities and enabling said sheet to be peeled back towards a respective first cavity to provide access thereto;
said second cavities having edges defining the area for peeling back the sheet covering the cavities.

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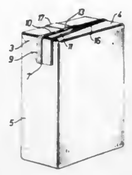
**4,294,362**
**PARALLELEPIPEDIC PACKING CONTAINER**
**Kjell H. Martensson, Malmö, Sweden, assignor to Tetra Pak International AB, Lund, Sweden**
**Filed Apr. 29, 1980, Ser. No. 144,862**
**Claims priority, application Sweden, May 10, 1979, 7904103**
**Int. Cl.[3] B43M *7/00*; B65D *5/70, 5/54***
**U.S. Cl. 206—622** **12 Claims**

1. A packing container of the type having an end wall and adjacent side walls and being substantially in the shape of a parallelepiped, said container comprising:
a sealing fin integral with said end wall, said sealing fin having a free edge, and when said container is sealed said fin overlies said end wall and a portion of an adjacent side wall;
said sealing fin including a triangular lug extending from said end wall and overlying said side wall;
a tear line in said sealing fin extending from a point adjacent said triangular lug along a portion of said sealing fin;

said free edge of said sealing fin being oblique with respect to said end wall and having a greater width adjacent said



triangular lug than adjacent the opposite end of said sealing fin.

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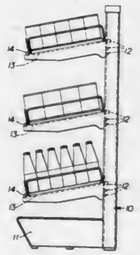
**4,294,363**

## MERCHANDISE SHELVING DISPLAY

**Muammer A. Oztekin, and Vincent J. Albano, both of Birmingham, Ala., assignors to The Kent Corporation, Birmingham, Ala.**

**Filed Dec. 17, 1979, Ser. No. 104,192**
**Int. Cl.³ A47F *1/00***
**U.S. Cl. 211—49 D** **3 Claims**



1. In a merchandise shelving display having at least one downwardly inclined shelf panel supported from a supporting frame,

(a) at least one downwardly inclined track unit integrally formed and having a pair of upstanding outer rails extending in spaced parallel relation to each other and a pair of upstanding inner rails between said outer rails and extending in spaced parallel relation to each other and said outer rails with the upper surfaces of said outer rails being at an elevation below the elevation of the upper surfaces of said inner rails, and

(b) means securing said track unit to the upper surface of said shelf panel.

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**4,294,364**

## LOG CRADLE

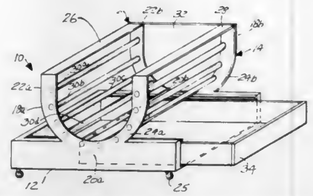
**Donald L. Bilbrey, 3481 Mills Acres, Flint, Mich. 48503**

**Filed Feb. 16, 1979, Ser. No. 12,642**
**Int. Cl.³ A47F *7/00***
**U.S. Cl. 211—60 R** **6 Claims**

1. A storage device for storing kindling materials comprising:

a base;

means for receiving kindling materials mounted on the base and having a bottom and sides provided with air access means, the means for receiving kindling material defined by a frame, the frame comprising at least two opposed frame members mounted to the base and a plurality of



material supporting elements extending between and supported from the frame members; and

a debris receiving receptacle adapted to be slidingly and removably inserted into and nest snugly within the base, beneath the receiving means.

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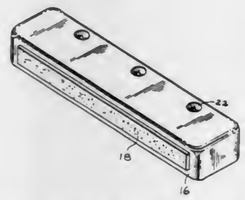
**4,294,365**

## COMBINED DART RACK AND SAFETY DEPOSITORY

**Ellsworth S. Henderson, 9532 Lamar St., Spring Valley, Calif. 92077**

**Filed Nov. 6, 1979, Ser. No. 91,705**
**Int. Cl.³ A47F *7/00***
**U.S. Cl. 211—60 R** **1 Claim**



1. A combined rack and safety depository for game darts having a spike tip and weighted boss at the base of the spike tip, said rack and safety depository comprising:

(a) an elongated, one-piece, generally rectangular simple parallelepiped hollow box-like body having a horizontal flat closed top, an open bottom and substantially vertical side walls when the rack is oriented as in use;

(b) adhesive, no-mar attachment means on one of said side walls enabling said body to be readily removably mounted on a wall surface with said top extending horizontally along and normal to said wall surface;

(c) said body having separate free standing cylindrical sockets extending normal to said top from said top substantially to the plane of the bottom of said body for substantially completely sheathing and protecting the spikes of said darts and said sockets having countersunk annular portions at said top functioning as guides to direct dart spikes into said sockets and also to serve as seats to receive terminals of said bosses, said sockets being offset horizontally from a longitudinal vertical center plane of said body toward the other of said vetical side walls to space darts well away from said wall surface so that the flights of said darts are not damaged by wall contact and finger access to said darts is assured, the lower ends of said sockets being open.

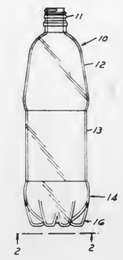


**4,294,366**

## FREE-STANDING PLASTIC BOTTLE

**Long F. Chang, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Mar. 17, 1980, Ser. No. 130,777**
**Int. Cl.³ B65D *23/00, 1/02***
**U.S. Cl. 215—1 C** **4 Claims**



1. A plastic container comprising

a side wall having an oriented generally cylindrical lower portion, and

a bottom joined to said side wall and closing the lower end of said container,

said bottom including a generally elliptical bottom wall and a plurality of oriented circumferentially spaced outwardly convexed legs extending from the elliptical wall,

said elliptical wall having a first portion extending downwardly from the lower cylindrical side wall portion and having a radius less than the diameter of the container,

said elliptical wall having a central portion,

each said leg having a first oriented portion extending downwardly from the cylindrical portion of the side wall and having a radius greater than the diameter of the cylindrical portion of the side wall,

a second oriented portion extending downwardly from said first portion of said leg and having a radius substantially less than the radius of said cylindrical portion,

a third oriented portion extending from said second portion defining a flat contacting portion,

a fourth oriented portion extending upwardly and inwardly from said flat portion and being convex outwardly,

a fifth oriented portion blending with said fourth portion and the central portion of the bottom wall,

the radius of said fourth portion being greater than the radius of said second portion,

the first and second portions of each said leg defining an outwardly extending convex surface,

each said leg having diverging oriented side wall portions merging radially inwardly with the elliptical wall portion of the bottom wall.

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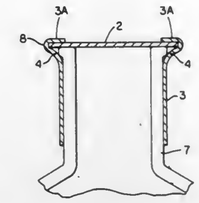
**4,294,367**

## CONTAINER HAVING RIMMED SHRINK CAP

**Chikao Otsuka; Reinosuke Hara, both of Kashiwa, and Yoshito Shigenaka, Tokyo, all of Japan, assignors to Asahi Breweries Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 833,682, Sep. 15, 1977, abandoned. This application May 17, 1979, Ser. No. 39,888**
**Claims priority, application Japan, Sep. 21, 1976, 51-113317**
**Int. Cl.³ B65D *41/54, 41/62;* B67B *5/00***
**U.S. Cl. 215—246** **8 Claims**

1. In combination with a container having a tubular neck and a mouth at the upper end of said neck, a rimmed shrink cap comprising a disc-shaped cover having a diameter which is from 10 to 40% larger than the outer diameter of the mouth of the container, said cover being made of a nonshrinkable material, a tubular skirt overlying the top surface of said cover and extending downwardly from the perimeter of said cover, said skirt being made of a heat-shrinkable material, said cap being positioned so that said cover is substantially concentric with and overlies and closes the mouth of the container, and the lower portion of said skirt surrounds the tubular neck of the container and is heat-shrunk into tight sealing contact with the exterior wall of the tubular neck of the container below the



mouth, the outer edge portion of said disc-shaped cover projecting radially outwardly beyond the outer edge of the mouth and forming an annular rim above said mouth, the upper portion of said skirt being exposed to but spaced outwardly from the outer edge of said tubular mouth and the outer surface of the portion of said neck adjacent to said mouth, said rim allows said cap to be readily torn off with ones fingers.

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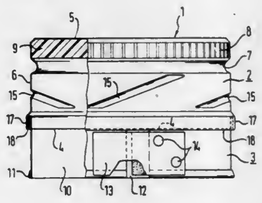
**4,294,368**

## METAL SEALING CAP

**Manfred Bodenbender, Kirchhain; Willy Reinhardt, Burgeln, and Hermann Ritzenhoff, Marburg, all of Fed. Rep. of Germany, assignors to Firma Hermann Ritzenhoff, Marburg an der Lahn, Fed. Rep. of Germany**

**Filed Feb. 11, 1980, Ser. No. 120,466**
**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2906065**
**Int. Cl.³ B65D *41/32***
**U.S. Cl. 215—256** **12 Claims**



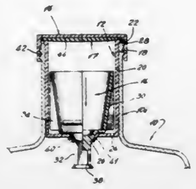
1. A metal sealing cap consisting of a cap upper part and a cap lower part removable from said cap upper part with aid of a tear-off band and by means of which cap lower part the sealing cap is securely sealed with the container by flanging in, the cap upper part of said sealing cap being removable from the container by rupturing a line of weakened strength connecting the cap upper part with the cap lower part, wherein the skirt of the cap upper part bordering on the line of weakened strength has been constructed as a folded area of at least three overlapping thicknesses of material, a first and second outer layer of material in the folded area forming a closed fold downwards and the second layer forming together with an inner third layer a closed fold upwards, the third inner layer of material being bounded at its lower perimeter by the line of weakened strength, characterized in that the line of weakened strength is axially overlapped by the lower edge formed by the downwardly closed fold of the two outerlayers of material, whereby upon rupture along the line of weakened strength, the downwardly closed fold circumferentially encloses the edge along which the line was ruptured.

**4,294,369**

## LIQUID DISPENSING RECEPTACLE

**Pierre Racine, 4801, rue Rachel, Pierrefonds, P. Q., Canada (H8Y 2C6)**

**Filed Jan. 21, 1980, Ser. No. 115,247**
**Claims priority, application Canada, Dec. 20, 1979, 342373**
**Int. Cl.³ E03D** *9/03*
**U.S. Cl. 215—311** **5 Claims**



1. A fluid-tight receptacle for ultimate use in the automatic and periodic dispensing of a liquid into a flush tank or the like, comprising:

(a) a container having a body with a neck portion, said neck portion having a mouth with an upper edge;

(b) a cup-shaped member tightly engaged in said neck portion, said member having a side wall with an annular rim extending at said upper edge of said neck portion of said container, said cup-shaped member including a bottom end wall with an axial opening therethrough;

(c) a cap threadedly engaged exteriorly with said neck portion, said cap having a flat circular inner top wall;

(d) a resilient liner tightly received in said cap on said top wall thereof; and

(e) a float member slidably mounted relative to said cup member, said float member including a cup portion concentrically mounted within said cup-shaped member and a lower stem portion slidable through said opening of said bottom end wall; said stem portion including an enlarged end portion adapted to abut against said bottom end wall whereby movement of said float member in said cup-shaped member and of the stem portion in the opening is limited by said enlarged portion and said cup portion; said cup portion having an upper edge extending at a level which is at or below the level of said rim of said cup-shaped member, whereby tight engagement of said cap with said container results in sunken engagement of said rim in said resilient liner to thereby prevent fluid leakage from said cup-shaped member.

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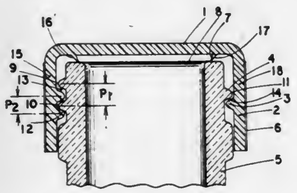
**4,294,370**

## THREADED CLOSURE AND CONTAINER

**Thurston H. Toeppen, Lois La. R.D. 3, Poughkeepsie, N.Y. 12603**

**Filed Mar. 24, 1980, Ser. No. 133,536**
**Int. Cl.³ B65D** *41/04*
**U.S. Cl. 215—329** **5 Claims**



1. A closure device of resilient material, in combination with a container having an external screw thread of less resilient material, comprising: a circular crown disc, a cylindrical sidewall or skirt depending from said disc and perpendicular to it, an internal screw thread within said sidewall to mate with said external screw thread, and sealing means integral with the inside surface of said crown disc for mating contact with the upper rim of the opening of said container; said internal thread having an initial axial pitch shorter than the initial axial pitch of said external thread by an amount proportional to the difference in the effective elasticities of said materials and to the axial pitch of said external thread.

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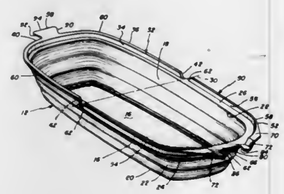
**4,294,371**

## SUNDAE DISH

**Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.**

**Filed Jan. 10, 1980, Ser. No. 111,102**
**Int. Cl.³ B65D** *1/22*
**U.S. Cl. 220—4 E** **7 Claims**



1. A thin-walled plastic sundae dish adapted to mate with a second identical dish so that one may serve as a cover for the other comprising:

a bottom wall and an upstanding continuous side wall,

an outwardly extending substantially horizontal flange attached to the top of the side wall about its periphery,

upstanding first and second beads formed on the flange and each extending about approximately one half the periphery of the flange, said first and second beads being substantially a continuation of one another so that the two together extend about the full periphery of the flange,

said second bead being positioned on the flange so that its inner side is disposed outwardly from the center of the dish beyond the outer side of the first bead,

and a male latching member formed at one end of the flange as an extension of the first bead and a female latching member formed at the other end of the flange and interrupting the second bead whereby when two identical dishes are placed flange to flange with the male and female latching members of the two dishes registering with one another, the second bead of each dish lies outside the first bead of the other dish to form a skirt about the closed container formed by the two dishes and the male and female latching members are positioned to engage one another and hold the two dishes together.

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**4,294,372**

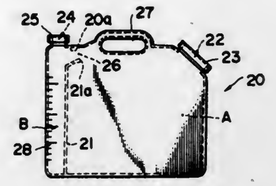
## SMALL-SIZED CONTAINER CAPABLE OF MIXING MORE THAN TWO COMPONENTS AT A PREDETERMINED MIXING RATIO

**Shigeru Onishi, Kanazawa, Japan, assignor to Nippon Clean Engine Laboratory Co., Japan**

**Filed Oct. 29, 1979, Ser. No. 89,041**
**Claims priority, application Japan, Nov. 3, 1978, 53-135949**
**Int. Cl.³ B65D** *1/24, 88/56*
**U.S. Cl. 220—20** **1 Claim**

1. Container apparatus for storing at least two components and for mixing the same according to a predetermined ratio, comprising:

means for defining at least two chambers, each chamber having a hollow interior space defined therewithin, and wherein the ratio of the cross-sectional areas of the interior spaces of said at least two chambers is substantially constant at any level of the apparatus when the latter is oriented in a storage position, said chamber defining means including a container having bottom, side and upper walls and a partition wall located within said container, said partition wall having connected to said container bottom and side walls along its bottom and side edges respectively to define said at least two chambers, said partition wall having a top edge which is spaced below the upper wall of said container, the space defined between said partition wall top edge and said upper wall



of said container forming a passage interconnecting said hollow interior spaces of said at least two chambers with each other;

at least two opening means formed in said container, each opening means communicating with only a respective one of said at least two chambers when the apparatus is oriented in the storage position, whereby each respective component can be charged into the hollow interior space defined by a respective chamber through the respective openings means communicating therewith; and

at least two lid members, each of said lid members being adapted to close a respective one of said openings means.

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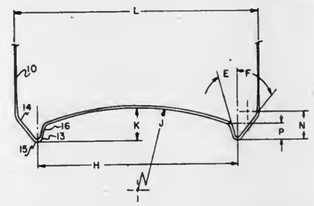
**4,294,373**

## LIGHTWEIGHT METAL CONTAINER

**Edward C. Miller, Broomfield, and David A. Straw, Lakewood, both of Colo., assignors to Ball Corporation, Muncie, Ind.**

**Continuation of Ser. No. 962,493, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 900,411, Apr. 26, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,733**
**Int. Cl.³ B23K** *9/00*
**U.S. Cl. 220—70** **10 Claims**



1. A lightweight aluminum-base alloy container capable of withstanding a substantial internal pressure without eversion comprising a unitary structure having a seamless cylindrical side wall and a bottom wall integrally formed with the side wall at the lower extremity thereof, the ratio of the thickness of said bottom wall to the thickness of said side wall being 3.0 or less, said bottom wall comprising a tapering surface extending downwardly from the side wall, said tapering surface forming a taper angle of between 1.3° and about 2.2° and a wall taper thickness of between about 0.006 inch and about 0.010 inch in excess of the side wall, an outer frustoconical surface extending downwardly and inwardly from said side wall toward the axis of said container, said outer frustoconical surface forming a bottom angle of between about 35° and about 45° with respect to the axis of the container, a bottom radius integrally connected with and extending downwardly from said outer frustoconical surface providing an annular supporting surface of the container, said annular supporting surface having a diameter in the range of about 2.05 inches to about 2.2 inches, an inner frustoconical surface integrally connected with said bottom radius and extending upwardly and inwardly from said annular supporting surface toward the axis of the container, said inner frustoconical surface forming an angle in the range of about 12°±4° with respect to the axis of the container, the height of said inner frustoconical surface being less than half the height of said outer frustoconical surface, and a downwardly concaved center panel integrally connected with said inner frustoconical surface and extending upwardly and inwardly from said inner frustoconical surface to the axis of said container, the radius of curvature of said downwardly concaved center panel being between about 2.250 inches and about 3.000 inches, said center panel extending at its uppermost portion slightly above said height of said outer frustoconical surface.

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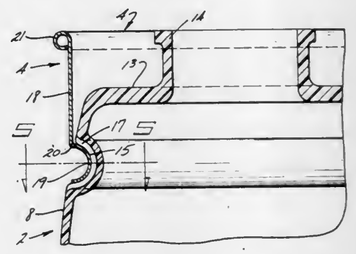
**4,294,374**

## PLASTIC DRUM ASSEMBLY

**Geoffrey C. Ames, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation of Ser. No. 636,272, Nov. 28, 1975, abandoned. This application Feb. 8, 1978, Ser. No. 876,081**
**Int. Cl.³ B65D** *1/46, 6/34, 25/22*
**U.S. Cl. 220—71** **17 Claims**



1. A plastic drum assembly comprising a single piece blow molded plastic drum having a top end panel, a bottom end panel, and a circumferential sidewall joining said top and bottom end panels, said top end panel defining at least one opening therethrough, said sidewall including a horizontal circumferential recess adjacent said top end having a substantially semi-circular cross section and at least one arcuate substantially vertical drain channel formed in the surface of said recess and a split metal collar mounted on said drum having a vertically disposed wall portion including a substantially circumferential inwardly extending projection adjacent the lower margin of said vertically disposed wall portion, said inwardly extending projection having a substantially semi-circular cross section positioned within and in snug contact with said recess, said metal collar further including a substantially circumferential rolled annular bead disposed adjacent the upper margin of said vertically disposed wall portion, said annular bead located above said top end, whereby said metal collar and drum are movable by chime-gripping drum handling devices.

**4,294,375**

## VEHICLE FUEL TANK SEALING CAP

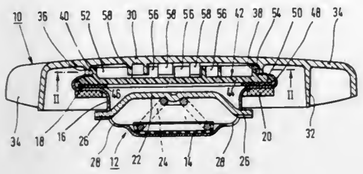
**Thedor Gerdes, Langenfeld, Fed. Rep. of Germany, assignor to Blau KG Fabrik Fur Kraftfahrzeugteile, Fed. Rep. of Germany**

**Filed Dec. 4, 1979, Ser. No. 100,159**

**Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852454**

**Int. Cl.³ B65D** *41/06, 51/18*

**U.S. Cl. 220—293** **6 Claims**



1. In a sealing cap, for the fuel tank pipe of a motor vehicle, comprising:

(i) an outer cap **10**

(ii) an inner cover portion **12**, said inner cover portion **12** being cup-shaped and having a peripheral flange **18** at its side facing the outer cap **10**, said cover portion **12** carrying packing means to form a seal with the fuel tank pipe, said cover portion **12** further comprising fastening means **22** for engagement with the fuel tank pipe, said outer cap **10** at its side facing the inner cover portion **12** including an integrally molded rib **36** of synthetic material having at its free end at least one inwardly-directed radial lug **38** engaging said inner cover portion **12**, said outer cap **10** being adapted to snap off from said inner cover portion **12** under the influence of forces exerted on it as a result of a motor vehicle accident,

the improvement which comprises:

(a) the strength of the lug **38** is selected such that it is adapted to break under the influence of said forces,

(b) positive anti-rotational coupling means **56**, **58**, **70**, **72** to prevent relative rotation between said inner cover portion **12** and said outer cap **10** and provided respectively on said inner cover portion **12** and on said outer cap **10**.

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**4,294,376**

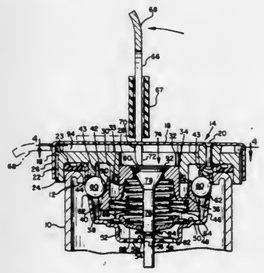
## FUEL TANK CAP

**Russell D. Keller, 1750 SE. Risley, Milwaukie, Oreg. 97222**

**Filed Jan. 3, 1980, Ser. No. 108,448**

**Int. Cl.³ B65D** *45/00*

**U.S. Cl. 220—318** **8 Claims**



1. A fuel tank cap comprising:

a cap body adapted to form a closure on the outer end of a fuel tank neck,

a housing member depending from underneath said cap body and provided with movable means comprising a plurality of balls for selectively engaging the underside of an inner lip of the fuel tank neck when said cap body is positioned on said fuel tank neck,

an actuating member for operating said movable means for moving the same between first and second positions into and out of engagement with the inner lip of the fuel tank neck,

and a manually operable control element on the outer side of said cap body for causing said actuating member to operate said movable means between said first and second positions.

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**4,294,377**

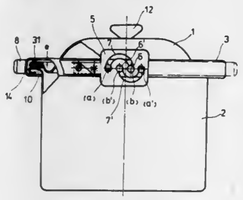
## CONSTANT PRESSURE COOKER AND FASTENER

**Shin-I. Chen, No. 5, 102 La., Ho-Chiang St., Taipei, Taiwan**

**Filed Mar. 14, 1980, Ser. No. 130,341**

**Int. Cl.³ B65D** *45/34*

**U.S. Cl. 220—321** **12 Claims**



1. A constant pressure cooker, comprising:

a cooker body having a protruding edge portion;

a cover having an exterior margin curved inward and under the cover to form a cover groove, the exterior margin being shaped so as to mate with the protruding edge portion of the cooker body when the cover is placed on the cooker body;

a thermal resistant rubber material placed within the cover groove; and

a coupling ring having a gap therein and having a cross sectional shape for clamping the protruding edge portion of the cooker body to the exterior margin of the cover and fabricated from a flexible metal material such that for pressures within the cooker below a predetermined threshold, the edge portion of the body is held tightly to the exterior margin of the cover, but for pressures within the cooker at or above the predetermined threshold, the cross-section of the ring deforms and allows the exterior margin of the cover to separate from the edge portion of the cooker body so that pressurized gases can escape from the cooker; and

means for adjusting the size of the gap to clamp and unclamp the coupling ring.

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**4,294,378**

## SAFETY HATCH COVER APPARATUS

**Evsey Rabinovich, Erie, Pa., assignor to Emco Wheaton Inc., Conneaut, Ohio**

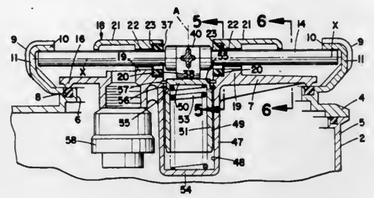
**Filed Feb. 4, 1980, Ser. No. 118,647**

**Int. Cl.³ B65D** *45/28*

**U.S. Cl. 220—323** **14 Claims**

1. Hatch cover apparatus for a tank comprising a base member fixed to the tank having an opening providing access to the tank; a pair of keeper members mounted on the base member at opposite sides of said opening, each keeper member providing lateral access for an end portion of a latch bar; a cover associated with the base member and adapted to be put in closed position to engage the base member and close the opening and to be put in opened position to open the opening; an elongated latch bar adapted to have its ends engage with the keeper members when the cover is in closed position and be disengaged from the keeper members when the cover is in opened position; means on the cover for mounting a latch bar on the cover so that it is capable of limited movement to engage and disengage from said keeper members and of rotation about its longitudinal axis, said latch bar being thus movable between a position in which its ends are engaged with the keeper members and another position in which its ends are not so engaged; a cam affixed to the latch bar and adapted to be rotated about the longitudinal axis of the latch bar, said cam having a projecting external surface portion that is located a maximum distance from the latch bar axis and toward the cover when the cover is in its closed position and retracted external surface portion





located at lesser distance from the latch bar axis and away from the cover when the cover is not in the closed position; resilient biasing means operating by cooperation with the cover, the cam, the latch bar, and the keeper members to urge the cover toward the base member when the cover is closed and the latch bar ends are engaged with the keeper members, yet when gas pressure above a predetermined amount exists within the receptacle and generates a force on said cover against the biasing force of said biasing means, said biasing means will permit at least a portion of the cover to lift from the base member and permit escape of such gas from the tank.

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**4,294,379**

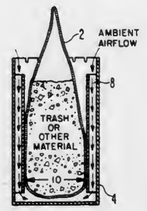
## UPWARD VENTED TRASH RECEPTACLE FOR FLEXIBLE COLLAPSIBLE TRASH LINER

**Robert A. Bard, 70 Hopatcong Dr., Lawrenceville, N.J. 08648**

**Filed Aug. 27, 1979, Ser. No. 70,179**

**Int. Cl.³ B65D** *25/16*

**U.S. Cl. 220—404** **4 Claims**




1. An apparatus for receiving a flexible and collapsible trash liner comprising:

a rigid upward vented trash receptacle having a main body with a closed bottom; a collapsible trash liner; and an open top with a rim containing circumferentially positioned notches for assisting the escape of air trapped between the walls of said main body and said trash liner; said main body including along its side walls a plurality of axially aligned hollow open ended conduits positioned in the corners of said main body and spaced sufficiently from said bottom and top of said receptacle to permit trapped air to flow out of said trash receptacle during the filling of said liner and to permit ambient air to flow into said trash receptacle as the liner is removed from said receptacle so as to reduce the vacuum created in the void between the exterior of said liner and the interior of said receptacle.

**4,294,380**

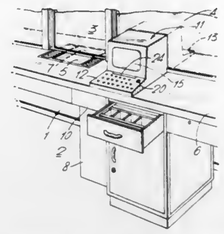
## TELLER MACHINES AND METHODS OF OPERATION THEREOF

**Kenneth F. Rankin, St. Albans, England, assignor to Chubb Integrated Systems Limited, Brighton, England**

**Filed May 21, 1979, Ser. No. 40,786**

**Int. Cl.³ E05G** *7/00*

**U.S. Cl. 221—195** **2 Claims**



1. A teller machine for use at a transaction location for delivery of items in accordance with a customer-requested transaction at that location, comprising transaction-counter means having a counter-surface for separating the customer from a human teller at the transaction location and across which counter-surface face to face personal service to the customer can be provided by the human teller, means including a first keyboard for defining a teller's station located to one side of the counter means, means including a second keyboard for defining a customer's station separated from the teller's station across the counter-surface, item-receptacle means located intermediate the customer's and teller's stations across the counter-surface, said receptacle means having a top opening within reach of the customer and the human teller when occupying their respective stations for access to the contents of said receptacle means, dispenser means operable to dispense items through an opening in a wall of said receptacle means different from said top opening for subsequent delivery via said top opening from the receptacle means to said customer, control means for controlling operation of said dispenser means, said control means being switchable selectively to a first mode in which it is responsive to operation of said first keyboard to operate said dispenser means under manual control from said first keyboard, or to a second mode in which the control means operates said dispenser means under machine control in dependence upon data entered via said second keyboard, and means operable from said teller's station to obstruct or enable, selectively, access from said customer's station via said top opening to the contents of said receptacle-means.

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**4,294,381**

## DISPENSER FOR AND METHOD OF DISPENSING A MATERIAL FROM A NON-PRESSURIZED MATERIAL RESERVOIR

**Kenneth L. Miller, 7345 N. Meridian St., Indianapolis, Ind. 46260**

**Continuation-in-part of Ser. No. 668,417, Mar. 18, 1976, Pat. No. 4,095,722. This application Jun. 15, 1978, Ser. No. 915,874**

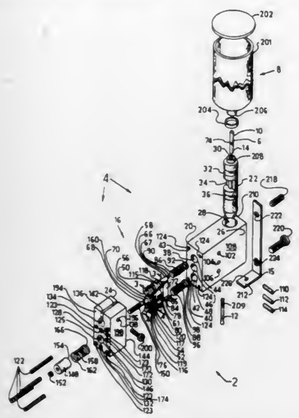
**The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.**

**Int. Cl.³ B65D** *37/00*

**U.S. Cl. 222—1** **21 Claims**

1. A material dispenser for dispensing a material from a non-pressurized material reservoir comprising a resilient pinch-off tube having opposite ends, one end of said pinch-off tube being removably coupled to said reservoir, a nozzle removably coupled to other end of said pinch-off tube, said nozzle being in communication with said reservoir through said tube, and squeezing means, operative with said tube, for selectively forcing a selected amount of said material out of said tube and nozzle and drawing said material from said noz-

zle into said tube, said squeezing means including an upper ram and an intermediate ram and a lower ram, each of said rams being selectively movable from a first position in which said ram is disengaged from said tube to a second position in which said ram engages and compresses said tube and back from said second position to said first position, said squeezing means further including means for positioning said rams and means, operative with said ram positioning means, for sequencing the movement of said rams to, firstly isolate said material in said tube by positioning said upper and lower rams in said second position thereof, secondly dispense a portion of said material in



said tube by positioning said upper ram in said second position thereof, and said lower ram in said first position thereof, and squeezing said tube by moving said intermediate ram from said first position thereof toward said second position thereof, thirdly withdraw said material from said nozzle into said tube by positioning said lower ram in said first position thereof and positioning said upper ram in said second position thereof, and positioning said intermediate ram in said first position thereof, and fourthly fill said tube from said reservoir by positioning said intermediate and upper rams in said first position thereof and said lower ram in said second position thereof.

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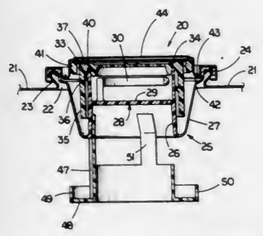
**4,294,382**
**CONTAINER CLOSURE DEVICE**
**Kenneth L. Summers, Angola, and Mahlon E. Rieke, Auburn, both of Ind., assignors to Riche Corporation, Auburn, Ind.**
**Filed Jul. 26, 1979, Ser. No. 60,971**
**Int. Cl.[3] B67D** *3/00*
**U.S. Cl. 222—529** **1 Claim**



1. A cap-like closure device for a container of the type including a flexible spout member having a substantially cylindrical top rim portion and an outer edge portion and extendable from a nested orientation to a pouring orientation, an anchor ring for securing the outer edge portion of the flexible spout member to the container, a first cap for engaging the top rim portion and closing said spout member, and a tamper-proof cap disposed over and removable from the top of said first cap, wherein the improvement comprises:

an interior annular groove disposed in a top lip portion of said first cap and including a base surface at the uppermost end, said interior annular groove opening downwardly toward said top rim portion of said flexible member, wherein said interior annular groove narrows as it extends upwardly away from the top rim portion of said flexible spout member, and wherein said top rim portion has an upwardly and outwardly inclined top surface which tapers to an edge at the outermost and uppermost location of said top rim portion, the width of the interior annular groove at said base surface is narrower than the maximum thickness of said top rim portion thereby forcing the thinner parts of said top rim portion corresponding to the inclined top surface to curl into said interior annular groove when said first cap is fitted onto said flexible spout member.

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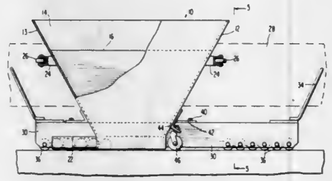
**4,294,383**
**MORTAR APPLYING DEVICE**
**Rodney J. Hession, and Brent M. Hession, both of New Orleans, La., assignors to Hession Industries, Inc., New Orleans, La.**
**Filed Jan. 18, 1980, Ser. No. 113,325**
**Int. Cl.[3] B05D** *1/26, 1/30;* **F04G** *21/16*
**U.S. Cl. 222—611** **5 Claims**



1. A device for applying mortar to a course of masonry units having side faces and a top surface, comprising a hopper formed with side members and end plate members and having an open top and bottom, plate members defining a divider mounted within said hopper and defining a pair of mortar receiving and delivering compartments communicating with the open top and bottom, the portion of said end plate members of said hopper lying between said plate members of said divider are formed to define an elongated recess extending through the bottom of said hopper, a wheeled undercarriage chassis entending through said recess and fastening means on said hopper for securing same to said chassis for moving said hopper over the top surface of a course of masonry units and semi-cylindrical guide members secured to said hopper in trailing relation for depositing uniform beads of mortar upon said surface, contemporaneous with the moving of said hopper.

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**4,294,384**
**LIQUID DISPENSER HOLDER**
**Terrence D. Howell, Apt. 214, 3395 Yankee Doodle Rd., Eagan, Minn. 55121**
**Filed Oct. 25, 1977, Ser. No. 844,632**
**Int. Cl.[3] B60N** *3/10, 3/18*
**U.S. Cl. 224—42.42** **1 Claim**

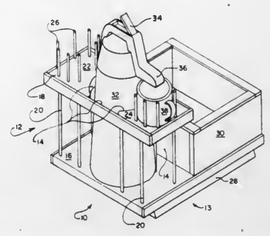
1. A liquid dispenser holder, comprising:

(A) a cradle for receiving and holding a liquid dispenser such as an Air Pot, which cradle includes a cradle base having a planar member for setting thereon of a dispenser and a collar supported vertically above the base for at least partially encircling the upper portion of a said dispenser to prevent the dispenser from tipping;

(B) cradle attachment means adapted to hold the cradle stationary when the cradle is on a vehicle seat, transmission shroud, or floor, which attachment means includes a pair of planar leg members rigidly attached to and depending from said cradle base and diverging from each other in two directions, which leg members are longitudinally elongate, closer together at one end than the other and closer together at their juncture with said cradle base than at their bottoms to form a saddle for securely engaging a transmission shroud graduating dimensionally either longitudinally or vertically;

(C) a ballast compartment supported by said base for accepting ballast or utilitarian articles of sufficient weight to stabilize said cradle; and





(D) receptacle holding means for supporting a receptacle in position under and to receive a fluid from an Air Pot dispensing spout, which holding means includes a platform which in turn is an extension of said collar and has at least one receptacle filling station having means for releasably engaging a receptacle such as a coffee mug and which receptacle holding means is supported vertically above said cradle base, whereby all the steps for filling a receptacle from a dispenser such as an Air Pot can be accurately and safely performed with only one hand.

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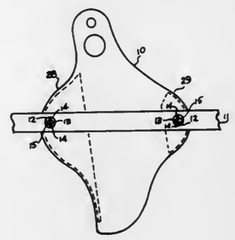
**4,294,385**
**RAPIDLY SEPARABLE HOLSTER AND HOLSTER-CARRYING BELT**
**William H. Rogers, Jacksonville, Fla., assignor to Alpha Plastics, Inc., Jacksonville, Fla.**
**Filed Feb. 25, 1980, Ser. No. 124,658**
**Int. Cl.[3] F41C** *33/02;* **F41B** *13/04*
**U.S. Cl. 224—240** **13 Claims**



1. A rapidly separable holster and holster-carrying belt comprising a holster with two spaced upstanding pins on the side of the holster next to the body of the person wearing the holster, said pins comprising a shank and a generally flat head of substantially larger diameter than the diameter of said shank; and a belt having on the inside surface thereof two rigid slotted plates spaced apart substantially the same distance as the distance between said pins, each of said plates and the contiguous portion of the belt being perforated with a slot, one end of which is slightly larger than the diameter of said head and the other end of which has a diameter larger than the diameter of said shank and smaller than the diameter of said head, said slots being oriented with the lengthwise axis of the slot substantially parallel to the lengthwise axis of the belt and with the distance between the smaller ends of the slots being less than the distance between the larger ends of the slots.

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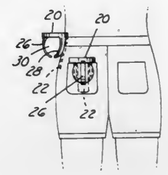
**4,294,386**
**TENNIS BALL HOLDER**
**Arlen E. Ingram, 32606 Barkley, Livonia, Mich. 48154**
**Continuation of Ser. No. 912,446, Jun. 5, 1978, abandoned. This application Jan. 25, 1980, Ser. No. 115,386**
**Int. Cl.[3] A45F** *5/00*
**U.S. Cl. 224—252** **5 Claims**



1. A tennis ball holder attachable to the garment of a player and constructed and arranged to receive and hold only one tennis ball at a time, comprising a homogeneously integral one-piece body of a plastic material having a retainer ring which is flexible, resilient, formretaining, and can be disposed in a generally horizontal plane with its central axis extending generally vertically, a plurality of discreet and generally circumferentially spaced apart fingers each at its proximal and homogeneously integral with said ring and depending normally generally downwardly from said ring and having its distal end curved generally inwardly of said ring toward its center axis and terminating at a point spaced from said center axis and the distal end of the other of said fingers, each said finger being flexible, resilient, form-retaining, and constructed and arranged so that its distal end, in the unflexed position of such finger, underlies and supports a single tennis ball inserted through said ring and can be yieldably moved away from said center axis to allow the tennis ball to be manually pushed generally downwardly beyond the distal end, out of the holder and into the fingers and hand of a user by pressure manually applied to the top of the tennis ball by the thumb of the same hand of the user extending through said ring, said ring being constructed, arranged, and dimensioned to yieldably permit the tennis ball to pass therethrough and into engagement with said flexible fingers and in its normal unflexed state to retain the tennis ball between said ring and said fingers, and a tab homogeneously integral with said ring and being constructed and arranged for attaching the holder to the garment of a tennis player.

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**4,294,387**
**CONVERTIBLE SKI CARRYING APPARATUS**
**Kenneth A. Wnek, 282 Valley Park South, Bethlehem, Pa. 18018**
**Continuation-in-part of Ser. No. 921,969, Jul. 5, 1978, Pat. No. 4,171,759. This application Jun. 25, 1979, Ser. No. 51,516**
**Int. Cl.[3] B60R** *9/12*
**U.S. Cl. 224—315** **10 Claims**

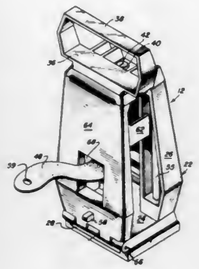
1. A convertible carrier for skis comprising:

(a) a generally L-shaped housing including a floor portion and a side portion, said floor portion having sufficient length and width to receive at least one pair of skis resting in parallel juxtaposition, and where said skis are supported on their longitudinal edge by said floor portion, said side portion being of sufficient height to provide lateral support for said skis, said floor portion also including a transverse opening, said opening being of a shape and size to permit the insertion therein of a bracket plate which is separate from said housing;

(b) retainer means for said skis of the same proximate size

and shape as said side portion, hingeably connected at its proximal end to said floor portion and at its distal end adapted to interface with a handle means whereby said carrier may be opened or closed;

(c) handle means to provide hand carrying of said carrier said handle means adapted to mate with said retainer means so that said handle means together with said floor portion, side portion and retainer means define a total closure for said skis and said poles, said handle means also including at least one shank portion containing at least one recess positioned intermittent its length to receive an extension bar section of a locking mechanism;



(d) bracket means, including at least one bracket plate, adapted to be affixed to a vehicle, said bracket plate adapted to slidably mate within said housing transverse opening, said bracket plate including at least one opening to receive and permit passage therethrough of said shank whereby when an end of a shank extends into an opening, sliding of said carrier from said bracket plate is prevented; and,

(e) locking means interconnected with said handle means and said shank so that when said shank is slidably mounted in said housing, said extension bar section operably connects with said locking mechanism so that unlocking of said locking mechanism operates to release said extension bar section from a recess of said shank.

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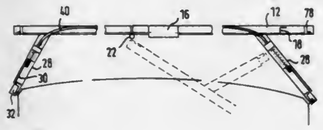
**4,294,388**

## CAR TOP CARRIER SUPPORT

**Franz Wünstel, Morellstr. 1, D-8900 Augsburg, Fed. Rep. of Germany**

**Filed Aug. 11, 1980, Ser. No. 177,445**
**Int. Cl.³ B60M** *9/04*
**U.S. Cl. 224—315** **10 Claims**



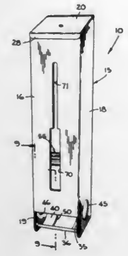
1. A car top carrier support comprising a substantially H-shaped frame, the frame consisting of a pair of parallel hollow tubes and at least one hollow tube cross-wise extending therebetween, at least four legs arranged at the frame and extending downwardly, the legs standing on the car top edge or the gutter of which, a claw associated with each leg and connected with a slide, the slide being movably guided in the leg for a reciprocating motion; a central hand operating means arranged at the frame and a set of at least four driving means, each one of the driving means being connected at its one end with one of the claws and at its other end with the central operating means.

**4,294,389**

## DISPENSER FOR ROLLS OF PAPER

**Filip Falk, Hammarbacken 22, S-182 35 Danderyd, and Lennart Falk, Visborgsgatan 16, S-621 00 Visby, both of Sweden**

**Filed Sep. 7, 1979, Ser. No. 73,270**
**Claims priority, application Sweden, Sep. 13, 1978, 782101**
**Int. Cl.³ B26D** *1/02;* **B26F** *3/02*
**U.S. Cl. 225—34** **5 Claims**



1. A dispenser for a plurality of rolls of paper or the like comprising:

(a) a longitudinally extending hollow housing having a rear wall, a front wall and confronting side walls;

(b) means at an upper section of said housing for depositing in said housing a column of rolls of paper, said column of rolls of paper extending in the longitudinal direction of said housing with the axes of said rolls of paper extending in parallel relation between said side walls and transversely of said housing;

(c) said front wall and said side walls at a lower section of said housing forming a paper exit opening for said housing;

(d) said housing being formed with a wall at the lower section thereof on which a dispensable roll of paper is seated for rotation, said dispensable roll of paper being a lower roll of said column of rolls of paper, said dispensable roll of paper having the free end thereof projecting through said paper exit opening;

(e) a cutting edge extending transversely across said paper exit opening for severing the free end of the dispensable roll of paper from the remainder of the roll of paper; and

(f) a gate supported in said housing by said rear wall between said dispensable roll of paper and a succeeding roll of paper, said gate being arranged to retain said succeeding roll of paper out of contact with said dispensable roll of paper, said gate being displaceable in response to said succeeding roll of paper being moved into the position occupied by said dispensable roll of paper after the supply of paper of said dispensable roll of paper has been expended, said gate being returned to its initial position to retain the next succeeding roll of paper out of contact with the roll of paper now occupying the position of a dispensable roll of paper, said gate being adjustably supported in said housing by said rear wall in the longitudinal direction for accommodating rolls of paper of various diameters in maintaining the succeeding roll of paper out of contact with the dispensable roll of paper.

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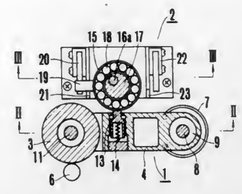
**4,294,390**

## PINCH ROLLER MECHANISM

**Takeshi Toriumi, Sagamihara, and Tamotsu Tominaga, Akishima, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 16, 1979, Ser. No. 85,377**
**Claims priority, application Japan, Oct. 23, 1978, 53-146353**
**Int. Cl.³ B65H** *17/22*
**U.S. Cl. 226—181** **3 Claims**

1. A pinch roller mechanism comprising a source of rotary motion, an eccentric cam coupled to said source of rotary motion and adapted to be rotated by said source, a capstan shaft, a pinch roller, an arm normally urged against the side surface of said eccentric cam and supporting said pinch roller,



spring means of different spring forces for urging said pinch roller against said capstan shaft when said eccentric cam is rotated by said source of rotary motion, and control means for controlling energization of said source.

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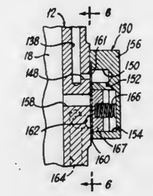
**4,294,391**

## FASTENER DRIVING TOOL

**Allen R. Obergfell, Park Ridge, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.**

**Filed Oct. 31, 1979, Ser. No. 89,878**
**Int. Cl.³ B25C** *1/04*
**U.S. Cl. 227—130** **13 Claims**



1. In a fastener driving tool including a housing defining a reservoir for pressurized fluid, a nose portion and a handle portion, a driver mounted in said nose portion, means for driving said driver through a driving stroke, the improvment comprising

means for returning said driver to a static position, said returning means comprises a chamber, first and second inlets in said chamber, said first and second inlets in fluid communication with said reservoir, a diaphragm mounted in said chamber and sealing said first inlet, and a first outlet in said chamber in fluid communication with said nose portion below said driver, said diaphragm separates said first inlet and said outlet from said second inlet and controls fluid flow therethrough.

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**4,294,392**

## METHOD OF JOINING A PAIR OF METAL PARTS

**Nicholas J. Colloff, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England**

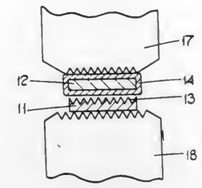
**Filed Dec. 28, 1979, Ser. No. 108,129**
**Claims priority, application United Kingdom, Jan. 16, 1979, 1598/79**
**Int. Cl.³ B23K** *21/00*
**U.S. Cl. 228—111** **4 Claims**

1. A method of joining a pair of metal parts wherein:

(a) at least one of the parts is provided with an insulative coating at its surface to be joined to the other part,

(b) at least one of the parts defines a plurality of substantially parallel, longitudinally extending splines at its surface to be joined to the other part, and

(c) the joining surfaces of the parts are urged into interengagement and are simultaneously caused to undergo relative vibrational movement in a direction substantially parallel with said splines.



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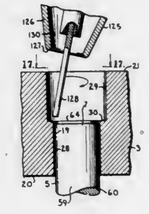
**4,294,393**

## METHOD OF MANUFACTURING A WIRE SPOKE AUTOMOTIVE WHEEL

**Richard G. Weld, Independence, Mo., assignor to Weldwheels, Inc., Kansas City, Mo.**

**Division of Ser. No. 918,606, Jun. 23, 1978, Pat. No. 4,226,479.**
**This application Sep. 28, 1979, Ser. No. 79,962**
**Int. Cl.³ B23K** *31/00*
**U.S. Cl. 228—134** **3 Claims**



1. A method of manufacturing a vehicular wheel rim comprising the steps of:

(a) providing a wire spoke vehicular wheel rim;

(b) providing a felly for said wheel rim and having walls defining spaced bores extending circumferentially thereabout;

(c) providing solid spokes having radially outer ends;

(d) securing said spoke outer ends within said felly bores by:

(1) inserting a spoke outer end partially within a felly bore, thereby leaving a cavity defined by said felly bore atop said spoke outer end with said spoke outer end providing a substantially closed bottom wall of said cavity;

(2) feeding a welding wire into said cavity under wire melting conditions;

(3) substantially filling said cavity with melted welding wire but not overfilling said cavity;

(4) producing a weld formation extending transversely across said spoke outer end;

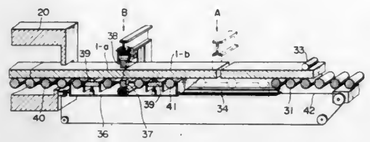
(5) fusing said spoke outer end to said melted welding wire which is fused to the felly bore wall; and

(e) assembling the wheel rim and felly-spoke assembly.

## 4,294,394
## METHOD OF AND APPARATUS FOR CONTINUOUSLY ROLLING STEEL SLABS

Yoshihiko Iida, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1979, Ser. No. 63,776
Claims priority, application Japan, Aug. 7, 1978, 53-95479
Int. Cl.³ B23K *37/04*; B21B *1/04*
U.S. Cl. 228—158 13 Claims



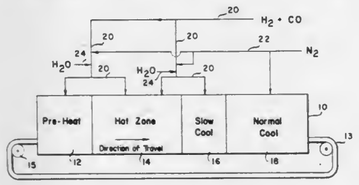

1. In a process for producing strip by a continuous hot rolling of slab steel including the steps of welding a piece of slab at its leading end to the trailing end of a steel slab while transferring said steel slab by making said piece of slab follow said steel slab, moving said steel slab including successive steel slab pieces welded together in series through a heating furnace to heat said steel slab, and effecting hot rolling of a steel slab by passing said steel slab through a rolling mill to produce a strip;

wherein the improvement resides in that said step of welding is made at the boundary surface between the trailing end of said steel slab and said piece of slab which is positioned in abutment at its leading end with said trailing end of said steel slab, over an area which amounts to 1/20 to ½ of the whole area of said boundary surface, and in the further step of shearing said roller strip at said areas of welding after said step of hot rolling.

## 4,294,395
## BRAZING PROCESS

Harbhajan S. Nayar, Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 23, 1979, Ser. No. 23,377
Int. Cl.³ B23K *1/04*
U.S. Cl. 228—220 15 Claims

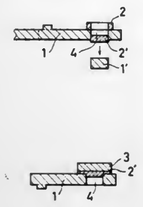



1. A process for copper brazing ferrous parts in a continuous furnace comprising the steps of: heating said furnace to establish a region therein at a temperature of at least 600° C.; establishing an atmosphere in said region under equilibrium conditions in the absence of parts comprised of at least 90% nitrogen, at total of about 1.0 to 7.0% hydrogen and carbon monoxide, wherein the concentration of hydrogen is greater than the concentration of carbon monoxide, and moisture sufficient to provide a dew point of about −40° C. to +10° C.; and passing through said furnace said ferrous parts having thereon a brazing paste comprised of a copper paste and 25–75% of a copper oxide paste whereby said parts are brazed.

## 4,294,396
## METHOD FOR MANUFACTURING BRAZED PARTS

Toshiharu Obata; Toshimasa Hagyu, and Hisao Kojima, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 23, 1979, Ser. No. 59,840
Claims priority, application Japan, Jul. 21, 1978, 53-89257
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—245 5 Claims



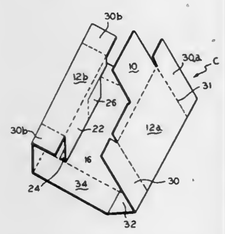

1. In a method for manufacturing brazed parts made by brazing a metal part with a base material made of a plate metal, the improvement comprising the steps of;

stamping out said base material to form a through-hole in said base material, stamping out said filler material and urging said filler material into said through-hole formed in said base material and held protruding outwardly therefrom, placing said metal part on said filler material and, brazing said metal part to said base material through said filler material.

## 4,294,397
## CARTON WITH SELF ERECTING PARTITIONS

Karl A. Kohler, Roselle, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 15, 1980, Ser. No. 169,192
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—27 2 Claims




1. In a folding carton, formed from a unitary blank of foldable paperboard, including automatically self-erecting interal longitudinal and transverse partition structures, the combination of:

(a) opposed pairs of major and minor side wall panels foldably joined to each other along parallel fold lines to form a tubular structure open at the ends;

(b) opposed pairs of major and minor end closure panels foldably joined to opposite ends of respective major and minor side wall panels, respectively, and adapted to be secured to each other in overlapped relation to close the ends of said carton;

(c) an internal longitudinal partition member including:

(i) a first element secured to and extending between and normal to opposed major side wall panels and disposed parallel to but spaced inwardly from one of said minor side wall panels;

(ii) a second element, having a width greater than that of said first element, secured at one side to one of said major side wall panels in alignment with said first element, and having its other side extending diagonally toward the junction of said other major side wall panel and said one minor side wall panel and being free from attachment to any of said panels;

(d) an internal transverse partition member being: (i) foldably joined at one end to an edge of said longitudinal element member first element at a location between the ends of said carton and extending transversely from said first element toward said one minor side wall panel between said longitudinal partition member first and second elements;

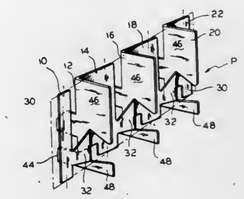
(ii) supported by an end edge of said longitudinal member second element.



## 4,294,398
## PARTITION FOR CARRIER CARTON

Francis A. Chidsey, Jr., Devon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 22, 1981, Ser. No. 227,542
Int. Cl.³ B65D *5/48*; *71/00*, *25/04*
U.S. Cl. 229—15 1 Claim




1. In a partition arrangement for separating corresponding areas of adjacent packaged articles, such as bottles, arranged in three side-by-side rows, a pair of partitions, each being formed of a unitary blank of paperboard or the like which is cut and scored to provide:

(a) a plurality of alternately disposed longitudinal members, for interposition between adjacent articles of separate rows, and transverse members, for interposition between adjacent articles of the same row;

(b) each of said members having a relatively narrow main section, extending the entire height thereof, and separator elements projecting laterally outward from opposite sides thereof;

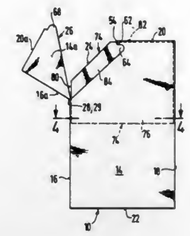
(c) said transverse member each having a pair of separator elements extending from one side of said main section toward upper end, center, and lower end areas of the articles and another pair of separator elements extending from the other side of said main section toward center and one of the end areas of the articles, so that when said partition is used with a similar partition, disposed in an inverted position, the elements extending from said other side of said partition main sections cooperate to prevent contact between corresponding areas of adjacent articles of the center row, at the center and both the upper and lower end areas of said partitions.

## 4,294,399
## FOLDING BOX

Oskar Wilfer, Grünenbach, Fed. Rep. of Germany, assignor to H. F. & Ph. F. Reemtsma, Hamburg, Fed. Rep. of Germany

Filed Sep. 21, 1979, Ser. No. 78,585
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841257; Apr. 6, 1979, 2913891
Int. Cl.³ B65D *5/66*
U.S. Cl. 229—44 CB 2 Claims

1. A unitary folding box for cigarettes and smoking articles comprising a single blank having a front wall, a rear wall, a pair of side walls, an upper wall, a bottom wall, and a cap formed from a portion of said front, side and upper walls which pivots about an axis in the plane of a wall in opening and closing; complementary locking means formed from a portion of said walls, said locking means having rotating locking means

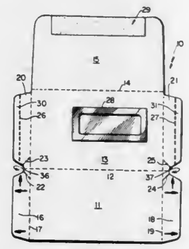



and stationary locking means, one of which is associated with said cap and the other of which is associated with said box, both said rotating locking means and said stationary locking means lying in the same plane as said wall portions from which they are formed.

## 4,294,400
## NON-GUSSETED EXPANSIBLE ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 17, 1980, Ser. No. 141,052
Int. Cl.³ B65D *27/00*, *30/20*; B31B *1/48*, *1/62*
U.S. Cl. 229—68 R 6 Claims




1. A non-gusseted expansible envelope comprising a one piece blank including a substantially rectangular rear panel, a front panel foldably attached thereto along a transverse fold line, a closure flap foldably attached to the front panel along another transverse fold line and two pairs of equally sized and shaped side seam flaps foldably attached respectively to the side edges of the front and rear panels along a pair of longitudinal fold lines, the improvement wherein the side seam flaps attached to the side edges of the front panels are each applied with longitudinal perforated lines which substantially bisect the flaps to form outer portions for the application of adhesive and to provide hinge connections which enable the side seam flaps to be folded inwardly upon themselves when the envelope is expanded.

**4,294,401**

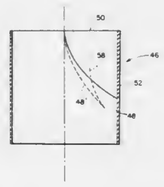
## DRAFT CONTROL ARRANGEMENT

**Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549; Luitpold Kutzner, Marschnerstrasse 78, D-8000 Munich, and Erwin Postenreider, Postfach 240, D-8031 Groebenzell, both of Fed. Rep. of Germany**

**Continuation of Ser. No. 831,547, Sep. 8, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,718**

**Int. Cl.³ G05D** *23/08*

**U.S. Cl. 236—1 G** **4 Claims**



**1.** In a gas-fired heating apparatus having a draft hood for directing a flow of waste gas to a vent, a throttling device comprising the combination of main flow control means for sensing temperature of the gas within the hood and responding to said temperature for reducing or enlarging the cross-sectional throttle area for directing gas to the vent, said main flow control means including bimetal element means shaped to project across said throttle area and changing shape at a first rate responsive to temperature change for reducing or enlarging the throttle area, and secondary bimetal element means which changes shape, at a rate which differs from the first rate, responsive to gas temperature for causing the rate of throttle area change for unit change in temperature during one phase of operation to vary from the rate of throttle area change for unit change in temperature during another phase.

**4.** In a gas-fired heating apparatus having a draft hood for directing a flow of waste gas to a vent, a throttling device comprising the combination of main flow control means for sensing temperature of the gas within the hood and responding to said temperature for reducing or enlarging the cross-sectional throttle area for directing gas to the vent, said main flow control means including bimetal element means shaped to project across said throttle area and changing shape responsive to temperature change for reducing or enlarging the throttle area, and secondary control means for causing the rate of throttle area change for unit change in temperature during one phase of operation to vary from the rate of throttle area change for unit change in temperature during another phase, said secondary control means including means forming an opening in the first-mentioned bimetal element means, together with secondary bimetal element means carried by the first element and extending across the opening for reducing or enlarging the flow area therethrough responsive to gas temperature for causing a high rate of throttle area change for unit change in gas temperature during said one phase.

**4,294,402**

## CONTROL DEVICES FOR HEATERS

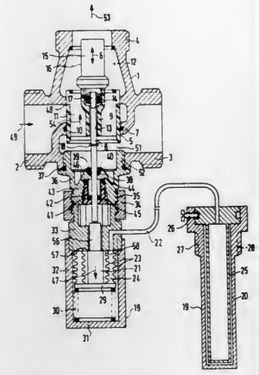
**Rudolf Vollmer, Mosbach, Fed. Rep. of Germany, assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Oct. 23, 1978, Ser. No. 953,453**

**Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747969**

**Int. Cl.³ G09D** *23/13*

**U.S. Cl. 236—12 R** **13 Claims**



**1.** A control device for a heating installation including one individually temperature controlled radiator means, first means for passing a heating medium to the heating installation and second means for returning the heating medium from the heating installation to mix with said heating medium passing into said heating installation, moveable means in said first and second means and control means actuable in response to the temperature of said heating medium and returning heating medium, said control means operating on said moveable means to vary inversely the flow of said heating medium as compared to the returning heating medium to maintain a pre-determined temperature drop between the heating medium passing to said radiator means and returning therefrom, said control means including a first thermostatic working element having a sensor for determining the temperature of the heating medium being passed to the heating installation and a second thermostatic working element having a sensor for determining the temperature of the heating medium being returned from said heating installation.

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**4,294,403**

## SYSTEM AND METHOD FOR CONTROLLING THE CONDITIONING AND DELIVERY OF AIR TO A CONDITIONED SPACE

**Staron E. Ammons, P.O. Box 17128, Dallas, Tex. 75217; Edwin L. Paschall, P.O. Box 35226, Dallas, Tex. 75235, and Morris G. Carter, P.O. Box 17128, Dallas, Tex. 75217**

**Continuation-in-part of Ser. No. 958,961, Nov. 9, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,996**

**Int. Cl.³ G05D** *23/13*

**U.S. Cl. 236—13** **19 Claims**

**1.** A system for controlling the conditioning and delivery of air to a conditioned space comprising

a cool air duct for connection to a cool air supply duct;

a warm air duct for communication with a return plenum;

a delivery duct connected to both said cool air and warm air ducts for delivering air to the conditioned space;

a thermostat control device for providing a varying control signal related to the varying temperature of the air in the conditioned space;

coupled discharge damper means for said cool air duct and said warm air duct, shiftable between a first condition wherein said cool air duct is open and said warm air duct is closed, and a second condition wherein said cool air duct is closed and said warm air duct is open;

a fan disposed in said warm air duct for effecting air flow from the return plenum to said delivery duct;

a variable flow control device disposed in said cool air duct for varying the air flow therein between maximum and minimum flow conditions;

first actuator means responsive to said thermostat signal for controlling said variable flow control device;

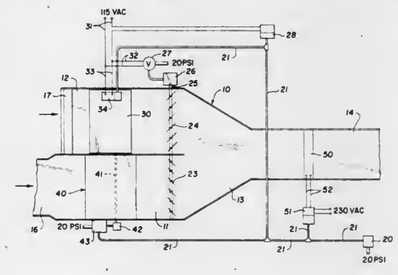
second actuator means responsive to said thermostat signal for controlling said discharge damper means and said fan;

said second actuator means being operative in one condition to start said fan simultaneously with the opening of said warm air duct discharge damper means; and being operative in another condition to stop said fan simultaneously with the closing of said warm air duct discharge damper means.

**10.** A system for controlling the conditioning and delivery of air to a conditioned space comprising

a cool air duct for connection to a cool air supply duct;

a warm air duct for communication with a return plenum;




a delivery duct connected to both said cool air and warm air ducts for delivering air to the conditioned space;

a thermostat control device for providing a varying control signal related to the varying temperature of the air in the conditioned space;

damper means for said warm air duct for allowing air flow from the return plenum to said delivery duct and for preventing reverse flow therein;

a fan disposed in said warm air duct for effecting air flow from the return plenum to said delivery duct;

variable flow control damper means disposed in said cool air duct for varying the air flow therein between maximum flow and no flow conditions;

first actuator means responsive to said thermostat signal for controlling said variable flow control damper means;

second actuator means responsive to said thermostat signal for controlling said damper means and said fan;

said second actuator means being operative in one condition to start said fan simultaneously with the closing of said cold air duct damper means; and being operative in another condition to stop said fan simultaneously with the opening of said cold air duct damper means.

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**4,294,404**

## ENVIRONMENTAL CONTROL SYSTEM

**Jagdishchandra T. Gajjar, Clifton Park, N.Y., assignor to Integrated Energy Systems, Schenectady, N.Y.**

**Filed Feb. 14, 1978, Ser. No. 877,682**

**Int. Cl.³ F24F** *7/00*

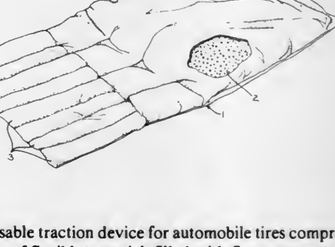
**U.S. Cl. 236—49** **18 Claims**

**1.** An environmental control system for a structure having a plurality of rooms and means for modifying an environmental parameter within said structure comprising:

an occupancy sensor in each room of at least two rooms of said plurality of rooms providing exclusively a first output signal when said room is occupied and a second output signal when said room is unoccupied;

a second sensor in each room of at least two rooms of said plurality of rooms for providing an output signal responsive to the level of said environmental parameter in said room;

control means for receiving the output signals of each and every of said occupancy sensors and said second sensors and for controlling said means for modifying responsively to a composite function of said output signals of said occupancy sensors and said sensors; and




wherein said control means more particularly includes means for receiving the output signals of said occupancy sensors and said second sensors and for providing a control output signal, said control output signal being a composite function of said output signals of said occupancy sensor and said second sensor; and

means for receiving said control output signal and controlling said means for modifying responsively to said control output signal; and

wherein further said environmental parameter is temperature, and said means for modifying comprises an energy conversion unit and means for conveying a fluid from said energy conversion unit to said rooms.

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**4,294,405**

## TRACTION BAG

**Lawrence M. Ross, 5840 Highway V, Racine County, Caledonia, Wis. 53108**

**Filed Mar. 3, 1980, Ser. No. 126,335**

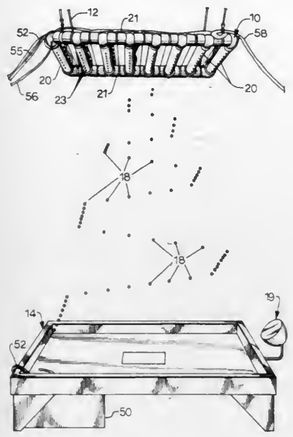
**Int. Cl.³ E01B** *23/00*

**U.S. Cl. 238—14** **1 Claim**



**1.** A reusable traction device for automobile tires comprising a bag made of flexible material, filled with fine aggregate, said filled bag being sufficiently flexible so that it will tend to conform to a tread pattern when in use, the bag having a plurality of rows of fingerlike compartments on one end, the number of compartments per row decreasing with distance from the end of the bag so that the filled bag has a wedge shaped cross section, the wedge shape of the bag tending to prevent the bag from sliding under the tire without moving the automobile.

**4,294,406**
**PROGRAM CONTROLLABLE FREE FALLING WATER DROP FOUNTAIN**
**Stephen H. Pevnick, 2314 E. Wyoming, Milwaukee, Wis. 53202**
**Filed Nov. 14, 1978, Ser. No. 960,621**
**Int. Cl.³ B05B *17/08*; F21P *7/00***
**U.S. Cl. 239—20** **13 Claims**



1. A free falling water droplet fountain comprising a manifold having a series of openings, means for independently controlling the size and rate of release of water droplets from said openings, said controlling means including a plurality of valve assemblies for defining the form and size of said water droplets, said controlling means including timing means connected to said valve assemblies to selectively control the length of time of opening to form the water droplets and the time of initiation of each of the valve assemblies to release the droplets at programmed intervals whereby a constant or asymmetrical frequency can be provided for the initialization of release of water droplets from the openings and a constant or asymmetrical size of water droplet can be provided within said frequency.

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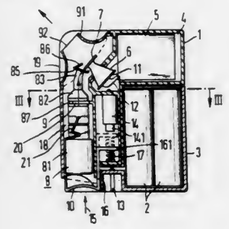
**4,294,407**
**ATOMIZER FOR FLUIDS, PREFERABLY AN INHALATION DEVICE**
**Ernst Reichl, Munich, and Herbert Marloth, Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany**
**Filed Dec. 17, 1979, Ser. No. 104,581**
**Claims priority, application Fed. Rep. of Germany, Dec. 19, 1978, 2854841**
**Int. Cl.³ A61M *11/00***
**U.S. Cl. 239—102** **9 Claims**



1. Atomizer for fluid, comprising an atomizer housing, a unitary fluid container removably inserted in said housing, an atomizing element activatable by ultrasonic flexural vibrations being disposed in said housing, manually operable means integral with said fluid container for transporting the fluid from said fluid container to said atomizing element, and manually activatable means for operating said transporting means and atomizing element.

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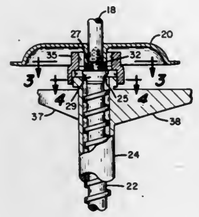
**4,294,408**
**IN CENTRIFUGAL SPRAY GUNS**
**Irving F. Snyder, and Duane A. Luebeck, both of Blaine, Minn., assignors to Graco Inc., Minneapolis, Minn.**
**Filed May 8, 1980, Ser. No. 148,135**
**Int. Cl.³ B05B *3/08***
**U.S. Cl. 239—218.5** **11 Claims**



1. An apparatus for spraying liquid by centrifugal atomization of liquid pumped from a container to the surface of a high speed spinning disk, comprising
(a) a drive motor mounted on a vertical axis and having a downwardly projecting motor shaft;
(b) a circular disk and helical screw pump attached to said motor shaft in axial alignment, the upper end of said screw pump forming a frusto conical valve member;
(c) a hollow tube surrounding said screw pump and extending into said container, said tube having a telescoping upper portion and a lower portion which is seatable against said valve member;
(d) means for axially fixing said tube upper portion relative to said disk; and
(e) means for axially varying said disk, said tube upper portion and said valve member relative to said tube lower portion.

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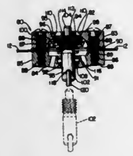
**4,294,409**
**SHOWER HEAD AND VALVE ASSEMBLY FOR CAMPING SHOWER**
**Charles H. Larsen, 901 Date St., Rawlins, Wyo. 82301**
**Continuation of Ser. No. 713,714, Aug. 12, 1976, Pat. No. 4,151,616. This application Apr. 25, 1979, Ser. No. 33,035**
**Int. Cl.³ B05B *1/30***
**U.S. Cl. 239—577** **18 Claims**



1. In a portable shower, a shower head and valve apparatus, comprising:
a housing with an upper body portion and a lower body portion enclosing a chamber in the space between said upper and lower body portions, said upper and lower body portions each having a hole from the exterior to the interior of said chamber, the hole in said upper body portion being axially aligned with the hole in said lower body portion, and a portion of the hole in said upper body portion having a progressively decreasing diameter defining a hole portion with upwardly converging sidewalls,
a valve stem member slidably extending through the hole in said lower body member and extending upwardly through said chamber and into said hole portion of said upper body portion, said valve stem including sealing means at its upper end, closing means normally urging said sealing means into sealing contact with said converging hole portion, and limit stop means on said valve stem operative to retain said valve in an open position and resist the urging of said closing means, and
said lower body portion including ports extending from the internal surface of said lower body porton to the external surface such that when said valve stem is moved downwardly allowing water to flow into said chamber through the opening between said converging sidewalls and said sealing means, said ports conduct the water in droplet form from said chamber to the underside of said shower head and valve apparatus for release in the form of a shower.



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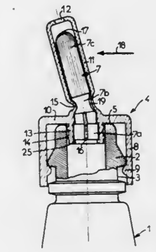
**4,294,410**
**CLOSING DEVICE, WITH A TILTABLE NOZZLE, FOR A PRESSURIZED CONTAINER**
**Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France**
**Filed Jan. 22, 1980, Ser. No. 114,260**
**Claims priority, application France, Feb. 28, 1979, 79 05192**
**Int. Cl.³ B65D *83/14***
**U.S. Cl. 239—577** **13 Claims**



1. A closing device intended to be fixed to a container neck, such closing device consisting of a dispensing cap made of an elastically deformable material; said dispensing cap comprising:
(a) a fixed part;
(b) a movable part;
(c) means on said fixed part effective to fasten said fixed part to a said container neck;
(d) deformable wall means connecting said movable part swingably to said fixed part;
(e) means on said movable part defining a discharge orifice whereby said movable part constitutes a dispensing nozzle projecting outside the container;
(f) two ends to said dispensing cap;
(g) means defining an axial channel connecting that end of the dispensing cap which is intended to face the internal volume of the container with said discharge orifice means;
(h) obturator means consisting of an elongate body of an elastically deformable material;
(i) means fixing one of the ends of said obturator body to at least one of said fixed part of the dispensing cap and said neck of the container; and
(j) means defining an externally concave intermediate zone of said obturator body between the ends thereof;
wherein said deformable wall means joining the dispensing nozzle to said fixed part of the dispensing cap surrounds said intermediate zone of the obturator means and forms a seal therewith when said dispensing nozzle is in a first position with said deformable wall means unstrained, whereby swinging of the dispensing nozzle about a transverse axis breaks said seal so that the dispensing operation can be carried out.

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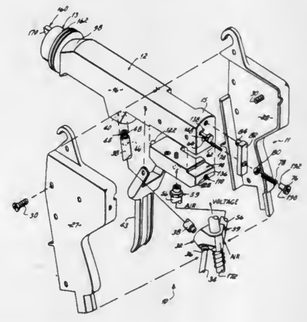
**4,294,411**
**ELECTROSTATIC SPRAY GUN**
**Donald R. Hastings, Elyria, and Martin J. Harjar, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio**
**Filed Jul. 5, 1979, Ser. No. 55,020**
**Int. Cl.³ B05B *5/02***
**U.S. Cl. 239—707** **20 Claims**



1. An electrostatic spray gun comprising:
a substantially electrically non-conductive barrel having a fluid conduit therein adapted to be connected to a source of fluid coating material under pressure, and an air conduit,
a nozzle made from a substantially non-conductive material on the forward end of said barrel, said nozzle having a fluid discharge opening effective to project coating material therefrom, fluid valve means for controlling the flow of coating material through said discharge opening, and an air opening communicating with said air conduit for dispensing air effective to atomize said coating material issuing from said discharge opening,
charging means for imparting an electrical charge to said coating material,
a removable air valve module mounted to and externally of the rear end of said barrel including an air valve and movable valve closure means for selectively opening and closing said air valve to selectively supply said air conduit with atomizing air,
a relatively thin-walled handle shell attached to the rear end of said barrel, said handle shell surrounding said rear end of said barrel and said air valve module without said air valve module being physically supported by said handle shell permitting ready access to said air valve module by removing said handle shell, and
means for moving said movable valve closure means for selectively opening and closing said air valve and for opening said fluid valve means on opening of said air valve and closing said fluid valve means before closing of said air valve.

**4,294,412**

## METHOD AND APPARATUS FOR CONTROLLING WOOD PULP GRINDING MACHINES

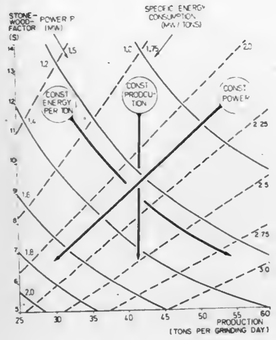
**Karl G. Bohlin, Sundsvall; Borje I. Fredriksson, Matfors; Kent A. B. Karlsson, and Lars T. Nelvig, both of Sundsvall, all of Sweden, assignors to SCA Development Aktiebolag, Sweden**

**Continuation-in-part of Ser. No. 864,231, Dec. 27, 1977, abandoned. This application Sep. 27, 1979, Ser. No. 79,486**

**Claims priority, application Sweden, Dec. 27, 1976, 7614558; Dec. 27, 1976, 7614559**

**Int. Cl.³ B02C** *25/00*

**U.S. Cl. 241—30** **28 Claims**




1. A method of controlling the operation of a wood pulp grinding machine of the type which has at least two pockets per grindstone and two grindstones coupled by way of a common shaft to a single drive motor, comprising the steps of:

(i) simultaneously measuring the power of the motor and the feed rates of the pockets;

(ii) repeating step (i) after a predetermined time interval during which the operating conditions of the machine change as a result of the operation thereof;

(iii) calculating the degrees of sharpness of the grindstones using the power and feed rate values measured in steps (i) and (ii); and

(iv) dressing each grindstone when its calculated degree of sharpness reaches a determined value.

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**4,294,413**

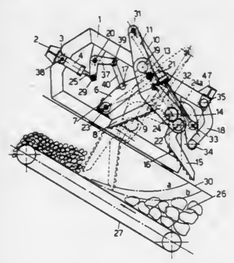
## APPARATUS FOR THE BREAKING OF HETEROGENEOUS MATERIALS, AS CITY SOLID WASTES

**Manlio Cerroni, Via Bruxelles 53, Roma, Italy**

**Filed Jul. 25, 1979, Ser. No. 60,322**

**Int. Cl.³ B02C** *1/00*

**U.S. Cl. 241—36** **7 Claims**



1. An apparatus for the breaking of heterogeneous materials, in particular city solid wastes in which the waste material (**26**) to the treated is conveyed by an endless belt conveyor (**27**) travelling at a constant speed, characterized by the fact that the apparatus comprises a first primary working system forming a working unit, including a rigid system of blades (**15**) and counterblades (**8**) respectively alternately juxtaposed to each other and mounted so as to rotate about a common axis and controlled in both their opening and closure directions by a guiding rod system forming an articulated quadrilateral system (**13, 14, 18**), pivotally connected to driving means (**10**), adapted to cause the articulated rod system to perform each operative stroke at a speed higher than that of the travel of the material (**26**) on the belt carried by the belt conveyor (**27**), while a return or closing stroke of the blades (**15**) and counterblades (**8**) is performed out of the contact of the waste material (**26**), owing to a displacement movement transmitted to the first primary system by an auxiliary system, including hydraulic driving means (**4**), further including means for performing the return stroke immediately, as the counterblades and blades (**8** and **15**) encounter a resistance higher than a predetermined value.

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**4,294,414**

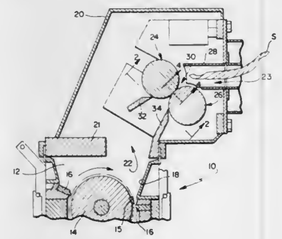
## FEED ROLL DEVICE FOR SHEET GRANULATOR

**Roy W. Gerstenberg, Norfolk, Mass., assignor to Leesona Corporation, Warwick, R.I.**

**Filed Jan. 14, 1980, Ser. No. 112,075**

**Int. Cl.³ B02C** *18/22, 18/44*

**U.S. Cl. 241—222** **6 Claims**



1. In combination with a granulator for size reduction of plastic sheet material, a feeding device for feeding such sheet material thereto, said granulator including walls defining a generally enclosed chamber, a rotor mounted for rotation about an axis within said chamber, cutting means affixed on said rotor, bed knife means mounted for projection into said chamber for cooperative cutting relationship with said rotor cutting means as said rotor is driven, said feeding device comprising first and second longitudinally oriented, generally cylindrical feed rolls coaxially mounted with respect to each other so as to form a longitudinally directed nip for receipt of a minimum thickness of at least a single material sheet therebetween and a maximum thickness of a plurality of said sheets, means for continuously rotating said rolls in opposite rotational directions, means for positioning said rolls in spaced relation with each other and means for directing said sheet material to said nip whereby said rolls feed said material to said chamber for granulation therein, the outer surface of both said rolls having a plurality of radial grooves inwardly extending a distance slightly greater than said maximum material thickness, said grooves longitudinally spaced from each other along each said rolls so as to form a plurality of spaced ridges adjacent said grooves, said rolls longitudinally positioned with respect to each other so that the ridges of said first roll and the grooves of said second roll and vice versa are aligned for respective interdigitation with each other such that said sheet material passing through said nip is forced into a sinuous cross-sectional configuration by said interdigitation of said rolls and whereby opposite surfaces portion of said sheet material are contacted by respective roll surfaces at different surface velocities.



**4,294,415**

## CUTTER KNIFE

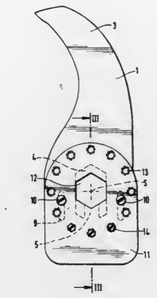
**Manfred Wetter, Biedenkopf-Breidenstein, and Karl H. Schmidt, Steffenberg-Quotshausen, both of Fed. Rep. of Germany, assignors to Kraemer & Grebe GmbH & Co. KG Maschinen- und Modellfabrik, Biedenkopf-Wallau, Fed. Rep. of Germany**

**Filed Aug. 9, 1979, Ser. No. 65,038**

**Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836630**

**Int. Cl.³ B02C** *18/18*

**U.S. Cl. 241—292** **12 Claims**



1. In a cutter knife having a knife blade and an opening for receiving a cutter spindle therein, which opening is constructed in the shape of a polygon and having a stop key means for said cutter spindle in a side of said opening which is opposite said knife blade, the improvement comprising at least one balancing disk having an opening therein for receiving said cutter spindle therein and being secured on said cutter knife in the region of said opening for said cutter spindle, the shape, weight and mounting of which are chosen such that the center of gravity of the totality of said cutter knife and balancing disk lies on the axis of said cutter spindle to thereby statically balance said cutter knife, said cutter knife further including dynamic balancing means for facilitating a dynamic balancing of said cutter knife.

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**4,294,416**

## CONTROLLED MULTIPACKAGE WINDING

**John T. Beckman, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Mar. 19, 1980, Ser. No. 132,473**

**Int. Cl.³ B65H** *54/08, 54/30*

**U.S. Cl. 242—18 G** **18 Claims**

1. A method of controlling the simultaneous winding of linear elements into more than one package, said method comprising:

(a) supplying at least two linear elements;

(b) engaging said elements in a guide means;

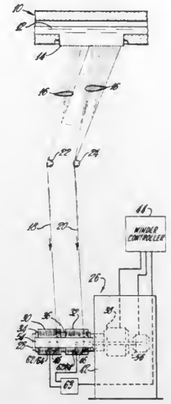
(c) forming said elements into at least a first and second package;

(d) sensing when said first package is a predetermined size;

(e) sensing when said second package is a predetermined size;

(f) determining when a predetermined period of time has elapsed after one of said packages has been sensed; and

(g) increasing the distance between said packages and said guide means when either said first and second packages




have been sensed or said predetermined period of time has elapsed.

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**4,294,417**

## STATIC WIRE TENSIONER FOR COIL WINDING MACHINES

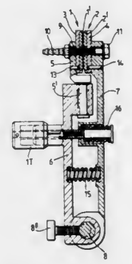
**Giuseppe Camardella, Saronno, Italy, assignor to Tekma Kinomat S.p.A., Caronno Pertusella, Italy**

**Filed Nov. 20, 1979, Ser. No. 95,940**

**Claims priority, application Italy, Nov. 24, 1978, 30141 A/78**

**Int. Cl.³ B65H** *59/22*

**U.S. Cl. 242—149** **9 Claims**



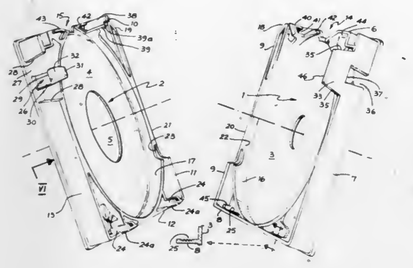
1. In a winding machine for winding coils of metallic wire for electrical or electronic use, a static wire tensioning device comprising a first friction shoe mounted fixedly on a first bearing arm, a second friction shoe, a second bearing arm, means mounting said second friction shoe on said second bearing arm for freely oscillating around an axis perpendicular to the sliding direction of the wire, means for mounting said two bearing arms rotatable one with respect to the other about an axis parallel to the sliding direction of the wire and for finely adjusting the mutual distance of said bearing arms at a distance from the friction shoe, and spring means acting on said arms for pushing said friction shoes one toward the other with finely adjusted force.

**4,294,418**

## TAPE CARTRIDGE

**Peter L. Gell, Redern, Australia, assignor to Tuscan Industries Pty. Limited, Redfern, Australia**

**Filed Mar. 22, 1979, Ser. No. 22,946**
**Claims priority, application Australia, Mar. 29, 1978, PD3805**
**Int. Cl.³ G03B *1/04*; G11B *15/32***
**U.S. Cl. 242—197** **5 Claims**



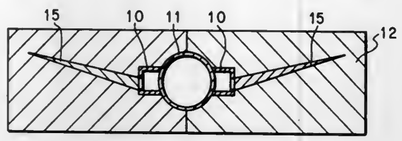
1. A cartridge to house a rotatable tape spool, said cartridge comprising a first part and a second part, each part including a rectangular panel of resilient material with upstanding flanges at the first and fourth edges of the respective panels, releasable coupling means on said first and second parts, alignment means to align corresponding flanges of the first and second parts and align said releasable coupling means to couple the first and second parts together to form a closed cartridge with an interior spool chamber to house a spool, a primary access opening comprising aligned gaps in corresponding first flanges at the first edges of the panels, a secondary access opening comprising aligned further gaps in said first flanges which further gaps provide extensions of aligned gaps in second flanges at second edges of said panels, arcuate upstanding walls on each panel to define said spool chamber and position said spool for rotation in the chamber, the upstanding arcuate walls and the flanges on the corresponding first, second, third and fourth edges of the panels substantially preventing flexure of the panel at those edges except in the panels adjacent the gaps of the primary access opening in the first flanges so as to permit flexure of the panels adjacent the gaps of the primary access opening, said releasable coupling means comprising complimentarily toothed upstanding lug means and surface means respectively at the third edges of the first and second panels which third edges lie opposite the first edges thereof, and a rigid upstanding first leg at the first edge of the panel having said lug means, the first leg at the first edge being disposed between the primary access opening and the secondary access opening in the second flange, and a rigid upstanding second leg at the fourth edge of the panel having said lug means, the second leg lying adjacent the first panel edge, shoulder means on the second leg, a rigid upstanding tongue at the fourth edge of the panel not having the lug means, the tongue engaging in a notch in the corresponding flange of the panel having the lug means so as to align the first and second parts, an aperture in the tongue engageable by the shoulder means of the second leg to releasably secure the parts together, said shoulder means being engageable in said aperture as a result of flexure of the first edges of the panels adjacent the primary access opening to convex and concave configuration to make the second leg lie inwardly of the flange of the fourth edge of the panel having the lugs and to make the tongue lie outwardly of the second leg, and an opening in one panel to permit driving engagement of driving means with a spool when housed in said chamber.

**4,294,419**

## AIRFRAME ASSEMBLY AND PROCESS

**Jack A. Fouse, Dallas, and Sherwood W. McClaren, III, Grand Prairie, both of Tex., assignors to Vought Corporation, Dallas, Tex.**

**Filed Jan. 22, 1979, Ser. No. 4,965**
**Int. Cl.³ B64C *1/00*; B23K *20/22***
**U.S. Cl. 244—117 R** **9 Claims**




1. The method of assembling a portion of an airframe having a minimum radar cross section comprising the steps of:
(a) diffusion bonding the periphery of a preform capable of being superplastically formed and diffusion bonded onto the outer surface of a substantially cylindrical casing,
(b) placing said cylindrical casing in a mold having a cavity therein substantially conforming to the external dimension of a structural air duct, said cavity enclosing said preform and said mold supporting a wing structure with the wing root face forming a portion of said cavity, and
(c) heating said preform to a superplastic forming and diffusion bonding temperature and applying sufficient pressure across said preform to superplastically deform said preform to conform to the dimensions of said mold and diffusion bond said deformed preform to said wing root face.

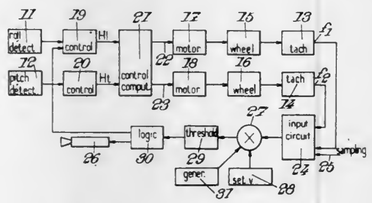
6. The product made by the method of claim 1.

**4,294,420**

## ATTITUDE CONTROL SYSTEMS FOR SPACE VEHICLES

**Jean B. Broquet, Saint Cyr l'Ecole, France, assignor to Matra, Paris, France**

**Filed Jan. 30, 1978, Ser. No. 873,684**
**Int. Cl.³ B64G *1/20***
**U.S. Cl. 244—165** **14 Claims**




1. An attitude control system for a body-stabilized space vehicle designed for travelling in an orbit and having roll, pitch and yaw axes, comprising: a plurality of sensors carried by the vehicle for sensing angular deviations about at least two of said axes, an actuator including only two wheels rotatable about respective non-aligned spin axes fixed with respect to said vehicle, electronic control means connected to receive input signals from the sensors and to control the rotation speeds of said two wheels for attitude correction about two orthogonal axes of said vehicle, said actuator permanently having, in operation, a momentum providing a gyroscopic stiffness providing short term stabilization about a third axis orthogonal to said two orthogonal axes, wherein each wheel is operatively associated with a tachometer generator and the electronic control means has means each associated with one of said tachometer generators to compute the angular position of the momentum of the actuator relative to said axes of the vehicle.

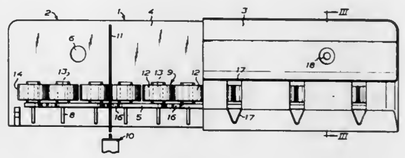


**4,294,421**

## KNIFE HOLDER

**Erich Künstlicher, Johan Baners Gata 6, 252 33 Helsingborg, and Harry V. Thomasson, Box 29, 260 33 Paarp, both of Sweden**

**PCT No. PCT/SE78/00093, § 371 Date Aug. 7, 1979, § 102(e) Date Aug. 7, 1979, PCT Pub. No. WO79/00376, PCT Pub. Date Jun. 28, 1979**
**PCT Filed Dec. 11, 1978, Ser. No. 140,387**
**Claims priority, application Sweden, Dec. 12, 1977, 7714058**
**Int. Cl.³ A47G *21/14*; A47F *7/00***
**U.S. Cl. 248—37.6** **11 Claims**



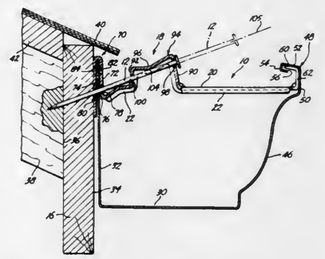
1. A holder for knives and similar flatware, the holder having an elongate base which may be mounted on a surface for example a wall or the like and supports one or more gripping members with which the knives may individually be moved with their blades into and out of retentive engagement, characterized in that each gripping member comprises two rollers in side by side relationship and cooperating with each other, the rollers being at least partially made of an elastomer material and each being mounted on a journal located on the base, the rollers having facing circumferential surfaces which form a nip into and out of which the knife blade may be moved, with the rollers rolling on the two sides of the blade under elastic blade-retentive deformation of the rollers.

**4,294,422**

## GUTTER HANGER

**William H. Odekirk, 7446 Gatewood Rd., SW., Seattle, Wash. 98136**

**Filed Sep. 24, 1979, Ser. No. 78,295**
**Int. Cl.³ E04D *13/06***
**U.S. Cl. 248—48.2** **8 Claims**



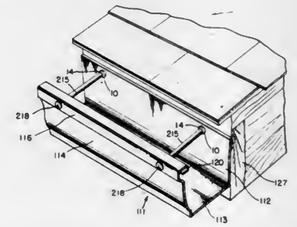
1. A hanger for mounting a gutter to a structure with a fastener, comprising:
a hanger member extending across the width of said gutter comprising a substantially horizontally disposed bracket arm and a raised fastener guide portion;
first means attached to one end of said bracket arm for engaging the outside wall of said gutter; and
second means attached to one end of said fastener guide portion for engaging the inside wall of said gutter and for receiving said fastener to mount said gutter to said structure;
said raised fastener guide portion comprising a first upright section extending upwardly from said bracket arm, a second upright section extending upwardly from said hanger member, a connecting crosspiece between said first upright section and said second connecting crosspiece including a downwardly bent mid-section for engaging and retaining a fastener extending through said fastener guide portion, said upright sections having apertures formed therein for receiving said fastener.

**4,294,423**

## SEALING MEANS FOR GUTTER HANGER FASTENING MEANS

**Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153**

**Filed Mar. 10, 1980, Ser. No. 128,727**
**Int. Cl.³ E04D *13/06***
**U.S. Cl. 248—48.2** **3 Claims**



1. Gutter wall fasterner nail hole sealing means for use with a rain gutter having a rear wall portion adapted to be secured to a facia board or wall of a building, fastening means for securing the gutter to the building wall, including a headed nail or like headed and sharpened fastening means adapted to be driven through a hole in the rear wall of the gutter and into the facia board; said sealing means comprising compressible elastomeric material adapted to be compressed about the rear gutter wall nail hole, when the nail is driven through the rear gutter wall into the facia board whereby the facia board is protected against deterioration due to leakage of water about the rear gutter wall nail hole, said gutter including a front wall spaced from the rear gutter wall, said front and rear walls having apertures through which said sharpened fastening means is adapted to be driven to secure the gutter to a facia board; a fastener receiving tube or ferrule interposed between the apertures in said front and rear walls of the gutter, said sealing means comprising a compressible grommet of elastomeric material having a body portion adapted to fit within one end of said fastener receiving tube or ferrule, said grommet body portion having a passage there through coaxial with the outer tube or ferrule when the body of the grommet is inserted therein, through which passage in the body of the grommet said sharpened fastening means is adapted to be driven, compressible means at one end of the grommet projecting beyond the ferrule and extending between the end of the ferrule and the gutter rear wall, said compressible means being adapted to be compressed when the fastener is driven into the facia board.

**4,294,424**

## SUCTION GRIPPING DEVICE

**Jacques Teissier, 18, rue Gustave Flaubert, Rueil-Malmaison, France (92500)**

**Filed Jul. 16, 1979, Ser. No. 57,634**
**Claims priority, application France, Jul. 20, 1978, 78 21554**
**Int. Cl.³ A45D *42/14*; F16B *47/00***
**U.S. Cl. 248—362** **6 Claims**

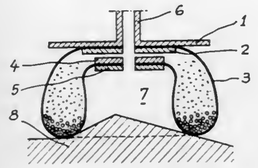
1. A gripping device adapted when under reduced pressure

to be brought into close gripping conformity with the surface of an object to be gripped, comprising,

(a) a ring-shaped body deformable in any direction and having a head portion and a skirt portion, the skirt portion having walls of deformable material defining a hollow interior within the skirt, and defining an open space outside the skirt and within the ring;

(b) at least one means in the head portion communicating the hollow interior of the skirt with means for withdrawing fluid from the interior and reducing pressure within the interior to below the pressure outside the skirt;

(c) at least one means in the head portion communicating the open space with means for withdrawing fluid from the




open space and reducing pressure within the space to below the pressure outside the ring when the skirt is in contact with an object to be gripped;

(d) a plurality of freely movable particles confined within the hollow interior of the skirt portion, and compelled to conform to any deformed configuration thereof adopted under reduced pressure within the interior of the skirt, and within the ring; and

(e) the body walls of the skirt portion under such reduced pressure and higher external pressure conforming closely to the surface of an object to be gripped, and retaining and fixing the particles in such conformity, thereby firmly gripping the object while such reduced pressure continues.

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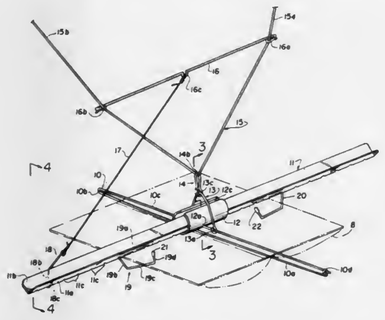
**4,294,425**
**OVERHEAD BOOKHOLDER**
**Paul J. Weber, 22 Seneca Rd., Fort Lauderdale, Fla. 33308**
**Filed Oct. 9, 1979, Ser. No. 82,862**
**Int. Cl.³ A47B *23/00***
**U.S. Cl. 248—445** **13 Claims**




1. In an apparatus for holding a book open above a reader, said apparatus comprising:

a suspension bar shaped and dimensioned to extend laterally across the cover of an open book and beyond the opposite side edges of said cover;

means for attaching said suspension bar to an open book to position the suspension bar extending across the cover of the book transverse to the spine of the book and projecting laterally past the opposite side edges of the book cover;

manually yieldable page retainer means operatively coupled to said suspension bar for engagement with the open pages of the book from below to hold the book open;

and suspension means operatively coupled to said suspension bar to suspend it from above;

the improvement wherein said suspension means comprises:

a flexible hang line having interconnected opposite segments attachable respectively at spaced points to an overhead support to position the middle of the hang line closely above said suspension bar;

means for operatively connecting said suspension bar to the middle of the hang line to be suspended from the latter;

a pitch bar extending transversely between and operatively connected to said opposite segments of the hang line above said last-mentioned means;

a pitch line attached at its upper end to said pitch bar between said opposite segments of the hang line and extending down and laterally outward therefrom;

and means attaching the lower end of said pitch line to said suspension bar laterally outward past one side edge of the book cover.

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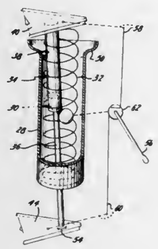
**4,294,426**
**UNIQUE JOINT ESPECIALLY USEFUL WITH JUVENILE FURNITURE AND PLAYTHINGS**
**Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424**
**Division of Ser. No. 758,799, Jan. 12, 1977, Pat. No. 4,160,553.**
**This application Apr. 2, 1979, Ser. No. 26,419**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—561** **15 Claims**




1. A joint adapted to be used in a child holding, carrying and amusement system, said joint comprising, in combination, an outer sleeve, said outer sleeve including at least two sections an upper section of which includes an upper end having a flared end portion, resilient means disposed within the outer sleeve, and a shock absorbing member employed in conjunction with the resilient means and spaced from the internal walls of said outer sleeve, said shock absorbing member including a lower portion and an upper portion, whereby said upper portion of said shock absorbing member is free to move up and down and from side to side within said outer sleeve, said flared end portion of said outer sleeve permitting increased side-to-side movement of said shock absorbing member, said joint being adapted to be removably connected to and between a child holding device and a support base for said holding device, said resilient means in conjunction with said shock absorbing member providing up and down motion and side-to-side motion with respect to said outer sleeve, further including connecting means for connecting said joint to a child holding device and a support base therefor, said connecting means comprising upper connecting means connected to said upper portion of said resilient means and shock absorbing member for connecting said shock absorbing member to a child holding device, and further including control means for controlling and locking said joint to limit movement, said control means comprising a lift member disposed between the two sections of said outer sleeve and pivotally connected to said sections, said lift member including handle means disposed externally to said outer sleeve and extending through a slot in one of said sections of said outer sleeve, whereby downwardly applied force on said handle means causes said lift member to separate said two sections of said outer sleeve.



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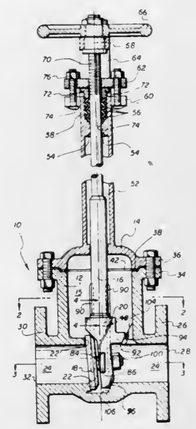
**4,294,427**
**MONO-SEAT GATE VALVE**
**Eugene J. Cilny, 13418 Lindsay, Cypress, Tex. 77429**
**Filed Jul. 19, 1979, Ser. No. 59,251**
**Int. Cl.³ F16K *25/00***
**U.S. Cl. 251—86** **3 Claims**




1. A gate valve comprising:

(a) a valve body formed to define inlet and outlet passages having a common axis, said valve body further defining a transverse axis being substantially normal to said common axis, said valve body defining an annular seat about at least one of said inlet and outlet passages, said seat lying in a plane that is inclined at a first angle with respect to said transverse axis, said seat being formed to define a frusto conical annular sealing surface, said sealing surface being generated about an axis disposed in normal relation to said inclined plane, said body defining first and second cam action surfaces inclined at a second angle with respect to said transverse axis in a direction opposite that of the plane of said valve seat, said cam action surfaces being positioned outside of the flow passage defined by said inlet and outlet passages and respectively above and below said flow passage, and a second body section defining a valve chamber communicating with said inlet and outlet passages;

(b) a bonnet cooperating with said second body section to further define said valve chamber;

(c) a closure member, comprising;

(1) a hanger forming a front surface defining a plane, said plane inclined at said first angle with respect to a central axis of said hanger, and having a mounting hole therethough normal to said front surface plane, and having a vertically oriented arcuate member positioned on each side of said mounting hole adjacent thereto, said hanger further defining first and second cam action surfaces for engaging respective body first and second cam action surfaces, each of said hanger cam action surfaces inclined at said second angle with respect to said central axis;

(2) a valve disc defining a plane and having a mounting shaft formed at the geometric center thereof normal to said valve disc plane, said valve disc being carried and retained solely by said hanger in a spaced relation to said valve body in a manner to permit limited universal movement of said disc with respect to said hanger about an axis passing through said mounting hole normal to said hanger front surface plane, and positioned so that said disc plane is essentially parallel to said valve seat plane, said valve disc permitted to pivot about said mounting hole axis sufficiently to engage said valve seat and effect a uniform seal therebetween to preclude fluid flow through said passage; and

(3) a valve stem having an axis coincident with said valve body transverse axis, said stem extending through said bonnet and valve chamber and carrying said hanger by a means permitting limited movement of said hanger with respect to said stem in a plane normal to said stem axis, said stem threadedly engaging said bonnet for raising and lowering said hanger and said valve disc with respect to said body flow passage;

(d) an annular seal positioned within said bonnet and about said stem for precluding the escape of medium fluid therebetween; and

(e) a back seal formed by said stem and said bonnet when said stem is in its uppermost position for sealing said valve chamber to permit said annular seal to be removed and replaced while said valve remains in service,

whereby lowering said stem and said hanger causes said hanger respective first and second cam action surfaces to engage respective first and second valve body cam action surfaces, thereby causing an axial force along said valve stem to be transmitted through said vertically oriented arcuate members to the geometric center of said valve disc in a direction essentially normal to said valve seat plane for urging said valve disc into sealing engagement with said valve seat to preclude fluid flow through said body flow passage.

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**4,294,428**
**BUTTERFLY VALVE**
**Yoshitsugu Okada, and Osamu Nakai, both of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan**
**Continuation of Ser. No. 892,342, Mar. 31, 1978, abandoned.**
**This application Dec. 3, 1980, Ser. No. 212,465**
**Claims priority, application Japan, Apr. 1, 1977, 52-37985; Apr. 1, 1977, 52-41104; Apr. 6, 1977, 52-40205**
**Int. Cl.³ F16K *31/44, 1/22, 41/02***
**U.S. Cl. 251—214** **7 Claims**

1. A butterfly valve comprising a valve housing having spaced bearing portions,

a valve stem rotatably supported by said bearing portions said valve stem being axially adjustable in said bearing portions,

a tubular bearing member disposed between at least one of said bearing portions and said valve stem,

a valve body mounted on said valve stem,

a tubular holder member including an elastic seal member having respective upper and lower ring portions retainable in respective annular recesses of the tubular holder member, said elastic seal member including at least one web portion interconnecting said upper and lower ring portions,

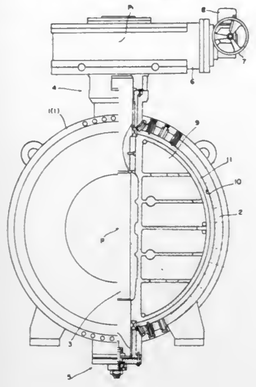
said upper ring portion contacting the bearing portion and said lower ring portion contacting said valve body, said tubular holder member further contacting one of a plurality of valve seat portions of said valve body,

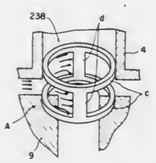
said plurality of valve seat portions attached to said valve housing to contact a periphery of said valve body in a closed position,

said elastic seal member fitted exteriorly on said tubular holder member contacting said bearing portions and being rotatable relative to said valve stem,

said elastic seal member upper and lower ring portions being

responsive to line fluid pressure for pressing the elastic seal member upper and lower ring portions against a side





wall of said annular recesses when in a closed valve position.

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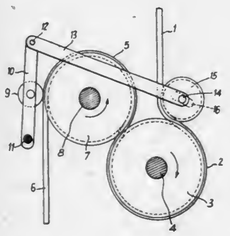
**4,294,429**

**PULLEY ASSEMBLY FOR IMPROVING THE COOPERATION BETWEEN A WINCH AND A CABLE ACTUATED THEREBY**

**André Desplats, Boulogne Billancourt, France, assignor to Tractel S.A., France**

**Filed Aug. 13, 1979, Ser. No. 66,276**
**Claims priority, application France, Aug. 22, 1978, 78 24359**
**Int. Cl.³ B66D *1/74***
**U.S. Cl. 254—272** **4 Claims**



1. A cable hoist apparatus comprising:

(i) a first pulley for driving in rotation in one direction, said pulley having a peripheral groove of which the cross-sectional shape is without cable-wedging action,

(ii) a second pulley for driving in rotation at the same velocity in the other direction, said second pulley having a peripheral groove of which the cross-sectional shape provides cable-wedging action.

(iii) a presser means movable in the same plane towards and away from the peripheral groove of said second pulley,

(iv) a third pulley having its axis of rotation movable in a common plane of rotation of the three pulleys, said third pulley being coupled to said presser means, and

(v) a cable which, starting from a load-bearing portion thereof, is passed in said other direction about said third pulley and then in said one direction about said first pulley and then in said other direction about said second pulley, between said second pulley and said presser means,

whereby force is exerted by said presser means to urge said cable into the peripheral groove of said second pulley in proportion to tension in the load-bearing portion of the cable tending to move the axis of the third pulley in said common plane.

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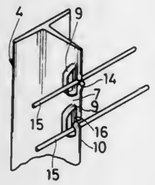
**4,294,430**

**SUPPORTS**

**Christiaan L. de Jager, Flat 1, 322 Kingsway, Amanzimtoti, Natal Province, South Africa**

**Filed Feb. 27, 1980, Ser. No. 125,403**
**Int. Cl.³ E04H *17/02***
**U.S. Cl. 256—58** **3 Claims**



1. A fence wire support, comprising:

(a) an elongated, substantially planar strap (7) of malleable metal,

(b) a plurality of closed, elongated slots (6) defined in the strap at spaced locations along its length,

(c) each slot lying just inwardly of one edge of the strap and oriented substantially parallel thereto to define an integral continuous strip (10) of the support between an outer side (8) of the slot and said one edge of the strap, said strip being frangible and deformable by manually operable tools pursuant to the installation of a fence wire in the slot; and a web of metal (9,11) displaced during the formation of each slot spanning and connected between the opposite ends thereof, each web (11) being bent away from said one edge of the strap to leave its associated slot substantially laterally unobstructed.

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**4,294,431**

**METHOD OF PROVIDING AND MAINTAINING A WEAR-LINING OF A STEEL CONVERTER AND A STEEL CONVERTER HAVING SUCH A LINING**

**Adam Steen, Heemskerk, and Hendrik M. Verhoog, Heemstede, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands**

**Filed Jul. 6, 1979, Ser. No. 55,388**
**Claims priority, application Netherlands, Jul. 14, 1978, 7807580**
**Int. Cl.³ C21B *13/00, 15/00***
**U.S. Cl. 266—44** **9 Claims**

1. In a method of operating a steel converter which has a basic wear-lining formed of refractory material at least partly composed of burnt magnesite, including the step of performing maintenance on the said lining by intermittently spraying refractory material onto the wear-lining and/or slagging-in while the wear-lining is hot, the improvement that the particles of the magnesite component of the wear-lining contain on average more than 6% monticellite.

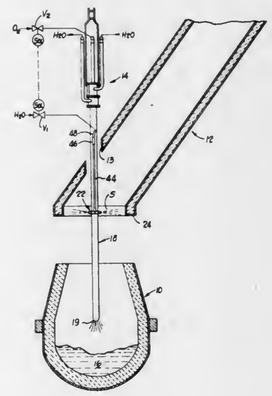


**4,294,432**

**METHOD AND APPARATUS FOR COOLING BOF HOOD PANELING**

**Matthew J. Blair, Niles, and Thomas A. Wiktorowski, Parma Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio**

**Filed Jun. 2, 1980, Ser. No. 155,311**
**Int. Cl.³ C21B *7/10***
**U.S. Cl. 266—46** **11 Claims**



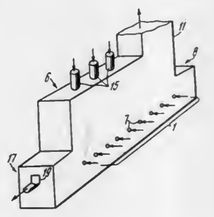
1. In a method of making steel in a basic oxygen furnace having an oxygen lance and an exhaust hood over the furnace, the steps comprising: providing a plurality of fluid outlet spray nozzles about the oxygen lance at a location adjacent the bottom edge of the exhaust hood when the lance is in an operative position in the furnace, supplying water under pressure to the nozzles, and directing the water outwardly from the lance toward the hood, with spray streams from adjacent nozzles intersecting between the lance and the hood.

**4,294,433**

**PYROMETALLURGICAL METHOD AND FURNACE FOR PROCESSING HEAVY NONFERROUS METAL RAW MATERIALS**

**Andrei V. Vanjukov, ulitsa Miklukho-Maklaya, 65, kv. 4, Moscow; Valery V. Mechev, prospekt Lenina, 44a, kv. 49, Norilsk; Valentin P. Bystrov, Schelkovsky proezd, 3, korpus 3, kv. 43, Moscow; Evgeny I. Ezhov, Grazhdansky prospekt, 11, Leningrad; Mikhail G. Vasiliev, prospekt Lenina, 31, kv. 89, Norilsk; Vladimir Y. Zaitsev, ulitsa Lobachevskogo, 6, kv. 34; Vladimir A. Romenets, Lomonosovsky prospekt, 33, korpus 2, kv. 87, both of Moscow; Vladimir V. Ivanov, ulitsa Leningradskaya, 22, kv. 26; Sergei Y. Golik, prospekt Lenina, 13, kv. 87, both of Norilsk; Evgeny S. Grin-Gnatovsky, 2 Schukinsky proezd, 5, kv. 1, Moscow; Alexandr V. Grechko, Vesennaya ulitsa, 4, kv. 42; Ivan V. Savin, ulitsa Vesennaya, 4, kv. 56, both of Ryazan; Sultanbek M. Kozhakhmetov, ulitsa Shevchenko, 32, kv. 16; Veniamin B. Meierovich, ulitsa Auezova, 175b, kv. 29, both of Alma-Ata; Vladimir D. Nagibin, ulitsa Pushkinskaya, 7/5, kv. 6, Moscow; Nariman A. Ramazanov, ulitsa Seifullina, 452/3, kv. 25; Almas B. Umarov, Mikroraion Koktem - 1, dom 37, kv. 51, both of Alma-Ata; Valentin E. Ziberov, ulitsa Voronezhskaya, 38/43, kv. 309, Moscow; Askar M. Kunaev, ulitsa Vinogradova, 49/130, kv. 23; Sauk T. Takezhanov, ulitsa Shevchenko, 44, kv. 3, both of Alma-Ata; Petr A. Alexandrov, ulitsa, Pushkinskaya, 2, Balkhash Dzhezkazganskoi oblasti; Boris I. Kolesnikov, prospekt Lenina, 11, kv. 24, and Dzhonson T. Khagazheev, ulitsa Entuziastov, 53, kv. 93, both of Norilsk, all of U.S.S.R.**

**Division of Ser. No. 962,603, Nov. 21, 1978, Pat. No. 4,252,560. This application Jul. 30, 1980, Ser. No. 173,807**
**Int. Cl.³ F27B *1/20***
**U.S. Cl. 266—161** **13 Claims**



1. A furnace for carrying out the pyrometallurgical method for processing heavy nonferrous metal raw materials comprising:

a shaft, where a charge is fed into a prepared heterogeneous melt composed of slag and matte, charge components being caused to interact with said melt and an oxygen-bearing gas to yield smelting products, said shaft having:

having a jacket section in the middle part of said shaft;

cooled side tuyeres intended to supply said oxygen-bearing gas into said molten bath and placed at a level dividing said shaft into two vertical parts, or a top and a bottom parts, the ratio of the height of said top part to that of said bottom part ranging from about 2-to-1 to about 10-to-1;

a hole for feeding said charge and/or said fuel provided in said top part of the shaft;

a flue for exhausting said gaseous smelting products placed in said top part of said shaft;

ducts intended for discharging said slag, said matte and/or said crude metal and arranged in said bottom part of the shaft; and

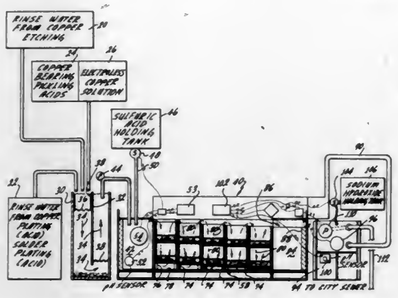
a device for discharging said slag from said bottom part of said shaft formed with a separate recipient adjoining said shaft and communicating therewith by means of a duct placed below the level of said tuyeres, but above the level of the matte inside said shaft with the effect that the level of the slag in said recipient determines that of the melt inside said shaft.

**4,294,434**

## HEAVY METAL REMOVAL APPARATUS

**Richard G. Durkee, 3616 W. Pendleton, Santa Ana, Calif. 92704**

**Filed Jan. 24, 1980, Ser. No. 115,039**
**Int. Cl.³ C22B *15/12***
**U.S. Cl. 266—170** **15 Claims**




1. An apparatus for reclaiming heavy metal from heavy metal salts in an aqueous solution, comprising:

a. A reaction chamber defining a path for receiving and for conducting said solution therethrough;

b. A source of concentrated acid sufficient to impart a pH less than 2 to said aqueous solution wherein said acid in solution has anions;

c. First valve means connecting said concentrated acid to said reaction chamber, said valve means operable in response to the pH of said aqueous solution for admitting amounts of said acid into said reaction chamber to maintain the pH of said solution at a predetermined level at least less than 2; and

d. Means for retaining, substantially pure aluminum stable in an acid aqueous solution, capable of forming a salt compound with said anions and having a relative electrode potential greater than that of the heavy metal to be reclaimed from the heavy metal salt in solution for precipitating said heavy metal from said heavy metal salt in said solution, said retaining means being positioned in said path in the reaction chamber at a plurality of points along said defined path.

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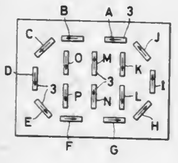
**4,294,435**

## METHOD FOR AGITATION OF MOLTEN METAL AND FURNACE FOR AGITATION OF MOLTEN METAL

**Ryohei Matsuno, Tokyo, Japan, assignor to Daido Giken Industries, Co., Ltd. and Amino Aluminium Industries, Co., Ltd., both of Tokyo, Japan**

**Filed Dec. 19, 1978, Ser. No. 971,044**
**Claims priority, application Japan, Dec. 26, 1977, 52-155651**
**Int. Cl.³ H05B *5/12***
**U.S. Cl. 266—234** **1 Claim**




1. An agitation melting furnace for molten metal, which comprises a furnace proper made of a refractory material and two sets of electromagnetic-wave devices each formed of a coil and an iron core, one set of electromagnetic-wave devices being disposed to define magnetic fields forming a circle on the outer surface of the bottom of said furnace, the magnetic fields of said one set of electromagnetic-wave devices being all in one same direction, the other set of electromagnetic-wave devices being disposed within said circle in at least one row, the magnetic fields of said other set of electromagnetic-wave devices in at least one row being all in one same direction.

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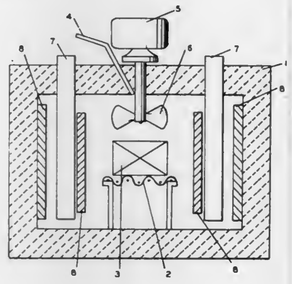
**4,294,436**

## FURNACE WITH PROTECTIVE ATMOSPHERE FOR HEATING METALS

**Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Japan**

**Filed Aug. 29, 1980, Ser. No. 182,774**
**Claims priority, application Japan, Sep. 5, 1979, 54-112996**
**Int. Cl.³ C21D *1/06***
**U.S. Cl. 266—257** **3 Claims**




1. A furnace having a protective atmosphere therein for heat-treating metallic articles, comprising

a heating enclosure having between the sidewalls thereof a space for accommodating said articles to be treated within the furnace, piping means having its discharge communicating with said space for supplying into said enclosure a raw material gas for forming said protective atmosphere,

heating elements provided in the said enclosure, and

catalytic means extending into the enclosure adjacent to said heating means and and operative to react with said raw material gas to convert it into said protective atmosphere,

said catalytic means comprising a plurality of spaced, metallic, catalytic elements secured in said enclosure adjacent opposite sides thereof, and with at least certain of said catalyst elements being disposed in spaced relation to said sidewalls of said enclosure.

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**4,294,437**

## SLIDE CLOSURE FOR THE POURING NOZZLE OF A MOLTEN METAL VESSEL

**Hajimu Sawada, Kawasaki, and Hisao Inubushi, Yokohama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo; Nippon Rotary Nozzle Co., Ltd., Kawasaki; Kokan Kikai Kogyo Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, both of Tokyo, all of, Japan**

**Filed Oct. 11, 1979, Ser. No. 83,970**
**Claims priority, application Japan, Oct. 12, 1978, 53-124654**
**Int. Cl.³ C21C *5/48***
**U.S. Cl. 266—272** **2 Claims**

1. In a slide closure for a molten metal vessel having a pouring nozzle comprising:

a fixed plate brick attached to a bottom portion of said vessel and having at least one pouring opening;

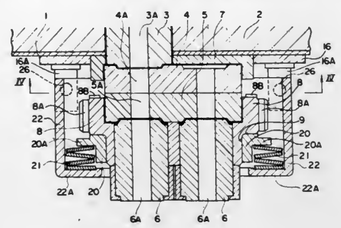
a sliding plate brick having at least one opening and rotatably pressed against a lower surface of said fixed plate brick whereby rotation of said sliding plate brick brings said opening into or out of alignment with said pouring opening to open or close said pouring nozzle;



a rotor for receiving said sliding plate brick so as to be rotated therewith by a driving source; and

supporting means for slidably supporting said rotor and for urging said rotor in a direction to press said sliding plate brick against said fixed plate brick with a bed plate of said vessel serving as a fulcrum;

a slide closure for a molten metal vessel having a pouring nozzle characterized in that said supporting means comprises a first supporter arranged to surround and slidably support said rotor and including an outwardly projected annular portion, and a second supporter fastened to said vessel bed plate with pins so as to urge said first supporter upwardly or in a direction to press said sliding plate brick against said fixed plate brick with dish spring means being placed between said second supporter and a lower side of the annular projection of said first supporter so as to surround said first supporter.

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**4,294,438**

## REPLACEABLE LINER FOR A CRUCIBLE

**William A. Nystrom; Leo C. Lanzel, and William A. Bauer, all of St. Marys, Pa., assignors to The Stackpole Corporation, St. Marys, Pa.**

**Filed Jul. 30, 1980, Ser. No. 173,735**
**Int. Cl.³ B28B *7/08***
**U.S. Cl. 266—280** **6 Claims**

1. A replaceable liner for a crucible for molten metal, the liner consisting of an open-top receptacle having at least its side wall made of graphite foil preformed from compressed expanded graphite.

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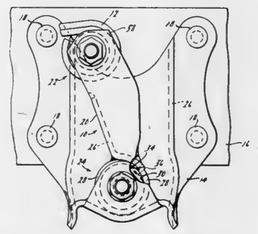
**4,294,439**

## SPRING SHACKLE

**Lester A. McIntosh, deceased, late of Grosse Pointe Shores, Mich. (by Detroit Bank & Trust Co., executor), assignor to McIntosh Corporation, Detroit, Mich.**

**Filed Apr. 9, 1979, Ser. No. 28,561**
**Int. Cl.³ F16F *1/26***
**U.S. Cl. 267—54 A** **10 Claims**



1. A spring shackle for mounting one end of a suspension spring to a vehicle frame, comprising:

a body member;

first mounting means integral with one end of said body member for connecting said shackle to one of said frame or spring;

second mounting means integral with the opposite end portion of said body member for connecting said shackle to the other of said frame or spring, said second mounting means comprising an integral extension of said body member curving in helical-like fashion and defining a generally cylindrical bore,

said integral extension having an offset portion defining a recess disposed radially outwardly from said bore and a free end portion, said recess terminating axially at points spaced axially inwardly from the ends of said bore, said integral extension tapering to a reduced circumferential thickness at said free end portion thereof, said free end portion being nestingly disposed in said recess whereby the internal wall of said bore is substantially continuous; and

an elastomeric bushing press fit into and directly frictionally engaging said bore.

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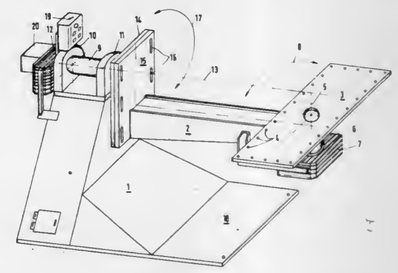
**4,294,440**

## HOLDING DEVICE

**Wilhelm Severt, Venn Diek 21, 4426 Vreden, Fed. Rep. of Germany**

**Filed Oct. 10, 1979, Ser. No. 83,445**
**Int. Cl.³ B23Q *1/04***
**U.S. Cl. 269—71** **3 Claims**



1. A holding device for enabling heavy workpieces of the order of several tons to be oriented without reclamping into any position so that welding seams in the workpiece may be favorably welded horizontally from above, comprising a frame, a first rotary support means mounted on said frame for rotation about a fixed horizontal axis, said first rotary support means comprising a first vertically disposed flange which is rotated about said fixed horizontal axis, a second vertically disposed flange mounted face-to-face on said first flange, mounting means on said first and second flanges for adjusting their relative mounting positions such that said second flange is displaceable relative to said first flange in a direction perpendicular to said fixed horizontal axis such that said second flange is mountable on said first flange at different positions relative to said first flange, a third rotary support means having an axis of rotation coincident with said fixed horizontal axis of said first rotary support means, said third rotary support means comprising a third vertically disposed flange rotatable about said fixed horizontal axis, a fourth vertically disposed flange mounted face-to-face on said third flange, additional mounting means for adjusting their relative mounting positions such that said fourth flange is displaceable relative to said third flange in a direction perpendicular to said fixed horizontal axis such that said fourth flange is mountable on said third flange at different positions relative to said third flange and in a direction perpendicular to said fixed horizontal axis, a support arm having one end mounted on said second vertical flange and extending generally horizontally from said second vertical flange, said

support arm having its other end mounted on said fourth flange, and a second rotary support means mounted on said support arm, said second rotary support means comprising a clamping plate on which said workpiece is clamped and a drive means for rotating said clamping plate about a rotary axis which is perpendicular to said fixed horizontal axis, whereby said clamping plate has unlimited rotational mobility and hence also the workpiece clamped thereto so that each welding seam on the workpiece may be disposed in a horizontal position and the seams in the workpiece may be favorably welded from above while such seams are horizontally disposed.

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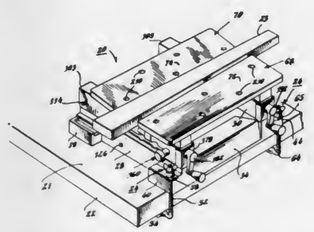
**4,294,441**

## APPARATUS FOR SUPPORTING A WORK PIECE

**Michael L. O'Banion, 15 Poppy La., East Lyne, Conn. 06333, and Jack R. Veara, 5408 Emerald Dr., Eldersburg, Md. 21784**

**Filed May 15, 1979, Ser. No. 39,244**
**Int. Cl.³ B23Q *3/02***
**U.S. Cl. 269—97** **26 Claims**



1. A worktable for use with an auxiliary support structure comprising:
(a) first and second elongated table members each having a work piece support surface for supporting and for gripping a work piece therebetween;
(b) an annular rectangular shaped base support body formed of a polymer plastic defining an enclosed aperture;
(c) means including first and second parallel aligned support bodies formed of metal for supporting said first and second table members on said support base body in a work plane parallel to and juxtaposed with said support base body;
(d) means including first and second screws supported by said first and second parallel aligned support bodies for varying the relative position between the first and second table members in said work plane to provide a spacing therebetween for receiving and gripping work pieces of different sizes between said table members;
(e) said support base body positioned relative to said table members for enabling a gripped work piece to extend through said aperture and to contact a surface of the auxiliary support structure; and,
(f) adjustable, demountable means for clamping said support base body to an auxiliary support structure at a plurality of different locations on said auxiliary support structure.

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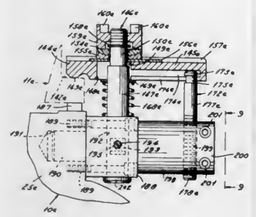
**4,294,442**

## WORKPIECE PALLET WITH DISTORTION FREE CLAMPING MEANS

**Kenneth O. Kolnes, and Wynsel J. Johnson, both of Rockford, Ill., assignors to Greenlee Bros. & Co., Rockford, Ill.**

**Division of Ser. No. 934,751, Aug. 21, 1978, abandoned, which is a division of Ser. No. 832,764, Sep. 12, 1977, Pat. No. 4,148,470, which is a division of Ser. No. 652,257, Jan. 26, 1976, abandoned.**
**This application Jan. 18, 1980, Ser. No. 113,012**
**Int. Cl.³ B25B *1/04***
**U.S. Cl. 269—101** **2 Claims**

1. In a clamping means for clamping workpieces on a pallet for use in a transfer machine, the combination comprising:
(a) an elongated support bar;
(b) means for attaching said support bar to a pallet;
(c) an elongated clamp bar having a clamp nose on one end thereof for engagement with a workpiece on the pallet to clamp the workpiece to the pallet;
(d) fulcrum means supported by said support bar and engaged with the other end of said elongated clamp bar;
(e) clamp screw means interconnecting said elongated clamp bar with sad support bar at a point between said clamp nose and fulcrum means;
(f) said elongated clamp bar is provided with a longitudinally extended recess on the lower side thereof and toward said other end thereof;



(g) said fulcrum means comprises a fulcrum clamp screw having a central body portion slidably mounted in a bore formed through the support bar, a head portion on the upper end thereof slidably mounted in said longitudinal recess in the lower side of said elongated clamp bar, and a lower end adjustably mounted in the outer end of the elongated support bar;
(h) the outer end of said support bar is bifurcated and includes means for forcing the parts of said bifurcated end together to retain said fulcrum clamp screw in fixed position in said support bar; and
(i) means for retaining said clamp screw means in said support bar against longitudinal movement relative to said support bar.

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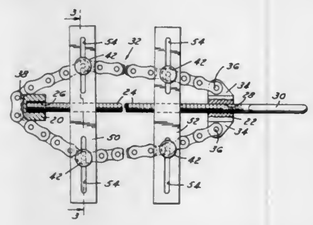
**4,294,443**

## WORKPIECE RETAINER

**Alex W. Sova, 19951 Houghton, Detroit, Mich. 48219**

**Filed Sep. 19, 1980, Ser. No. 188,892**
**Int. Cl.³ B25B *1/24***
**U.S. Cl. 269—108** **7 Claims**



1. A device for holding irregular stones for the purpose of performing mechanical operations thereon which comprises:
(a) spaced support members,
(b) means mechanically associating said members operable to move said members toward and away from each other,
(c) a length of flexible member mechanically associated with a portion of each of said members to form a closed loop, said flexible member lying essentially in a single plane, said flexible member having two ends secured to one of said support members and a portion passing around a portion of the other support member, and
(d) a plurality of means on said flexible member in opposed positions to engage a stone positioned in the loop of said flexible member,
whereby when said members are moved away from each other the loop is tightened to secure a stone to said chain.



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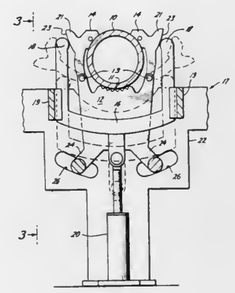
**4,294,444**

## PIPE GRIPPING VISE

**Herbert D. Horton, Mayhill, N. Mex., assignor to World Wide Oil Tools, Inc., Houston, Tex.**

**Filed Apr. 29, 1980, Ser. No. 145,367**
**Int. Cl.³ B25B *1/08***
**U.S. Cl. 269—156** **2 Claims**



1. An apparatus for gripping pipe, said apparatus comprising:
a frame for supporting a pipe to be gripped;
a housing for supporting said frame;
at least two vise jaws pivotally mounted on said frame with a first vise jaw disposed on a first side of said pipe when said pipe is supported on said frame and with a second vise jaw disposed on a second side of said pipe when said pipe is supported on said frame;
a yoke having a first arm for slidably moving along a surface of said first vise jaw to cause said first vise jaw to pivot into gripping contact with said pipe and having a second arm for slidably moving along a surface of said second vise jaw to cause said second vise jaw to pivot into gripping contact with said pipe, said first and second arms of said yoke being slidably mounted within said housing so that the ends of said first and second arms of said yoke slidably communicate with said first and second vise jaws, respectively;
means for biasing said yoke with respect to said housing to cause the ends of the first and second arms of said yoke to press against said first and second vise jaws, respectively; and
means, mounted on said frame, for translating a rotational force acting on said pipe into a gripping force exerted on said pipe by said vise jaws.

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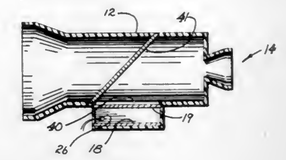
**4,294,445**

## SIGHTING DEVICE WITH MEANS FOR REFLECTING AND SUPERIMPOSING LIGHT FLASHES ON A VIEWED OBJECT

**Scott C. Crosbie, 4349 Brookside Ave., St. Louis Park, Minn. 55436**

**Filed Feb. 15, 1980, Ser. No. 121,807**
**Int. Cl.³ A63J *5/02***
**U.S. Cl. 272—8 M** **9 Claims**

9. In an amusement device, the combination, comprising;
viewing means for observing an object, said viewing means including an aperture for directing the viewing attention of an observer to said object and means for super-imposing a pattern of indicia on the field of view through said aperture, said means including opposed reflective surfaces and a light source, said pattern of indicia being comprised of individual indicia of progressively increasing size with increasing distance from the view of said object observed through said aperture.



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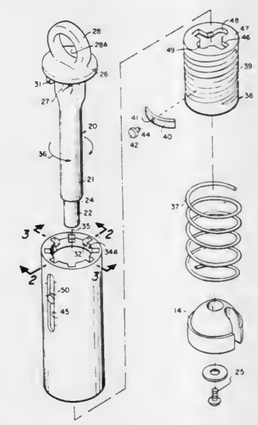
**4,294,446**

## FRICTION TYPE EXERCISING DEVICE WITH IMPROVED FRICTION SETTING INDICATOR

**Gerald L. Moore, San Jose, Calif., assignor to Ronald E. Useldinger, San Jose, Calif.**

**Filed Jul. 23, 1979, Ser. No. 59,899**
**Int. Cl.³ A63B *21/00***
**U.S. Cl. 272—133** **11 Claims**



1. An exercise device, comprising in combination:
a housing having an outer wall forming a hollow cavity, said housing having a central axis;
a shaft positioned within the cavity and held to allow axial and rotative movement relative to said housing when moved in one axial direction and preventing axial rotative movement relative to said housing when moved in the other axial direction;
a hub positioned in said cavity and fixed to said shaft to move axially therewith while allowing rotation of the shaft relative to said hub, said hub being nonrotatable with respect to said housing;
first and second openings in said hub;
a rope-like member extending through said first opening in the hub, around said shaft and out the second opening in said hub whereby when the rope-like member is pulled frictional resistance is exerted on said rope-like member in proportion to the number of turns around said shaft;
means attaching said rope-like member to the shaft whereby with relative rotation of the shaft and the hub, the number of turns of the rope-like member about the shaft is changed;

releasable means for holding the shaft against rotation relative to said housing which when released allows rotation of said shaft within said cavity thereby to change the number of turns said rope-like member is wound around said shaft;
a slide positioned with said cavity;
means connecting said slide, shaft and housing to cause movement of said slide in the direction parallel of the central axis with relative rotation between said shaft and housing; and
an opening in said housing in a position to allow viewing of the position of said slide thereby to indicate the number of turns said rope-like member is wound around said shaft.

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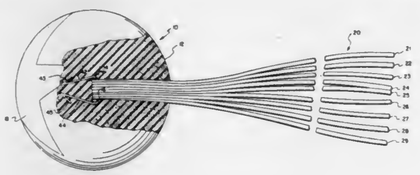
**4,294,447**
**AERIAL AMUSEMENT PROJECTILE AND METHOD OF MANUFACTURE**
**Merlin W. Clark, Rte. 1, Box 171, Spanish Fork, Utah 84660**
**Continuation-in-part of Ser. No. 19,050, Mar. 9, 1979, abandoned. This application Sep. 10, 1979, Ser. No. 74,222**
**Int. Cl.³ A63B** *43/00*
**U.S. Cl. 273—58 R** **15 Claims**



9. An aerial amusement projectile comprising:
an aerodynamic body fabricated as a solid shape from a penetrable, resilient, sponge material;
a streamer comprising a plurality of ribbons, the ribbons being fabricated from a flexible material; and
a fastener for securing the streamer to the aerodynamic body, the fastener being fabricated as a harpoon member having a penetrating means and a streamer engaging means to accommodate being inserted inside the aerodynamic body to thereby secure an end of the streamer inside the aerodynamic body, the harpoon member comprising a body having a base at one end and an apex at the other end, the fastener comprising an angular face on the base and a leading edge defined by the perimeter of the angular face, the angular face being positioned at the end of the fastener nearest the point of insertion on the aerodynamic body after the fastener has been inserted into the aerodynamic body, the angular face comprising a planar element forming an angle of less than 90° with the axis of the harpoon member so that pulling forces against said harpoon member cause the leading edge of said planar element to cut into said sponge material thereby accommodating the base causing the leading edge of the fastener to cut into the sponge material and thereby twist the harpoon member longitudinally under pulling forces exerted on the streamer, the apex allowing the body to be forceably inserted inside the aerodynamic body while the base inhibits its dislodgment of the harpoon member from the aerodynamic body.

14. A method for manufacturing an aerial amusement projectile comprising:
preparing an aerodynamic body from a solid mass of synthetic sponge material, the synthetic sponge material being resilient and penetrable, the body having a suitable aerodynamic profile;
obtaining a plurality of ribbons by cutting a flexible sheet material into a plurality of strips and bundling the strips into a streamer;
fabricating a fastener for the streamer by forming the fastener as a harpoon member having a base and a penetrating means extending from the end opposite the base and having a streamer engaging means, the base having a counterbore formed therein to serve as an insertion rod receiving means;
forming a slanted face on the base of the harpoon member, the slanted face being formed as a planar element angularly offset from an axis of insertion of said harpoon member into said sponge material so that pulling forces against said streamer tend to cause a leading edge of said planar element to cut into said sponge material thereby accommodating the harpoon member being longitudinally offset upon rearward movement of the harpoon member in the aerodynamic body;
mounting the streamer to the aerodynamic body by securing the streamer with the streamer engaging means of the fastener and by placing an insertion rod into the counterbore and inserting the insertion rod and fastener into the aerodynamic body so that the fastener is completely inside the aerodynamic body with the streamer extending from the aerodynamic body, the resilient material of the aerodynamic body resisting dislodgment of the fastener and the streamer from the body; and
rotating the fastener inside the aerodynamic body by pulling on the streamer and causing the base to cut into the resilient material of the aerodynamic body so as to provide better securement of the fastener thereto.

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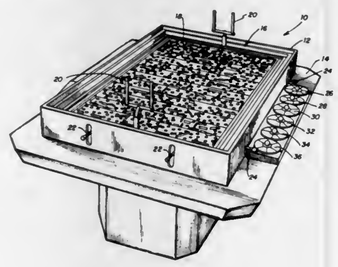
**4,294,448**
**GAME APPARATUS**
**Newell B. Oler, 4323 Brown, Apt. 149, Dallas, Tex. 75219**
**Filed Jan. 21, 1980, Ser. No. 113,492**
**Int. Cl.³ A63F** *7/06, 7/10*
**U.S. Cl. 273—94** **12 Claims**



1. A game apparatus for use with a ball, which comprises:
an outer frame supported for pivotal movement about a first axis;



a first handle secured to said outer frame;
an inner frame supported within said outer frame for pivotal movement about a second axis perpendicular to said first axis;
a second handle secured to said inner frame;
a planar game board defining a playing field mounted on said inner frame, said board including a plurality of apertures therein sized to receive the ball, certain ones of the apertures being designated penalty apertures;
spring means for normally biasing said inner and outer frames to urge said game board toward a horizontal orientation;
a plurality of fences attached to said game board so as to define, together with the apertures therein, an obstacle course for the ball; and
spinner means for defining one of a plurality of predetermined rule infractions and penalties therefor to be applied when the ball enters a penalty aperture on said game board.

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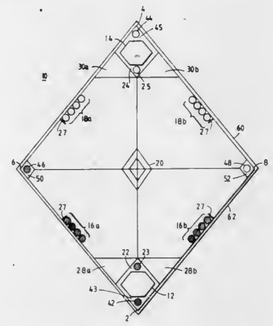
**4,294,449**
**AMUSEMENT DEVICE**
**James K. Shaw, 4916 Erie St., Annandale, Va. 22003**
**Filed Oct. 13, 1978, Ser. No. 950,966**
**Int. Cl.³ A63F** *3/00*
**U.S. Cl. 273—126 R** **7 Claims**



1. A game apparatus comprising: a substantially planar playing surface mounted atop a game table; vertical walls attached to the perimeter of said playing surface; indicia located substantially at the center of said playing surface; said surface having a plurality of corners; some of said corners having indicia and others of said corners having receptacles; the number of said corners being greater than the number of said receptacles, and said receptacles being dimensioned for receiving playing pieces used in conjunction with said game apparatus; a plurality of playing pieces; said playing pieces including separate sets of playing pieces for use by separate players, each of said separate sets of playing pieces having means for distinguishing it from the other sets; each separate set being divided into at least one pair of subsets whereby players using said subsets from the same separate set may play as partners; side indicia on said gameboard between a receptacle and one of said corner indicia; each of said side indicia being located adjacent said side walls to define a position at which at least one subset of said playing pieces is placed; each receptacle being placed a distance from said walls to define an area between said wall and said receptacle for receiving a playing piece therein; at least one cue piece, each receptacle having means adjacent thereto for defining an area whereby said at least one cue piece may be positioned.

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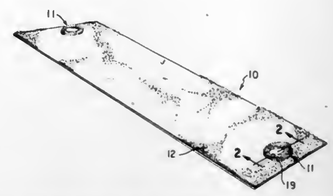
**4,294,450**
**GOLF TRAINING AID AND GAME**
**John Gallic, 151 Lenape La., Berkeley Heights, N.J. 07922**
**Filed May 2, 1980, Ser. No. 146,336**
**Int. Cl.³ A63B** *69/36*
**U.S. Cl. 273—176 F** **12 Claims**



1. A practice putting game comprising
a flexible base layer of predetermined length,
a plurality of smooth monofilament fibers locked into said base from the back and protruding through the front surface thereof to form a simulated golf green surface, said fibers having a predetermined essentially uniform first height above said base,
a continuous wear layer comprising a material having a high coefficient of friction covering the back of said base,
a group of upright fibers anchored in said wear layer and protruding from said base through said monofilament fibers to a substantially uniform second height above said first height, said group of upright fibers being arrayed in a circle to define a raised ring, said ring having a predetermined interior diameter on the surface of said green, and said upright fibers being substantially less resilient than said monofilament fibers to permit a ball rolling on said monofilament fibers to pass through the circle of said upright fibers and into the interior of said ring.

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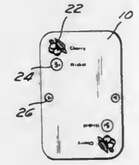
**4,294,451**
**SLOT MACHINE CARD GAME**
**Robert A. Wollner, 5547 Yarmouth Ave., Apt. #9, Encino, Calif. 91316**
**Filed Aug. 27, 1979, Ser. No. 70,244**
**Int. Cl.³ A63F** *1/00*
**U.S. Cl. 273—308** **1 Claim**



1. A card game comprising:
a plurality of cards, said cards being divided into several different groups with there being ten in number of said groups, there also being an equal number of said cards within each of said groups, the basic format of the different card groups being similar, each said card having a first indicia with there being several different first indicias, each said first indicia comprising symbols from the group consisting of fruits, bar representations, enlarged single numerals, and a slot machine with only a single said object represented on a single card, each said group of cards having identical first indicia;
second indicia located on each card of said cards, said second indicia comprising monetary numerical values, there being different said monetary numerical values within each said group with each said card having only a single monetary value of said second indicia; and

third indicia located on each of said cards within certain said groups of cards, said third indicia comprising different monetary numerical values with there being the identical monetary numerical value used entirely throughout each of said certain groups.

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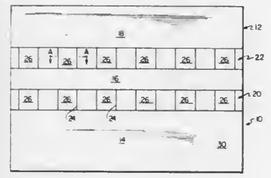
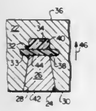
**4,294,452**
**TARGET BACKSTOP**
**Harold J. Schlotter, Springfield, and Leroy Young, Sedalia, both of Mo., assignors to Champion International Corporation, Stamford, Conn.**
**Filed Nov. 29, 1979, Ser. No. 98,657**
**Int. Cl.³ F41J *1/00***
**U.S. Cl. 273—403** **13 Claims**





1. A target backstop for supporting a target in which projectiles may be embedded comprising
a plug;
a wall member formed of corrugated material having a front face, a rear face, and at least one cavity formed therein opening on said front face, said cavity comprising a front portion adjacent said front face for receiving said plug and a rear portion remote from said front face;
a resilient member formed of a heavy rubberized material mounted in said rear portion to abut said plug when said plug is mounted in said front portion, said rear portion having a rear chamber on the side of said resilient member remote from said front face;
said plug being formed of corrugated material and adapted to be coupled releasably within said cavity.

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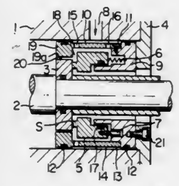
**4,294,453**
**MECHANICAL SEAL**
**Hiroshi Inouye, and Eiichi Sato, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Apr. 1, 1980, Ser. No. 136,368**
**Claims priority, application Japan, Apr. 4, 1979, 54-39827**
**Int. Cl.³ F16J *15/34***
**U.S. Cl. 277—22** **8 Claims**



1. A mechanical seal comprising:
a rotary sealing element rotatable with a shaft; and
a stationary sealing element secured to a casing through resilient means and recoil preventing means to cooperate with said rotary sealing element to form a sealed surface;
wherein the improvement comprises:
a stationary retainer located opposite said sealed surface with respect to said stationary sealing element for holding said stationary sealing element, said resilient means and said recoil preventing means;
a seal housing provided to said stationary retainer for enclosing said stationary sealing element; and
an inwardly projecting portion formed in said seal housing in a portion thereof near said sealed surface for preventing axial movement of said stationary sealing element which might otherwise be caused by the biasing force of said resilient means when the seal is disassembled, whereby the stationary retainer including said stationary sealing element, said resilient means and said recoil preventing means as well as said seal housing can be attached to and detached from the casing as a unit.

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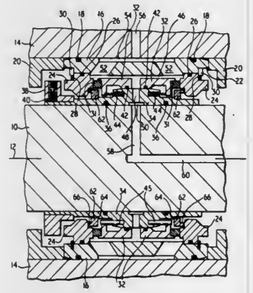
**4,294,454**
**ROTARY SEAL UNIT**
**John A. Cannings, Midway, Crowe Hill, Limpley Stoke, Bath, Avon, England**
**Filed Jan. 30, 1980, Ser. No. 117,836**
**Claims priority, application United Kingdom, Feb. 5, 1979, 03907/79**
**Int. Cl.³ F16J *15/34***
**U.S. Cl. 277—65** **4 Claims**



1. A rotary seal for establishing a seal between a shaft and a surrounding member with which the shaft is relatively rotatable, comprising:
an annular outer component adapted to be rotatable relative to the shaft;
an annular runner component adapted to be secured around the shaft;
a first sealing member carried by the outer component;
a second sealing member carried by the runner component;
one of said first and second sealing members being axially located on said component which carries it, the other of said first and second sealing members being axially slidable on said component which carries it;
spring means acting between said other sealing member and the component carrying said other sealing member to urge said other sealing member into sealing engagement with said one sealing member, thereby establishing an annular seal separating spaces on either side; and
a setting ring engaging axially between said components and rotatable relative to at least one of them so as to locate axially the two said components relative to each other while allowing them to rotate relative to each other, the setting ring being of a material of substantially different hardness from the material of a said component with which it is in rotatable axial engagement, so that after the seal has been running for some time the softer material



wears away to provide a clearance between the setting ring and at least one of said components.

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**4,294,455**
**ROLLER SKATE CONSTRUCTION**
**Arnold F. Krueger, Buffalo, N.Y., assignor to M & K Industries, Inc., Buffalo, N.Y.**
**Filed May 2, 1979, Ser. No. 35,242**
**Int. Cl.³ A63C *17/02, 17/14***
**U.S. Cl. 280—11.2** **15 Claims**

1. A roller skate construction comprising an elongated cast plastic body member including front and rear axle supporting portions, first and second bores in said front and rear axle supporting portions, respectively, first and second axles extending through said first and second bores, respectively, first and second axle supporting bolts extending perpendicularly through said first and second axles, respectively, in said front and rear axle supporting portions, respectively, first and second wear plates in said first and second bores, respectively, interposed between said first and second axles, respectively, and said front and rear axle supporting portions, respectively, for bearing the load of said first and second axles, respectively, said first and second axles including a rectangular solid central portion through which said first and second axle supporting bolts, respectively, extend, and flat planar portions defining the sides of said first and second bores and diverging away from said rectangular solid central portions on opposite sides of a plane extending perpendicularly thereto and passing through the axis of said first and second bolts, said flat planar portions providing limit stops for limiting pivotal movement of said first and second axles, respectively.

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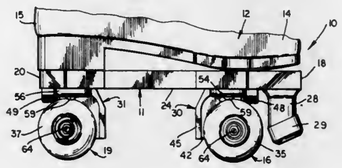
**4,294,456**
**PIVOTABLE BALL SKATE**
**James L. Tuell, and Paul Wahnschaff, both of Atlanta, Ga., assignors to Tuell Industries, Inc., Atlanta, Ga.**
**Filed Nov. 13, 1979, Ser. No. 93,746**
**Int. Cl.³ A63C *17/02, 17/24***
**U.S. Cl. 280—11.28** **5 Claims**



1. A roller skate comprising an elongated foot support platform having a front end and a rear end for mounting against the bottom surface of a shoe or the like with its front end adjacent the toe of the shoe and the rear end adjacent the heel of the shoe, a front roller assembly mounted to said foot support platform adjacent the front end of said foot support platform, a rear roller assembly mounted to said foot support platform adjacent the rear end of said foot support platform, at least said front roller assembly comprising a roller support bracket including a support plate portion in abutment with the foot support platform and an axle support projection extending from said support plate, an axle extending outwardly to opposite sides of said axle support projection and rollers mounted on said axle with one roller on each end of said axle, said rollers each being approximately of similar size and hemispherical in shape with their larger diameters positioned in juxtaposition with respect to said support projection, a pivot connector pivotally connecting said support plate portion of said roller support bracket to said foot support platform at a position of said support plate which is longitudinally offset from said axle so that when a lateral force is applied to said rollers the rollers tend to pivot about said pivot connector out of alignment with said foot support platform, and restraining means comprising a resilient pad positioned on each side of said roller support bracket and attached to said foot support platform, said resilient pads being offset longitudinally along the length of said foot support platform with respect to said pivot connector for resiliently maintaining said rollers in alignment with said foot support platform, and means for connecting said resilient pads to said foot support platform at a multiple number of positions along the length of said foot support platform.

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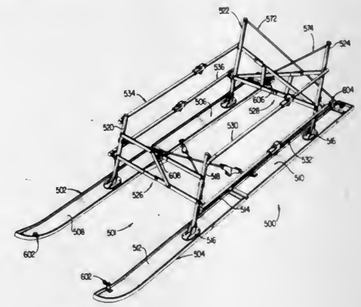
**4,294,457**
**COLLAPSIBLE SUPPORT DEVICE FOR A FOLDING SLED**
**Robert Thiboutot, Lac St. Charles, Canada, assignor to Les Entreprises Rotot Ltee, Comte de Bellechasse, Canada**
**Division of Ser. No. 960,444, Nov. 13, 1978, Pat. No. 4,245,849.**
**This application Apr. 11, 1980, Ser. No. 139,206**
**Int. Cl.³ B62B *13/16***
**U.S. Cl. 280—20** **2 Claims**



1. A sled which is collapsible in height and in width, the sled having a pair of spaced apart foldable runners and collapsible support structure pivotally connected to the runners for pivotal movement about axes extending transversely to the longitudinal axes of the runners, said collapsible support structures comprising:
a. a first collapsible support structure forming the back of said sled;
b. a second collapsible structure forming the front of said sled;
wherein each of said collapsible support structures has
(1) a first and a second support member pivotally connected to a respective runner and positionable in an upright position;
(2) a collapsible support mechanism interconnecting said support members and movable between a collapsed position in which the support members are adjacent to each other and an erected position in which the support members are spaced apart from each other;
(3) side members, generally parallel to said runners, interconnecting the support members forming the said front and back of said sled; and

(4) diagonal members interconnecting each of said runners with the support members not privotally connected thereto so that pivotal movement of said support members towards said runners moves said runners towards each other, said diagonal members being adapted to support said support members in upright positions.

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**4,294,458**

## SKI STOP

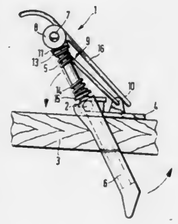
**Gerhard Sedlmayr, Farchant, Fed. Rep. of Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany**

**Filed Nov. 16, 1978, Ser. No. 961,458**

**Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751602**

**Int. Cl.³ A63C *7/10***

**U.S. Cl. 280—605** **10 Claims**



1. A ski stop in the form of a two-armed lever having a extending transversely to the length of a ski on an upper surface thereof, one arm of said lever being divided to form two brake prongs disposed at both sides of the ski, the other arm being spring-loaded into a first position in which said prongs are in braking positions and being engageable by a ski boot for movement into a second position in which said prongs are in non-braking positions, a coupling (**9, 10**) having a first end mounted at a position fixed with respect to the ski at a spacing from the pivot shaft (**2**), and a second end connected to the other lever arm (**5**), yoke means (**12, 23**) for intercoupling the second end of the coupling and the other lever arm, the yoke means extending parallel to the pivot shaft and being displaceable lengthwise of the shorter of the other lever arm and the coupling (**5; 9, 20**), and spring biassing means for spring loading said other arm and for biassing the yoke means (**12, 23**) towards a limiting position remote from the pivot shaft.

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**4,294,459**

## SKI BRAKE

**Josef Svoboda, Schwechat; Erwin Krob, Vienna, and Erwin Weigl, Brunn am Gebirge, all of Austria, assignors to TMC Corporation, Baar, Switzerland**

**Division of Ser. No. 896,216, Apr. 13, 1978, Pat. No. 4,272,099. This application Nov. 7, 1979, Ser. No. 92,139**

**Claims priority, application Austria, Apr. 18, 1977, 2678/77**

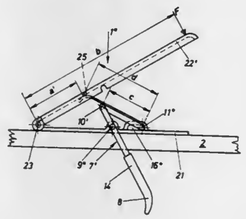
**Int. Cl.³ A63C *17/10***

**U.S. Cl. 280—605** **1 Claim**

1. A support structure for mounting a ski brake on a ski adjacent to a safety ski binding means also mounted on said ski, comprising:

a mounting plate mounted on said ski and having means defining first and second axle receiving openings thereon spaced along the longitudinal axis of said ski;

a U-shaped, spring wire ski brake means having a pair of brake arms located along opposite side edges of said ski interconnected by a first bight portion, each of said brake arms having a first axle segment therein received in said first axle receiving opening, said first bight portion including an integral U-shaped central segment opening outwardly in a direction opposite to the opening of said U-shaped, brake means to thereby define two laterally spaced second bight portions located on opposite lateral sides of said U-shaped central segment, said U-shaped central segment having a third bight portion defining a second axle segment received in said second axle receiving opening, said first and second axle segments supporting said ski brake means for pivotal movement between a braking position wherein said brake arms extend at a transverse angle to the bottom surface of said ski and a retracted position wherein said brake arms extend generally parallel to the upper surface of said ski, said first and second axle segments extending perpendicular to the longitudinal axis of said ski, one of said first and second axle openings fixedly locating one of said first and second axle segments, the other of said first and second axle openings being elongated in the direction of said longitudinal axis of said ski to facilitate a sliding movement of said one of said first and second axle segments; and



stepping plate means pivotally mounted for movement about a pivot axle on said mounting plate by a pivot axle support, said stepping plate means including guide means for slidably supporting thereon said second bight portions, said second bight portions sliding along said guide means toward said pivot axle support during a movement of said ski brake means from said braking position toward said retracted position to thereby reduce the force required to hold said stepping plate in a position parallel with the upper surface of said ski,

said second bight portions' contact location being located on said stepping plate and divides the length of said stepping plate into two segments, a first segment extending between the pivot axle support and said location and a second segment extending between said location and an end of said stepping plate remote from said pivot axle whereat an external force is to be applied, whereby as said stepping plate is urged to said parallel position with said upper surface of said ski, the value of a ratio

$$\frac{\text{length of first segment}}{\text{length of second segment}}$$

is reduced; and

said guide means includes an intermediate lever engaging said second bight portions, one end of said lever being pivotally secured to said mounting plate adjacent said other of said first and second axle openings, the other end being slidingly engaged with said stepping plate at said contact location thereon, wherein a further location of said second bight portions' contact location on said lever divides the length of said lever into third and fourth segments, said third segment extending between the pivotal support for said lever and said further location, said fourth segment extending between said further location and an end of said lever engaging said stepping plate at said contact location thereon whereby as said stepping plate is urged to said parallel position with said upper surface of said ski, the value of said ratio is further reduced.



**4,294,460**

## FOOT-PLATES FOR SKI-BINDINGS

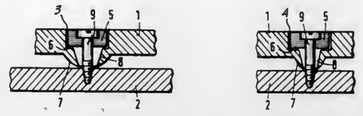
**Bernhard Kirsch, Im Litzelholz 23, 5500 Trier-Biewer, Fed. Rep. of Germany**

**Filed Nov. 14, 1978, Ser. No. 960,662**

**Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752206**

**Int. Cl.³ A63C *9/00***

**U.S. Cl. 280—607** **17 Claims**



1. In a ski assembly, a foot-plate member for carrying a ski-binding, a substantially rigid member including a ski and rigid pin means including at least one rigid pin rigidly connected to said ski, said rigid pin having a portion projecting upward from the ski, said foot-plate member having an upright recess receiving said rigid pin projecting portion which recess is of a cross-sectional size substantially larger than the cross-sectional size of said rigid pin projecting portion in said recess for enabling movement during skiing of said foot-plate member relative to said ski a substantial distance in all directions laterally of the direction of projection of said rigid pin projecting portion, the upright sides of said recess limiting the maximum range of lateral movement of said foot-plate member relative to said substantially rigid member, and resilient means including at least one pad of resilient material interposed between said substantially rigid member and said foot-plate member for cushioning lateral movement of said foot-plate member relative to said substantially rigid member throughout the full range of relative lateral movement of said two members permitted by said rigid pin projecting portion in combination with the upright sides of said foot-plate member recess for cushioning the transmission of lateral forces exerted on said ski from being directly transmitted to said foot-plate member.

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**4,294,461**

## SAFETY SKI BINDING COMPRISING A SOLE PLATE

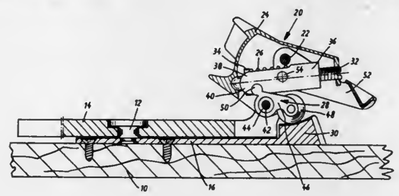
**Erich G. Eckart, Angererstr. 36, 8000 München 40, Fed. Rep. of Germany**

**Filed Nov. 19, 1979, Ser. No. 95,441**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851634**

**Int. Cl.³ A63C *9/081***

**U.S. Cl. 280—618** **8 Claims**



1. A safety ski binding comprising:

a sole plate pivotally connected to a ski by a trunnion approximately below the heel position of a skier;

a heel assembly on said sole plate adapted to pivot about a first axis transverse to said ski, said assembly being connected to a holder member having means for engaging the heel of a user for maintaining that heel of the sole plate;

spring means urging said assembly to pivot about said axis in a direction to maintain a heel on the sole plate; said spring means including a carriage biased by spring force to a normal position;

a curved cam member rigidly attached to the ski;

a double-armed rocker pivotally mounted on said assembly about an axis extending laterally perpendicular to the ski, one arm of said rocker being rearwardly directed and being formed to define a cam follower engaging said curved cam member, the other arm of said rocker being pivotally connected to said carriage whereby said spring means biases said carriage to pivot said rocker and hold said cam follower against said curved cam member in a region thereof wheren said holder members holds the heel on the sole plate and said sole plate is held against free rotation on said ski.

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**4,294,462**

## SPRING LOCKING DEVICE

**Josef Svoboda, Schwechat; Herbert Wuerthner, Hainburg, and Karl Stritzl, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland**

**Division of Ser. No. 900,302, Apr. 26, 1978, Pat. No. 4,213,630. This application Dec. 21, 1979, Ser. No. 106,054**

**Claims priority, application Austria, Apr. 27, 1977, 2929/77**

**Int. Cl.³ A63C *9/08***

**U.S. Cl. 280—634** **4 Claims**

1. The combination of a release ski binding having a housing and an adjustable spring abutment thereon for changing the effective force of a spring in said ski binding housing, said adjustable spring abutment being initially exposed through an opening in said ski binding housing, and a seal member of brittle material for indicating that an adjustment of said adjustable spring abutment has taken place subsequent to an authorized adjustment thereof, said seal member being received in said opening in said ski binding housing directly in the pathway to said adjustable spring abutment, said seal member having destructible means thereon for securely holding said seal means in said pathway to prevent ready access to said adjustable spring abutment, said adjustable spring abutment means being adjustable only through a destruction of said destructible means, said adjustable spring abutment being threadedly coupled to said ski binding housing and having means thereon for receiving an adjustment tool therein, said destructible means on said seal member being positioned between said adjustable spring abutment and said ski binding housing whereby an axial movement of said adjustable spring abutment in response to a rotary movement thereof in said threaded coupling beyond a predetermined limit will cause a destruction of said destructible means.

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**4,294,463**

## COLLAPSIBLE LUGGAGE CARRIER

**Hirotaro Kotani, No.2-4, Ayameike-cho Minami-6-chome, Nara-shi, Nara-ken, 631, Japan**

**Filed Oct. 10, 1979, Ser. No. 83,368**

**Int. Cl.³ B62B *1/00***

**U.S. Cl. 280—646** **11 Claims**

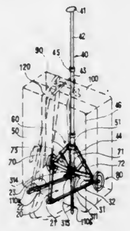
1. A portable luggage carrier collapsible into the form of a bundle comprising:

a base platform frame including a pair of first links each pivotally connected to the other at one end and angular expansible and collapsible and a pair of second links each

pivoted to the midporton of one of the first links approximately at one end portion of each second link intersecting said first link, the second links being pivotally connected to each other at the other ends thereof and being angularly expansible and collapsible, the base platform frame being adapted to receive luggage thereon for transport;

a back frame including a collapsible handle bar pivotally connected at its lower portion to said other ends of the pair of second links and having the handle member at its upper portion and a pair of third links each pivotally connected approximately at one end portion thereof to a portion of one of the first links close to its free end and having the other ends pivotally connected to each other and also connected to the handle bar, the third links being angularly expansible and collapsible, the back frame being unfoldable to a position at least at a right angle with the base platform frame and foldable over the base platform frame, the back frame being laterally expansible and collapsible in operative relation with the base platform frame when folded over the base platform frame;

first hinge means pivotally connecting the handle bar to the second links as pivotal movement for pivotally connecting the base platform frame to the back frame and provided with movement compensating means for compensating



for the expanding or collapsing movement of the pair of second links relative to each other so as to be serviceable as the pivotal movement;

a pair of second hinge means pivotally connecting the first links to the third links as said pivotal movement and provided with movement compensating means for compensating for the operatively related expanding or collapsing movement of the pair of the first links relative to each other and of the pair of the third links relative to each other so as to be serviceable as said pivotal movement, said back frame being pivotally connected to said base platform frame at no more than three locations by said first hinge means and said pair of second hinge means;

expanding means for holding both the frames in a laterally expanded position and for permitting the back frame to independently retain the shape to which the back frame is expanded laterally along with the base platform frame as folded over the base platform frame, also when the back frame is in its unfolded position approximately at right angle with the base platform frame; and

a pair of wheels being mounted at a first pivot on the first links to the rear of a second pivot position where the third link is pivotally connected to the first link, and so as to be positioned on lateral side portions of the first links when the base platform frame is in a horizontal position.

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**4,294,464**

## CHILD'S STROLLER

**John P. Ettridge, 235 Diagonal Rd., Warradale, Australia (5046)**

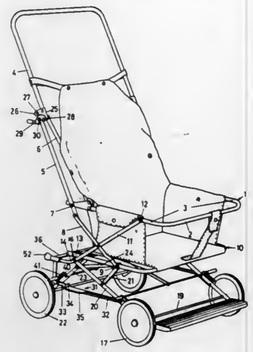
**Filed Feb. 14, 1979, Ser. No. 11,794**

**Claims priority, application Australia, Feb. 17, 1978, PD3427**

**Int. Cl.³ B62B** *7/06*

**U.S. Cl. 280—649** **6 Claims**

1. A child's stroller comprising an upper horizontal frame, a lower horizontal seat frame, a pantograph linkage connecting the said frames, an articulated handle connected to the upper frame and also to a first arm of the pantograph linkage, a second arm of the pantograph linkage connected to a first wheel frame having wheels, a second wheel frame having wheels and link means extending between and interconnecting



said wheel frames, so that on collapsing said stroller said handle folds onto the upper frame and said upper frame moves in parallel manner to be adjacent said seat frame, said link means moving said first wheel frame wheels towards the second wheel frame wheels.

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**4,294,465**

## OPERATOR'S STATION AND MOUNTING

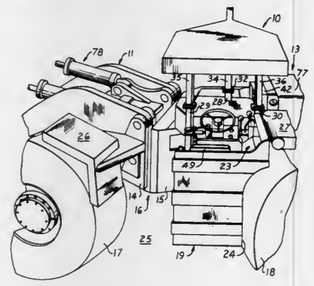
**Gerald P. Simmons, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Continuation of Ser. No. 859,361, Dec. 13, 1977, abandoned.**

**This application Jun. 9, 1980, Ser. No. 157,332**

**Int. Cl.³ B62D** *33/06*

**U.S. Cl. 280—756** **7 Claims**



1. In an earthworking machine having frame means defining opposite side portions, a pair of front wheels carried by a front portion of said frame means, a pair of rear wheels carried by a rear portion of said frame means, said wheels being disposed outwardly of said frame means side portions, and mechanism for operating the machine, the improvement comprising:

wall means defining an upwardly open operator's station;

means for securing said wall means to one of said frame side portions to dispose said operator's station outwardly thereof between a front wheel and rear wheel;

a protective canopy mounted to said frame inwardly of said operator's station and including a cantilevered portion overlying and being unsupported by the operator's station outwardly of the frame for protecting the operator in said station from injury by falling objects and permitting substantially unobstructed viewing forwardly, rearwardly and outwardly from said station, said frame being provided with connector portions on the opposite side portions thereof, said canopy being provided with depending leg portions arranged to be connected to said connecting portions; and

bolt means for removably securing said leg portions to said connector portions to removably support the canopy at each of the opposite sides of the frame, the canopy being supported to the frame side portion opposite that to which the operator's station wall means is secured by only one of said leg portions.



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**4,294,466**

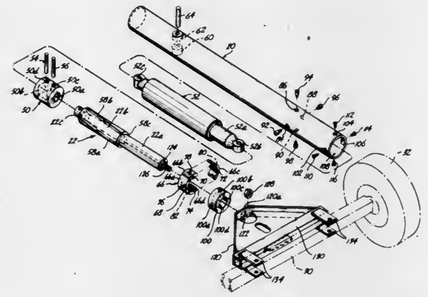
## WEIGHT REDISTRIBUTION APPARATUS

**Dennis C. Hyman, Olympia, Wash., assignor to Molly Presley, Olympia, Wash.**

**Filed Oct. 4, 1979, Ser. No. 81,858**

**Int. Cl.³ B62D** *9/02*

**U.S. Cl. 280—772** **9 Claims**



1. An apparatus for redistributing the weight of a vehicle as said vehicle negotiates a turn, said vehicle including a frame, two front wheels, and two rear wheels, comprising:

a pair of relatively telescoping elements, a first of said elements being affixed to said frame, the second of said elements being operatively coupled to said two front wheels to mount said front wheels for fore and aft longitudinal movement relative to said frame,

means associated with said elements for axially rotating said second element in a predetermined direction relative to said first element as said elements telescope, said second element being operatively coupled to said front wheels to alter the relative elevation of said wheels as said second element rotates relative to said first element,

biasing means operatively coupled between said telescoping elements to bias the telescoping movement of said second element in a forward direction, said biasing means being resiliently collapsible in reaction to exertion of a turning force on said front wheels to allow said second element to telescope relative to said first element, to thereby effect an elevation differential in said front wheels relative to said frame in reaction to said turning force.

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**4,294,467**

## SEAT BELT COMFORT DEVICE

**Richard L. Frantom, Richmond, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Filed Oct. 5, 1979, Ser. No. 82,397**

**Int. Cl.³ B60R** *21/10*

**U.S. Cl. 280—801** **17 Claims**

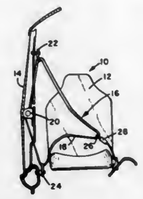
1. A vehicle seat belt system comprising:

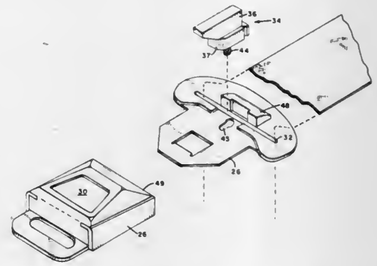
seat belt webbing adapted to at least extend over the torso of an occupant seated in a seat in said vehicle;

rewind means exerting a biasing force and biasing said webbing in a rewind direction and permitting extension of said webbing against said biasing force, said biasing force causing said webbing to exert pressure against the torso of said occupant;

a tongue and buckle assembly associated with said seat belt webbing to provide a releasable interconnection for fastening said webbing about said occupant; and

comfort means associated with said tongue and buckle assembly and actuable to at least reduce the pressure exerted by said webbing against the torso of said occupant;





said comfort means comprising a contact means for contacting said webbing, said contact means normally being located at a first position at which said webbing is not contacted by said contact means, said contact means being manually movable to a second position at which said webbing is contacted, said contact means including means responsive to release of said tongue from said buckle to automatically move said contact means from said second position to said first position to thereby automatically disengage said comfort means.

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**4,294,468**

## SEATBELT SYSTEM

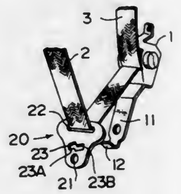
**Eiichi Kinaga, Toyota, and Mamoru Mori, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jun. 8, 1979, Ser. No. 47,140**

**Claims priority, application Japan, Aug. 24, 1978, 53-116464[U]**

**Int. Cl.³ B60R** *21/02*

**U.S. Cl. 280—807** **2 Claims**



1. In a vehicle seatbelt system having a retractor fixedly mounted to said vehicle, a lap slip anchor rotatably mounted to

said vehicle subjacent said retractor and a seatbelt wound into and out of said retractor, and slideably received by said slip anchor, the improvement comprising means for preventing said slip anchor from rotating beyond a predetermined range wherein smooth extension and retraction of said seatbelt is assured, said preventing means including a slot in said slip anchor and a pawl fixed relative to said vehicle and extending into said slot, the dimension of said slot relative to said pawl enabling said anchor to rotate relative to said pawl within said range.

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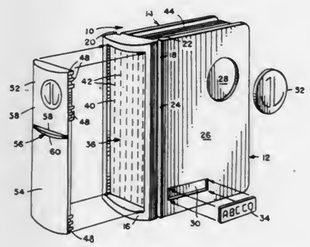
**4,294,469**
**BOOK BINDERS AND BOOKS MADE WITH SAID BINDERS**

**Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108**

**Filed Aug. 6, 1979, Ser. No. 63,859**
**Int. Cl.³ B42F *15/04***
**U.S. Cl. 281—29** **4 Claims**



1. A book comprising an integrally molded binder of a thermoplastic polymer having a spine with a substantially planar, longitudinal panel portion and a front cover panel and rear cover panel respectively hingedly mounted on opposite, longitudinal sides of said spine by means of a living hinge formed between each of said cover panels and respective longitudinal sides of said spine; and paper pages positioned in said binder between said cover panels, one edge of said pages being fastened to said planar panel portion of said spine by means of stitching or stapling extending through said pages and said planar panel portion.

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**4,294,470**
**IN-LINE TUBE JUNCTIONS**

**Alfred D. Tucker, Kersbrook, Australia, assignor to Reed Irrigation Systems Pty Ltd., Australia**

**Filed Dec. 7, 1979, Ser. No. 101,275**
**Claims priority, application Australia, Dec. 11, 1978, PD7073; Jun. 1, 1979, PD9044**
**Int. Cl.³ F16L *41/00***
**U.S. Cl. 285—5** **2 Claims**

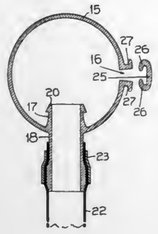
1. An in-line tube junction for joining a first flexible tube to a lateral tube, said in-line tube junction comprising:

an open-ended, tubular socket member having a socket passage extending longitudinally therethrough, said socket member being formed of resilient material and having a longitudinal slit, the width of the slit being sized so that the first flexible tube when flattened can be inserted into the socket passage of the tubular socket member through the slit at least when the slit is increased in width by flexing the tubular socket member;

a hollow spike joined to the tubular socket member and projecting inwardly thereof, said spike being arranged to pierce the first flexible tube or to engage in an aperture in the first flexible tube to thereby place the hollow of the spike into communication with the interior of the first flexible tube;

a hollow take-off projecting outwardly from the tubular socket member adjacent said spike, the hollow of said take-off communicating with the hollow of the spike;

means for coupling the lateral tube to the take-off whereby fluid can flow from the first tube to the lateral tube through the spike and the take-off;



a removable keeper; and

means on the socket member adjacent said slit for cooperating with said removable keeper to prevent removal of the first tube from the socket member through the slit.

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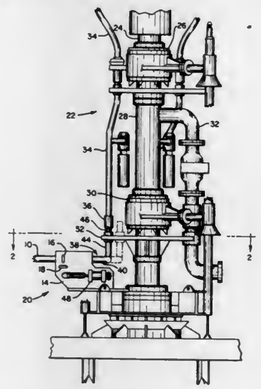
**4,294,471**
**SUBSEA FLOWLINE CONNECTOR**

**Bernard H. van Bilderbeek, Monymusk, Scotland, assignor to Vetco Inc., Ventura, Calif.**

**Filed Nov. 30, 1979, Ser. No. 99,183**
**Int. Cl.³ F16L *55/00***
**U.S. Cl. 285—24** **3 Claims**



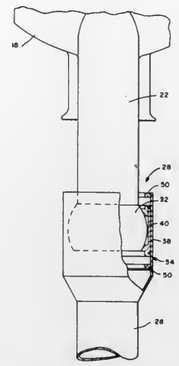
1. An apparatus for connecting a horizontal subsea flowline having a first sealing surface at one end thereof, to a generally vertical production riser comprising: means for holding an end of said flowline at a predetermined location; a rigid tubular spool piece having, a generally horizontally extending portion, a generally vertically extending portion, and a second sealing surface at the end of said horizontal portion and adapted to mate with said first sealing surface; guide means for guiding movement of the end of the horizontal portion of said spool piece substantially perpendicular to said second sealing surface, and for guiding movement of the end of the vertical portion of said spool piece in a manner to maintain it a fixed distance from the end of the horizontal portion of said spool piece; means for stroking said entire spool piece in a manner producing the guided movement of said spool piece; and stab means for stabbing and sealing the vertical riser on the upper end of said vertically extending portion of said spool piece.



**4,294,472**
**PIPE COUPLING ASSEMBLY ESPECIALLY SUITABLE FOR USE IN THE NUCLEAR REACTOR**

**William E. Stolecki, East Longmeadow, Mass., assignor to Electric Power Research Institute, Palo Alto, Calif.**

**Filed Jun. 25, 1979, Ser. No. 51,805**
**Int. Cl.³ F16L *27/04***
**U.S. Cl. 285—27** **12 Claims**



1. A pipe coupling assembly especially suitable for fluid connecting together certain components submerged within a pool of liquid metal in a nuclear reactor, said assembly comprising a first tubular section having one end adapted for connection with one of said reactor components, a second tubular section having one end adapted for connection with another of said reactor components, a third intermediate tubular section and first and second joint arrangements for respectively connecting one end of said intermediate section with the otherwise free end of said first second and the opposite end of said intermediate section with the otherwise free end of said second section, said first joint arrangement forming the connecting ends of said first and intermediate sections and including a male portion having an outer partially spherical contour, an associated female portion including means interconnected with said male portion for providing limited axial and pivotal movement between said first and intermediate tubular sections and means for interlocking said male and female portions together, said interconnecting means including an outer cylindrical housing and a concentric inner cylindrical sleeve shorter in length than said outer housing and slidable within and against the inner surface of said housing along a longitudinal section of the latter, said housing and sleeve being positioned around their associated male portion for pivotal movement about the latter, said second joint arrangement forming the connecting ends of said second and intermediate sections and including a male portion having an outer partially spherical contour and an associated female portion including means supporting said last-mentioned male portion for pivotal movement.

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**4,294,473**
**DEVICE AT MUTUALLY LOCKABLE FIRST AND SECOND PARTS**

**Kjell R. Ekman, Zug, Switzerland, assignor to Ekman Engineering AG, Switzerland**

**Filed Mar. 12, 1980, Ser. No. 129,804**
**Claims priority, application Switzerland, Mar. 20, 1979, 02488/79**
**Int. Cl.³ F16L *55/00***
**U.S. Cl. 285—50** **10 Claims**

1. An improved coupling device for providing a fluid-tight connection between a source of fluid and a hollow conduit unit having an enlarged cavity for receiving said coupling device, and comprising:

a first coupling member having a fluid passageway extending therethrough;

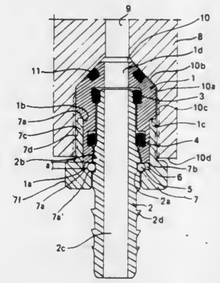
a second coupling member having a fluid passageway extending therethrough;

said first and second coupling members each having on a respective first end portion thereof means for permitting insertion of said second coupling member into said first coupling member, thereby aligning said flow passageways extending therethrough;

at least one sealing ring means compressed between confronting surface portions of said first and second coupling members for preventing the flow of fluid between said coupling members while simultaneously surpressing the transmission of vibrations through said coupling device;

said first coupling member further having on a second end portion thereof means for permitting free insertion of said first coupling member into an enlarged cavity in a hollow conduit unit until said second end portion abuts a portion of an end wall of said enlarged cavity and an exterior surface portion of said first coupling member is radially spaced from a surface portion of said enlarged cavity a distance sufficient to create a substantially cylindrically-shaped slot therebetween;

at least one additional sealing ring means contacting said abutting portions of said first coupling member and said enlarged cavity for preventing fluid from leaking therebetween;



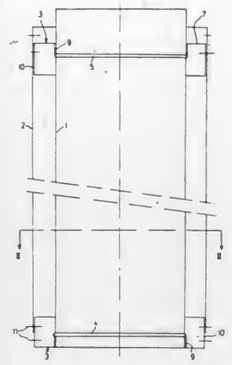
a hollow nut assembly including on a first portion thereof means for permitting insertion of said nut assembly into said cylindrically-shaped slot a sufficient distance such that an end surface of said hollow nut assembly abuts a radially extending wall portion of said first coupling member and a second end portion of said hollow nut assembly overlaps and faces a substantially radially extending end wall of said first coupling member, defining a circumferentially extending locking slot therebetween;

said hollow nut assembly including attachment means engaging complimentary attachment means formed on said hollow conduit unit for fixedly positioning said hollow nut assembly within said substantially cylindrically-shaped slot;

a substantially ring-shaped locking member formed of resilient material extending partially into said circumferentially extending locking slot and confronting a circumferentially extending stop assembly formed on an exterior surface of said second coupling member; and

said second end portion of said hollow nut assembly including wall means for engaging and biasing said substantially ring-shaped locking member into tight frictional contact with said stop assembly, thereby preventing inadvertent withdrawal of said second coupling member from said first coupling member.

**4,294,474**
**PREFABRICATED CHIMNEY-SHAFT**
**Josephus J. D. Harm, Vijzelgracht 29-31, Amsterdam, Netherlands**
**Filed Sep. 25, 1978, Ser. No. 945,234**
**Int. Cl.³ F16L *39/00***
**U.S. Cl. 285—133 R** **5 Claims**



1. A prefabricated chimney-shaft comprising an inner sheath and an outer sheath surrounding said inner sheath, in which the inner sheath and the outer sheath are interconnected near their two ends with the aid of tie-members and at least the outer sheath has a multi-angled cross section, and near each said end of the outer sheath is positioned a tie-member comprising a plate extending substantially perpendicular to the longitudinal axis of the chimney, the shape of said plate being adapted to the inner cross-section of the outer sheath, and at its periphery said plate is provided with first bent-over rims for joining the outer sheath, and the tie-member further has a passage bounded by a second bent-over rim for engaging the inner sheath, such that said first and second bent-over rims of each said tie-member are arranged to face one another, and at one end of the outer sheath both of said rims project a longitudinal distance out of the outer sheath over a portion of their height and near the other end of the outer sheath the tie-member and both of its rims are recessed a longitudinal distance from said other end.

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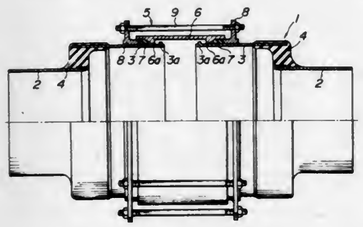
**4,294,475**
**FLEXIBLE PIPE CONNECTOR**
**Isamu Kanai, Sayama; Shigeki Okubo, Yokosuka; Kazuo Tsuchiya, Ebina, and Toshio Takasaki, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**
**Filed Nov. 8, 1979, Ser. No. 92,262**
**Claims priority, application Japan, Nov. 10, 1978, 53-154012[U]**
**Int. Cl.³ F16L *15/02***
**U.S. Cl. 285—165** **5 Claims**



1. A flexible pipe connector comprising; a pair of connection pipes arranged on the same axial line and spaced apart from each other, a pair of intermediate sleeves each having one end portion overlapped with each of said connection pipes and coaxially arranged therewith, each of said intermediate sleeves being provided at its opposed end portion with projections defining abutments limiting axial movement of said intermediate sleeves away from each other, a rubber-like elastic body filling up a gap formed between each of said intermediate sleeves and each of said connection pipes and bonding the former with the latter, and connection fitting means to fluid-tightly seal and connect both said intermediate sleeves with each other and permitting said intermediate sleeves to slidably move in the axial direction and limit in cooperation with said projections said movement away from each other.

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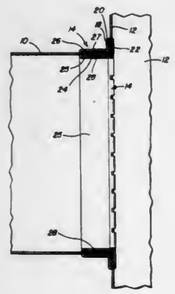
**4,294,476**
**CONNECTING DEVICE**
**Patrick L. Nash, 7 E. Mill St., Shelburn, Ind. 47879**
**Filed Nov. 8, 1979, Ser. No. 92,929**
**Int. Cl.³ F16L *41/00***
**U.S. Cl. 285—189** **13 Claims**



1. A connecting device for anchoring a duct segment to an opening in a wall, the duct segment having a peripheral edge portion closely receivable into the opening, the connecting device being formable of integral construction from a metal sheet of substantially uniform thickness and comprising a plurality of strips defined by bending said sheet along crease lines, the strips including first and second gripping strips and first and second flange strips, said first and second gripping strips being adapted for grippingly fitting over said peripheral edge portion of the duct, said first and second gripping strips being connected to said first and second flange strips along a joint and being substantially orthogonally aligned to said second flange strip and in parallel alignment with said first flange strip, said first and second flange strips being positioned to abut against said wall in close proximity to the opening, said first flange strip including a plurality of tabs substantially orthogonally aligned to said second flange strip and being manually bendable around said opening to a position parallel to said second flange strip with the portion of the wall immediately adjacent said opening included therebetween, whereby secure anchoring of the duct to the wall around said opening is effected.

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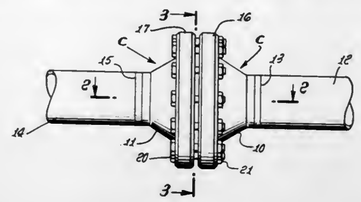
**4,294,477**
**FLEXIBLE RING GASKET RETAINER FOR FLANGED CONNECTORS**
**Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Inc., Ventura, Calif.**
**Continuation of Ser. No. 804,584, Jun. 8, 1977, abandoned. This application May 29, 1979, Ser. No. 42,461**
**Int. Cl.³ F16L *17/06***
**U.S. Cl. 285—336** **18 Claims**

1. In a connector: a pair of connector bodies having a fluid passage therein when said bodies are connected together, said bodies having opposed radial surfaces with circumferentially continuous grooves circumscribing said fluid passage and defined between inner and outer side walls converging outwardly from the bottom of the groove, a metal gasket ring in said grooves in sealing and radially inwardly loaded engagement with at least said outer side walls, retainer means carried by one of said bodies, means connecting said retainer means to said gasket ring and initially holding said gasket ring in position





with respect to the groove in one of said bodies to be clamped between said bodies in said grooves with at least said outer side walls loaded against said gasket ring, and means independent of said retainer means clamping said bodies together, said means connecting said retainer means to said gasket ring being flexible to enable movement of said gasket ring during loading thereof, said radial surfaces engaging said retainer means to limit the loading of said gasket ring by said side walls.

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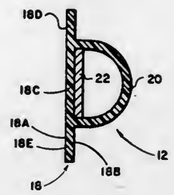
**4,294,478**
**DETACHABLE PROTECTOR FOR STEEL OBJECTS**
**Russell C. Marquette, 2415 E. 15 St., Tulsa, Okla. 74104**
**Continuation of Ser. No. 867,239, Jan. 6, 1978, abandoned. This application Mar. 19, 1979, Ser. No. 22,215**
**Int. Cl.³ B60R *19/08***
**U.S. Cl. 293—128** **2 Claims**



1. An improved detachable protector for steel objects comprising:

an elongated body formed of magnetic plastic material which adheres to metal, such as steel, the body in cross-section being defined by a thin flat part having an upper and a lower surface and an arcuate part extending from the flat part upper surface, the width of the arcuate part being less than the width of the flat part, said flat part has side portions along each side of said arcuate part and a mediate portion substantially equal to the internal width of the arcuate part, said portions of said flat part extending along each side of said arcuate part are integral with said arcuate part and wherein the intermediate portion of said flat part is a separate element bonded to said arcuate part, the lower surface being planar; and

a thin elongated flat paramagnetic metal member of length substantially equal to the length of the detachable protector, positioned within said arcuate part and in close engagement with the upper surface of the intermediate portion of said flat part, said metal member having width substantially equal to the internal width of the arcuate part at point adjacent the intermediate flat part upper surface.

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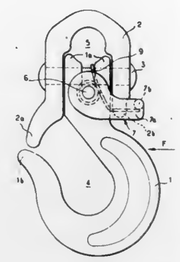
**4,294,479**
**SAFETY LIFTING HOOKS**
**Jean-Francois Archer, Villennes, France, assignor to Stas Societe Technique d'Accessoires Specialises S.A., Sartrouville, France**
**Filed Jan. 17, 1980, Ser. No. 112,822**
**Claims priority, application France, Jan. 25, 1979, 79 02691**
**Int. Cl.³ B66C *1/36***
**U.S. Cl. 294—82 R** **10 Claims**



1. A safety hook comprising means defining a hook body having an upper part and a hook nose lying in a plane, a generally U-shaped latch having two opposed noses, first spindle means pivotally mounting the latch on the upper part of the hook body, said first spindle means lying in the plane of the hook body and horizontal in the normal position of utilization of the hook, so that the latch can occupy a safety position in which one of its noses is situated in the vicinity of the nose of the hook, and means for locking the latch in its safety position, said locking means comprising a pawl, second spindle means pivotally mounting the pawl on the hook body, said second spindle means being perpendicular to the plane of the hook body, and said pawl being operative to retain the other nose of the latch to prevent the latter from pivoting, and resilient means biasing the pawl in a sense to hold it in a position in which it prevents the latch from pivoting.

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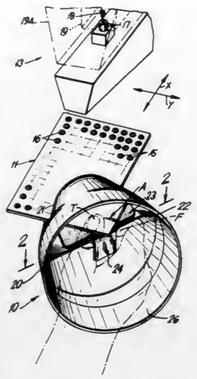
**4,294,480**
**SAFETY GUARDS AND METHODS FOR MANUALLY FEEDING WORKPIECES TO ASSEMBLY MACHINES**
**William S. Burns, Jr., and William M. Sankey, both of Shreveport, La., assignors to Western Electric Company, Incorporated, New York, N.Y.**
**Filed Feb. 1, 1980, Ser. No. 117,687**
**Int. Cl.³ B25D *17/10*; F16P *1/00***
**U.S. Cl. 294—131** **6 Claims**

1. A safety guard that permits manual gripping of an end portion of a workpiece to be fed to an assembly machine, which comprises:

a hollow shield having an opening at one end thereof into which an operator's hand can be inserted, the shield having a slot at the opposite end arranged for receiving the end portion of the workpiece within the shield, the shield further having means for supporting the end portion of the

workpiece within the shield and for permitting manual gripping of the end portion by the operator within the



shield, while the shield precludes injury to the operator's hand when the workpiece is fed to the assembly machine.

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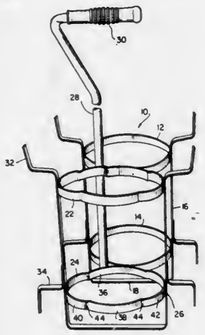
**4,294,481**
**GAS CYLINDER CARRIER**
**Douglas B. Pearl, Pompano Beach, Fla., assignor to Uniweld Products, Incorporated, Ft. Lauderdale, Fla.**
**Filed Jun. 26, 1980, Ser. No. 163,176**
**Int. Cl.³ B62B *1/14***
**U.S. Cl. 294—146** **3 Claims**



1. In a gas cylinder stand or truck including cylinder support or base means, handle means and cylinder retaining means, improvements in said cylinder retaining means comprising:
- first and second pairs of spaced, opposed arcurate sections;
- said first pair of said sections being spaced and having a radius to accommodate and retain a gas cylinder of a given size therebetween;
- said second pair of said sections being joined to said first pair at four junction points to form a unitary, cylinder-retaining structure;
- said second pair of said sections having radii and an included angle or length to accommodate two adjacent gas cylinders of smaller size than said given size therebetween;
- the radii of said second pair of said sections being smaller than the radius of said first pair of said sections.

**4,294,482**
**RAILWAY WHEEL TREAD PROFILE**
**Herbert Scheffel; Rowlen E. von Gericke, and Joseph A. Viviers, all of Transvaal, South Africa, assignors to South African Inventions Development Corporation, Transvaal, South Africa**
**Filed Aug. 23, 1979, Ser. No. 69,515**
**Claims priority, application South Africa, Aug. 23, 1978, 78/4791**
**Int. Cl.³ B60B *17/00***
**U.S. Cl. 295—34** **19 Claims**

1. A profiled wheel-tread for a railway wheel having a circumferential running surface and a circumferential wheel flange with the running surface having a taping line and a running zone between the taping line and a radiussed fillet portion at the base of the wheel flange with the improvement that the effective conicity across the running zone, the effective conicity being dependent on the rate of change of rolling diameter, decreases progressively while remaining positive from a zone adjacent the taping line towards the wheel flange.

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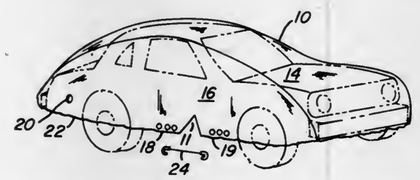
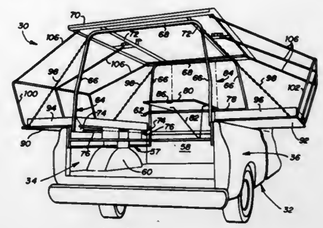
**4,294,483**
**INFLATABLE VEHICLE COVER**
**Sean D. Ferris, 96 Spruce St., Natrona, Pa. 15065**
**Filed Mar. 14, 1980, Ser. No. 130,249**
**Int. Cl.³ B62D *25/00***
**U.S. Cl. 296—136** **6 Claims**



1. A cover for protecting the body of a vehicle during transit against damage from the force of foreign objects directed at said vehicle body comprising:
- a body member defining at least one cell adapted for inflation by the introduction of a fluid into said cell;
- a surface of said cell being shaped to conform to the contours of the outer surface of said vehicle body when said cell is inflated;
- means for allowing introduction of said fluid into said cell to inflate said cell and for permitting release of said fluid from said cell to deflate said cell; and
- means for securing said cell to said vehicle body to completely cover the exterior surface thereof.



**4,294,484**
**VEHICLE CAMPER**
**Robert H. Robertson, Dallas, Tex., assignor to Ronbil Industries, Inc., Dallas, Tex.**
**Filed Mar. 9, 1979, Ser. No. 18,888**
**Int. Cl.³ B60P *3/32***
**U.S. Cl. 296—156** **23 Claims**



10. A camper mounted on a vehicle having a vehicle bed, two sidewalls and a front wall, said camper comprising:
- a top covering the vehicle bed and movable between a lowered position adjacent the upper edge of the two sidewalls and the front wall and a raised position elevated above the vehicle bed;
- main frame means pivotally attached adjacent said sidewalls for supporting the rigid top in the raised position and for pivotally moving between a lowered frame position and a raised frame position;
- lever means extending from said main frame means for applying a rotational force to said main frame means and comprising:
  - triangular plates extending from the lower end of said main frame means; and
  - catch means on said triangular plates disposed remotely from said main frame means for attaching said tension means to said triangular plates, whereby said tension means will impart a tension force to said triangular plates for applying a torque to said main frame means causing said main frame means to rotate toward the raised frame position; and
- force means for applying a force to said lever means to apply a rotational force to said main frame means for urging said main frame means to rotate from the lowered frame position towards the raised frame position.

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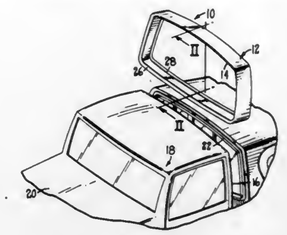
**4,294,485**
**WINDOW BOOT**
**Thomas E. Engelhard, 4325 Colfax Ave. South, Minneapolis, Minn. 55409**
**Continuation-in-part of Ser. No. 921,276, Jul. 3, 1978, Pat. No. 4,222,605, which is a continuation-in-part of Ser. No. 738,313, Nov. 2, 1976, Pat. No. 4,114,943. This application Feb. 2, 1979, Ser. No. 8,539**
**Int. Cl.³ B60P *3/32***
**U.S. Cl. 296—166** **7 Claims**

1. A combination including a boot and frame windows of a cab/camper assembly of the type having a rear frame window in the cab and a corresponding front frame window in the forward wall of the camper, said boot comprising a boot frame including a continuous resiliently deformable sidewall, said sidewall defining an aperture corresponding respectively to said windows in said cab and said camper, said sidewall terminating in respective opposite ends, one of said opposite ends including a thickened resilient continuous lip, said lip being adapted to be snap-fit into a corresponding window frame for thereby mounting said boot between said cab and camper, said window frame including an exteriorly extending substantially U-shaped channel in which the lip of said boot is grippingly receivable, the other of said ends including magnetic means for



securement of said boot to said cab, whereby said boot may be easily mounted and dismounted from said cab and camper.

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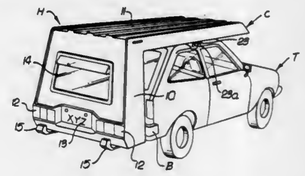
**4,294,486**
**CAMPER AND TENT UNIT**
**Eusebio H. Espejo, 1429 Alma St., San Pedro, Calif. 90731**
**Filed Dec. 21, 1978, Ser. No. 971,871**
**Int. Cl.³ B60P *3/34***
**U.S. Cl. 296—167** **21 Claims**



1. A camper tent unit comprising a housing structure having a vertical section and a horizontal hollow shell section; means for supporting said housing structure on a passenger vehicle with said vertical section supported on the rear and said horizontal section extending forwardly on top of the vehicle; said horizontal shell section having a roof and front and side walls extending downwardly from said roof to form a storage space; flexible fabric tent components having means connecting the components to said front and side walls for folding storage in said shell and erectable to form with said housing structure, when removed from the vehicle, a laterally extended tent roof and side, front and rear tent walls connected with one another and with said housing structure to form an enclosure; and means providing frame structures connected with said roof and said front wall tent components to form rigid support therefore, when deployed from said housing structure.

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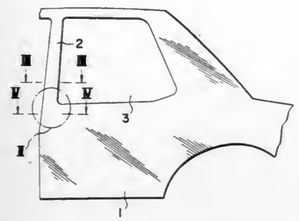
**4,294,487**
**CAR BODY**
**Yoshiharu Nakamura, Koganei, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan**
**Filed Aug. 20, 1979, Ser. No. 68,002**
**Claims priority, application Japan, Sep. 12, 1978, 53-125960[U]**
**Int. Cl.³ B62D *25/04***
**U.S. Cl. 296—188** **3 Claims**

1. A car body of two-door type comprising:
- a center pillar provided on each side portion of the car body;
- a rear fender integrated with the bottom of said center pillar;
- a rear side glass elevatably provided along said center pillar; and
- a stiffener having a front wall, a side wall and a rear wall which are formed of a channel shape in cross section so as to fit on the inside of said center pillar, said stiffener being

arranged within said center pillar, said stiffener extending downwards beyond the waist line of said rear fender, the



rear wall of said stiffener being fixed through a flange formed at an edge of said stiffener to an inner panel of said car body.

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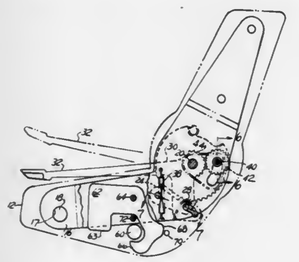
**4,294,488**
**RECLINER AND INERTIA LATCH**
**Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.**
**Filed Nov. 23, 1979, Ser. No. 96,883**
**Int. Cl.[3] A47C *1/026***
**U.S. Cl. 297—367** **13 Claims**



1. A vehicle seat construction comprising a vehicle seat having seat brackets fixed to opposite lateral ends thereof, a reclining seat back having recliner brackets fixed to opposite sides at the lower end thereof, pivot means interconnecting the seat brackets and the adjacent recliner brackets, lock means for positively locking both recliner brackets simultaneously in selected positions relative to said seat brackets, said lock means comprising a movable lock member at each side of the seat construction, a rotatably mounted actuator cooperating with each of said lock members, a manually movable lever fixed to one of said actuators, and a drive connection between said actuators to insure identical simultaneous movement of said actuators at opposite sides of said seat construction, said drive connection comprising an elongated straight, rigid torsion bar extending between and mounted for rotation about its longitudinal axis relative to a first pair of like brackets at opposite sides of the seat construction, and means providing for movement of said bar relative to the other pair of like brackets in an arcuate path concentric with but displaced substantially from the transverse pivot axis determined by the location of the pivot means interconnecting the brackets at opposite side of said seat construction.

**4,294,489**
**UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE**
**Colin Anolick; Vivian M. Robinson, both of Wilmington, and Charles W. Stewart, Sr., Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Continuation of Ser. No. 572,709, Apr. 29, 1975, Pat. No. 4,174,420. This application Mar. 13, 1978, Ser. No. 886,260**
**The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.**
**Int. Cl.[3] A47C *5/12*; B32B *3/26***
**U.S. Cl. 297—452** **3 Claims**

1. A flame resistant cushion comprising a metal frame assembly, an inner padding of foamed urethane material, an exterior layer of foamed neoprene material covering the entire exterior surface of said inner padding, and means for uniting said padding and said exterior layer together integrally.

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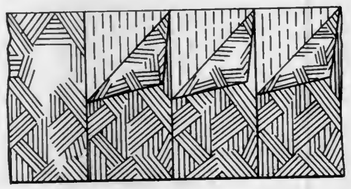
**4,294,490**
**FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION**
**James A. Woelfel, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.**
**Filed Feb. 6, 1980, Ser. No. 119,141**
**Int. Cl.[3] B60B *21/00, 1/06***
**U.S. Cl. 301—63 PW** **26 Claims**



1. A composite wheel of fiber-reinforced resin comprising a disc wherein reinforcing fibers comprise fibers oriented randomly of the wheel axis and a rim wherein reinforcing fibers include first fibers oriented substantially randomly of the wheel axis and directional second fibers all extending in a direction essentially parallel to the wheel axis with the random and directional reinforcing fibers in said rim being disposed in essentially distinct layers radially of said wheel axis and with the fiber to resin weight ratio being in the range of 30% to 80%.

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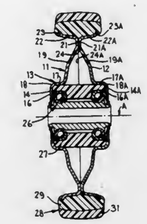
**4,294,491**
**METAL DISK WHEEL WITH RESILIENT TREAD AND BEARING SUPPORT**
**John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.**
**Continuation of Ser. No. 964,133, Nov. 27, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,279**
**Int. Cl.[3] B60B *1/06*; F16C *33/00***
**U.S. Cl. 301—63 DD** **5 Claims**

1. A wheel construction, comprising:
bearing means defining an axis of rotation, said bearing means being housed in an elastically deformable elastomeric sleeve;
a pair of identically shaped metallic stampings, each having a central cylindrical shell part axially aligned with the other and means defining a hole therethrough in approximately the center thereof, said stampings each having a surface portion intermediate said central cylindrical shell part and a first peripheral surface which is coextensive with a central plane through said wheel construction and perpendicular to said axis of rotation, said axially aligned cylindrical shell parts of each stamping housing said bearing means therein with at least a portion of the inner surface of said cylindrical shell part engaging a portion of the external surface of said elastomeric sleeve adjacent the axial ends thereof and said surface portions slidingly engaging one another; and
an elastically deformable annulus of moldable synthetic resin material and means for fixedly securing said annulus to said first peripheral surface of said pair of metallic stampings to effect, along with said elastomeric sleeve engaging said inner surface of said cylindrical shell parts, a holding of said cylindrical shell parts and said surface portions in axial alignment, the material of said annulus and said sleeve having an elastically deformable characteristic to thereby permit said pair of stampings to temporarily shift radially relative to one another against the elastic resistance of said annulus and said sleeve arising due to an





elastic deformation of said annulus and said sleeve while maintaining said surface portions in sliding engagement with one another and to temporarily facilitate an orientation of said central plane inclined to said axis of rotation in response to shock loads having a component of force applied to said wheel construction in a direction parallel to said axis of rotation, said material further having a sufficient resistance to elastic deformation to thereby hold said metallic stamping in axial alignment during normal use thereof, said sleeve and said annulus thereby facilitating an absorption of said shock loads applied to said bearing means, said material further effecting a return of said pair of stampings to said axially aligned position thereof with said central plane oriented perpendicular to said axis of rotation following the termination of a shock load applied thereto.

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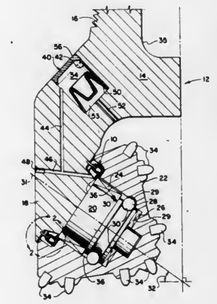
**4,294,492**
**CALIPER SEAL ASSEMBLY**
**Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631**
**Continuation-in-part of Ser. No. 95,532, Nov. 19, 1979, Pat. No. 4,240,674. This application May 27, 1980, Ser. No. 153,540**
**Int. Cl.[3] F16C *33/74***
**U.S. Cl. 308—8.2** **20 Claims**



1. In combination with a drill bit, which includes a cutter wheel rotatably connected by a bearing assembly to a body element of the drill bit, a caliper seal assembly operatively extending between the cutter wheel and the bit body to seal the bearing assembly from the ambient environment of the bit, said caliper seal assembly comprising:
a first structure having a bifurcated end defined by a pair of flexible flank members separated by an intermediate channel, each flank member including a contact pad formed thereon facing into the intermediate channel; and
means defining a flange-like projection extending into the intermediate channel of said first structure, said flange-like projection including a pair of sealing surfaces, each sealing surface being positioned in contacting and movable sealing relation with a different contact pad.

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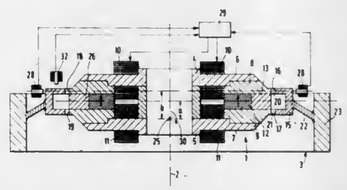
**4,294,493**
**MAGNETIC BEARING ASSEMBLY**
**Rainer Sindlinger, Hirschberg, and Josef Hammer, Rotenberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany**
**Filed Nov. 2, 1979, Ser. No. 90,588**
**Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847930**
**Int. Cl.[3] F16C *39/06***
**U.S. Cl. 308—10** **16 Claims**



1. In a magnetic bearing assembly for a rotor having an axis of rotation; the assembly including at least two actively regulated magnetic bearings for stabilizing the rotor in radial directions oriented substantially perpendicularly to one another and to said axis; said magnetic bearings defining a bearing plane oriented perpendicularly to said axis; means for sensing radial motions of said rotor and emitting first signals in response to said radial motions; and force generating means for applying to said rotor radial return forces as a function of said first signals; the improvement wherein said rotor has a center of gravity situated at an axial distance from said bearing plane whereby tilting motions of said rotor about tilt-axes perpendicular to said axis of rotation can be sensed; further comprising sensors for sensing said tilting motions of said rotor and emitting second signals in response to said tilting motions; said sensors being situated at an axial distance from said bearing plane; said force generating means applying to said rotor, as a function of said second signals, return forces opposing said tilting motions of said rotor.

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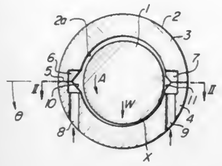
**4,294,494**
**SLIDING-TYPE BEARING**
**Masahiro Yoshioka; Toshifumi Koike, both of Ibaraki, and Hideki Izumi, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Nov. 27, 1979, Ser. No. 97,698**
**Claims priority, application Japan, Dec. 4, 1978, 53-149117**
**Int. Cl.[3] F16C *1/24***
**U.S. Cl. 308—76** **6 Claims**

1. In a sliding-type bearing having a bearing surface provided with a lubricating oil groove at each of two portions thereof substantially 90° apart from the point to which the load of a rotary shaft is applied,
an improvement which comprises: a chamfer formed in at least the portion of the bearing surface near one of the

lubricating oil groove remoter from the point of the minimum bearing clearance determined by the direction of rotation of the shaft and by the direction of application of the load, said chamfer being communicated with said one



of said lubricating oil groove and opening at the side of said bearing, said chamfer being adapted to permit the discharge of the heated lubrication oil to the outside of said bearing together with the cooled lubricating oil supplied to said one of said lubricating oil grooves.

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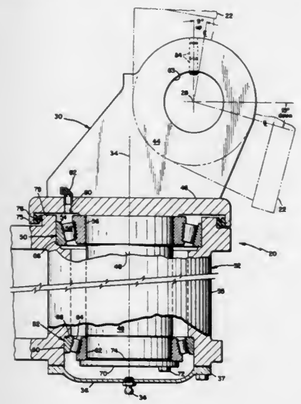
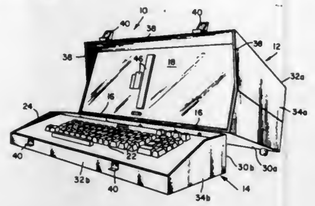
**4,294,495**
**BOOM SOCKETS**
**Morris L. Whaley, Chula Vista, Calif., assignor to Morris Whaley, Inc., Chula Vista, Calif.**
**Filed Oct. 15, 1979, Ser. No. 84,852**
**Int. Cl.³ F16C *19/36***
**U.S. Cl. 308—174** **14 Claims**



**1**. A boom socket or the like, comprising: a housing; a gooseneck assembly comprising a vertical pin and a gooseneck at the upper end thereof; means comprising vertically spaced, upper and lower tapered roller bearings rotatably supporting said vertical pin in said housing for rotation about a vertical axis; a boom end; and means for rotatably supporting said boom end for rotation about a horizontal axis from said gooseneck comprising a cross pin extending through said gooseneck, boom end brackets embracing said gooseneck, and tapered roller bearings surrounding the respective end of said cross pin for rotatably supporting said boom end brackets from the respective ends of said cross pin.

**4,294,496**
**PORTABLE COMPUTER ENCLOSURE**
**James D. Murez, Santa Monica, Calif., assignor to GM Research, Carson, Calif.**
**Filed Aug. 3, 1979, Ser. No. 63,418**
**Int. Cl.³ A47B *21/00*; A47R *81/00*; H05K *5/00***
**U.S. Cl. 312—208** **4 Claims**



**1**. A portable computer including:
first and second enclosures hinged together at ends which are closeable upon each other to define a single suitcase-type cabinet having a general rectangular parallelepiped configuration;
said first enclosure comprising a main frame with a display at its closeable end, and a rear panel backing said main frame;
said second enclosure having a keyboard at its closeable end, a front panel backing said keyboard, and a handle extending from said front panel;
said enclosures further having top and bottom panels respectively segmented into first and second portions respectively on said first and second enclosures;
hinges connecting said first and second portions of said segmented bottom panel;
cooperating latches respectively on said first and second portions of said segmented top panel for securing said enclosures together when closed; and
foot pads extending from said rear panel, said first portion and said front panel.

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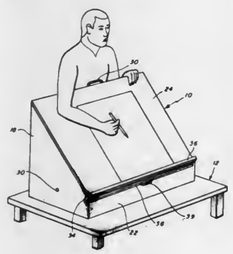
**4,294,497**
**COMBINED CARRYING CASE, DISPLAY DEVICE AND LECTERN**
**Robert A. Daniel, 455 Center St., Bridgewater, Mass. 02324**
**Filed Aug. 14, 1980, Ser. No. 178,085**
**Int. Cl.³ A47B *27/00***
**U.S. Cl. 312—231** **5 Claims**



**1**. A multi-use carrying case, display and lectern device comprising:
a bottom wall;
an upwardly extending rear wall;
a relatively short front wall;
a pair of side walls, the side walls being tapered upwardly so as to present a narrowing and reduced width at their upper ends;
said walls being secured together to define a case configuration which, in cross section, tapers upwardly;



a rectangular cover extending downwardly along the front edge of each of the side walls and being arranged to cover fully the case, the cover being hinged at its upper end to the upper end of the rear wall;
a transversely extending slot formed in the short front wall;
a shelf defining a false bottom within the case, the shelf being extendable through the slot to provide a forwardly extending shelf on which materials may be supported;
guide means for guiding and supporting the shelf for movement between its retracted configuration in which it defines the false bottom for the case and its extended configuration in which it projects outwardly through the slot; and
a carrying handle secured to the upper region of the device.

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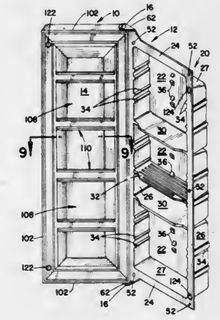
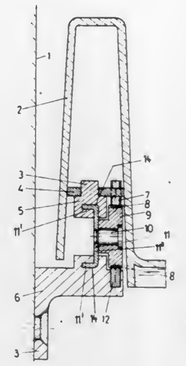
**4,294,498**
**WALL CABINET AND METHOD OF MAKING**
**Richard D. Van Luit, 189 Manning Dr., Berea, Ohio 44017**
**Filed Oct. 17, 1979, Ser. No. 85,691**
**Int. Cl.³ A47B *67/02*; A47F *5/08*; E05D *7/00***
**U.S. Cl. 312—245** **7 Claims**



**1**. A plastic wall cabinet comprising a body portion of plastic sheet material and having a back wall and top, bottom and side walls integral with and extending forwardly of said back wall to provide said body portion with an open front, mounting flange means including upper and lower planar mounting flanges integral with and extending upwardly and downwardly respectively from said top and bottom walls, said upper and lower mounting flanges having upwardly and downwardly facing terminal edges, respectively, extending laterally between said side walls, said planar mounting flanges having corresponding first ends adjacent one of said side walls, upper and lower hinge leaf means each integral with the corresponding one of said upper and lower terminal edges of said first ends of said mounting flanges, each said hinge leaf means including a laterally narrow planar hinge leaf vertically spaced from the corresponding one of said top and bottom walls and extending horizontally forwardly of the corresponding mounting flange, a hollow door for closing said open front, said hollow door comprising front and back panels of plastic sheet material bonded together to provide a central portion bounded by a peripherally continuous hollow portion including a seam between said panel sheets extending about said hollow portion and rearwardly from said front panel toward said back panel, said panel sheets in the area of said seam having rearwardly facing terminal end edges transverse to said seam, and a hinge pin extending through each said hinge leaf and into said hollow portion of said door to pivotally mount said door on said body portion.

**4,294,499**
**PULL-OUT GUIDE ASSEMBLY**
**Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria**
**Filed Jun. 4, 1979, Ser. No. 45,264**
**Claims priority, application Austria, Jun. 6, 1978, 4097/78**
**Int. Cl.³ A47B *88/04, 88/14, 88/16***
**U.S. Cl. 312—334** **9 Claims**



**1**. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein a drawer is slidably insertable into and removable from a furniture body, said pull-out guide assembly comprising:
separate plural first rail supports adapted to be fixed to a side of a drawer in spaced relationship with respect to each other along a direction of sliding movement of the drawer;
separate plural second rail supports adapted to be fixed to a side of a furniture body in spaced relationship with respect to each other along said direction;
a single rail directly supported by said plural first rail supports and by said plural second rail supports for relative sliding movement therebetween in said direction;
an endless belt mounted on said rail for movement in said direction; and
connecting means for fixing said endless belt to the drawer and to the furniture body, such that movement of the drawer in said direction will pull said endless belt in said direction and cause said rail to slide with respect to said plural first and second rail supports.

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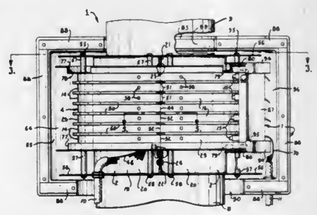
**4,294,500**
**ROTARY ELECTRICAL JUNCTION ASSEMBLY**
**Jack A. Wilson, 502 N. Santa Fe, Salina, Kans. 67401**
**Filed Aug. 30, 1979, Ser. No. 71,191**
**Int. Cl.³ H01R *39/08, 39/14***
**U.S. Cl. 339—5 M** **13 Claims**



**1**. A rotary electrical junction device comprising:
(a) stator means formed in at least two stator sections;

(b) means securing said stator sections around a stationary support member for selective mutual separation of said stator sections laterally outward from said stationary support member;
(c) stator contact means on said stator means and electrically connected to stationary electrical means;
(d) rotor means formed in at least two rotor sections;
(e) means securing said rotor sections around a rotary support member for selective mutual separation of said rotor sections laterally outward from said rotary support member, said rotary support member being rotatably connected to said stationary support member;
(f) rotor contact means on said rotor means and electrically connected to revolving electrical means associated with said rotary support member, said rotor contact means being in contact with said stator contact means when said junction device is assembled to thereby provide continuous electrical communication between said stationary electrical means and said revolving electrical means, and whereby the laterally outward separability of said stator and rotor sections facilitates the installation and removal of said rotary electrical junction device on and from said stationary and rotary support members;
(g) said rotary support means being rotatable about an axis of rotation and wherein:
(1) said stator means is separable along a stator split plane including said axis of rotation into a pair of stator halves; and
(2) said rotor means is separable along a rotor split plane including said axis of rotation into a pair of rotor halves;
(h) said stator contact means being a plurality of slip rings, each of said slip rings being separable into a pair of slip ring halves;
(i) said rotor contact means being a plurality of brushes, each brush being associated with a respective slip ring;
(j) said brushes mounted in side-by-side relation on at least one brush rack;
(k) annular guide means provided on each of said stator halves to receive said brush rack thereon with said brushes conductively engaging respective slip rings such that said brush rack may be revolved about said stator means; and
(l) said rotor means including a split construction housing enclosing said stator means and said brush rack, said housing being mounted on said rotary support member and including brush rack engaging means whereby said brush rack is revolved about said stator means upon rotation of said housing.

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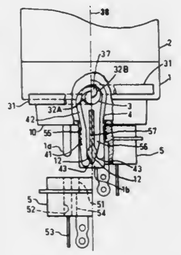
**4,294,501**
**PLUG MEMBER FOR THE ELECTRICAL CONNECTION OF AN APPLIANCE TO A BASE**
**Edouard Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France**
**Filed Nov. 26, 1979, Ser. No. 97,428**
**Claims priority, application France, Dec. 1, 1978, 78 34162**
**Int. Cl.³ H01R** *13/639*
**U.S. Cl. 339—66 M** **4 Claims**



1. In an electrical connector including a plug member and a base having conducting pins extending from the plug to be introduced into metal-sheathed holes in the base for electrically connecting the plug to the base, a centering stud adapted to be introduced in a centering hole in the base, and locking means for locking the plug member on the base, the improvement wherein the locking means comprises a hollow recess in said stud, at least two lateral openings through said stud between said recess and the outer surface of said stud, a U-shaped locking member mounted within said recess for sliding movement with respect to said stud between a locking and a release position, means in said recess for spreading apart the arms of the U-shaped locking member as it moves from said release to said locking position so that said arms project from the centering stud through said lateral openings to engage the wall of the centering hole in the base, and means on said plug to move said locking member between said release and locking positions.

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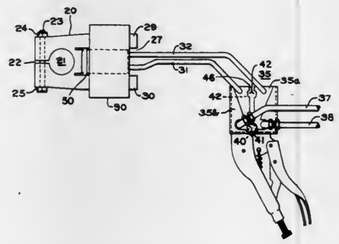
**4,294,502**
**BUSHING TERMINAL AND BUSS BAR**
**Walter L. Martin, Jr., Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.**
**Filed Sep. 4, 1979, Ser. No. 72,702**
**Int. Cl.³ H01R** *13/00*
**U.S. Cl. 339—112 L** **6 Claims**



1. An electrically conductive supply connector suitable for use in connecting a power transformer to a fiber glass forming bushing comprising a bushing terminal connector having an electrically conductive body provided with a slot adapted to receive the electrical supply terminal of a fiber glass bushing, means to circulate cooling fluid through said body, means to connect at least two tubular bus bars to said body, a metal block on the opposite the ends of said bus bars provided internally with a cooling fluid passage and in communication with the bus bars so that fluid can be circulated from said body through one of said bus bars and said block and back to said body, a transformer terminal connector having a solid electrically conductive core provided with two arm like extensions forming a recess therein and adapted to receive said body, means to clamp said body in said recess and form an electrical connection between said extension and said body and means in said core to connect said core to the secondary of a power transformer.

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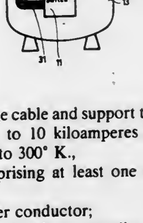
**4,294,503**
**LOCKING MEANS FOR A LAMP HOLDER**
**Gilbert R. Lieberman, Hampstead, Canada, assignor to Gilbert Products, Pointe-aux-Trembles, Canada**
**Filed Jan. 11, 1980, Ser. No. 111,372**
**Claims priority, application Canada, Dec. 7, 1979, 341477**
**Int. Cl.³ H01R** *13/629*
**U.S. Cl. 339—119 L** **13 Claims**

1. A locking arrangement for a lamp holder which has a threaded opening to receive a threaded component and having an axis, the locking device comprising:
a locking member captively carried by the lamp holder and which is mounted for limited movement in a direction normal to the axis of the threaded opening,
the locking member having opposed inwardly facing edges for contact with a threaded component into the lamp holder,



the lamp holder comprising a body portion and a cap portion, the locking member being positioned in a cavity provided in the cap portion and held captively therein by a retaining cap, and
the locking member permitting threaded insertion of the threaded component and preventing inadvertent threaded removal.

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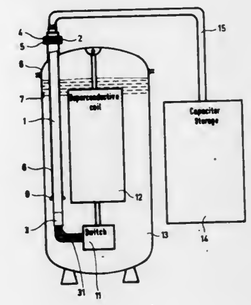
**4,294,504**
**HIGH VOLTAGE CABLE**
**Lothar Siewerdt, Eggenstein-Leopoldshafen, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany**
**Filed Jul. 13, 1979, Ser. No. 57,373**
**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830736**
**Int. Cl.³ H01R** *15/12;* **H01B** *11/18*
**U.S. Cl. 339—132 R** **7 Claims**



2. A high voltage cable and support therefor for transmitting current pulses up to 10 kiloamperes at temperatures in the range from 4° K. to 300° K.,
said cable comprising at least one conductive element including:
a flexible inner conductor;
an insulating sheath surrounding said inner conductor, said inner conductor moving freely within said insulating sheath;
a flexible outer conductor encasing said insulating sheath, the cross-sectional area of said outer conductor being relatively small compared to that of said inner conductor, said inner and outer conductors being electrically conductively connected together; and
an insulating jacket encasing said outer conductor and insulating sheath without the formation of gas bubbles within said insulating jacket; and
said support structure comprising a plug-in coupling including:
a cast resin block having a plurality of said conductive elements encased therein;
a soldering sleeve having a threaded opening therein positioned within the bore in said block, said inner conductor being soldered within the opening of said soldering sleeve and said insulating jacket surrounding said sleeve;
an annular flange enclosing said block; and
a contact pin threaded into the opening of said soldering sleeve.

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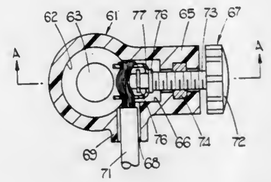
**4,294,505**
**TERMINAL CONNECTOR FOR AN ELECTRIC STORAGE BATTERY**
**Edward N. Gaffney, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England**
**Filed May 3, 1979, Ser. No. 35,766**
**Claims priority, application United Kingdom, May 12, 1978, 19141/78**
**Int. Cl.³ H01R** *11/26*
**U.S. Cl. 339—231** **7 Claims**



1. A terminal connector for an electric storage battery comprising a body having a bore therein arranged to receive a terminal post, an electric cable, a conductive element to which the electric cable is secured with the cable being presented to said bore, and an operating member movable relative to the body and said conductive element and carrying said conductive element, the operating member being movable relative to the body, while the body remains stationary, to move the conductive element and the electrical cable relative to said bore whereby the electrical cable can be moved into and out of electrical contact with a terminal post received in said bore in use.

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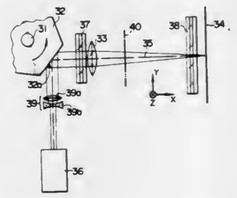
**4,294,506**
**OPTICAL SCANNER WITH ANAMORPHIC OPTICAL SYSTEM**
**Nobuoto Hattori, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan**
**Filed Dec. 15, 1978, Ser. No. 969,849**
**Claims priority, application Japan, Dec. 26, 1977, 52/156954**
**Int. Cl.³ G02B** *27/17*
**U.S. Cl. 350—6.8** **8 Claims**



1. An optical scanner comprising a laser unit for producing a collimated light beam, a multi-faceted rotating mirror for

receiving said collimated light beam and reflecting it to a scanning surface, an anamorphic optical system disposed between said rotating mirror and said scanning surface for focussing said beam on the latter surface in a scan direction and for focussing said beam on a plane located short of said scanning surface in a direction perpendicular to said scan direction, said anamorphic optical system comprising a first lens which has a focussing power only in a direction perpendicular to said scan direction and a second lens, said first and second lenses disposed between said rotating mirror and said plane for focussing said beam on said plane at a location short of said scanning surface, and an optical element disposed between said plane and said scanning surface and having a focussing power only in a direction perpendicular to said scan direction and having a magnification of projection which is equal to or less than unity, said optical element projecting said beam which is focussed on said plane onto said scanning surface to focus said beam thereon.

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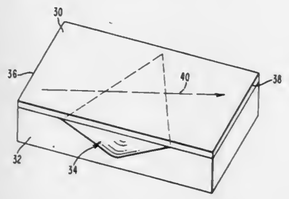
**4,294,507**

## CONTROLLABLY DEFORMED ELASTIC WAVEGUIDE ELEMENTS

**Mark Johnson, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 25, 1980, Ser. No. 115,477**
**Int. Cl.³ G02B *5/14***
**U.S. Cl. 350—96.13** **41 Claims**




1. An active waveguide element, comprising:
an elastic two dimensionally guiding waveguide for propagating wave energy therethrough along a first path, said wave energy having immediately adjacent rays each experiencing the same effective propagation path lengths; and
means for stretchably deforming said waveguide to a different configuration such that said adjacent rays would experience effective propagation path lengths different from each other if said wave energy were to still propagate along said first path, said wave energy propagating instead along a second different path through said waveguide when said waveguide is stretchably deformed to said different configuration such that said adjacent rays each experience the same effective propagation path length also when said wave propagates along said second path.

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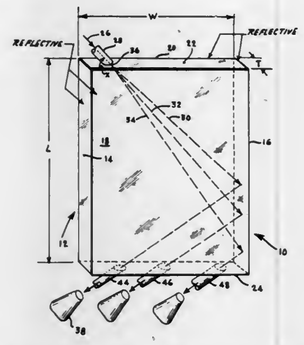
**4,294,508**

## OPTICAL MULTIPLEXER/DEMULTIPLEXER

**Charles R. Husbands, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Aug. 22, 1979, Ser. No. 68,822**
**Int. Cl.³ G02B *5/14***
**U.S. Cl. 350—96.15** **17 Claims**

1. An optical multiplexer/demultiplexer comprising a body having a preselected index of refraction, said body having a pair of reflective sides and a pair of non-reflective sides, means associated with one of said non-reflective sides for directing a single beam of radiant energy at a predetermined angle with respect to said one non-reflective side into or out of said body, said single beam of radiant energy containing at least two preselected wavelengths, means associated with the other of said non-reflective sides for directing at least two beams of radiant energy, each at predetermined angles with respect to said other non-reflective side into or out of said body, each of said two beams of radiant energy containing only one of said preselected wavelengths, respectively, said two beams of radiant energy being spaced apart a preselected distance along said other non-reflective side, and each of said predetermined angles lying between angles of complete refraction and complete reflection, whereby when said single beam of radiant energy is directed into said body through said one non-reflective side, said multiplexer/demultiplexer operates as a demultiplexer with said single beam of radiant energy being separated within




said body into said two beams of radiant energy, each of said two beams containing only one of said preselected wavelengths, respectively, said two beams reflecting off at least one of said reflective sides of said body before being output from said other non-reflective side, and when said two beams of radiant energy are directed into said body through said other non-reflective side, said multiplexer/demultiplexer operates as a multiplexer with said two beams of radiant energy being reflected off at least one of said reflective sides of said body and combining into said single beam of radiant energy at said one non-reflective side of said body before being output therefrom.

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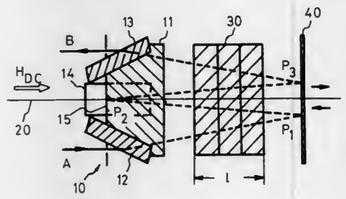
**4,294,509**

## OPTICAL CIRCULATORS

**Tsukasa Nagao, 4-75, Mabori, Yokosuka-shi, Kanagawa-ken, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,893**
**Claims priority, application Japan, Dec. 8, 1978, 53-152308**
**Int. Cl.³ G02F *1/00*; G02B *5/30***
**U.S. Cl. 350—96.15** **27 Claims**




1. An optical circulator comprising:
a plurality of optical fiber transmission lines for guiding a signal light,
a magneto-optic structure made of magneto-optic material displaying optical anisotropy under a biasing magnetic field to produce a given Faraday rotation of said signal light on passage through said magneto-optic structure,



a signal coupler having a plurality of openings which define polarized Brewster windows formed on a common region in rotational symmetry around a symmetric axis, said transmission lines being coupled to the windows of the common region in rotational symmetry around the symmetric axis to transmit said signal light through said windows with respectively given angles of polarization,
a first reflecting mirror formed on said common region except said openings of said signal coupler, said first mirror being positioned on said symmetric axis facing said magnetro-optic structure,
a second reflecting mirror being positioned facing the rear surface of said magneto-optic structure, thereby said reflecting mirrors forming a reflection-type resonator,
and means for magnetically biasing said magneto-optic structure in the direction parallel to said symmetric axis.

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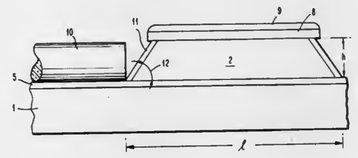
**4,294,510**

## SEMICONDUCTOR FIBER OPTICAL DETECTION

**Terry I. Chappell, Amawalk, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 10, 1979, Ser. No. 101,960**
**Int. Cl.³ G02B *5/172***
**U.S. Cl. 350—96.17** **8 Claims**




1. A coupler for converting light signals transmitted by an optical fiber to electrical signals wherein the optical path in said coupler is longer than the length dimension of said coupler comprising in combination:
a coupler body of semiconductor material having a length dimension governed by the optical absorption coefficient of said semiconductor material and the wave length of said light signals and having width and height dimensions less than said length dimension;
a region of p conductivity type along a first side of said body essentially parallel to said length dimension and having an external electrical connection;
a region of n conductivity type along a second side of said body opposite to said first side and having an external electrical connection;
internal reflection means on each of the remaining sides of said body that are essentially parallel to said length dimension; and
alignment means positioning the end of an optical fiber adjacent one end of said body with the axis of said optical fiber parallel with said length dimension of said body.

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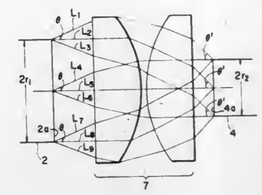
**4,294,511**

## CONNECTING OPTICAL SYSTEM FOR LIGHT GUIDES

**Nobuo Yamashita, Tama, and Miwako Maeda, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jul. 5, 1979, Ser. No. 55,035**
**Claims priority, application Japan, Jul. 10, 1978, 53-83825**
**Int. Cl.³ G02B *5/16***
**U.S. Cl. 350—96.18** **1 Claim**

1. An optical system for connecting light guides for endoscopes comprising a first light guide which is arranged on the side of the light source and functions to transmit rays from said light source, a second light guide which receives the rays transmitted through said first light guide and which emerge from the emerging end surface thereof, transmits said rays and allows said rays to emerge from the emerging end surface of said second light guides for illuminating an object, and a lens system arranged between said first and second light guides; the emerging end surface of said first light guide being arranged in the vicinity of the front focal point of said lens system, the incidence end surface of said second light guide being arranged




in the vicinity of the rear focal point of said lens system with the diameter of the end surface of said first light guide being larger than that of the incidence end surface of said second light guide; and said optical system being so designed as to satisfy the following condition:

$$\frac{2r_1}{f} \geqq 1$$

wherein the reference symbol $r_1$ represents radius of the emerging end surface of said first light guide and the reference symbol F designates focal length of said lens system.

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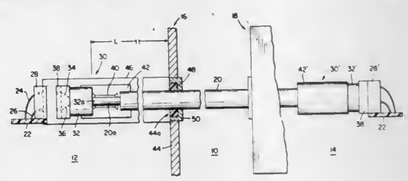
**4,294,512**

## OPTOELECTRONIC INTERFACE APPARATUS

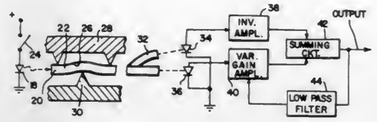
**Maurus C. Logan, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.**

**Filed Jan. 14, 1980, Ser. No. 111,943**
**Int. Cl.³ G02B *5/14***
**U.S. Cl. 350—96.20** **11 Claims**




1. Optoelectronic apparatus comprising a housing having an upstanding wall defining an entry aperture, said housing supporting a first disconnect electrical contact distal from said wall and interiorly of said entry aperture, and a fiber optic assembly including a fiber optic cable, transducer means for conversion between light and electrical energy in registry with said cable, a second disconnect electrical contact coupled to said transducer means and configured to couple to said first disconnect electrical contact, and ferrule means for securing said cable and said transducer means to one another, said fiber optic assembly being of cross-section less than the cross-section of said entry aperture, whereby said fiber optic assembly is insertable through said entry aperture and said second disconnect contact may be coupled to said first disconnect contact within said housing remotely from said entry aperture.

**4,294,513**
**OPTICAL SENSOR SYSTEM**
**David E. Nelson, and John V. Bouyoucos, both of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.**
**Filed Sep. 11, 1979, Ser. No. 74,270**
**Int. Cl.³ G02B** *5/172*
**U.S. Cl. 350—96.29** **29 Claims**




1. An optical sensor system which comprises an optical waveguide, first and second means each for detecting light which is propagated along different paths in said waveguide to reach said detection means, means for deforming said waveguide to provide a bias deformation which, on the average, approximately equally partitions the light energy which propagates to said detecting means along said different paths, and to modulate the partitioning of light energy between said paths in response to the parameter to be sensed, and means for providing an electrical output corresponding to the difference between light energies detected by said first and second detection means.

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**4,294,514**
**LIGHT-WAVE GUIDES AND METHOD OF PRODUCING SAME**
**Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**
**Filed Sep. 10, 1979, Ser. No. 73,724**
**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843276**
**Int. Cl.³ G02B** *5/14;* **C03B** *37/00*
**U.S. Cl. 350—96.31** **5 Claims**

5. A low loss light-wave guide comprising a fiber composed of a substantially chemically homogeneous material having a given density along the center axis thereof and a density lower than said given density at peripheral surface areas thereof whereby such fiber exhibits a radially outwardly decreasing refractive index.

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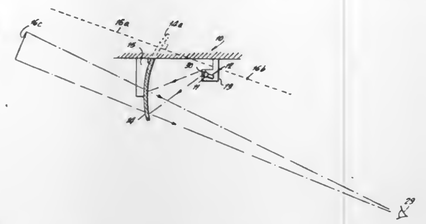
**4,294,515**
**VIRTUAL IMAGE DISPLAY APPARATUS**
**Arthur Kaufman, 19 Covlee Dr., Westport, Conn. 06880**
**Filed Mar. 23, 1979, Ser. No. 23,160**
**Int. Cl.³ G02B** *27/14, 5/10*
**U.S. Cl. 350—174** **18 Claims**

1. A virtual image display apparatus comprising a mirror in the shape of a substantially concave segment of a hemisphere said spherical mirror having an optical axis and a focus, an image source means for said mirror segment, and an image display face on said image source disposed substantially perpendicular to said optical axis but located off said axis and substantially on the same side of the axis as the line of sight of an observer and between said focus and said mirror segment.



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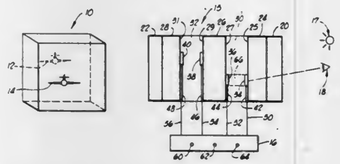
**4,294,516**
**MOVING PICTURE APPARATUS**
**Philip A. Brooks, 436 NW. 46th Terrace, Oklahoma City, Okla. 73118**
**Filed Sep. 11, 1978, Ser. No. 941,146**
**Int. Cl.³ G02F** *1/133*
**U.S. Cl. 350—335** **1 Claim**



1. An apparatus for creating the effect upon a viewer of a three-dimensional moving image, comprising:
a display structure including a stacked array of a plurality of transparent members and liquid crystal members alternatingly positioned so that said stacked array has a first end thereof defined by a respective one of the transparent members and a second end thereof defined by another respective one of the transparent members and said stacked array also has a liquid crystal member disposed between consecutive transparent members whereby there are a plurality of sets of facing surfaces of consecutively stacked transparent members, each set being disposed adjacent the two major surfaces of a respective one of the liquid crystal members;
a plurality of pairs of image producers associated with said display structure, each pair of said image producers comprising solely:
a first transparent electrode having a predetermined shape in the configuration of a total pictoral image to be displayed, said first transparent electrode being disposed on a respective one of the facing surfaces of a respective one of the sets of facing surfaces; and
a second transparent electrode having a predetermined shape which is the mirror image of the predetermined shape of said first transparent electrode, said second transparent electrode being disposed in alignment with said first transparent electrode on the other facing surface of the respective set of facing surfaces with which said first transparent electrode is associated; and
a scanning controller means, electrically connected to said plurality of pairs of image producers, for sequentially activating at a selectable rate said image producers so that each set of first and second transparent electrodes be-



comes periodically visible to the viewer so that the effect of motion is imparted thereto.

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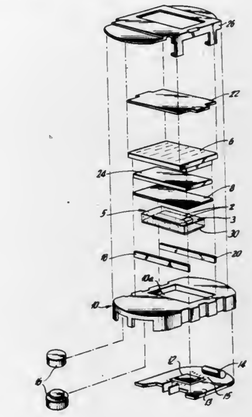
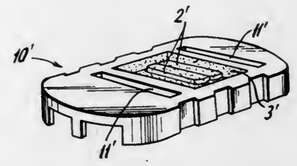
**4,294,517**
**ELECTROOPTICAL DEVICE WITH ENCAPSULATED SELF-LUMINOUS BACKLIGHT ASSEMBLY**
**John Jakubek, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.**
**Filed May 14, 1979, Ser. No. 39,095**
**Int. Cl.³ G02F** *1/133*
**U.S. Cl. 350—345** **10 Claims**






1. An illuminated electrooptical device, comprising:
(a) an electrooptic display;
(b) a unitary pod member-backlight assembly comprising,
(1) a pod member located behind and supporting the display, said pod member including a receptacle in a surface facing the display, and
(2) a backlight comprising at least one self-luminous light source encapsulated in situ within a substantially transparent carrier medium in the receptacle with the receptacle acting as a mold during encapsulation.

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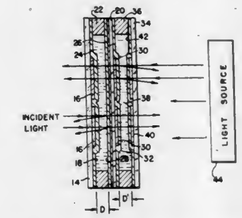
**4,294,518**
**DUAL MODE LIGHT VALVE DISPLAY**
**James M. O'Connor, Farmington, and George W. Goodrich, Bloomfield Hills, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.**
**Filed Nov. 30, 1978, Ser. No. 965,117**
**Int. Cl.³ G02F** *1/17*
**U.S. Cl. 350—357** **18 Claims**

1. A dual mode display comprising:
a front transparent window having a front and a rear surface, said rear surface having a first set of transparent electrically conductive electrodes arranged in a predetermined pattern disposed thereon;
a rear transparent window disposed parallel to said, front window said rear window having a front surface and a rear surface, the front surface of said rear window further having deposited thereon a second set of electrically conductive transparent electrodes corresponding to said first set of electrically conductive transparent electrodes and in registration therewith;
a semi-transparent reflective substrate disposed intermediate said front and rear windows and parallel thereto, said semi-transparent reflective substrate having an electrically conductive front surface facing said front window, and a rear surface facing said rear window, the rear surface of said semi-transparent substrate having disposed thereon a third set of transparent electrodes corresponding to said first set of transparent electrodes and in registration therewith;
a first layer of electro-responsive material filling the space between said front window and said semi-transparent substrate, said first layer of electro-responsive material




having a first optical density in the absence of an electrostatic field, and a second optical density in response to an electrostatic field applied there across;
a second layer of electro-responsive material filling the space between said semi-transparent substrate and said rear window, said second layer of electro-responsive material having a third optical density in the absence of an electrostatic field and a fourth optical density in response to an electrostatic field applied thereacross;
means for sealing said front window, said semi-transparent substrate and said rear window in said parallel relationship; and
means for individually conducting electrical potentials to said first, second and third sets of electrically conductive transparent electrodes and the electrically conductive front surface of said semi-transparent reflective substrate.

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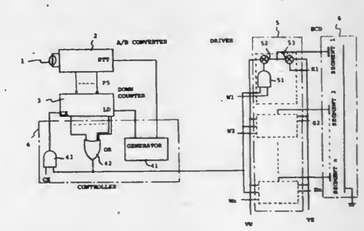
**4,294,519**
**COLOR DENSITY STABILIZER FOR ELECTROCHROMIC DISPLAY**
**Sadakatsu Hashimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed May 23, 1979, Ser. No. 41,637**
**Claims priority, application Japan, May 26, 1978, 53-64173**
**Int. Cl.³ G02F** *1/17;* **350** *357*
**U.S. Cl. 350—357** **9 Claims**



1. A driving circuit for developing driving signals to drive an electro-optical device, said device including an optical

element, said element being colored in response to said driving signals, the coloration of said element depending on the surrounding temperature, said driving circuit comprising:

monitoring means for monitoring variations in the surrounding temperature; and

controlling means responsive to the monitoring means for controlling the time interval of application of the driving signals being applied to the electro-optical device in accordance with the variations in the surrounding temperature monitored by the monitoring means; whereby a single, uniform depth of color of the optical element is maintained regardless of the variations in the surrounding temperature monitored by the monitoring means.

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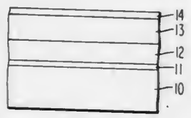
**4,294,520**

## ELECTROCHROMIC DISPLAY DEVICE

**Eiichi Inoue, Tokyo; Isamu Shimizu, Yokohama, and Makoto Shizukuishi, Kamakura, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigarah, Japan**

**Filed Sep. 6, 1979, Ser. No. 73,032**
**Claims priority, application Japan, Sep. 6, 1978, 53-110171**
**Int. Cl.³ G02F *1/17***
**U.S. Cl. 350—357** **12 Claims**




**1**. An electrochromic display device comprising a transparent electrode, a laminate structure provided on said electrode comprising a vapor deposited layer of an electrochromic substance and a second vapor deposited mixed layer of chromium (III) oxide and an oxide selected from the group consisting of a transition metal oxide and silicon oxide and a counter electrode provided on said laminated structure wherein said oxide is present in an amount of 5 to 80% of said second vapor deposited mixed layer.

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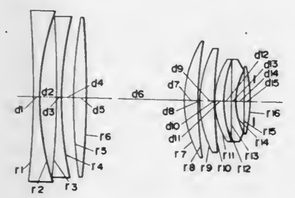
**4,294,521**

## REAR STOP TYPE ZOOM LENS

**Yoshikazu Doi; Yutaka Sakai, and Kazunori Ohno, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Japan**

**Filed Aug. 30, 1979, Ser. No. 71,042**
**Claims priority, application Japan, Sep. 1, 1978, 53-107735**
**Int. Cl.³ G02B *15/16***
**U.S. Cl. 350—426** **2 Claims**




**1**. A rear stop type zoom lens, comprising a front lens group possessing negative refracting power and a rear lens group possessing positive refracting power relative to the object side which two lens groups effect variation in magnification by being moved in opposite directions on the optical axis of the entire lens, a diaphragm fixed externally and to the rear of the rear lens group, the front lens group consisting of two biconcave lenses and one convex lens and the rear lens group consisting of five lenses, the first three in order being convex meniscus lenses each having its convex surface on the object side, and satisfying the following conditions:

(1) $-2.4<F_A<-2.0$
(2) $0.13<d11+d12+d13<0.19$
(3) $\nu d3<30.0$, $\nu d8<30.0$
(4) $0.35<1/r4<0.55$
(5) $1.7<1/r9<1.9$

wherein, $r_i$ (i=1, 2, . . . ) stands for the radius of curvature of the lens surface of the respective lenses beginning from the foremost surface of the front lens group, $d_i$ for the center thickness of the lenses or the air gaps between the adjacent lenses, $\nu d_i$ for the Abbe number of the lenses, and $F_A$ for the focal length of the front lens group as a whole.

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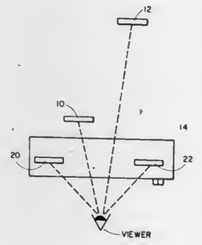
**4,294,522**

## VISION THERAPEUTIC APPARATUS

**John T. Jacobs, 1318 Rimrock Dr., San Jose, Calif. 95120**

**Filed Aug. 16, 1978, Ser. No. 934,381**
**Int. Cl.³ A61B *3/00*; A61H *1/02***
**U.S. Cl. 351—2** **6 Claims**




**1**. Vision thereapeutic apparatus comprising means for automtically generating sequences of different images at different spaced apart locations, different ones of the images displayed at one of the locations providing preselected information when matched with preselected ones of the images displayed at another of said locations, the images at each of said locations being selected for display on a non-predictable basis among various other images not providing said preselected information, whereby said matching occurs on a non-predictable basis, and means for detecting responses from the user indicative of his observations of said images.

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**4,294,523**

## THREE-DIMENSIONAL DISPLAY APPARATUS

**Edward A. Woloshuk; Gregory J. Walz, both of New York, and Robert O. Kretzschmar, Brooklyn, all of N.Y., assignors to The Zyntrax Corporation, New York, N.Y.**

**Filed Oct. 19, 1979, Ser. No. 86,393**
**Int. Cl.³ G03B *21/32***
**U.S. Cl. 352—86** **20 Claims**

**1**. Apparatus for forming and displaying a three-dimensional image of a selectable portion of a three-dimensional object, comprising:

a. a series of two-dimensional photographs of successive sections of said object, said photographs being arranged in a predetermined order corresponding to the relationship that said successive sections bear to each other;

b. illuminating means;

c. an optical system defining an optical path extending from said illuminating means;

d. means supporting said series of photographs and operable to move said series of photographs repeatedly through said optical path in said predetermined order and at a rate such that the series moves through the path within the period of persistence of vision, whereby said photographs are successively positioned for projection along said path;

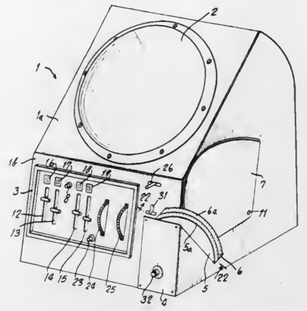


e. stroboscopic means for flashing said illuminating means as a photograph is aligned with said path;

f. a projection screen disposed in said optical path and adapted to move along the optical path toward and away from the photographs moving through the optical path, said projection screen having its surface formed with a curved cross-section and being rotatable about an axis displaced from the center of curvature of the cross-section, which axis is disposed substantially at right angles to the optical path, said rotation being in synchronization with the motion of said photographs so that said photographs are projected onto the screen at successive positions thereof, and form a series of images which appear to an observer having persistence of vision to be a composite three-dimensional image;

wherein the improvement comprises:

g. means, including selection means manually settable at any time, for controlling said illuminating means to illuminate only selected photographs of said series during each movement of the series through said optical path.

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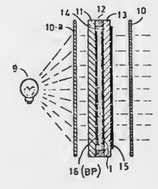
**4,294,524**

## IMAGE OR PICTURE PROJECTING SYSTEM USING ELECTRONICALLY CONTROLLED SLIDES

**Michael Stolov, 25 Hapoel St., Nof-Yam, Herzlia, Israel**

**Division of Ser. No. 943,982, Sep. 20, 1978, Pat. No. 4,222,641. This application May 16, 1980, Ser. No. 150,520**
**Claims priority, application Israel, Jun. 29, 1978, 55032**
**Int. Cl.³ G03B *21/00, 21/14*; H04N *9/31***
**U.S. Cl. 353—84** **17 Claims**




**1**. A changeable image or picture system for producing complex, colored, images or pictures, the system comprising a light source; liquid crystal display means for displaying images or pictures spaced from said light source; at least one electronically controlled liquid crystal multiple color filter positioned between said light source and said liquid crystal display means; a light scattering means positioned between said at least one electronically controlled multiple color filter and said liquid crystal display means for diffusing light which has passed through said at least one electronically controlled multiple color filter into light of substantially uniform intensity at any given time; a plurality of electrodes operatively associated with said liquid crystal display means; means for supplying selectively to individual ones of said electrodes associated with said liquid crystal display means voltages to make selected portions or said liquid crystal display means transparent thereby selectively passing area portions of light from said means tor diffusing; a screen; and lens means for projecting the area portions of light passing through said liquid crystal display means onto said screen; whereby colored, complex images or pictures appear on the screen.

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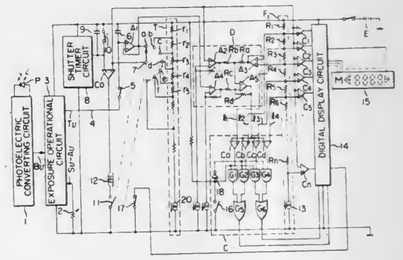
**4,294,525**

## CAMERA HAVING A DIGITAL EXPOSURE VALUE DISPLAY DEVICE

**Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Oct. 14, 1980, Ser. No. 196,358**
**Claims priority, application Japan, Oct. 20, 1979, 54-135507**
**Int. Cl.³ G03B *7/091, 9/62, 17/18***
**U.S. Cl. 354—23 D** **9 Claims**




**1**. A camera having a digital exposure display device ($C_1$–$C_n$, **14**, **15**) for comparing a voltage associated with an exposure value such as a shutter time value or an aperture value obtained from exposure operating means (P, **1**, **2**, **3**, **4**, **5**, **6**, $A_1$) with a plurality of reference voltages produced by a reference voltage generating circuit ($F_1$) and thereby converting the exposure value into a digital signal and digitally displaying said exposure value on the basis of said digital signal, said camera further having a digital fixed point match type exposure display device comprising:

an exposure value setting circuit (T) for generating a voltage associated with a manually set exposure value;

differential amplifier circuit means (D) for generating a voltage including a voltage corresponding to the difference between the voltage of said exposure value setting circuit (T) and the voltage obtained from said exposure operating means;

forming means ($l_1$–$l_4$) for forming a first comparison voltage and a second comparison voltage greater than said first comparison voltage by using the output voltage of said reference voltage generating circuit;

comparing means (C) for comparing the comparison voltage of said forming means ($l_1$–$l_4$) with the output of said differential circuit means (D) and producing a first signal variable in condition depending on whether said output is smaller or greater than said first comparison voltage and a second signal variable in condition depending on whether said output is greater or smaller than said second comparison voltage; and

display means (**14**, **15**) operative to effect a display based on said first and second signals of said comparing means.

**4,294,526**

## AUTOMATIC FOCUSING CAMERA COMBINED WITH MANUAL FOCUSING SYSTEM

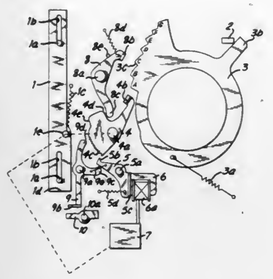
**Tadashi Nakagawa, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 17, 1980, Ser. No. 188,115**

**Claims priority, application Japan, Oct. 27, 1979, 54-148913[U]**

**Int. Cl.³ G03B** *3/10, 7/08*

**U.S. Cl. 354—25** **1 Claim**



1. An automatic focusing camera comprising an automatic focus detecting electronic circuit capable of detecting the distance between the camera and an object and automatically focus the taking lens, an electromagnet controlled by said electronic circuit, a release member actuated in interlocking relation with the shutter release operation and operative to actuate the shutter at the end of the operation of the same, an armature lever controlled by said electromagnet to operate between a resting position and a taking lens focusing position in interlocking relation with said release operation, a locking means which locks the shutter actuating operation of said release member with said armature lever at said resting position and allows the actuation of the shutter at the taking lens focusing position, and a selecting means for selecting between automatic focusing mode and manual focusing mode and operative to retract said locking means to a position where said locking means will not lock said release member when said manual focusing mode is selected.

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**4,294,527**

## MOTOR DRIVEN CAMERA

**Akihiko Hashimoto; Yukio Nakajima, both of Hachioji; Tamotsu Koiwai, Shimosuwa, and Toyohiko Kimura, Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Japan**

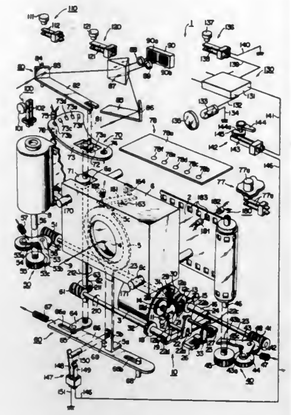
**Filed Jan. 7, 1980, Ser. No. 109,764**

**Claims priority, application Japan, Feb. 2, 1979, 54-11260**

**Int. Cl.³ G03B** *1/12, 3/00*

**U.S. Cl. 354—25** **14 Claims**

1. A motor driven camera, comprising:
- a camera body;
- a film winding shaft disposed in said camera body;
- a film rewind shaft disposed in said camera body parallel to said film winding shaft;
- a single reversible drive motor disposed in said camera body, said motor having an output shaft;
- a first connection shaft disposed in a direction perpendicular to the direction of extension of said film winding shaft and said film rewind shaft; said first connection shaft having two ends;
- a motor drive transmission mechanism for transmitting drive from said motor to said first connection shaft;
- a film winding mechanism adjacent one said end of said first connection shaft for selectively transmitting drive from said first connection shaft to said film winding shaft; and



- a film rewind mechanism adjacent the other said end of said first connection shaft for selectively transmitting drive from said first connection shaft to said film rewind shaft.

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**4,294,528**

## AUTOMATICALLY CONTROLLED ELECTRONIC FLASH DEVICE

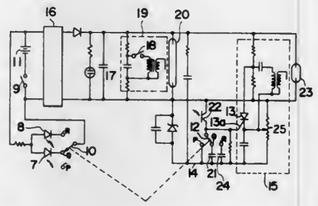
**Yoshiharu Ohta, and Mikio Naya, both of Izumi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 20, 1979, Ser. No. 67,968**

**Claims priority, application Japan, Aug. 23, 1978, 53-103054**

**Int. Cl.³ G03B** *15/05;* **H05B** *41/32*

**U.S. Cl. 354—33** **8 Claims**



1. An automatic electronic flash device for use with a camera, comprising:
- a housing;
- an electronic flash tube provided in said housing;
- a battery provided in said housing as a source of electric supply;
- a DC-DC converter circuit connected to said battery for generating a high DC voltage;
- a capacitor connected to said DC-DC converter circuit to be charged up to the DC voltage and connected to said flash tube to energize said tube when discharged;
- a manual switching member provided on said housing, said switching member having a plurality of settable positions;
- calculator means carried on said housing for calculation of a plurality of combinations of aperture settings and distance settings in response to a film speed setting;
- a plurality of illuminators each of which is associated with said calculator means for indication of one of said combinations calculated by said calculator means;
- a control circuit having a light receiving element, said control circuit adapted for adjusting the amount of light emitted from said flash tube in accordance with a film speed setting and the intensity of light which is reflected by an object to be photographed and received by said light receiving element during the firing of said flash tube;
- means connected to said control circuit for adjusting the amount of light emitted from said tube in accordance with the setting of said manual switching member; and
- means interlocked with said manual switching member for selectively and directly connecting one of said illuminators to said battery for energization thereof in accordance with the setting of said manual switching member.



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**4,294,529**

## CAMERA

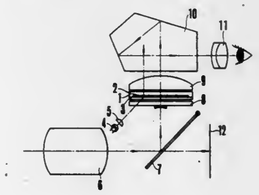
**Yasuhisa Sato, Kawasaki; Sadahiko Tsuji, and Kazuo Ishikawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 28, 1979, Ser. No. 70,659**

**Claims priority, application Japan, Sep. 7, 1978, 53-122915[U]; Sep. 7, 1978, 53-122916[U]**

**Int. Cl.³ G03B** *17/20*

**U.S. Cl. 354—53** **8 Claims**



1. A camera apparatus, comprising:
- a photo-taking optical system;
- a finder optical system including a focusing screen;
- a diffraction device arranged near one of a plurality of predetermined planes including a focal plane of said photo-taking optical system and an optically conjugate plane thereto and having recorded therein on indicium to be displayed;
- a pair of optical members,
- said diffraction device being supported and sealed between the two optical members;
- a light source for illuminating said diffraction device from an oblique direction; and
- an electrical power circuit for energizing said light source.

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**4,294,530**

## MOTORIZED PHOTOGRAPHIC SYSTEM AND CAMERA AND POWER DRIVE UNIT THEREFOR

**Tomonori Iwashita, Fuchu; Hidehiko Fukahori, Kawasaki, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

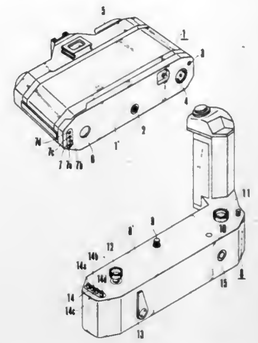
**Filed Jul. 19, 1979, Ser. No. 59,233**

**Claims priority, application Japan, Jul. 28, 1978, 53-92318**

**Int. Cl.³ G03B** *1/18, 1/60*

**U.S. Cl. 354—173** **15 Claims**

1. A motor drive unit for a camera comprising:
- an electric motor,
- a control circuit connected to said electric motor to control the electrical power supply to said motor, said control circuit having a control input and responsive to at least an electrical control signal applied to said input for controlling the electrical power to said motor,
- terminal means connected to the input of said control circuit to receive from the camera a combination signal including a first electrical signal indicating completion of a winding operation for advancing film one frame and a second electrical signal indicating completion of a rewinding operation for rewinding film in the camera, the combination signal representing winding completion signal when the first and second signals assume one set of states, and rewind completion signal when the first and second signals assume another set of states, and



- a motion transmitting mechanism for transmitting the driving force of said electric motor to the camera to perform a winding or rewinding operation.

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**4,294,531**

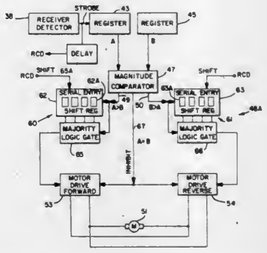
## AUTO-FOCUS MOVIE CAMERA

**Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Continuation of Ser. No. 899,785, Apr. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 729,289, Oct. 4, 1976, abandoned. This application Sep. 26, 1979, Ser. No. 79,052**

**Int. Cl.³ G03B** *3/10*

**U.S. Cl. 354—195** **13 Claims**




1. In a camera having an adjustable lens for directing scene light onto a focal plane of a recording station when a shutter mechanism is operated, the lens having a predetermined lens/subject function that relates the desired focus position of the lens to the subject distance, and also having range finding means operable for generating a range parameter related to subject distance, the improvement comprising:
- a programmer periodically operating the range finding means for generating a range parameter to track changes in subject distance;
- first means responsive to the generation of a range parameter for generating a first number representative of the desired focus position of the lens;
- a first register for storing said first numbers generated by said first means whereby the contents of this register varies in response to changes in subject distance at a rate dependent on the repetition rate of generation of said range parameters;
- second means responsive to the position of the lens for generating a second number representative of the actual position of the lens;
- a second register for storing said second number representative of lens position whereby the contents of the second

register varies in response to changes in the position of the lens at a rate determined by the rate of change of lens position;

a comparator for comparing the contents of the first and second register, the comparator having first and second terminals, a signal appearing on the first terminal only when the contents of the first register exceeds the contents of the second register, and a signal appearing on the second terminal only when the reverse relationship between the contents occurs;

sample-and-hold means associated with each terminal for sampling and storing the state thereof as determined by the presence or absence of a signal thereon, logic means associated with each sample-and-hold means for producing a control signal when either sample-and-hold means has a majority of a predetermined number of samples in a state indicated by the presence of a signal; and

drive means responsive to the output of the comparator for causing the lens to track changes in subject distance, the drive means including a reversible motor operatively associated with the lens, a forward motor control for operating the motor in one direction to thereby move the lens in one direction, and a reverse motor control responsive to a signal on the second terminal for operating the motor in the opposite direction so as to move the lens in its opposite direction, the two motor controls being respectively responsive to the control signals of the sample-and-hold means for operating the motor in a direction that moves the lens mount toward a focus position at which the signals on the terminals are nulled.

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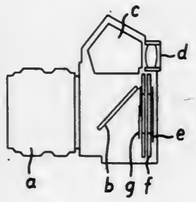
**4,294,532**

## SHUTTER BLADE DEVICE FOR FOCAL PLANE SHUTTER

**Tadashi Nakagawa, Shikawatashi, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 23, 1980, Ser. No. 143,008**
**Claims priority, application Japan, Apr. 24, 1979, 54/51085**
**Int. Cl.³ G03B** *9/40*
**U.S. Cl. 354—246** **8 Claims**



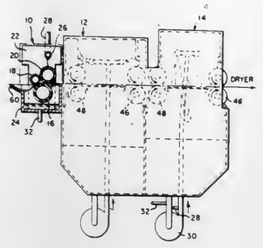

**1**. In a focal plane shutter for a single lens reflex camera having on the side of the shutter aperture two blade groups each consisting of a plurality of separate blades adapted to operate sequentially in exposure operation and located adjacent to the focal plane, a shutter blade device for the focal plane shutter including said two blade groups having at least some of blades formed of thin synthetic resin plates, and a reflex mirror, and characterized by a shielding member provided between the reflex mirror and said blade groups and adapted to retract from an aperture shielding position during the exposure operation of said two blade groups and return to an aperture shielding position before and after the exposure operation.

**4,294,533**

## APPARATUS FOR PRE-CONDITIONING FILM

**Martin D. Bratt, Old Bridge, and John F. Oakley, Parlin, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 889,420, Mar. 23, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,471**
**Int. Cl.³ G03D** *5/06*
**U.S. Cl. 354—318** **6 Claims**




**1**. In an apparatus for developing film, a pre-conditioner comprising: a scrub roll; a second roll in engagement with the scrub roll for transporting a film to be developed therebetween; a conduit positioned above and provided with perforations directed at said scrub roll; a source of flushing liquid connected to said conduit; and drive means coupled to said rolls for their co-current rotation at different surface speeds.

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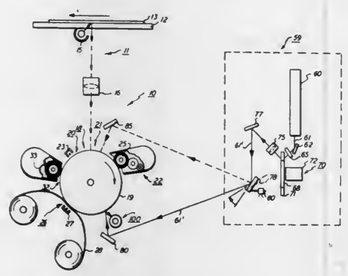
**4,294,534**

## MULTIPLE FUNCTION REPRODUCTION APPARATUS

**Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 14, 1980, Ser. No. 111,519**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—3 R** **23 Claims**



**12**. In a copying apparatus having a photoreceptor, means to charge said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to produce latent electrostatic images, developing means for developing said latent electrostatic images, and transfer means for transferring said developed images to copy substrate material, the improvement comprising:

a high intensity light beam;

means to focus said light beam onto said photoreceptor;

scanning means astride the path of said light beam for line scanning said light beam across said photoreceptor;

radiation detection means for converting scattered radiation resulting from scanning developed images on said photoreceptor with said beam to image signals representative of the image scanned; and

lens means for focusing said scattered radiation onto said radiation detection means.

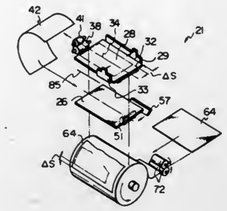


**4,294,535**

## ELECTROSTATIC COPYING APPARATUS

**Kenzo Ariyama; Syozo Miyawaki, and Takashi Murakami, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jan. 21, 1980, Ser. No. 114,016**
**Claims priority, application Japan, Jan. 30, 1979, 54-9412**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—14 SH** **7 Claims**



**1**. An electrostatic copying apparatus including a transparent document support platen, document feed means for feeding an original document along a document feed path onto the platen in a first direction, a photoconductive member, imaging means for radiating a light image of the document onto the photoconductive member to form an electrostatic image, developing means for developing the electrostatic image to produce a toner image and transfer means for feeding a copy sheet into engagement with the photoconductive member in a second direction which is perpendicular to the first direction to transfer the toner image to the copy sheet, characterized by comprising:

document support means for supporting the document prior to feeding by the document feed means such that a center of the document is aligned with a center line of the document feed path;

sensor means for sensing a width of the document perpendicular to the document feed path;

sheet feed timing means for controlling the transfer means to begin feeding the copy sheet to the photoconductive member at a timing corresponding to a predetermined function of the width of the document such that a leading edge of the copy sheet aligns with a leading edge of the toner image on the photoconductive member.

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**4,294,536**

## AUTOMATIC CONTROL OF COPIER COPY CONTRAST AND DENSITY FOR PRODUCTION RUNS

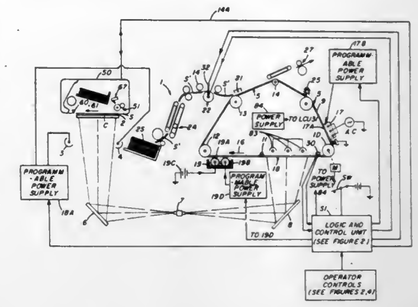
**Kenneth B. Paxton, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 30, 1980, Ser. No. 154,747**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—14 C** **12 Claims**

**1**. In apparatus for producing copies of a multi-sheet document which includes at least one sheet having a copy characteristic that is substantially different from the other sheets, said copier including adjustable control means for varying at least one copy process parameter to change copy contrast and density, and means for feeding seriatim the sheets of a multi-sheet document to a copying position to produce copies of the document, the improvement comprising:

(a) memory means for storing production run signals corresponding to (i) the number of copies to be made of a multi-sheet document, (ii) the copy process parameters for said multi-sheet document including the variation in said one copy process parameter for said one sheet, and (iii) the position of said one sheet in the multi-sheet document; and

(b) logic and control means responsive to said signals for operating said feeding means to sequentially feed the sheets of said multi-sheet document to said copying position and for setting said adjustable control means prior to copying said one sheet to produce copies of the document,




with each copy of a document sheet having a desired contrast and density.

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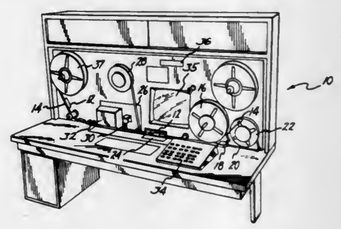
**4,294,537**

## PHOTOGRAPHIC REPRINT SYSTEM WITH INFORMATION DISPLAY

**Ronald C. Laska, Minnetonka, and Janis Pone, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 23,521, Mar. 23, 1979, abandoned. This application Jan. 7, 1980, Ser. No. 109,825**
**Int. Cl.³ G03B** *27/72, 27/76*
**U.S. Cl. 355—35** **12 Claims**



**1**. In a photographic reprint system in which photographic prints are produced from film frames of short previously-severed film strips which are connected together, the improvement comprising:

storage means for storing information for each film frame to be printed, the information including the number of prints to be made from each film frame;

a print gate at which light is directed through a film frame to expose a photosensitive medium and produce a print;

means for sequentially advancing the film frames to the print gate;

means for sequentially retrieving the stored information from the storage medium; and

means for displaying in human readable form information retrieved from the storage means in a predetermined time relationship with respect to the sequential advancing of the film frames to the print gate and printing of the film frames; and

means for displaying a human readable indication of the film frame for which information has been retrieved.

**4,294,538**

## IMAGE FORMING OPTICAL SYSTEM

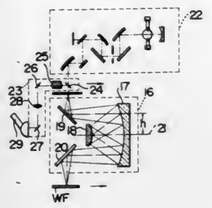
**Mikichi Ban, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 18,910, Mar. 9, 1979, abandoned. This application Jan. 30, 1980, Ser. No. 116,752**

**Claims priority, application Japan, Mar. 18, 1978, 53-31578; Mar. 18, 1978, 53-31579**

**Int. Cl.[3] G03B** *27/48, 27/50, 27/70;* **G02B** *21/18*

**U.S. Cl. 355—51** **7 Claims**



1. An image forming optical system using a concave spherical mirror, said system comprising a band-like spherical mirror obtained by optically sectioning the concave spherical mirror, said band-like spherical mirror enabling the meridional light beam from a spot object on the rotational symmetry axis other than the center of curvature of the spherical surface of said band-like spherical mirror to be imaged on a predetermined surface perpendicular to said rotational symmetry axis, causing a sagittal light beam not to be imaged and enabling an arcuate image centered at said rotational symmetry axis to be obtained on said predetermined surface.

**4,294,539**

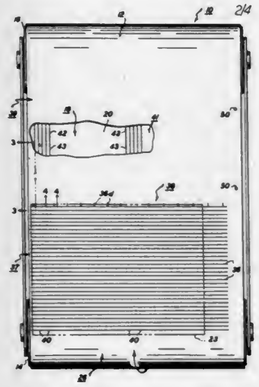
## DOCUMENT VACUUM WEIR SYSTEM

**Charles W. Spehrley, Jr., Lebanon, N.H., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 10, 1980, Ser. No. 111,059**

**Int. Cl.[3] G03B** *27/62, 27/64*

**U.S. Cl. 355—76** **9 Claims**



1. In a document handling system in which documents are moved with a vacuum belt to an imaging station of a copier where the documents are imaged against a light reflective document imaging surface on the first side of said belt, and in which the documents are attracted to said first side of said belt by an air flow applied from a vacuum manifold at the second side of said belt through multiple vacuum apertures extending through the belt and opening on said first side of said belt, the improvement wherein:

said apertures open on said first side of said belt only within minor, spaced, discrete limited first surface areas of said belt which first belt surface areas have a first convoluted surface configuration which holds the documents substantially spaced from said vacuum apertures and provides substantially unrestricted (low impedance) communication of said vacuum air flow under the documents from said apertures throughout said first surface areas,

said first surface areas of said belt surface being substantially enclosed by narrow border areas comprising unapertured pneumatic weirs

said weir areas having a second and much more finely convoluted surface configuration than said first surface areas,

said weir areas providing an air flow therethrough under a document, but with a substantially higher air flow impedance than said first surface areas to provide a substantial restriction in the air flow under the document to said vacuum apertures in said first areas, and

said weir areas being located on said belt surface at positions corresponding to the edges of a conventional size of documents, and configured to provide light reflective characteristics generally corresponding to the remainder of said light reflective document imaging surface of said belt to improve said imaging of documents against said belt.

**4,294,540**

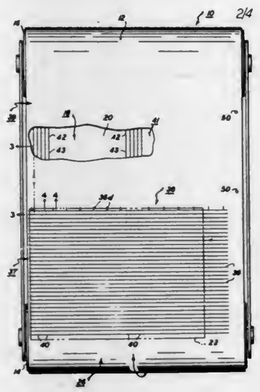
## DOCUMENT BELT VACUUM MANIFOLD

**Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan, 10, 1980, Ser. No. 111,061**

**Int. Cl.[3] G03B** *27/62, 27/64*

**U.S. Cl. 355—76** **7 Claims**



1. In a document handling system in which documents are moved with a vacuum belt to an imaging station of a copier where the document are illuminated for imaging against a light reflective document imaging surface on a first side of said belt with a width greater than that of the document, and in which document handling system the documents are vacuum attracted toward said first side of said belt by an air flow applied from vacuum apertures in a light reflective vacuum manifold surface at the backside of said belt, which vacuum air flow is communicated from said manifold apertures through further apertures in said vacuum belt which open on said first side of said belt, the improvement wherein:

said vacuum manifold surface at said backside of said belt has elongated grooves slightly recessed in said manifold surface,

said manifold surface grooves extend in the direction of movement of said belt spaced apart transverse the direction of movement of said belt, and relatively narrow in comparison to the overall width of said vacuum belt,

said vacuum apertures in said vacuum manifold surface open recessed within said grooves in said vacuum manifold surface;

said vacuum belt apertures are in narrow bands of apertures similarly transversely spaced apart and similarly extending in the direction of movement of said belt to generally overlie said grooves in said vacuum manifold surface,

said manifold surface grooves have a sufficiently large cross-sectional area to provide relatively unrestricted air flow from said manifold surface apertures along said grooves under said belt to said vacuum belt apertures.



**4,294,541**

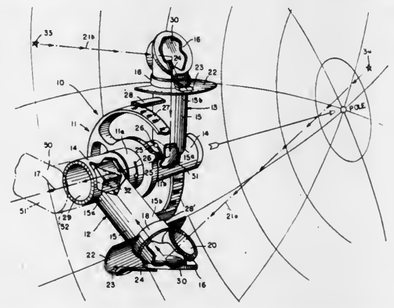
## BI-PERISCOPIC INSTRUMENT FOR USE IN DETERMINING TERRESTRIAL POSITIONS THROUGH CELESTIAL OBSERVATION

**William L. Abler, 3350 S. Michigan, Chicago, Ill. 60616**

**Filed Jun. 18, 1979, Ser. No. 49,567**

**Int. Cl.[3] G01C** *1/00, 1/14;* **G02B** *23/04*

**U.S. Cl. 356—145** **9 Claims**



1. An instrument for use in establishing terrestrial positions through celestial observation, comprising in operative combination:

(a) an annular body having a central axis;

(b) a first periscope having a tubular axial portion coaxial with said body and a tubular arm portion with an axis extending radially from said central axis, said arm portion having a proximal end secured to said axial portion and having said radial axis thereof perpendicular to said central axis;

(c) a second periscope having a tubular axial portion coaxial with said body and a tubular arm portion with an axis extending radially from said central axis, said arm portion having a proximal end secured to said axial portion and having said radial axis thereof perpendicular to said central axis;

(d) said tubular axial portions of said periscopes being adjustably mounted upon opposite ends of said annular body for independent relative rotation about said central axis;

(e) each of said periscopes having rotatably mounted on a distal end thereof a turret having a sight opening;

(f) each of said turrets having reflecting means fixed therewithin for transmitting images from said sight openings to said central axis;

(g) one of said periscopes having a viewing opening for viewing along said central axis;

(h) said annular body having a single 360° scale extending circumferentially thereabout;

(i) indicator means disposed on each of said periscopes for indicating the angular position thereof along said scale and to indicate Local Hour Angle of Aries along said scale when said instrument is positioned for the viewing, in superimposed relation, a pair of celestial reference objects through said turret sight openings via said viewing opening; and

(j) direct-line-of-sight horizon viewing means for indicating the angle of said central axis from horizontal disposed connected to said viewing opening of said periscope, which viewing means provides for a central superimposed image of said celestial reference objects sighted through said turrets and a view of said horizon alignable with said central superimposed image, said horizon view being disposed located in an annular zone around said central image of said celestial objects.

**4,294,542**

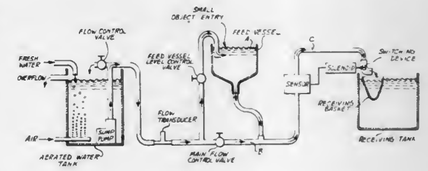
## METHOD AND APPARATUS FOR COUNTING SMALL OBJECTS SUSPENDED IN A LIQUID STREAM

**Gary M. Strauss, Kent, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Dec. 17, 1979, Ser. No. 104,596**

**Int. Cl.[3] B65G** *51/36;* **G06M** *7/00*

**U.S. Cl. 356—339** **17 Claims**



1. A method for counting suspended discrete small objects carried in a liquid stream which comprises:

a. splitting a liquid stream into primary and secondary streams;

b. introducing the objects into the moving secondary liquid stream, said stream having sufficient velocity to prevent settling or back movement;

c. recombining the primary and secondary streams;

d. maintaining the moving stream at a steady flow rate;

e. measuring turbidity of the stream containing the objects;

f. establishing a calibration algorithm of turbidity measurement versus number count of the objects for a given increment of time;

g. integrating the turbidity measurement over time and comparing the integrated value with the calibration algorithm;

h. providing an output signal responsive to the integrated value that indicates the number of individual objects that have passed the turbidity counter within a given time period.

**4,294,543**

## OPTICAL SYSTEM FOR DEVELOPING POINT COORDINATE INFORMATION

**Joseph Apple, Canoga Park, Calif., and Eric L. Upton, Mesa, Ariz., assignors to Command Control & Communications Corporation, Lomita, Calif.**

**Filed Nov. 13, 1979, Ser. No. 93,524**

**Int. Cl.[3] G08C** *21/00*

**U.S. Cl. 356—375** **15 Claims**

1. A means for defining coordinates of an object intersecting a predefined plane, comprising:

a first rotatable means for sweeping a first light beam over a plane substantially coincident with said predefined plane;

a second rotatable means for sweeping a second light beam over a plane substantially coincident with said predefined plane;

an elongated light detection means positioned to be continuously irradiated by said first and second light beams while being swept over said predefined plane, said light detection means providing a first intersection pulse when said first light beam intersects and is blocked by said object and a second intersection pulse when said second light beam intersects and is blocked by said object;

first timing means for generating a first timing signal when

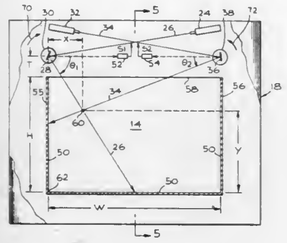
said first light beam is at a first predetermined reference angle;

second timing means for generating a second timing signal when said second light beam is at a second predetermined reference angle;

processor means responsive to the time duration between said first timing signal and said first intersection pulse and between said second timing signal and said second intersection pulse for producing X-Y coordinate signals defining the coordinates of said object;

said first rotatable means including a first motor;

a first tachometer providing an output signal indicative of the rotational velocity of said first motor;



a reference oscillator;

means for controlling said first motor rotational velocity in accordance with a phase difference between said first tachometer output signal and a signal produced by said reference ocillator;

a first voltage controlled ocillator; and

means for controling the frequency of said first voltage controlled ocillator in accordance with a phase difference between a signal related to the output of said first voltage controlled ocillator and said first tachometer output signal.

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**4,294,544**

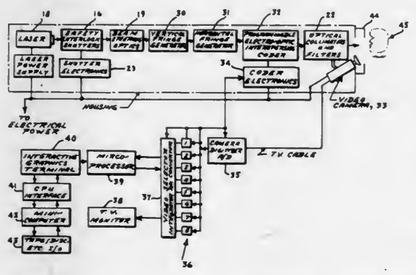
## TOPOGRAPHIC COMPARATOR

**Bruce R. Altschuler, 123 Thornell, San Antonio, Tex. 78235; John Taboada, 12530 Elm Country La., San Antonio, Tex. 78230, and Martin D. Altschuler, 228 Ranch Trail, Amherst, N.Y. 14221**

**Filed Aug. 3, 1979, Ser. No. 63,500**

**Int. Cl.³ G01B** *11/00*

**U.S. Cl. 356—376** **21 Claims**



1. Apparatus for providing three dimensional location information relative to a coordinate system for selected points on a remote surface, said apparatus comprising

a source of illumination for providing light beam illumination of said surface, said source of illumination comprising means for providing an array of light beams,

a scene recording device for providing surface scene images from an aspect angle other than parallel or normal to said light beam, each said surface scene image having an x,y coordinate system correlated with the surface x,y coordinate system, the elevation dimension of the surface at any selected illuminated x,y coordinate position being a function of (a) the displacement of the corresponding imaged spot from its x,y coordinates, (b) the scene recording device aspect angle and (c) surface to image coordinatc system conversion factors, and

space coding means for correlating spots illuminated by said array of light beams with spots imaged by said scene recording device.

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**4,294,545**

## DEVICE FOR CONTINUOUSLY MEASURING A TRANSVERSE DIMENSION OF A THREAD-LIKE STRUCTURE

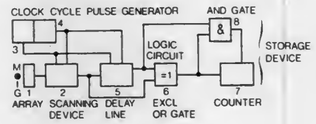
**Hansruedi Stutz, Dietlikon, Switzerland, assignor to Gebrüder Loepfe AG, Zurich, Switzerland**

**Filed Dec. 10, 1979, Ser. No. 101,879**

**Claims priority, application Switzerland, Dec. 18, 1978, 12824/78**

**Int. Cl.³ G01B** *11/10, 11/02*

**U.S. Cl. 356—386** **5 Claims**




1. A device for continuously measuring a transverse dimension of a traveling yarn-like structure, comprising:

an array of optoelectrical sensors extending in a direction transverse to the traveling yarn-like structure;

means for scanning sensors of the array in consecutive cycles for producing a digital scanning signal in serial form;

means for delaying the digital scanning signal by an integer number $n \geqq 1$ of cycles;

logic means for producing a serial signal representative of the difference of the delayed and undelayed scanning signals;

means for storing consecutive serial signals, for producing a signal representative of an instantaneous transverse dimension of the yarn-like structure; and

the storing means being arranged as a counting device comprising a bidirectional counter, and an AND-gate having a first input connected to the output of the delaying means and a second input connected to the output of the logic means, the AND-gate having an output controlling the counting direction of the bidirectional counter.

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**4,294,546**

## APPARATUS FOR WORKING ALIGNED BORES

**Irolt Killmann, St. Augustin-Mülldorf, and Georg W. Bonifer, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Apr. 2, 1979, Ser. No. 26,076**

**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758742**

**Int. Cl.³ G01B** *11/26*

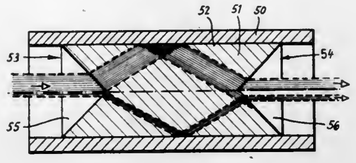
**U.S. Cl. 356—399** **8 Claims**

1. An apparatus for working with a tool at least one of a plurality of bores aligned on an axis wherein the bores are associated with the crankshaft bearings of internal combustion engines, said apparatus comprising in combination:

means for generating a laser beam to be passed through said bores and for aligning the laser beam with a longitudinal axis aligning said bores;

a driven hollow shaft for supporting said tool in one of said bores, said hollow shaft being positioned within said bore and surrounding the longitudinal axis thereof and said hollow shaft being adjustable with respect to said laser beam to align with the laser beam and said longitudinal axis;

centering discs positioned in those bores not being worked on by said tool, said centering discs including means for indicating misalignment between said discs and said laser beam, said centering discs further including movable measuring devices and chucking means for adjusting and subsequently fixing, respectively, said centering discs within said bores wherein the centering discs are centered with respect to the bores;



a cylindrical prism centrally mounted mounted within said hollow shaft for alignment with the laser beam, the prism having a cylindrical reflecting mantle surface and conical end surfaces having aligned axes which are aligned with the laser beam for initially splitting the laser beam into components which components reflect from said reflecting mantle surface and converge back to a single beam when the aligned axes are aligned with the laser beam and converge back into a plurality of beams when the aligned axes are out of alignment with the laser beam, whereby misalignment can be detected.

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**4,294,547**

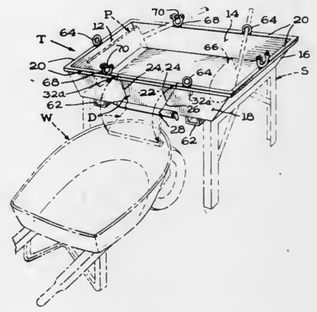
## MORTAR/CONCRETE HAND-MIXING TUB

**James F. Harkleroad, 9032 - 49th Ave., College Park, Md. 20740**

**Filed Jul. 20, 1979, Ser. No. 59,359**

**Int. Cl.³ B01F** *13/00, 15/02*

**U.S. Cl. 366—1** **14 Claims**



1. In a concrete or mortar mixing tub or box of the type having a flat bottom wall integrally joined with peripheral side walls upstanding therefrom and terminating in an upper edge forming an open top, the improvement comprising a selectively openable planar panel constituting a mortar discharge door formed in conjunction with a door opening provided in one of said peripheral side walls, said door panel being of lesser length than said side wall panel with which it is associated, and support and retaining means operatively connected with said side wall and said door to facilitate its selective opening and closing.

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**4,294,548**

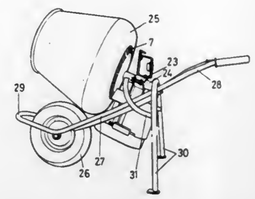
## DRIVE ARRANGEMENT FOR CONCRETE MIXERS

**Arthur Watson, Sellicks Beach, Australia, assignor to Lightburn & Co. Limited, Novar Gardens, Australia**

**Filed Mar. 21, 1980, Ser. No. 132,404**

**Int. Cl.³ B28C** *5/18*

**U.S. Cl. 366—60** **3 Claims**



1. A concrete mixer drive arrangement, said mixer including a bowl having a base and an axis of rotation extending through the base, said bowl being supported by a shaft extending from the base of the mixer, a ring gear on said base about the shaft, a drive shaft having a pinion arranged to operably engage said ring gear, an electric motor having a motor shaft, a multiple stage speed reduction operably connected between said motor shaft and drive shaft, said motor shaft extending at a right angle to said axis of rotation, said drive shaft extending parallel to said motor shaft, characterized in that said multiple stage speed reduction comprises a three-stage V-belt drive including pulleys and driving belts, said first stage comprising a pulley fast to said motor shaft driving a pulley loose on said drive shaft, said second stage comprising a pulley loose on said drive shaft and drivingly connected to said first mentioned pulley on said drive shaft driving a pulley loose on said motor shaft, and said third stage comprises a further pulley loose on said motor shaft and drivingly connected to said first mentioned loose pulley on said motor shaft driving a drive pulley fast on said drive shaft.

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**4,294,549**

## MIXING APPARATUS

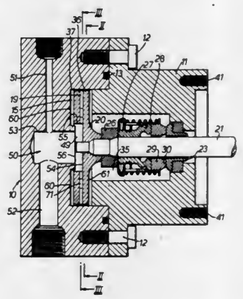
**Raymond V. Thompson, Stocksfield; Alan Todd, Chester-le-Street, and Albert B. Constantine, Great Lumley, all of England, assignors to Dynatrol Consultants (U.K.) Limited, Newcastle-upon-Tyne, England**

**Division of Ser. No. 749,369, Dec. 10, 1976, Pat. No. 4,172,668. This application Jun. 14, 1979, Ser. No. 48,383**

**Claims priority, application United Kingdom, Dec. 12, 1975, 51027/75; Aug. 26, 1976, 35600/76**

**Int. Cl.³ B01F** *5/06, 5/12*

**U.S. Cl. 366—164** **3 Claims**



1. Apparatus for mixing fluids comprising a housing affording a substantially annular mixing chamber, an annular rotor

mounted for rotation in the mixing chamber, the rotor having one or more inlet orifices disposed at or adjacent its axis of rotation, an inlet chamber communicating with the inlet orifices in the rotor and disposed at or adjacent the axis of rotation of the rotor, the inlet chamber being provided with inlet means for the fluids to be mixed, outwardly extending passages being located in the rotor, and leading from the said inlet orifices to the periphery of the rotor and emerging therethrough, each passage diverging from an inlet to a constriction region in which a multiplicity of constrictions are located and each passage issuing out as a diverging passage through an annular wall at the periphery of the rotor, the mixing chamber having a circular outer wall extending around a major proportion of its circumference with a small clearance between the said circular wall and the periphery of the rotor, the circular outer wall extending outwardly into a spiral shape so as to define a generally crescent shaped outlet region between the spiral shaped wall of the mixing chamber and the periphery of the rotor, the outlet region communicating with an outlet passage and drive means arranged to enable the rotor to be rotated in the mixing chamber.

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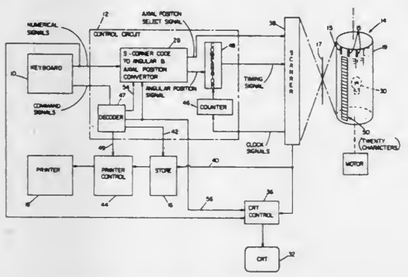
**4,294,550**
**IDEOGRAPHIC TYPEWRITER**
**An Wang, Lincoln, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.**
**Filed Mar. 10, 1980, Ser. No. 129,074**
**Int. Cl.³ B41J** *5/00, 5/44*
**U.S. Cl. 400—110** **1 Claim**




1. An ideographic typewriter comprising:
a keyboard providing keys for generating numerical signals representative of numerical values corresponding to an ideographic character, and command signals representative of operational commands,
control means connected to said keyboard for receiving said signals and including
decoding means responsive to said command signals for deriving control signals,
conversion means for converting said numerical signals corresponding to a said character to signals representative of first and second position parameters, and means for deriving from said second position parameter signal element selection signals, and
comparator means for comparing said first position parameter signal with an input first position signal, and for deriving therefrom timing signals,
a rotating optical storage device having stored visual representations of characters, a said visual representation of a character comprising character portions and background portions of contrasting light transmission characteristics, each said character representation having first and second position parameters defining its location on said optical storage device, said first position parameter being related to the rotational position of said device, said optical storage device providing to said control means a signal representative of its rotational position,
a light source directing light through at least a group of said visual representations having a common value of said first position parameter,
a scanner disposed to receive light from an opposed group of said visual representations having a common value of said first position parameter, said scanner comprising a plurality of light-sensitive elements having positions corresponding with the range of said second position parameter of said visual representations, said elements being selectively actuatable in response to said timing and element selection signals, an actuated said element being selectively responsive to the presence and absence of incident light to generate output signals having either of two possible values,
visual display means,
display control means connected between said scanner and said visual display means and responsive to said scanner output signals and to a said control signal to control said display means to display a visual representation of a character,
a store responsive to said scanner output signals and to a said control signal to store said scanner output signals,
a printer, and
printer control means connected between said store and said printer and responsive to a said control signal to cause said printer to print a character corresponding to said input numerical signals.

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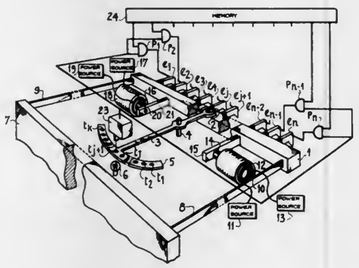
**4,294,551**
**SERIES-PARALLEL PRINT MECHANISM FOR PRINTER**
**Felix Chehovah, Paris, France, assignor to Thomson-CSF, Paris, France**
**Filed Sep. 25, 1979, Ser. No. 78,804**
**Claims priority, application France, Sep. 29, 1978, 78 27921**
**Int. Cl.³ B41J** *3/10, 3/16*
**U.S. Cl. 400—119** **2 Claims**




1. A series-parallel print mechanism permitting the printing of lines of m (m=Kn with k and n being positive integers greater than 1) characters on an electrosensitive paper, comprising n electrodes which can print simultaneously, each of said electrodes being able to print a sequence of k consecutive characters per line, an electrode holder linked with the n electrodes, means for displacing the electrode holder at a substantially constant speed for the time of printing one line, and means for fixing the position of each character to be printed during this displacement; a mechanical coupling member fixed to the electrode holder where the position fixing means comprise a plate having k holes, a fixed optical reading device, a fixed pin, a rod having first and second ends pivoting at a point located between its ends about the fixed pin, and whose first end is coupled with the mechanical coupling member and whose second end supports the plate having k holes, said holes and the optical reading device being disposed in such a way that for a displacement of the electrode holder corresponding to the printing of one line the optical reading device reads each of the k holes and whereby for each reading of a hole the



reading device supplies an electrical control signal to permit the printing of one character by each of the n electrodes.

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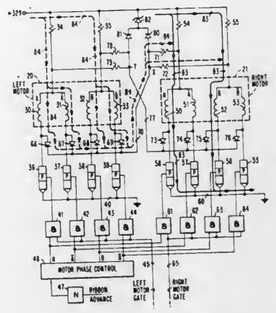
**4,294,552**
**BIDIRECTIONAL RIBBON DRIVE CONTROL FOR PRINTERS**
**John Mako, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed Jan. 28, 1980, Ser. No. 115,849**
**Int. Cl.³ B41J** *33/40*
**U.S. Cl. 400—219.1** **7 Claims**




1. A printer for printing characters on a print medium via an ink ribbon having a reversible ribbon drive for feeding said ribbon during printing comprising:
a pair of ribbon spools,
first and second stepper motors connected separately to said spools,
said first and second stepper motors each including windings for the operation thereof,
control circuitry for operating said stepper motors such that when one stepper motor is driven, the other stepper motor is dragged,
said control circuitry comprising a first set of motor drivers connected to said windings of said first stepper motor,
a second set of drivers connected to said windings of said second stepper motor,
means for applying phase sequencing signals to either said first or second set of drivers for driving only one of said stepper motors,
and cross-coupling connections between said windings of said first and said second stepper motors forming a current path for drag current between said windings of one stepper motor when the other stepper motor is driving.

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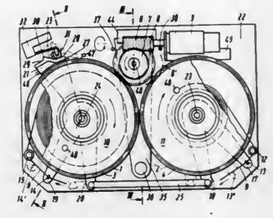
**4,294,553**
**RIBBON FEED MECHANISM**
**Werner Wüthrich, Gümligen, Switzerland, assignor to Autelca AG, Güligen, Switzerland**
**Filed Apr. 18, 1980, Ser. No. 141,476**
**Claims priority, application Switzerland, Apr. 20, 1979, 3717/79**
**Int. Cl.³ B41J** *33/44, 33/46*
**U.S. Cl. 400—219.1** **9 Claims**

1. A ribbon feed mechanism comprising, first (**2,4,11**) and second (**1,3,10**) ribbon spool carrier means rotatably connected on axes adjacent each other and adapted to feed ribbon (**9**) from one to the other, a reversible electrical drive motor (**5**) that is reversible for reversing the ribbon feed direction between said first and second ribbon spool carrier means, a reversing switch (**32**) having two switch positions connected to control said drive motor (**5**), two mutually coupled ribbon guide means (**13,17,18,25 & 14,19,20**) respectively, pivotally connected for movement about the respective axes of said first and second ribbon spool carrier means, first catch means on the ribbon (**9**) adjacent one of its ends adapted to engage one of said ribbon guide means (**13**) and pivotally move said two mutually coupled ribbon guide means from a first position (**13,14**) coordinated with the first ribbon feed direction into a second position (**13',14'**) coordinated with the opposite ribbon feed direction, second catch means on the ribbon (**9**) adjacent its other end adapted to engage the other of said ribbon guide means (**14**) and pivotally move said two mutually coupled ribbon guide means from the second position (**13',14'**) into the first position (**13,14**), operating means (**21,27,31**) connected with the mutually coupled ribbon guide means and connected



to actuate said reversing switch (**32**) between its two switch positions, said operating means (**21,27,31**) in the first position of said ribbon guide means (**13,14**) connected to actuate said reversing switch (**32**) to its first switch position which coordinates the direction of rotation of said drive motor (**5**) to that which transports the ribbon (**9**) in the first ribbon feed direction, and said operating means (**21,27,31**) in the second position of said ribbon guide means (**13',14'**) connected actuate said reversing switch (**32**) to its second switch position which coordinates the direction of rotation of said drive motor (**5**) to that which transports the ribbon (**9**) in the opposite ribbon feed direction.

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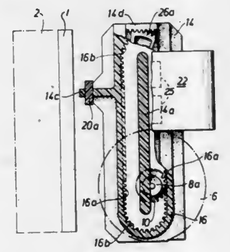
**4,294,554**
**DRIVING DEVICE FOR A PRINTING CARRIAGE PROVIDED WITH A PRINT HEAD**
**Mats E. Mattsson, Sollentuna, Sweden, assignor to Svenska Kassaregister AB, Solna, Sweden**
**Filed May 23, 1979, Ser. No. 41,726**
**Claims priority, application Sweden, Jun. 6, 1978, 7806627**
**Int. Cl.³ B41J** *19/00*
**U.S. Cl. 400—320** **1 Claim**



1. A driving device for a printing carriage with a print head including printing elements actuable to print characters on a data carrier, the driving device including a motion converting means and a pinion driven by a motor and always in engagement with an inner continuous gear path on the motion converting means, said gear path consisting partly of two opposed essentially straight first gear paths located at a distance from each other greater than the outer diameter of the pinion and partly of second gear paths connecting said first gear paths and located at a distance from each other essentially exceeding the

distance between the first gear paths, the motion converting means converting the rotational movement of the pinion to a reciprocating movement of the print head along the data carrier, the driving device further including guiding means in engagement with each other, with the motion converting means and with the printing carriage, the guiding means moving the printing carriage in the printing direction when the pinion is in engagement with any of the first gear paths of the motion converting means and permitting the displacement of the motion converting means essentially perpendicularly to the printing direction when the pinion is in engagement with any of the second gear paths of the motion transmitting means, characterized in that the guiding means consist of two gear segments each one provided with two gear paths, that the gear paths turned towards each other on the gear segments are in engagement with each other and the gear paths turned away from each other on the gear segments are in engagement with gear paths on one of the motion converting means and the printing carriage, and that the gear segments are pivotally supported on one of the printing carriage and the motion converting means.

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**4,294,555**

## MULTI-ROW KEYBOARD FOR TYPEWRITERS OR SIMILAR MACHINES

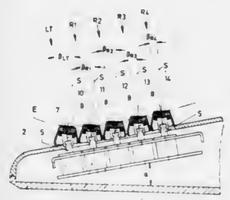
**Folker Galaske, and Oswald Hack, both of Pforzheim, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.**

**Filed Jan. 28, 1980, Ser. No. 116,228**

**Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 2903780**

**Int. Cl.³ B41J** *5/10, 5/16*

**U.S. Cl. 400—488** **4 Claims**



1. A multi-row keyboard for typewriters or similar machines comprising a set of keys arranged in an inclined position ($\alpha$) and comprising a plurality of individual keys arranged in parallel, longitudinally extending rows, each said key comprising a key element having a plunger and a keyhead connected to said plunger, the center points of the upper surfaces of said keyheads lying in a plane dished transversely in relation to the longitudinal direction of said rows of keys, wherein the improvement comprises:

said keyheads of all rows of said set of keys all having the same shape;

an adapter being located between each said plunger and its associated keyhead;

the heights of said adapters differing from row to row of said keys; and

said adapters having supporting surfaces for their respective keyheads having a slope (angle $\beta$) differing from row to row of said keys, said slope angles of said supporting surfaces being selected to cause said upper surfaces of said keyheads to lie in said dished plane.

**4,294,556**

## GUIDE FOR RECORD CARRIER IN PRINTERS

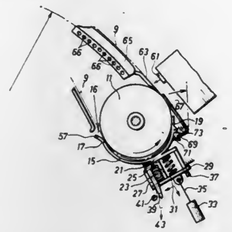
**Albert Rix, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany**

**Filed Jul. 9, 1979, Ser. No. 56,001**

**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829827**

**Int. Cl.³ B41J** *3/04, 13/18*

**U.S. Cl. 400—643** **14 Claims**



1. A device for guiding a record medium sheet which is to be printed upon in a printing machine having a platen, said device being arranged to guide the sheet around the platen and comprising: an apron member formed and positioned to hold the sheet in contact with said platen and to guide the sheet at a point closely below the line being printed, said member being constructed to conform to the curvature of the lower portion of said platen and presenting a press and guide edge at each end of said member in the direction of the circumference of said platen; and spring biassing means disposed for pressing said member resiliently against said platen to cause said edges to bear against said platen; wherein said member is of a material selected so that the coefficient of friction between the record medium sheet and said press and guide edges is less than the coefficient of friction between said platen and the record medium sheet, said apron member is provided with at least one bearing portion presenting a guide slot, said portion being mounted to be slidable and pivotal relative to a pivot axis fixed relative to the machine and extending parallel to the axis of said platen, said spring biassing means act on said member via said bearing means, and said spring biassing means are constructed and mounted for pressing said apron member against said platen in a manner to establish a self-centering action between said press and guide edges and said platen.

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**4,294,557**

## SHIELD FOR TYPEWRITER KEYBOARD AND CYLINDER

**Carroll H. Blanchard, 26 S. Royal Dr., Albany, N.Y. 12205, and Robert P. Marcelonis, 170 Ottawa St., Lake George, N.Y. 12845**

**Filed Dec. 27, 1979, Ser. No. 107,543**

**Int. Cl.³ B41J** *29/12*

**U.S. Cl. 400—714** **4 Claims**

1. A portable and compact shield for use with a typewriter supported by legs and having a keyboard, a cylinder and a casing comprised of:

a keyboard screen;

a cylinder screen hingedly connected to the keyboard screen;

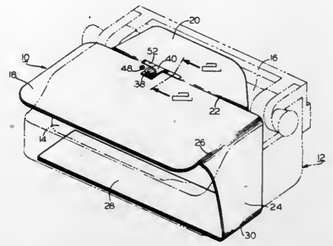
vertical extension member hingedly connected to the keyboard screen on one side thereof and adapted to extend vertically downwardly from the keyboard screen along the side of the typewriter;

a lateral extension member hingedly connected to the vertical extension member, said lateral extension member being of sufficient length to extend under at least one of the legs of the typewriter; and

means for flexibly and releasable fastening the keyboard screen to the casing of the typewriter,



once the keyboard screen is released from the casing, the hinge between the keyboard screen and the vertical extension and the hinge between the vertical and lateral extensions being such as to permit the screens to be lifted away and folded off to the side of the typewriter for unobstructed access to the keyboard and cylinder.



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**4,294,558**

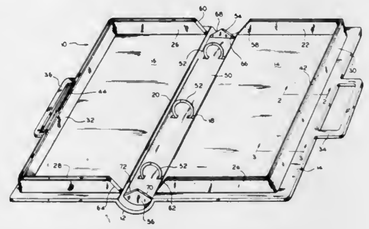
## WEATHERPROOF PORTFOLIOS

**Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108**

**Filed Aug. 6, 1979, Ser. No. 63,865**

**Int. Cl.³ A45C** *3/02;* **B65D** *43/14*

**U.S. Cl. 402—75** **4 Claims**



1. An integrally molded weatherproof portfolio of a thermoplastic polymer comprising an elongated spine having a first side panel and a second side panel hingedly mounted on respective, opposite, longitudinal edges of said spine, each said panel having two integrally molded side flanges connected by an integrally molded top flange to form two opposite, three-sided, substantially identical enclosures on respective panels, the longitudinal edges of said two side flanges and said top flange of the respective enclosures being aligned when said side panels are swung about their hinges from an open position toward each other and into abutting contact by said flanges in the closed position, and sealing means comprising longitudinal tongues and mating longitudinal grooves on respective longitudinal edges of said flanges providing a substantially water-tight seal when the edges of respective enclosures are in abutting contact;

and a substantially triangular wall near each end of said spine and aligned with respective side flanges on the respective panels, said side flanges each having a diagonal edge adjacent said spine, which edge abuts against one of the diagonal walls of said triangular wall when said portfolio is in the closed position, and sealing means on the respective edges of said diagonal walls to provide a substantially water-tight seal between said edges when they are in abutting contact.

**4,294,559**

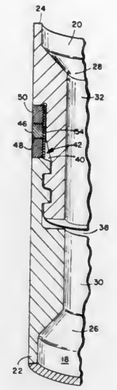
## PRE-STRESSED STRUCTURAL JOINT

**Jerome C. Schutzler, El Toro, Calif., assignor to PDA Engineering, Santa Ana, Calif.**

**Filed Aug. 27, 1979, Ser. No. 70,167**

**Int. Cl.³ F16B** *4/00;* **F16D** *1/00;* **F16L** *25/00*

**U.S. Cl. 403—28** **6 Claims**



1. A structural joint wherein two portions of a structure are joined together by a connection means at a parting line which joint comprises:

a first member;

a second member;

a connection means;

a third member interposed within said connection means which has been formed from a nickel-titanium alloy containing up to 5% by weight of cobalt and which has been compressively deformed below its transformation temperature to provide an expansive stress against said connection means and said first and second members when at ambient temperature.

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**4,294,560**

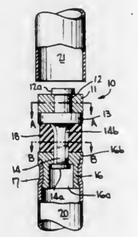
## LOCKING MEANS

**Miles K. Larkin, 13 Roadley Ave., Pakuranga, Auckland, New Zealand**

**Filed Mar. 12, 1980, Ser. No. 129,665**

**Int. Cl.³ F16B** *7/10*

**U.S. Cl. 403—104** **8 Claims**



1. Locking means for inner and outer telescopically engageable tubes, including at least one primary locking member and at least one secondary locking member in the form of a substantially resilient bushing mounted within a section of the inner tube which is within the outer tube, so as to be engageable with the inner surface of the outer tube, the primary locking member and resilient bushing being mounted relative to the inner

tube and to each other so that relative rotational movement between said inner and outer tubes causes said primary locking member to lockingly engage the inner surface of said outer tube and a further relative axial movement between said inner and outer tubes causes said resilient bushing to be compressed longitudinally and thereby to expand substantially radially into engagement with the inner surface of said outer tube.

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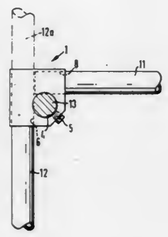
**4,294,561**

## JOINTING MEMBER FOR FRAME SYSTEMS

**Arthur J. Chapman, Reading, and Geoffrey M. G. Hayes, Weybridge, both of England, assignors to Pentabloc, Ltd., London, England**

**Filed Jan. 14, 1980, Ser. No. 111,675**
**Int. Cl.³ F16B *7/04***
**U.S. Cl. 403—219** **10 Claims**



1. A jointing member for a frame system comprising: a member having three bores therein with the axes of said bores mutually perpendicular and with two of said bores lying in the same plane, and securing means for securing an elongate member engaged in one of said bores against longitudinal movement with respect to said member, said bores being so interconnected within said member that tightening said securing means to secure an elongate member in one of said bores, said one of said bores being other than one of said two bores lying in said plane, will secure respective elongate members engaged in the others of said bores against longitudinal movement with respect to said member; wherein said securing means is a set screw engaged in a screw-threaded hole in said member and engageable, by screwing it inwardly, with the elongated member engaged in said one of said bores, to press that elongate member against the elongate members engaged in said others of said bores to bind them therein, and wherein one of said two bores lying in the same plane is a blind bore.

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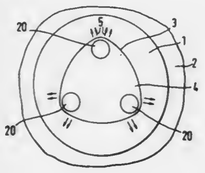
**4,294,562**

## POLYGON CONNECTION OF A HUB WITH A SHAFT

**Ralph Müllenberg, Im Wiesengrund 6, 4048 Grevenbroich 12, Fed. Rep. of Germany**

**Filed Jul. 23, 1980, Ser. No. 171,484**
**Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929908**
**Int. Cl.³ F16D *1/06***
**U.S. Cl. 403—383** **1 Claim**



1. A polygonal connection for joining a hub with a shaft, said hub and shaft each having an axis, the connection comprising:

a bore of non-circular cross section in the hub;

a joining portion of non-circular cross section in the shaft, said joining portion of said shaft fitting within said bore, said non-circular cross sections of said bore and of said joining portion approximately corresponding with each other in size and shape, said non-circular cross sections being taken in planes normal to the axes of the hub and shaft, said joining portion of said shaft having a perimeter defining said non-circular cross section of said joining portion, said joining portion of the shaft being so configured as to define a plurality of corners at said perimeter of said joining portion;

a plurality of fasteners disposed in vicinities of said corners of said joining portion of said shaft, said fasteners extending in directions parallel to the axis of the shaft; each fastener including means for effecting radial expansion thereof, said fasteners having longitudinal axes located within said perimeter of said joining portion of said shaft;

said fasteners being disposed entirely within said perimeter of said joining portion of said shaft.

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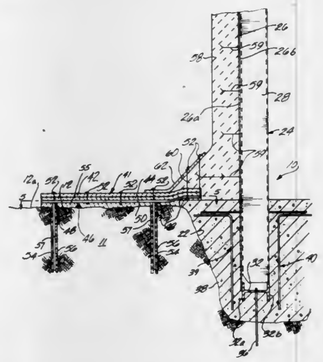
**4,294,563**

## THERMALLY INSULATED BULKHEAD FOR IN SITU OIL SHALE RETORT

**James S. Kilburn, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.**

**Filed Apr. 9, 1979, Ser. No. 28,226**
**Int. Cl.³ E21F *17/00***
**U.S. Cl. 405—132** **37 Claims**



1. An insulated heat seal in an access drift adjacent a portion of in situ oil shale retort comprising:

a bulkhead placed across an access drift excavated in formation containing oil shale, the drift being in communication with a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort, the bulkhead having an inside surface facing toward the fragmented mass, the access drift having an inside wall between the inside surface of the bulkhead and the fragmented mass;

a first layer of heat insulating material on the inside surface of the bulkhead for reducing heat transfer to the bulkhead from a hot portion of the fragmented mass in communication with said access drift; and

a second elongated layer of heat insulating material on the inside wall of the access drift on the same side of the bulkhead as the first layer of heat insulating material, the second layer of heat insulating material extending along the length of the inside wall of the drift away from the first layer of heat insulating material for reducing heat transfer from said hot portion of the fragmented mass to formation forming the drift wall adjacent the inside surface of the bulkhead.



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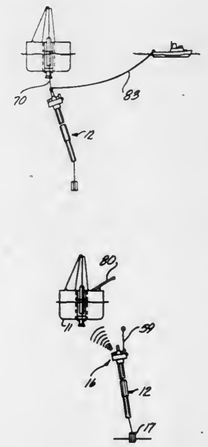
**4,294,564**

## METHOD OF DEPLOYMENT, RELEASE AND RECOVERY OF OCEAN RISER PIPES

**Abraham Person, Los Alamitos; Sherman B. Wetmore, Westminster, and James F. McNary, Santa Ana, all of Calif., assignors to Global Marine Inc., Los Angeles, Calif.**

**Division of Ser. No. 935,672, Aug. 21, 1978, Pat. No. 4,234,269. This application Jan. 14, 1980, Ser. No. 111,812**
**Int. Cl.³ E02D *21/00, 29/06***
**U.S. Cl. 405—195** **9 Claims**



1. A method for connecting to a structure adjacent the surface of an ocean an elongate pipe assembly having overall negative buoyancy and which, when connected to the structure, depends downwardly from the structure and is supported thereby, the method comprising the operations of

(a) fabricating the pipe assembly to an essentially finished state at a location away from the structure, the upper end of the pipe assembly being sufficiently positively buoyant that the normal stable position of the assembly when submerged and released from support from above is substantially vertical,

(b) moving the pipe assembly in a horizontal attitude to the location of the structure,

(c) controllably lowering the pipe assembly toward the ocean floor and concurrently both maintaining a connection to the upper end of the assembly and causing the assembly to assume a vertical attitude in a fully submerged state thereof, the lowering operation including a further operations of (1) connecting a line from the structure to the lower end of the assembly while the assembly is horizontal at the location of the structure, and (2) paying out the line from the structure to lower the lower end of the assembly,

(d) moving the submerged vertically disposed pipe assembly to below the structure, and

(e) raising the pipe assembly into engagement with the structure and connecting the same to the structure for support thereafter by the structure.

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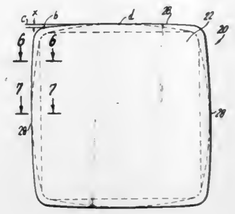
**4,294,565**

## INDEXABLE FINISHING INSERT FOR A MILLING CUTTER

**Donald S. Erkfritz, Clarkston, Mich., assignor to General Electric Company, Columbus, Ohio**

**Filed Mar. 6, 1980, Ser. No. 127,598**
**Int. Cl.³ B26D *1/12***
**U.S. Cl. 407—113** **14 Claims**



1. A finishing insert for use with an indexable cutting tool, said insert comprising:

a flat wafer of cutting material having parallel, spaced front and rear planar rake surfaces and a plurality of edge faces disposed therebetween, said rake faces being of equilateral, polygonal configuration with the side edges of said polygonal front rake surface corresponding to the cutting edges of said insert, said cutting edges being arcuate having a radius of curvature several times greater than the width of said front rake surface and with the intermediate portion of each said edge face being substantially planar and defining a locating land, with at least a portion of the opposed ends of said edge faces being curved and sloped away from said front rake surface in order to provide clearance along said edge faces when said insert is mounted on a cutting tool at a rake angle between said front rake surface and the workpiece.

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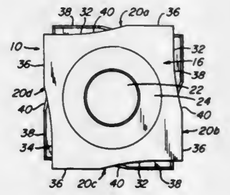
**4,294,566**

## EIGHT EDGE POSITIVE CHIP CONTROL INSERT

**Gary A. Boone, Farmington, Mich., assignor to Carmet Company, Pittsburgh, Pa.**

**Filed Jun. 16, 1980, Ser. No. 159,580**
**Int. Cl.³ B26D *1/00, 1/12***
**U.S. Cl. 407—114** **10 Claims**



1. An eight-edge cutter insert adapted for use with a tool holder having an insert-receiving square pocket formed therein, said insert comprising:

a generally rectangular prismatic element of cutting material, said element having a pair of parallel, laterally offset primary faces, and four rectangular side faces each outwardly bounded by a respective side reference plane extending perpendicularly of said primary faces and the adjacent side reference planes,

each of said side faces having an opposed pair of recessed, beveled facets formed therein, said facets each intersecting a respective primary face to form a cutting edge ex-

tending parallel to the side reference plane of the side face containing the said facet,

each facet being inwardly inclined away from its respective cutting edge to define a shear angle measured from said side reference plane,

said side faces each having a diametrically opposed pair of flat lands substantially coplanar with a respective side reference plane whereby to define a planar base on each side face for permitting said cutter to be accurately located, and securely clamped, in said square pocket.

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**4,294,567**

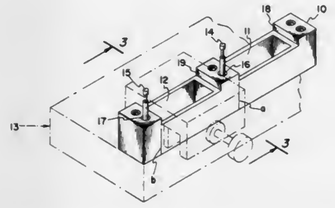
## DOWELING JIG TEMPLATE

**Garfield Wiggins, 162 Burnett Ave., Maplewood, N.J. 07040**

**Filed Jan. 11, 1979, Ser. No. 2,506**

**Int. Cl.³ B23B *47/28***

**U.S. Cl. 408—72 R** **5 Claims**



**1**. In combination a template to support a doweling jig in a position above and parallel to a flat surface for drilling longitudinally spaced series of vertical dowel holes for mating with similiarly positioned holes in an edge or end of another workpiece to be joined in a right angle relationship to a flat surface, said doweling jig characterized by a horizontally elongated channel having a flat top member and two parallel side members extending transversely to said top member, said top member having parallel ends extending transversely to said side members and having an undersurface parallel with its upper surface and having longitudinally spaced vertical guide bushings through which a drill bit can pass for making spaced holes in a piece of stock beneath said undersurface, one of said side members having attached means for clamping a template against the other side member in a position for such drilling, said template characterized by a horizontally elongated body having at least one vertical cavity to allow passage of the drill bit through the guide bushing into the flat piece of stock held in contact with the undersurface of said elongated body, a channel portion containing said cavity recessed into the upper surface of said elongated body and extending across the entire width of said upper surface and forming spaced abutments to allow precise positioning and support against movement in one horizontal direction by abutment of either end of the flat top of the dowel jig in the channel portion, and vertical guide holes at each end of said elongated body for allowing the passage of securing means for holding the elongated body in contact with the flat workpiece.

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**4,294,568**

## PROCESS FOR BROACHING OF GROOVES

**Dieter Lipowsky, Grobenzell, and Karl Meyle, Munich, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany**

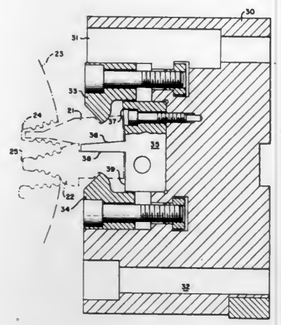
**Continuation of Ser. No. 875,403, Feb. 6, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,659**

**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704812**

**Int. Cl.³ B23D *37/04, 41/04***

**U.S. Cl. 409—244** **12 Claims**

**1**. A process for production of a series of circumferentially adjacent retaining grooves for turbine blades in the peripheral surface of a rotor plate for a turbine engine by broaching, said retaining grooves being inclined with a predetermined pitch relative to the longitudinal axis of the rotor plate and being spaced from each other at a predetermined distance comprised



by the simultaneous broaching of two adjacent retaining grooves in one broaching stroke by means of two broaching tools positioned relative to each other at the distance and in the angular position of the pitch of the grooves that are to be produced.

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**4,294,569**

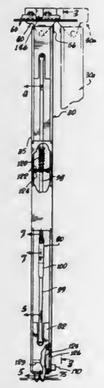
## SINGLE COLUMN LOAD DIVIDING GATE

**Alfred E. Lewis, Tustin, and Robert E. Salisbury, Whittier, both of Calif., assignors to Preco Inc., Los Angeles, Calif.**

**Filed Jun. 14, 1979, Ser. No. 48,454**

**Int. Cl.³ B60P *17/14*; B61D *17/10***

**U.S. Cl. 410—133** **23 Claims**



**10**. In a load dividing gate movable along a track and lockable by locking pin means projectable to engage the track, said gate having a vertical edge structure comprising spaced flanges with a web recessed between the flanges and forming therewith a channel; control mechanism for the locking pin means comprising

a crank shaft journaled on said web and terminating outward of the web in a coupling formation,

crank means mounted on the shaft and coupled to the locking pin means for operating the same in response to shaft rotation,

a handle rigidly carrying at one end coupling means for engaging and disengaging said coupling formation in response to respective movements of said one handle end along the shaft axis to and from said one end of the shaft,



a support member mounted for rotation about the shaft axis, and linkage means for interconnecting the handle and the support member with freedom of relative movement sufficient to permit said axial handle movement and to permit handle movement to and from a stowed position radially spaced from the shaft and substantially within the channel.

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**4,294,570**

## LOCKABLE CAP SCREW

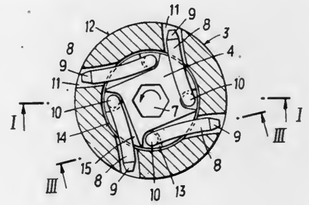
**Albin Meschnig, Müllnern 72 (Kärnten), A-9585 Gödersdorf, Austria**

**Filed Feb. 21, 1979, Ser. No. 13,659**

**Claims priority, application Austria, Mar. 7, 1978, 1638/78; Sweden, Oct. 30, 1978, 7811221**

**Int. Cl.³ F16B *39/00***

**U.S. Cl. 411—103** **13 Claims**



**1**. A lockable cap screw having a head formed with a bore opening in an outside peripheral surface of the head, and a pin slidable in said bore between a position of rest and an operative position in which an outer end of the pin protrudes over the outside peripheral surface of the head of the screw, comprising

means, comprising an actuating member engaging an inner end of the pin and being adjustable relative to the head of the screw, for shifting the pin to said operative position, said actuating member is formed with an opening, and the inner end of said pin is angled and enters said opening of the actuating member,

the bore in the head of the screw is oblique to a radial plane of the actuating member.

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**4,294,571**

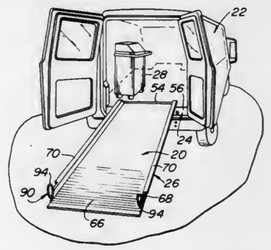
## VAN PLATFORM WITH LOCKABLE RAMP

**Joseph R. Tordella, 128 B Elm Dr., Medford, N.J. 08055**

**Filed Nov. 30, 1979, Ser. No. 99,069**

**Int. Cl.³ B60P *1/00***

**U.S. Cl. 414—537** **12 Claims**



**1**. A van platform comprising a housing including first floor means terminating outwardly in an outer edge and defining a space thereunder, movable ramp means located in said space and having roller means to enable said ramp means to be extended from a retracted position within said space to an extended, ramp-functioning position outside said space, a pair of inclined guides positioned in said space adjacent the outer edge of said first floor, each of said guides being inclined upwardly and outwardly and including an indentation at the top thereof, said rollers being arranged to engage said inclined guides to facilitate movement of said ramp means to and from the extended position, at least one of said rollers being received in said indentation when said ramp means is brought to the extended position, and first releasable locking means for preventing said roller from moving inwardly out of said indentation when said ramp means is in said extended ramp functioning position, said releasable locking means comprising at least one stop member located adjacent said indentation and a movable to a position immediately inward of said indentation to engage the roller disposed therein.

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**4,294,572**

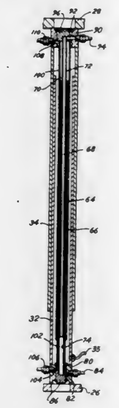
## INTERNAL FLUID COMMUNICATION SYSTEM FOR POWER CYLINDERS

**Jack E. Pattison, 115 S. Ridgeway Dr., Battle Creek, Mich. 49015**

**Filed Apr. 10, 1978, Ser. No. 894,691**

**Int. Cl.³ B66F *9/22***

**U.S. Cl. 414—641** **6 Claims**



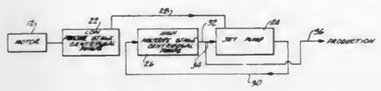
**1**. In a lift truck having an upright with two sections, each with spaced vertical side members, and a fluid operated attachment on said upright: a fluid operated ram disposed vertically between said side members and in spaced relation thereto and consisting of two ram sections with directly interconnecting chambers containing the operating fluid therefor, for operating said upright sections between raised and lowered positions, a conduit having a first pair of tubular sections comprising upper and lower tubular sections disposed in telescopic relationship lengthwise within the chambers containing the operating fluid of said ram and forming a first fluid passageway for transmitting fluid through said ram separate from the operating fluid therein, a bottom end member connecting the lower end of said lower tubular section with the lower end of said lower ram section, means forming a passage in said bottom end member for receiving fluid from a source to be transmitted through the first passageway in said telescopic sections, a top end member connecting the upper end of said upper tubular section with the upper end of said upper ram section, and means forming a passage in said top end member for transmitting the fluid in said first passageway to said attachment.

4,294,573

## SUBMERSIBLE ELECTRICALLY POWERED CENTRIFUGAL AND JET PUMP ASSEMBLY

John W. Erickson, Huntington Beach, and Harold L. Petrie, Sierra Madre, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 17, 1979, Ser. No. 39,775
Int. Cl.³ F04B 23/14
U.S. Cl. 417—83 19 Claims



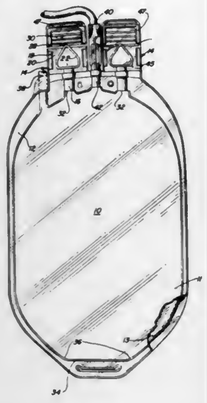

1. A downhole petroleum pump comprising:
(a) a housing adapted for residence in a downhole location within a well;
(b) an electric motor within the housing;
(c) a plurality of centrifugal pump stages within the housing and driven by the motor, the centrifugal pump stages being serially coupled and having at least one low pressure stage and at least one high pressure stage to progressively increase the pressure of well fluid from a low value at the low pressure stage to a high value at the high pressure stage;
(d) means for providing the well fluid as the fluid to be pumped to the centrifugal pump stages;
(e) a jet pump within the housing having means for receiving an aspirated fluid and means for receiving a power fluid;
(f) means for providing high pressure well fluid to the jet pump from the high pressure centrifugal pump stage as the power fluid for the jet pump;
(g) means for providing well fluid to the jet pump at a pressure lower than the power fluid as the aspirated fluid to the jet pump;
(h) means for recirculating well fluid from the output of the jet pump, including the power fluid, to the high pressure centrifugal pump stage including the power fluid;
(i) means for drawing off well fluid from the high pressure centrifugal pump stage as the production fluid from the well; and
(j) centrifugal cleaner means upstream of the jet pump for cleaning the power fluid of particulate matter, the cleaner means being powered by the electrical motor.

4,294,574

## METHOD OF MAKING SEAL FOR FLEXIBLE CONTAINER

Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 17,529, Mar. 5, 1979, Pat. No. 4,234,026.
This application Oct. 29, 1979, Ser. No. 89,815
Int. Cl.³ B31B 1/84
U.S. Cl. 493—213 13 Claims



1. The method of sealing a flexible container with an openable seal member which comprises:
inserting a thermoplastic tube between thermoplastic members with a portion of the tube communicating outwardly beyond said members;
enclosing the outer end of said tube with a thermoplastic pocket member having an open outer end;
inserting a mandrel through the outer end of said pocket member and said tube;
sealing said thermoplastic members, tube, and inner end of the pocket member together in a smooth, continuous seal such that the inner and outer ends of the tube communicate through said seal;
withdrawing said mandrel through the outer end of said pocket member; and
sealing the outer end of the pocket member.



4,294,575

## PEROXIDE STABILIZATION

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 403, Jan. 2, 1979, Pat. No. 4,239,643. This application Jul. 18, 1980, Ser. No. 170,201
Int. Cl.³ D06C 3/02; D21C 9/16
U.S. Cl. 8—111 5 Claims

1. In a process for bleaching cellulose fiber with an aqueous peroxide-containing solution having a pH from about 7 to about 12.5, the improvement which comprises including in said solution from about 0.2 to about 20 grams per liter of alkali metal polyphosphate and from about 0.1 to about 10 grams per liter of alkali metal diethylene triamine penta(methylene phosphonate).

4,294,576

## REMOVAL OF OLIGOMER DEPOSITS FROM TEXTILE MATERIALS

Herbert Helfert, Frankenthal; Friedrich Reinert, Wachenheim; Paul Richter, Friedelsheim; Michele Vescia, Limburgerhof, and Dieter Wegerle, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,178
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925477
Int. Cl.³ D06L 1/12; D06P 5/02; C11D 1/62
U.S. Cl. 8—137.5 10 Claims

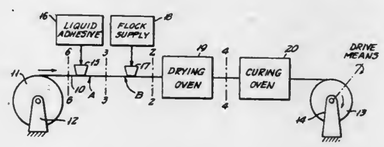
1. A process for removing oligomer deposits from textile materials which consist of polyester fibers or of blends of polyester fibers with other fibers, and from dyeing machinery, comprising:
treating said fibers or machinery with an aqueous alkaline liquor at a temperature from 30° to 100° C., containing as the active ingredient of the liquor, at least one quaternary ammonium compound whose quaternary nitrogen atom bears not less than two $C_6$–$C_{22}$-alkyl or -alkenyl groups with the remaining groups being selected from the group consisting of alkyl, aryl, alkylphenyl, aralkyl, alkylene oxide and $RCO—X—(CH_2)_n—$, wherein R is $C_1$–$C_{18}$ alkyl, X is —NH— or —O— and n is a value from 1 to 6.

4,294,577

## DYED FLOCKED FABRIC AND METHOD OF MAKING THE SAME

Leo N. Bernard, Plainfield, Conn., assignor to Pervel Industries, Inc., Plainfield, Conn.

Filed Mar. 25, 1980, Ser. No. 133,864
Int. Cl.³ D06P 5/00, 7/00
U.S. Cl. 8—488 40 Claims




1. The method of producing a dyed flocked fabric, which comprises selecting a suitable substrate fabric, coating the substrate fabric with a wet layer of flock adhesive, said adhesive having as an essential component thereof a selected heat-sublimable dye, selecting flock of a material capable of being dyed with a heat-sublimable dye, applying the selected flock to the wet coating of flock adhesive, drying the adhesive at a temperature less than that at which said dye sublimes, and then curing the adhesive by exposing the dried flocked substrate for a predetermined period of time to an elevated curing temperature at which said dye substantially fully sublimes.

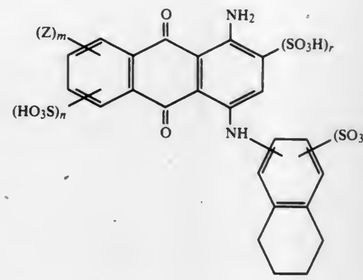
4,294,578

## COLORANTS

Friedrich W. Kröck, Cologne, and Rütger Neeff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1979, Ser. No. 20,867
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811718
Int. Cl.³ D06P 3/04, 1/24
U.S. Cl. 8—516 4 Claims

1. A polymeric material containing amide groups dyed with a dye which, in the form of the free acid, corresponds to the formula




in which
Z represents halogen or alkylcarbonylamino with 1–4 C atoms in the alkyl radical,
m is 0, 1 or 2 and n, r and s represent the numbers 0 or 1, with the proviso that the sum of n, r and s has a value of 1 or 2 and s can be 1 only if r at the same time is 0.

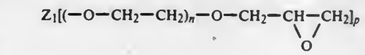
4,294,579

## PROCESS FOR THE ONE-BATH, SINGLE-STAGE DYEING OR PRINTING OF CELLULOSE FIBRES WITH FIBRE-REACTIVE DISPERSE DYESTUFFS

Udo-Winifred Hendricks; Dietrich Hildebrand, both of Odenthal, and Robert Kuth, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 69,690
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914142
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ D06P 3/66, 3/84
U.S. Cl. 8—549 3 Claims

1. In the dyeing and printing of fibres and textile materials containing cellulose wherein the fibres or textile materials are contacted with a padding liquor or printing paste containing a water-insoluble reactive disperse dyestuff in the absence of alkali or alkaline compounds, the improvement which comprises incorporating in the padding liquor or printing paste at least one compound of the formula




wherein
$Z_1$ is a monovalent to tetravalent aliphatic hydrocarbon radical with 1–5 carbon atoms,
n is 0–10, and
p is 1–4.

**4,294,580**

## REACTIVE DYESTUFFS, THEIR PREPARATION AND THEIR USE FOR DYEING MATERIALS CONTAINING OH OR N

**Hermann Henk, Cologne; Klaus Wunderlich, Leverkusen, and Peter Wild, Alten Buseck, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

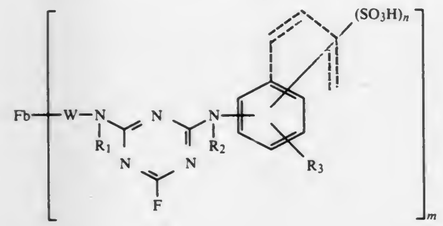
**Filed Dec. 31, 1979, Ser. No. 108,307**

**Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901546**

**Int. Cl.³ C09B** *62/06*

**U.S. Cl. 8—549** **9 Claims**

1. Reactive dyestuffs of the formula



wherein

Fb denotes the radical of an organic dyestuff,

W denotes a direct bond or a bridge member, W being bonded to a C atom of an aromatic-carbocyclic ring of the chromophor Fb,

$R_1$ denotes hydrogen, optionally substituted $C_1$–$C_4$-alkyl or aralkyl,

$R_2$ denotes $C_2H_4$—OH,

$R_3$ denotes hydrogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, carboxyl, $C_1$–$C_4$-alkoxycarbonyl, $C_1$–$C_4$-alkyl- or -dialkyl-aminocarbonyl, optionally substituted arylaminocarbonyl, sulpho, $C_1$–$C_4$-alkyl- or -dialkyl-aminosulphonyl, hydroxyl, optionally substituted $C_1$–$C_4$-alkyl- or aryl-carbonylamino, formylamino, oxalylamino, optionally substituted ureido or sulphomethylene,

n is 0, 1, 2 or 3 and

m is 1 or 2.

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**4,294,581**

## UNIFORMLY DYED WATER-SWELLABLE CELLULOSIC FIBERS

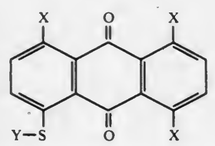
**Siegfried Mensch; Gerhard Epple, Weisenheim, and Wolfgang Elser, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Nov. 16, 1979, Ser. No. 94,893**

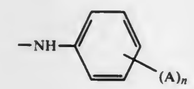
**Int. Cl.³ C09B** *1/00, 1/56*

**U.S. Cl. 8—611** **6 Claims**

1. Uniformly dyed water-swellable cellulosic fibers prepared by a process comprising: contacting water-swellable cellulosic fibers successively or simultaneously with water, with ethylene glycol, propylene glycol or a derivative thereof and, while the fibers are still swollen, with an essentially water-insoluble dye of the formula



where Y is phenyl which is unsubstituted, or is monosubstituted or disubstituted by $C_1$–$C_4$-alkyl, chlorine, bromine, nitro, cyano, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkoxy-$C_2$–$C_3$-alkyl, $C_1$–$C_4$-alkylsulfonyl, $C_1$–$C_4$-alkanoylamino or phenoxy, the substituents, in the case of disubstitution, being identical or different, or is α- or β-naphthyl, thiazol-2-yl, 4-($C_1$–$C_4$-alkyl)-thiazol-2-yl, 4-phenylthiazol-2-yl, 4-($C_1$–$C_4$-alkyl)-thiazolin-2-yl, 4-phenylthiazolin-2-yl, 5-amino-thiazol-2-yl, pyrazol-5-yl, imidazol-2-yl, 3-($C_1$–$C_4$-alkyl)-imidazol-2-yl, 3-($C_1$–$C_4$-alkyl)-1,2,4-triazol-5-yl, 2-phenyl-1,3,4-thiadiazol-5-yl, 2- or 5-thio-1,3,4-thiadiazol-5- or -2-yl, 3-phenyl-1,2,4-thiadiazol-5-yl, 2-($C_1$–$C_4$-alkyl)-1,3,4-oxadiazol-5-yl, 2-phenyl-1,3,4-oxadiazol-5-yl, pyrid-2-yl, quinol-2-yl, quinazol-2-yl, quinazol-4-yl, benzimidazol-2-yl, 3-($C_1$–$C_4$-alkyl)-benzimidazol-2-yl, benzoxazol-2-yl or benzthiazol-2-yl, two of the three radicals X being hydroxyl and the remaining radical being



where A is (a) saturated, linear or branched, $C_1$–$C_{18}$-alkyl; (b) $C_2$–$C_8$-alkyl substituted by cyano, chlorine, bromine, carbonyl-$C_1$–$C_5$-alkoxy, N-$C_1$–$C_8$-alkylcarbamyl, N,N-di-$C_1$–$C_8$-alkylcarbamyl, $C_1$–$C_4$-alkylsulfonyl, amino, di-$C_1$–$C_4$-alkylamino or phenoxy, the number of substituents being 1 or 2; (c) $C_1$–$C_{10}$-alkoxy, alkoxyalkoxy and alkoxyalkyl of a total of 3 to 11 carbon atoms; (d) hydroxyalkoxyalkyl of a total of 4 to 10 carbon atoms, and alkoxyalkoxyalkyl of a total of 5 to 11 carbon atoms; (e) phenoxyalkoxyalkyl, where the alkoxyalkyl radical is of a total of 4 to 6 carbon atoms; (f) saturated 5-, 6-, 7- or 8-membered cycloalkyl or polycycloalkyl of a total of 5 to 15 carbon atoms; (g) $C_5$–$C_8$-cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_8$-alkyl, cycloalkyl or hydroxyl; (h) phenyl-$C_1$–$C_4$-alkyl, where alkyl is unsubstituted or substituted by hydroxyl and phenyl is unsubstituted or substituted by $C_1$–$C_{15}$-alkyl; (i) phenyl which is unsubstituted or in which from 1 to 3 hydrogen atoms are replaced by $C_1$–$C_{18}$-alkyl, hydroxyl, chlorine, bromine, trifluoromethyl, nitro, cyano, $C_1$–$C_5$-alkoxy, $C_1$–$C_4$-alkylthio, $C_1$–$C_5$-alkanoylamino, sulfamyl, N-$C_1$–$C_8$-alkylsulfamyl, N,N-di-$C_1$–$C_8$-alkylsulfamyl, N-phenylsulfamyl, carbamyl, N-$C_1$–$C_8$-alkylcarbamyl, N,N-di-$C_1$–$C_8$-alkylcarbamyl, N-phenylcarbamyl, where phenyl is unsubstituted or substituted by methoxy, ethoxy or methyl, carbalkoxy of a total of 2 to 6 carbon atoms, $C_1$–$C_4$-alkylsulfonyl, phenylsulfonyl, where phenyl is unsubstituted or substituted by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkylcarbonyl, phenalkoxy of 7 to 10 carbon atoms or phenoxy, and, if more than one substituent is present, these may be identical or different and, if more than one alkyl, alkoxy or alkyl and alkoxy is present, the sum of the carbon atoms in these substituents is at most 12; (j) cyano; (k) carbalkoxy of a total of 2 to 12 carbon atoms; (l) nitro; (m) N-$C_1$–$C_8$-alkylamino or N,N-(di-$C_1$–$C_8$-alkyl)-amino; (n) carbamyl, N-$C_1$–$C_8$-alkylcarbamyl or N,N-di-$C_1$–$C_8$-alkylcarbamyl; (o) alkanoylamino of 2 to 12 carbon atoms; (p) $C_1$–$C_6$-alkylsulfonyl; (q) sulfamyl, N-$C_1$–$C_8$-alkylsulfamyl or N,N-di-$C_1$–$C_8$-alkylsulfamyl; (r) azophenyl; (s) phenoxy which is unsubstituted or in which 1 or 2 hydrogens are replaced by chlorine or bromine, or (t) α- or β-naphthyl, and n is 0, 1 or 2.



**4,294,582**

## METHOD FOR PROCESSING A BODY LIQUID SPECIMEN

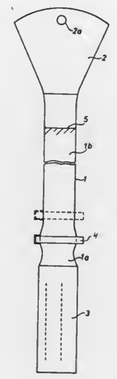
**Jan I. Naslund, Vassvagen 21, Huddinge, Sweden**

**Continuation-in-part of Ser. No. 62,617, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 903,259, May 5, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,199**

**Claims priority, application Sweden, May 17, 1977, 7705788**

**Int. Cl.³ A61B** *10/00;* **G01N** *1/10*

**U.S. Cl. 23—230 B** **2 Claims**



1. A method of processing a urine specimen for diagnostic examination, comprising the steps of:

introducing a fixative into the lower, closed end of an elongated tube formed of flexible material;

closing the tube with a first removable clip just above the portion containing the fixative;

introducing the urine specimen into the tube through a collapsible hopper which forms an open upper end of the tube and which funnels the urine down into said tube just above said removable clip;

permitting the urine specimen to separate, by settlement, to form a concentrate having a higher concentration of settled body cells than the rest of the urine specimen, and such that said concentrate is located adjacent the said removable clip;

applying a further removable clip across the first chamber of said tube to separate some or all of said concentrate from the remainder of the urine specimen therein;

removing said first removable clip to place said concentrate and said fixative into communication with each other to mix said concentrate with said fixative; and

removing the remainder of the urine specimen from said tube.

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**4,294,583**

## HIGHLY SENSITIVE GAS MEASURING METHOD FOR THE ANALYSIS OF BREATH ALCOHOL CONCENTRATIONS, USING TEST TUBES

**Kurt Leichnitz, Grosse Grönau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**

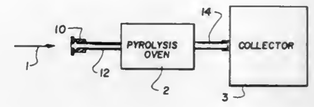
**Filed Feb. 29, 1980, Ser. No. 125,978**

**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1979, 2912967**

**Int. Cl.³ G01N** *31/12, 31/22*

**U.S. Cl. 23—232 R** **3 Claims**

1. A method of testing a person's breath for the purpose of determining its alcohol content as an indication of the ethyl alcohol in the person's blood of the type using a colorimetric carbon monoxide gas detector tube, comprising obtaining a sample of expiratory breathing air of the person, conducting the sample through a pyrolysis oven and operating the pyrolysis oven to decompose the alcohol and form carbon monoxide, collecting a predetermined quantity of the pyrolized sample,




and passing the collected quantity through the detector tube to determine the quantity of carbon monoxide as an indication of the alcohol content.

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**4,294,584**

## DEWATERING OF COAL SLURRIES

**Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

**Filed Nov. 10, 1980, Ser. No. 205,394**

**Claims priority, application Netherlands, Feb. 7, 1980, 8000750**

**Int. Cl.³ C10L** *5/14, 5/22*

**U.S. Cl. 44—23** **10 Claims**

1. A process for dewatering a slurry of coal particles and for producing strong pellets therefrom comprising agglomerating the coal particles with a hydrocarbon binder at an elevated temperture to obtain coal pellets, subjecting the pellets to heat treatment at a temperature of between 200° and 300° C., contacting gases released by the coal pellets during the heat treatment with the slurry to remove condensable components from the gases and to transfer heat to the slurry, and burning at least a part of the non-condensable gases to product heat for the heat treatment.

6. Apparatus for dewatering a slurry of coal particles and for producing strong pellets therefrom by agglomeration of the coal particles with a hydrocarbon binder at an elevated temperature comprising a slurry feed line, a pelletizer downstream of the slurry feed line, means for supplying binder to the pelletizer, mechanical dewatering means downstream of the pelletizer, heat treatment means downstream of the dewatering means, a recycle passageway for condensable and non-condensable gases from the heat treatment means to a scrubber situated in the slurry feed line upstream of the pelletizer, and means in the slurry feed line between the scrubber and the pelletizer for separating non-condensable gases from the slurry feed.

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**4,294,585**

## NOVEL FUEL COMPOSITION FOR INTERNAL COMBUSTION ENGINE

**Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Sep. 22, 1980, Ser. No. 189,530**

**Int. Cl.³ C10L** *1/18, 1/22*

**U.S. Cl. 44—53** **46 Claims**

1. A fuel composition for internal combustion engines comprising

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

(b) a minor corrosion inhibiting amount of, as a corrosion inhibiting agent, a reaction product of (i) an aminotetrazole, (ii) a ketone or an aldehyde, and (iii) a $C_3$–$C_{12}$ poly-primary amine bearing at least one free —$NH_2$ group and at least one —NHR′ group wherein R′ is a $C_{12}$–$C_{18}$ hydrocarbon group.

**4,294,586**

## GASOLINE AND DIESEL FUEL ADDITIVE

**Charles P. Cox, Jr., 208 S. Sunnyside Rd., Decatur, Ill. 62522**

**Filed Jun. 5, 1980, Ser. No. 156,843**
**Int. Cl.³ C10L *1/18***
**U.S. Cl. 44—56** **18 Claims**

1. The process of making a fuel additive comprising the steps of:
placing a predetermined quantity of alcohol in a mixing vessel;
adding a predetermined quantity of toluene to said predetermined quantity of alcohol;
blending thoroughly the aforesaid quantities of substances by vigorous agitation of the mixing vessel;
adding a predetermined quantity of hydrogen peroxide; and then blending all together by further vigorous agitation of the mixing vessel.

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**4,294,587**

## MOTOR FUEL

**Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 24, 1980, Ser. No. 200,366**
**Int. Cl.³ C10L *1/22***
**U.S. Cl. 44—74** **9 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of N-methallylaniline (I), N-allyl-o-toluidine (II), and N-crotyl-p-toluidine.

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**4,294,588**

## ELECTROSTATIC PRECIPITATOR EFFICIENCY ENHANCEMENT

**David M. Polizzotti, Yardley, and Joe C. Steelhammer, Lansdale, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.**

**Continuation-in-part of Ser. No. 140,287, Apr. 14, 1980, Pat. No. 4,239,504, which is a continuation-in-part of Ser. No. 29,414, Apr. 12, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,173**
**Int. Cl.³ B03C *3/00***
**U.S. Cl. 55—5** **37 Claims**

1. In an electrostatic precipitator, a method for removing particles from a particle-laden gas stream, which method comprises electrically charging the particles by passing the gas stream through an ionization field and attracting the thus-charged particles to a grounded collecting electrode for collection, the improvement comprising: prior to collection of the particles distributing across the gas stream within the ionization field from about 1 to 200 parts of an additive selected from the group of morpholine, morpholine compounds, and mixtures thereof per million parts of gas to enhance the efficiency of particle removal.

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**4,294,589**

## METHOD FOR REMOVING TRAPPED GAS UNDER POND LINERS

**Richard E. Zachary, Clinton, La., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Dec. 22, 1977, Ser. No. 863,633**
**Int. Cl.³ B01D *53/00***
**U.S. Cl. 55—36** **5 Claims**

1. A method for removing trapped gases under a liner in a lined pond adapted for storing liquids comprising:
(a) partially filling the pond excavation under the liner with a liquid thereby floating the liner on the liquid and collecting the trapped gases between the surface of the liquid and liner;
(b) Progressively filling the pond of top of the liner with another liquid thereby forcing the trapped gases beneath the liner to the sides of the pond and venting the gases up the sides of the pond to the atmosphere; and
(c) draining away the liquid under the liner thereby settling the liner onto the bottom of the pond excavation.

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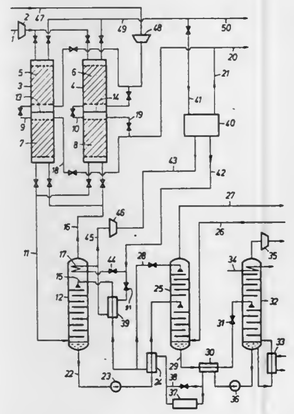
**4,294,590**

## REMOVAL OF UNDESIRED GASEOUS COMPONENTS FROM HOT WASTE GASES

**Gerhard Linde, Gruenwald; Peter Haeussinger, Munich, and Claus Schliebener, Strasslach, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany**

**Filed Nov. 9, 1979, Ser. No. 93,089**
**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2848721; Oct. 25, 1979, 2943130**
**Int. Cl.³ B01D *53/14***
**U.S. Cl. 55—48** **28 Claims**



1. In a process for removing undesired gaseous components from hot combustion gases by scrubbing with a regenerable absorbent,
the improvement which comprises:
conducting the scrubbing with a liquid physical absorbent at a temperature less than 0° C. and supplying cooling requirements of the scrubbing process by means of an absorption-type refrigeration unit, cooling the combustion gases prior to scrubbing, in indirect heat exchange with gas streams to be heated, the indirect heat exchange being performed in an upper temperature range and a subsequent lower temperature range and using air as said gas stream to be heated in the upper temperature range of the indirect heat exchange, resultant heated air being used in part as (a) preheated air of combustion and in part as (b) an energy source for the operation of the absorption-type refrigeration unit.

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**4,294,591**

## MOUNTING FOR HIGH-VOLTAGE ELECTRODE SUPPORT FRAME IN AN ELECTROSTATIC PRECIPITATOR

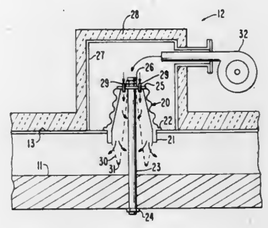
**Melvin R. Kahl, Richland, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.**

**Filed May 12, 1980, Ser. No. 148,845**
**Int. Cl.³ B03C *3/70, 3/41;* H01B *17/54, 17/52***
**U.S. Cl. 55—120** **9 Claims**

1. In an electrostatic precipitator having a housing with an opening formed therein and a mounting assembly suspending an electrically conductive support frame for a high-voltage electrode in the electrostatic precipitator, said mounting assembly comprising:



(a) an electrical insulator having a bore therethrough, said insulator being secured to said housing of the precipitator circumjacent the opening therein;
(b) a substantially gas-tight housing portion, stationed on said housing over said opening, said housing portion enclosing said insulator;
(c) fastening means for securing said support frame to said insulator, said fastening means including:
(i) an elongate portion affixed to said support frame and extending upward through said opening and through said insulator bore, and
(ii) a connecting portion extending outward from said



elongate portion and bearing against said insulator, said connecting portion having inlet ports for permitting gas flow from said housing portion into said bore;
(d) means for introducing heated gas into said housing portion; and
(e) a porous fabric skirt positioned in said insulator bore so that heated gas flowing from said housing portion into said insulator bore passes through said porous fabric skirt as it enters into said precipitator, said skirt being mechanically fastened to said connecting portion and to a bottom portion of said insulator to prevent direct exposure of the bore of the insulator to particulate-laden gas within the precipitator housing.

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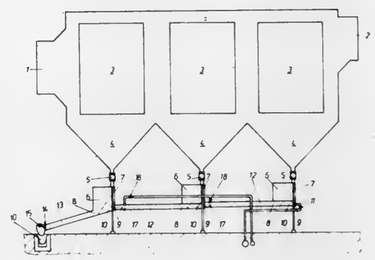
**4,294,592**

## APPARATUS FOR THE HYDRAULIC TRANSPORT OF PRECIPITATOR DUST

**Horst Buchmüller, Hünxe, and Bernhard Michelbrink, Wesel, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Filed Jun. 20, 1980, Ser. No. 161,653**
**Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926330**
**Int. Cl.³ B03C *3/00***
**U.S. Cl. 55—120** **5 Claims**



1. Apparatus for precipitating dust and the hydraulic transport of precipitator dust from a precipitator plant, comprising precipitator cells; a plurality of hoppers consecutively arranged in flow direction of gas to be cleaned by said precipitator cells; discharge means connected to said hoppers; a sluice chamber for each hopper and connected to said discharge means underneath said hoppers, said sluice chamber having an inlet for rinse water and an outlet for a mixture of rinse water and precipitator dust; the outlet of the sluice chamber of the rear hopper in gas flow direction being connected with the inlet of the sluice chamber of the preceding hopper by one sluiceway each, only the sluice chamber of the last hopper being supplied with fresh rinse water; each chamber having only a single source of rinse water, the sluice chamber of the last hopper having an outlet connected to an inlet of its immediately preceding sluice chamber so that said latter chamber is rinsed with water already containing filtered dust; said latter chamber having an outlet connected to the input of its own immediately preceding chamber so that the rinse water flows thereby in sequence through all sluice chambers located below the individual hoppers, the rinse water becoming increasingly laden with dust in its flow direction, the flow direction of the rinse water being opposite to the flow direction of the gas to be cleaned.

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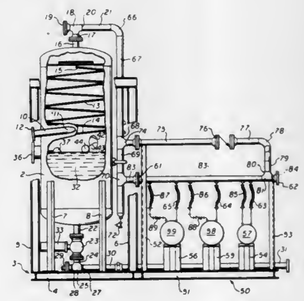
**4,294,593**

## DRILLING MUD DEGASSER APPARATUS AND SYSTEM

**William A. Rehm, 1726 Augusta, Suite 113, Houston, Tex. 77057**

**Filed May 2, 1980, Ser. No. 145,895**
**Int. Cl.³ B01D *19/00***
**U.S. Cl. 55—166** **15 Claims**



1. A drilling mud degasser system comprising
a tank having an inlet for drilling mud and an overhead outlet for removal of gas and a bottom outlet for removal of degassed mud,
a plurality of blowers operatively connected to said overhead outlet for evacuating the same to remove gas from drilling mud therein,
pressure operated switch means operable to energize said blowers successively upon occurence of a predetermined pressure on the inlet side of said blowers, and
thermostatic switch means responsive to gas temperature on the outlet sides of said blowers and operable upon occurence of a predetermined temperature to deenergize at least one of said blowers.

15. A drilling mud degasser tank comprising
a hollow enclosed tank having
a side inlet for receiving drilling mud,
a top outlet for removal of gas, and
a bottom outlet for removal of degassed drilling mud,
a helical shelf supported inside the wall of said tank having the bottom end thereof adjacent to said side inlet to receive drilling mud thereon and spiralling upward along the tank wall so that mud moving along said shelf may fall as a thin sheet or film into the interior of the tank, thus facilitating removal of gas therefrom, and
said helical shelf narrower at its bottom end than at its top end and tapering outward from bottom to top along its helical length.

**4,294,594**

## SELF-CONTAINED FILTER ASSEMBLY FOR REMOVING AIR, PARTICLES AND BACTERIA FROM A SOLUTION

**Thomas E. Sloane, Jr., West Redding; Clair Melius, Southport, both of Conn., and Erich Kling, Carmel, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.**

**Filed Oct. 2, 1979, Ser. No. 81,185**
**Int. Cl.³ B01D** *25/00, 53/22*
**U.S. Cl. 55—186** **15 Claims**

1. A filter assembly for removing particulate matter, bacteria, and air from a liquid, said filter assembly comprising:
a housing having first, second, and third chambers;
inlet means for receiving said liquid containing air in said first chamber;
first venting means for venting said air in said first chamber to the atmosphere;
passage means providing a fluid passage from said first chamber to said second chamber;
prefilter means for preventing particulate matter in said liquid from entering said second chamber;
second venting means for venting to the atmosphere the air entering said second chamber;
means providing a fluid passage from said second chamber to said third chamber;
bacteria filtering means for preventing air and bacteria in said second chamber from entering said third chamber; and
outlet means for providing an exit for the liquid in said third chamber.

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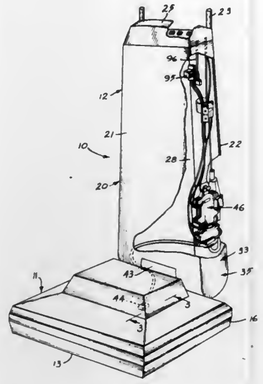
**4,294,595**

## VACUUM CLEANER INCLUDING AUTOMATIC SHUTOFF DEVICE

**Leonard E. Bowerman, Fairfield, Conn., assignor to Electrolux Corporation, Old Greenwich, Conn.**

**Filed Jul. 18, 1980, Ser. No. 170,244**
**Int. Cl.³ B01D** *46/46;* **A47L** *9/12*
**U.S. Cl. 55—213** **7 Claims**

1. In a vacuum cleaner having a motor, a nozzle intake, dirty air passageways extending from the nozzle intake to a filter, a housing for the filter, and a door in the housing for access to the filter, a fan operably connected to the motor to draw air through the dirty air passageways and the filter, and a clean air passageway extending between the filter and the fan, the improvement comprising:
means for sensing the differential pressure between the dirty air passageways at a first point ajacent the nozzle intake and at a second point along the clean air passageway,
a first switch means responsive to a predetermined change in the differential pressure due to clogging of the dirty air passageways or a full filter,
relay means normally electrically connecting said first switch means and the motor, said relay means being activated in response to said first switch means to interrupt power to the motor until said relay is reset,



a second switch means operatively connected through said relay means to interrupt power to the motor in response to the absence of the filter in the filter housing,
and a bypass valve means selectively connecting said sensing means to atmosphere for defeating the operation of said pressure differential sensing means to thereby permit an auxiliary cleaning tool to be operatively connected along the dirty air passageway.

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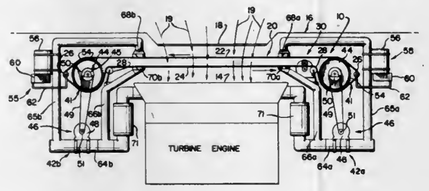
**4,294,596**

## AIR-FILTER APPARATUS IN COMBINATION WITH A TURBINE ENGINE

**Dan Taverez, 17375 Brookhurst, No. 46, Fountain Valley, Calif. 92644**

**Filed Apr. 25, 1980, Ser. No. 143,880**
**Int. Cl.³ B01D** *45/10, 46/04, 46/22*
**U.S. Cl. 55—242** **3 Claims**




1. An air-filter apparatus in combination with a turbine engine having an air intake, wherein said air-filter apparatus comprises:
an air filter formed as a continuous movable loop positioned transversely over the air intake of said turbine engine, said air filter being defined by a continuously formed belt-like blanket of fibrous material to filter foreign matter, and having a first outer layer and a second inner layer which continuously move in opposite directions from each other longitudinally;
means for movably supporting said looped air filter, whereby said air filter moves longitudinally about said support means, said support means including rotatable support spindle guides and tension spindles;
a first drive means positioned and arranged to drive said air filter;



a pair of rotating brushes, each brush being positioned within respective looped ends of said air filter to engage said first and second layers thereof;
brush-drive means attached to said brushes to rotate said brushes at a speed less or greater than the longitudinal movement of said air filter;
means for applying a cleaning fluid to said air filter, which comprises a plurality of holes formed in said support spindle guides, to supply the cleaning fluid directly to said air filter and a reservoir having a pump interconnected to said support spindle guides, to provide cleaning fluid to said support rollers as said air filter moves thereon;
a pair of vacuum systems, each being positioned on opposite sides of said turbine engine and having vacuum means for removing said foreign matter from said air filter, and said vacuum systems being connected to said air intake such that said air intake provides a vacuum source.

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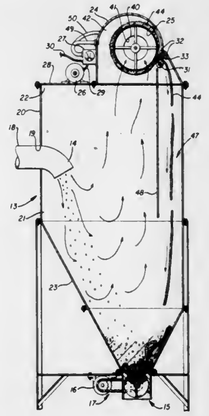
**4,294,597**

## LINT COLLECTING SYSTEM AND APPARATUS

**Ronald J. Archer, 3414 Brookglen, Garland, Tex. 75042, and Richard V. Fetterly, 12801 Champion Forest Dr., Houston, Tex. 77066**

**Filed Mar. 17, 1980, Ser. No. 131,280**
**Int. Cl.³ B01D** *46/04*
**U.S. Cl. 55—283** **9 Claims**



1. In an air cleaning system having a rotary filter means and bin structure: said bin structure comprising, a bin with a plenum chamber; said filter means comprising roller filter means mounted in the top of said bin plenum chamber; doffer roller means for removing bat deposited on said roller filter means; air flow system means for delivery of particle laden air to said bin plenum chamber, and developing a pressure differential across from a first side to a second side of said roller filter means and for exhausting air from the second side of said roller filter means and from said bin; barrier wall means within said bin extending down from said doffer roller means through a substantial vertical distance within said bin to provide a still chamber generally separate from said plenum chamber, with bat removed from said roller filter means falling through said still chamber to the bottom of said bin and air lock means for removing deposited material from bottom of said bin.

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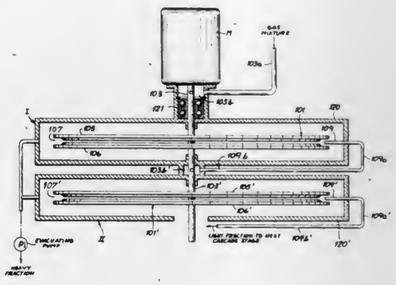
**4,294,598**

## APPARATUS FOR THE SEPARATION OF GAS MIXTURES, PARTICULARLY THE ENRICHMENT OF A GAS MIXTURE IN A COMPONENT CONTAINING URANIUM 235

**Hans O. E. Gazda, Anton-Krieger-Gasse 155, A-1238 Wien, Austria**

**Division of Ser. No. 889,395, Mar. 23, 1978, Pat. No. 4,225,324. This application Jul. 19, 1979, Ser. No. 59,055**
**Claims priority, application Austria, Mar. 24, 1977, 2076/77**
**Int. Cl.³ B01D** *45/14*
**U.S. Cl. 55—403** **5 Claims**



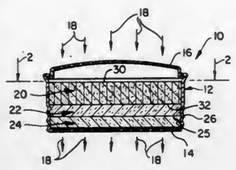
1. An apparatus for separating a light component from a heavy component in a gas mixture, said apparatus comprising:
a housing; a shaft rotatable about an upright axis; and extending into said housing;
a motor operatively connected to said shaft for rotating same;
a plurality of axially spaced centrifuge disks positioned in said housing and mounted on said shaft and rotatable therewith, each of said disks being formed with a radial passage extending from a central portion of the respective disk outwardly and opening into a peripheral compartment of greater axial width than the passage at the outer periphery of the respective disk;
means for feeding said gas mixture centrally to a first of said disks for acceleration outwardly through its radial passage whereby a turbulent flow is formed along the peripheral compartment of said first of said disks;
means in said housing for recovering a light component from said mixture through the passage of said first of said disks and including a duct reaching into said boundary layer from said housing at a location thereon radially outwardly of said one of said disks;
means for feeding the light component collected from the boundary layer of said first of said disks and supplying it centrally to a second of said disks for acceleration through the passage of said second of said disks whereby another boundary layer is maintained adjacent the periphery of said second of said disks by the interaction of the accelerated light component in said second of said disks and the surrounding body of gas retained by the respective compartment of said housing; and
a further duct reaching radially from said housing into said boundary layer of said second of said disks to collect a light component therefrom whereby said disks are connected in cascade for multistage recovery of said light component from said mixture.

**4,294,599**

## AEROSOL FILTER CARTRIDGE

**William R. Grovesteen, Southbridge, and John A. Jones, Wilbraham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.**

**Filed Feb. 19, 1980, Ser. No. 122,206**
**Int. Cl.³ B01D** *50/00, 46/12*
**U.S. Cl. 55—485** **6 Claims**



1. In an aerosol filter cartridge having a shell containing an air filtering system including final filtering components, the improvement of a prefiltering component comprising:

an elongated mat of glass fibers, said mat being closely spiraled with opposite edges thereof providing opposite air-receiving and air-emitting faces of said component, one of said faces being adjacent to said final filtering components and a side of said spiraled mat being closely fitted against said shell.

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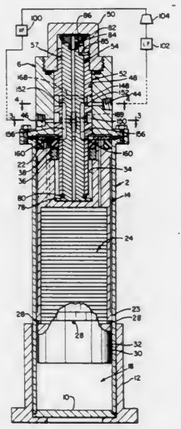
**4,294,600**

## VALVES FOR CRYOGENIC REFRIGERATORS

**Domenico S. Sarcia, Carlisle, Mass., and Calvin K. Lam, Bedford, N.H., assignors to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.**

**Filed Oct. 29, 1979, Ser. No. 89,272**
**Int. Cl.³ F25B** *9/00*
**U.S. Cl. 62—6** **29 Claims**



19. A cryogenic refrigerator comprising:

cylinder means;

displacer means movable within the cylinder means according to a four step sequence wherein it (a) dwells in an uppermost position, (b) moves downwardly, (c) dwells in a lowermost position and (d) moves upwardly again;

first and second chambers the volumes of which are defined by movement of the displacer means,

conduit means connecting said first and second chambers,

thermal storage means associated with said conduit means,

supply reservoir means for supplying high pressure fluid;

exhaust reservoir means for receiving low pressure fluid; and

refrigerator regulating valve means associated with the supply and exhaust reservoir means for causing high pressure fluid to enter the first chamber and the conduit means during the first-mentioned and second-mentioned steps of the displacer means motion and to exhaust low-pressure fluid during the third and fourth steps of the displacer means motion, said valve means comprising a valve casing fixed with respect to the cylinder means and a valve member slidable relative to the casing, the casing having one or more pairs of diametrically opposed inlet ports communicating with said supply reservoir means and one or more pairs of diametrically opposed outlet ports communicating with said exhaust reservoir means, said valve casing and valve member also having cooperating means for alternately connecting said first chamber to said inlet or outlet ports according to the movement of the valve member between two limit positions, and cooperating means on the displacer means and valve member for (a) causing the valve member to be in one of its limit positions and the displacer means to be in its uppermost position concurrently, and (b) causing the valve member to be in its other limit position and the displacer means to be in its lowermost position concurrently.

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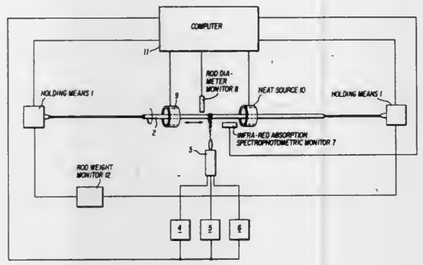
**4,294,601**

## APPARATUS AND PROCESS FOR AUTOMATIC CONTROL OF THE PRODUCTION OF OPTICAL FIBER

**Franklin W. Dabby, Woodbridge, and Ronald B. Chesler, Cheshire, both of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.**

**Filed Jul. 13, 1979, Ser. No. 57,501**
**Int. Cl.³ C03B** *37/025, 37/07, 37/075*
**U.S. Cl. 65—3.12** **19 Claims**




16. In a process for the production of optical fiber comprising preparing a preform by depositing and sintering glass particles on a cylindrical glass rod, heating said preform to the drawing temperature, and drawing said preform into optical fiber, the improvement comprising continuously monitoring the diameter of the glass rod during deposition of the glass particles and adjusting the composition of said particles in response to the diameter measurement such that the particles are uniformly distributed across the length of the rod at the appropriate composition for a given radial distance from the rod axis.

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**4,294,602**

## ELECTRO-OPTICALLY ASSISTED BONDING

**William E. Horne, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Aug. 9, 1979, Ser. No. 64,994**
**Int. Cl.³ C03C** *27/00*
**U.S. Cl. 65—40** **12 Claims**

1. A method of integrally bonding a cover glass to a surface of a semicondutor cell having conductors thereon, comprising the steps of:

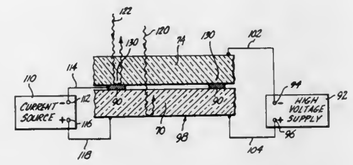


providing a semiconductor cell and a cover glass having a desired ratio of energy absorptions at a certain wavelength;

juxtaposing the cover glass and the semiconductor cell, the conductors spacing apart the cover glass and the semiconductor cell;

applying a predetermined electrostatically-bonding high voltage between the outer surfaces of the juxtaposed cover glass and the semiconductor cell;

pre-heating the juxtaposed cover glass and the semiconductor cell to a first temperature sufficient to promote ion drift in the cover glass and to establish an electrostatic field between the cover glass and the cell; and




irradiating the juxtaposed cover glass and the semiconductor cell with a pulsed beam of electromagnetic energy at the certain wavelength on a path substantially normal to said cover glass to heat the juxtaposed cover glass and the silicon cell to a second temperature higher than the first temperature except in those regions above the conductors which are heated to a third temperature higher than the second temperature due to reflection back into said cover glass of the pulsed beam by the conductors, the third temperature sufficient to enable the cover glass to soften and flow around the conductors so that the cover glass is electrostatically drawn toward the adjacent surface of the semiconductor cell to bond the surfaces thereof along substantially all of the interface therebetween.

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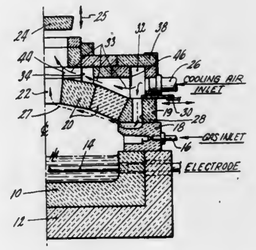
**4,294,603**

## GLASS FOREHEARTH CONSTRUCTION

**Frederick W. Winzer, East Granby, and James R. Ault, New Britian, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.**

**Filed Sep. 4, 1979, Ser. No. 71,923**
**Int. Cl.³ C03B** *5/16*
**U.S. Cl. 65—346** **1 Claim**




1. A molten glass forehearth comprising an elongated channel for constraining the flow of molten glass, a roof structure for said channel and including side blocks of heat conductive refractory material supported on the channel sides, said roof structure including arch blocks also of heat conductive refractory material supported on said side blocks, said roof structure defining top openings at longitudinally spaced locations in the forehearth, closure blocks supported in spaced relationship above said top openings, roof superstructure means supported by said side blocks and said arch blocks, said roof superstructure means including a plurality of longitudinally spaced blocks defining transverse muffled cooling air passageways therebetween, a source of cooling air communicating with the outer ends of said muffled cooling air passageways, inner ends of said muffled cooling air passageways communicating with said top openings, said roof superstructure further including insulating bricks supported by said longitudinally spaced blocks to provide for substantial heat transfer from said refractory brick roof structure to the cooling air flowing in said muffled cooling air passageways, said refractory blocks of said roof structure defining direct cooling air passages having inner ends communicating with the interior of said forehearth channel to direct air along the interior of the arch blocks toward said top openings, and outer ends of said direct cooling air passageways communicating with a plenum defined by said roof superstructure insulating bricks, said plenum also communicating with said transverse muffled cooling air passageways and with said source of cooling air, and means for selectively closing said direct cooling air passageways.

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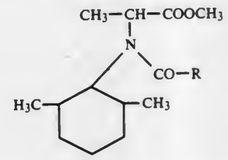
**4,294,604**

## USE OF SELECTED N-(2,6-DIMETHYLPHENYL)-ALANINE METHYL ESTER COMPOUNDS AS AMMONIUM NITRIFICATION COMPOUNDS

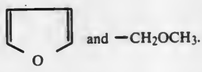
**Thomas O. Evrard, Little Rock, Ark., assignor to Olin Corporation, New Haven, Conn.**

**Filed Feb. 25, 1980, Ser. No. 124,185**
**Int. Cl.³ C05C** *11/00*
**U.S. Cl. 71—27** **12 Claims**

1. A method for inhibiting the nitrification of ammonium-nitrogen in soil which comprises treating the soil with an effective nitrification-inhibiting amount of at least one of the nitrification-inhibiting compounds having the formula:



wherein R is selected from the group consisting of:



and $-CH_2OCH_3$.

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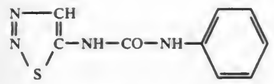
**4,294,605**

## AGENTS FOR THE DEFOLIATION OF PLANTS

**Friedrich Arndt; Reinhard Rusch, and Heinz Schulz, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

**Continuation of Ser. No. 651,522, Jan. 22, 1976, abandoned. This application Nov. 21, 1979, Ser. No. 96,577**
**Claims priority, application Fed. Rep. of Germany, Feb. 14, 1975, 2506690**
**Int. Cl.³ A01N** *43/82*
**U.S. Cl. 71—73** **3 Claims**

1. Method for defoliating cotton plants, comprising applying to the plants N-phenyl-N¹-1,2,3-thiadiazol-5-yl urea of the formula



in mixture with liquid or solid carriers.

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**4,294,606**

## NOVEL N-PHENYL-SUBSTITUTED N-HETEROCYCLIC COMPOUNDS, THEIR PREPARATION AND USE IN AGENTS FOR REGULATING PLANT GROWTH

**Hans Tobler, Allschwil; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

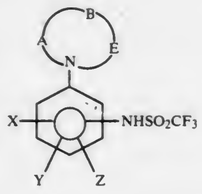
**Division of Ser. No. 896,970, Apr. 12, 1978, Pat. No. 4,208,202. This application Jan. 14, 1980, Ser. No. 111,552**

**Claims priority, application Switzerland, Apr. 15, 1977, 4702/77; Nov. 9, 1977, 13661/77**

**Int. Cl.³ A01N** *43/40;* **C07D** *295/12;* **A01N** *43/36, 43/46*

**U.S. Cl. 71—88** **13 Claims**

1. A compound of the formula



or a physiologically acceptable salt thereof, in which A + B + E together are $C_3$-$C_6$ alkylene, and X, Y and Z independently of one another are each hydrogen, halogen, $C_1$-$C_4$ alkyl or halogenoalkyl, cyano, nitro, —CS-$NH_2$, substituted or unsubstituted benzyl or a group $—S(O)_n—R_6$, $—OR_7$, $—COOR_8$, $—SO_2—N(R_{10})_2$ or $—N(R_{11})_2$, in which n is a number from nought to 2, $R_6$ is $C_1$-$C_5$ alkyl, or phenyl or phenylalkyl ($C_1$-$C_5$), $R_7$ is $C_1$-$C_5$ alkyl, lower alkoxyalkyl, lower alkoxyalkoxyalkyl, lower alk(en)ylcarbonyl, phenyl or benzoyl which can be substituted by lower alkyl, halogen, CN, $CF_3$ or $NO_2$, $R_8$ is hydrogen or lower alkyl, $R_{10}$ is $C_1$-$C_4$ alkyl and $R_{11}$ is hydrogen or $C_1$-$C_4$ alkyl.

11. An composition for regulating plant growth which contains, in addition to carrier materials, at least one trifluoromethanesulphonamido-phenyl-substituted heterocyclic compound according to claim 1 as the active component.

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**4,294,607**

## HERBICIDAL COMPOSITIONS

**Robert R. Schmidt, Cologne, and Rudolf Thomas, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Sep. 10, 1979, Ser. No. 73,982**

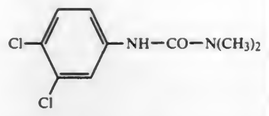
**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842003**

**Int. Cl.³ A01N** *43/56, 47/30*

**U.S. Cl. 71—92** **13 Claims**

1. Herbicidal composition containing a total of 0.1 to 95% by weight as active ingredients

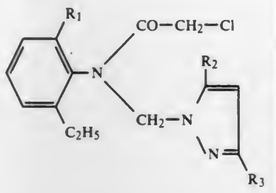
(1) 3-(3,4-dichlorophenyl)-1,1-dimethylurea, of the formula



(I),

and

(2) at least one N-substituted haloacetanilide compound of the formula



(II),

wherein

$R^1$ is methyl or ethyl;

$R^2$ is hydrogen or methyl; and

$R^3$ is hydrogen or methyl.

in a ratio of between 1:0.5 to 1:5 by weight compound (I):(II).

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**4,294,608**

## CATALYTIC ALLOYS

**John M. Sedlak, Andover, Mass., and Richard J. Lawrance, Hampstead, N.H., assignors to General Electric Company, Wilmington, Mass.**

**Filed Mar. 27, 1980, Ser. No. 134,853**

**Int. Cl.³ C22B** *61/00*

**U.S. Cl. 75—0.5 A** **21 Claims**

1. A method of making a finely-divided metal alloy comprising the steps of:

(a) mixing in aqueous solution the water-soluble salts of at least two metals and a first reducing agent in an amount and under conditions insufficient to reduce the metal salts in solution;

(b) adding the aqueous solution of metal salts containing the first reducing agent to a caustic solution of a second reducing agent present in an amount sufficient to cause the reduction of the dissolved metal salts at elevated temperatures, whereby a precipitate of alloy of the metals in the metal salts forms in the solution; and

(c) separating the precipitate from the solution.



**4,294,609**

## PROCESS FOR THE REDUCTION OF IRON OXIDE

**Stefano Taricco, Turin, Italy, assignor to Centro Ricerche Fiat S.p.A., Turin, Italy**

**Filed May 15, 1980, Ser. No. 150,113**

**Claims priority, application Italy, Jun. 25, 1979, 68346 A/79**

**Int. Cl.³ C21B** *13/14*

**U.S. Cl. 75—34** **5 Claims**

1. A process for the reduction of particulate iron oxide, wherein said iron oxide is heated continuously in an atmosphere of reducing gas as the sole reducing agent at a temperature between 600° C. and 650° C. for about one hour to convert the particles of said iron oxide to a porous form which allows thorough penetration by said reducing gas and than at a temperature between 900° C. and 1100° C. for about one hour to complete the reduction of said iron oxide to iron.

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**4,294,610**

## FOUNDRY COKE

**Edward D. Burton, Chesterfield, Mo., assignor to Great Lakes Carbon Corporation, New York, N.Y.**

**Continuation of Ser. No. 896,579, Apr. 14, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,547**

**Int. Cl.³ C04B** *7/02*

**U.S. Cl. 75—43** **9 Claims**

1. A coke suitable for use as fuel in a foundry cupola to produce gray iron, said coke containing uniformly distributed throughout its structure from 0.5 to 2.5% by wt. of silicon carbide effective to act as a deoxidizer and inoculant during the melting of said gray iron and which is blended with the coal used to produce said coke prior to coking said coal.

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**4,294,611**

## PROCESS AND APPARATUS FOR REDUCING THE INCLUSION CONTENT OF STEELS AND FOR REFINING THEIR STRUCTURE

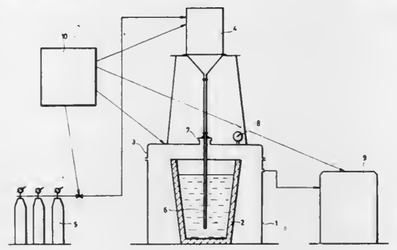
**Istvan Tamas; Lajos Tamas; Gyula Kiss; Jozsef Kiss, and Antal Kaldor, all of Budapest, Hungary, assignors to Vasipari Kutató Intézet, Budapest, Hungary**

**Filed Oct. 3, 1979, Ser. No. 81,350**

**Claims priority, application Hungary, Oct. 4, 1978, VA 1535**

**Int. Cl.³ C21C** *7/10*

**U.S. Cl. 75—49** **2 Claims**



1. A process for reducing the inclusion content of steels and refining their structure which comprises the steps of subjecting molten steel containing inclusions to a pressure about 2 to 6 atms; removing inclusions from the molten steel by injecting therein at said pressure through a blast lance by means of an inert gas an inclusion-removing alloy containing calcium or magnesion; and thereafter applying a vacuum of $10^{-3}$ to 10 Torr to the molten steel to evaporate residual calcium or magnesium from the steel.

**4,294,612**

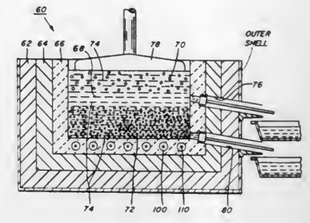
## FRACTIONAL CRYSTALLIZATION PROCESS

**Robert K. Dawless, Monroeville, and Robert E. Graziano, Arnold, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 973,138, Dec. 26, 1978, Pat. No. 4,221,590. This application Nov. 30, 1979, Ser. No. 98,736**

**Int. Cl.³ C22B** *21/02*

**U.S. Cl. 75—68 R** **4 Claims**




1. An improved method for purifying impure aluminum by fractional crystallization comprising the steps of:

(a) providing an open topped vessel for retention of molten aluminum, the vessel having sidewalls and a bottom which are comprised of an outer shell and a multilayered lining which is used for purposes of containing the molten aluminum, the lining having

(i) an outer insulating layer adjacent said shell;

(ii) an intermediate layer of powdered alumina; and

(iii) an inner layer of high purity refractory being at least 90 wt.% alumina and being sintered in place from a powder form to provide a monolithic lining resistant to penetration by molten aluminum and thereby providing the aluminum with substantial freedom from contamination;

(b) providing a body of impure aluminum in a molten state in the vessel for purposes of purification;

(c) removing heat at the surface of the body of impure aluminum for purposes of removing eutectic impurities therefrom by forming aluminum crystals therein, said crystals having a higher purity than the remaining liquid aluminum constituting the remaining fraction having impurities concentrated therein, the crystals being displaced away from the heat removing surface, a portion of the crystals collecting in a bed adjacent the bottom of the vessel; and

(d) introducing heat to the body adjacent the bottom thereof for purposes of melting a portion of the crystals collected adjacent the bottom of the vessel using heating elements which are protected from molten aluminum by said monolithic lining, and the melted portion is moved through the crystals by action of crystals being displaced away from the heat removing surface and whereby the melted portion carries impurities towards the upper part of the body.

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**4,294,613**

## ACID RESISTANT, HIGH-STRENGTH STEEL SUITABLE FOR POLISHING

**Henrik Giflo, III Ujitok u.5, 3532 Miskolc, Hungary**

**Filed Jul. 3, 1979, Ser. No. 54,526**

**Int. Cl.³ C22C** *38/06*

**U.S. Cl. 75—124** **4 Claims**

1. A high strength steel, suitable for polishing and acid-resistant cohesion, consisting essentially of, besides iron and the usual residual elements, 0.04 to 2% (by weight) of C, 0.1 to 1% (by weight) of Si, 0.1 to 5% (by weight) of Mn, at least 5% (by weight) of Cr, at most 12% (by weight) of Ni, 0.01 to 4% (by weight) of Cu, 0.05 to 3% (by weight) of Mo, 0.005 to 0.6% (by weight) of N, 0.005 to 0.25% (by weight) of Zr or Be or their mixture, 0.001 to 0.2% (by weight) of Al, 0.04 to 1.5% (by weight) of Nb or V or their mixture, 0.001 to 0.01% (by

weight) of Ca and at least 0.001 (by weight) of B or Ce or their mixture.

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**4,294,614**

## AUSTENITIC IRON-BASE CRYOGENIC ALLOY AND ARC WELDING ELECTRODE FOR DEPOSITING THE SAME

**Damian J. Kotecki, Spring Garden Township, York County, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.**

**Filed Oct. 17, 1979, Ser. No. 85,471**
**Int. Cl.³ C22C *39/54, 38/04, 38/44***
**U.S. Cl. 75—128 A** **4 Claims**

1. An austenitic iron-base cryogenic alloy consisting essentially of, in weight percent,

| | |
|---|---|
| Carbon | 0.05 min. to 0.20 max. |
| Manganese | 3.5 to 7.0 |
| Silicon | 0.75 max. |
| Chromium | 13.0 to 17.0 |
| Nickel | 14.0 min. |
| Molybdenum | 1 to 3 |
| Iron plus unavoidable impurities | Balance, |

and containing no more than 2FN delta ferrite, said alloy displaying at least 15 mils lateral expansion when impact tested by the Charpy V-notch test at −320° F.

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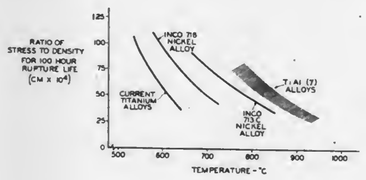
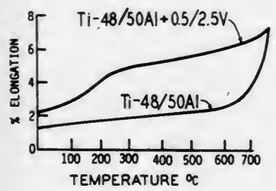
**4,294,615**

## TITANIUM ALLOYS OF THE TIAL TYPE

**Martin J. Blackburn, Kensington, and Michael P. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Jul. 25, 1979, Ser. No. 60,265**
**Int. Cl.³ C22C *14/00;* C21D *1/00***
**U.S. Cl. 75—175.5** **6 Claims**




1. A cast and forged titanium alloy with ductility at room temperature and good high temperature strength, consisting essentially of by weight percent 31-36 aluminum, 0.1-4 vanadium, balance titanium (in atomic percent, about: 45-50Al, 0.1V, bal Ti).

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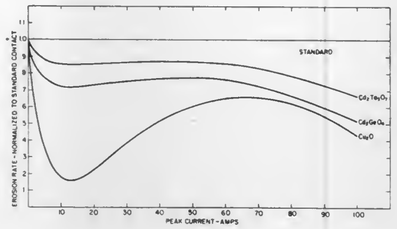
**4,294,616**

## ELECTRICAL CONTACTS

**Han J. Kim, Greensburg, Pa.; Thomas E. Peters, Chelmsford, and John Gustafson, Harvard, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jan. 2, 1979, Ser. No. 628**
**Int. Cl.³ H01H *1/02***
**U.S. Cl. 75—234** **5 Claims**




1. An electrical contact having a working surface consisting essentially of from about 50 to about 95 percent by weight silver or silver alloy, from about 5 to about 50 percent by weight of cadmium oxide, and an additional oxide selected from the oxides of germanium, tantalum, and mixtures thereof, said additional oxide being present in an effective amount sufficient to reduce the surface energy between said working surface and the liquid phase of said silver and being substantially homogeneously distributed on said surface in a silver matrix.

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**4,294,617**

## COMPOSITIONS AND METHODS FOR THE DENATURATION OF WATER-BASE PAINTS

**Philippe Schlicklin, Nancy; Anne-Marie Mertzweiller nee Maillard, Maidieres, and Jacques Ploussard, Pont a Mousson, all of France, assignors to Air Industrie, France**

**Continuation of Ser. No. 938,909, Sep. 1, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 141,796**
**Claims priority, application France, Sep. 6, 1977, 77 26948**
**Int. Cl.³ C09D *5/08***
**U.S. Cl. 106—14.37** **9 Claims**

1. Method for the denaturation of water-base paints, characterized in that the paint is contacted with and dispersed in a solution containing between 1.5 to 10 g/l of at least one sulphate of iron (II), of magnesium or of manganese and at least one non-ionic surface active agent corresponding to general formula

$$R{-}O(CH_2{-}CH_2{-}O)_n{-}(CH_2{-}\underset{CH_3}{CH}{-}O)_p{-}H$$

in which R is an alkyl, aryl, aryl-alkyl or alkyl-aryl group, containing at least 10 carbon atoms, and n and p are whole numbers of which one may be zero, and n+p being comprised between 12 and 100, said solution having a pH during use of between 6.5 and 8.0.

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**4,294,618**

## SILICA-DOPED, CHROME-ALUMINA MONOLITHIC REFRACTORY COMPOSITIONS

**Henry E. Anthonis, Annapolis, Md., assignor to General Refractories Company, Bala Cynwyd, Pa.**

**Filed May 27, 1980, Ser. No. 152,992**
**Int. Cl.³ C04B *35/10, 35/12***
**U.S. Cl. 501—129** **8 Claims**

1. A monolithic refractory composition comprising:
from about 63% to 90% by weight high purity $Al_2O_3$;



from about −2-8% by weight free crystalline silica having a particle size of −200 mesh;
from about 2-6% by weight high purity $Cr_2O_3$;
from about 1-8% by weight high purity kaolin clay having a particle size of −10μ (micron); and
from about 5-15% by weight phosphate binder.

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**4,294,619**

## METHOD OF PRODUCING PIGMENTED SILICATE COATINGS

**Donald C. Dulaney, Gurnee, and John A. Bowman, Wheeling, both of Ill., assignors to Rust-Oleum Corporation, Vernon Hills, Ill.**

**Filed Apr. 1, 1980, Ser. No. 136,322**
**Int. Cl.³ C09D *5/04, 5/08, 5/10***
**U.S. Cl. 106—188** **4 Claims**

1. A method of manufacturing pigmented hydrolyzed ethyl silicate binders suitable for use in zinc-rich primers wherein an extender pigment suitable for use in zinc-rich primers is added to an organic solvent containing ethyl hydroxy ethyl cellulose, ground in a paint manufacturing grinder to the proper size, and added to a solution containing partially hydrolyzed ethyl silicate.

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**4,294,620**

## PHTHALOCYANINE FORMULATIONS

**Reinhard Sappok, Heidelberg, and Joachim Kranz, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jan. 29, 1980, Ser. No. 116,582**
**Int. Cl.³ C09B *47/08***
**U.S. Cl. 106—288 Q** **10 Claims**

1. A pigmentary phthalocyanine formulation, prepared by a process comprising:
dry milling (a) a crude phthalocyanine with (b) from 2 to 20% by weight, based on (a), of at least one urea derivative of the formula:

$$K{-}(-NHCO{-}NH{-}R)_2 \quad (I)$$

where K is 1,5-naphthylene or 4,4'-diphenylenemethane; R is alkyl of 12 to 18 carbon atoms, alkenyl of 12 to 18 carbon atoms, 3-(alkoxy of 8 to 18 carbon atoms)-propyl, 2-(alkylthio of 8 to 18 carbon atoms)-ethyl, 2-(alkylamino of 8 to 18 carbon atoms)-ethyl or $-(CH_2)_3-O-(CH_2CH_2O)_n-R^1$, wherein $R^1$ is alkyl of 2 to 8 carbon atoms or phenyl; and n is a integer of 1 to 4, in the absence of a grinding medium.

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**4,294,621**

## PRODUCTION OF AN ANTICORROSIVE PIGMENT ON PHOSPHATE BASIS

**Alexander Maurer; Renate Adrian, both of Hürth; Klaus Hestermann, and Gero Heymer, both of Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Apr. 16, 1980, Ser. No. 141,135**
**Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916029**
**Int. Cl.³ C08K *3/10;* C09D *5/08***
**U.S. Cl. 106—306** **8 Claims**

1. A process for making phosphorus-containing anticorrosive pigments with a particle size of at most 20 microns which comprises: converting, with agitation, fine pulverulent calcium and magnesium compounds selected from the group consisting of oxides, hydroxides, carbonates, basic carbonates or carboxylates together with water to a homogeneous suspension; intimately mixing said suspension inside a dispersing means rotating at a speed of 3000 to 10,000 rpm at 0° to 40° C. and in an approximately stoichiometric ratio with phosphoric acid or a solution of acid alkali metal or ammonium phosphates; separating resulting and precipitated pigment and drying it while maintaining its content of water of crystallization, the anticorrosive pigment being comprised of a homogeneous mixture or mixed crystals of which 10 to 95 mol% is calcium hydrogen phosphate dihydrate, the balance being magnesium hydrogen phosphate trihydrate, and of which an at least 55 weight% proportion consists of particles with a size of up to 5 microns with a BET-surface area of at least 1 $m^2/g$.

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**4,294,622**

## DRY WALL JOINT AND FINISHING COMPOUNDS

**William F. Brown, Wausau, Wis., assignor to Weston Research Corporation, Wausau, Wis.**

**Division of Ser. No. 954,445, Oct. 25, 1978, Pat. No. 4,238,239. This application Jun. 9, 1980, Ser. No. 157,306**
**Int. Cl.³ C04B *11/14***
**U.S. Cl. 106—314** **2 Claims**

1. A liquid additive composition for admixing with a wall board joint compound to provide a joint cement, said liquid additive composition comprising an aqueous mixture containing about 0.35 to about 8 weight % zinc oxide, about 0.35 to about 1.5 weight % sodium acetate, about 0.35 to about 3 weight % ammonium alum, and about 0.35 to about 8 weight % of an acrylic resin, based on the total weight of the aqueous mixture.

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**4,294,623**

## METHOD OF PRODUCING HIGH PURITY MALTOSE

**Hidemasa Hidaka, Urawa; Toshiaki Kohno, Yokohama, and Toshiaki Eida, Chigasaki, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan**

**Filed Dec. 5, 1979, Ser. No. 100,435**
**Claims priority, application Japan, Dec. 7, 1978, 53-150547**
**Int. Cl.³ C13D *3/12;* C13K *7/00;* C12P *19/22***
**U.S. Cl. 127—55** **3 Claims**

1. Method of producing high purity maltose having more than 97% of maltose content from a saccharified liquor containing less than 0.5% of glucose, 60~85% of maltose and less than 5% of maltotriose, the remainder oligosaccharide and/or dextrin, comprising passing said saccharified liquor through a column filled with granular activated carbon having a peak micropore diameter above 25 Å, thereby removing mainly dextrin, and then passing the liquor through a column filled with granular activated carbon having a main peak of micropore diameter distribution below 25 Å, thereby removing mainly oligosaccharide, and eluting without using any organic solvent.

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**4,294,624**

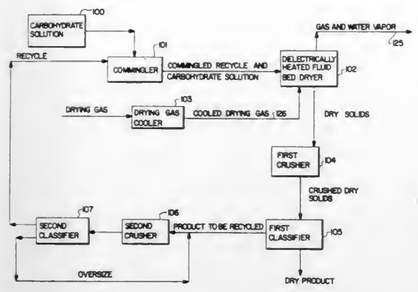
## DRYING CO-MINGLED CARBOHYDRATE SOLUTION AND RECYCLED PRODUCT BY DIELECTRIC HEATING

**Preston L. Veltman, 212 Old County Rd., Severna Park, Md. 21146**

**Filed Mar. 14, 1980, Ser. No. 130,531**
**Int. Cl.³ C13F *1/00, 5/00;* C13K *11/00***
**U.S. Cl. 127—62** **13 Claims**

1. A process for drying a carbohydrate solution to form a stable, solid, substantially anhydrous particulate product therefrom comprising:
(a) co-mingling said carbohydrate solution with recycled dry product solid to form a particulate admixture dryable in a dielectrically heated drying zone;
(b) drying said particulate admixture in said dielectrically heated drying zone at a particle temperature below the melting point of said particulate admixture to form said stable, solid, substantially anhydrous product;
(c) removing said stable, solid, substantially anhydrous prod-

uct from the drying zone and dividing it into a first portion and a second portion;




(d) recycling said first portion; and
(e) recovering said second portion.

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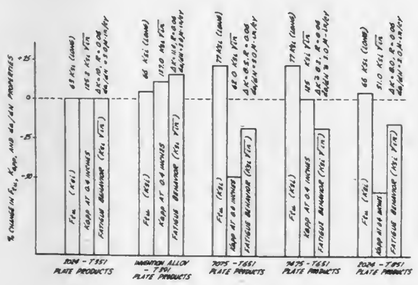
**4,294,625**

**ALUMINUM ALLOY PRODUCTS AND METHODS**

**Michael V. Hyatt, Bellevue, and William E. Quist, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Continuation-in-part of Ser. No. 974,484, Dec. 29, 1978, abandoned. This application Apr. 18, 1980, Ser. No. 141,272**
**Int. Cl.³ C22F *1/04*; C22C *21/16***
**U.S. Cl. 148—2** **33 Claims**



**11**. A method for producing a plate product from an aluminum alloy, said product having high strength, high toughness and improved fatigue properties comprising the steps of

providing an alloy consisting essentially of

| weight percent | element |
|---|---|
| 3.8 to 4.4 | Cu |
| 1.2 to 1.8 | Mg |
| 0.3 to 0.9 | Mn |
| 0.12 maximum | Si |
| 0.15 maximum | Fe |
| 0.25 maximum | Zn |
| 0.15 maximum | Ti |
| 0.10 maximum | Cr |
| 0.05 maximum | each trace element |
| 0.15 maximum | total of trace elements |
| balance | Al, |

casting said alloy into a body,
hot working said body to form a plate product,
solution heat treating the alloy in said product such that the maximum amount of Cu is taken into solid solution during the solution heat treating step;
quenching said product,
preaging said alloy at room temperature,
thereafter cold rolling said product to reduce the thickness of said product,
and
thereafter stretching said product to relieve residual stresses in said product.

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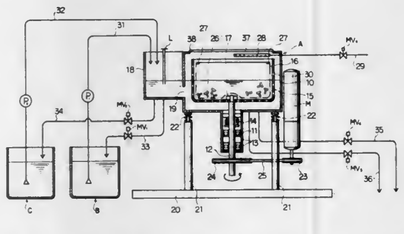
**4,294,626**

**METHOD FOR THE TREATMENT OF SURFACES AND APPARATUS EMPLOYED IN SAID METHOD**

**Atsushi Kirisawa, Maehara, Japan, assignor to Japan Envirotic Industry Co., Ltd., Nagoya, Japan**

**Filed Nov. 2, 1979, Ser. No. 90,578**
**Claims priority, application Japan, Nov. 9, 1978, 53-138487**
**Int. Cl.³ C23F *7/26***
**U.S. Cl. 148—6.2** **2 Claims**



**1**. A method of the chromate treatment which comprises; filling materials to be treated into holed container rotatably equipped in a vessel, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, charging nitric acid solution into said vessel with or without rotation of said holed container, exhausting said nitric acid solution with rotation of said holed container, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, charging chromate solution into said vessel with or without rotation of said holed container, exhausting said chromate solution with rotation of said holed container, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, and dehydrating and drying said material treated.

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**4,294,627**

**TREATMENT OF TINPLATE SURFACES**

**Peter J. Heyes, Swindon, England, assignor to Metal Box Limited, Reading, England**

**Filed May 28, 1980, Ser. No. 153,910**
**Claims priority, application United Kingdom, Jun. 7, 1979, 19793/79; Apr. 25, 1980, 13748/80**
**Int. Cl.³ C23F *7/02***
**U.S. Cl. 148—6.14 R** **8 Claims**

**1**. A method of treating a tinplate surface comprising the steps: wetting said tinplate surface with a solution free of organic polymeric materials and consisting essentially of a solvent, and a zirconium compound selected from the group consisting of ammonium zirconium carbonate and zirconium acetate at a concentration, calculated as $ZrO_2$, in the range between 0.1 and 10% w/w; and thereafter heating said tinplate surface to a temperature in the range between 20° and 300° C. until said surface is dry.



**4,294,628**

**METHOD FOR THE PRODUCTION OF CATHODE FOR USE IN ELECTROLYSIS**

**Kazuki Kasuya, Ichihara, Japan, assignor to Chlorine Engineers Corp., Ltd., Tokyo, Japan**

**Division of Ser. No. 008,813, Feb. 2, 1979, Pat. No. 4,238,311. This application Jun. 17, 1980, Ser. No. 160,333**
**Claims priority, application Japan, Feb. 20, 1978, 53/17690**
**Int. Cl.³ C25B *11/06, 11/02*; B01J *25/02***
**U.S. Cl. 148—6.35** **4 Claims**

**1**. A method for producing a cathode for use in electrolysis which comprises:
(a) forming a compact layer of $Fe_3O_4$ on a substrate of iron or an alloy of iron; and
(b) coating activating nickel comprising mainly nickel or an alloy of nickel on the $Fe_3O_4$ layer.

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**4,294,629**

**DRAWN RODS MADE OF LEAD BRASS AND A PROCESS FOR THE THERMAL TREATMENT THEREOF**

**Adam Szyszkowski, Tignieu; Marc Moreau, Asnieres, and Pierre Priester, Paris, all of France, assignors to Trefimetaux, Clichy, France**

**Filed Oct. 2, 1979, Ser. No. 81,173**
**Int. Cl.³ C22F *1/08***
**U.S. Cl. 148—11.5 C** **9 Claims**

**1**. In a process for the thermal treatment of drawn copper-zinc-lead brass alloy stock to improve the machinability by ensuring fine short shavings, the improvement which comprises:

providing a billet consisting essentially on the basis of weight percentage

| | |
|---|---|
| zinc | 30 to 42 |
| lead | 1.5 to 4.5 |
| arsenic | ≦0.1 |
| aluminum | ≦2.5 |
| tin | ≦1.3 |
| iron | ≦0.1 |
| silicon | ≦0.01 |
| copper | balance; |

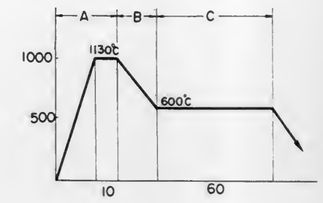
extruding said stock to obtain a blank;
subjecting the blank to a drawing pass to provide stock of a desired final dimension;
subjecting the drawn stock to a rapid annealing comprising heating said drawn stock to a temperature between about 425° C. and about 10° C. below the solidus temperature of the alloy for a period of between about 1/100 of a second and about 10 minutes.

**4,294,630**

**METHOD AND APPARATUS FOR THE CONTINUOUS FURNACE BRAZING AND SOFT-NITRIDING TREATMENTS OF IRON ARTICLES**

**Teruoki Watanabe; Tadao Kanno; Akio Hidaka, all of Kawagoe, and Shunji Kobayashi, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 12, 1979, Ser. No. 56,922**
**Claims priority, application Japan, Jul. 12, 1978, 53-84680; Jul. 13, 1978, 53-85384**
**Int. Cl.³ C21D *1/48***
**U.S. Cl. 148—16.6** **12 Claims**




**1**. A method for the continuous furnace brazing and gas soft-nitriding treatments of an iron member, comprising the steps of:
subjecting the iron member to a furnace brazing treatment in a controlled gas for brazing:
furnace-cooling the brazed member only sufficiently to attain a temperature suitable for a subsequent gas soft-nitriding treatment, such that sufficient heat energy is retained from said brazing treatment without re-heating said member for said gas soft-nitriding treatment; and
adding a predetermined amount of ammonia gas to said controlled gas to conduct said gas soft-nitriding treatment of said member in the resulting atmosphere.

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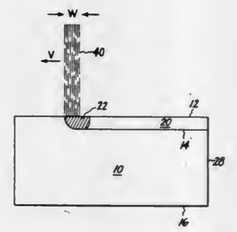
**4,294,631**

**SURFACE CORROSION INHIBITION OF ZIRCONIUM ALLOYS BY LASER SURFACE β-QUENCHING**

**Thomas R. Anthony, Schenectady, N.Y., and Harvey E. Cline, Stanford, Calif., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 22, 1978, Ser. No. 972,389**
**Int. Cl.³ C22F *1/18*; B23K *26/00***
**U.S. Cl. 148—133** **9 Claims**




**1**. A method for improving the corrosion resistance of a body of a zirconium alloy to high pressure and high temperature steam including the process steps of
(a) heating substantially isothermally, without melting, by means of a scanning laser beam a surface region of said body to a temperature range for a sufficient period of time to assure nucleation and growth of the body centered cubic β grains of said zirconium alloy material; and
(b) quenching said heated surface region at a rate effective to form thereby a metallurgical microstructure in said sur-

face region consisting of $\beta$-quenched zirconium alloy material, said surface region encompassing thereby a core of zirconium alloy material, said core having a metallurgical structure selected to maximize the physical and mechanical properties of the body.

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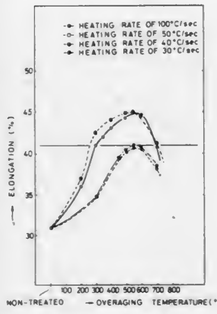
**4,294,632**

## METHOD FOR OVERAGING OF HOT DIP METAL COATED STEEL MATERIAL

**Michio Kubota; Kazuhiro Takagi, both of Amagasaki, and Yorimasa Mitani, Osaka, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan**

**Filed Sep. 24, 1979, Ser. No. 78,407**
**Int. Cl.³ C21D** *6/02, 9/48*
**U.S. Cl. 148—142** **5 Claims**




1. A continuous method for the overaging of a hot dip metal coated steel sheet material to improve the formability of the material, which is hard due to the presence of C and N in the form of supersaturated solid solution, said method comprising the steps of continuously passing the material through a heating zone so as to rapidly heat the material at a rate of heating of at least 50° C./sec. to a temperature above 300° C. but below that at which alloying of the coating with the base steel or formation of additional alloys not already present in the coated material will substantially take place, and continuously passing the heated material through a cooling zone so as to cool the material at a controlled rate of cooling of not more than 20° C./sec. until the supersaturation of C and N in the base steel substantially disappears.

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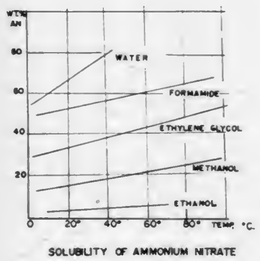
**4,294,633**

## BLASTING COMPOSITION

**Robert B. Clay, 728 West 3800 South, Bountiful, Utah 84010**

**Filed Jun. 7, 1979, Ser. No. 46,360**
**Int. Cl.³ C06B** *45/00*
**U.S. Cl. 149—2** **14 Claims**




SOLUBILITY OF AMMONIUM NITRATE

1. A blasting agent having a bulk density above 1.0 grams per cc. of generally solid or plastic solid consistency, based largely on particulate ammoniun nitrate, which comprises, in combination:

(a) 60 to 90% by weight, based on the total, of solid particulate oxidizer sale which includes ammonium nitrate, and

(b) 10 to 40% by weight of a thickened liquid component comprising a nitrate oxidizer salt dissolved in a polar organic solvent selected from the group which consists of methanol, ethylene glycol and, said solution being substantially fully saturated by said salt and only partially filling the interstices in component (a) to provide for sensitizing the overall composition to detonation by standard detonating devices.

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**4,294,634**

## METHOD FOR MANUFACTURING A SOLID STATUE

**Byun Mookil, 190, Simkoc-dong, Buchyun-shi, Kyungki-do, Rep. of Korea**

**Filed Apr. 1, 1980, Ser. No. 136,267**
**Int. Cl.³ B32B** *31/22;* **B44C** *3/02;* **G09B** *25/00*
**U.S. Cl. 156—59** **7 Claims**

1. A method of producing a three-dimensional solid art object comprising:

forming a solid basic body and component parts from a shapeable art medium in initial shapes corresponding approximately to those of said solid basic body and said component parts when said three-dimensional solid art object is assembled and finished,

adhesively attaching said component parts on said solid basic body to form an assembled object with a three-dimensional surface;

adhesively and conformationally attaching a covering sheet to the three-dimensional surface of said assembled object to form said three-dimensional solid art object.

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**4,294,635**

## PROCESS FOR MAKING GLAZED CERAMIC WARE

**Donald C. Hurley, Jr., 183 St. Joseph Ave., Long Beach, Calif. 90803**

**Continuation-in-part of Ser. No. 718,344, Aug. 27, 1976, Pat. No. 4,200,468. This application Jan. 28, 1980, Ser. No. 116,229**
**Int. Cl.³ C03C** *5/02*
**U.S. Cl. 156—89** **8 Claims**

1. A process for making a glazed ceramic ware comprising the steps of:

(a) mixing sufficient clay, feldspar, flux and water containing a deflocculant to form a slurry glaze-forming composition, said slurry composition consisting essentially of at least 30%, by weight, of clay, and where the molecular ratio of flux to alumina to silica in said slurry is from 1–0.1–1.15 to 1–1.05–9.2 and wherein said deflocculant is included with said water to minimize the amount of said water necessary to form said slurry;

(b) applying the slurry onto the surface of an unfired clay body to form a decorative pattern;

(c) firing the combined clay body and decorative pattern so that they are matured in one firing operation.

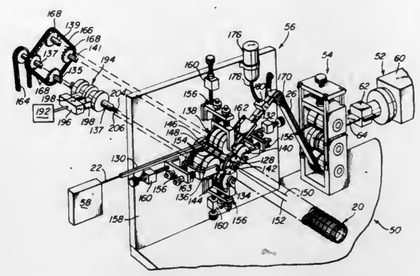


**4,294,636**

## METHOD AND APPARATUS FOR MAKING WIRE REINFORCED HOSE

**Frank A. Vitellaro, Trenton, N.J., assignor to Dayco Corporation, Dayton, Ohio**

**Filed Jul. 10, 1980, Ser. No. 167,293**
**Int. Cl.³ B65H** *81/00*
**U.S. Cl. 156—143** **12 Claims**



1. A method for producing a reinforced flexible polymeric hose which comprises the steps of extruding a continuous flat strip of polymeric material, forming said flat strip to define a profiled strip having a flat side portion and a convoluted portion by continuously passing said flat strip between two profiled rollers to thereby define the desired strip profile with the convoluted side portion, and thereafter helically winding said profiled strip with adjoining turns in overlapping relation, disposing a reinforcing wire in said convoluted side portion in sandwiched relation between the overlapping portions during said helical winding step, and bonding together the overlapping portions.

8. A flexible hose forming apparatus comprising:

(a) extruder means for forming an elongated flat strip of polymeric material;

(b) means for shaping said flat strip to define a profiled strip having a flat side portion and a convoluted side portion, said strip shaping means comprising at least two spaced profiled rollers having parallel axes of rotation, a first of said rollers having a circumferential ridge and a second of said rollers having a corresponding circumferential groove, said ridge and said groove cooperating to form a convolution in said polymeric strip passing therebetween;

(c) means for helically winding said profiled strip with adjoining turns having portions in overlapping relation;

(d) means for disposing a reinforcing wire in said convoluted side portion in sanwiched relation between said overlapped strip portions; and

(e) means for bonding said overlapping portions.

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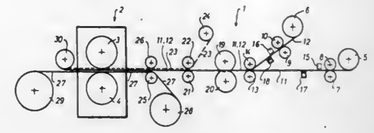
**4,294,637**

## PROCESS FOR MANUFACTURE OF A WIDE PATTERNED BAND SUCH AS A TRANSFER-CARRYING SHEET AND FOR PRINTING ON A SUBSTRATE THEREWITH

**Björn S. Rump, Le Rossignol, Vandoeuvres, Switzerland (1253), assignor to Björn Sigurd Rump, Switzerland**

**Division of Ser. No. 598,545, Jul. 23, 1975, abandoned, which is a continuation of Ser. No. 893,289, Apr. 5, 1978, abandoned, which is a continuation of Ser. No. 961,231, Nov. 16, 1978. This application Dec. 21, 1977, Ser. No. 862,834**
**Claims priority, application Switzerland, Jul. 31, 1974, 10568/74; Jul. 31, 1974, 10570/74**
**Int. Cl.³ B44C** *1/16;* **B41M** *5/26;* **B31F** *5/00;* **B65H** *69/02*
**U.S. Cl. 156—157** **16 Claims**

1. A process for the transfer printing of a substrate from opaque transfer webs of lesser width than said substrate, said transfer webs each having a straight edge and carrying transferable designs or patterns, said process comprising the steps of: aligning at least two transfer webs with their respective straight edges near and parallel to each other; feeding the thus aligned transfer webs, together with the substrate onto which the designs or patterns are to be transferred, into transfer means; and transferring the designs or patterns onto the substrate in the transfer means after previously adjusting the relative position of the webs in a direction parallel to said straight edges, utilizing registration means which are formed on said transfer webs but are separate from and non-transferable with said designs or patterns, in such a manner that the designs or patterns on each of said transfer webs are in register with each other during said transferring step.



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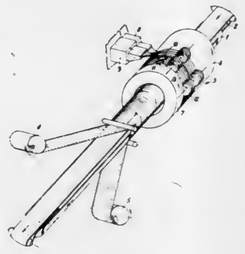
**4,294,638**

## CIRCULAR EXTRUSION METHOD PROVIDING FOR ROTATION AROUND THE EXTRUSION OPENING

**Ole-Bendt Rasmussen, 7, Topstykket, 3460 Birkeroed, Denmark**

**Continuation of Ser. No. 841,481, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 657,649, Feb. 12, 1976, abandoned. This application Dec. 11, 1979, Ser. No. 102,561**
**Claims priority, application United Kingdom, Feb. 12, 1975, 5971/75**
**Int. Cl.³ B29F** *3/10*
**U.S. Cl. 156—176** **35 Claims**



1. An improved method of extruding elongated structures in annular form, by feeding an inhomogeneous extrudable material in a generally fluid state through a circular die which has a hollow center and an annular die part defining at least one extrusion exit orifice extending annularly around the die part and rotating bodily around its axis to extrude with substantial helical drawing or stretching a material structure in generally annular form which has a generally uniaxial grain therein extending in a substantially helical direction making a significant angle with respect to the extrusion die axis, the method being characterized by the following steps:

supplying said extrudable material to said circular die while rotating said annular die part;

discharging the extrudable material from the rotating exit orifice defined by said die part in at least one stream extending in generally annular form;

collecting the thus discharged generally annular-form stream of extrudable material in a collecting zone downstream of such exit orifice by collecting means comprising a generally rigid support and a conveying surface which receives said stream and at least said conveying surface extending axially through said hollow interior and being moved forwardly along the extrusion die axis to convey

the extrudable material stream collected thereon from said die orifice while said annular die part is rotating bodily around its axis about said conveying surface, whereby the material stream is drawn or stretched at an angle to the extrusion axis by virtue of said rotation between said exit orifice and said conveying surface;

solidifying the collected material stream while being conveyed; and

removing said solidified material stream from at least the support of said collecting means.

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**4,294,639**

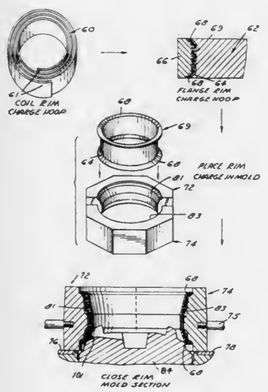
## FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION

**James A. Woelfel, and Richard W. Smith, both of Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.**

**Continuation-in-part of Ser. No. 14,265, Feb. 22, 1979, abandoned. This application Feb. 6, 1980, Ser. No. 119,128**

**Int. Cl.³ B65H** *81/00*

**U.S. Cl. 156—185** **44 Claims**




1. A method of constructing a vehicle wheel of the type which includes a rim portion for mounting of a tire thereon and a disc portion for mounting the wheel to a vehicle, said method comprising the steps of:

(a) coiling a first sheet section of fiber-reinforced plastic resin construction having laterally spaced parallel side edges to form a rim charge hoop consisting of at least one coil ply having said laterally spaced side edges disposed in respective axially spaced planes,

(b) placing said rim charge hoop in a mold,

(c) placing a separate disc charge into said mold within said rim charge hoop, said disc charge comprising at least one second sheet section of fiber-reinforced plastic resin construction,

(d) compression molding said rim and disc charge to form an integral fiber-reinforced composite wheel, and

(e) removing said wheel from said mold.

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**4,294,640**

## FORMING PROCESS FOR LIGHT GAUGE POLYMER SHEET MATERIAL

**Lawrence G. Martinelli, San Jose, and Mark R. Garrison, Santa Clara, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.**

**Filed Dec. 12, 1979, Ser. No. 102,777**

**Int. Cl.³ B29C** *17/04;* **B29F** *1/10;* **B29C** *3/00;* **B65D** *85/30*

**U.S. Cl. 156—213** **5 Claims**

1. A method for forming a substantially flat, warp-free flexible magnetic disk jacket assembly from a pre-cut sheet of light gauge polymeric material having wipe material pre-attached to one planar side thereof, comprising the steps of:

clamping a rear panel region of a pre-cut sheet of light gauge polymeric material having wipe material pre-attached to one planar side thereof between a first substantially rigid base and a second substantially rigid square-shaped folding member so that said wipe material is contacted by said substantially rigid folding member, said pre-cut sheet being essentially at room temperature;

folding a front panel region of said sheet over said substantially rigid folding member by means of a first substantially rigid folding bar into a substantially 180° flat fold whereby a first folded edge is formed in said sheet;

retaining said front panel region of said sheet in said folded condition without slippage by means of said first substantially rigid folding bar;

folding a first and a second tab region of said sheet over said front panel region by means of a second and a third substantially rigid folding bar into substantially 180° flat folds whereby a second and a third folded edge are formed in said sheet, said second and third folded edges being formed essentially perpendicularly to and extending from opposite terminal ends of said first folded edge along opposite edges of said rear panel region whereby a pocket is formed between said front panel region and said rear panel region, said pocket being enclosed around its edges by said first, second and third folded edges, said pocket having an open end along an edge of said front panel region opposite to said first folded edge, said open end extending between said terminal ends of said second and said third folded edge furthest from said first folded edge;

retaining said first and second tab regions of said sheet in said folded condition without slippage by means of said second and third substantially rigid folding bar;

applying heat uniformly along said first, second and third folded edges of said sheet by contacting said outer surface of said sheet with a first, a second and a third heated bar having a U-shaped trough adapted to mate with said outer surface of said sheet along said folded edges;

inserting a flexible magnetic disk into said pocket;

folding a third tab region of said sheet over said front panel region by means of a fourth substantially rigid folding bar into a substantially 180° flat fold whereby a fourth folded edge is formed in said sheet, said fourth folded edge being formed essentially perpendicular to said second and third folded edge, extending between said terminal ends of said second and third folded edge furthest from said first folded edge;

retaining said third tab region of said sheet in said folded condition without slippage by means of said fourth substantially rigid folding bar; and

applying heat uniformly along said fourth folded edge of said sheet by contacting said outer surface of said sheet with a fourth heated bar having a U-shaped trough adapted to mate with said outer surface of said sheet along said folded edge.



**4,294,641**

## HEAT TRANSFER SHEETS

**Kenneth J. Reed, Deer Park Rd., Wimbledon, London, S.W. 19, and Alan L. Lythgoe, 25 Sene Park, Hythe, Kent, both of England**

**Continuation of Ser. No. 817,707, Jul. 21, 1977, abandoned. This application Jul. 6, 1979, Ser. No. 55,929**

**Claims priority, application United Kingdom, Jul. 23, 1976, 30925/76**

**Int. Cl.³ B32B** *3/18;* **B41M** *5/26;* **B44C** *1/16*

**U.S. Cl. 156—234** **34 Claims**

1. A method of marking or decorating a textile or other absorbent surface with a design, said method comprising the steps of:

(a) providing a heat transfer including a flexible support substrate coated with a solid printing ink layer embodying the design to be transferred,

(b) contacting the printing ink layer face to face with the textile under conditions of temperature and pressure which do not damage the textile and which cause the solid printing ink layer to melt to a liquid ink composition having a viscosity less than 100 poise and to penetrate the textile and transfer the ink layer to the textile as a nonlabel like design,

(c) separating the support substrate from the textile with the transferred design being retained in the form of solid ink within the textile,

(d) said solid printing ink layer being substantially non-tacky and non-blocking at room temperature and including at least one polymer having solid particles of a tack reducing agent present as a separate phase in at least a surface portion of the layer,

(e) said tack reducing agent being sublimable at said elevated temperature or having a melting point of at least 60° C. and melting at said elevated temperature to a liquid which reduces the viscosity of the polymer composition.

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**4,294,642**

## PROCESS FOR THE PRODUCTION OF PACKAGE FOR CIGARETTES OR THE LIKE

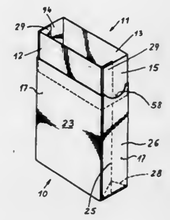
**Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany**

**Division of Ser. No. 886,700, Mar. 15, 1978, Pat. No. 4,225,040. This application Dec. 5, 1979, Ser. No. 100,784**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712482**

**Int. Cl.³ B65D** *85/10*

**U.S. Cl. 156—250** **3 Claims**



1. A method for the production of cigarette pack blanks from a web of relatively thick, stiff cardboard, paste board or the like, said blanks being subsequently folded in a U-shape around the front, bottom and rear surfaces of a rectangular block of cigarettes, and wherein the lateral edges of said web coincide with the upper edges of the blanks laid out thereon, after folding, characterized by the steps of:

(a) coating one entire surface of said web (**34**) with a moisture and aroma-proof metal coating (**17**), said one surface being the outer surface of the folded cigarette pack,

(b) applying by gluing or the like a pair of relatively thin and pliable, continuous strips of metal foil (**11***a*, **11***b*) to the respective lateral edges of said web on the other side thereof opposite said metal coating such that the outer edges of said metal foil strips extend outwardly beyond the lateral edges of said web,

(c) applying a relatively thin and pliable sealing layer (**30**, **33**) of metal foil to said other side of said web at least in the areas which form the four bottom corners of the folded pack, and

(d) separating said blanks from said web by cross stamping.

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**4,294,643**

## HEATER ASSEMBLY AND METHOD OF FORMING SAME

**Thomas D. Tadewald, La Crosse, Wis., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Sep. 5, 1978, Ser. No. 939,764**

**Int. Cl.³ B29C** *19/00;* **B32B** *31/00*

**U.S. Cl. 156—293** **7 Claims**

1. A method of forming a heater plate assembly comprising the steps of: forming a C-stage laminate assembly from layers of glass cloth and epoxy resin with at least one cut-out opening therein for receiving at least one complementary shaped heater member; laying up a stack of B-stage layers of epoxy resin coated glass; positioning at least one heater member within said at least one cut-out opening in said C-stage assembly so that its flat outer surface is exposed and its inner surface is in surface contact with said stack of B-stage layers; applying heat and pressure to the top and bottom of said final laminate assembly to cure said B-stage layers and bond them to each other and to said C-stage laminate and to the inner surface of said at least one heater member; said at least one heater member being of a more thermally conductive material than the adjacent portions of C-stage laminate so that when said heat is applied, the resin in the B-stage layers in the regions immediately laterally adjacent the said at least one heater member will become liquid sooner than in areas further laterally spaced from said at least one heater member and will tend to flow toward said heater member and seal the open area between the edges of the heater member and the internal edges of the C-stage laminate which define said at least one opening.

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**4,294,644**

## SERVO MOTOR CONTROL LABELLER

**Dale L. Anderson, Mound, Minn., assignor to Datafile Limited, Toronto, Ontario, Canada**

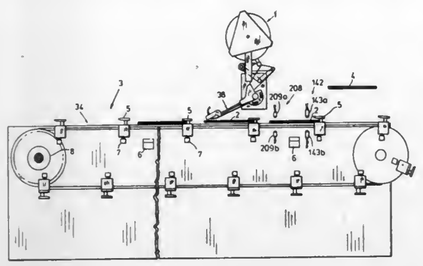
**Filed Jan. 30, 1980, Ser. No. 112,341**

**Int. Cl.³ B32B** *31/00*

**U.S. Cl. 156—361** **48 Claims**

1. In a labeller actuated to advance and dispense labels by a rotary drive onto a surface fed therepast, a servo motor for actuating said labeller drive and a control system for said servo motor, said system having means adapted to respond to the rate of feed of a surface to be labelled to accelerate the servo motor from zero to the desired labelling speed corresponding to the rate of feed of the surface to be labelled while the surface to be labelled is advanced towards the labeller a predetermined distance, and means to decelerate the servo motor from labelling speed to zero while label feed is advanced a predetermined distance, the system being adapted so that upon a label instructing signal being fed to the control system at a preselected point of advance of the surface towards the labeller, the labeller will accelerate a label from a predetermined start position and

deliver same to touch down on the surface to be labelled at the precise desired point with the label moving at the same speed as the surface and upon a label feed sensing signal generated by



label feed being fed to the control system the labeller will decelerate to bring the next label to be delivered to said predetermined start position in preparation for the next label instructing signal.

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**4,294,645**

## LABEL APPLICATORS

**Anthony V. J. Figg, Spalding, and Harry Cunnington, Boston, both of England, assignors to Norprint Limited, Boston, England**

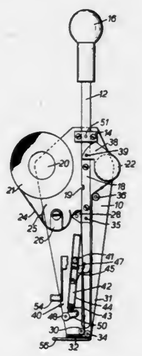
**PCT No. PCT/GB79/00005, § 371 Date Sep. 12, 1979, § 102(e) Date Sep. 12, 1979, PCT Pub. No. WO79/00499, PCT Pub. Date Aug. 9, 1979**

**PCT Filed Jan. 11, 1979, Ser. No. 74,724**

**Claims priority, application United Kingdom, Jan. 12, 1978, 1160/78; Jul. 20, 1978, 30511/78**

**Int. Cl.³ B32B *31/00***

**U.S. Cl. 156—384** **19 Claims**



1. Apparatus for dispensing individual labels from a web of labels including a backing strip and a series of labels mounted on the backing strip, said apparatus comprising in succession along a web path through the apparatus,

reel mounting means for carrying a reel of the said web,

continuously-operative brake means for applying a continuous braking force to the web,

a rotary registration device co-operating with the web,

dispensing means at which individual labels can be peeled from the backing strip of the web,

a take-up reel for taking up spent backing strip, and

means for synchronously actuating the registration device and the take-up reel to index the web through the apparatus and dispense a label at the dispensing means.

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**4,294,646**

## APPARATUS FOR MANUFACTURING FLAT PLASTIC NET

**Thomas Urquhart, Cobourg, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

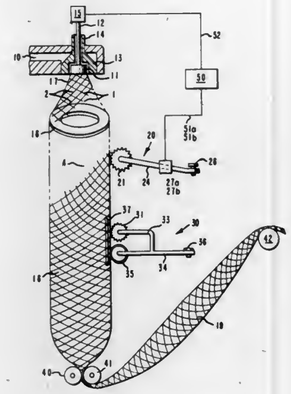
**Division of Ser. No. 26,206, Apr. 2, 1979, Pat. No. 4,242,295.**

**This application Jun. 3, 1980, Ser. No. 155,980**

**Claims priority, application Canada, Oct. 4, 1978, 312717**

**Int. Cl.³ B29C *17/14***

**U.S. Cl. 156—500** **5 Claims**



1. An apparatus comprising in combination

(a) an extruder adapted to extrude, about an axis of extrusion, plastic net in tubular form through two coaxial circular counter-rotating die members, said plastic net comprising a plurality of crossing plastic strands;

(b) a detector adapted to detect the angular displacement of substantially successive longitudinally-aligned junctions of the crossing strands about the axis of extrusion and relative to a fixed plane through the axis of extrusion;

(c) a controller adapted to regulate the relative rotation of the die members to minimize said angular displacement;

(d) guide means, adapted to align successive longitudinally aligned junctions of the strands of the tubular net with a cutting means, said cutting means being adapted to cut each junction longitudinally and within each junction; and

(e) advancing means adapted to move the tubular net from the extruder past said cutting means, and to tension the tubular net during extrusion of the plastic net.

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**4,294,647**

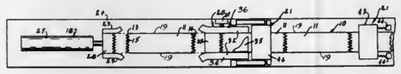
## WOOD FINGER JOINTING APPARATUS

**Melvin D. Strickler, 192 Larch La., Columbia Falls, Mont. 59912**

**Filed May 20, 1980, Ser. No. 151,714**

**Int. Cl.³ B27F *1/16*; B32B *31/20***

**U.S. Cl. 156—558** **7 Claims**



1. Apparatus for end joining straight elongated boards having a preselected maximum length and a common transverse cross section, the boards having complementary configurations of elongated parallel fingers formed between opposed side edges of the boards across opposed first and second transverse end faces thereof, comprising:

an elongated frame;

guide means on the frame for engaging the opposed side edges of the boards and directing the boards along a straight path parallel to the board lengths;

ram means movably mounted on said frame at a location adjacent the guide means at one end of the path for reciprocating movement along the path in a first direction for engaging successive boards across their first end faces and for imparting movement to the boards along the path their second end faces into mating engagement with the first end faces of preceeding boards and in an opposite second direction for providing clearance for engagement of incoming boards by said guide means;

said ram means having a ram face for engaging the first end faces of the boards, said ram face having a configuration matching the finger configuration of the first board ends;

channel means on said frame positioned transversely adjacent to the path for receiving successive boards moved along the path by the ram means and for transversely engaging the opposed edges of the board to align the first end of each board with the second end of a preceding board at the instant of mating the joint between them; and

thrusting means on the frame for clamping opposed side edges of the boards and forcibly resisting movement of the mated first and second ends of successive boards as imparted by said ram means.



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**4,294,648**

## METHOD FOR INCREASING THE RESISTANCE OF IGNITER ELEMENTS OF GIVEN GEOMETRY

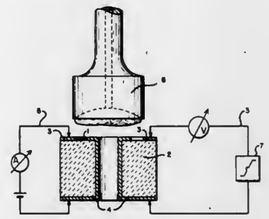
**Uwe Brede, Fürth, and Heinz Kern, Fürth-Burgfarnbach, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Postfach, Fed. Rep. of Germany**

**Filed Feb. 26, 1980, Ser. No. 124,894**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908361**

**Int. Cl.³ C23F *1/02***

**U.S. Cl. 156—627** **7 Claims**



1. A method for increasing the resistance of an igniter element of given geometry in an electrical circuit to a predetermined, specific value by the removal of resistance material, which comprises heating the resistance material situated between two acid-resistance electrodes simultaneously etching the resistance material with acid until the desired resistance value has been established.

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**4,294,649**

## METHOD OF MAKING DIE PLATES

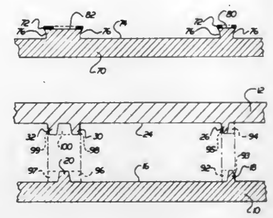
**Albert J. Sarka, 18828 Canyon Dr., Fairview Park, Ohio 44126**

**Filed Nov. 5, 1979, Ser. No. 91,361**

**Int. Cl.³ C23F *1/02***

**U.S. Cl. 156—645** **7 Claims**

1. A method of forming accurately located lands on an opposing pair of die plates, the lands cooperating to cut material pressed between the die plates in regions where the lands on one die plate are positioned in a predetermined relationship with the lands on the opposite die plate, said method comprising the steps of forming a master image having lines representing the lands to be formed on both die plates, the lines in said master image having a width exceeding by a predetermined amount a desired width of the cooperating lands on the die plates, utilizing the master image to directly control exposure of a resist on the surface of the two die plates, chemical etching of the surface of the two die plates until raised portions configured the same as the lines of said master image are formed on each die plate, and thereafter selectively removing material from at least one side of the raised portions on each plate until the lands of each plate are formed.



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**4,294,650**

## METHOD OF AND APPARATUS FOR PRODUCING EMBOSSING TOOLS

**Wilfried Werthmann, Krefeld, Fed. Rep. of Germany, assignor to Firma Standex International GmbH, Krefeld, Fed. Rep. of Germany**

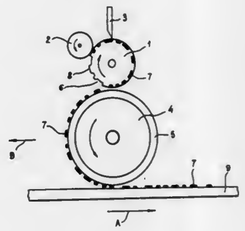
**Continuation of Ser. No. 878,432, Feb. 16, 1978, Pat. No. 4,213,819. This application Jan. 7, 1980, Ser. No. 110,252**

**Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706947**

**The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.**

**Int. Cl.³ C23F *1/02***

**U.S. Cl. 156—660** **9 Claims**



1. A method of making a large-format surface-texture embossing tool free from pattern-separating lines for the embossing plates, sheets, or foils, said method comprising the steps of:

(a) juxtaposing a large-format press plate having a width in excess of 160 centimeters with a synthetic elastic-surfaced transfer roll of a length substantially corresponding to said width;

(b) applying a layer of an etching resist to a patterned roll having a surface texture corresponding to the pattern to be applied to said plate to impart a corresponding pattern to said layer;

(c) rotating said rolls into close proximity to each other to deposit said layer onto said transfer roll substantially over a length thereof corresponding to said width;

(d) rolling said transfer roll over a surface of said press plate and relatively displacing said transfer roll and said press plate to deposit the layer of said resist from the synthetic elastic surface of said transfer roll onto said surface of said plate while leaving exposed locations of said surface of said plate within the pattern of the resist layer deposited thereon;

(e) etching said locations of said surface of said plate; and
(f) repeating steps (a) through (e) in succession with application of a second layer of resist to said surface of said plate in a pattern out of perfect registry with the previously applied pattern.

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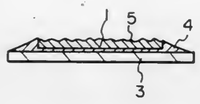
**4,294,651**
**METHOD OF SURFACE-TREATING SEMICONDUCTOR SUBSTRATE**
**Sohshi Ohmura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Filed May 16, 1980, Ser. No. 150,686**
**Claims priority, application Japan, May 18, 1979, 54-61228**
**Int. Cl.³ C09K** *13/02, 13/08;* **H01L** *21/306*
**U.S. Cl. 156—662** **10 Claims**




1. A method of roughening at least one surface of a silicon semiconductor substrate comprising the step of bringing each surface of the semiconductor substrate that is to be roughened into contact with an etchant comprising (i) at least one fluorine-containing compound selected from the group consisting of hydrofluoric acid (HF), ammonium fluoride ($NH_4F$) and acid ammonium fluoride ($NH_4HF_2$), (ii) at least one oxidizing agent selectively containing manganese and chromium, and (iii) an alkali.

2. The method of claim 1, wherein the etchant contains, based on the weight of the etchant, (i) 7% to 38% by weight of the fluorine-containing compound, (ii) 2.5% to 7% by weight of the manganese- or chromium-containing oxidizing agent and (iii) 1% to 10% by weight of the alkali.

3. The method of claim 1, wherein the etchant comprises, based on the weight of the etchant, (i) 13% to 35% by weight of the fluorine-containing compound and (ii) 3% to 7% by weight of the oxidizing agent.

7. A method according to claim 1, 2 or 3, wherein prior to the step of bringing each surface of the semiconductor substrate to be etched into contact with the etchant, each said surface is subjected to a pre-etching by using an etchant comprising (i) at least one fluorine-containing compound selected from the group consisting of hydrofluoric acid (HF), ammonium fluoride ($NH_4F$) and acid ammonium fluoride ($NH_4HF_2$) and (ii) at least one manganese-containing oxidizing agent selected from the group consisting of potassium permanganate ($KMnO_4$) and potassium manganate ($K_2MnO_4$).

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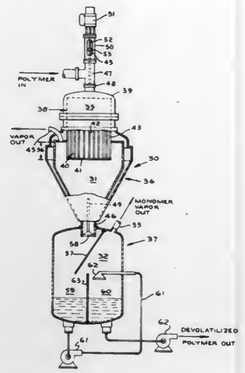
**4,294,652**
**FALLING STRAND DEVOLATILIZER**
**Randolph E. Newman, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.**
**Filed Jun. 30, 1980, Ser. No. 164,414**
**Int. Cl.³ B01D** *1/00*
**U.S. Cl. 159—2 R** **5 Claims**

1. An improved staged falling strand devolatizing apparatus for a polymer-monomer melt, comprising a heating means for said melt mounted integrally above first and second flash vaporization tanks positioned respectively in contiguous descending vertical relationship and communicating with one another, means for producing a different vacuum within each of said flash vaporization tanks and means for maintaining an elevated temperature in said tanks, the improvement comprising: said second tank having a baffle means to pass the falling strand melt to a first bottom side compartment of said second tank, a recycle transfer means for the melt from said first side compartment to a second bottom side compartment in said second tank such that the melt is devolatilized again by the vacuum applied to said second tank and a means to withdraw the melt from said second side compartment, said first and second bottom side compartments are formed by a generally vertical partition dividing said second tank into substantially




equal compartments, said partition extending from the bottom of said second tank for a portion of the vertical dimension of said second tank allowing each compartment to operate under a common partial vacuum contained in said second tank.

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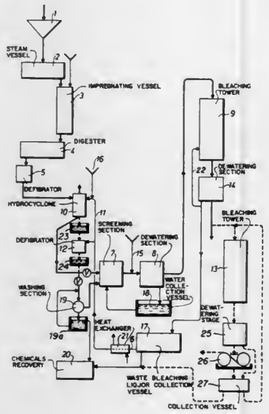
**4,294,653**
**PROCESS FOR MANUFACTURING CHEMIMECHANICAL CELLULOSE PULP IN A HIGH YIELD WITHIN THE RANGE FROM 65 TO 95%**
**Jonas A. I. Lindahl, Domsjoverken, and Lars G. Rudstrom, Husum, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden**
**Continuation-in-part of Ser. No. 615,625, Sep. 22, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,163**
**Claims priority, application Sweden, Sep. 23, 1974, 7411949**
**Int. Cl.² D21B** *1/16;* **D21D** *1/20*
**U.S. Cl. 162—25** **33 Claims**




1. In the process for the manufacture of chemimechanical cellulose pulp in high yields within the range from about 65 to about 95% from particulate lignocellulosic material which comprises subjecting particulate lignocellulosic material to a mild partial digestion in the presence of a delignifying agent, and then mechanically defibrating the partially digested material, the improvement which comprises blending the partially digested lignocellulosic material after it has been defibrated to within the range from about 27 to about 44% of completion with waste bleaching liquor from a lignin-preserving bleaching process cooled to a temperature not exceeding 40° C.; and then completing the defibration to obtain a pulp of improved brightness and strength.



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**4,294,654**
**DELIGNIFICATION AND BLEACHING OF LIGNOCELLULOSIC PULP VIA PHOTO-OXYGENATION**
**Rex H. Turner, Mobile, Ala., assignor to International Paper Company, New York, N.Y.**
**Filed Mar. 21, 1980, Ser. No. 132,604**
**Int. Cl.³ D21C** *5/00, 9/10*
**U.S. Cl. 162—50** **12 Claims**

1. A process for delignification and bleaching of lignocellulosic pulp employing electronically excited oxygen generated in situ, which comprises:
subjecting an aqueous slurry of said lignocellulosic pulp having a consistency of from about 0.01% to about 10.0%, by weight of oven-dried pulp, and whose slurry pH is between about 8 and about 13 to irradiation with ultraviolet light while admitting oxygen into said slurry, whereby the ultraviolet light excites the oxygen to produce electronically excited oxygen in situ which bleaches and delignifys the pulp.

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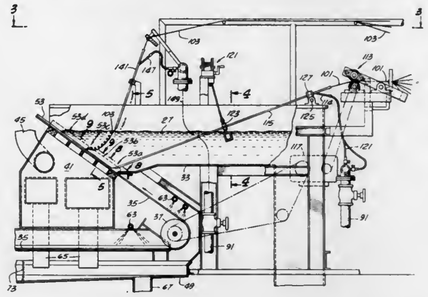
**4,294,655**
**METHOD AND APPARATUS FOR FORMING FIBERGLASS MATS**
**John R. Pfeffer, Bakersfield, Calif., assignor to Consolidated Fiberglass Products Company, Bakersfield, Calif.**
**Continuation of Ser. No. 886,881, Mar. 15, 1978, abandoned. This application Nov. 27, 1979, Ser. No. 97,776**
**Int. Cl.³ D21H** *3/82*
**U.S. Cl. 162—107** **14 Claims**



1. The method of making a wet process fiber mat comprising the steps of:
a. forming an aqueous body of chopped fiber slurry;
b. moving an endless screen upwardly through said slurry from an entrance position spaced substantially below said slurry surface and at a predetermined rate of movement to an exit position at the surface of said slurry;
c. applying suction to the lower surface of said screen, in a zone through which said screen moves in order to draw water of said slurry through said screen thereby;
d. collecting a first layer of chopped fibers on the surface of the screen with increasing thickness as the distance traveled by the screen through the slurry increases;
e. positioning a first reinforcement strand projecting means beneath the surface of the slurry;
f. projecting a plurality of first continuous reinforcement strands through said first strand projecting means below the slurry surface by propelling said first strands at approximately the same velocity as said screen onto said first chopped fiber layer at a first predetermined location intermediate the ends of the screen thereby depositing said first reinforcement strands in a longitudinally oriented configuration and in a first substantially horizontal plane within the resultant mat;
g. collecting a second layer of chopped fibers on top of said first layer and said first reinforcement strands with increasing thickness as the distance traveled by the screen through the slurry increases;
h. positioning a second reinforcement strand projecting means above the surface of said slurry at a location between the first projecting means and the exit position;
i. projecting a plurality of second continuous reinforcement strands onto the surface of said slurry by projecting said second strands from said second strand projecting means from above the slurry surface onto that slurry surface near said exit position at a velocity greater than the velocity of said screen such that the second strands assume a randomly oriented interengaged configuration upon entering said slurry;
j. allowing said random interengaged strands to migrate in an unconstrained manner from the slurry surface through the slurry and onto said second chopped fiber layer captured by the screen at a second predetermined location intermediate the ends of said screen thereby depositing said second reinforcement strands in a substantially horizontal plane within the resultant mat so that both random and longitudinal reinforcement strands will be present in the resultant mat;
k. continuing the movement of the screen past the point of randomly oriented strand installation to cover said strands with a third uniform layer of chopped fibers; and
l. moving the screen out of the slurry, thus withdrawing the wet mat from the slurry.

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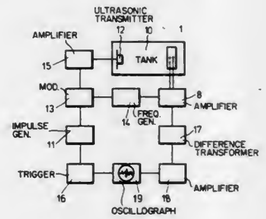
**4,294,656**
**PROCESS FOR MEASURING THE STATE OF CHARGE OF SUSPENSIONS AND FOR CONTROLLING THE ADDITION OF AUXILIARY AGENTS TO THE SUSPENSIONS**
**Ulrich Beck, Bornheim-Merten, and Ekhard Rohloff, Düsseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Continuation of Ser. No. 949,357, Oct. 6, 1978, abandoned. This application Apr. 1, 1980, Ser. No. 136,188**
**Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746179**
**Int. Cl.³ D21F** *11/00*
**U.S. Cl. 162—192** **6 Claims**




1. A process for controlling the addition of retention agents to a fibrous suspensions, comprising the steps of: exposing a portion of the suspension of an ultrasonic field in a measuring cell having two electrodes which extend into the suspension and are spaced from each other by an odd multiple of half ultrasonic wavelengths of the ultrasonic field in the suspension; measuring the ultrasonic vibration potential generated by the ultrasonic field; and adding retention agents to the suspension in response to the magnitude of the measured ultrasonic vibration potential.

**4,294,657**

## APPARATUS FOR MAKING FIBERBOARD

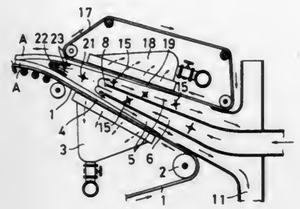
**Tsutomu Saito, Tokyo, and Masaaki Shida, Fuji, both of Japan, assignors to Kabushiki Kaisha Fuji Seisakusho, Fuji, Japan**

**Continuation of Ser. No. 7,641, Jan. 29, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 175,826**

**Claims priority, application Japan, Nov. 15, 1976, 51-136268; Jan. 31, 1978, 53-8850**

**Int. Cl.³ D21F *11/02***

**U.S. Cl. 162—303** **2 Claims**



1. An apparatus for manufacturing fiberboard, comprising:
a first endless belt conveyor having a slanted portion constituting a first fiber layer forming section;
a first suction box provided on the inner surface of said first fiber layer forming section;
a second endless belt conveyor having a slanted portion constituting a second fiber layer forming section disposed above said first fiber layer forming section;
a second suction box provided on the inner surface of said second fiber layer forming section;
a passage means disposed between said first and second fiber layer forming sections for directing a slurry flow of fibers and so arranged whereby the speed of the slurry flow through the passage and onto the surfaces of said first and second fiber layer forming sections is differentiated from the running speed of said conveyors;
a supply duct for the slurry of fibers, said duct being disposed in the center of said passage and having an outlet positioned near the upper ends of said first and second fiber layer forming sections whereby the slurry flow of fibers from said outlet diverges upwards and downwards and flows down the respective first and second fiber layer forming sections so that two separate fiber layers may be formed simultaneously and subsequently placed one upon another to form a single sheet of fiberboard.

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**4,294,658**

## NUCLEAR REACTORS

**Peter Humphreys, Warrington; Daniel F. Davidson, Altrincham, and Gordon Thatcher, Lymm, all of England, assignors to United Kingdom Atomic Energy Authority, London, England**

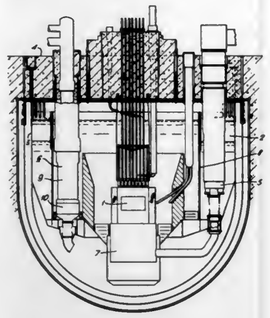
**Filed Sep. 19, 1979, Ser. No. 76,943**

**Claims priority, application United Kingdom, Oct. 9, 1978, 39814/78**

**Int. Cl.³ G21C *9/00, 15/18***

**U.S. Cl. 376—404** **3 Claims**

1. A liquid metal cooled nuclear reactor comprising:
a primary vessel;
a fuel assembly submerged in a pool of primary liquid metal coolant within the primary vessel;
a concrete vault housing said primary vessel;
at least one heat exchange module carried by a roof of the vault and immersed in the pool of coolant, and
a pump for circulating primary coolant from the pool through the fuel assembly to the heat exchange module, the heat exchange module comprising a tube-in-shell heat exchanger and an electromagnetic flow coupler disposed in the base region of the module for driving primary coolant through the heat exchanger, the electromagnetic flow coupler being associated with a secondary coolant



circuit from which the driving effort for the primary coolant is derived.

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**4,294,659**

## APPARATUS FOR USE IN A LIQUID ALKALI METAL ENVIRONMENT

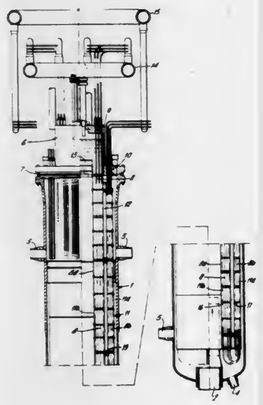
**Charles S. Campbell, Hale, England, assignor to United Kingdom Atomic Energy Authority, London, England**

**Filed Jan. 16, 1978, Ser. No. 869,443**

**Claims priority, application United Kingdom, Feb. 4, 1977, 11924/77**

**Int. Cl.³ G21C *19/28***

**U.S. Cl. 165—133** **3 Claims**



1. Heat exchange apparatus for use in a liquid alkali metal environment comprising,
a bundle of spaced heat exchange tubes of stainless steal,
a tubular shell housing the tubes and adapted by inlet and outlet ports for conducting liquid alkali metal therethrough in heat exchange with the tubes, and
a plurality of cellular grids laterally supporting the tubes in the shell, each tube slidably occupying a discrete cell of each grid and wherein the complementary bearing surfaces of the grids for the tubes are aluminised.



**4,294,660**

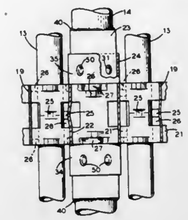
## SPACER ASSEMBLY RETAINER ARRANGEMENT

**David W. Christiansen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Oct. 7, 1977, Ser. No. 840,207**

**Int. Cl.³ G21C *3/30***

**U.S. Cl. 376—442** **4 Claims**



1. In combination with a nuclear fuel assembly of the type having a plurality of vertically extending fuel elements and guide tubes maintained in a laterally spaced array by at least one spacer assembly with a multiplicity of intersecting slotted grid plates that form first cells through which the fuel elements are inserted and second cells through which the guide tubes are inserted, an improved arrangement for restraining spacer assembly movement comprising: guide tube sleeves circumscribing and fixedly connected to the guide tubes, each guide tube sleeve positioned so as to completely circumscribe the guide tube within each guide tube cell and partly beyond each guide tube cell, said guide tube sleeve portion extending beyond said guide tube cell completely connected to the circumference of said guide tube by welding, each sleeve having at least one aperture in the portion thereof extending beyond the guide tube cell; a plurality of collars; said collars having at least one longitudinal slot therein for mechanically interlocking each collar with a portion of the grid plates defining a respective guide tube cell by passing a grid plate within said slot; each of the collars circumscribing completely part of a guide tube sleeve, and each of said collars being crimped in part to extend into at least one aperture of said sleeves.

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**4,294,661**

## LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTOR CONSTRUCTIONS

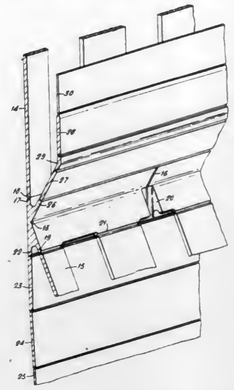
**Geoffrey Seed, St. Helens; Graham Chesworth, Lymm; John R. Hind, Warrington, and Donald Hodgson, Ormskirk, all of England, assignors to Nuclear Power Company Limited, England**

**Filed Apr. 4, 1979, Ser. No. 26,819**

**Int. Cl.³ G21C *13/00***

**U.S. Cl. 376—363** **6 Claims**

1. A liquid metal cooled fast breeder nuclear reactor construction comprising:
a concrete containment vault,
a primary vessel containing a pool of liquid alkali metal coolant housed within the vault,
a nuclear fuel assembly support strongback within the primary vessel, and
a nuclear fuel assembly submerged in the pool of coolant and supported by the strongback,
the primary vessel incorporating a yoke comprised of a plurality of arcuate segments welded end-to-end to form an annular support member, the yoke being suspended from the roof structure of the vault by a first annular series of tie straps disposed outside the primary vessel whilst the strongback is supported from the yoke by a second annular series of tie straps, the yoke having upwardly and downwardly extending legs which are extended by upper and lower strakes respectively of the primary vessel.



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**4,294,662**

## PROCESS FOR THE FINAL ASSEMBLY OF A NUCLEAR REACTOR VESSEL

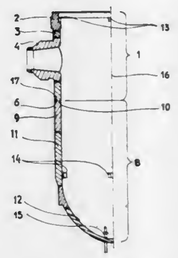
**Paul Guignard, Le Creusot, and Alain Commeau, Montchanin, both of France, assignors to Framatome, Courbevoie, France**

**Filed May 12, 1980, Ser. No. 150,224**

**Claims priority, application France, May 16, 1979, 79 12399**

**Int. Cl.³ B23K *31/06***

**U.S. Cl. 219—61** **5 Claims**



1. A process for the final assembly of a nuclear reactor vessel comprising two sub-assemblies possessing symmetry of revolution, which sub-assemblies have been assembled and machined to provide elements for positioning the internal fitments of the vessel and which have been provided with annular mating surfaces in planes perpendicular to said axes of symmetry of said sub-assemblies and with assembly ridges projecting from each said mating surface at a median part of said surface and extending over the complete perimeter of said surface, said process comprising arranging said sub-assemblies with said axes thereof horizontal and with said mating surfaces thereof facing, bringing said ridges into contact and coincidence thereby defining two annular spaces between said mating surfaces, one said space opening into the interior of said vessel and the other said space opening into the exterior over the whole periphery of said vessel, said spaces being separated by a wall formed by said contacting ridges, initially welding said sub-assemblies by deposition of a filler metal in one of said spaces, removing by machining said ridges and part of said deposited metal, and finally welding said sub-assemblies by

deposition of filler metal in said annular spaces between said mating surfaces, said process additionally comprising providing at the level of one of said annular spaces at least three female centering stubs projecting from said mating surface of one of said sub-assemblies, each said female stub having an associated seat recessed relative to the outer surface of said stub, said female stubs extending over a fraction of said perimeter of said vessel, providing at least three male centering stubs on said mating surface of the other said sub-assembly, the shape, size and position thereof corresponding to the shape, size and position of said seats of said female stubs, said male stubs and female stubs being in positions matched in a precise manner relative to said positioning elements for internal fitments of said vessel, and at least one of said male stubs and at least one of said female stubs together providing a radially directed key socket, introducing said male stubs into said seats of said corresponding female stubs when bringing said ridges into contact to simultaneously achieve centering, axial alignment and orientation of said sub-assemblies relative to one another, checking alignment thereof preferably by an optical method, inserting a key into said socket provided by said pair of stubs, which socket has been obtained by bringing said sub-assemblies into contact and orientation, to maintain the relative positioning of said sub-assemblies, joining said stubs together by point-welds before effecting initial welding, and, after initial welding, removing said male and female stubs by machining when removing said ridges and before completely filling said annular spaces with filler metal.

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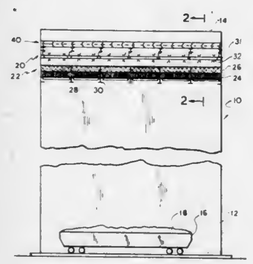
**4,294,663**

## METHOD FOR OPERATING A COKE QUENCH TOWER SCRUBBER SYSTEM

**Richard P. Tennyson, Fort Myers, Fla., assignor to Munters Corporation, Fort Myers, Fla.**

**Filed Jun. 18, 1980, Ser. No. 160,744**
**Int. Cl.³ C10B *39/08;* B01D *47/00***
**U.S. Cl. 201—39** **8 Claims**



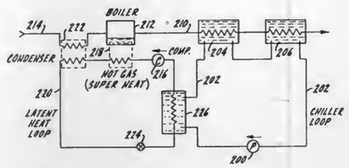
1. The method of quenching coke and scrubbing the resulting gases comprising the steps of placing a supply of hot coke in an enclosed natural draft tower having an open top, passing water from above to said coke through at least one layer of a liquid gas contact body formed of corrugated sheets of materials arranged with the corrugations in each adjacent sheet crossing each other, passing gases from the quenched coke through said contact body countercurrent to said water to remove particulate matter, liquid drops and water soluble vapors from said gases in said contact body, the pressure drop across the contact body being on the order of 0.15 inches w.g., and thereafter passing said gases through a mist eliminator structure to remove water droplets therefrom, the pressure drop across the mist eliminator being on the order of 0.10 inches w.g.

**4,294,664**

## LATENT HEAT RECIRCULATING SYSTEM

**Myron L. Anthony, Grand Junction, Colo., assignor to Sax Zzyzx, Ltd., Clifton, Colo.**

**Filed Jul. 16, 1980, Ser. No. 169,441**
**Int. Cl.³ B01D *3/02, 3/22***
**U.S. Cl. 203—19** **11 Claims**




1. A method of conserving energy while processing a process liquid in a process stream to recover its latent heat of condensation for return to the process stream and comprising the following steps:

(1) providing an open process stream having a first heat accepting means and a first heat rejecting means;

(2) providing a closed refrigerator loop having second heat accepting means and second heat rejecting means;

(3) providing a closed chiller loop having third heat accepting means and third heat rejecting means;

(4) indirectly exchanging heat between said second heat accepting means and said third heat rejecting means;

(5) indirectly exchanging heat between said first heat rejecting means and said third heat accepting means; and

(6) indirectly exchanging heat between said second heat rejecting means and said first heat accepting means,

thereby enabling said latent heat to be passed to the chiller loop and from there to the refrigerator loop for exchange back to the process stream, and allowing adjustments to be made in the refrigerator loop for efficiency and performance without necessarily effecting the chiller loop.

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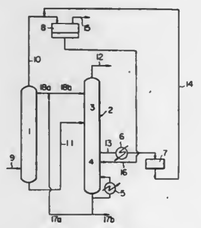
**4,294,665**

## SEPARATION OF ACETONITRILE FROM CRUDE OLEFINICALLY UNSATURATED NITRILE

**Katsuta Issei, and Tanaka Tetsuo, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Jan. 28, 1980, Ser. No. 115,865**
**Claims priority, application Japan, Feb. 2, 1979, 54/11109**
**Int. Cl.³ B01D *3/00;* C07C *121/32***
**U.S. Cl. 203—50** **11 Claims**



1. A process for separating acetonitrile from a crude olefinically unsaturated nitrile which comprises passing a reaction gas obtained in the ammoxidation of propylene or isobutylene through a quenching column, an absorption column with water, an extractive distillation column for the olefinically unsaturated nitrile and a stripping column for acetonitrile successively, condensing the acetonitrile-containing vapor from the top of the stripping column, evaporating the condensed acetonitrile-containing liquid into the waste gas discharged from



the top of the absorption column, subjecting the waste gas containing a gas and a liquid obtained by the evaporation to a vapor-liquid separation subjecting the gas separated thereby to incineration and recycling the liquid thereby separated to a preselected point selected from the group consisting of the bottom of the quenching column, the stripping column and the bottom of the extractive distillation column.

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**4,294,666**

## PROCESS FOR THE MANUFACTURE OF 4,4'-DIPHENYL-METHANE DIISOCYANATE AND A MIXTURE OF DIPHENYL-METHANE DIISOCYANATE ISOMERS CONTAINING A SMALL AMOUNT OF URETDIONES AND HYDROLYZABLE CHLORINE

**Hans J. Astheimer, Neuhofen; Horst Brandtstaedter, Ludwigshafen; Rainer Ohlinger, Heidelberg, all of Fed. Rep. of Germany; Willy Van Pee, Ekeren; Jaak Van Steen, Wuustwezel, both of Belgium; Friedrich Sauer, Obersuelzen, Fed. Rep. of Germany; Rudolf Schmidt, Frankenthal, Fed. Rep. of Germany, and Siegfried Krueger, Speyer, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Aug. 15, 1980, Ser. No. 178,673**
**Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933601**
**Int. Cl.³ B01D *3/10;* C07C *119/048***
**U.S. Cl. 203—72** **6 Claims**

1. A process for the manufacture of a mixture of diphenylmethane diisocyanate isomers and particularly 4,4'-diphenylmethane diisocyanate containing a small amount of uretdiones and hydrolyzable chlorine by the distillation of a mixture of crude MDI, diphenylmethane diisocyanate isomers and polyphenylene polymethylene polyisocyanates, which comprises:

A. feeding crude MDI into an evaporator at temperatures of 175° C. to 210° C. under reduced pressure,

B. discharging a non-distilled bottom fraction of from 97 weight percent to 50 weight percent based on the feed amount of crude MDI,

C. evaporating a head fraction of from 3 weight percent to 50 weight percent based on the feed amount of crude MDI,

D. condensing from the head fraction a fraction I of from 90 weight percent to 99 weight percent based on the feed amount of the head fraction, in a condensation stage I, at a temperature of from 130° C. to 170° C., the fraction I containing at least 96 weight percent, based on the weight of fraction I, of diphenylmethane diisocyanate isomers, less than one weight percent, based on the weight of fraction I, of uretdiones and less than 50 ppm based on the weight of fraction I of hydrolyzable chlorine, and

E. condensing the remaining 10 weight percent to one weight percent, based on the feed amount of head fraction, in a condensation stage II at a temperature of from 45° C. to 60° C.

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**4,294,667**

## CORROSION EVALUATION TESTING METHOD OF COATED METALLIC MATERIAL AND APPARATUS EMPLOYED THEREFOR

**Takashi Yamamoto, Kyoto, and Hiroshi Amako, Hirakata, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Mar. 14, 1980, Ser. No. 130,443**
**Claims priority, application Japan, May 10, 1979, 54-57868**
**Int. Cl.³ G01N *27/30, 27/46***
**U.S. Cl. 204—1 T** **28 Claims**

1. A method of testing coated metallic material for corrosion, comprising the steps of:

(a) providing a metallic specimen plate having a film face coated by a film of paint and bringing the film face in contact with a corrosive test medium;

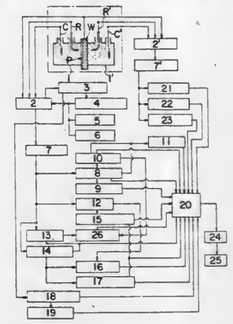
(b) detecting the plate's spontaneous electrode potential with respect to the corrosive medium and potentiostatically electrolyzing said film face at said spontaneous electrode potential;

(c) selectively pulse polarizing said film face by cathodic-anodic voltage and computing the existence or non-existence of a film defect from the polarizing voltage and detected induced polarization current;

(d) selectively sweep polarizing said film face by a linear positive and negative potential sweep to induce a sweep polarization current;

(e) responding to the computation of non-existence of a film defect in step (c) by

(i) selectively pulse polarizing said film face by small



voltage cathodic-anodic pulses and computing the film face's film resistance from the polarizing pulses and detected induced pulse polarization current; said

(ii) selectively subtracting a current correction portion, computed as caused by the film resistance, from said sweep polarization current to detect a comparatively very small current-potential variation and from this very small current-potential variation computing the specimen's corrosion current; and

(f) responding to the computation of existence of a film defect in step (c) by detecting said sweep polarization current to selectively form cathodic polarization curves and anodic polarization curves.

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**4,294,668**

## METHOD OF MEASURING OXYGEN AND PROCESS FOR PRETREATING A SOLID ELECTROLYTE OXYGEN GAS SENSING ELEMENT

**Ching T. Young, Troy, Mich., assignor to Bendix Autolite Corporation, Fostoria, Ohio**

**Division of Ser. No. 942,102, Sep. 13, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,843**
**Int. Cl.³ G01N *27/58***
**U.S. Cl. 204—1 T** **13 Claims**

1. A process for pretreating a solid electrolyte oxygen gas sensor element so as to increase the voltage output under rich gas conditions, shorten the switching response time, and reduce the internal resistance thereof, the sensor element comprising a solid electrolyte body having an inner conductive catalyst electrode on the inner surface, that is to be in contact with a reference gas during operation of the sensor, an outer conductive catalyst electrode coating on the outer surface thereof, that is to be in contact with a gas, the oxygen content of which is to be measured during operation of the sensor, and a porous protective coating over at least a portion of said outer electrode, comprising:

(a) heating the sensor element to an elevated temperature in excess of 450° C. and subjecting the outer surface thereof, with said outer conductive catalyst coating, to a nonoxidizing atmosphere; and

(b) applying a direct current to the sensor element, with said outer electrode as an anode, while said outer surface is at

said elevated temperature and subjected to said nonoxidizing atmosphere, the current density thereof being at least 5 milliamperes per square centimeter of the planar surface of said outer conductive catalyst electrode.

10. The solid electrolyte oxygen gas sensor element pretreated according to the process of claim 1.

13. A method for measuring the oxygen content of a gas with a solid electrolyte oxygen gas sensor element comprising a solid electrolyte body, an inner electrode on the inner surface, that is to be in contact with a reference gas during operation of the sensor, and an outer electrode on the outer surface, that is to be in contact with a gas, the oxygen content of which is to be measured during operation of the sensor, said method comprising:

heating the sensor element to an elevated temperature in excess of 450 degrees C. and subjecting the outer surface thereof to a non-oxidizing atmosphere;

applying a direct current to the sensor element, with said outer electrode as an anode, while said outer surface is at said elevated temperature and subjected to said non-oxidizing atmosphere, the current density thereof being at least 5 milliamperes per square centimeter of the planar surface of said outer electrode;

removing the current from the sensor;

exposing the outer electrode of said sensor to a gas the oxygen content of which is to be measured, with the inner electrode in contact with a reference gas; and

measuring an electrical output from said sensor electrodes as a measure of the oxygen content of in said gas.

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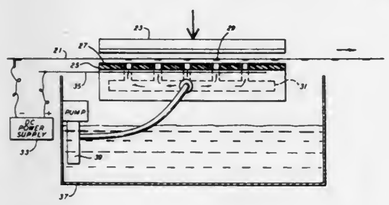
**4,294,669**

## PROCESS FOR PLATING SELECTED METAL AREAS

**Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 8, 1980, Ser. No. 185,091**
**Int. Cl.³ C25D** *5/02*
**U.S. Cl. 204—15** **3 Claims**



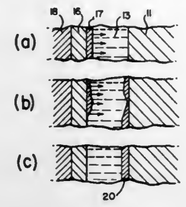
1. In a process for plating selected areas of a metal wherein a rigid plate covered with a resilient material is placed in contact with one surface of the metal and a plating solution is energized and applied to the selected areas of the opposite surface of the metal, the improvement comprising the steps of contacting the opposite surface of the metal with an apertured mask comprising a mask blank having a plurality of apertures and having a layer of polyurethane on one surface for forming a seal with said metal, a layer of polyurethane affixed to the inner periphery of the apertures of said apertured mask, and a layer of polyurethane in a recessed portion of an opposite surface of said apertured mask blank surrounding each one of said apertures and applying said plating solution to said selected areas of said metal through said apertures of said apertured mask.

**4,294,670**

## PRECISION ELECTROPLATING OF METAL OBJECTS

**Louis W. Raymond, 2500 Post Rd., Fairfield, Conn. 06430**

**Filed Oct. 29, 1979, Ser. No. 89,589**
**Int. Cl.³ C25D** *7/04, 17/10*
**U.S. Cl. 204—26** **5 Claims**




1. In the process for the precision electroplating of a layer of metal of predetermined uniform thickness on the surface of a metal object in which an anode comprising the source of the metal being electroplated on the surface of the metal object is positioned in close proximity to said surface with the facing surfaces of the anode and the metal object spaced a predetermined uniform distance apart, in which the space between said facing surfaces of the anode and the metal object being electroplated is filled with an aqueous electrolyte containing a cation of the electroplating metal and in which an electrolyzing current is passed through said aqueous electrolyte between the facing surfaces of the anode and the object being electroplated to cause the electroplating metal of the anode to be electrolytically dissolved in the aqueous electrolyte and to cause an exactly equal amount of said metal to be electrolytically deposited on said facing surface of the metal object being electroplated, the improvement which comprises:

employing a composite anode having an under body of generally electrically conductive but anodically non-conductive material on the surface of which under body is disposed an outer layer of the metal being electroplated on the surface of the metal object, said outer layer of electroplating metal of the anode initially being of predetermined uniform thickness and completely covering the surface of the under body of the anode that immediately faces the surface of the metal object being electroplated, and

continuing the electroplating operation to effect the complete electrolytic dissolution of the outer layer of electroplating metal of the anode, the complete removal of said outer layer of electroplating metal from any given area of the anode under body automatically terminating the flow of electrolyzing current from that area of the anode with the concomitant termination of the electrodeposition of said metal onto the corresponding area of the metal object being electroplated, whereby a layer of metal of predetermined uniform thickness is electroplated onto the surface of said metal object.

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**4,294,671**

## HIGH TEMPERATURE AND LOW FEED ACID CONCENTRATION OPERATION OF HCL ELECTROLYZER HAVING UNITARY MEMBRANE ELECTRODE STRUCTURE

**Edward N. Balko, Wilmington, Mass., assignor to General Electric Company, Wilmington, Mass.**

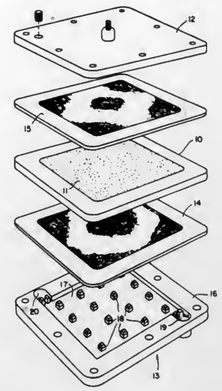
**Filed May 14, 1980, Ser. No. 149,619**
**Int. Cl.³ C25B** *1/26, 9/00*
**U.S. Cl. 204—128** **13 Claims**

1. A process of generating halogens which comprises,

(a) electrolyzing an aqueous halide between an anode and a cathode electrode separated by a permselective, liquid and gas impervious ion exchanging membrane, said anode being bonded to the membrane to provide a gas and liquid permeable electrode which forms part of a unitary electrode-membrane structure,



(b) applying potential to the anode through a separate electron current conducting structure to introduce electron current flow to the bonded anode at a plurality of discrete areas on the surface of the anode,



(c) establishing turbulent anolyte flow conditions over the surface of the anode to maintain the chloride ion concentration at the discrete areas of the anode at a level to minimize chloride ion starvation and oxygen evolution at the operating current density to maintain the oxygen content of the evolved halogen below 1%.

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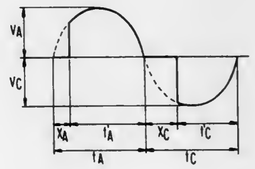
**4,294,672**

## METHOD FOR PREPARING A SUPPORT FOR A LITHOGRAPHIC PRINTING PLATE

**Hisao Ohba; Kazutaka Oda; Yukio Yabuta, and Azusa Ohashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed May 30, 1980, Ser. No. 154,665**
**Claims priority, application Japan, May 30, 1979, 54-67210**
**Int. Cl.³ C25F** *3/04*
**U.S. Cl. 204—129.4** **15 Claims**



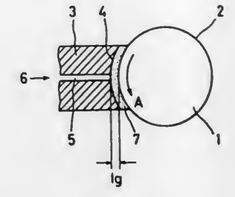

1. A method for preparing a support for a lithographic printing plate comprising electrolytically graining an aluminum plate in an acidic electrolyzing bath, wherein an alternating charge voltage having a wave form which includes at least one intermission period of zero voltage in at least one of the anode or the cathode phases is applied to said plate, and is such that the electric quantity for the anode phase $Q_a$ is larger than the electric quantity for the cathode phase $Q_c$.

**4,294,673**

## METHOD OF MIRROR-FINISHING A CYLINDRICAL WORKPIECE

**Yasuo Kimoto, Fujiidera; Katsunori Tamiya, Kobe; Shoichi Honda, Osaka; Hidehiko Maehata, Toyonaka, and Hiroshi Kamada, Takatsuki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan**

**Filed Feb. 22, 1980, Ser. No. 123,648**
**Claims priority, application Japan, Feb. 24, 1979, 54-20919; Mar. 27, 1979, 54-36618; May 2, 1979, 54-55086; May 2, 1979, 54-55087; Aug. 15, 1979, 54-104313; Aug. 15, 1979, 54-104314; Aug. 15, 1979, 54-104315**
**Int. Cl.³ C25F** *3/16*
**U.S. Cl. 204—129.46** **2 Claims**



1. A method of mirror finishing a cylindrical workpiece comprising the steps of:

disposing a plurality of working electrodes oppositely to one surface of said cylindrical workpiece defining a plurality of gaps between said working electrodes and said cylindrical workpiece;

introducing an electrolyte and an abrasive matter into said plurality of gaps, said electrolyte being in a passive state, said abrasive matter being water permeable;

connecting said cylindrical workpiece to the anode of a power supply and said working electrodes to the cathode of said power supply, said power supply providing an electrolytic voltage in a range from 2 volts to 15 volts and an electrolytic current less than or equal to 10 amperes /cm$^2$;

performing an anodic liquation operation by electrolysis onto a metallic surface of the cylindrical workpiece being treated;

assisting said anodic liquation operation by simultaneously performing an abrasive operation to the metallic surface of the workpiece being treated resulting in the abrasion of an anodic passive film formed on said metallic surface;

the steps of performing an anodic liquation operation and performing an abrasive operation further including the steps of:

swivelling each of said plurality of working electrodes and the cylindrical workpiece relative to one another in a circumferential direction of the cylindrical workpiece, and

simultaneously pressing said working electrodes and the abrasive matter toward the metallic surface of the cylindrical workpiece, the pressing force of said abrasive matter on the surface of the cylindrical workpiece being greater than or equal to 0.5 kgf/cm$^2$,

the steps of swivelling one of said plurality of working electrodes and said cylindrical workpiece relative to one another and simultaneously pressing said one of said working electrodes and the abrasive matter toward the surface of the cylindrical workpiece providing a speed of abrasion of said abrasive matter across a portion of the metallic surface of the cylindrical workpiece of greater than or equal to 2 meters/second,

a period of time between the steps of swivelling and simultaneously pressing said one of said working electrodes relative to said portion of the metallic surface of the cylindrical workpiece and swivelling and simultaneously pressing an adjacent one of said working elec-

trodes relative to said portion of the surface of the cylindrical workpiece being in a range from 20 milliseconds to 200 milliseconds.

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**4,294,674**

## METHOD OF TREATING WASTE GAS BY IRRADIATION

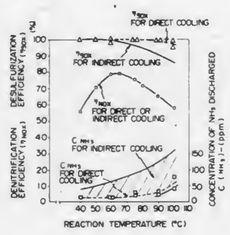
**Shinji Aoki, Tokyo; Keita Kawamura; Hitoshi Kimura, both of Fujisawa; Tsutomu Katayama; Chikara Kaido, both of Kitakyushu, and Hiroshi Yoshida, Koganei, all of Japan, assignors to Ebara Corporation, Tokyo, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,500**

**Claims priority, application Japan, Dec. 29, 1978, 53-162153**

**Int. Cl.³ B01J** *19/08*

**U.S. Cl. 204—157.1 H** **4 Claims**




1. An improved method of treating waste gas containing sulfur oxides and nitrogen oxides and having ammonia added, the waste gases being subjected to ionizing radiation characterized in that the reaction temperature is held between 50° C. and 80° C. during the treatment.

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**4,294,675**

## PROCESS FOR PRODUCTION OF FLUORINE-CONTAINING MULTI-COMPONENT COPOLYMERS

**Osamu Matsuda; Terutaka Watanabe, both of Takasaki; Yoneho Tabata, Tokyo, and Sueo Machi, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan**

**Filed Oct. 16, 1979, Ser. No. 85,328**

**Claims priority, application Japan, Oct. 18, 1978, 53-128206; Mar. 20, 1979, 54-32962; Mar. 20, 1979, 54-32963; Apr. 27, 1979, 54-52278**

**Int. Cl.³ C08F** *8/00, 214/18, 214/26*

**U.S. Cl. 204—159.14** **29 Claims**

1. A process for the cross-linking of fluorine-containing multi-component interpolymer of regular repeating sequential alternating structure of $-A_1-B_1-A_2-B_2-A_3-B_3-$, wherein $A_1$, $A_2$ and $A_3$ represent α-olefin units and $B_1$, $B_2$ and $B_3$ represent α,β,β-trifluoroacrylate or tetrafluoroethylene

formed by copolymerizing by irradiating with ionizing radiation a mixture of tetrafluoroethylene; at least one α,β,β-trifluoroacrylate selected from the group consisting of methyl α,β,β-trifluoroacrylate, ethyl α,β,β-trifluoroacrylate, and butyl α,β,β-trifluoroacrylate; and at least one α-olefin selected from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 1-heptene, 1-octene, 1-nonene, 1-decene, 1-undecene, 1-dodecene, 1-tridecene, 1-isobutylene, 2-methyl-1-butene, 2-methyl-1-pentene, 2-methyl-1-hexene, 2-methyl-1-heptene and 2-methyl-1-octene;

comprising subjecting said interpolymer to electron beam irradiation in air or in an inert gas.

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## AQUEOUS MONOMER SOLUTIONS ADAPTED FOR DIRECT PHOTOPOLYMERIZATION

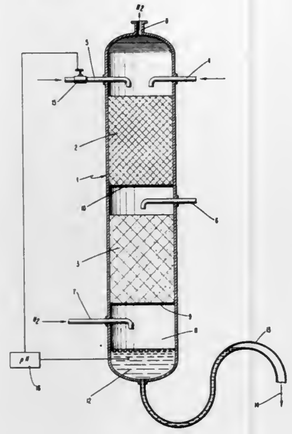
**Jean Boutin, Mions; Bernard Guenot, Paris, and Bruno Jamet, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Jul. 10, 1979, Ser. No. 56,337**

**Claims priority, application France, Jul. 24, 1978, 78 22883**

**Int. Cl.³ C08F** *2/10, 2/46*

**U.S. Cl. 204—159.23** **19 Claims**



1. A process for the preparation of an aqueous monomer solution adapted for direct photopolymerization into water soluble polymers, comprising deoxygenating and countercurrently scrubbing an aqueous solution of olefinically unsaturated hydrophilic monomer with an inert gas in a packed column, and concurrently adding a photopolymerization inducing amount of photoinitiator to said aqueous solution.

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**4,294,677**

## METHOD FOR ELECTRODEPOSITING A PROTEIN ONTO AN ION-EXCHANGE MEMBRANE

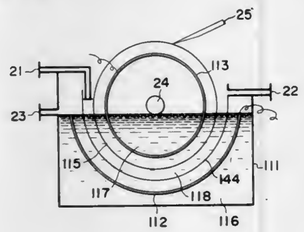
**Teruo Sakagami, Iwaki; Tadaaki Kato, Tokyo; Toru Hirai, and Naohiro Murayama, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 12, 1979, Ser. No. 74,826**

**Claims priority, application Japan, Nov. 17, 1978, 53-141863**

**Int. Cl.³ C25D** *1/18, 1/20*

**U.S. Cl. 204—181 F** **11 Claims**




1. A process for recovering protein from an aqueous solution or suspension containing the protein by electrically depositing the protein on at least one diaphragmatic membrane comprising introducing an aqueous solution of an electrolyte into at least one electrode-chamber formed by an electrode and an ion-exchange membrane as said diaphragmatic membrane, and electrophoretically moving said protein contained in said aqueous solution or suspension in a chamber adjacent to said electrode-chamber while controlling the pH of the surface of said ion-exchange membrane by creating a difference between the pH of said aqueous solution or electrolyte and the pH of said aqueous solution or suspension whereby said protein is recovered as a film or cylindrical film without bubbling.



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**4,294,678**

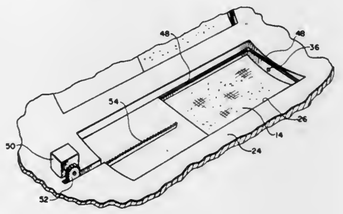
## APPARATUS AND METHOD FOR PREVENTING CONTAMINATION OF SPUTTERING TARGETS

**Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.**

**Filed Nov. 28, 1979, Ser. No. 98,223**

**Int. Cl.³ C23C** *15/00*

**U.S. Cl. 204—192 R** **10 Claims**




1. In a sputtering apparatus which comprises a vessel including means for establishing low pressure gas conditions within the vessel and maintaining the interior of the vessel in sealed condition relative to the exterior ambient atmosphere, anode and cathode means within the vessel and the cathode means including at least one target material surface exposed to the interior of the vessel, the anode and cathode means being disposed in such a manner that said target material surface is in face to face relationship with the anode means and spaced therefrom whereby to enable a substrate member to be interposed in said space, means for extending electrical connections from said anode and cathode means to an exterior source of electrical energy, means for establishing and maintaining sputtering conditions within the vessel and means for maintaining a substrate member adjacent to the anode means in said space during the period of time that the sputtering conditions are being maintained within said vessel, the invention herein which comprises:

means for preventing contamination of the target material surface when the vessel is opened to the exterior ambient atmosphere comprising remotely controlled shutter means for selectively sealing off said target material surface from the interior of the vessel and exposing said target material surface to said interior of the vessel.

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**4,294,679**

## FLAT ELECTROCHEMICAL SENSOR, AND METHOD OF ITS MANUFACTURE

**Helmut Maurer, Schwieberdingen; Klaus Müller, Tamm; Ernst Linder, Mühlacker; Franz Rieger, Aalen-Wasseralfingen, and Günther Stecher, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed May 1, 1980, Ser. No. 145,738**

**Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928496**

**Int. Cl.³ G01N** *27/58*

**U.S. Cl. 204—195 S** **34 Claims**

1. Electrochemical sensor unit for determination of oxygen content in gases, particularly exhaust gases from a combustion process, especially exhaust gases from an internal combustion engine, adapted for support by and in a metallic housing,

said sensor unit being of essentially elongated plate-like form having a sensing end portion adapated for exposure to the gases and a holding end portion adapted for attachment into the housing, and an intermediate portion intermediate said end portions,

said sensor units having a plate carrier element (**11**, **14**; **31**, **32**; **46**; **59**; **71**; **89**; **108**; **112**);

a plate-like solid electrolyte body (**11**; **31**; **46**; **59**; **71**; **89**; **108**; **112**) forming at least in part said carrier element;

a measuring electrode and a reference electrode forming an electrode pair (**12**, **13**; **29**, **30**; **45**, **50**; **60**, **61**; **69**, **70**; **92**, **93**; **108**; **113**, **114**), said electrodes being porous metallic layers located on said electrolyte body, spaced from each other, at least the measuring electrode being adapted to be exposed to the gases to be tested; wherein, in accordance with the invention, at least one of the electrodes is covered with a cover plate (**17**; **36**; **63**, **77**; **83**; **103**; **103'**, **120**), and

to conduct a gas to at least one of the electrodes, depressions, grooves, ducts or flutes (**22**; **94**, **94'**; **115**) are formed between the respective electrode and at least one of said cover plates said depressions, grooves, ducts or flutes being open to the gas to be admitted and dimensioned to control the quantity of gas being admitted to the respective electrode.

22. Method to make an electrochemical sensor unit, for the determination of oxygen content in gases, particularly exhaust gases from a combustion process and especially exhaust gases from an internal combustion engine, adapted for support in a metallic housing, said sensor unit being essentially of elongated

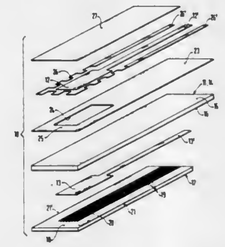

plate-like form having a sensing end portion adapted for exposure to the gases, a holding end portion adapted for attachment in the housing, and an intermediate portion intermediate said end portions,

said sensor unit having a plate-like carrier element;

a plate-like solid electrolyte body forming at least in part said carrier element;

a measuring electrode and a reference electrode forming an electrode pair, said electrodes being porous metallic layers located on said electrolyte body, spaced from each other, at least the measuring electrode being adapted to be exposed to the gases to be tested;

and at least one cover plate element covering at least one of the electrodes,

and wherein the sensor is characterized in that ducts or flutes are formed between a respective electrode and at least one of said elements, said ducts or flutes being open to a gas to be admitted and dimensioned to control the quantity of gas being admitted to the respective electrode to conduct the gas thereto,

said method comprising the steps of

(a) applying the electrodes (**92**,**93**) on the carrier (**89**); then

(b) applying projecting elements (**100**, **100/1**; **99**, **99'**) of a gas-impervious material capable of being sintered on at least one of the electrodes and at least portions of the carrier (**89**), said projecting elements defining the grooves or flutes therebetween; then

(c) applying a filler material in the grooves or flutes which, upon a sintering process, is volatile or dissolvable; then

(d) applying a cover (**103**, **103'**) of a gas-impervious material capable of being sintered on the surface formed by the projecting elements and the filler material; then

(e) sintering said sensor unit to unite the components thereof to sinter together the projecting elements and the cover and evaporate or dissolve and filler to leave the grooves or flutes free.

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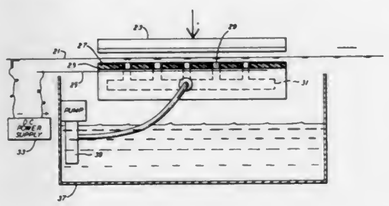
**4,294,680**

## APPARATUS FOR SELECTIVE METAL PLATING

**Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 8, 1980, Ser. No. 185,092**
**Int. Cl.³ C25D *17/00***
**U.S. Cl. 204—224 R** **4 Claims**



**1**. In apparatus for plating selected areas of a metal wherein a rubber-covered rigid plate is placed in contact with one surface of the metal, an apertured mask is placed in contact with an opposite surface of the metal, and a plating solution is applied to selected areas of the opposite surface of the metal through said mask and energized for a given period of time, the improvement wherein said apertured mask comprises a mask blank having a top surface, at least one aperture having an inner perimeter, and a bottom surface with a recessed portion surrounding said aperture and a layer of polyurethane covering said top surface for forming a seal with said metal, said inner perimeter of said aperture and said recessed portion of said bottom surface whereby said polyurethane forms a seal surrounding said selected areas of the metal.

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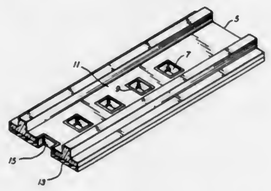
**4,294,681**

## MOLDED SELECTIVE PLATING MASK

**Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 8, 1980, Ser. No. 185,094**
**Int. Cl.³ C25D *17/00***
**U.S. Cl. 204—224 R** **10 Claims**



**1**. A mask for selectively plating specific areas of a metal comprising:

a mask blank having a plurality of apertures therein for alignment with said specific areas for selective plating of said metal with each of said apertures surrounded by a recessed portion of said mask blank on one surface thereof; and a layer of polyurethane covering a surface opposite said one surface of said mask blank for forming a seal with said metal, said recessed portion of said one surface of said mask blank, and the inner perimeter of each aperture in said mask blank.

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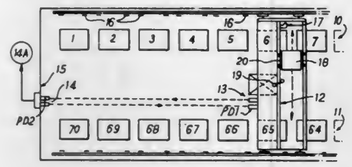
**4,294,682**

## DATA ACQUISITION SYSTEMS

**Andrew E. Deczky, Ottawa, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada**

**Filed Jan. 31, 1977, Ser. No. 764,167**
**Claims priority, application Canada, Jan. 29, 1976, 244504**
**Int. Cl.³ H04B *9/00*; G06K *15/20***
**U.S. Cl. 204—244** **14 Claims**



**1**. A system for a hot metal handling operation comprising:

a plurality of operating stations each including an electrolytic aluminum reducing pot;

a mobile crane for servicing said pots at each operating station by adding raw materials and removing molten metal;

a data acquisition system comprising:

means associated with the crane for providing identification information of a particular pot and pot row being serviced;

means associated with the crane for measuring process variables at each operating station; and means on the crane for optically transmitting said identification information and said information concerning the measurements over a cableless path from said crane to a receiver and computer located remotely of said operating stations.

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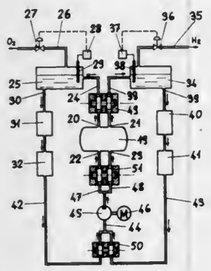
**4,294,683**

## ELECTROLYSIS UNIT

**Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France**

**Filed Mar. 31, 1980, Ser. No. 136,099**
**Claims priority, application France, Apr. 2, 1979, 79 08694**
**Int. Cl.³ C25B *9/00, 15/08***
**U.S. Cl. 204—258** **10 Claims**



**1**. Electrolysis unit comprising at least one electrolyzer provided with at least one anolyte outlet and at least one catholyte outlet, a degasser for each of said outlets, a circuit connecting each degasser to its respective outlet, means for controlling the flow of electrolyte in each connecting circuit means, each for controlling the flow of anolyte being coupled to the corresponding means for controlling the flow of catholyte, and vice versa, by a coupling connection producing concomitant variations in these two flow-control means and an electrolyte return circuit leading from each degasser, said return circuits being connected together at a point upstream of the electrolyzer.



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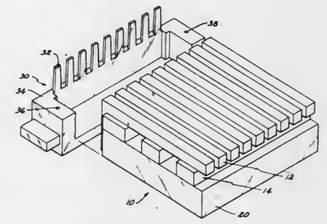
## TEMPLATE FOR FORMING MULTIPLE GEL TRACKS WITHIN A SINGLE ELECTROPHORETIC GEL FRAME

**Philip Serwer, San Antonio, Tex., assignor to Board of Reagents, University of Texas, Austin, Tex.**

**Filed Jun. 30, 1980, Ser. No. 164,274**
**Int. Cl.³ G01N *27/28***
**U.S. Cl. 204—299 R** **9 Claims**



**1**. A template for forming multiple gel tracks in a gel bed, which comprises:

a support frame;

a plurality of rigid elongate bars, each bar spaced a sufficient distance from an adjacent bar effective to form gel tracks in a gel bed, each bar of which is securely attached to the support frame in a parallel alignment with respect to the other bars; and

a sample-well forming comb having a plurality of teeth projecting linearly from a base, said comb adapted to be detachably disposed with respect to the support frame, the teeth of the comb aligned in a manner to form a flush contact with one set of ends presented by the elongate bars.

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**4,294,685**

## PROCESS FOR COAL LIQUEFACTION AND CATALYST

**Dae K. Kim, Naperville; Ralph J. Bertolacini, Chesterton; L. Charles Gutberlet, Wheaton, and Ken K. Robinson, St. Charles, all of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Division of Ser. No. 20,209, Mar. 13, 1979, Pat. No. 4,257,922.**
**This application Jul. 7, 1980, Ser. No. 166,552**
**Int. Cl.³ C10G *1/06***
**U.S. Cl. 208—10** **8 Claims**

**1**. An improved process for hydroconversion of coal solids to liquid and gaseous products comprising contacting the coal solids, a gas containing molecular hydrogen and catalyst solids in a coal reaction zone at elevated temperatures and pressures at which a major portion of said coal solids undergo hydroconversion to gaseous and liquid products, the improvement comprising using, as catalyst solids, a supported catalyst comprising a catalytically active substance on support particles, said particles having essentially bimodal pore distribution with peak concentrations of smaller pores below about 600 angstroms and larger pores above about 600 angstroms, with the average diameter of the smaller pores ranging from about 100–200 angstroms, and the average diameter of the larger pores being in excess of 1000 angstroms said catalyst including at least 5.0% of the total pore volume of the larger pores and at least 70.% of the total pore volume of the smaller pores.

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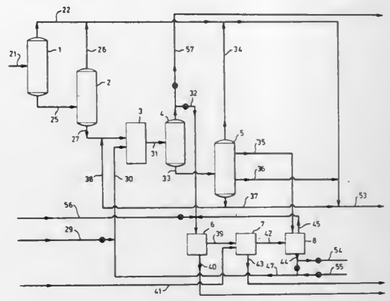
**4,294,686**

## PROCESS FOR UPGRADING HEAVY HYDROCARBONACEOUS OILS

**Ian P. Fisher, Oakville; H. John Woods, Campbellville, and Frank Souhrada, Weston, all of Canada, assignors to Gulf Canada Limited, Toronto, Canada**

**Filed Mar. 11, 1980, Ser. No. 129,288**
**Int. Cl.³ C10G *45/28, 47/34***
**U.S. Cl. 208—56** **13 Claims**



**1**. A process for the upgrading of viscous hydrocarbonaceous oils comprising:

(a) fractionally distilling said hydrocarbonaceous oil to produce at least one fraction boiling below a temperature from substantially 300° C. to substantially 570° C. and a residuum boiling above said temperature, without significantly cracking said hydrocarbonaceous oil,

(b) contacting said residuum with a liquid hydrogen donor material stream at hydrocracking conditions to produce a hydrocracked stream,

(c) separating said hydrocracked stream into a gaseous stream and a liquid hydrocracked stream,

(d) fractionally distilling said liquid hydrocracked stream to separate, from lower and higher boiling fractions, a hydrogen donor precursor stream boiling above a temperature from substantially 180° C. to substantially 200° C. and below a temperature from substantially 330° C. to substantially 350° C.,

(e) catalytically reacting said hydrogen donor precursor stream with a hydrogen-rich gaseous stream to produce a hydrogenated donor material, and

(f) recycling at least part of said hydrogenated hydrogen donor material as the material which constitutes the entire liquid hydrogen donor material stream to contact said residuum in step (b) noted above.

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**4,294,687**

## LUBRICATING OIL PROCESS

**Ronald Pinaire, Park Forest, and Gary L. Everett, Chicago Heights, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.**

**Filed Dec. 26, 1979, Ser. No. 106,973**
**Int. Cl.³ C10G *45/00, 47/02, 65/12***
**U.S. Cl. 208—58** **29 Claims**

**1**. A process for preparing a mineral hydrocarbon lubricating oil base stock comprising:

(a) contacting a mineral hydrocarbon oil feedstock of lubricating oil viscosity with molecular hydrogen in the presence of a hydrotreating catalyst under hydrotreating conditions to avoid undue cracking of said feedstock such that less than about 5% by volume of said feedstock is cracked to produce materials boiling below about 600° F.;

(b) contacting the effluent oil from step (a) with molecular hydrogen in the presence of a hydrocracking catalyst under hydrocracking conditions; and

(c) contacting the effluent oil from step (b) with molecular hydrogen in the presence of a hydrogenation catalyst under hydrogenation conditions such that less than about 5% by volume of said effluent oil from step (b) which boils above 600° F. is cracked to produce material boiling below about 600° F.

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**4,294,688**

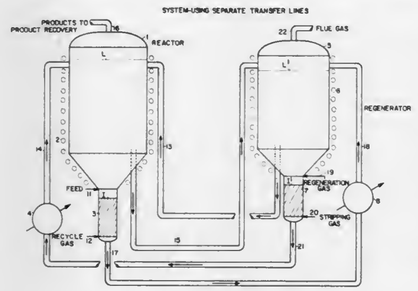
## HEAT TRANSFER IN MAGNETICALLY STABILIZED, FLUIDIZED BEDS

**Francis X. Mayer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation of Ser. No. 737,227, Nov. 1, 1976, abandoned. This application Mar. 19, 1980, Ser. No. 131,855**

**Int. Cl.³ C10G** *11/00, 15/00*

**U.S. Cl. 208—164** **10 Claims**




1. A hydrocarbon conversion process which comprises (a) contacting a hydrocarbon feedstock in a conversion zone having a magnetic field applied thereto with a fluidizable particulate solids mixture containing a plurality of separate discrete substantially inert heat carrier particles and magnetizable catalyst particles, said substantially inert heat carrier particles having settling rates higher than the settling rates of said catalyst particles; (b) permitting said heat carrier particles to settle in preference to the catalyst particles in a settling zone communicating with said conversion zone; (c) circulating said catalyst particles from the conversion zone to a regeneration zone having a magnetic field applied thereto; (d) circulating said heat carrier particles from the settling zone to said regeneration zone, said circulation of heat carrier particles being independent of the circulation of catalyst particles; (e) contacting said catalyst particles in the presence of said heat carrier particles with oxygen at elevated temperatures to burn coke deposited upon said catalyst particles; (f) permitting said heat carrier particles to settle in preference to the catalyst particles in a settling zone communicating with said regeneration zone; (g) circulating said catalyst particles from the regeneration zone to a conversion zone having a magnetic field applied thereto; and (h) circulating said heat carrier particles from the settling zone to said reaction zone, said circulation of heat carrier particles being independent of the circulation of catalyst particles.

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**4,294,689**

## SOLVENT REFINING PROCESS

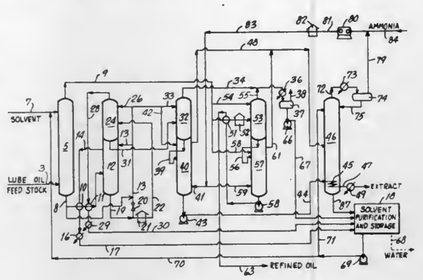
**Avilino Sequeira, Jr., Port Arthur; Benjamin F. Smith, Jr., Groves, and Theodore C. Mead, Port Neches, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.**

**Filed Feb. 14, 1980, Ser. No. 121,571**

**Int. Cl.³ C10G** *21/20*

**U.S. Cl. 208—326** **4 Claims**

1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted with N-methyl-2-pyrrolidone as selective solvent for aromatic constituents of said feedback in an extraction zone thereby forming an extract phase rich in said aromatic constituents and comprising a major portion of said solvent and a non-aromatic raffinate phase comprising a minor portion of said solvent, said raffinate phase is separated from said extract phase, and solvent is removed from each of said phases by flash vaporization, distillation, rectification, or a combination thereof, the improvement which comprises stripping residual solvent from said extract and from said raffinate with gaseous ammonia thereby forming a mixture of gaseous ammonia and solvent vapor, passing said




mixture of gaseous ammonia and solvent vapor to a solvent recovery zone wherein said mixture is cooled to a temperature sufficient to condense at least a portion of said solvent therefrom, separating gaseous ammonia from liquid condensate solvent, returning said condensate solvent to said extraction zone, and passing gaseous ammonia from which solvent has been removed into contact with said extract and said raffinate as said stripping gas for the removal of solvent therefrom.

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**4,294,690**

## PROCESS FOR SEPARATING WEAKLY MAGNETIC ACCOMPANYING MINERALS FROM NONMAGNETIC USEFUL MINERALS

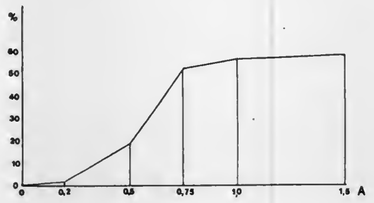
**Erich Kollenz, Leoben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria**

**Filed Apr. 2, 1980, Ser. No. 136,708**

**Claims priority, application Austria, May 31, 1979, A3984/79**

**Int. Cl.³ B03C** *1/00*

**U.S. Cl. 209—3** **6 Claims**




1. A process for separating minerals having a mass susceptibility of below $200 \times 10^{-6}$ cm³/g from useful minerals or ores which are nonmagnetic or less magnetic than the minerals to be separated therefrom comprising the steps of:

crushing said minerals or ores to a grain size no greater than 0.2 mm; and

separating said minerals in a magnetic separator having a strong magnetic field.



**4,294,691**

## HYDRODYNAMIC BLUEBERRY SORTING

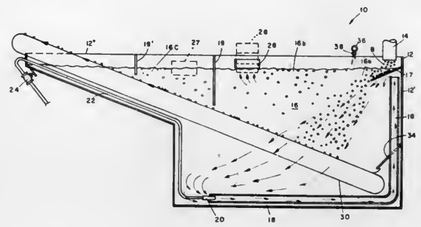
**Albert W. Patzlaff, South Haven, Mich., assignor to Blueberry Equipment, Inc., South Haven, Mich.**

**Continuation of Ser. No. 962,381, Nov. 20, 1978, Pat. No. 4,225,424. This application Jan. 7, 1980, Ser. No. 110,259**

**The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.**

**Int. Cl.³ B07C** *5/02*

**U.S. Cl. 209—3.1** **4 Claims**



1. Blueberry sorting apparatus comprising:

a water bath vessel having a receiving and immersion zone for receiving a harvested mixture of green, partially ripe, and ripe blueberries in the water bath; means for causing a downward current of water at said receiving and immersion zone for entraining and immersing the mixture of berries into the water bath whereby air bubbles are separated from berries to decrease their buoyancy, while green berries rise and float; a perforate conveyor in the path of said downward current to allow water flow therethrough while retaining ripe and partially ripe berries thereon; and means forming a quiescent zone in said water bath vessel, and said conveyor extending through said quiescent zone to allow partially ripe berries to rise to the bath surface and separate from the ripe berries remaining on said conveyor; said current causing means being at one upper side of said vessel, including water oulet means for propelling water into the bath, and oriented to cause said current to be directed smoothly and continuously downwardly toward the opposite lower side of said vessel; water inlet means beneath said conveyor for receiving water after flow through said conveyor; and conduit means for returning water from said water inlet means to said water outlet means.

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**4,294,692**

## DRUM-TYPE SCREENING MACHINE AND METHOD OF OPERATION

**Alois Keller, Uzwil, Switzerland, assignor to Gebrueder Buehler AG, St. Gallen, Switzerland**

**Continuation of Ser. No. 934,022, Aug. 16, 1978, abandoned, which is a division of Ser. No. 873,896, Jan. 31, 1978, Pat. No. 4,222,864. This application May 1, 1980, Ser. No. 145,834**

**Claims priority, application Switzerland, Feb. 3, 1977, 1349/77**

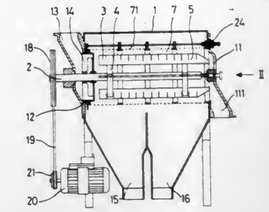
**Int. Cl.³ B07B** *1/20, 1/48*

**U.S. Cl. 209—300** **16 Claims**

1. A method of operating a drum type separator of the type having a stationary tubular screen, opposed support means for supporting the screen at opposite ends thereof and a rotor for causing movement of ground stock to be filtered, comprising the steps of:

supplying ground stock to be sieved through an inlet opening to the interior of the tubular screen while operating the rotor to cause movement of the ground stock such that the finer product passes through the stationary tubular screen and through a first outlet while the coarser product passes out a second outlet without having passed through the tubular screen,

and, while the rotor is rotating and while product is being delivered to and through the separator, operating an adjusting means accessible exteriorly of the separator to vary the distance between the opposed support means to vary the tension of the tubular screen, one of the opposed support means being fixed axially and the other being



axially moveable in either direction, and wherein the step of operating the adjusting means includes turning a turning means at one end of the drum to move the axially moveable support means axially in one direction or the other relative to the fixed support means.

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**4,294,693**

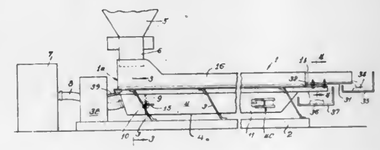
## AIR FLOTATION ORE ENRICHING APPARATUS

**Ray A. Brennan, Rte. 1, Box 575, Lake Geneva, Wis. 53147**

**Filed Dec. 8, 1980, Ser. No. 214,085**

**Int. Cl.³ B03B** *4/00*

**U.S. Cl. 209—466** **10 Claims**



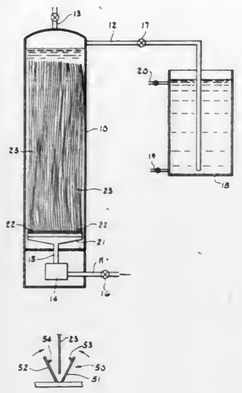
1. In a flotation ore enriching apparatus including a classification trough having an air-diffusing floor composed of interstitially cellular ceramic material having spaced riffle traps in the top surface thereof, a plenum chamber subjacent and opening to said floor to supply flotation air thereto, means for continuously supplying air under pressure to said plenum chamber, means for continuously supplying pulverized gangue and value ore mixture to be enriched to the inlet end of said classification trough, and means for controlling the flow of flotation air to said classification trough, the improvement wherein said means for continuously supplying air consists of a positive blower, said plenum chamber contains a partition defining within said chamber an inlet plenum located subjacent the inlet end of said trough and a classification plenum subjacent the remainder of said trough downstream from said inlet end thereof, said blower being connected to discharge only into said inlet plenum, said means for controlling the flow of air consisting essentially of an adjustable bleeder valve in a wall of said classification plenum to control the total volume of air forced through said air-diffusing floor and adjustable valve means in said partition to impede the flow of air from said inlet plenum to said classification plenum to maintain a high pressure in said inlet plenum sufficient to force sufficient air through said inlet end of said trough to impregnate and suspend the ore as it is being fed to said trough while maintaining by means of said bleeder valve a relatively low pressure in said classification plenum.

**4,294,694**

## ANAEROBIC FILTER

**John L. Coulthard, 16 Newry St., Richmond, Victoria, Australia**

**Filed Mar. 26, 1979, Ser. No. 24,083**
**Claims priority, application Australia, Mar. 28, 1978, PD3787**
**Int. Cl.³ C02C *1/04***
**U.S. Cl. 210—150** **6 Claims**



1. A biological filter for the treatment of a liquid medium comprising: a tank having an inlet and an outlet, the inlet of the tank being arranged to be connected to a source of polluted liquid medium, whereby said medium can flow through the tank; means for sealing said tank sufficiently to effect anaerobic conditions in said tank; an array of a plurality of vertically elongated strips of plastics material disposed in the tank and randomly floating in the liquid medium present in the tank, said strips having surfaces along essentially their entire lengths which are provided with a plurality of indentations and which are suitable for the attachment thereto of anaerobic biologically-active organisms, at least said surfaces being sufficiently flexible to move randomly so as to cause the flow path of the liquid medium to vary and so as to cause dead clusters of anaerobic organisms to break away from the surfaces thereby permitting renewed growth on the surfaces.

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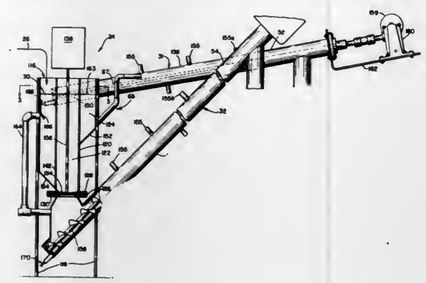
**4,294,695**

## MULTI-PHASE SEPARATION METHODS AND APPARATUS

**Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.**

**Division of Ser. No. 662,888, Mar. 1, 1976, Pat. No. 4,055,480, which is a continuation-in-part of Ser. No. 460,558, Apr. 12, 1974, Pat. No. 3,941,679, and Ser. No. 561,168, Mar. 24, 1975, Pat. No. 4,173,530, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 8, 1977, Ser. No. 814,040**
**Int. Cl.³ B01D *17/02, 11/02, 45/02***
**U.S. Cl. 210—173** **11 Claims**

1. Apparatus for resolving a composite composed of a first, soluble phase and second and third phases of insoluble solids into the phases of which it is composed, said apparatus comprising: an extractor in which a solvent extraction of said first phase from said composite and a gravity separation of the second insoluble phase of said composite from the third insoluble phase thereof can concurrently be effected; means for introducing the composite into the extractor; means in said extractor for effecting said solvent extraction and said gravity separation which includes a body of a liquid which is comprised of a solvent for said first phase of the composite and which has a specific gravity intermediate those of the solids respectively making up the insoluble second and third phases of said composite, whereby: said first phase of the composite introduced into the extractor will dissolve in said body of liquid isolating said first phase and freeing the solids making up the insoluble second and third phases; the solids making up one of said insoluble phases will then migrate toward the top of said body of liquid; and the solids making up the other of the insoluble phases will sink to the bottom thereof, thereby effecting a separation in said extractor of said three phases, each from the other; means for introducing into said extractor a solvent as aforesaid; offtake means for removing from said extractor solvent as aforesaid and that material making up the



first phase of the composite which is dissolved therein; a first solids transfer means for removing from said extractor independently of said first phase solids which have a specific gravity lower than that of the liquid in the extractor and therefore tend to collect in the upper part of the body of liquid therein; and a second solids transfer means for removing from said extractor solids which have a specific gravity higher than the specific gravity of said liquid and therefore tend to collect in the lower part of said body of liquid.

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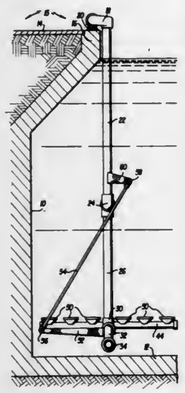
**4,294,696**

## SWING DIFFUSER

**Paul M. Thayer, Shorewood, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.**

**Filed Jan. 25, 1980, Ser. No. 115,470**
**Int. Cl.³ C02F *3/20*; B01F *3/04***
**U.S. Cl. 210—220** **12 Claims**



1. A swing diffuser apparatus for gas diffuser systems of the type in which diffusers are submerged in a tank of liquids to be treated, said apparatus comprising:
a rigid upper hanger arm;
means for pivoting said upper hanger arm to or adjacent to said tank for movement in a generally upright plane;
a rigid lower hanger arm;
means for pivoting said lower arm to said upper arm for movement in said generally upright plane or a parallel plane;
an array of gas diffusers pivotably connected to the lower portion of said lower hanger arm, said array having a substantially horizontal operating position when submerged in said liquids; and
means cooperating with said upper hanger arm and said diffuser array for rotating said diffuser array from said substantially horizontal position to an upwardly extending servicing position above the surface of said liquids at the side of said tank, said rotating occurring as said upper hanger arm is pivoted to a servicing position extending upwardly from said means for pivoting said upper hanger arm.



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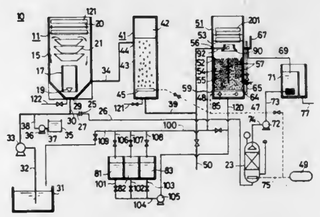
**4,294,697**

## APPARATUS FOR TREATMENT OF SEWAGE

**Toshio Sawa; Masayoshi Kubota; Sankichi Takahashi, and Toyohiko Kaneko, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 25, 1979, Ser. No. 60,475**
**Claims priority, application Japan, Mar. 22, 1979, 54/34592**
**Int. Cl.³ C02F *1/24;* B03D *1/00***
**U.S. Cl. 210—221.1** **12 Claims**



1. An apparatus for the treatment of sewage comprising:
a processing tank having a floating-separation zone formed at the upper portion therein and an electrolysis zone formed therein below the floating-separation zone;
inlet means to introduce sewage into said tank in the float-separation zone;
means regulating flow of the sewage into the tank comprising a cylinder mounted in the processing tank and said inlet means opening inwardly into the cylinder, said cylinder having a lower portion in the form of a skirt that opens downwardly so as to collect bubbles;
means dividing the floating-separation zone into two portions;
a fixed bed of electrically conductive porous adsorbant particles disposed in the electrolysis zone for adsorbing organic matter, nitrogen compounds and metal ions in the sewage;
a plurality of anode and cathode electrodes disposed among the adsorbent particles;
means supplying electric current to said electrodes thereby polarizing the individual absorbent particles and electrolyzing water to produce hydrogen and oxygen bubbles on the surface of each individual adsorbent particle, the rising flow of the bubbles floating suspended matter and organic matter upward into the floating-separation zone;
means to discharge the suspended matter and organic matter attached to the bubbles out of the processing tank; and
means to take out the sewage so that the sewage will pass from said inlet means to be treated through the floating-separation zone and the electrolysis zone out of the processing tank.

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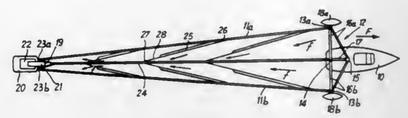
**4,294,698**

## DEVICE FOR CLEANING LIQUID SURFACES

**Jean A. L. Bronnec, Brest, France, assignor to Etablissements Generaux de Mecanique de l'Ouest, Brest, France**

**Filed Nov. 26, 1979, Ser. No. 97,724**
**Claims priority, application France, Apr. 12, 1981, 78 34077**
**Int. Cl.³ E02B *15/04***
**U.S. Cl. 210—242.3** **16 Claims**



1. A device for cleaning a liquid surface to remove a polluted material therefrom, said device comprising:
(a) a barrier adapted to float on the surface of said liquid, said barrier comprising two diverging wing portions and a tow portion positioned between said wing portions;
(b) inlet means adapted to receive said polluted material prior to passing said polluted material to a recovery apparatus; and
(c) hitching means adapted to maintain each of said wing portions spaced from one another at one of their ends while said barrier is being towed;
each of said wing portions of said barrier comprising only a wing rope adapted to at least partially float on said liquid surface, and wherein said central portion comprises only a flexible tow rope arranged between said wing ropes, said tow rope being adapted to pull said recovery apparatus to thereby exert tension on each of said wing ropes in an amount adapted to maintain each of said wing ropes such that they do not substantially curve in a horizontal plane relative to said surface and to allow for movement of said wing ropes in a vertical plane with respect to said surface.

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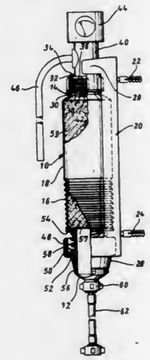
**4,294,699**

## APPARATUS FOR PURIFYING A LIQUID BY ION-EXCHANGE

**Willy Herrmann, Strombergstrasse 21, 7140 Ludwigsburg, Fed. Rep. of Germany**

**Continuation of Ser. No. 952,635, Oct. 19, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,926**
**Claims priority, application Fed. Rep. of Germany, May 29, 1978, 2823432**
**Int. Cl.³ B01D *15/00***
**U.S. Cl. 210—287** **4 Claims**



1. Filtering apparatus for treating a liquid such as softening and/or purifying water, comprising an axially elongated hol-

low tubular body, a bed of particulate ion-exchange material confined in said tubular body, at least a portion of the axial length of said tubular body being compressible for varying the volume within said tubular body, said tubular body having an inlet opening and an outlet opening for flowing a liquid through said bed therein, biasing means for applying compressive force for adjusting the volume within said tubular body when said bed of particulate ion-exchange material shrinks, wherein the improvement comprises a supporting bracket for mounting said tubular body and said bracket being arranged to be secured on a wall, the compressible portion of said tubular body comprises an axially extending tubular bellows portion so that the axial length of said tubular body can be decreased as the volume of said bed of particulate ion-exchange material shrinks, said bracket being elongated in the same direction as said tubular body and having an integral stationary abutment at each of the ends thereof spaced apart in the elongated direction, said tubular body being supported between said support abutments with said biasing means securing said tubular body between said support abutments and said tubular body being removably mounted between said abutments, and said biasing means comprising an axially extending compression spring extending in the elongated direction of said tubular body and support bracket and bearing at one end against one of said abutments and at the other end against said tubular body for applying a compressive force against the bed of ion-exchange material within said tubular body and against said tubular body so that as the volume of the bed of ion-exchange material shrinks said spring maintains the compressive force on the bed and deforms the tubular bellows part in the axial direction relative to the shrinkage of the bed, said compression spring being located exteriorly of said tubular body and said tubular body being displaceable in the elongated direction within said bracket against said compressive spring for removing said tubular body from said bracket.

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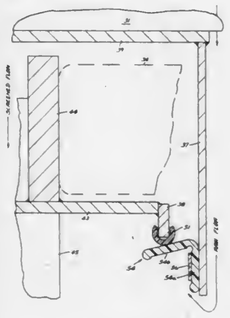
**4,294,700**
**SUBMERGED LARGE DIAMETER SEAL**
**Thomas J. Casper, Waukesha, Wis., assignor to Envirex Inc., Waukesha, Wis.**
**Filed Jun. 8, 1979, Ser. No. 47,191**
**Int. Cl.³ B01D *33/10***
**U.S. Cl. 210—403** **4 Claims**



2. A drum screen comprising a rotatable drum having one end provided with a central opening to receive the raw flow, a drum well surrounding the lower part of the drum to receive the screened flow through the drum periphery, one wall of the drum well being provided with an opening which adjoins the opening of said one end of the drum, said one end of the drum having an inwardly extending circular flange, said flange having an end face which is normal to the axis of rotation of the drum, said one wall having a circular rim which is concentric with said flange and extends into the drum through the opening of said one end thereof, and a seal to function between said end of the drum and said wall of the drum well, said seal comprising (1) a seamed tubing of a flexible, low friction material fitted over said flange, said tubing being of one of two forms, one form being a circular element of integral construction, the second form being a linear element with aligned and abutted ends, said tubing being opened at the seam and assembled on said flange with its inner side opposite the seam pressed against the end face of the flange, and (2) a stationary element of a molded wear resistant material and including a flat base which is drawn around the outside of said rim and clamped thereto, said stationary element further including a radially projecting flange which is pivotally movable relative to and pressed by the raw water within the drum against the tubing.

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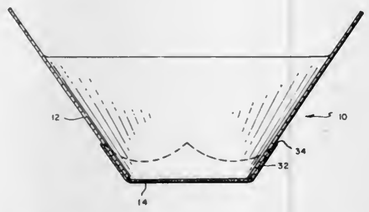
**4,294,701**
**PAINT STRAINER**
**James P. Whelan, North Marshfield, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.**
**Filed Jan. 24, 1977, Ser. No. 761,895**
**Int. Cl.³ B01D *23/28***
**U.S. Cl. 210—497.2** **3 Claims**



1. A paint strainer comprising a hollow truncated conical structure having an imperforate side wall of stiff paperboard and open ends, one of which is smaller than the other, a web of flexible screening material stretched taut across the smaller end constituting a perforate bottom for the structure, said screening material being folded upwardly from the bottom onto the outer surface of the side wall and a layer of solvent-resistant adhesive securing the entire surface area of the upwardly-folded portion of the web of flexible screening material to the entire outer surface area of the side wall covered by said upwardly-folded portion of the web of flexible screening material.

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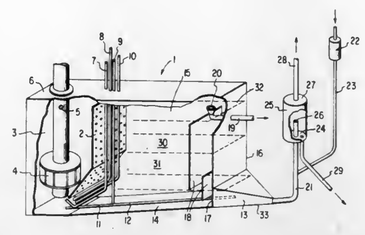
**4,294,702**
**APPARATUS FOR THE CONTROLLABLE REMOVAL OF ONE OR MORE PHASES FROM A LIQUID-LIQUID EXTRACTOR**
**Lorenz Finsterwalder, Karlsruhe, Fed. Rep. of Germany, assignor to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany**
**Filed Jun. 3, 1977, Ser. No. 803,317**
**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624936**
**Int. Cl.³ B01D *11/04***
**U.S. Cl. 210—513** **12 Claims**

1. In a liquid-liquid extractor, including a settler for separation of light and heavy liquid phases, an arrangement for controllable removal of one or more liquid phases said arrangement comprising: a tapering member connected to an opening in a wall of the settler for removing a heavy phase from the settler; a first tube having a first end connected to an opening in said tapering member and a second end extending to the level of a light phase; and a second tube and means for introducing a gas into said second tube, said second tube being connected to said first tube for introducing gas into said first tube to move liquid present in the first tube in an upwardly direction.





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**4,294,703**
**HYDROGEN PEROXIDE TREATMENT OF EFFLUENT**
**Klaus G. Wilms, Dormagen, and Helmut Waldmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Filed Jul. 2, 1980, Ser. No. 165,422**
**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927912**
**Int. Cl.³ C02F *3/00***
**U.S. Cl. 210—631** **6 Claims**

1. In the process for decreasing the COD-content of effluent by treating with hydrogen peroxide in the presence of a transition metal compound, the improvement which comprises adding to the effluent about 5 to 40% of the calculated quantity of $H_2O_2$ required for the total oxidation of the total COD-content of the effluent, the transition metal compound being dissolved in the effluent in an amount such that the molar ratio of $H_2O_2$ to transition metal is from about 30:1 to 3:1, bringing the pH initially to about 2 to 9, maintaining the effluent at about 5° to 100° C., separating from the effluent whatever material has flocculated, and after the removal of the flocculated material the effluent is subjected to biological degradation.

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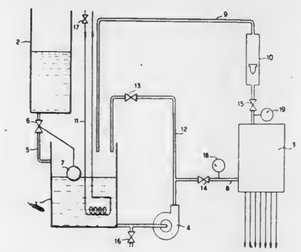
**4,294,704**
**PROCESS FOR THE MANUFACTURE OF PRINTING PAPER AND BOARD**
**Jean-Claude Daniel, Fontenay-Sous-Bois; Jacques Grossoleil, Pairs, and Robert Roullet, Lyon, all of France, assignors to Rhone-Poulenc Industries, Paris, France**
**Continuation of Ser. No. 898,953, Apr. 21, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,239**
**Claims priority, application France, Apr. 22, 1977, 77 12159**
**Int. Cl.³ B01D *13/00*; C02F *1/44***
**U.S. Cl. 210—651** **5 Claims**



1. Process for the manufacture of printing paper and board having increased wet tear strength and dry tear strength comprising coating the paper or board on one surface with a coating composition containing as a binder an aqueous latex of a synthetic polymer characterized by the fact that the content in the latex of hydrosoluble compounds dissolved in the aqueous phase is less than 0.5% by weight in relation to the polymer, said synthetic polymer being selected from the group consisting of styrene-butadiene copolymers, carboxyl styrene-butadiene copolymers, vinyl polyacetates, carboxyl vinyl polyacetates, alkyl acrylate-vinyl acetate copolymers, and carboxyl alkyl acrylate-vinyl acetate copolymers.

2. Process as claimed in claim 1, in which hydrosoluble compounds are removed from a latex obtained of a synthetic polymer prepared by emulsion polymerization.

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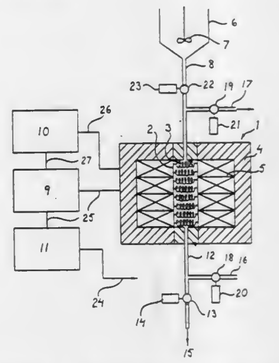
**4,294,705**
**METHOD AND AN AGENT FOR CHEMICAL PURIFICATION OF WATER BY MEANS OF CHEMICAL PRECIPITATION AND MAGNETIC SLUDGE SEPARATION**
**Carl-Johan S. Hellestam, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden**
**PCT No. PCT/SE78/00063, § 371 Date Jun. 25, 1979, § 102(e) Date May 31, 1979, PCT Pub. No. WO79/00230, PCT Pub. Date May 3, 1979**
**PCT Filed Oct. 23, 1978, Ser. No. 117,492**
**Int. Cl.³ B01D *35/06***
**U.S. Cl. 210—695** **1 Claim**



1. A method of chemically purifying water with a subsequent magnetic sludge separation comprising introducing into water a solid crystalline precipitant comprising as major components $Al_2(SO_4)_3$ and/or $FeSO_4$ together with a magnetic material, said precipitant consisting of a solid, crystalline composition having a uniform distribution of the magnetic material therein.

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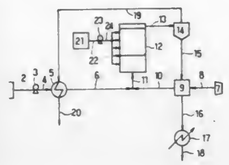
**4,294,706**
**PROCESS FOR TREATING WASTE WATER**
**Naomichi Kakihara; Yoshiaki Harada, and Norio Uedono, all of Osaka, Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan**
**Filed Apr. 28, 1980, Ser. No. 144,696**
**Claims priority, application Japan, May 16, 1979, 54-60886**
**Int. Cl.³ C02F *1/74***
**U.S. Cl. 210—762** **12 Claims**

1. A process for treating ammonia-containing waste water which comprises introducing at a pH of about 8.5 to about 11.5 the waste water to a reactor to subject the same to wet oxidation with an oxygen-containing gas in the presence of a catalyst while maintaining the waste water at a temperature of about 100° to about 370° C. and at pressure permitting the waste water to remain in the liquid phase, the oxygen-containing gas containing oxygen in an amount of about 1 to about 1.5 times

the theoretical amount required for decomposing the ammonia, organic substances and inorganic substances contained in the waste water, the catalyst being supported by at least one of zirconia and titania and comprising at least one of iron, cobalt, nickel, ruthenium, rhodium, palladium, iridium, platinum, copper, gold, tungsten and compounds thereof insoluble or



sparingly soluble in water, and supplying an alkali substance to the reactor at a rate required to maintain at least about 80% of the waste water introduced to the reactor and positioned toward the water inlet of the reactor at a pH of at least about 8 at all times and to permit the water resulting from the wet oxidation to retain a pH of about 5 to about 8.

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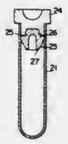
**4,294,707**

## METHOD FOR SEPARATING BLOOD AND A BARRIER DEVICE THEREFOR

**Tatsuhiko Ikeda, Kawasaki, and Soichiro Terada, Tama, both of Japan, assignors to Terumo Corporation, Tokyo, Japan**

**Filed Mar. 19, 1980, Ser. No. 131,874**
**Claims priority, application Japan, Mar. 23, 1979, 54-33943**
**Int. Cl.³ B01D** *21/26*
**U.S. Cl. 210—782** **16 Claims**



1. A method for separating blood collected in a blood-collecting tube into a serum part and a solid component part by centrifugation, comprising:

introducing a barrier formed of an elastic foamed plastic member into said blood-collecting tube, said elastic foamed plastic member having a porosity of 97 to 98%, a continuous-pore size of 50 to 400μ, the pores of said elastic foamed plastic member being thermally treated for dissolving a filmy material formed around the pores in the foaming step, an overall true specific gravity greater than that of said serum part, and a frusto-conical upper portion, the upper cross section of which is larger than the cross section of said blood-collecting tube;

moving said elastic foamed plastic member to the interface between a serum part layer and a solid component layer in the blood by centrifugal force produced in centrifuging the blood; and

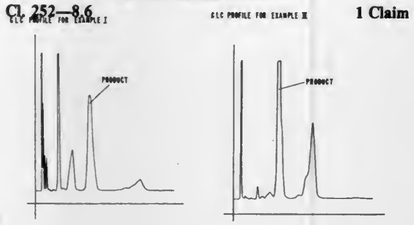
separating serum in the blood.

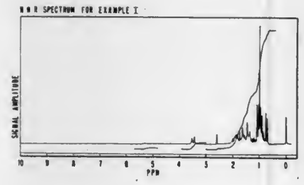
**4,294,708**

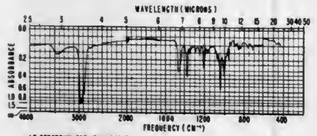
## PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF PERFUMED ARTICLE USING ALKYL CYCLOALKENYL CARBINOL

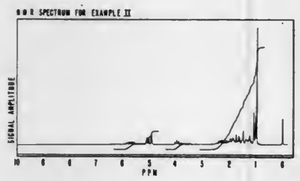
**Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

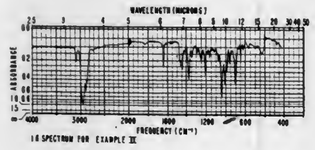
**Division of Ser. No. 52,335, Jun. 27, 1979, Pat. No. 4,235,729, which is a division of Ser. No. 8,924, Feb. 2, 1979, Pat. No. 4,197,328, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Feb. 8, 1980, Ser. No. 119,889**
**Int. Cl.³ D06M** *13/16*
**U.S. Cl. 252—8.6** **1 Claim**



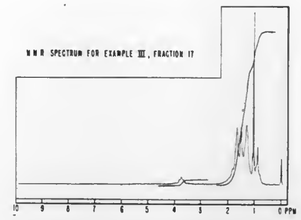



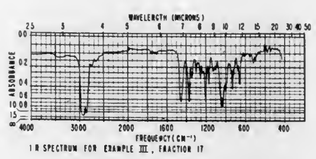




1. A process for augmenting or enhancing the aroma of a perfumed article selected from the group consisting of fabric

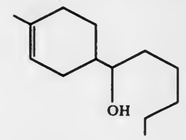


softener compositions, fabric softener articles and optical brightener compositions comprising the step of intimately




admixing with a fabric softener article coating, or a fabric softener composition, or an optical brightener composition, from 0.01% up to 0.5% of a compound having the structure:

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**4,294,709**

## SPIN FINISH WITH ANTI-STATIC AGENT

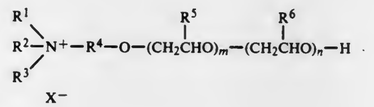
**Norman Anderson, Matthews, N.C.; Richard Peak, and James A. Moyse, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Jan. 10, 1980, Ser. No. 110,994**
**Claims priority, application United Kingdom, Jan. 26, 1979, 02933/79; Jun. 4, 1979, 19385/79**
**Int. Cl.³ D06M** *15/42, 13/46, 15/00*
**U.S. Cl. 252—8.8** **4 Claims**

1. A spin finish composition comprising

(1) a lubricant selected from the group consisting of mineral oils, esters and copolymers of ethylene oxide, propylene oxide and mixtures thereof for spin finishes, and

(2) an antistatic agent of the formula



where:

$R^1$ and $R^2$, which may be same or different, are alkyl groups containing up to six carbon atoms;

$R^3$ is an alkyl group containing up to twelve carbon atoms;

$R^4$ is an alkylene group containing up to ten carbon atoms;

$R^5$ and $R^6$ are hydrogen or methyl;

m and n are integers from 0 to 60, provided that either m or n is at least 1 and where $R^5$ and $R^6$ are different, the poly alkylene oxide units are in block or random copolymer relationship and further provided that at least one propylene oxide unit is always present; and

X is an anion.

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**4,294,710**

## DETERGENT SOFTENER WITH AMINE INGREDIENT

**Frederick E. Hardy, Gosforth, and Colin A. Dewar, Tweedmouth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jun. 30, 1980, Ser. No. 164,446**
**Claims priority, application United Kingdom, Jul. 5, 1979, 23527/79**
**Int. Cl.³ D06M** *11/04, 13/36, 13/46*
**U.S. Cl. 252—8.8** **6 Claims**

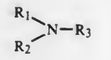
1. A method of preparing a detergent composition adapted to provide fabric softening benefits when used to wash textiles, said method constituting the steps of

(a) forming a slurry containing (i) an anionic surfactant selected from the group consisting of sodium and potassium $C_9$–$C_{15}$ alkyl benzene sulphonates, $C_{12}$–$C_{18}$ alkyl sulphates and $C_{12}$–$C_{18}$ alkyl polyethoxy ether sulphates containing from about 1 to about 12 ethoxy groups per mole and mixtures thereof, said anionic surfactant being present in an amount to provide from about 3% to about 30% of the composition, (ii) a water soluble alkaline detergency builder salt selected from the group consisting of alkaline sodium and potassium carbonates, borates, phosphates, polyphosphates, silicates, polycarboxylates, polyphosphonates, amino polycarboxylates, amino polymethylene phosphonates and mixtures thereof, said detergency builder salt being present in an amount to provide from about 10% to about 80% of the composition,

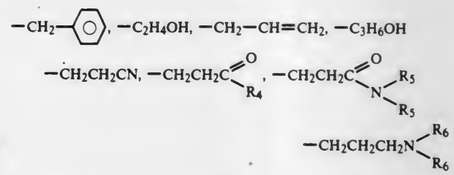
(b) spray during said slurry so as to form free-flowing spray dried granules and

(c) spraying said spray dried granules with a tertiary amine in liquid form in an amount of from about 1% to about 25% by weight of the composition, said amine being selected from the group consisting of

(i) alkylamines of formula

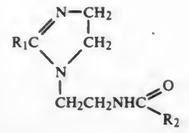


wherein $R_1$ and $R_2$ are each radicals independently selected from $C_{10}$–$C_{26}$ alkyl and alkenyl groups and $R_3$ represents a radical selected from the group consisting of



wherein $R_4$ is a $C_1$–$C_4$ alkyl group, each $R_5$ is independently selected from H and $C_1$–$C_4$ alkyl groups and each $R_6$ is independently selected from H and $C_1$–$C_{20}$ alkyl groups and

(ii) imidazoline derivatives of formula



wherein $R_1$ and $R_2$ are as defined above and (iii) mixtures of any of (i) and (ii).

(d) dry mixing oxygen bleaching agent or enzyme or silica/-silicone suds suppressor or mixtures thereof with the product of step (c).

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**4,294,711**

## WASHING AND SOFTENING COMPOSITIONS AND METHODS FOR THEIR MANUFACTURE

**Frederick E. Hardy, Gosforth, and Barry Stoddart, Gateshead, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Sep. 15, 1980, Ser. No. 187,371**

**Claims priority, application United Kingdom, Sep. 21, 1979, 32918/79**

**Int. Cl.³ C11D** *3/42, 11/00, 11/02;* **D06M** *13/44*

**U.S. Cl. 252—8.75** **9 Claims**

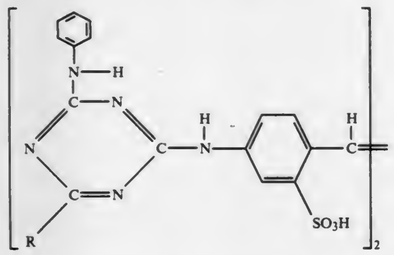
1. A granular detergent composition adapted to impart a soft feel to fabrics washed therewith, consisting essentially of:

(a) from about 3% to about 30% by weight of a polyethoxy nonionic detergent having a hydrophilic-lipophilic balance in the range from about 8 to about 15 and having not more than an average of 16 ethoxy units per molecule;

(b) from about 1% to about 15% by weight of a cationic surfactant material;

(c) from about 10% to about 80% by weight of a detergency builder; and

(d) from about 0.001% to about 3% by weight of an acid optical brightener of the following structure



wherein R is selected from the group consisting of methylamino- and morpholino- groups.

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**4,294,712**

## SELF-LUBRICATING BEARING

**Toshihiko Ueno, and Teruhisa Tomogane, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan**

**Filed Aug. 21, 1980, Ser. No. 180,166**

**Claims priority, application Japan, Aug. 29, 1979, 54-110944; Sep. 26, 1979, 54-124401; Mar. 17, 1980, 55-34339; Mar. 17, 1980, 55-34340; Mar. 17, 1980, 55-34341**

**Int. Cl.³ C10M** *5/10, 5/02, 7/14, 7/04*

**U.S. Cl. 252—12** **11 Claims**

1. A self-lubricating bearing comprising 1 to 40 volume percent lubricating oil; 0.1 to 20 volume percent carrier for said lubricating oil, said carrier being selected from the group consisting of polynorbornene resin, expanded graphite and mixtures thereof; and remainder main bearing material comprising another synthetic resin having properties of slidability and abrasion resistance.

11. The bearing of claim 1, wherein said synthetic resin is selected from the group consisting of polyamides, polyacetals, polybutylenephthalates, polycarbonates, and polytetrafluroethylenes.

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**4,294,713**

## GREASE COMPOSITIONS CONTAINING SELECTED SHIELDED POLYSILICATE COMPOUNDS

**Karl O. Knollmueller, Hamden; Robert J. Fairbrother, and David F. Gavin, both of Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed Mar. 31, 1980, Ser. No. 135,744**

**Int. Cl.³ C10M** *5/26, 7/48, 7/50*

**U.S. Cl. 252—28** **28 Claims**

1. A grease composition comprising:

(a) a major amount of a shielded polysilicate compound selected from the group consisting of alkoxysilane cluster compounds, alkoxysilanol cluster compounds, alkoxysilane ester compounds, alkoxysilane multiple cluster compounds, silicone-bridged alkoxysilane double cluster compounds, distillation residues containing these compounds, and mixtures thereof; and

(b) an amount of at least one grease thickener sufficient to thicken said shielded polysilicate compound to a grease consistency.

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**4,294,714**

## CARBOXYLIC ACID SALT CONTAINING DEPOSIT CONTROL ADDITIVES AND FUEL AND LUBE OIL COMPOSITIONS CONTAINING THEM

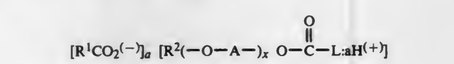
**Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Jul. 25, 1979, Ser. No. 60,306**

**Int. Cl.³ C10M** *1/32, 3/26;* **C10L** *1/22*

**U.S. Cl. 252—34** **13 Claims**

2. An additive composition effective as a minor component in a fuel or lubricating oil composition for reducing the deposition of solids in the intake system and crankcase of an internal combustion engine, said additive composition comprising at least one salt of the formula



wherein:

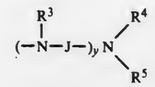
(1) $R^1$ is a hydrocarbyl group having a carbon atom content in the range 3 to 30 selected from the group consisting of alkyl, phenyl, cyclohexyl, alkenyl, cyclohexenyl, combinations thereof and of said groups having a single hydrogen atom thereof substituted by a hydroxyl or alkoxyl group, provided that said substituent is attached to a carbon atom at least 4 carbon atoms distant from the carboxyl group of said anion;



(2) $R^2$ is a hydrocarbyl group having a carbon atom content in the range from 1 to 30 selected from the group consisting of phenyl, mono-, di- and trialkylphenyl, alkyl, alkenyl, cyclohexyl, cyclohexenyl and combinations thereof;

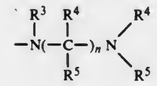
(3) A is an alkylene group having a carbon atom content in the range of from 2 to 4 and x is an integer sufficient to provide said cation in unprotonated form with a molecular weight in the range of from about 500 to 10,000;

(4) L is monovalent and selected from the group consisting of radicals of the formula



(i)

wherein J is an alkylene group having a carbon atom content in the range 2 to 6 and y is an integer in the range 1 to 11,



(ii)

wherein n is an integer in the range 2–6, and

(iii) $NHCH_2C(OH)HCH_2NH_2$;

(5) $R^3$, $R^4$ and $R^5$ are the same or different groups having a carbon atom content in the range 0 to 16 selected from the group consisting of hydrogen, hydrocarbyl, acyl, alkoxy, ketoalkyl, hydroxyalkyl and cyanoalkyl groups; and

(6) a is an integer in the range 1 to 3.

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**4,294,715**

## IMPREGNATING AGENT AND ITS USE

**Alfons Klein, Duesseldorf; Rudolf Kron, Leverkusen; Karlfried Wedemeyer, Cologne; Ernst Knust, and Lothar Havenith, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Oct. 11, 1979, Ser. No. 83,876**

**Claims priority, application Fed. Rep. of Germany, Jul. 2, 1979, 2926609**

**Int. Cl.³ H01B** *3/18, 3/40*

**U.S. Cl. 361—318** **5 Claims**

1. A dielectric composition comprising a mixture of isopropylated diphenyls, said mixture containing 30 to 60 parts by weight of mono-isopropylated diphenyls and 70 to 40 parts by weight of poly-isopropylated diphenyls, said poly-isopropylated diphenyls comprising di-, tri- and tetra-isopropylated diphenyls, said poly-isopropylated diphenyls comprising 60 to 85 parts by weight of di-isopropylated diphenyls, 10 to 35 parts by weight of tri-isopropylated diphenyls and 0.5 to 5 parts by weight of tetra-isopropylated diphenyls, the amount of di, tri- and tetra-isopropylated diphenyls being based upon the total amount of poly-isopropylated diphenyls said mixture containing an epoxide and a hydroquinone derivative.

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**4,294,716**

## HALOCARBON AND AZEOTROPE REFRIGERANT COMPOSITIONS CONTAINING OFFENSIVE WARNING COMPONENT

**Joseph F. Saccavino, W. Branch Rd., Mahopac, N.Y. 10541, and Edward A. Vanek, 964 Cedarhurst St., North Woodmere, N.Y. 11581**

**Filed May 14, 1980, Ser. No. 149,163**

**Int. Cl.³ C09K** *5/00;* **C10M** *01/30*

**U.S. Cl. 252—68** **1 Claim**

1. A refrigerant composition comprising:

a substantially odorless chlorofluorocarbon;

an odorant component, said component being not more than 2% by weight of the composition, said component being inert, volatile and soluble in said chlorofluorocarbon, said component being an organic ketone selected from the group consisting of 3-Methyl-Cyclohexanone and Methyl Isobutyl Ketone, said refrigerant composition adapted for use in a refrigeration system whereby any leaks which develop in said system can be readily detected due to the noticeable and pervasive odor resulting from the vaporation of said odorant component such that said leak may be rapidly repaired preventing continued operation of said refrigeration system at reduced efficiency.

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**4,294,717**

## COMPOSITIONS CONTAINING AN ALKALI METAL MONO- OR POLYALKYLARYLSULFONATE AND THE CORRESPONDING HYDROPEROXIDE, PROCESS FOR THEIR PREPARATION AND DETERGENT COMPOSITIONS CONTAINING THEM

**Pierre Couderc; Jean-Luc Grardel, both of Bethune, and Gerard Caux, Bully les Mines, all of France, assignors to Societe Chimique des Charbonnages SA, Paris, France**

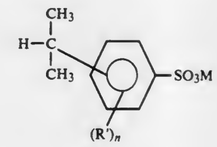
**Filed Apr. 16, 1979, Ser. No. 30,666**

**Claims priority, application France, Apr. 14, 1978, 78 11082; Oct. 10, 1978, 78 28907**

**Int. Cl.³ C11D** *7/54, 7/56, 9/42*

**U.S. Cl. 252—97** **36 Claims**

11. A dry detergent composition containing up to 30% of a solid, dry bleaching agent comprising (a) at least one alkali metal alkylarylsulfonate having the formula:



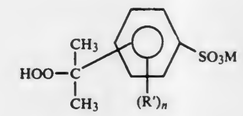
wherein

M is an alkali metal;

R′ is lower alkyl; and

n is 0, 1, 2, 3, or 4; and

(b) the hydroperoxide obtained by hydroperoxidation of said at least one alkali metal alkylarylsulfonate and having the formula



wherein M, R′ and n are as defined above;

wherein the amount of said hydroperoxide contained in said detergent composition is from 0.1 to 21% by weight of said detergent composition.

14. The detergent composition of claim 11, further comprising at least one anionic detergent, at least one soap, at least one non ionic detergent, sodium tripolyphosphate, sodium silicate and at least one of sodium sulfate or sodium carbonate.

**4,294,718**

## NON-GELLING INORGANIC SALT CRUTCHER SLURRIES

**James A. Kaeser, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.**

**Filed Mar. 10, 1980, Ser. No. 128,574**

**Int. Cl.³ C11D** *3/04, 7/14*

**U.S. Cl. 252—135** **22 Claims**

1. A method of retarding or preventing the gelation of a miscible and pumpable crutcher slurry containing from about 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, about 55 to 85% is sodium bicarbonate, about 5 to 25% is sodium carbonate, and about 5 to 25% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.4 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of about 2:1 to 8:1, the ratio of sodium carbonate:sodium silicate being within the range of about 1:3 to 3:1, and the ratio of sodium bicarbonate:sodium silicate being within the range of about 2:1 to 10:1, which comprises preparing a crutcher slurry of the described composition containing from 0.1 to 2% of a citric material selected from the group consisting of citric acid, water soluble citrate and mixtures thereof, and from 0.1 to 1.4% of magnesium sulfate, with the total of such citric material and magnesium sulfate, in combination, being gelation retarding and at least 0.4% of the slurry, and mixing such composition in the crutcher during preparation thereof.

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**4,294,719**

## POLYISOCYANATES WHICH CONTAIN CARBODIIMIDE GROUPS AND WHICH ARE STABLE IN STORAGE

**Kuno Wagner, Leverkusen; Hans-Dieter Block, and Walter Schäfer, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 653,689, Jan. 30, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,489**

**Claims priority, application Fed. Rep. of Germany, Feb. 1, 1975, 2504400**

**Int. Cl.³ C08G** *18/18, 73/10*

**U.S. Cl. 252—182** **19 Claims**

1. A composition of matter comprising a storage-stable, catalyst-free, equilibrium mixture of an organic carbodiimide, an organic uretone imine, and an organic isocyanate produced by the process comprising:

(a) contacting an organic mono- and/or polyisocyanate, optionally dissolved in an inert solvent, with a high molecular weight, insoluble catalyst, said catalyst comprising a high molecular weight, insoluble inorganic or organic matrix and a low molecular weight carbodiimidization catalyst linked to said matrix via ionic bonds, and

(b) removing said insoluble catalyst when the desired degree of carbodiimidization has been reached.

**4,294,720**

## PROCESS FOR THE PREPARATION OF GAS MIXTURES

**Pieter Visser, Amsterdam, and Johan P. van de Water, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Dec. 7, 1979, Ser. No. 101,340**

**Claims priority, application Netherlands, Dec. 22, 1978, 7812466**

**Int. Cl.³ C01B** *2/06*

**U.S. Cl. 252—373** **5 Claims**

1. A process for preparing a gas mixture containing hydrogen and carbon monoxide comprising partially oxidizing a hydrocarbon feedstock with oxygen or an oxygen-containing gas in a partial oxidation reactor at elevated pressure to produce a raw product gas, contacting the raw product gas in a quench zone with water to remove soot and other contaminating material from the gas and producing a gas mixture and a soot-containing liquor, removing soot-containing liquor from the quench zone, and contacting the liquor removed with oxygen or an oxygen-containing gas in a soot oxidation reactor at a temperature between 240° C. and 375° C., and at a pressure at least equal to the vapor pressure of water at the temperature used to oxidize the soot in the liquor and producing $CO_2$ and a substantially soot-free water effluent.

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**4,294,721**

## PROCESS FOR PREPARING COMPONENTS OF CATALYSTS FOR POLYMERIZING ALPHA-OLEFINS AND MIXTURES THEREOF WITH ETHYLENE

**Giuliano Cecchin, Ferrara, and Enrico Albizzati, Arona, both of Italy, assignors to Montedison S.p.A., Milan, Italy**

**Continuation of Ser. No. 921,717, Jul. 3, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 134,773**

**Claims priority, application Italy, Jul. 4, 1977, 25345 A/77**

**Int. Cl.³ C08F** *4/64*

**U.S. Cl. 252—429 B** **7 Claims**

1. Process for preparing solid catalyst components for the polymerization of alpha-olefins and mixtures thereof with ethylene, which comprises reacting a Ti compound containing at least one Ti-halogen linkage with at least one of the following substances:

(1) a hydrocarbyl electron-donor compound ED which does not contain active hydrogen atoms and an adduct (a) of a Mg dihalide with at least one hydrocarbyl electron-donor compound AH containing active hydrogen atoms and present in the adduct in an amount of at least 0.5 moles/mole of Mg dihalide, electron-donor compound ED being reacted in an amount of not less than 0.05 moles/mole of compound AH of the adduct;

(2) an adduct (b) of at least a Mg dihalide with a compound AH and ED, as defined in (1), compound ED being present in an amount ranging from 0.05 to 1 mole/mole of compound AH, and adducts (a) and (b) being prepared without co-grinding of the Mg dihalide with compounds AH and ED; the amount of compound ED that remains in the solid after extraction thereof with $TiCl_4$ at 80° C. for 2 hours being comprised between 0.3 and 3 moles/gram atom of Ti, and the amount of Ti compounds extractable with $TiCl_4$ at 80° C. being lower than 50%.

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**4,294,722**

## PREPARATION OF VANADIUM PHOSPHORUS CATALYSTS

**Noel J. Bremer, Kent, and Dennis E. Dria, Spencer, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio**

**Division of Ser. No. 106,786, Dec. 26, 1979, Pat. No. 4,244,879. This application May 19, 1980, Ser. No. 150,783**

**Int. Cl.³ B01J** *27/14*

**U.S. Cl. 252—435** **18 Claims**

1. A process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus which comprises



(a) introducing a pentavalent vanadium-compound into an organic liquid capable of at least partially solubilizing and capable of reducing vanadium to a valence state less than +5 to form a reaction medium in which at least a portion of said vanadium compound remains unsolubilized;

(b) effecting reduction of at least a portion of said vanadium to a valence state of +4;

(c) removing unsolubilized vanadium-containing compounds having a particle size greater than about 0.1 mm diameter;

(d) adding a pentavalent phosphorus-containing compound to the reaction medium resulting from step (c) to form a catalytst precursor precipitate;

(e) recovering said catalyst precursor precipitate;

(f) drying said catalyst precursor precipitate;

(g) calcining said precipitate to form the active oxidation catalyst.

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**4,294,723**

## HEAT RESISTANT CATALYST FOR THE PRODUCTION OF SULFURIC ACID FOR USING A GAS CONTAINING SULFUR DIOXIDE IN A HIGH CONCENTRATION

**Haruichi Hara, Toyonaka; Toshihide Kanzaki, Takatsuki; Hisanao Motomuro, and Akiyoshi Adachi, both of Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaki, Japan**

**Continuation of Ser. No. 689,807, May 25, 1976, abandoned. This application Sep. 27, 1977, Ser. No. 837,226**

**Claims priority, application Japan, May 29, 1975, 50-63492**

**Int. Cl.³ B01J** *27/02*

**U.S. Cl. 252—440** **5 Claims**

1. A heat resistant catalyst suitable for the production of sulfuric acid by using a gas containing sulfur dioxide in a high concentration at a reaction temperature of 420° to 800° C. which consists essentially of vanadium pentoxide as the main catalytic component, potassium sulfate as a promoter and a carrier consisting essentially of diatomaceous earth wherein the ratio of $K_2O$(mol)/$V_2O_5$(mol) is 4 to 5, $V_2O_5$ content is 5.5 to 7% by weight and the sum of the value of said ratio and the $V_2O_5$ content (% by weight) is 9.5 to 11.

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**4,294,724**

## TITANIUM IMPREGNATED SILICA-CHROMIUM CATALYSTS

**Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

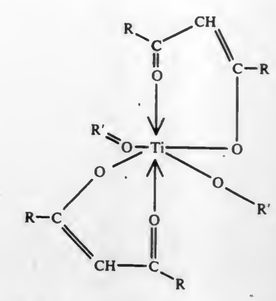
**Filed Feb. 6, 1980, Ser. No. 118,893**

**Int. Cl.³ B01J** *21/08, 23/26, 21/00*

**U.S. Cl. 252—451** **28 Claims**

1. A process for producing a chromium-containing catalyst comprising forming a silica hydrogel containing a pore preserving agent selected from (1) organic silicon compounds having the structure $R_nSiA_{4-n}$ wherein n is an integer of 2 or 3, and wherein each R is a saturated or unsaturated hydrocarbon group wherein each R can be the same or different and wherein A is selected from the group consisting of hydroxy radicals, halides and alkoxy radicals in which the alkyl group therein contains from 1 to about 10 carbon atoms, (2) water soluble inorganic acids which are sufficiently ionized to produce a pH of 0 to 3.5, (3) organic acids having an acid strength equal to or greater than that of acetic acid, and (4) anionic, cationic or non-ionic surfactants; drying said hydrogel by means of air oven drying, spray drying, tray drying, vacuum oven drying or drying under a heat lamp to form a xerogel; and anhydrously incorporating a titanium compound into said xerogel, and wherein said chromium is introduced by either coprecipitating same with said silica hydrogel, by combining an aqueous solution of a water-soluble chromium compound with said hydrogel, or adding anhydrous solution of a chromium compound soluble in non-aqueous solvents to said xerogel.

17. A process for producing a chromium-containing catalyst comprising forming a silica hydrogel and thereafter removing water to form a xerogel, said silica in either the hydrogel stage or the xerogel stage being impregnated with an aqueous titanium-containing composition formed by mixing an essentially water-free organic acid and a titanium compound of the formula



wherein the R and R′ groups are the same or different and are selected from 1–7 carbon atom alkyl radicals to give a titanium-containing composition and thereafter diluting said titanium-containing composition with water to give said aqueous titanium-containing composition, and wherein said chromium is introduced by either coprecipitating same with said silica hydrogel, by combining a aqueous solution of a water-soluble chromium compound with said hydrogel, or adding an anhydrous solution of a chromium compound soluble in a non-aqueous solvent to said xerogel.

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**4,294,725**

## CATALYST, METHOD FOR CATALYST MANUFACTURE AND USE

**Dan Fraenkel, and Bruce C. Gates, both of Newark, Del., assignors to University of Delaware, Newark, Del.**

**Filed Nov. 20, 1979, Ser. No. 95,989**

**Int. Cl.³ B01J** *29/14*

**U.S. Cl. 252—455 Z** **3 Claims**

1. A Fischer-Tropsch type catalyst comprising a particulate synthetic zeolite catalyst support having a pore size in the range of 2–10 A, which has ion exchange properties, within which there is incorporated, by ion exchange, at least one reducible transition metal having catalytic properties effective in the conversion of CO and $H_2$ to hydrocarbon products consisting essentially of cobalt, said transition metal being reduced by the vapor of at least one preselected reductant metal consisting essentially of cadmium having a reduction potential greater than the reduction potential of said transition metal at a temperature below about 800° C.

2. The method of preparing a Fischer-Tropsch catalyst comprising in sequence: (a) contacting a particulate synthetic zeolite catalyst support having a pore size in the range of 2–10 A with a solution of a salt of a reducible transition metal having catalytic properties effective in the conversion of CO and $H_2$ to hydrocarbon products consisting essentially of cobalt; (b) drying to eliminate substantially all water from the zeolite pores; (c) reducing a substantial proportion of the transition metal within the dried reducible transition metal solution-treated zeolite prepared per step (b) by exposure to the vapor of a reductant metal consisting essentially of cadmium, having a reduction potential greater than the reduction potential of said transition metal at a temperature below about 800° C.; (d) heating the product of step (c) to remove superfluous reductant metal from said product of step (c); and (e) cooling under vacuum or in an inert atmosphere to a temperature below about 200° C.

**4,294,726**

## CATALYST FOR THE PURIFICATION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

**Alfred Bozon, Erlensee; Edgar Koberstein, Alzenau; Hans-Dieter Pletka, Freigericht; Herbert Völker, Hanau, and Eduard Lakatos, Rheinfelden-Eichsel, all of Fed. Rep. of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany**

**Filed Feb. 11, 1980, Ser. No. 120,172**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907106**

**Int. Cl.³ B01J** *21/06, 23/10, 23/89*

**U.S. Cl. 252—462** **27 Claims**

1. A catalyst for simultaneous oxidation of carbon monoxide and hydrocarbons and reduction of nitric oxides in exhaust gases of internal combustion engines, comprising

(a) 0.03–3% by weight of a platinum and rhodium containing active phase with a weight ratio between platinum and rhodium of 2:1-20:1;

(b) 5–15% by weight of a mixture of $CeO_2$ and $ZrO_2$, whereby these oxides are at weight ratios of 20–80:80–20;

(c) 1–10% by weight of $Fe_2O_3$ as well as

(d) a residual quantity up to 100% by weight of aluminum oxide of the transition series

and obtained by impregnating a carrier material of $Al_2O_3$ of the transition series, with an aqueous solution containing cerium, zirconium and iron salts or, mixing the carrier material with the respective oxides of cerium, zirconium and iron, tempering for 30–180 minutes in air at 500°–700° C. thereupon impregnating the carrier with an aqueous solution of a salt of platinum and a salt of rhodium, drying and subsequently treating in a gas current containing hydrogen at temperatures 250°–650° C.

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**4,294,727**

## PERFUME COMPOSITION CONTAINING 4,5-DIOXA-5-ALKYL-TRICYCLO[7.2.1.0 2,8 ]DODEC-10-ENES AND ITS USE AS AN ODORANT

**Jens Conrad, Hilden; Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany**

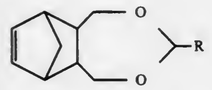
**Filed Apr. 21, 1980, Ser. No. 142,607**

**Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918168**

**Int. Cl.³ C11B** *9/00*

**U.S. Cl. 252—522 R** **5 Claims**

1. A perfumery composition comprising from about 1 to 50 percent by weight of at least one tricyclododecene of the formula:



wherein R is a member selected from the group consisting of alkyl having from 1 to 8 carbon atoms, alkenyl having from 2 to 8 carbon atoms and alkynyl having from 2 to 8 carbon atoms, and the remainder customary constituents of perfumery compositions.

**4,294,728**

## SHAMPOO AND/OR BUBBLE BATH COMPOSITION CONTAINING SURFACTANT AND 1,2 ALKANE DIOL

**Guy Vanlerberghe, Montjay-La-Tour; Henri Sebag, Paris, and Claire Fiquet, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France**

**Continuation of Ser. No. 565,130, Apr. 4, 1975, abandoned, which is a continuation of Ser. No. 227,299, Feb. 17, 1972, abandoned. This application Nov. 26, 1979, Ser. No. 97,492**

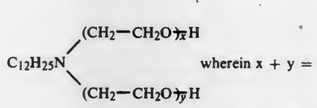
**Claims priority, application Luxembourg, Feb. 17, 1971, 62616; Feb. 17, 1971, 62617**

**Int. Cl.³ C11D** *1/835;* **A61K** *7/06*

**U.S. Cl. 252—542** **8 Claims**

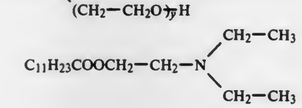
1. A shampoo composition consisting essentially of an aqueous solution of

(a) 0.5–30 percent by weight based on the total weight of the composition of a surfactant selected from the group consisting of

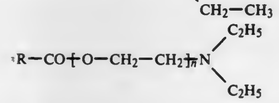


(1)

wherein x + y = 15,

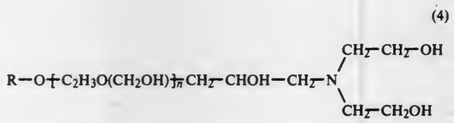


(2)



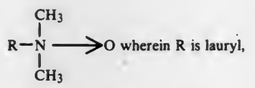
(3)

wherein R is the hydrocarbon chain from the fatty acids of copra and n=2.5,



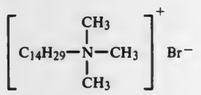
(4)

wherein R is the hydrocarbon radical of oleic acid and n=1,



(5)

O wherein R is lauryl,



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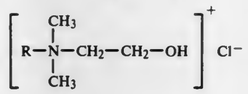
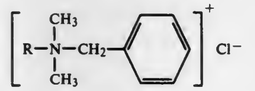


(7)

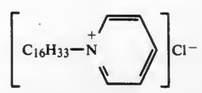
wherein R is the alkyl from the fatty acids of tallow,



(8)

wherein R is a mixture of dodecyl to hexadecyl,





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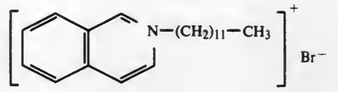
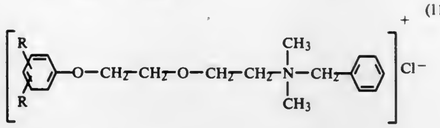
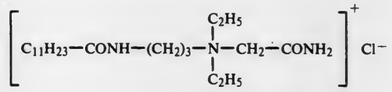


(10)



(11)

wherein R is isobutyl,



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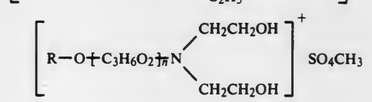
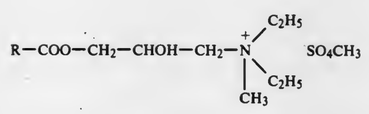


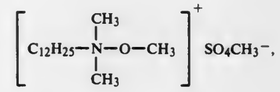
(13)

wherein R is a mixture of doecyl and tetradecyl, and n=1.5,



(14)

wherein R is the alkyl from the fatty acids of copra,



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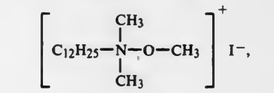

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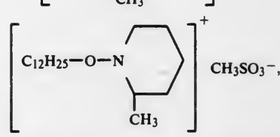

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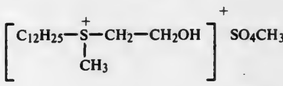

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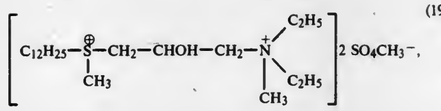

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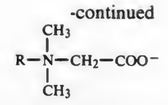
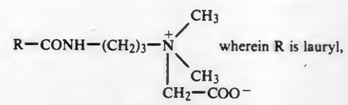


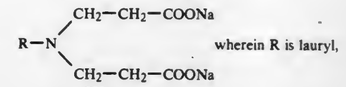
(20)

wherein R is a mixture of dodecyl and tetradecyl,



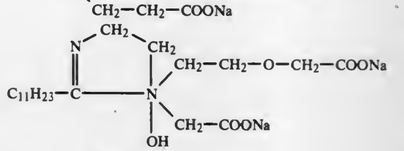
(21)

wherein R is lauryl,



(22)

wherein R is lauryl,



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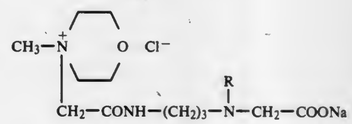
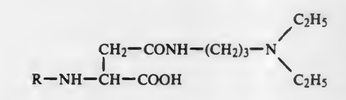


(24)

wherein R is the alkyl of the fatty acids of copra and



(25)

wherein R is the hydrocarbon chain from the fatty acids of copra and mixtures thereof; and

(b) 0.4 to 4.5 percent by weight based on the total weight of the composition of a straight chain 1,2-alkane diol selected from the group consisting of 1,2-alkane diols having 10–14 carbon atoms, and mixtures thereof.

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**4,294,729**

## COMPOSITION CONTAINING ALCOHOL AND USE THEREOF FOR EPOXY REMOVAL

**Peter Bakos, Endicott; Russell E. Darrow, Newark Valley; Joseph Funari, Vestal, and Richard M. Poliak, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 104,623**

**Int. Cl.³ C09D** *9/00, 9/04;* **C11D** *3/43, 3/44*

**U.S. Cl. 252—545** **42 Claims**

1. A removal composition capable of removing a cured epoxy polymer from a substrate consisting essentially of at least about 75% by weight based upon the weight of the composition of an organic cyclohydrocarbyl alcohol boiling above about 110° C., wherein said hydrocarbyl is selected from the group of aromatic ring, cycloaliphatic ring or terpene ring, and a minor amount of an ionic fluorocarbon surface agent.

**11.** The composition of claim **1** wherein the surface-active agent is present in an amount of at least about 0.05% by weight of the composition.

**4,294,730**

## GELLED LUBRICANT COMPOSITION FOR RUN-FLAT TIRES COMPRISING POLYBUTENE ACRYLIC OR POLYOLEFIN GELLING AGENT AND PARTICULATE SOLID PUNCTURE SEALING MATERIAL

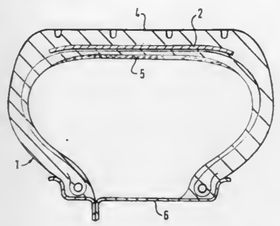
**Michael J. Kenney, Sutton Coldfield, England, assignor to Dunlop Limited, England**

**Division of Ser. No. 766,679, Feb. 8, 1977. This application Oct. 2, 1979, Ser. No. 81,158**

**Claims priority, application United Kingdom, Feb. 13, 1976, 5674/76; Oct. 15, 1976, 42864/76**

**Int. Cl.³ C08L** *1/02*

**U.S. Cl. 260—17.4 BB** **14 Claims**




1. A composition for application to the interior surface of the tread of a pneumatic tire to facilitate relative movement between contacting portions of the interior surface of the tire when the tire is driven deflated, said composition comprising a polybutene, an acrylic polymer or a polyolefin as gelling agent for the polybutene, and a particulate solid puncture sealing material, the particles of said puncture sealing material being of sizes distributed in a range extending from particles passing through a 7 mesh B.S. screen and retained on a 10 mesh B.S. screen to particles which will pass through a 150 micron aperture sieve, the volume of particulate solid material being at least 8% and no more than 66% of the total volume of said composition.

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**4,294,731**

## METHOD FOR DRYING ABSORBENT MODIFIED CELLULOSIC POLYMERS AND THE LIKE

**Thomas C. Allen, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.**

**Continuation of Ser. No. 39,725, May 17, 1979, abandoned. This application Aug. 13, 1980, Ser. No. 177,678**

**Int. Cl.³ C08L** *1/00*

**U.S. Cl. 260—17.4 CL** **18 Claims**

1. A method for drying chemically modified cellulose or starch materials which comprises mixing the materials with an aqueous solution of at least one amphiphilic compound, which is miscible with water nonvolatile and substantially non-reactive with said modified cellulose and thereafter evaporating the water from the materials at an elevated temperature whereby said amphiphilic compound is retained by said materials and prevents the substantial collapse of the cellulosic structure, thereby avoiding significant reduction in water absorbency or loss of aesthetics of the material.

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**4,294,732**

## RUBBER MOUNTING COMPOSITIONS

**Tomio Ohyachi, Akigawa, and Koichi Irako, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

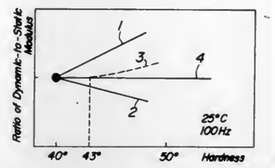
**Filed Aug. 14, 1980, Ser. No. 177,962**

**Claims priority, application Japan, Aug. 16, 1979, 54/103535; Feb. 15, 1980, 55/16541**

**Int. Cl.³ C08L** *93/04;* **F16M** *13/00*

**U.S. Cl. 260—27 BB** **6 Claims**

1. Rubber mounting compositions having excellent vibration isolating properties at a relatively high hardness obtained by compounding 100 parts by weight of at least one of natural rubber, diene rubbers and diene copolymeric rubbers or a rubber blend of these rubbers and a halogenated butyl rubber, 0.5–35 parts by weight of an oil modified phenol resin selected




from the group consisting of tall oil modified phenol resin and cashew oil modified phenol resin, a modified ratio of said tall oil being 30% or more, and 2–30 parts by weight based on said resin, of a hardening agent for the phenol resin and hardening the resulting mixture.

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**4,294,733**

## ADHESIVE FOR DOUBLE GLAZING UNITS

**Taieb Marzouki, and Bernd Schwisser, both of Taunus, Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.**

**Filed Apr. 2, 1979, Ser. No. 26,064**

**Claims priority, application United Kingdom, May 5, 1978, 13236/78**

**Int. Cl.³ C08L** *53/00, 63/00, 91/06*

**U.S. Cl. 260—28.5 B** **26 Claims**

1. A sealant system comprising an adhesive composition and a primer composition which on combination provide a cured adhesive;

said adhesive composition being a composition which is extrudable as a hot melt from about 140° C. to about 190° C. and is hardenable to yield a non-tacky, cohesive elastic mass having a moisture vapor transmission rate of not more than about 0.5 g/m²/day measured at 38° C. and comprising per hundred parts by weight of the adhesive composition, from about 5 to about 50 parts by weight of a block copolymer having two polystyrene end blocks linked to a substantially saturated polyolefin rubber midblock, from about 5 to about 50 parts by weight of an aliphatic hydrocarbon resin having a melting point not less than 60° C., from about 2 to about 40 parts by weight of a curable epoxy resin and a finely divided inorganic filler;

said primer composition comprising a heat softenable polymeric composition and an amine curing agent for the epoxy resin in the adhesive composition.

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**4,294,734**

## LOW VISCOSITY UNSATURATED POLYESTER RESINS

**Giovanni Corrado, 190, Via Gentile da Mogliano, Roma; Elvio Bertotti, 45, Corso Garibaldi, Colleferro, Roma, and Bruno Sopino, 21, Via Belvedere, Colleferro, all of Italy**

**Filed Dec. 27, 1979, Ser. No. 107,709**

**Claims priority, application Italy, Dec. 29, 1978, 31405 A/78; Jun. 29, 1979, 23991 A/79**

**Int. Cl.³ C08L** *91/00;* **C08G** *63/52*

**U.S. Cl. 260—22 CB** **5 Claims**

1. Low viscosity unsaturated polyester resins for making glass fiber reinforced products by the injection between coupled moulds, vacuum moulding, vacuum injection moulding, low pressure pressure moulding, filament winding, application by hand and by spraying, essentially comprising:

(A) an alkyd prepared by esterification of

(a) a compound selected from the group consisting of maleic anhydride, maleic acid, fumaric acid, and mixtures thereof alone or in association with phthalic anhydride or phthalic acid, with



(b) one or more glycols essentially comprising dipropylene glycol, and at least

(B) one ethylenically unsaturated monomer copolymerizable with (A), selected from the group consisting of styrene and vinyltoluene, in an amount of 27–34% by weight of the total (A)+(B), said unsaturated polyester resins being characterized by the fact that said alkyd (A) has a molecualr weight/double bond factor between 200 and 360 and has an amount of free functional groups constituted by hydroxyl groups+carboxyl groups, between 80 and 100, inclusive expressed as mg of KOH per g of alkyd (A).

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**4,294,735**

## COATING COMPOSITIONS

**John Bentley, and Morice Thompson, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England**

**Continuation-in-part of Ser. No. 896,597, Apr. 14, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,316**

**Claims priority, application United Kingdom, Apr. 25, 1977, 17124/77**

**Int. Cl.³ C09D** *3/48, 3/66, 5/02*

**U.S. Cl. 260—22 CB** **12 Claims**

1. A coating composition in which the film-forming material consists of:

(a) from 30% to 85% by volume of a disperse phase consisting of particles having a size or size distribution in the range 0.01 to 20 microns, not less than 50% by volume of those particles consisting of non-crosslinked polyester microparticles, and the disperse phase being in a state of stable dispersion maintained by means of an amphipathic dispersing agent in a substantially deflocculated, sterically stabilized state of dispersion in

(b) from 70% to 15% by volume of a liquid continuous phase in which said polyester is insoluble, the continuous phase having a viscosity of from 0.1 to 20 poise at room temperature, being capable of curing to a film-forming polymer by an autoxidative polymerisation reaction and consisting of a homogeneous mixture of:

(i) an autoxidisable derivative of a polyhydric alcohol such that in each molecule of the derivative there are present from 4 to 12 autoxidisable groupings bound by ester or ether linkages to a polyhydric alcohol residue, the said derivative having a boiling point in excess of 150° C., and

(ii) a liquid compound of viscosity less than 2 poise at room temperature which contains in the molecule at least one unsaturated grouping correactive with the autoxidisable groupings in (i) but which is not itself capable of undergoing autoxidative polymerisation, the said compound having a boiling point in excess of 150° C.; the total volume of (a) and (b) being 100% and the autoxidisable groupings constituting at least 30% of the total number of autoxidisable and coreactive groupings in the continuous phase.

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**4,294,736**

## ACCELERATED PROCESS FOR MAKING NONLINEAR POLYESTERS

**William H. Burgess, III, Newark, Del., and Philip Heiberger, Broomall, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 24, 1980, Ser. No. 132,839**

**Int. Cl.³ C08G** *63/48;* **C09D** *3/64*

**U.S. Cl. 260—22 M** **14 Claims**

1. In a process for the manufacture of an alkyd resin by reaction between a polybasic acid, a polyhydric alcohol and a fatty acid under reaction temperature conditions with removal of water formed in the process, the improvement which comprises carrying out this reaction in 15–50% by weight, based on the weight of the reaction ingredients, of an inert volatile organic solvent.

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**4,294,737**

## WATER SOLUBLE EPOXY ESTER COPOLYMERS FOR INTERIOR CAN USE

**Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 108,283, Dec. 28, 1979. This application May 27, 1980, Ser. No. 153,429**

**Int. Cl.³ C08L** *35/02*

**U.S. Cl. 260—29.2 EP** **11 Claims**

1. An aqueous dispersion comprising water having dispersed therein in the form of a salt with an amine an epoxy ester copolymer comprising a polyepoxide having a 1,2-epoxy equivalency in excess of 1.0 and a molecular weight of from 350 to 8000 esterified with at least about 0.5% of the copolymer of a monoester of a saturated monohydric alcohol with a monoethylenically unsaturated dicarboxylic acid which resists homopolymerization, said polyepoxide ester being copolymerized with from 15% to 70% of monoethylenic monomers, based on the weight of the copolymer, and said monoethylenic monomers including carboxy functional monomer providing an acid number of from 20–150 in the copolymer.

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**4,294,738**

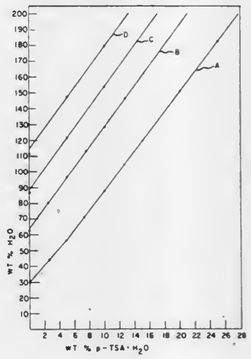
## WATER-EXTENDIBLE OLIGOMER SOLUTIONS AND COATINGS THEREFROM

**Aleksander Beresniewicz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Oct. 28, 1980, Ser. No. 201,468**

**Int. Cl.³ C08L** *61/20*

**U.S. Cl. 260—29.4 UA** **5 Claims**




1. Coating solution consisting essentially of:

(a) about 30 to 75 wt % of the following non-volatile ingredients which are present in amounts, relative to each other:

(i) 30 to 80 wt % of an oligomer having a degree of polymerization (DP) of about 10 to about 50 and a polyalkylene ether glycol having a molecular weight of about 400 to about 1300, the amount of glycol being 0 to 60 wt % of the amount of oligomer;

(ii) 2 to 12 wt % of a non-volatile, water-miscible compound selected from p-toluenesulfonic acid, trifluorosulfonic acid, 5-sulfosalicyclic acid, 1-naphthalene-sulfonic acid, 2,5-dimethylbenzene-sulfonic acid, the sodium salts of the above acids, the sodium salts of aliphatic monocarboxylic acids having 6 to 12 carbon atoms, ammonium benzoate, and sodium di-2-ethylhexylsulfosuccinate;

(iii) 5 to 65 wt % of an amine-aldehyde cross-linking resin; and

(iv) 0 to 10 wt % of an acidic curing catalyst;

and

(b) 25 to about 70 wt % of the following volatile ingredients which are present in amounts, relative to each other:

(i) 5 to 70 wt % of water-miscible organic solvent; and

(ii) 30 to 95 wt % of water,

with the sum of the weight percentages being 100% for each of (a) and (b); (i), (ii), (iii) and (iv) of (a); and (i) and (ii) of (b), and with the proviso that the amounts of non-volatile ingredients, water and organic solvent are such that the coating solution contains not more than 250 g of volatile organic compounds per liter of solution, excluding water, the oligomer of (a) (i) being prepared by uniformly copolymerizing, using free radical initiation, in the presence of about 0.5 to about 10 wt % of a mercaptan of the formula $R^2SH$ wherein $R^2$ is hydroxyalkyl or alkyl of 2 to 10 carbon atoms:

(a) 0 to about 80 wt % of a monomer selected from vinyl acetate, vinyl propionate, N-vinyl pyrrolidone, acrylamide, acrylonitrile, vinyl chloride, methyl vinyl ether, ethyl vinyl ether, and styrene; provided, however, the amount of styrene shall not exceed 60 wt %;

(b) about 5 to about 50 wt % of a monomer selected from hydroxyethyl and hydroxypropyl acrylates and methacrylates; and

(c) 0 to about 80 wt % of a monomer selected from alkyl acrylates and alkyl methacrylates, wherein alkyl is of 1 to 8 carbon atoms,

with the sum of the weight percentages being 100%.

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**4,294,739**

## ANTISTATIC COMPOSITIONS COMPRISING CROSSLINKABLE LATEX BINDERS

**Donald A. Upson; Gerald A. Campbell, both of Webster, and Diane E. Kestner, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 26, 1979, Ser. No. 33,617**
**Int. Cl.³ C08L *35/06***
**U.S. Cl. 260—29.6 RW** **25 Claims**

1. A coating composition comprising a mixture of at least two different polymers:

a. a first polymer which is a conductive, water-dispersible, particulate polymer and

b. a second polymer which is a crosslinkable latex polymer binder, represented by the formula:

$$-(A)_x(B)_y(C)_z-$$

wherein A is an alkyl methacrylate, B is styrene or a haloalkyl methacrylate and C is derived from a monomer which contains an active epoxide group; x is from about 5 to about 80 weight percent; y is from about 5 to about 80 weight percent; and z is from about 15 to about 40 weight percent; said latex polymer having a first glass transition temperature before crosslinking of substantially less than 50° C. and a second glass transition temperature after crosslinking and coalescing of substantially greater than 50° C.

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**4,294,740**

## PROCESS FOR PREPARING ACRYLIC RESIN EMULSIONS

**Ryuzo Mizuguchi, Yawata; Shinichi Ishikura, Osaka; Keizou Ishii, Ashiya, and Tamotu Yoshioka, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan**

**Filed Apr. 23, 1980, Ser. No. 143,923**
**Claims priority, application Japan, Apr. 23, 1979, 54-50726**
**Int. Cl.³ C08F *2/22***
**U.S. Cl. 260—29.6 RB** **1 Claim**

1. In a process for preparing a substantially lump-free acrylic resin emulsion by emulsion polymerization of one or more acrylic monomers in water in the presence or absence of an emulsifier or a dispersing agent and then filtering the polymerization product, the improvement which comprises performing the polymerization in the presence of a water-insoluble resin which is immiscible with the acrylic resin in the emulsion and has a softening or melting point of 20° C. or higher, said water-insoluble resin being a chlorinated polyethylene or a chlorinated polypropylene.

**4,294,741**

## CATIONIC POLYMERS AND THEIR USE IN ELECTRODEPOSITION

**Joseph F. Bosso, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 23, 1980, Ser. No. 162,224**
**Int. Cl.³ C08L *63/10***
**U.S. Cl. 260—29.6 NR** **32 Claims**

1. A stable, aqueous dispersion of a cationic polymeric product prepared by polymerizing in aqueous medium under free radical initiated addition polymerization conditions:

(A) an aqueous dispersed phase of a polymerizable, ethylenically unsaturated monomer composition, in the presence of

(B) a quaternary ammonium base group-containing polymer which is formed from reacting a polyepoxide with an unsaturated tertiary amine in the presence of a proton source.

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**4,294,742**

## PLASTICIZED VINYL RESINS CONTAINING A LINEAR MONO $C_{12}$ALKYL DIPHENYL COMPOUND

**Donald F. Rugen, Wilmington, Del., and Alan F. Dickason, Delaware, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.**

**Filed Apr. 15, 1980, Ser. No. 140,636**
**Int. Cl.³ C08K *5/01***
**U.S. Cl. 260—31.8 H** **2 Claims**

1. A plasticized polyvinylchloride resin containing a primary plasticizer and as a secondary plasticizer a linear monoalkyl diphenyl wherein said alkyl group contains 12 carbon atoms.

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**4,294,743**

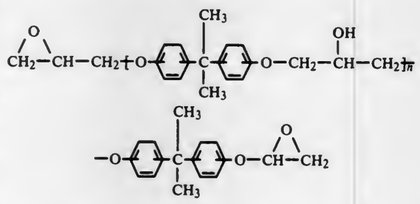
## EPOXY IMIDE

**William F. Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 27,444, Apr. 5, 1979, which is a continuation-in-part of Ser. No. 848,638, Nov. 4, 1977, abandoned. This application Jun. 6, 1980, Ser. No. 157,453**
**Int. Cl.³ C08L *63/00***
**U.S. Cl. 260—32.8 EP** **4 Claims**

1. A composition comprising 50–70% by weight of a reaction product and about 30–50% by weight of a solvent selected from the group consisting of acetone, methylene dichloride, cyclohexanone, pentanedione, methyl-N-amyl ketone, methylisobutyl ketone, methylethyl ketone; and mixtures thereof; wherein the reaction product consists essentially of about

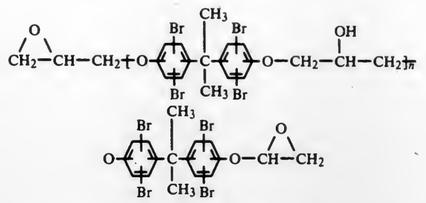
(a) 10–96% by weight, based on the weight of the reaction product, of a blend of the following



wherein n is a positive integer sufficient to provide a viscosity of 16,000–25,000 centipoises measured at 25° C. and having an epoxide equivalent of about 180–300 and

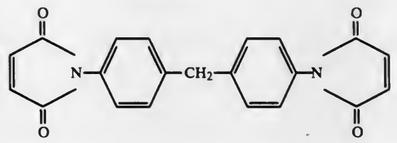
(b) a brominated epoxy resin of the formula





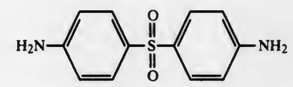
wherein n is a positive integer sufficiently large to provide a viscosity of 250–4,000 centipoises measured at 25° C., and the resin having an epoxide equivalent of about 300–800;

(2) 2–60% by weight, based on the weight of the reaction product, of a bismaleimide of the formula



wherein (1) and (2) are reacted for about 0.5–2 hours at about 115°–135° C. and subsequently reacting the product of (1) and (2) with

(3) 2–30% by weight, based on the weight of the reaction product, of a diamine of the formula



to form the reaction product;

wherein the molar ratio of bismaleimide to diamine is about 0.6–0.8.

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**4,294,744**

## PROCESS FOR FORMING A POWDERED EPDM TERPOLYMER (C-955)

**Robert R. Klein, Berkeley Heights, N.J., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia Makowski, executrix), assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Apr. 1, 1980, Ser. No. 136,366**
**Int. Cl.³ C08F *6/12***
**U.S. Cl. 260—33.6 AQ** **5 Claims**

1. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water and said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer; and

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer.

4. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water and said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer;

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer; and

(f) adding a non-polar process oil to said cement prior to adding said water to said cement, said oil being added at a concentration of about 20 to about 200 parts by weight per 100 parts by weight of the EPDM terpolymer.

5. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water to said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer;

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer; and

(f) dry blending an oil, a filler or a polyolefinic thermoplastic or mixture thereof with said formed powder.

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**4,294,745**

## CURABLE MIXTURE FOR PRODUCING REINFORCED ELASTOMERIC PLASTICS BASED ON EPOXIDE RESIN

**Rolf Schmid, Gelterkinden, and Friedrich Lohse, Oberwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jan. 4, 1980, Ser. No. 109,739**
**Claims priority, application Switzerland, Jan. 16, 1979, 403/79; Jan. 16, 1979, 404/79**
**Int. Cl.³ C08L *63/00***
**U.S. Cl. 260—37 EP** **11 Claims**

1. A curable mixture containing

(1) an epoxide resin, and

(2) a curing agent for epoxide resins, wherein

(a) at least one of the components (1) and (2) is at least trivalent,

(b) the components (1) and (2) together consist to the extent of at least 60 percent by weight of aliphatic chain segments,

(c) the number of atoms in the chains of components (1) and (2) between two active groups is 25 to 700, a phenylene group being reckoned to have 4 atoms, and

(d) the components (1) and/or (2) contain aliphatic chain segments in the form of polyester or polyether groups, or hydrocarbon radicals unsubstituted or substituted in the side chain; the curable mixture also containing

(2) an amount of 1 to 20 percent by weight, relative to the total amount of components (1) to (2), of needle-shaped to rod-shaped crystals which are insoluble in epoxide resin, and which have a length of 0.1 to 600 μm, a thickness of 0.01 to 60 μm, a length/thickness ratio of 3 to 200, and a density of 1.3 to 3.0.

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**4,294,746**

## STABILIZERS FOR CYCLOALIPHATIC EPOXIDE CONTAINING COMPOSITIONS

**Eskel B. Blair, St. Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Jun. 17, 1980, Ser. No. 160,287**
**Int. Cl.³ C08G** *59/68, 59/72*
**U.S. Cl. 260—37 EP** **26 Claims**

1. A stabilized curable composition comprising a cycloaliphatic epoxide, a Bronsted or Lewis acid catalyst and a stabilizing amount of a compound containing at least one nitrile and/or isocyanate group.

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**4,294,747**

## SHAPEABLE THERMOPLASTIC RESIN COMPOSITION CONTAINING CYCLIC ACETAL

**Tien-Kuei Su, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.**

**Continuation-in-part of Ser. No. 78,315, Sep. 24, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,753**
**Int. Cl.³ C08K** *5/06*
**U.S. Cl. 260—37 R** **12 Claims**

1. A shapeable resin composition which consists essentially of a thermoplastic, condensation polymer substantially free of olefinic unsaturation having an intrinsic viscosity of from about 0.1 to 5 measured at 25° C. in a mixture of equal parts by volume of sym-tetrachloroethane and phenol and an effective minor amount sufficient to improve crystallization properties of a cyclic acetal as a nucleating agent, said cyclic acetal being at least one member selected from the polyhydric alcohol acetals of benzaldehyde or derivatives thereof wherein the benzene ring of said benzaldehyde moiety is substituted with at least one substituent selected from the group consisting of halogen substituents, alkyl groups having one to eight carbon atoms, and alkoxy groups having one to eight carbon atoms, said polyhydric alcohols having 5 to 7 hydroxyl groups.

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**4,294,748**

## LOW VISCOSITY UNSATURATED POLYESTER RESINS

**Giovanni Corrado, 190, Via Gentile da Mogliano, Roma; Elvio Bertotti, 45, Corso Garibaldi, Colleferro, Roma, and Bruno Sopino, 21, Via Belvedere, Colleferro, all of Italy**

**Filed Dec. 27, 1979, Ser. No. 107,708**
**Claims priority, application Italy, Dec. 29, 1978, 31404 A/78**
**Int. Cl.³ C08L** *91/00;* **C08G** *63/52*
**U.S. Cl. 260—22 CB** **4 Claims**

1. Low viscosity unsaturated polyester resins for making products, optionally reinforced with glass fibers, by conventional polyester resin processing techniques, essentially comprising:

(A) an alkyd prepared by esterification of (a) a compound selected from the group consisting of maleic anhydride, maleic acid, fumaric acid, and mixtures thereof in association with isophthalic acid, with (b) one or more glycols, essentially comprising dipropylene glycol, and at least

(B) one monomer copolymerizable with (A), selected from the group consisting of styrene, toluene, and mixtures thereof, in an amount of 25–40% by weight of the total (A)+(B), said unsaturated polyester resins being characterized in that said alkyd A has a molecular weight/double bond factor between 300 and 390 and an amount of free functional groups constituted by hydroxyl groups+-carboxyl groups, of between 50 and 85, inclusive expressed as mg of KOH per g of alkyd.

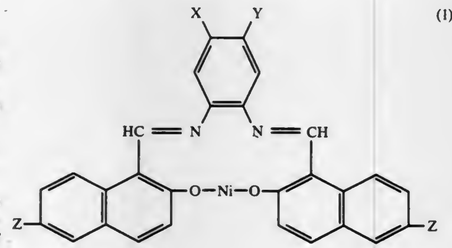
**4,294,749**

## PROCESS FOR THE COLORATION OF THERMOPLASTIC POLYMERS AND POLYCONDENSATES IN THE MASS WITH WATER-INSOLUBLE DISAZO-METHINE COMPOUNDS

**Theodor Papenfuhs, Frankfurt am Main, and Wolfgang Teige, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 2,250, Jan. 10, 1979, abandoned. This application Dec. 28, 1979, Ser. No. 107,936**
**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801288**
**Int. Cl.³ C08L** *67/00;* **C09B** *55/00*
**U.S. Cl. 260—40 P** **5 Claims**

1. In a process for spin-dyeing a water-insoluble thermoplastic polyester with a nickel-complex disazomethine coloring compound, the improvement consisting of spinning a melt of said polyester containing dissolved therein, as the coloring compound, a disazomethine compound of the formula (1)



(1)

in which

X and Y each is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, carboxy or carbalkoxy of from 1 to 4 carbon atoms in the alkyl moiety, and

Z is hydrogen, carboxy or carbalkoxy of from 1 to 4 carbon atoms in the alkyl moiety,

X, Y and Z being identical or different to each other, with the proviso that either X or Y or both are not hydrogen if Z is hydrogen.

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**4,294,750**

## PYROPLASTOID PARTICLES, COMPOSITION AND METHOD OF PRODUCTION

**Richard M. Klingaman, Philadelphia, Pa., and Leo C. Ehrenreich, Amherst, N.Y., assignors to Penn Virginia Corporation, Philadelphia, Pa.**

**Division of Ser. No. 921,523, Jul. 3, 1978, abandoned, which is a continuation of Ser. No. 786,513, Apr. 11, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,043**
**Int. Cl.³ C08L** *67/00*
**U.S. Cl. 260—40 R** **28 Claims**

1. A composite comprising from about 15 to 99% by volume of one or more polymeric media and about one to about 85% of particulate material composed of particles:

at least about 85% of which (number basis) have a well-defined, regular, ellipsoidal shape;

having a size less than about 25μ, with at least about 90% by weight of the particles having a size less than about 15μ and at least about 50% being less than about 10μ;

the specific surface of the particles being in the range of about 0.75 to about 2.5 square meters per gram;

said particles having a specific gravity of about two to three, and being composed substantially of alumino-silicate glass.



**4,294,751**

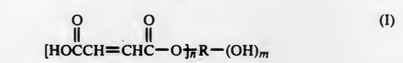
## POLYESTER RESIN COMPOSITIONS

**Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 34,997, May 1, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 135,905**
**Int. Cl.³ C08L** *67/02*
**U.S. Cl. 260—400 R** **7 Claims**

1. A curable molding composition comprising a mixture of:

(a) a polyester of the following formula



(I)

wherein n has an average value between 1.5 and 2, m is 2-n, R is the hydroxyl-free residue of a predominantly hydroxyl terminated polyester having a molecular weight not exceeding about 1500 and obtained by the condensation of a diol selected from the class consisting of 1,2-propylene glycol, 1,3-butanediol, 2,2-dimethyl-1,3-propanediol, dipropylene glycol, diethylene glycol, 2,2-dimethyl-3-hydroxypropyl 2,2-dimethyl-3-hydroxypropionate, the ethylene and propylene oxide derivatives of 2,2-bis(4-hydroxyphenyl)propane, and mixtures thereof, and mixtures of ethylene glycol and said diols, with a dicarboxylic acid or anhydride selected from the class consisting of maleic acid and anhydride, fumaric acid, ortho-phthalic acid and anhydride, isophthalic acid, terephthalic acid, carbic acid and anhydride, and mixtures thereof,

(b) maleic anhydride,

(c) an ethylenically unsaturated monomer which forms a homogeneous mixture with and is copolymerizable with (a) and (b) and

(d) one or more reinforcing fibers having a melting point or a glass transition temperature above about 130° C.

5. A composition as in claim 1 wherein the reinforcing fiber is selected from fiberglass, carbon fibers, or polyamide fibers.

6. A composition as in claim 1 wherein the composition contains from about 15 to about 80 weight percent of the reinforcing fiber.

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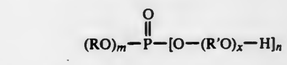
**4,294,752**

## FILLED VINYL CHLORIDE POLYMER COMPOSITION

**Joseph Silberberg, Brooklyn, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Jan. 14, 1980, Ser. No. 111,626**
**Int. Cl.³ C08K** *9/04, 5/52*
**U.S. Cl. 260—42.14** **7 Claims**

1. A filled vinyl chloride polymer composition having improved processing characteristics and impact resistance comprising a vinyl chloride polymer, a filler, and an effective amount for said improved processing and impact resistance of a composition comprising a lower alkoxylated alkyl acid phosphate ester having the formula



where x is an integer of from 1 to 5, m and n are either 1 or 2, with the sum of m and n being 3, R is a $C_1$–$C_{20}$ alkyl group, and R′ is a $C_2$–$C_5$ alkyl group.

**4,294,753**

## BONE MORPHOGENETIC PROTEIN PROCESS

**Marshall R. Urist, Pacific Palisade, Calif., assignor to The Regents of the University of California, Calif.**

**Filed Aug. 4, 1980, Ser. No. 174,906**
**Int. Cl.³ C07G** *7/00*
**U.S. Cl. 260—112 R** **17 Claims**

1. The process of separating bone morphogenetic protein (BMP) from bone tissue comprising the steps of:

(a) demineralizing bone tissue;

(b) treating said demineralized bone tissue under aqueous conditions with a water soluble neutral salt and a solubilizing agent for said BMP, said agent being selected from the group consisting of urea and guanidine, and thereby transforming the bone collagen to gelatin and extracting BMP into said solution of solubilizing agent; and

(c) separating said solubilizing agent and neutral salt from said solution, thereby precipitating BMP in the aqueous medium.

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**4,294,754**

## RING PEPTIDE ANTIBIOTICS, PERMETIN A AND A PROCESS FOR PRODUCING THE SAME

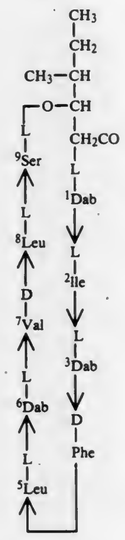
**Yoshiyuki Takahara, Tokyo; Yoshiteru Hirose, Kamakura; Yoko Takeuchi; Asao Murai, both of Tokyo; Masatsune Kainosho, Kawasaki, and Sawao Murao, Sakai, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan**

**Filed Apr. 4, 1979, Ser. No. 27,029**
**Claims priority, application Japan, Apr. 7, 1978, 53-40999**
**Int. Cl.³ C07C** *103/52;* **C12P** *21/04*
**U.S. Cl. 260—112.5 R** **1 Claim**

1. A purified ring peptide antibiotic having the following empirical formula:

Nα-(3-hydroxy-4-methyl-1-oxohexyl)-L-α, γ-diaminobutyrl-L-isoeucyl-L-α,γ-diaminobutryl-D-phenylalanyl-L-leucyl-L-α,γ-diaminobutyrl-D-valyl-L-leucyl-L-serine(9-1)-lactone;

and which has the following structural formula:




and wherein Dab represents 2,4-diamino butyric acid.

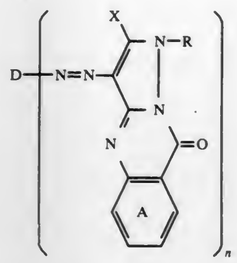
**4,294,755**

## PIGMENTS CONTAINING PYRAZOLO QUINAZOLONE RADICALS

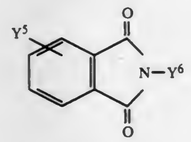
**Hartmut Kanter, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Herne, Fed. Rep. of Germany**

**Filed Oct. 10, 1979, Ser. No. 83,327**
**Int. Cl.**[3] **C09B** *29/01, 29/52, 35/233, 35/26*
**U.S. Cl. 260—154** **6 Claims**

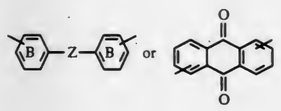
1. An azo compound of the formula:



wherein D is an unsubstituted anthraquinone radical or an anthraquinone radical substituted by one or more substituents selected form the group consisting of chlorine, bromine, $NHCOCH_3$, $CH_3$, $NHCOC_6H_5$ or $NHCOC_6H_4Cl$; or D is a amino phthalimide radical of the formula:



or D is the radical of a tetraazo component $H_2N—D—NH_2$ having the formulae:



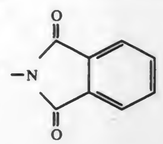
$Y^5$ is hydrogen, chlorine, bromine, methyl or cyano; and $Y^6$ is hydrogen, phenyl, benzoylamino, or phenyl or benzoylamino which are substituted by nitro;

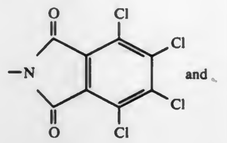
wherein Z is a direct bond, $SO_2$, NH, CO, $SO_2NH$, CONH, NHCONH, or NHCOCONH and the rings B are unsubstituted or substituted by chlorine, bromine, methyl, nitro, or methoxy;

wherein said radical D is free from complex-forming hydroxyl and carboxyl groups; n is one or two;

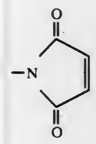
R is hydrogen or a phenyl, naphthyl or pyridyl radical which may be substituted by chlorine, bromine, nitro, methyl, methoxy or ethoxy;

X is hydroxyl, alkyl or a carboxylic acid alkyl ester having an alkyl ester radical selected from the group consisting of $C_1$-$C_6$ alkyl or alkoxyalkyl, phenyl and benzyl; or X is phenyl, naphthyl or pyridyl which is unsubstituted or substituted by chlorine, bromine, nitro, methyl, methoxy or ethoxy; or X is acylamino selected from the group consisting of $NHCOCH_3$, $NHCOC_2H_5$, $NHCOC_3H_7$, $NHCOC_6H_5$, $NHCOC_6H_4Cl$, $NHCOC_6H_3Cl_2$, $NHCOC_6H_4Br$, $NHCOC_6H_4OCH_3$, $NHCOC_{10}H_7$, $NHCONH_2$, $NHCONHC_6H_5$,





and



and the ring A is a substituted or unsubstituted, with a proviso that said ring A is free from $SO_3H$ groups.

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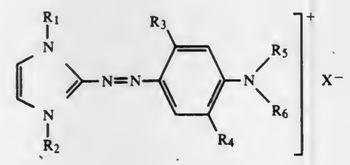
**4,294,756**

## CATIONIC DYESTUFFS

**Hans-Peter Kühlthau, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Aug. 13, 1979, Ser. No. 65,775**
**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837987**
**Int. Cl.**[3] **C09B** *29/22*
**U.S. Cl. 260—163** **10 Claims**

1. Dyestuffs of the formula



wherein

$R_1$ and $R_2$ independently of one another represent a lower alkyl, alkenyl or hydroxyalkyl radical,

$R_3$ represents H or halogen,

$R_4$ represents H, halogen, or a lower alkyl, alkenyl or alkoxy radical,

$R_5$ represents H or a lower alkyl radical,

$R_6$ represents a lower alkyl, alkenyl, halogenoalkyl, alkoxyalkyl, hydroxyalkyl or cyanoalkyl radical and

$X^-$ represents an anion,

at least one of the substituents $R_3$ and $R_4$ being other than H, and at least one of $R_3$ and $R_5$ being hydrogen.



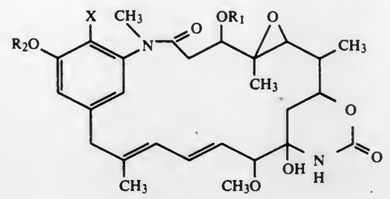
**4,294,757**

## 20-O-ACYLMAYTANSINOIDS

**Mitsuko Asai, Takatsuki, Japan, assignor to Takeda Chemical Industries, Ltd, Osaka, Japan**

**Filed Jan. 15, 1980, Ser. No. 112,237**
**Claims priority, application Japan, Jan. 31, 1979, 54-10551**
**Int. Cl.**[3] **C07D** *498/18*
**U.S. Cl. 260—239.3 P** **37 Claims**

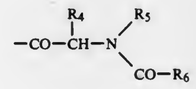
1. A compound of the formula:



wherein X is chlorine or hydrogen, $R_1$ is hydrogen or acyl; $R_2$ is acyl; said acyl being represented by the formula:

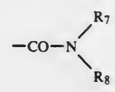
$$—CO—R_3 \quad (a)$$

wherein $R_3$ is hydrogen, $C_{1-18}$ alkyl, $C_{2-18}$ alkenyl, $C_{3-10}$ cycloalkyl, $C_{3-10}$ cycloalkenyl, heterocyclic group selected from the group consisting of azetidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3-isoquinolyl, 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, 2-imidazolyl, imidazolidinyl, benzoimidazolyl; indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl 1,4-benzodioxanyl, 1,2-dithiolanyl, 1,3-dithiolanyl, 1,3-dithianyl, isooxazolyl, oxazolyl, morpholinyl, benzoisoxazolyl benzoxazolyl, isothiazolyl, thiazolyl, benzoisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,5-triazolyl, 1,3,4-triazolyl, 1,3,5-triadinyl, benzotriazolyl and 1,2,3,4-tetrazolyl, said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being attached directly to the carbonyl carbon or through a $C_{1-4}$ alkylene chain, said alkyl, alkenyl, cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by $C_{1-4}$ alkoxy, $C_{2-4}$ alkanoyl, $C_{2-4}$ alkanoyloxy, $C_{2-4}$ alkanoyl, $C_{2-4}$ alkanoyloxy, $C_{2-4}$ alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-$C_{1-4}$-alkylamino, $C_{1-4}$ alkylthio methylsulfinyl, methylsulfonyl, oxo, thioxo, $C_{1-4}$ alkanoylamido or carboxy group of the formula $-COOR_{12}$ wherein $R_{12}$ is hydrogen, $C_{1-6}$ alkyl, phenyl or benzyl, and said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by $C_{1-4}$ alkyl;



(b)

wherein $R_4$ is hydrogen, $C_{1-18}$ alkyl, $C_{3-10}$ cycloalkyl, phenyl, indolyl or imidazolyl group, said cycloalkyl, phenyl, indolyl or imidazolyl groups being attached directly to the alpha-carbon atom or, through a $C_{1-4}$ alkylene chain, said alkyl, cycloalkyl, phenyl, indolyl or imidazolyl being unsubstituted or substituted by $C_{1-4}$ alkoxy, $C_{2-4}$ alkanoyl, $C_{2-4}$ alkanoyloxy, $C_{2-4}$ alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-$C_{1-4}$-alkylamino, $C_{1-4}$ alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or $C_{1-4}$ alkanoylamido, and said cycloalkyl, phenyl, indolyl or imidazolyl being unsubstituted or substituted by $C_{1-4}$ alkyl; $R_5$ is hydrogen, $C_{1-18}$ alkyl, $C_{3-10}$ cycloalkyl, $C_{4-14}$ cycloalkylalkyl, phenyl or benzyl group, said alkyl, cycloalkyl, cycloalkylalkyl, phenyl or benzyl group being unsubstituted or substituted by $C_{1-4}$ alkoxy, $C_{2-4}$ alkanoyl, $C_{2-4}$ alkanoyloxy, $C_{2-4}$ alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-$C_{1-4}$-alkylamino, $C_{1-4}$ alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or $C_{1-4}$ alkanoylamido, and said cycloalkyl cycloalkylalkyl, phenyl or benzyl group being unsubstituted or substituted by $C_{1-4}$ alkyl; $R_6$ is hydrogen, $C_{1-7}$ alkoxy, bornyloxy, isobornyloxy, benzyloxy, $C_{1-18}$ alkyl, $C_{2-18}$ alkenyl, $C_{3-10}$ cycloalkyl, $C_{3-10}$ cycloalkenyl, phenyl or heterocyclic group selected from the group consisting of azetidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3-isoquinolyl, 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, 2-imidazolyl, imidazolidinyl, benzoimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl 1,4-benzodioxanyl, 1,2-dithiolanyl, 1,3-dithiolanyl, 1,3-dithianyl, isooxazolyl, oxazolyl, morpholinyl, benzoisoxazolyl benzoxazolyl, isothiazolyl, thiazolyl, benzoisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,5-triazolyl, 1,3,4-triazolyl, 1,3,5-triadinyl, benzotriazolyl and 1,2,3,4-tetrazolyl, said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being attached directly to the carbonyl carbon or through a $C_{1-4}$ alkylene chain, said alkyl, alkenyl, cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by $C_{1-4}$ alkoxy, $C_{2-4}$ alkanoyl, $C_{2-4}$ alkanoyloxy, $C_{2-4}$ alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-$C_{1-4}$-alkylamino, $C_{1-4}$ alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or $C_{1-4}$ alkanoylamido, and said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by $C_{1-4}$ alkyl;



(c)

wherein $R_7$ and $R_8$ may be the same or different and each is hydrogen, $C_{1-18}$ alkyl, $C_{2-18}$ alkenyl, $C_{3-10}$ cycloalkyl, $C_{3-10}$ cycloalkenyl, $C_{4-14}$ cycloalkylalkyl, $C_{4-10}$ cycloalkenylalky phenyl, phenyl-$C_{1-4}$-alkyl, phenyl-$C_{3-10}$-cycloalkyl, $C_{3-10}$ cycloalkylphenyl, biphenyl or heterocyclic group selected from the group consisting of azetidinyl, pyrrolyl, furyl, thienyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrazolyl, imidazolyl, pyridyl, pyrimidinyl, pyrazinyl, triazinyl, quinolyl, quinazolyl, quinoxalyl, indolyl, benzofuranyl and benzothienyl, and wherein $R_7$ and $R_8$ together may form a heterocyclic group of azetidinyl, pyrrolidinyl, piperadinyl or morpholinyl taken together with the adjacent nitrogen atom, these groups being unsubstituted or substituted by $C_{1-4}$ alkoxy, $C_{1-4}$ alkylthio, phenoxy, phenylthio, cyclohexyloxy, halogen, cyano, $C_{2-5}$ alkoxycarbonyl, benzyloxycarbonyl, nitro, aminosulfonyl or di-$C_{1-4}$-alkylamino, and said cyclic moiety or heterocyclic group being unsubstituted or substituted by $C_{1-4}$ alkyl; or

$$—CO—O—R_9 \quad (d)$$

wherein $R_9$ is $C_{1-18}$ alkyl, $C_{3-10}$ cycloalkyl, phenyl or phenyl-$C_{1-4}$-alkyl, said groups being unsubstituted or substituted by

$C_{1-4}$ alkoxy, phenoxy, benzyloxy, halogen or cyano, and said cyclic moiety being unsubstituted or substituted by $C_{1-4}$ alkyl.

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**4,294,758**

## 7-ISOCYANATO-1,4-BENZODIAZEPIN-2-ONES

**Albert E. Fischli, and Andre Szente, both of Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

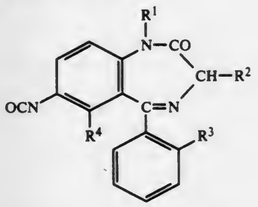
**Division of Ser. No. 63,288, Aug. 2, 1979, Pat. No. 4,251,443. This application Sep. 11, 1980, Ser. No. 186,094**

**Claims priority, application Switzerland, Aug. 11, 1978, 8563/78; Jun. 6, 1979, 5270/79; Jul. 5, 1979, 6296/79**

**Int. Cl.³ C07D *243/24***

**U.S. Cl. 260—239.3 D** **2 Claims**

1. A compound of the formula



II

wherein $R^1$ represents lower alkyl, $R^2$ represents a hydrogen atom or lower alkyl, $R^3$ represents a halogen atom and $R^4$ represents a hydrogen or halogen atom.

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**4,294,759**

## STRUCTURAL ANALOGUES OF 5,6,-DIHYDRO $PG_1$

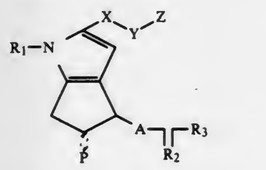
**Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 94,572, Nov. 15, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,738**

**Int. Cl.³ C07D *209/12***

**U.S. Cl. 260—326.27** **9 Claims**

1. A compound of the formula



Formula I

wherein P is H, $\overline{O}H$, or $\overline{C}H_2OH$;

X is $(CH_2)_n$ wherein n is 2 or 4;

Y is $CH_2—CH_2$, —CH=CH— (trans), or $CH_2CF_2$;

Z is

a. $CO_2R_8$ wherein $R_8$ is hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl or a pharmacologically acceptable metal or amine cation, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to three carbon atoms, inclusive, phenyl substituted in the para position by

(i) $NHCOR_{10}$

(ii) $COR_{11}$

(iii) $OCOR_{12}$

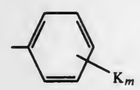
(iv) $CH{=}NNHCONH_2$

wherein $R_{10}$ is methyl, phenyl, acetamidophenyl, benzamidophenyl or $NH_2$, $R_{11}$ is methyl, phenyl, $NH_2$ or methoxy; and $R_{12}$ is phenyl or acetamidophenyl;

b. $CONR_{13}R_{14}$ wherein $R_{13}$ and $R_{14}$ are the same or different and are hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl or benzyl, or

c. $CH_2OR_5$ wherein $R_5$ is hydrogen, alkyl or one to six carbon atoms, inclusive, $COC_6H_5$ or $COCH_3$;

$R_1$ is hydrogen, alkyl of one to four carbon atoms, inclusive, cycloalkyl three to seven carbon atoms, inclusive,



wherein Km is as defined above, the Km of E being the same or different as the Km of $R_1$.

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**4,294,760**

## PREPARATION OF 5-(ARYLCYANOHYDROXYMETHYL)-1-LOWERALKYL-PYRROLE-2-ACETIC ACID DERIVATIVES

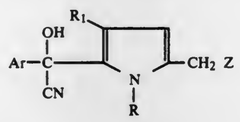
**John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.**

**Filed Apr. 17, 1980, Ser. No. 141,438**

**Int. Cl.³ C07D *207/337***

**U.S. Cl. 260—326.47** **6 Claims**

1. A 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivative having the formula:



wherein:

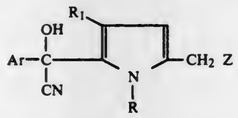
R is loweralkyl;

$R_1$ is hydrogen or loweralkyl;

Z is CN or COO(loweralkyl); and

Ar is phenyl or phenyl substituted with a substituent selected from the group consisting of loweralkyl, halo, nitro, methylthio, trifluoromethyl, and loweralkoxy.

6. The process of preparing 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivatives of formula:

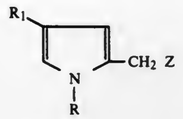




which comprises reacting an aroylcyanide of formula:

ArCOCN

with a 1-loweralkylpyrrole-2-acetic acid derivative of formula:



in the presence of an acid of pK below about 2, in an inert aprotic solvent at a temperature between 0° and 40° C., wherein in the foregoing formulae:

R is loweralkyl;

$R_1$ is hydrogen or loweralkyl;

Z is CN OR COO(loweralkyl);

Ar is phenyl or phenyl substituted with a substituent selected from the group consisting of loweralkyl, halo, nitro, methylthio, trifluoromethyl and loweralkoxy.

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**4,294,761**

## PREPARATION OF 7,12-DIOXASPIRO[5,6]DODECANE-3-ONE

**John A. Hyatt, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 14, 1980, Ser. No. 121,549**

**Int. Cl.³ C07D *321/10***

**U.S. Cl. 260—338** **1 Claim**

1. Process for the preparation of 7,12-dioxaspiro[5,6]-dodecane-3-one which comprises reacting under dehydrating conditions 1,4-cyclohexanedione and 1,4-butanediol in an inert hydrocarbon solvent in the presence of an effective amount of a ketal-forming, acid catalyst.

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**4,294,762**

## PREPARATION OF α-CYANO-BENZYL ESTERS

**Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

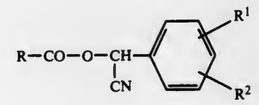
**Filed May 1, 1980, Ser. No. 145,636**

**Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2916224**

**Int. Cl.³ C07C *121/66, 121/75;* C07D *317/60, 319/20***

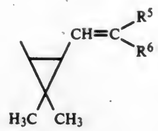
**U.S. Cl. 260—340.3** **9 Claims**

1. A process for the preparation of an α-cyano-benzyl ester of the formula



in which

R represents a radical of the formula



in which

$R^5$ represents hydrogen, methyl, chlorine, or bromine and

$R^6$ represents methyl, chlorine, bromine or optionally halogen-substituted phenyl, or

R represents the radical

in which

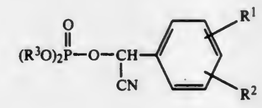
$R^7$ represents phenyl which is optionally substituted by halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, halogenomethyl, $C_1$–$C_2$-halogenoalkoxy, $C_1$–$C_2$-halogenoalkylthio, $C_1$–$C_2$-alkylenedioxy or $C_1$–$C_2$-halogenoalkylenedioxy and

$R^8$ represents isopropyl or cyclopropyl,

$R^1$ represents hydrogen, halogen or an optionally halogen-substituted alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, aralkyl or aryloxy radical and

$R^2$ represents hydrogen or halogen,

comprising reacting a phosphoric acid α-cyano-benzyl ester of the formula



in which

$R^3$ each independently is alkyl or phenyl or both together are alkanediyl,

with a carboxylic acid salt of the formula

$R—CO—O^{\ominus}M^{\oplus}$

in which

M represents one equivalent of an alkali metal or alkaline earth metal,

at a temperature of about 20° to 250° C.

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**4,294,763**

## INTERMEDIATES FOR THE PRODUCTION OF PICROPODOPHYLLIN AND RELATED COMPOUNDS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

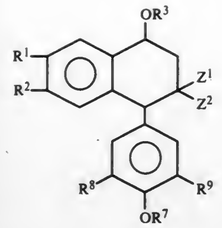
**Andrew S. Kende, Pittsford, N.Y.; Dennis P. Curran, Madison, Wis.; Margaret L. King, Rochester, and Neil A. Feldstein, Westbury, both of N.Y., assignors to University of Rochester, Rochester, N.Y.**

**Filed Mar. 5, 1980, Ser. No. 127,436**

**Int. Cl.³ C07D *317/70;* C07C *69/76, 49/337***

**U.S. Cl. 260—340.5 DP** **8 Claims**

1. A compound of the formula:



wherein;

$R^1$ represents alkoxy or aralkoxy,

$R^2$ represents hydrogen, alkoxy or aralkoxy,

or $R^1$ and $R^2$ taken together represent the group —O—CH-$_2$—O—,

$R^3$ represents hydrogen, alkyl, aralkyl, or a conventional protecting group,

$Z^1$ represents a non-reacting electron withdrawing group which can be readily converted to a carboxyl group,

$Z^2$ represents a non-reacting electron withdrawing group which can be readily converted to a carboxyl group, or hydrogen,

$R^7$ represents hydrogen, alkyl, aralkyl or acyl, and

$R^8$ and $R^9$ are the same or different and represent hydrogen, alkoxy or aralkoxy.

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**4,294,764**

## N-(OPTIONALLY SUBSTITUTED 1,3-DIOXOLAN- OR DIOXAN-2-YLMETHYL)-N-ALKYL, ALKENYL, OR ALKYNYL-2,2-DICHLOROACETAMIDES

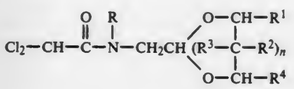
**Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Dec. 26, 1979, Ser. No. 106,434**

**Int. Cl.³ C07D** *317/10, 317/12, 319/04*

**U.S. Cl. 260—340.9 R** **2 Claims**

1. A compound represented by the formula:



wherein:

R is ethyl, propyl, 1-methylethyl, 2-propenyl, 2-butenyl, 2-methyl-2-propenyl, 2-propynyl, or 1,1-dimethyl-2-propynyl;

$R^1$, $R^2$, $R^3$, and $R^4$ are independently hydrogen or methyl; and

n is 0 or 1.

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**4,294,765**

## CIS-LACTONE PYRETHROID INTERMEDIATES

**Petrus A. Kramer, and Pieter A. Verbrugge, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

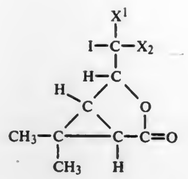
**Filed Oct. 23, 1980, Ser. No. 200,227**

**Claims priority, application United Kingdom, Nov. 1, 1979, 37858/79**

**Int. Cl.³ C07D** *307/93*

**U.S. Cl. 260—343.3 R** **3 Claims**

1. A cis-lactone of formula III



III

wherein $X^1$ and $X^2$ each represents an alkyl group containing fewer than five carbon atoms, phenyl, benzyl or phenethyl, substantially free of other stereoisomers.

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**4,294,766**

## PREPARATION OF PURE POTASSIUM RIBONATE AND RIBONOLACTONE

**Wolfram Schmidt, Friedelsheim, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Dec. 6, 1979, Ser. No. 100,724**

**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852721**

**Int. Cl.³ C07D** *307/32;* **C07C** *59/105*

**U.S. Cl. 260—343.6** **5 Claims**

1. A process for the preparation of pure ribonolactone from a mixture of ribonolactone and arabonolactone, which contains 70% by weight or more of the ribonolactone, wherein the mixture is subjected to fractional crystallization from a concentrated solution in dioxane or ethylene glycol monomethyl ether at a low temperature.

2. A process for the preparation of pure potassium ribonate, comprising:

(a) epimerizing potassium arabonate in an aqueous solution at 130°–140° C. thereby forming a mixture of potassium ribonate and potassium arabonate in solution;

(b) mixing the product solution from step (a) with from 40 to 900% by wt., based on the amount of water present, of an organic solvent selected from the group consisting of $C_1$–$C_4$ alkanols, cycloaliphatic ethers, alkanediols of 2 or 3 carbon atoms which are partially etherified with methanol or ethanol and mixtures thereof and allowing most of the potassium arabonate present to crystallize from solution;

(c) removing the solvent from said aqueous potassium ribonate containing solution;

(d) concentrating the aqueous solution to a salt strength from about 40 to 60% by weight;

(e) crystallizing the potassium ribonate from the solvent free, concentrated aqueous solution at from about −2° to 10° C.

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**4,294,767**

## PROCESS FOR THE PREPARATION OF 2,5-DIMETHYL-4-HYDROXY-3(2H)-FURANONE AND ITS 2,5-DIALKYL HOMOLOGUES

**Emile H. Eschinasi, Haifa, Israel, and Enrico Castelli, Leumann, Italy, assignors to Instituto per la Ricerca Scientifica e Applicata di Technologie Alimentari S.p.A, Turin, Italy**

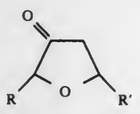
**Filed Aug. 21, 1980, Ser. No. 180,179**

**Int. Cl.³ C07D** *307/32*

**U.S. Cl. 260—347.8** **8 Claims**

1. A process comprising the steps of:

effecting an aldol condensation reaction between a 2,5-dialkyl-dihydro-3(2H)-furanone having the formula:

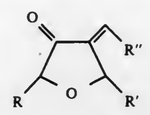


(I)



wherein R and R′ are each selected from the lower alkyl groups having from 1–3 carbon atoms, and an aldehyde having the formula R″CHO, wherein R″ is chosen from alkyl and isoalkyl groups having from 1 to 6 carbon atoms and aryl groups, under basic conditions at a temperature of from −10° C. to 100° C. to obtain the corresponding aldol compound;

dehydrating said aldol compound to form the corresponding exocyclic alkene having the formula:



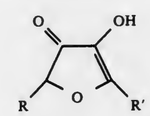
(II)

wherein R, R′ and R″ have the significations indicated above;

treating said exocyclic alkene (II) with ozone in the presence of a participating solvent selected from the group consisting of aliphatic alcohols and acyl compounds having from 1 to 4 carbon atoms, water, acetone and mixtures thereof, at a temperature of from −70° C. to 30° C. to obtain the corresponding hydroperoxyhemiacetal;

reducing said hydroperoxy-hemiacetal to the corresponding hemiacetal;

converting said hemiacetal to its corresponding 2,5-dialkyl-4-hydroxy-3(2H)-furanone having the formula:



(III)

wherein R and R′ have the significations indicated above, by refluxing under acidic conditions in an inert atmosphere; and

recovering said 2,5-dialkyl-4-hydroxy-3(2H)-furanone (III).

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**4,294,768**

## WATER-SOLUBLE ANTHRAQUINONE DYES

**Jean-Marie Adam, Saint-Louis, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

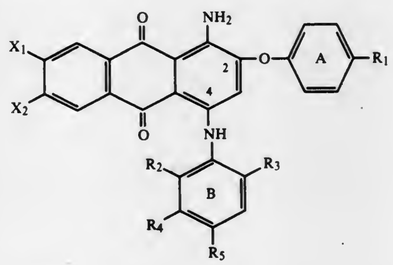
**Continuation of Ser. No. 908,495, May 23, 1978, abandoned. This application May 9, 1980, Ser. No. 148,443**

**Claims priority, application Luxembourg, May 26, 1977, 77419**

**Int. Cl.³ C07C** *143/675*

**U.S. Cl. 260—372** **10 Claims**

1. A new water-soluble anthraquinone dye which, in the form of the free acid, corresponds to the formula I



(I)

wherein

$R_1$ represents a straight-chain or branched chain alkyl group having 4 to 8 carbon atoms,

$R_2$ and $R_3$ independently of one another represent a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms,

$R_4$ represents hydrogen, an optionally acylated amino group, or a fibre-reactive radical bonded by way of an amino group,

$R_5$ represents hydrogen or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms, and the phenylene rings

A and/or B can be further substituted, with the proviso that one X of the symbols $X_1$ and $X_2$ represents the —$SO_3H$— group, and the other X represents hydrogen.

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**4,294,769**

## PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-2,3-DICYANO-ANTHRAQUINONES

**Friedrich W. Kröck, Cologne; Rütger Neeff, and Heinz Scheiter, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

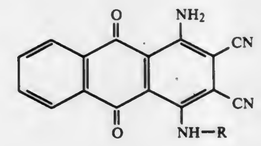
**Filed Jul. 24, 1980, Ser. No. 171,870**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931981; Feb. 1, 1980, 3003657**

**Int. Cl.³ C07C** *97/12*

**U.S. Cl. 260—378** **10 Claims**

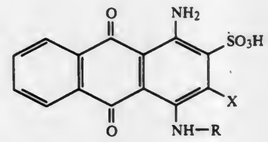
1. Process for the preparation of 2,3-dicyanoanthraquinones of the formula



wherein

R denotes hydrogen, optionally substituted alkyl or optionally substituted cycloalkyl,

by reacting sulphonic acids of the formula



or salts thereof,

wherein

R has the abovementioned meaning and

X denotes hydrogen or the sulphonic acid group, with compounds which donate cyanide ions, characterised in that the reaction is carried out in formamide or N-methyl-formamide.

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**4,294,770**

## PROCESS FOR PREPARING A NORMAL LONG CHAIN ALKANOIC ACID

**Hitoshi Takita; Yutaka Mukaida, both of Tokyo, and Satoru Enomoto, Fujisawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 15, 1980, Ser. No. 121,875**

**Claims priority, application Japan, Feb. 22, 1979, 54-19998**

**Int. Cl.³ C11C** *1/00*

**U.S. Cl. 260—413** **4 Claims**

1. A process for preparing a normal alkanoic acid of 26 to 36 carbon atoms comprising the steps of heating a mixture of 1,1,1-trihalogeno-normalalkane of 26 to 36 carbon atoms dissolved in an organic solvent which is not completely miscible with water and an aqueous alkali solution to a temperature of 40° to 100° C. while stirring said mixture, thereby hydrolyzing

said 1,1,1-trihalogeno-normalalkane into an alkali normalalkanoate, and neutralizing said alkali normalalkanoate, thereby obtaining said normal alkanoic acid of 26 to 36 carbon atoms.

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**4,294,771**

## METHOD FOR THE PRODUCTION OF METAL SOAPS

**Norbert Pietralla, Weidenstrasse 33, 8034 Unterpfaffenhofen; Valentin Ausserbauer, Zugspitzweg 29, 8015 Markt Schwaben, and Christian Rosenthal, Bäckergasse 15, 8131 Berg, all of Fed. Rep. of Germany**

**Filed Mar. 27, 1980, Ser. No. 134,194**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913592**

**Int. Cl.³ C08H** *17/36*

**U.S. Cl. 260—413** **7 Claims**

1. In a process for producing granulate metal soap or metal soap mixture in which at least one aliphatic carboxylic acid having about 8 to 22 carbon atoms is reacted with at least one soap-forming metal compound selected from the group consisting of metal oxide, metal hydroxide and metal carbonate in the presence of water at elevated temperature to provide soap, and water is subsequently removed, the improvement which comprises:

(a) heating a reaction mixture containing carboxylic acid and soap-forming metal compound in the presence of from 1 to 5 weight percent water based on the total weight of carboxylic acid(s) to a temperature at which the soap-forming reaction is initiated;

(b) permitting the soap-forming reaction to proceed under built-up overpressure without further supply of external heat;

(c) reducing the built-up overpressure; and,

(d) removing water from the reaction mixture under reduced pressure to provide granulate metal soap or metal soap mixture.

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**4,294,772**

## OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

**Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

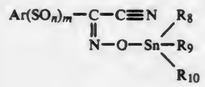
**Filed Aug. 20, 1979, Ser. No. 68,262**

**Claims priority, application Switzerland, Aug. 31, 1978, 9200/78**

**Int. Cl.³ C07F** *7/22*

**U.S. Cl. 260—429.7** **5 Claims**

1. An oxime derivative of the formula



wherein

n is 0, 1 or 2,

m is 0 or 1,

Ar is alkylphenyl in which the alkyl group has from 1 to 4 carbon atoms, alkoxyphenyl in which the alkyl group has from 1 to 4 carbon atoms, halo-phenyl or naphthyl, and

$R_8$, $R_9$ and $R_{10}$ are the same and are $C_1$–$C_4$ alkyl, benzyl or phenyl.

**4,294,773**

## PREPARATION OF 1-HALOALKYL ISOCYANATES AND 1-ALKENYL ISOCYANATES

**Karl-Heinz Koenig, Frankenthal; Karl-Heinz Feuerherd, and Heinz-Guenter Oeser, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

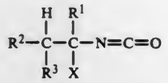
**Filed Aug. 5, 1980, Ser. No. 175,591**

**Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937006**

**Int. Cl.³ C07C** *118/00, 119/042*

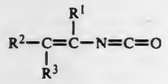
**U.S. Cl. 260—453 P** **10 Claims**

1. A process for the preparation of 1-haloalkyl isocyanates of the formula



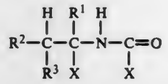
Ia

and 1-alkenyl isocyanates of the formula



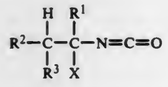
Ib

where $R^1$, $R^2$ and $R^3$ may be identical or different and each is hydrogen or methyl, and X is halogen, wherein a 1-haloalkylcarbamic acid halide of the formula



II

or a 1-haloalkyl isocyanate of the formula



III

where $R^1$, $R^2$, $R^3$ and X have the above meanings, is reacted with α-pinene.

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**4,294,774**

## PREPARATION OF ORGANIC ISOCYANATES

**Thomas R. Henson, and John F. Timberlake, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Nov. 14, 1980, Ser. No. 206,747**

**Int. Cl.³ C07C** *118/00*

**U.S. Cl. 260—453 P** **5 Claims**

1. A process for the preparation of an organic isocyanate product comprising the step of preparing a heated solution of an alkyl carbamate in a solvent whereby the carbamate is catalytically decomposed into the corresponding organic isocyanate product and alkyl alcohol, said solvent being an N,N-dialkyl aniline compound which is characterized as being catalytic with respect to the decomposition rate of the carbamate but unreactive with respect to the organic isocyanate product.



**4,294,775**

## RESOLUTION OF ACYLATED D,L-ALKYL SUBSTITUTED ALKANOIC ACIDS

**Bonnie G. McKinnie, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Mar. 3, 1980, Ser. No. 126,678**

**Int. Cl.³ C07C** *153/07, 153/09*

**U.S. Cl. 260—455 R** **12 Claims**

1. A process for resolving a racemic mixture of 3-benzoylthio- or 3-acetylthio-2-D,L-methylpropanoic acid comprising the steps of reacting said racemic mixture with an organoamine resolving agent in a solvent having an active oxygen selected from alcohols, ketones, esters and aldehydes suitable for the particular acid at a temperature sufficient to form the 3-benzoylthio- or 3-acetylthio-2-D,L-methylpropanoic acid organo-amine salt, cooling the resultant salt-containing solution at a rate sufficient to preferentially form crystalline solids containing a substantially enriched proportion of the 3-benzoylthio- or 3-acetylthio-2-D-methylpropanoic acid organoamine salt and separating said crystalline solids from the remaining salt-containing solution and recovering from the resultant crystalline solids said 3-benzoylthio- or 3-acetylthio-2-D-methylpropanoic acid.

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**4,294,776**

## PROCESS FOR THE PURIFICATION OF ORGANIC SOLUTIONS OF PERCARBOXYLIC ACIDS

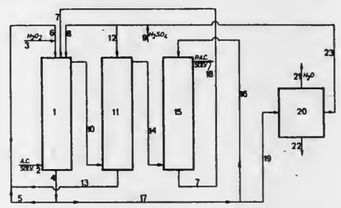
**Nicolas Hardy, and Georges Dancot, both of Jemeppe-sur-Sambre, Belgium, assignors to Propylox (Societe Anonyme), Brussels, Belgium**

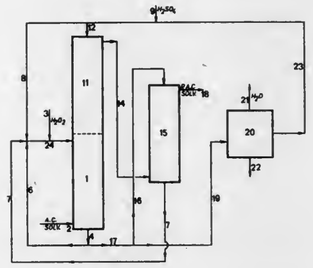
**Filed May 1, 1980, Ser. No. 145,836**

**Claims priority, application France, May 4, 1979, 79 11234**

**Int. Cl.³ C07C** *179/10*

**U.S. Cl. 260—502 R** **10 Claims**





1. In a process for the purification of an organic solution of a percarboxylic acid in an inert organic solvent, the solution originating from the manufacture of a percarboxylic acid by reaction of the corresponding carboxylic acid or carboxylic anyhydride with hydrogen peroxide in the presence of a catalyst, under conditions sufficient to produce said percarboxylic acid, the improvement comprising subjecting the solution to be purified to a wash at a temperature of 263° to 303° K., by means of a dilute aqueous solution containing from 35 to 60% by weight of sulphuric acid.

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**4,294,777**

## COLOR-STABILIZED AROMATIC CARBOXYLIC ACID CHLORIDES AND A PROCESS FOR THEIR PREPARATION

**Walter Böckmann; Karl-August Lipper, and Friedrich Brühne, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

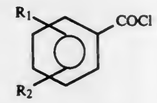
**Filed Oct. 17, 1979, Ser. No. 85,553**

**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848356**

**Int. Cl.³ C07C** *51/64*

**U.S. Cl. 260—544 D** **15 Claims**

1. A process for color stabilizing an aromatic carboxylic acid chloride of the formula



wherein

$R_1$ and $R_2$ independently represent hydrogen and halogen, alkyl or alkoxy which comprises introducing into a composition containing said aromatic carboxylic acid chloride 0.001 to 2% by weight of a color stabilizer, based upon the amount of said carboxylic acid chloride, said color stabilizer being selected from the group consisting of

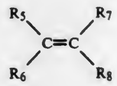
A. A stabilizer of the formula

wherein

$R_3$ and $R_4$ can be identical or different and represent hydrogen, halogen, hydroxy, alkoxy, aryloxy, aralkoxy, alkyl, aralkyl, aryl, alkenyl or mono- or di-alkylamino radicals;

$R_3$ and $R_4$ together with the carbonyl group can further form a ring;

B. A stabilizer of the formula



wherein

$R_5$ to $R_8$ are identical or different and represent hydrogen, nitrile, halogen, carboxyl, carbaryloxy, carbalkoxy, alkoxy, aryloxy, acyloxy, alkyl, aryl, aralkyl or alkenyl and

$R_5$ and $R_6$ and/or $R_7$ and $R_8$, or $R_5$ and $R_7$, and/or $R_6$ and $R_8$ together with the atoms to which they are linked, can further form a ring; and

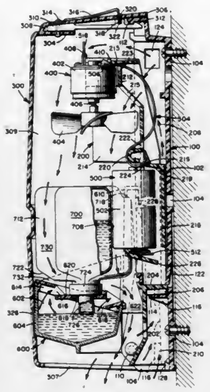
C. A stabilizer of the formula

wherein

$R_9$ to $R_{11}$ can be identical or different and represent alkyl, aryl, alkoxy, or aralkoxy and

X denotes phosphorus or arsenic.

**4,294,778**
**EVAPORATIVE DISPENSER**
**Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.**
**Filed Oct. 18, 1978, Ser. No. 952,386**
**Int. Cl.³ A61L 9/04**
**U.S. Cl. 261—30** **14 Claims**



1. A dispenser for emitting a vaporized material into the ambient comprising:
a housing;
a reservoir disposed within said housing for containing a quantity of material to be vaporized;
inlet means for admitting air into said housing;
outlet means for exhausting air mixed with vaporized material from said housing;
air circulation means for effecting a flow of air through said housing from said inlet means to said outlet means;
a supply container for replenishing material evaporated from said reservoir and replaceable when empty with a full supply container;
means for removably supporting said supply container within said housing; and
air channelling means carried by said supply container for channelling the air flowing through said housing across said reservoir, whereby said material is vaporized from said reservoir, entrained in said air flow and exhausted from said housing through said outlet means, said air channelling means comprising a protrusion formed on the exterior of said supply container which cooperates with said housing to define an airway for directing said air flow toward said reservoir.

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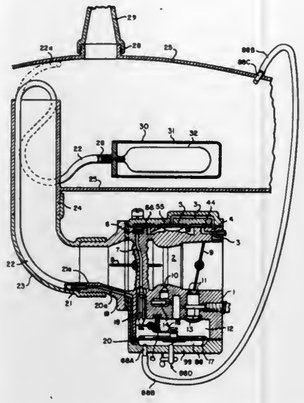
**4,294,779**
**CARBURETOR DEVICE**
**William J. Alape, Springfield, N.J., assignor to Aquascooter Inc., Springfield, N.J.**
**Filed Aug. 14, 1980, Ser. No. 178,061**
**Int. Cl.³ F02M 17/04**
**U.S. Cl. 261—35** **8 Claims**

1. In a compensating membrane carburetor having a fuel accumulating chamber connected through idling and high-speed jets to a Venturi, the improvement which comprises: compensating chamber means maintained naturally or artificially at atmospheric pressure; second chamber means for sealing the external face of the compensating membrane from the environment of the carburetor; first relief means partially disposed in the carburetor providing fluid communication between the compensating chamber means and the second chamber means to maintain the second chamber means at atmospheric pressure; and second relief means disposed substantially outside of the carburetor for providing a second fluid



communication between the compensating chamber means and the second chamber means.

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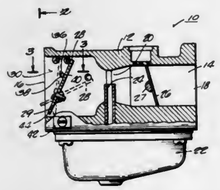
**4,294,780**
**TEMPERATURE COMPENSATOR FOR A CARBURETOR CHOKE VALVE**
**Chester G. DuBois, Zion, and Richard P. Hulsebus, Waukegan, both of Ill., assignors to Outboard Marine Corporation**
**Filed Mar. 26, 1980, Ser. No. 134,065**
**Int. Cl.³ F02M 1/10**
**U.S. Cl. 261—39 B** **4 Claims**



1. A carburetor comprising an air induction passage, a choke valve movable in said air induction passage between a first position and a range of positions spaced from said first position and including within said range of positions a second position of said choke valve, a pin movable between a first pin position extending into the path of choke valve movement for preventing movement of said choke valve from said choke valve second position toward said choke valve first position and a second pin position retracted from the path of choke valve movement for permitting movement of said choke valve between said choke valve first position and said range of choke valve positions, and thermostatic activation means operatively connected with said pin for controlling movement of said pin between said extended position and said retracted position.

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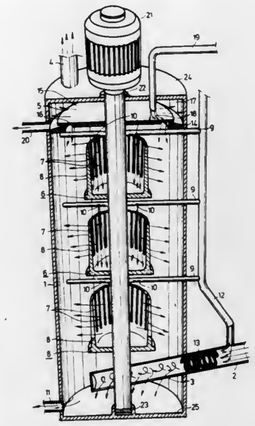
**4,294,781**
**APPARATUS FOR WASHING GASES AND/OR RECOVERING HEAT THEREFROM**
**Börje G. A. Holmquist, Solna, Sweden, assignor to Leitex Stockholms-Tvatt Aktiebolag, Solna, Sweden**
**Filed Jan. 22, 1980, Ser. No. 114,381**
**Int. Cl.³ B01D 47/16**
**U.S. Cl. 261—89** **7 Claims**

1. An apparatus for washing gases and/or recovering heat



therefrom, wherein said apparatus includes a cylindrical treatment vessel having at the bottom thereof a gas inlet connected to a gas supply line and at the top thereof a gas outlet for processed gas; a vertical rotatable centre shaft which carries at least one cup-shaped rotary body having a plurality of openings in the form of slots in the side wall thereof; respective means cooperating with said at least one rotary body for introducing liquid to at least one location within said at least one rotary body; and a liquid outlet at the bottom of the vessel; and said vessel also having an upper part defined by a ring-shaped



segment, arranged on the inside of said vessel, and a circular disc of porous material mounted on the shaft above said ring-shaped segment; a liquid inlet being directed onto the upper surface of the disc; and in which vessel the gas is arranged to flow past the at least one rotary body on the outside thereof in a space located between said at least one body and the wall of said vessel and substantially upwardly along said vessel wall and the outside of said rotary body; and in which vessel the liquid is arranged to be thrown out freely through the openings in the side wall of said at least one rotary body, out towards the wall of said vessel.

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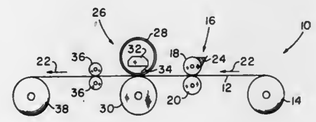
**4,294,782**
**METHOD FOR SUBSTANTIALLY INSTANTANEOUS LIQUID MOLDING OF AN ARTICLE**
**Guy M. Froehlig, Glen Cove, N.Y., assignor to Jerome Bauer and Myron Amer, both of Mineola, N.Y.**
**Filed Apr. 10, 1979, Ser. No. 28,687**
**Int. Cl.³ B29D 11/00, 17/00**
**U.S. Cl. 264—1.4** **8 Claims**



1. A method of producing an article by substantially instantaneous liquid molding comprising:
depositing a film of radiation-curable liquid material onto a support,
applying a radiation-transparent molding element to the film of liquid material to predeterminately configure the material by impressing it to the form of the article to be produced,
and irradiating the film of material with a source of radiation transmitted through the radiation-transparent molding element during said forming application of the molding element to the material so as to effect substantially instantaneous curing of the material and complete the production of the article in an essentially single-step molding and curing operation.

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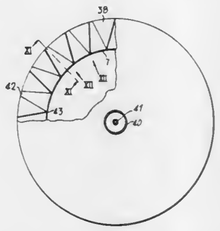
**4,294,783**
**SPINNING PROCESS AND APPARATUS**
**Paul Snowden, Redcar, England, assignor to Imperial Chemical Industries, Inc., London, England**
**Filed Apr. 9, 1980, Ser. No. 138,547**
**Claims priority, application United Kingdom, Apr. 9, 1979, 12359/79; Mar. 3, 1980, 07084/80**
**Int. Cl.³ B29C 6/00**
**U.S. Cl. 264—8** **3 Claims**



1. A process for the centrifugal spinning of fibres, utilizing the centrifugal spinning cup comprising a hollow cylinder with a plurality of discrete passages positioned around and extending through its circumferential wall from the interior cylindrical surface of the cup, the inlets to the passages being wider then the outlets and contiguous so that all the fibre-forming material flowing over the interior cylindrical surface from the supply region towards the inlets is directed, by the contiguous passage inlets, into the passages; said method comprising the steps of:
supplying a fibre-forming material in liquid form to the interior cylindrical surface at an area axially spaced from the passages so that the material must flow over a portion of the interior cylindrical surface before reaching the passages;
dividing all the fibre-forming material into a plurality of separate streams at the contiguous inlets of the passages, the fibre-forming material flowing into the passages;
rapidly spinning the cup; and
collecting formed fibres from the passages.

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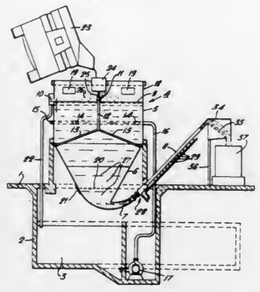
**4,294,784**
**METHOD OF HAULING GRANULATES AND SIMILAR MATERIAL**
**Steinar J. Mailund, Kamomillegatan 9, 653 45 Karlstad, Sweden**
**Filed Mar. 28, 1979, Ser. No. 24,688**
**Claims priority, application Sweden, May 3, 1978, 7805088**
**Int. Cl.³ B01J 2/06**
**U.S. Cl. 264—14** **6 Claims**

1. A method of producing metallic particles having improved drying efficiency, said method comprising:
(a) providing a treatment vessel having a main portion and an inclined riser having a lower part, said treatment vessel including a curved transition section leading from said main portion to said inclined riser, said treatment vessel having a predetermined level of water therein;
(b) introducing individual molten droplets of a metal into said water in said main portion of said treatment vessel to quench said droplets and solidify same to form metallic particles;
(c) passing said metallic particles from said main portion through said curved transition section to said inclined riser;

(d) introducing compressed air into said lower part of said inclined riser to rapidly transport said metallic particles and a first portion of said water through said curved transition section and up said inclined riser, said metallic particles being formed so that upon solidification, they have an elevated temperature above the temperature of said water in said treatment vessel, at least a portion of said elevated temperature being retained by said metallic particles during passage through said treatment vessel and up said inclined riser;

(e) adjusting the level of said water in said treatment vessel



by means other than said inclined riser, to thereby maintain said predetermined level of water in said treatment vessel; and

(f) removing at least a part of said first portion of water from said metallic particles after rapid passage through said inclined riser, to recover metallic particles having improved drying efficiency, wherein after removal of part of said first portion of water said metallic particles still have an elevated temperature above the temperature of the water in said treatment vessel, thereby causing evaporation of residual water associated with said metallic particles.

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**4,294,785**

**PROCESS OF CASTING POLYPARABANIC ACID FILMS FROM STABILIZED ORGANIC AMIDE SOLVENTS**

**Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 967,660, Dec. 8, 1978, Pat. No. 4,208,486, which is a division of Ser. No. 797,842, May 17, 1977, Pat. No. 4,144,213. This application Dec. 12, 1979, Ser. No. 102,678**

**Int. Cl.³ B29D *27/00*; B32B *3/14***

**U.S. Cl. 264—41** **8 Claims**

1. The method of casting polyparabanic acid films stabilized against degradation in the presence of amines, comprising preparing a solution of polyparabanic acid in a suitable solvent, said solvent containing a stabilizing amount of an aromatic sulfonic acid ester of an aliphatic, arylaliphatic or alicyclic alcohol or polyol, casting said solution of polyparabanic on a suitable surface, evaporating said solvent to obtain a polyparabanic acid film and drying said film.

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**4,294,786**

**SOLAR HEAT ENERGY COLLECTING SYSTEMS AND METHODS OF MAKING THE SAME**

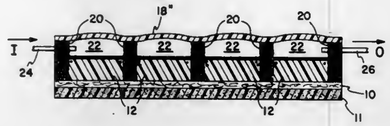
**Alan A. Graham, Mercerville, N.J.; Laurence F. Haemer, Newton, Pa., and Charles H. Miller, Lawrenceville, N.J., assignors to Congoleum Corporation, Kearny, N.J.**

**Filed Apr. 2, 1979, Ser. No. 26,274**

**Int. Cl.³ B29D *27/00***

**U.S. Cl. 264—46.4** **8 Claims**

1. A method of making a solar heat energy collecting system which comprises: forming a potentially foamable, resinous base layer containing a blowing agent; applying a printing composition to the surface of said potentially foamable, resinous base layer in the form of at least one continuous path extending from one edge point to another edge point of said potentially foamable, resinous base layer, said printing composition comprising a blowing inhibitor and a release agent; applying a top surface layer to the surface of said printed potentially foamable, resinous base layer which adheres thereto except in those areas containing said blowing inhibitor and said release agent; and heating said potentially foamable, resinous base layer to decompose or to activate said blowing agent in those portions of said potentially foamable, resinous base layer not lying under said blowing inhibitor and said release agent, whereby said portions are blown and expand to extend and stretch



upwardly so as to form upright walls of foamed, relatively lower density resinous material extending away from the main level portion of said resinous base layer and capable of supporting said top surface layer at varying distances from the surface of said main level part of said resinous base layer, while those other portions of said potentially foamable, resinous base layer lying under said blowing and said release agent remain relatively unaffected and do not expand to extend or stretch upwardly, said upright walls, said top surface layer, and said relatively unaffected portions of the main level part of said resinous base layer forming at least one continuous open channel extending from one edge point to another edge point of said resinous base layer.

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**4,294,787**

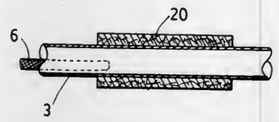
**METHOD OF PRODUCING REINFORCED COMPOSITE RACKET FRAME**

**Kun-Nan Lo, No. 7-1, La. 246, Sec. 3, Chung-Shan Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan**

**Filed May 5, 1980, Ser. No. 146,593**

**Int. Cl.³ B29D *27/00*; A63B *49/10***

**U.S. Cl. 264—46.6** **2 Claims**



1. A method of producing reinforced composite racket frames composed of an outer shell made of a thermosetting material and a foam core comprising the steps of:

(a) inserting a foamable material in a shell of thermosetting material, the outer dimension of the foamable material being less than the inner dimension of the shell so as to create a space between said shell and said foamable material;

(b) inserting the shell and the foamable into a mold;

(c) initially pressurizing the space with pressurized gas to force the shell to intimately contact the inner surface of the mold; and

(d) after the initial pressurizing step, heating the mold to a temperature at which the foamable material expands to subsequently fill said space and to pressurize said space by said foamable material.



**4,294,788**

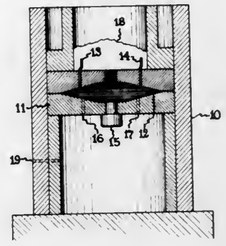
**METHOD OF MAKING A SHAPED SILICON CARBIDE-SILICON MATRIX COMPOSITE AND ARTICLES MADE THEREBY**

**William Laskow, Downingtown, Pa., and Charles R. Morelock, Ballston Spa, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 100,579, Dec. 5, 1979, Pat. No. 4,240,835, which is a continuation-in-part of Ser. No. 946,718, Sep. 28, 1978, abandoned, which is a division of Ser. No. 572,969, Apr. 30, 1975, Pat. No. 4,141,948, which is a continuation-in-part of Ser. No. 354,106, Apr. 24, 1973, abandoned. This application Mar. 21, 1980, Ser. No. 131,941**

**Int. Cl.³ C04B *34/70***

**U.S. Cl. 264—101** **8 Claims**



1. A method for making a silicon carbide-silicon matrix ceramic of the desired shape which comprises:

(a) infiltrating molten silicon at a temperature of from 1400° C. to 1800° C. into a shaped carbon fiber part which further includes silicon carbide crystals dispersed therein while said part is substantially contained in a mold in a non-oxidizing atmosphere and under reduced pressure, and

(b) separating the resulting silicon carbide ceramic from the mold where the fiber used in (a) has a specific gravity of from about 1.3 to 1.5.

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**4,294,789**

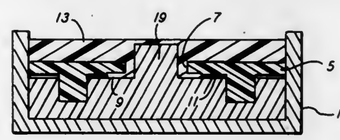
**PLATING MASK FABRICATING PROCESS**

**Howard P. Lincoln, N. Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Sep. 8, 1980, Ser. No. 185,093**

**Int. Cl.³ B29C *25/00***

**U.S. Cl. 264—102** **10 Claims**



1. A plating mask fabricating process comprising the steps of:

forming and positioning a mask blank within a mold member, said mask blank having a relatively flat surface, a plurality of apertures each with an inner peripheral surface and a surface opposite to said relatively flat surface with a recessed portion surrounding each aperture on said surface opposite said relatively flat surface, said inner peripheral surface of said apertures of said mask blank being spaced from said mold member;

depositing polyurethane in said mold member to provide a layer thereof on said relatively flat surface, said inner peripheral surface of said apertures and said recessed portion of said surface opposite said relatively flat surface;

curing said deposited polyurethane in said mold member to provide a mask blank having polyurethane affixed to said relatively flat surface, said inner peripheral surface of said apertures and said recessed portion of said surface opposite said relatively flat surface;

treating said polyurethane in said mold member to provide said polyurethane on said flat surface of said mask blank with a substantially flat surface suitable for sealing to a metal; and

removing said mask blank and affixed polyurethane from said mold member to provide an apertured mask having a polyurethane surface suitable for selective plating of specified areas of a metal.

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**4,294,790**

**MANUFACTURE OF SHEET MATERIAL**

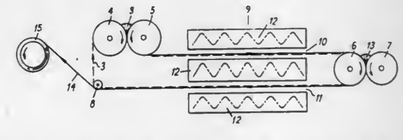
**Harry Thornley, Rochdale, England, assignor to TBA Industrial Products Limited, Manchester, England**

**Continuation of Ser. No. 892,512, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,513, Apr. 3, 1978, abandoned, which is a continuation of Ser. No. 657,477, Feb. 12, 1976, abandoned. This application Nov. 27, 1979, Ser. No. 97,887**

**Claims priority, application United Kingdom, Feb. 13, 1975, 6160/75**

**Int. Cl.³ B29D *7/14***

**U.S. Cl. 264—171** **8 Claims**



1. A process for the production of fiber-reinforced sheet material of indefinite length, which comprises the steps of:

(a) providing an uncured, heat-curable dough compounded from thermoplastic polymer, reinforcing fiber and a solvent system which comprises a liquid solvent for the polymer and a liquid which is a non-solvent for the polymer, the non-solvent imparting release characteristics to the dough;

(b) rolling the dough of step (a) onto one face of a metal band, at ambient temperature and under a rolling pressure in the order of 10 kg per cm sufficient to form an uncured first coating of dough having a thickness in the order of 0.5 mm and which is wholly exposed on that side face thereof remote from said one face of the band;

(c) heating said first coating while exposed as in step (b) under conditions of time and temperature sufficient to dry said first coating but insufficient significantly to cure same, whereby the flow characteristics of the first coating are not drastically altered;

(d) rolling the dough of step (a) onto said first coating on said one face of the band, at ambient temperature and under a rolling pressure sufficient to form, with said first coating, a single uncured layer of thickness increased with respect to that of said first coating and which is wholly exposed on that side face thereof remote from said one face of the band;

(e) heating said single layer while exposed as in step (d) under conditions of time and temperature sufficient to dry said single layer but insufficient significantly to cure same, whereby the flow characteristics of the single layer are not drastically altered;

(f) stripping said single layer from said band; and

(g) heating said stripped layer under conditions of time and temperature sufficient to cure the dough and drastically alter the flow characteristics thereof.

**4,294,791**

## PROCESS FOR PRODUCING THERMOPLASTIC RESIN FILM OF MARKEDLY REDUCED THICKNESS UNEVENNESS

**Hiroshi Nouda, Sagamihara; Yoshiaki Tanihara, Machida; Takashi Ikeda, and Ituo Ogiuchi, both of Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,280**

**Claims priority, application Japan, Jan. 5, 1979, 54/22; Jan. 5, 1979, 54/23; Jan. 5, 1979, 54/24**

**Int. Cl.³ B29D** *7/24*

**U.S. Cl. 264—210.2** **4 Claims**

1. In a process for producing a film of a thermoplastic resin which comprises extruding a molten thermoplastic resin in film form onto a rotating cooling drum through a die slit, cooling the film-like extrudate on the cooling drum, withdrawing the cooled film-like extrudate from the cooling drum, and then stretching it, the improvement wherein the rotation of the cooling drum is controlled such that the variation rate (%) of instantaneous rotation under no load defined by the following

$$\frac{\text{(Maximum instantaneous rotating speed)} - \text{(Minimum instantaneous rotating speed)}}{\text{Average rotating speed}} \times 100$$

is less than about 1%, and wherein said withdrawal of the cooled film-like extrudate is carried out so that substantially no tension in the subsequent stretching step is exerted on the film-like extrudate on the cooling drum.

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**4,294,792**

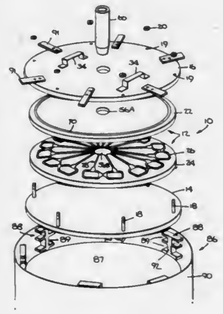
## MOLDED PLASTIC PARTS, PARTICULARLY SPIN-CAST PLASTIC PARTS FOR EYEGLASS FRAMES

**Irving J. Arons, Peabody; Richard E. Merrill, Wakefield, and Arthur P. Drennan, Brighton, all of Mass., assignors to Universal Optical Company, Inc., Providence, R.I.**

**Filed Oct. 27, 1978, Ser. No. 955,149**

**Int. Cl.³ B29C** *5/04*

**U.S. Cl. 264—311** **13 Claims**



1. A spin casting process for producing a solid, substantially clear, low color thermoset plastic part which has a cross-linked structure when cured, particularly an eyeglass part, in a flexible mold from a curable liquid resin system, the flexible mold including separable mold portions at least one of which is flexible and which define at least one mold cavity when the mold portions are assembled to form the flexible mold, means being provided for rigidly holding the mold portions together as a rigid, transportable mold assembly, said process comprising the steps of:

assembling the mold portions to form the flexible mold;

introducing the liquid resin system comprising an epoxy resin and a curing agent therefor which are substantially clear and of low color into the flexible mold;

rotating the flexible mold in the rigid mold assembly in or on spinning apparatus until the liquid resin system is distributed in the mold cavity but is still soft and uncured and is yet not self-supporting;

removing the rigid mold assembly including the flexible mold as a rigid unit from the spinning apparatus while the liquid resin system therein is still soft and uncured and is yet not self-supporting;

hardening the liquid resin system while in the rigid mold assembly after removal of the rigid mold assembly from the spinning apparatus to form the part; and

thereafter disassembling the rigid mold assembly and removing the part.

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**4,294,793**

## METHOD AND APPARATUS FOR MANUFACTURING A SPHERICAL HOLLOW BODY

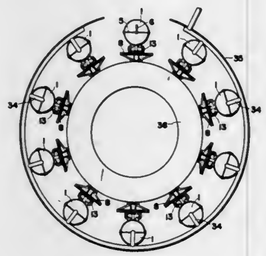
**Kazuyasu Takazawa, Tokyo, Japan, assignor to Tachikara Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 894,007, Apr. 6, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,389**

**Claims priority, application Japan, Nov. 15, 1977, 52-136813; Nov. 30, 1977, 52-143379**

**Int. Cl.³ B29C** *5/04*

**U.S. Cl. 264—311** **8 Claims**



1. A method for manufacturing a spherical hollow body, comprising the steps of:

providing a plurality of individual openable spherical hollow molds each defining therein a single spherical mold cavity disposed so that its center is located substantially at the intersection of first and second orthogonal rotational axes;

mounting said molds in horizontally angularly spaced relationship on a supporting turntable rotatable about a vertical axis positioned at the center of a circular locus defined by the centers of said plurality of molds;

loading liquid thermoplastic material into each said hollow mold at an operator position;

circulating said hollow molds along a horizontal circular path by movement of said supporting turntable about said vertical axis so that the centers of said molds are maintained in a horizontal plane defined by said circular locus;

rotating each said spherical hollow mold with respect to said turntable about said first axis by clutching a rotating drive member to said spherical hollow mold through a clutch having driving and driven clutch members to effect said rotating;

simultaneously rotating each said spherical hollow mold with respect to said turntable about said second axis whenever the respective mold is rotated about said first axis by rotatably driving the mold through a clutch-free driving mechanism which is continuously driven whenever said driven clutch member is rotatably driven;

forcibly effecting said circulating of the turntable during said rotation of the molds;

discharging cooling water over the molds for effecting hardening of the thermoplastic material to provide a hardened



spherical body while continuing to rotate said molds simultaneously about said first and second orthogonal axes;

circulating a declutching member with said turntable for each said hollow spherical mold and connecting said declutching member to said clutch of the respective hollow spherical mold;

locating an elongated guide plate in fixed relation to said operator position adjacent said turntable;

riding the follower along the guide plate contoured to move the following transversely thereof to effect declutching and clutching of each said mold from the corresponding said drive member by contact of said guide plate and follower moving said declutching member with respect to said turntable as said turntable circulates each said mold respectively into and out of said operator position.

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**4,294,794**

## ETHYLENE POLYMERS OF HIGH MELT INDEX

**Peter J. Lovell, Kingston, and Ian C. B. Saunders, Sarnia, both of Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 77,717, Sep. 21, 1979, abandoned, which is a division of Ser. No. 170, Jan. 2, 1979, Pat. No. 4,192,935. This application Aug. 20, 1980, Ser. No. 179,811**

**Claims priority, application United Kingdom, Jan. 6, 1978, 000517/78; Mar. 21, 1978, 011206/78**

**Int. Cl.³ B29F** *1/00*

**U.S. Cl. 264—328.1** **7 Claims**

1. In a process for the manufacture of containers having a wall thickness of less than 0.7 mm, said containers being manufactured from thermoplastic polymer by injection-moulding said polymer, the improvement comprising using as the thermoplastic polymer an ethylene polymer having a density in the range of about 0.940–0.960, a melt index in the range 100–200 and a ratio of weight-average molecular weight to number-average molecular weight of less than 5, said polymer being a copolymer of ethylene and at least one α-olefin having 4–10 carbon atoms, the α-olefin being an aliphatic hydrocarbon.

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**4,294,795**

## STABILIZED ELECTROCAST ZIRCONIA REFRACTORIES

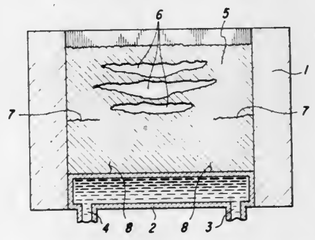
**Toshikatsu Haga; Hiroyuki Fukuda, both of Iwaki; Hiroshi Shinoda, Gifu, and Hideharu Hayakawa, Nagoya, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and NGK Insulators, Ltd., Aichi, both of, Japan**

**Continuation-in-part of Ser. No. 45,687, Jun. 5, 1979, abandoned. This application Jan. 29, 1980, Ser. No. 116,409**

**Claims priority, application Japan, Jun. 12, 1978, 53-70529; Jun. 27, 1978, 53-77837**

**Int. Cl.³ C04B** *35/48*

**U.S. Cl. 264—332** **12 Claims**



1. A method for producing a stabilized electrocast zirconia refractory having a bending strength of over 500 kg/cm² at room temperature and containing less than 1% each of $TiO_2$, $Al_2O_3$ and $SiO_2$, which comprises the steps of:

blending a zirconia base material and a stabilizing agent selected from the group consisting of alkaline earth metal compounds and rare earth compounds,

electrofusing the thus formed mixture thereby obtaining a stabilized molten zirconia blend,

pouring said stabilized molten zirconia blend into a mold,

letting said melt solidify from its lower portion by cooling forcibly the bottom of the mold, and

cutting out the portion of the solidified mass where voids were formed,

thus obtaining said stabilized electrocast zirconia refractory.

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**4,294,796**

## EXTRUSION PROCESSES AND APPARATUS FOR QUENCHING TUBES

**James Jack, Mistley, and Derek C. Gray, Colchester, both of England, assignors to BXL Plastics Limited, London, England**

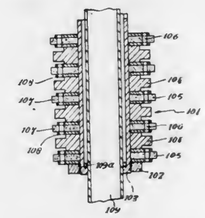
**Continuation of Ser. No. 903,914, May 8, 1978, abandoned, which is a continuation of Ser. No. 514,801, Oct. 15, 1974, abandoned. This application Jan. 22, 1979, Ser. No. 5,231**

**The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.**

**Claims priority, application United Kingdom, Oct. 15, 1973, 48047/73**

**Int. Cl.³ B29D** *7/20*

**U.S. Cl. 264—559** **13 Claims**



1. In an apparatus for use in the production of a quenched tube of organic thermoplastic polymeric material comprising a downwardly operating extrusion die, a quenching bath, an assembly of calibrating discs which are disposed perpendicularly to the axis of the tube and which are mutually coaxial with each other as well as with the axis of the tube and which assembly is supported by a tubular structure attached to and passing through the mandrel of the extrusion die, means for passing quenching liquid continuously through the tubular structure into contact with the inner surface of the tube at a level below that of the lowermost of the calibrating discs, suction means for continuously drawing the same liquid upwardly as a continuous column within said tube to a selected level above the uppermost level of the assembly of calibrating discs and for removing said liquid upwardly from said selected level, means for controlling a gas pressure in the space enclosed by the die, the thermoplastics tube and the surface of the quenching liquid, a pair of nip rollers which flatten the tube across only part of its width and which enable the direction of travel of the tube to be changed from a vertically downward direction to an upward direction of travel in the quenching bath and means for taking the tube from the quenching bath to a point where it is batched or is subjected to additional treatment, the improvement whereby at least the peripheral portions of all of the calibrating discs that in operation contact the wall of the tube comprise a soft, liquid absorbent material.

8. In a process for quenching a continuously extruded tube of organic thermoplastic polymeric material which comprises the steps of leading the tube from the die of an extrusion machine vertically downward around an assembly of a plurality of calibrating discs which are positioned coaxially of said tube and perpendicular to the axis thereof into a quenching bath, while bathing the inner surface of said tube with a quenching liquid which is circulated through said tube by first forming a body of liquid in contact with said inner surface beneath said

assembly, causing the liquid in said body to rise in a continuous column within said tube to a selected level lying above the top of said assembly while remaining in contact with said inner surface between the discs of said assembly and at said selected level above said assembly, and withdrawing said liquid upwardly from a point above said assembly by suction means which maintains said liquid at said selected level, causing said tube to change its direction of travel from a vertically downward direction to an upward direction of travel in the quenching bath after it has passed through a pair of nip-rollers which flatten the tube across only part of its width, and withdrawing the tube from the quenching bath, the improvement which comprises the step of forming a lubricating layer of quenching liquid between the periphery of each disc and the wall of the tube by causing said liquid to saturate at least peripheral portions of the calibrating discs that contact the wall of the tube, which portions are made of a soft, liquid absorbent material so that a lubricating layer of quenching liquid is continuously in contact with the inner surface of said tube from a point below to a point above said discs.

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**4,294,797**

## SERVICING COMPOSITION FOR SPRAYING ON MEDICAL INSTRUMENTS

**Eugen Eibofner, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Fed. Rep. of Germany**

**Filed Apr. 18, 1980, Ser. No. 141,363**

**Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916552**

**Int. Cl.³ A01N *31/00***

**U.S. Cl. 422—36** **1 Claim**

1. A method of lubricating and sterilizing a medical instrument comprising: spraying a servicing composition on said instrument so that the latter is wetted internally and externally with the servicing composition, said composition comprising a mixture of a lubricating oil and a propellant, and a sterilizing agent added to said mixture and comprising an isopropanol-aldehyde active substance combination in a proportion of 5 to 15% by weight of the servicing composition wherein the aldehyde is selected from the group consisting of formaldehyde and a succinic acid dialdehyde complex;

and heating the medical instrument, so as to increase the sterilizing effect of said active substance combination, until the active substance combination has vaporized.

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**4,294,798**

## SODIUM AMALGAM MONITOR

**Italo A. Capuano; Patricia A. Turley, both of Orange, and Edward W. DuBord, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Filed May 31, 1979, Ser. No. 44,295**

**Int. Cl.³ G01N *21/00, 31/12***

**U.S. Cl. 422—62** **10 Claims**

1. An apparatus for automatically monitoring sodium concentration in a sodium-mercury amalgam, which comprises:

(a) a reactor;

(b) sample supply means positioned above said reactor, fluidly connecting said reactor with said sodium amalgam for automatically supplying a selected sample of said sodium-mercury amalgam to said reactor;

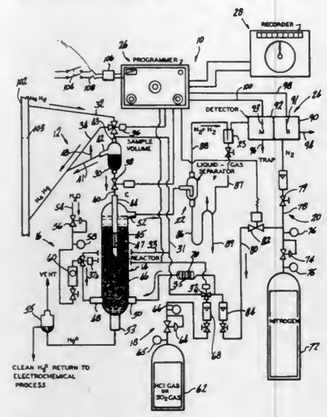
(c) acid supply means containing acid connected to the lower end of said reactor for automatically supplying a sufficient quantity of acid to said reactor to completely react with and remove any metallic sodium from said sample and producing a quantity of hydrogen gas proportional to the amount of sodium in said sample;

(d) a liquid-gas separator located at the upper end of said reactor in fluid communication with said reaction chamber, for separating liquid and gaseous reaction products produced by said reaction of said mineral acid with said sample;

(e) inert gas supply means containing inert gas connected to the lower end of said reactor in selective communication with said reaction chamber, for automatically forcing said gaseous reaction products out of said reactor and into said liquid-gas separator;

(f) a reactor outlet for mercury removal located at the bottom of said reactor;

(g) detector means for determining the amount of hydrogen in the gas fraction from said liquid-gas separator and




producing a signal which is indicative of said amount of hydrogen;

(h) a programmer means for controlling the order of operation of said sample supply means, mineral acid supply means and inert gas supply means; and

(i) display means, for providing a visual indication of the amount of said quantity of hydrogen in terms of percent sodium concentration in said sample.

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**4,294,799**

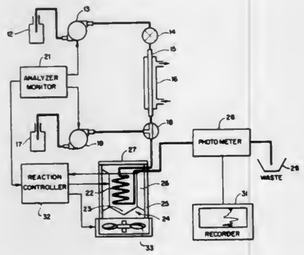
## TEMPERATURE REGULATING APPARATUS

**Donald E. Stephens, Palo Alto, and John T. Taylor, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Apr. 24, 1980, Ser. No. 143,212**

**Int. Cl.³ G01N *31/22, 31/08;* G01J *3/46***

**U.S. Cl. 422—62** **13 Claims**




1. An apparatus for preventing boiling of a liquid flowing through a heated reaction chamber of a liquid chromatograph instrument due to a change in the boiling point of said liquid, said apparatus comprising:

said heated reaction chamber;

means, adjacent said reaction chamber, for exchanging heat to and from said reaction chamber;

means, associated with said flowing liquid, for monitoring a change in the ratio of reactants in said flowing liquid, said change in the ratio of reactants resulting in a change in the boiling point of said flowing liquid;

means, defining a substantially enclosed space containing said reaction chamber and said heat exchanging means, for retaining heat;

means, responsive to said monitoring means, for introducing a coolant into said substantially enclosed space in response to a change in boiling point; and

means defining an exit for said coolant from said enclosed space.

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**4,294,800**

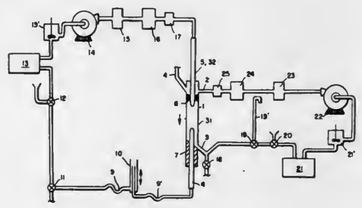
## LIQUID JET RECYCLE REACTOR

**Lawrence L. Tavlarides, 940 Sheridan Rd., Wilmette, Ill. 60091; Robert W. Freeman, 1539 S. Wolf Rd., Wheeling, Ill. 60090, and Alexander M. Hsia, c/o Illinois Intitute of Technology, 71 E. 32nd St. - Room 110, Chicago, Ill. 60616**

**Filed Oct. 30, 1978, Ser. No. 955,581**

**Int. Cl.³ G01N *21/00;* B01J *14/00***

**U.S. Cl. 422—68** **7 Claims**



1. A liquid-liquid jet reactor apparatus in which, for the investigation of interphase phenomena two immiscible or partially miscible liquids, one being represented by an aqueous phase and the other by an organic phase, are brought into mutual contact, said reactor apparatus comprising:

a nozzle means for producing a vertical jet of the first liquid,

a receiver means longitudinally spaced from and axially aligned with said nozzle means for collecting said jet, said receiver means having an inner surface and an outer surface,

a tubular vessel coaxial with said nozzle means and said receiver means,

the inner wall of said tubular vessel being radially spaced from said nozzle means and said receiver means so that said tubular vessel closely surrounds said nozzle means and said receiver means in sleevelike fashion, and said tubular vessel extending both upstream of the inner end of said nozzle means and downstream of the inner end of said receiver means so as to define a narrow annular gap between said nozzle means, said liquid jet and said receiver means on the one hand and said tubular vessel on the other hand,

feed means opening into said narrow annular gap upstream of the inner end of said nozzle means for admitting the second liquid into said annular gap so as to produce, in operation, a separate steady stream of the second liquid which is confined to said annular gap and flows coaxially and cocurrently about, and in contiguity with, said jet throughout the length thereof,

outlet means located downstream of the inner end of said receiver means for removing the second liquid from the corresponding portion of the annular gap, and baffle means between said nozzle means and said vessel for directing the stream of said second liquid, one of said surfaces of said receiver means, which serves to conduct said organic phase, having a coating of hydrophobic material deposited thereon so as to be less readily wetted by said aqueous phase than by said organic phase thereby to facilitate separation of said two streams.

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**4,294,801**

## GAS COMPONENT DETECTOR

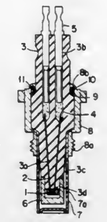
**Yoshihiro Segawa, Okazaki; Minoru Ohta, Anjo, and Eturo Yasuda, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan**

**Continuation of Ser. No. 20,927, Mar. 15, 1979, abandoned. This application Jul. 15, 1980, Ser. No. 169,162**

**Claims priority, application Japan, Mar. 24, 1978, 53/38196**

**Int. Cl.³ G01N *27/04***

**U.S. Cl. 422—98** **4 Claims**



1. A gas component detector comprising:

a detector element of a metal oxide, said metal oxide exhibiting an electrical resistance value change depending upon a gas component in detected gases,

a pair of electrodes connected to said detector element for picking up an electrical signal indicative of said electrical resistance value change,

a holding body of an electrically insulating and heat-resistant metal oxide having a pair of through holes for supporting said pair of electrodes inserted therein,

a cup-shaped catalyst carrier body of a heat-resistant metal oxide having a well, said catalyst carrier body being fixed to one end of said holding body to enclose said detector element within said well, said catalyst carrier body being so porous as to allow the exhaust gases to be detected to pass therethrough,

a catalyst material carried by said catalyst carrier body for effecting oxidating reaction of said gas component in the detected gases,

said cup-shaped catalyst carrier body having an internal surface of the well being spaced from the metal oxide of said detector element by an air gap with the catalyst thereon, which catalyst is not contacting the metal oxide,

a cover of heat resistant metal enclosing said cup shaped catalyst carrier body, said cover having opening means provided therethrough for exposing the cup shaped catalyst carrier body to the exhaust gas.

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**4,294,802**

## APPARATUS FOR PARALLEL FEEDING OF SMALL VOLUMES OF FLUIDS IN SEVERAL ESSENTIALLY PARALLEL FLEXIBLE HOSES

**Henry Johansson, Törevägen 28, S-741 00 Knivsta, Sweden**

**Filed Feb. 14, 1980, Ser. No. 121,534**

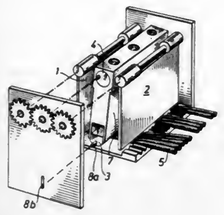
**Claims priority, application Sweden, Feb. 27, 1979, 7901775**

**Int. Cl.³ G01N *1/14***

**U.S. Cl. 422—103** **12 Claims**

1. Apparatus for parallel feeding of small volumes of liquids in essentially parallel flexible hoses comprising a surface over which said hoses extend during operation of said apparatus, a pumping bar extending substantially perpendicular to said surface, at least one hose clamp extending substantially perpendicular to said surface, an eccentric coupled to said pumping bar, a shaft coupled to said hose clamp, a support coupled to said eccentric and said shaft, and means coupled to said eccentric and said shaft for causing said eccentric and shaft to synchronously rotate causing said pumping bar to reciprocate in a pendulum motion towards and away from said surface for

subjecting said hoses to a pumping action and said hose clamp to reciprocate towards and away from said surface for clamping said hoses together at predetermined times during the pumping cycle.



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**4,294,803**

## APPARATUS FOR PREVENTING COKING IN FLUIDIZED BED REACTOR FOR CRACKING HEAVY HYDROCARBON OIL

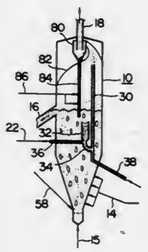
**Seiichi Uchida, Urawa; Yoshihito Satomi, Kurashiki; Norihiro Kiuchi, Hachioji; Takeo Yamagata, Takahagi; Susumu Yoshioka, Hitachi; Tomohiko Miyamoto, Takahagi, and Jinichi Tomuro, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Nippon Mining Co., Ltd., both of Tokyo, Japan**

**Division of Ser. No. 946,426, Sep. 27, 1978, Pat. No. 4,220,518. This application Aug. 21, 1979, Ser. No. 68,452**

**Claims priority, application Japan, Sep. 28, 1977, 52-115538; Sep. 28, 1977, 52-115539; Nov. 7, 1977, 52-132478**

**Int. Cl.³ G05D** *16/00, 7/00;* **F27B** *15/08*

**U.S. Cl. 422—111** **10 Claims**



1. In an apparatus, for cracking heavy hydrocarbon oil through a fluidized bed, comprising a reactor column of fluidized bed type for cracking heavy hydrocarbon oil through contact with fluidization particles, provided with a means for supplying a fluidization gas at its lower part and an outlet port for discharging a cracked effluent gas at its top, and a regenerator column of fluidized bed type for regenerating the fluidization particles, the reactor column provided with a means for supplying a fluidized gas at its lower part and an outlet port for gas at its top, and the reactor column and the regenerator column communicating with each other,

an apparatus which comprises: a fluidization particle vessel having an inlet for fluidization particles at its top, and a lower part throttled to a smaller cross-sectional area than the top; a lift gas supply line means moving a stream of lift gas through said lift gas supply line and communicating with the bottom of the particle vessel to receive fluidization particles at a controlled rate determined by the throttled part into said lift gas supply line and entrain them in the lift gas moving in said lift gas supply line; said lift gas supply line having one end open towards one of the outlet ports for discharging the entrained fluidization particles and lift gas above the associated fluidized bed; a control gas supply line means conducting control gas into the throttled lower part of the particle vessel; and means selectively controlling the control gas conducted through said control gas supply line into said throttled lower part to correspondingly control the movement of the fluidization particles from the particle vessel to the lift gas supply line.

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**4,294,804**

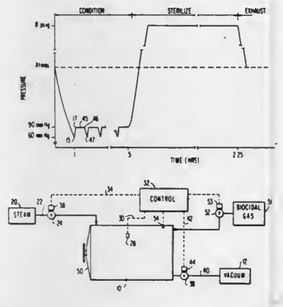
## PRESSURE RESPONSIVE CONDITIONING CONTROL GAS STERILIZATION

**Walter J. Baran, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.**

**Division of Ser. No. 9,818, Feb. 6, 1979, Pat. No. 4,241,010. This application Jun. 25, 1980, Ser. No. 162,812**

**Int. Cl.³ A61L** *2/20, 2/24*

**U.S. Cl. 422—112** **3 Claims**




1. Apparatus for conditioning goods for sterilization and sterilizing goods with a chemically biocidal gas, the conditioning including heating the goods to a selected temperature related to the desired sterilization temperature and moistening the goods to a desired level for such biocidal gas sterilization, with conditioning steps being free of temperature and moisture measurement requirement levels in the goods and chamber, comprising in combination

a sealable chamber capable of operating at pressures other than atmospheric,

means providing access for loading goods to be sterilized into the chamber and closing the chamber to permit operation at other than atmospheric pressure,

means for evacuating the chamber,

means for sensing pressure levels in the chamber,

means for injecting a conditioning vapor comprising steam into the chamber,

valve means for controlling injection of conditioning vapor into the chamber, said valve means being free of flow rate control adjustment capabilities,

means for introducing a chemically biocidal gas, and

control means electrically interconnected to activate and deactivate the means for evacuating the chamber, the valve means for controlling injection of conditioning vapor, and the means for introducing a biocidal gas,

such control means being electrically connected to the means for sensing pressure level within the chamber and including timer means and sequencing means to evacuate the chamber to a preselected subatmospheric level responsive to such pressure level sensing means, then

inject conditioning vapor to raise chamber pressure to a higher preselected subatmospheric pressure level responsive to such pressure level sensing means, then

hold the chamber in sealed condition with evacuation and vapor injection interrupted for a predetermined time responsive to the timer means, then

repeat such sequence of evacuating the chamber, injecting conditioning vapor, and holding the chamber in sealed condition, then

add biocidal gas to raise chamber pressure to a desired pressure above atmospheric pressure responsive to such pressure sensing means, and

hold such biocidal gas and conditioning vapor in the chamber a predetermined time responsive to the timer means to complete desired sterilization.



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**4,294,805**

## METHOD OF LEACHING THE CONTENTS OF A CAN

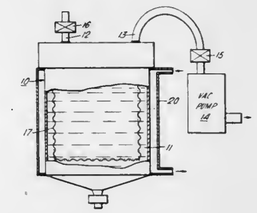
**Thomas D. Hodgson, and Tony W. J. Jordan, both of Abingdon, England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Filed Aug. 8, 1979, Ser. No. 64,911**

**Claims priority, application United Kingdom, Aug. 9, 1978, 32747/78**

**Int. Cl.³ C01G** *43/00*

**U.S. Cl. 423—4** **7 Claims**



1. A method of leaching material from a composite body with a liquid dissolvent which evolves a gas on contacting the material, the composite body comprising the material to be leached located in a tubular can, said can being insoluble in the dissolvent and open at one end thereof to expose said material, the method comprising placing the body in a vessel containing a said liquid dissolvent for the material and heating the vessel to a temperature near to the boiling point of the dissolvent, and then subjecting the vessel to a plurality of pressure cycles, each pressure cycle comprising, firstly, reducing the pressure inside the vessel using a vacuum source connected to the vessel so as to cause boiling of the dissolvent, and subsequently, introducing a gas into the vessel through a vent means of the vessel so as to increase the pressure inside the vessel from the reduced pressure therein to inhibit the boiling of the dissolvent, thereby to displace from partially enclosed cavities in said body during the reduced pressure portions of the cycles evolved gas entrapped in said cavities.

7. A method of leaching irradiated nuclear material and fission products from at least one length cut from an irradiated nuclear fuel element said fuel element comprising said nuclear material clad with a metal can, the method comprising placing the cut length of the fuel element into a vessel containing nitric acid and heating the vessel near to the boiling point of the nitric acid, and subjecting the vessel to a plurality of pressure cycles, each pressure cycle comprising, firstly, reducing the pressure inside the vessel using a vacuum source connected to the vessel so as to cause boiling of the nitric acid, and subsequently, introducing a gas into the vessel through a vent means of the vessel so as to increase the pressure inside the vessel from the reduced pressure therein to inhibit the boiling of the nitric acid, thereby to displace from partially enclosed cavities in the cut length during the reduced pressure portions of the cycles gas evolved from contact of the nitric acid with the nuclear material.

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**4,294,806**

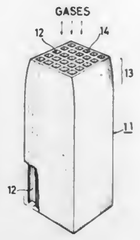
## METHOD FOR PREVENTING THE WEAR OF A MONOLITHIC CATALYST BY DUSTS

**Kazunobu Abe, Izumi; Shoichi Tamura, Sakai, and Tadao Nakatsuji, Matsubara, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 12,196, Feb. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 974,519, Dec. 29, 1978, abandoned. This application Nov. 21, 1979, Ser. No. 96,561**

**Int. Cl.³ B01D** *53/36*

**U.S. Cl. 423—239** **12 Claims**




1. In a method for the catalytic reduction of nitrogen oxides contained in waste gases together with dusts therein in the presence of ammonia as a reducing agent so as to convert said nitrogen oxides to nitrogen and water by use of a monolithic ceramic honeycomb catalyst having at least one passage therethrough parallel to the direction of flow of gas for allowing the gas to pass therethrough and comprising a support of at least one member selected from the group consisting of alumina and titanium dioxide and a catalytically active ingredient uniformly dispersed in the support, the ingredient being of at least one oxide of a base metal selected from the group consisting of Cu, Ni, Co, V and W, the improvement in which the support and the active ingredient are not sintered but calcined throughout the structure so as to be substantially porous throughout the structure but wherein the honeycomb catalyst is sintered only at its front inlet so as to render it substantially non-porous, thereby making the honeycomb catalyst more wear-resistant as a whole.

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**4,294,807**

## SYSTEM FOR REMOVING SOLIDS FROM A USED LIME OR LIMESTONE SLURRY SCRUBBING LIQUOR IN FLUE GAS DESULFURIZATION

**Alan D. Randolph, Tuscon, Ariz., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif. and The Arizona Board of Regents, The University of Arizona, Tucson, Ariz.**

**Filed Nov. 10, 1980, Ser. No. 205,702**

**Int. Cl.³ B01D** *9/02*

**U.S. Cl. 423—242** **11 Claims**

1. In a flue gas desulfurization process using a lime or limestone slurry scrubbing liquor in which used liquor including crystallizable solids comprising calcium sulfite or sulfate, in hydrated or unhydrated form, is produced, wherein precipitated particles are removed from the used scrubbing liquor, the steps of

(a) feeding the used scrubbing liquor to an agitated crystallization zone and agitating the liquor therein, thereby growing crystals from said crystallizable solids,

(b) directing part of the used scrubbing liquor from the agitated crystallization zone to an inlet in the lower portion of a quiescent crystallization zone, and settling said crystals therein back into the agitated crystallization zone,

(c) removing an underflow stream of crystal-containing liquor from the agitated crystallization zone and separate overflow stream of crystal-containing liquor from an upper part of the quiescent crystallization zone, the ratio

of said underflow stream to said overflow stream being adjusted to cause crystals above a predetermined size to settle from the quiescent zone back into said agitated zone, rather than being carried out in the overflow stream, to promote secondary crystal nucleation.

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**4,294,808**

## PRODUCTION OF ANTICORROSIVE PIGMENTS CONTAINING PHOSPHORUS

**Horst-Dieter Wasel-Nielen; Renate Adrian; Herbert Panter, all of Hürth; Gero Heymer, Erftstadt; Alexander Maurer, and Raban von Schenck, both of Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Sep. 17, 1979, Ser. No. 76,307**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840820**

**Int. Cl.³ C01B** *25/26, 25/32, 25/36, 25/37*

**U.S. Cl. 423—305** **8 Claims**

1. In a process for making phosphorus-containing anticorrosive pigments having a size of at most 20 microns by reacting at least one compound of the metals selected from the group consisting of magnesium, calcium, strontium, barium, zinc, aluminum, iron, chromium and manganese with an oxygen acid of phosphorus or an alkali metal or ammonium salt of said acid at temperatures within the range 10° to 100° C., the improvement which comprises: intimately mixing and thereby reacting an aqueous suspension or solution of the reactants inside a dispersing means rotating at a speed of 3000 to 10,000 rpm, separating and drying precipitated pigment, the pigment consisting to an extent of at least 90% of particles with a size between 0.05 and 8 microns.

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**4,294,809**

## AERATION OF PHOSPHORIC ACID

**Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.**

**Continuation-in-part of Ser. No. 54,449, Jul. 3, 1979, which is a continuation-in-part of Ser. No. 951,804, Oct. 16, 1978, abandoned, which is a continuation of Ser. No. 767,175, Feb. 9, 1977, abandoned, which is a division of Ser. No. 683,756, May 6, 1976, abandoned, said Ser. No. 54,449, is a continuation-in-part of Ser. No. 883,381, Mar. 6, 1978, Pat. No. 4,164,550, said Ser. No. 883,381, and Ser. No. 951,804, each is a continuation-in-part of Ser. No. 812,319, Jul. 1, 1977, Pat. No. 4,110,422, which is a continuation-in-part of Ser. No. 683,756,. This application Sep. 29, 1980, Ser. No. 191,940**

**Int. Cl.³ C01B** *25/16*

**U.S. Cl. 423—321 R** **4 Claims**

1. In the method of making wet process phosphoric acid analyzing about 56–63% $P_2O_5$ prepared by steps including

(a) clarifying crude feed acid in a clarifier, said feed acid analyzing about 26–36% $P_2O_5$, and containing $Fe^{++}$ and $Fe^{+++}$, the weight ratio of Fe as $Fe_2O_3$:$P_2O_5$ being 0.04–0.065:1;

(b) treating the clarified acid with aluminum silicate;

(c) concentrating the treated acid to about 46–52% $P_2O_5$;

(d) settling solids in the concentrated acid in a crystallizer-settler providing an overflow and an underflow;

(e) further concentrating the overflow in (d) to about 56–63% $P_2O_5$;

the improvement comprising aerating with strong agitation the clarified acid resulting from step (a) to oxidize at least some $Fe^{++}$ to $Fe^{+++}$, whereby post-precipitation characteristics of the acid are improved.

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**4,294,810**

## ALKALI CALCIUM SILICATES AND PROCESS FOR PREPARATION THEREOF

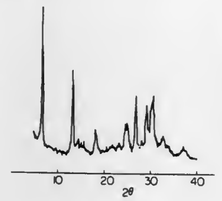
**Genji Taga, Shinnanyo; Teruo Oikawa, Kudamatsu, and Yoshiaki Watanabe, Hikari, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan**

**Division of Ser. No. 54,810, Jul. 5, 1979. This application Feb. 27, 1980, Ser. No. 125,186**

**Claims priority, application Japan, Jul. 7, 1978, 53-81935; Jul. 11, 1978, 53-83565; Aug. 7, 1978, 53-95397; Sep. 21, 1978, 53-115131; Dec. 5, 1978, 53-158639**

**Int. Cl.³ C01B** *33/24*

**U.S. Cl. 423—331** **23 Claims**




1. An alkali calcium silicate having an X-ray diffraction pattern having diffraction peaks at spacings (d) of 13.0–13.4 Å, 6.7 Å and 3.1 Å said silicate having a composition represented by the following formula:

$$aNa_2O.bK_2O.cCaO.dSiO_2.eH_2O$$

wherein a is zero or a number larger than 0, b is zero or a number larger than 0, c is a number of from 7 to 9, d is a number of from 30 to 34 and e is a number of from 0 to 30, with the proviso that the sum of a and b is larger than 0 but smaller than or equal to 8.

8. A process for the preparation of alkali calcium silicates, which comprises subjecting an aqueous suspension of an alkali component, a calcium component and a silicon dioxide component to hydrothermal reaction under pressure at a temperature of 150° to 250° C., wherein the silicon dioxide component is a soluble silicon dioxide component and the hydrothermal reaction is carried out under conditions satisfying the requirement defined by the following formula combination (H):

$$0.00533t + 0.4 \leqq T \leqq 0.008t + 0.8$$
$$0.0002t - 0.025 < U \leqq 0.04 \quad \text{(H)}$$

wherein T stands for the starting material charge coefficient, said coefficient T being represented by the following formula (A):

$$T = \frac{9Y - 32Z}{9X - 12Z} \quad \text{(A)}$$

wherein X stands for the amount (moles) of the alkali component as $R_2O$ contained in the aqueous suspension, in which R is an alkali metal selected from the group consisting of sodium and potassium, Y stands for the amount (moles) of the silicon dioxide component as $SiO_2$ contained in the aqueous suspension and Z stands for the amount (moles) of the calcium component as CaO contained in the aqueous suspension, when an alkali metal salt is formed as a by-product by the reaction, or the following formula (B):

$$T = \frac{9Y - 32Z}{9X - 3Z} \quad \text{(B)}$$

wherein X, Y and Z are as defind above, when an alkali metal salt is not formed as a by-product by the reaction, U stands for the alkalinity coefficient, said coefficient U represented by the following formula (C):



$$U = \frac{3X - 4Z}{3S} \quad \text{(C)}$$

wherein X and Z are as defined above and S stands for the amount (moles) of $H_2O$ contained in the aqueous suspension, when an alkali metal salt is formed as a by-product by the reaction, or the following formula (D):

$$U = \frac{3X - Z}{3S} \quad \text{(D)}$$

wherein X, Z and S are as defined above, when an alkali metal salt is not formed as a by-product by the reaction, and t stands for the hydrothermal reaction temperature (°C.), whereby an alkali calcium silicate of the type 13 A is formed.

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**4,294,811**

## PROCESS FOR MANUFACTURING SI USEFUL FOR SEMICONDUCTOR COMPONENTS FROM QUARTZ SAND

**Hubert Aulich, Munich, and Josef Grabmaier, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 6, 1980, Ser. No. 194,336**

**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945141**

**Int. Cl.³ C01B** *33/02*

**U.S. Cl. 423—350** **18 Claims**

1. In a method of producing silicon which is useful for fabrication of semiconductor components, such as solar cells, wherein quartz sand is utilized as a starting material and silicon is obtained through reduction of silicon dioxide in an electrical arc process, the improvement comprising:

(a) admixing select amounts of quartz sand with suitable amounts of glass-forming materials and melting such admixture and converting it into glass;

(b) annealing the so-obtained glass at an elevated temperature below the temperature utilized to form such glass to that a phase-separation occurs comprised of a silicon dioxide-rich phase and an impurity-rich phase;

(c) subjecting the so-annealed glass to a leaching-out process with an acid and/or lye so that the impurity-rich phase is extracted; and

(d) admixing the remaining silicon dioxide-rich glass with a carbon-containing compound and reducing such glass to silicon in an electrical arc.

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**4,294,812**

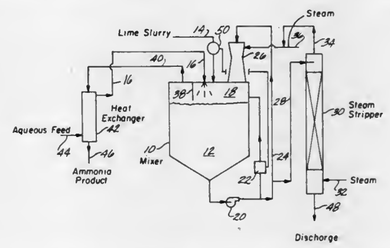
## RECOVERY OF AMMONIA FROM AQUEOUS STREAMS

**Robert A. Oler, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.**

**Continuation of Ser. No. 909,674, May 25, 1978, abandoned. This application Sep. 7, 1979, Ser. No. 73,316**

**Int. Cl.³ C01C** *1/02*

**U.S. Cl. 423—357** **21 Claims**




8. A method of recovering ammonia from a continuously circulating aqueous stream containing an ammonium compound capable of reacting with lime to form free ammonia in solution, which consists essentially of the steps of:

(a) contacting the continuously circulating aqueous stream with a lime slurry to form a mixture containing free ammonia in solution and continuing the circulating of the mixture to maintain solids thereof in suspension;

(b) contacting the mixture of step (a) while continuously circulating with the vapor stream from step (c) and steam to form a heated liquid mixture and an ammonia-rich product vapor,

(c) contacting a portion of the continuously circulating heated liquid mixture from step (b) with steam in a stripping zone to form a liquid waste stream and a vapor stream containing free ammonia and steam; and

(d) recovering ammonia-rich product vapor.

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**4,294,813**

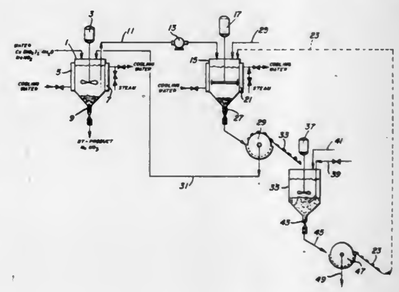
## PROCESS FOR FORMING CALCIUM NITRITE

**James M. Gaidis, Ellicott City, and Arnold M. Rosenberg, Potomac, both of Md., assignors to W. R. Grace & Co., New York, N.Y.**

**Filed Sep. 23, 1980, Ser. No. 189,993**

**Int. Cl.³ C01B** *21/20;* **C01D** *9/00*

**U.S. Cl. 423—385** **13 Claims**



12. A method for preparing aqueous solutions of calcium nitrite comprising the successive steps of:

(a) forming an aqueous solution of sodium nitrite and calcium nitrate;

(b) cooling said solution to insolubilize sodium nitrate and form an aqueous solution of calcium nitrite; and

(c) separating the aqueous calcium nitrite solution from the insoluble sodium nitrate.

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**4,294,814**

## CARBON BLACK PROCESS AND REACTOR

**Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 895,430, Apr. 12, 1978, Pat. No. 4,224,284, which is a continuation-in-part of Ser. No. 498,776, Aug. 19, 1974, abandoned. This application Mar. 28, 1980, Ser. No. 134,856**

**Int. Cl.³ C09C** *1/50*

**U.S. Cl. 423—457** **9 Claims**

1. In a process for the production of carbon black by the pyrolytical decomposition of hydrocarbons comprising the steps

(a) introducing hydrocarbons along the axis of a tubularly shaped longitudinal reactor having an upstream confining wall,

(b) introducing hot combustion gases of nonstoichiometric composition tangentially into said reactor at a location close to said upstream confining wall to form a vortex of hot combustion gases spinning around the axial hydrocarbon stream,

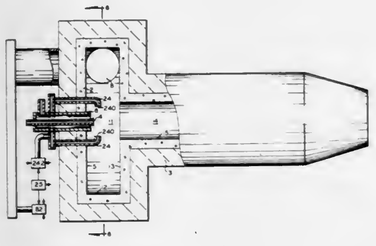
(c) withdrawing carbon black containing smoke from the downward end of said reactor, the improvement comprising

(d) introducing hot combustion gases of nonstoichiometric composition opposite to the nonstoichiometric composition of the tangentially introduced hot combustion gases radially inwardly toward its longitudinal axis into the reactor from orifices located radially at a distance from the axially introduced hydrocarbon stream and located axially at a distance from said upstream confining wall and located within said vortex, the nonstoichiometric compositions of said tangentially introduced hot combustion gases as well as of said radially inwardly introduced hot combustion gases being such that said radially inwardly introduced hot combustion gases mixed with a portion of the tangentially introduced hot combustion gases form a stoichiometric hot combustion gas mixture, and

(e) contacting said stoichiometric hot combustion gas mixture with said axially introduced hydrocarbon stream to effect pyrolytical decomposition thereof.

4. A carbon black reactor comprising:

(a) a housing with tubular-shaped interior from heat resistant



material having an upstream confining wall arranged essentially orthogonally to the longitudinal axis of the reactor,

(b) first conduit means for axial introduction of hydrocarbon feed into said housing, said first conduit means being arranged extending axially through said upstream confining wall,

(c) a cylindrical portion of said housing attached to said upstream confining wall,

(d) second conduit means for tangential introduction of combustion gases into said housing, said second conduit means being arranged extending tangentially through said cylindrical portion of the housing close to said confining wall,

(e) third conduit means for radially inward introduction of a gas into said housing, said third conduit means comprising a plurality of conduits extending into the interior of the reactor and ending in openings facing the stream of axially introduced hydrocarbon feed, said conduits extending axially through said confining wall and end turned 90° from the axial direction toward the radial direction,

(f) means to withdraw the carbon black smoke from the downstream end of the reactor.

**4,294,815**

## PROCESS OF PRODUCING CHLORINE DIOXIDE AND, IF DESIRED, CHLORINE

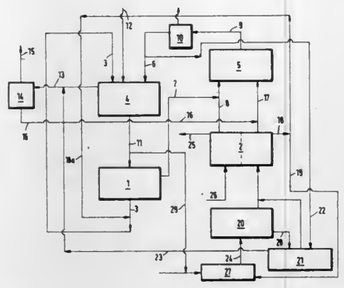
**Karl Lohrberg, Heusenstamm; Siegfried Bielz, Frankfurt am Main, and Paul Janisch, Steinau, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Nov. 13, 1979, Ser. No. 93,708**

**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849250**

**Int. Cl.³ C01B** *11/02*

**U.S. Cl. 423—478** **13 Claims**



1. A process for producing $ClO_2$ which comprises

(A) feeding aqueous NaCl into an electrolyte membrane cell and therein electrolyzing the same to obtain $H_2$ $Cl_2$, NACH

(B) reacting the $H_2$ and $Cl_2$ formed in step A to form HCl;

(C) feeding HCl from step B into a chlorate reaction zone;

(D) feeding $NaClO_3$ into said chlorate reaction zone, with $NaClO_3$ being obtained as a product of an electrolysis of NaCl;

(E) reacting sodium chlorate with hydrochloric acid in said chlorate reaction zone to form chlorine dioxide chlorine and sodium chloride;

(F) separating said $ClO_2$ and $Cl_2$ from NaCl and electrolyzing said NaCl in an electrolysis cell to obtain $NaClO_3$ and recycling the same to step D.

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**4,294,816**

## PROCESS FOR PRODUCING HYDROGEN FLUORIDE FROM FLUORINE CONTAINING MATERIALS BY CONTINUOUS PYROHYDROLYSIS

**Jorg Kruger, Schwandorf; Roland Thome, Bonn; Dieter Moritz, Lunen; Hubert Bings, Lunen, and Herbert Losert, Lunen, all of Fed. Rep. of Germany, assignors to Vereinigte aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany**

**Filed Oct. 17, 1980, Ser. No. 198,217**

**Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942439**

**Int. Cl.³ C01B** *7/19*

**U.S. Cl. 423—484** **9 Claims**

1. A process for producing hydrogen fluoride from fluorine containing materials which comprises introducing a quantity of a solid material containing a mixture of fluorine and carbon into a first zone of a rotating kiln,

heating said material in said first zone with a countercurrent atmosphere containing oxygen and steam,

conducting said material from said first zone to a second zone in said kiln,

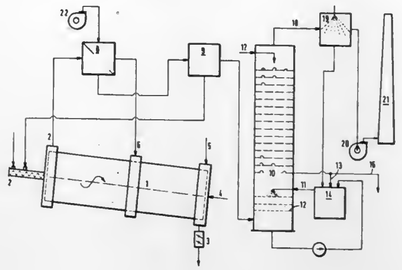
injecting oxygen into said second zone, heating said material to a temperature of between 1200° and 1800° C. in said second zone,

conducting said material from said second zone to a third zone in said kiln,

said third zone having an atmosphere comprising steam,



injecting said steam into said kiln to create a turbulent flow of steam and oxygen in said kiln,



and continuously recovering said hydrogen fluoride from said third zone.

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**4,294,817**

## METHOD OF FLUORO IMMUNOASSAY

**Michael W. Burgett, El Granada, and Richard A. Harte, Redwood City, both of Calif., assignors to International Diagnostic Technology, Inc., Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 854,613, Nov. 25, 1977, abandoned. This application Sep. 18, 1978, Ser. No. 943,314**

**Int. Cl.³ G01N** *33/58, 33/54, 21/25, 1/28*

**U.S. Cl. 424—8** **14 Claims**

1. An immunofluorescence method of testing for the presence of an analyte where a test sample may contain an unknown amount of an interfering material which comprises preparing a first surface having bound thereto an antigen for the analyte with which the interfering material may interfere, preparing a second surface which is adapted to bind a broad spectrum of protein materials including said interfering materials but which does not bind any substantial amount of said analyte, performing an immunoassay of an unknown serum sample with said first and second surfaces by (a) immersing said first surface in an aliquot of said unknown serum, (b) immersing said first surface in an aliquot of a fluorescent labeled material adapted to bind to antibodies in the serum sample, (c) immersing the second surface in an aliquot of said unknown serum, (d) immersing said second surface in an aliquot of a fluorescent labeled material adapted to bind to antibodies in the serum sample, and thereafter measuring the difference in the amount of labeled material on the first and second surfaces.

2. An imminofluorescence method for the detection of an analyte in serum in the presence of interfering sera constituents comprising:

(a) providing two test surfaces each nonreactive with the analyte but capable of binding a broad spectrum of serum components;

(b) binding an antigen for the analyte on only one of the surfaces;

(c) moving the test surfaces through an aliquot of serum to be tested and a fluorescent labeled material;

(d) measuring quantitatively the fluorescence of each surface and subtracting the measurement of one of the surfaces from the other surface measurement to provide an analyte specific fluorescent measurement.

14. The method of claim 2 in which the test surfaces are mounted on a single sampler.

**4,294,818**

## METHODS AND MATERIALS FOR DETECTION OF MULTIPLE SCLEROSIS

**John McMichael, Cambridge Springs, Pa.; Ellis L. Kline, Pendleton, S.C., and James G. Spaulding, Saegertown, Pa., assignors to University Patents, Inc., Norwalk, Conn.**

**Filed Jul. 30, 1979, Ser. No. 61,759**

**Int. Cl.³ G01N** *33/48, 33/50, 33/54*

**U.S. Cl. 424—12** **6 Claims**

1. A diagnostic reagent for use in serological determination of the presence of a multiple sclerosis disease state in a human patient, said reagent comprising heterologous species antibodies obtained by means of a heterologous species immune response to exposure to components of a homogenizate of lymphocytes of a human patient suffering from multiple sclerosis.

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**4,294,819**

## ALKALINE ANALGESIC CAPSULE

**Thomas M. Tencza, Wallington, N.J., assignor to Bristol-Myers Company, New York, N.Y.**

**Filed Aug. 18, 1980, Ser. No. 179,191**

**Int. Cl.³ A61K** *9/48, 31/60, 33/10, 33/12*

**U.S. Cl. 424—14** **13 Claims**

1. As a unit dosage form a capsule having incorporated therein an alkaline tablet having a fast distintegration rate and an aspirin mixture; said aspirin mixture being present in said capsule as a powder or granulated material; said aspirin being present in said capsule at a level in the range of from about 160 mg. to about 500 mg. per capsule; and the quantity of alkaline material contained in said capsule being between about 30% to about 100% by weight based on the total weight of aspirin contained in the capsule.

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**4,294,820**

## POLYMERIC DIFFUSION MATRIX CONTAINING PHENYLEPHRINE

**Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.**

**Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,101**

**Claims priority, application Japan, Aug. 14, 1979, 54-103459**

**Int. Cl.³ A61L** *15/03;* **A61K** *31/79*

**U.S. Cl. 424—28** **10 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of phenylephrine in order to transdermally deliver said phenylephrine to a patient and provide said patient with a decongestant effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of phenylephrine to provide a sustained release of said phenylephrine over a prolonged period.

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**4,294,821**

## ODOR ABSORBING COMPOSITIONS

**Phillip J. Neumiller, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.**

**Filed Dec. 15, 1980, Ser. No. 216,411**

**Int. Cl.² A61L** *13/00, 9/01*

**U.S. Cl. 424—45** **10 Claims**

1. An odor absorbing composition comprising:

(a) from about 0.5 to 45% by weight of diethylene glycol;

(b) from about 0.5 to 45% by weight of propylene glycol;

(c) from about 0.5 to 30% by weight triethylene glycol;

(d) from about 1 to 50% by weight of glycerine;

(e) from about 0.1 to 20% by weight of a diethanol amide of a $C_{16}$ to $C_{18}$ unsaturated fatty acid, and

(f) from about 0.05 to 5% by weight of an unsaturated fatty acid.

10. A solid air treating composition which comprises an

absorbent substrate containing from 10 to 200% by weight based on the weight of the substrate of the composition of claim 1.

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**4,294,822**

## 5-AMINOALKYL-4,4,8-TRIALKYLPSORALENS

**Kurt D. Kaufman, Kalamazoo, Mich. (by Marilee Kaufman, conservator), assignor to Thomas C. Elder, Inc., Hamilton, Ind.**

**Filed Jul. 29, 1980, Ser. No. 173,437**
**Int. Cl.³ C07D *493/02;* A61K *31/365***
**U.S. Cl. 424—59** **6 Claims**

1. 5'-primaryaminoloweralkyl-4',4,8-triloweralkylpsoralen.

3. The method of effecting photochemical sensitivity on the skin of a mammal comprising the step of orally administering to the said mammal an effective photosensitizing dose of a compound of claim 1.

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**4,294,823**

## ASTRINGENT OR DEGREASING LOTION

**Thomas J. Elliott, London, and David Ford, Isleworth, both of England, assignors to Beecham Group Limited, England**

**Continuation of Ser. No. 965,790, Dec. 4, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,275**
**Claims priority, application United Kingdom, Nov. 26, 1977, 49304/77**
**Int. Cl.³ A61K *7/00, 7/035, 7/48, 31/74***
**U.S. Cl. 424—78** **1 Claim**

1. A cosmetic ethanol:water based astringent or degreasing lotion which provides a long lasting smoothing and matting effect comprising in suspension in said lotion base from 3 to 10% by weight of spherical or substantially spherical particles of polystyrene, polymethylmethacrylate or polyethylene, said particles having an average particle side of 5 to 7 microns, together with a skin emoillent and a cosmetically acceptable suspending agent, said ethanol: water being present relative to one another in a ratio of from 1:19 to 19:1.

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**4,294,824**

## EXTRACTS OF THE HEMOPOIETIC SYSTEM

**William A. Jones, Staines; Tse Lin Sin Tse Hing Yuen, Harpenden, both of England; Tapio Rytomaa, Helsinki, Finland; Norman J. Harper, Pyrford, and Henry F. Frost, Hemel Hempstead, both of England, assignors to The Union International Company, Ltd., England**

**Continuation-in-part of Ser. No. 667,217, Mar. 15, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,076**
**Claims priority, application United Kingdom, Aug. 5, 1975, 32659/75**
**Int. Cl.³ A61K *35/14***
**U.S. Cl. 424—101** **5 Claims**

1. A pharmaceutical composition for producing temporary remissions with minimal serious side effects in the treatment of myeloid leukaemia in human patients in intravenous injectable form which comprises an antimyeloid leukaemic effective amount of granulocytic chalone having an elemental analysis of carbon 43.6%, hydrogen 5.8% and nitrogen 6.0%, a molecular weight less than 1.500 daltons when determined by gel techniques and having an infrared spectrum as shown in FIG. 10, sufficient to produce such remissions without impairing the immune defense system of the patient as the active therapeutic agent in combination with a pharmaceutically acceptable carrier suitable for intravenous injection to human patients.

**4,294,825**

## PROCESS FOR THE PRODUCTION OF AN ANDREXOGENIC SUBSTANCE HAVING SPECIFIC EFFECT ON THE CENTRAL REGULATION OF FOOD INTAKE

**Jozsef Knoll; Huba Kalasz; Berta Knoll, all of Budapest, and Janos Nagy, Szentendre, all of Hungary, assignors to Richter Gedeon Vegyészeti Gyár RT, Budapest, Hungary**

**Filed Aug. 23, 1979, Ser. No. 68,766**
**Claims priority, application Hungary, Aug. 29, 1978, RI 683**
**Int. Cl.³ A23J *1/06;* A23K *1/04;* C07G *7/00***
**U.S. Cl. 424—101** **5 Claims**

1. A process for the preparation of an endogenous anorexogenic substance having a satiety effect on the central regulation of food intake which comprises the steps of:
(a) membrane filtering mammalian serum or plasma to separate out materials having a molecular weight of up to 50,000 as a filtrate;
(b) drying the filtrate;
(c) dissolving the filtrate dried during step (b) in water;
(d) chromatografically fractioning on a gel with a void volume under 50,000 the filtrate dissolved during step (c) with a 'neutral', aqueous, eluting salt solution containing at least 0.1% of the salt to obtain a fraction with high anorexogenic activity;
(e) drying the fraction with high anorexogenic activity;
(f) dissolving the fraction with high anorexogenic activity in water;
(g) subjecting the fraction with high anorexogenic activity to a second chromatographic fractioning on a gel with a void volume under 50,000 with distilled water to obtain a second fraction of higher anorexogenic activity; and
(h) lyophilizing the second fraction of higher anorexogenic activity.

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**4,294,826**

## PROCESS FOR THE PREPARATION OF HIGHLY PURIFIED ANTIHEMOPHILIC FACTOR

**Fred Feldman, Park Forest, Ill., assignor to Armour Pharmaceutical Company, Tuckahoe, N.Y.**

**Filed May 7, 1980, Ser. No. 147,441**
**Int. Cl.³ A61K *35/14, 37/00***
**U.S. Cl. 424—101** **4 Claims**

1. A process for the preparation of an aqueous composition of antihemophilic factor having a concentration of about 20 to 45 units of antihemophilic factor per ml, a specific antihemophilic factor activity of at least 1 unit per mg protein, and being obtained from an aqueous solution of antihemophilic factor derived from human blood plasma, said aqueous solution having a concentration of about 5 to 15 units of antihemophilic factor per ml, and a specific antihemophilic factor activity of about 0.3 to 1.0 unit per mg protein, which comprises:
(a) effecting about a 2- to 10-fold concentration of the low concentrate solution,
(b) adjusting the pH of said concentrated solution to about 5.0 to 6.0,
(c) cooling the resultant solution to about 0 ° to 14° C.,
(d) removing the precipitate which forms at said pH and temperature,
(e) further clarifying the solution from step (d), and
(f) adjusting the pH to about 7.0.

3. A freezé-dried composition of antihemophilic factor derived from human blood plasma, having about 1 to 10 units antihemophilic factor activity per mg protein with a ratio of antigenic Factor VIII to Factor VIII procoagulant activity of approximately one and being substantially free of denatured antihemophilic factor.



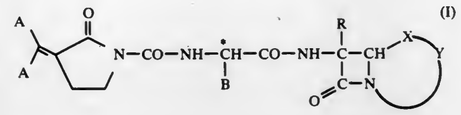
**4,294,827**

## ANTIBACTERIAL AND GROWTH PROMOTING β-LACTAM ANTIBIOTICS CARRYING AN -YLIDENE-2-PYRROLIDINON-1-YL RADICAL

**Michael Preiss, and Karl G. Metzger, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 20, 1977, Ser. No. 862,452**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658905**
**Int. Cl.³ A61K *31/655;* C07D *499/68, 501/22, 501/34***
**U.S. Cl. 424—226** **17 Claims**

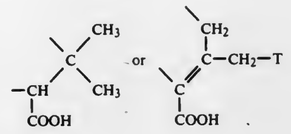
1. A β-lactam antibiotic of the formula (I)



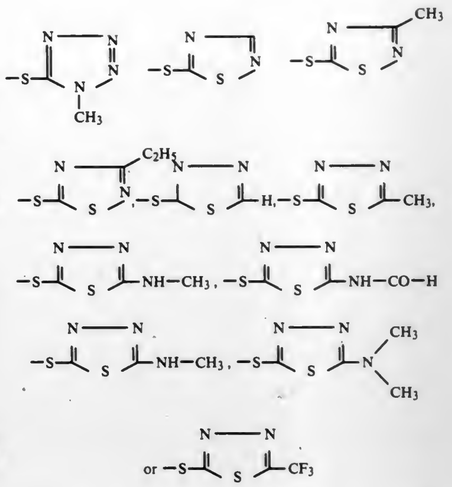
(I)

in which
A and A' represent hydrogen; alkyl of up to 5 carbon atoms optionally substituted by halogen, cyano or nitro; a phenyl, naphthyl or furyl radical; or a group of the formula $R_1$—X'
in which
X' denotes a-CO— or —$SO_2$— group and
$R_1$ denotes hydrogen; alkyl of up to 5 carbon atoms optionally substituted by halogen, cyano or nitro; a phenyl, naphthyl, thienyl, furyl, pyrrolidyl or piperidyl radical; amino; monoalkylamino or dialkylamino of up to 4 carbon atoms per alkyl group, it being furthermore possible for $R_1$ to denote alkoxy of up to 4 carbon atoms if X' represents the -CO- group;
R represents H or $OCH_3$,
B represents phenyl, methylphenyl, chlorophenyl, hydroxyphenyl, furyl or the radical

X represents S, SO or $SO_2$; and
Y represents the group



in which
the carbon atom which carries the carboxyl group is bonded to the nitrogen atom of the β-lactam ring and T denotes hydrogen, $C_{1-4}$- alkyl-CO-O, pyridinium, aminopyridinium, carbamoyloxy, azido, cyano, hydroxyl, the group -S-phenyl, which can be substituted by halogen, amino, lower alkylamino, di-lower alkylamino, lower alkyl, cycloalkyl of 3–7 ring carbon atoms, lower alkoxy, trifluoromethyl, phenyl, benzyl or acylamino with 2 to 5 carbon atoms, or the group —S—Het,
in which
Het represents



optionally substituted by halogen, amino, lower alkylamino, di-lower alkylamino, lower alkyl, cycloalkyl of 3–7 ring ring carbon atoms, lower alkoxy, trifluoromethyl, phenyl, benzyl or acylamino with 2 to 5 carbon atoms; or a pharmaceutically acceptable salt thereof.

13. An antibacterial and growth promoting composition containing as an active ingredient an effective amount of a compound according to claim 1 in admixture with a diluent.

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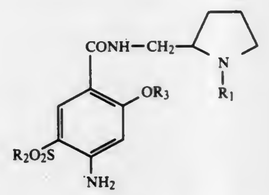
**4,294,828**

## NEW DERIVATIVES OF 4-AMINO-5-ALKYL SULPHONYL ORTHOANISAMIDES, METHODS OF PREPARING THEM AND THEIR APPLICATION AS PSYCHOTROPIC AGENTS

**Michel Thominet, Paris; Jacques Acher, Itteville, and Jean-Claude Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile de-France, Paris, France**

**Filed Jan. 18, 1979, Ser. No. 4,397**
**Claims priority, application France, Jan. 20, 1978, 78-01632**
**Int. Cl.³ A61K *31/40, 31/62;* C07D *207/08***
**U.S. Cl. 424—232** **3 Claims**

1. A pharmaceutical composition having antiemetic or antiserotonin activity comprising an effective amount of a compound selected from the group consisting of 4-amino-5-alkylsulphonylortho-anisamides having the formula:



wherein:
$R_1$ is lower alkyl of 1 to 5 carbon atoms or lower alkenyl of 2 to 5 carbon atoms and $R_2$ and $R_3$ are lower alkyl of 1 to 5 carbon atoms,
the N-oxides of said anisamides, the addition salts of said derivatives with pharmacologically acceptable acids, the quaternary ammonium salts of said derivatives and the

levorotatory and dextrorotatory optical isomers of all of the foregoing compounds, and a pharmaceutically acceptable carrier.

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**4,294,829**

## POWDERY PHARMACEUTICAL COMPOSITION AND POWDERY PREPARATION FOR APPLICATION TO THE NASAL MUCOSA, AND METHOD FOR ADMINISTRATION THEREOF

**Yoshiki Suzuki; Hiroshi Ikura, both of Hino; Gentaro Yamashita, Koganei, and Tsuneji Nagai, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan**

**Filed Jul. 30, 1980, Ser. No. 173,906**
**Claims priority, application Japan, Jul. 31, 1979, 54-96666**
**Int. Cl.[3] A61K *31/58, 31/56;* A01N *43/36***
**U.S. Cl. 424—241** **19 Claims**

**1**. A powdery pharmaceutical composition for application to the mucosa of the nasal cavity, at least about 90% of which consists of particles having an effective particle diameter of about 20 to about 250 microns, said composition comprising a lower alkyl ether of cellulose selected from the group consisting of methyl cellulose, hydroxy-lower alkyl cellulose and carboxylate formed between alkali metals and carboxy-lower alkyl cellulose wherein said lower alkyls have 2 or 3 carbon atoms, said lower alkyl ether of cellulose having a viscosity, determined at about 37° C. for a 2% aqueous solution thereof, of at least about 5 centipoises and a pharmaceutically effective amount of a drug selected from the group consisting of a steroidal anti-inflammatory agent, a nonsteroidal anti-inflammatory agent, an anti-histaminic agent, an anti-allergic agent and a vasoconstrictor.

**8**. The composition of claim **1** wherein said steroidal anti-inflammatory agent is triamcinolone acetonide or beclomethasone dipropionate.

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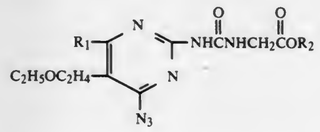
**4,294,830**

## {[[4-AZIDO-5-(ETHOXYETHYL)-6-PHENYL-2-PYRIMIDINYL]AMINO]CARBONYL}GLYCINE AND ESTERS THEREOF

**Hans A. Wagner, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.**

**Filed Jun. 16, 1980, Ser. No. 159,703**
**Int. Cl.[3] A61K *31/505;* C07D *239/48***
**U.S. Cl. 424—251** **5 Claims**

**1**. A compound of the formula



wherein $R_1$ is phenyl or substituted phenyl wherein the substituents are from one to three selected from lower alkyl, chloro, bromo, or fluoro; $R_2$ is hydrogen or $C_1$-$C_4$ alkyl; and when $R_2$ is hydrogen, a pharmaceutically acceptable salt thereof.

**5**. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier or diluent.

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**4,294,831**

## PURINE DERIVATIVES

**Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Division of Ser. No. 718,105, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 662,900, Mar. 1, 1976, Pat. No. 4,199,574, and Ser. No. 608,263, Aug. 27, 1975, abandoned. This application Feb. 1, 1978, Ser. No. 874,060**
**Claims priority, application United Kingdom, Sep. 2, 1974, 38278/74**
**The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.**
**Int. Cl.[3] C07D *473/18***
**U.S. Cl. 424—253** **14 Claims**

**1**. 9-(2-propionyloxyethoxymethyl)guanine.

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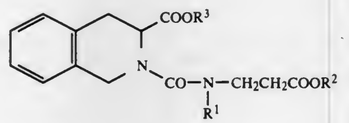
**4,294,832**

## TETRAHYDROISOQUINOLINE COMPOUNDS AND A PHARMACEUTICAL COMPOSITION THEREOF

**Naoto Yoneda, Suita; Jyoji Kato, Yawata, and Keizo Kinashi, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

**Filed Apr. 10, 1980, Ser. No. 138,933**
**Claims priority, application Japan, Apr. 28, 1979, 54/52796; Jul. 17, 1979, 54/91123; Aug. 2, 1979, 54/98832**
**Int. Cl.[3] A61K *31/47;* C07D *217/16, 217/24***
**U.S. Cl. 424—258** **17 Claims**

**1**. A tetrahydroisoquinoline compound of the formula:



(I)

wherein $R^1$ is alkyl of one to six carbon atoms, cycloalkyl of three to six carbon atoms, allyl or propargyl, $R^2$ is hydrogen or alkyl of one to six carbon atoms, and $R^3$ is hyrodgen, alkyl of one to six carbon atoms or benzyl, or a pharmaceutically acceptable salt thereof.

**17**. An inhibitory composition for the treatment of angiotensin-related hypertension comprising an amount of the compound of claim **1** such that, when said composition is administered to a warm blooded animal, it will provide an effective amount in said animal, and a pharmaceutically acceptable carrier therefor.

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**4,294,833**

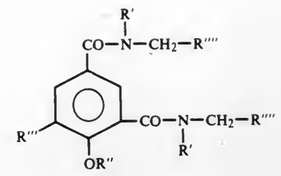
## SUBSTITUTED 4-HYDROXY-ISOPHTHALIC ACID PICOLYLAMIDES HAVING A PHARMACEUTICAL ACTIVITY IN THROMBOEMBOLIC DISORDERS

**Franco Innocenti; Giovanni Orzalesi, and Ivo Volpato, all of Florence, Italy, assignors to Societa Italo-Britannica, Florence, Italy**

**Filed Aug. 29, 1978, Ser. No. 937,732**
**Claims priority, application Italy, Sep. 6, 1977, 50896 A/77**
**Int. Cl.[3] A61K *31/44;* C07D *213/40***
**U.S. Cl. 424—263** **24 Claims**

**1**. 4-hydroxy-isophthalic acid bis(3-or 4-picolylamides) of the formula I:





wherein R′ is H or an aliphatic or alicyclic hydrocarbon group with 1 to 6 carbon atoms, R″″ is 3-pyridyl or 4-pyridyl, R‴ is H, Cl, $NO_2$, or $-OCH_3$, R″ is an aliphatic or alicyclic hydrocarbon group with 1 to 8 carbon atoms, with the exception that when R″″ is 3-pyridyl and R′ and R‴ are both H, then R″ is an aliphatic or alicyclic hydrocarbon group with 3 to 8 carbon atoms.

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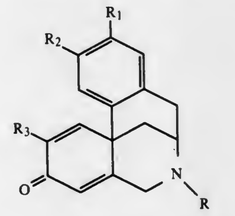
**4,294,834**

## AZOCINE ANALGESICS AND METHOD FOR THEIR PREPARATION

**Johannes Hartenstein, Stegen-Wittental; Gerhard Satzinger, Denzlingen; Heinrich Bahrmann, Kirchzarten, and Volker Ganser, Freiburg, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Freiburg, Fed. Rep. of Germany**

**Filed Nov. 13, 1979, Ser. No. 93,314**
**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849472; Jul. 7, 1979, 2927501**
**Int. Cl.[3] C07D *221/22;* A61K *31/435***
**U.S. Cl. 424—260** **22 Claims**

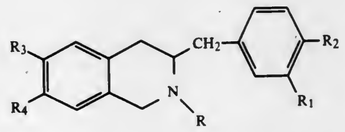
**1**. A compound having the structural formula:



wherein R is hydrogen, branched or straight chain alkyl of from 1 to 3 carbon atoms, branched or straight chain alkenyl of 2 to 5 carbon atoms, cycloalkylalkyl of from 4 to 8 carbon atoms, or benzyl or phenethyl the aromatic rings of which may be optionally substituted by from 1 to 3 alkoxy groups of 1 to 3 carbon atoms or methylenedioxy; $R_1$ is hydroxy or alkoxy of from 1 to 3 carbon atoms; $R_2$ is hydrogen or alkoxy of from 1 to 3 carbon atoms; $R_1$ and $R_2$ when taken together may form a methylenedioxy group; $R_3$ is alkoxy of 1 to 3 carbon atoms; and the pharmacologically acceptable salts thereof.

**2**. A pharmaceutical composition for treating pain consisting essentially of an analgesic-effective amount of a compound as defined in claim **1** in combination with a pharmaceutically acceptable carrier.

**16**. A process for preparing a compound as defined in claim **1** which comprises treating a compound having the structural formula II



II

with an oxidizing agent in the presence of a strong acid at a temperature of from −15° C. to +30° C.; wherein R, $R_1$, $R_2$ and $R_3$ are as defined in claim **2** and $R_4$ is hydroxy, alkoxy of from 1 to 6 carbon atoms or benzyloxy.

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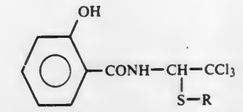
**4,294,835**

## 2-HYDROXY BENZAMIDE DERIVATIVES AND USE THEREOF AS A FUNGICIDE

**Taizo Nakagawa; Hiroshi Matsumoto, both of Ageo; Kaoru Ohmori, Okegawa; Shizuo Shimano, and Kengo Koike, both of Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan**

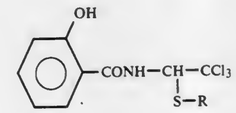
**Filed Feb. 20, 1980, Ser. No. 123,766**
**Claims priority, application Japan, Feb. 27, 1979, 54-21350**
**Int. Cl.[3] C07C *103/26;* C07D *213/75;* A01N *43/40, 37/24***
**U.S. Cl. 424—263** **7 Claims**

**1**. A compound represented by the formula:



wherein R is alkyl having 1–12 carbon atoms.

**6**. A fungicidal composition for agriculture and horticulture comprising 0.5 to 95% by weight of a compound of the formula:



wherein
R is alkyl having 1–12 carbon atoms,
and 99.5 to 5% by weight of inert adjuvants.

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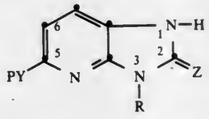
**4,294,836**

## 1,3-DIHYDRO-6-(PYRIDINYL)-2H-IMIDAZO[4,5-B]PYRIDIN-2-ONES AND -IMIDAZO[4,5-B]-PYRIDINE-2-THIONES AND THEIR CARDIOTONIC USE

**George Y. Lesher, Schodack, and Ruth P. Brundage, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 132,907**
**Int. Cl.[3] C07D *471/04;* A61K *31/415***
**U.S. Cl. 424—263** **14 Claims**

**1**. A 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridin-2-one or -2-thione having the formula



where Z is O, or S, R is hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition salt thereof.

**11**. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to

such patient an effective amount of the cardiotonic 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridin-2-one or -2-thione or pharmaceutically-acceptable acid-addition salt thereof, where Z is O or S, R is hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

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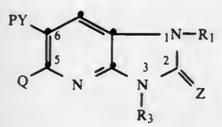
**4,294,837**

## 1,3-DIHYDRO-6-(PYRIDINYL)-2H-IMIDAZO[4,5-B]PYRIDIN-2-ONES AND -IMIDAZO[4,5-B]PYRIDINE-2-THIONES AND THEIR CARDIOTONIC USE

**George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Filed Mar. 28, 1980, Ser. No. 135,105**
**Int. Cl.³ C07D *471/04;* A61K *31/415***
**U.S. Cl. 424—263** **12 Claims**

1. A 1,3-dihydro-1-$R_1$-3-$R_3$-6-PY-5-Q-2H-imidazo[4,5-b]pyridin-2-one or -2-thione having the formula



where Z is O or S, Q is hydrogen or lower-alkyl, $R_1$ and $R_3$ each are hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, at least one of $R_1$ or $R_3$ being hydrogen, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition salt thereof.

11. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of the cardiotonic 1,3-dihydro-1-$R_1$-3-$R_3$-6-PY-5-Q-2H-imidazo[4,5-b]pyridin-2-one or -2-thione or pharmaceutically-acceptable acid-addition salt thereof, where Z is O or S, Q is hydrogen or lower-alkyl, $R_1$ and $R_3$ each are hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, at least one of $R_1$ or $R_3$ being hydrogen, and PY or 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

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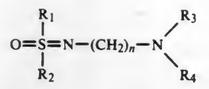
**4,294,838**

## CERTAIN HETEROCYCLIC SULFOXIMIDE DERIVATIVES

**Peter Stoss, Mooswaldstr. 11,, 7801 Vorstetten; Gerhard Satzinger, Im Mattenbühl 7, 7809 Denzlingen; Manfred Herrmann, Wolfweg 25, 7811 St. Peter, and Wolfgang Heldt, Weidenmattenstr. 4, 7803 Emmendingen 16, all of Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 971,139, Dec. 19, 1978, abandoned. This application May 15, 1980, Ser. No. 150,119**
**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758613**
**Int. Cl.³ A61K *31/44;* C07D *213/62, 407/12, 409/12***
**U.S. Cl. 424—263** **11 Claims**

1. Sulphoximide derivatives of the general formula:



wherein $R_1$ is a phenyl, thienyl, furyl or pyridyl ring; $R_2$ is a thienyl, furyl or pyridyl ring; $R_3$ and $R_4$, which can be the same or different, are alkyl groups containing up to 6 carbon atoms and n is a whole number of from 1 to 5; and the pharmaceutically acceptable salts thereof with organic and inorganic acids, as well as the pharmaceutically acceptable quaternary ammonium salts thereof.

11. An anti-spasmodic composition, comprising a sulphoximide derivative according to claim **1**, in admixture with an inert solid or liquid pharmaceutical diluent or carrier.

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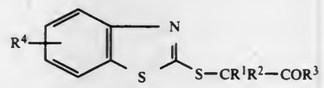
**4,294,839**

## BENZOTHIAZOLE DERIVATIVES AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

**Thomas Doll, Mainz; Erich Schacht, Seeheim-Jugenheim; Hans-Eckart Radunz, Mühltal, and Ernst Schulze, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany**

**Filed Dec. 12, 1980, Ser. No. 215,987**
**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950095**
**Int. Cl.³ A61K *31/425, 31/44;* C07D *277/74, 417/12***
**U.S. Cl. 424—263** **8 Claims**

1. A benzothiazole derivative of the formula



wherein $R^1$ is H or $CH_3$; $R^2$ is phenyl, tolyl, xylyl or pyridyl; $R^3$ is OH, alkoxy of 1–4 C atoms or $—NHCH_2CH_2OH$; and $R^4$ is H, Cl, Br, OH or alkoxy of 1–4 C atoms,

or a physiologically acceptable salt thereof.

8. A method of lowering the lipid level in a patient in need of such lowering, comprising administering to the patient an amount of a compound of claim **1** effective for such lowering.

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**4,294,840**

## KETAZOCINE ANESTHETIC METHOD OF USE

**Alfred E. Farah, Shodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**Division of Ser. No. 11,107, Feb. 12, 1979, Pat. No. 4,217,354. This application Aug. 31, 1979, Ser. No. 71,774**
**Int. Cl.³ A61K *31/445***
**U.S. Cl. 424—267** **3 Claims**

1. The method of producing general anesthesia in a mammal in need of general anesthesia which comprises administering diazepam intramuscularly to the mammal and subsequently administering intravenously to the mammal an amount effective for producing general anesthesia of a pharmaceutically acceptable salt of racemic or levo 1,2,3,4,5,6-hexahydro-1-oxo-3-cyclopropylmethyl-8-hydroxy-6(eq),11(ax)-dimethyl-2,6-methano-3-benzazocine.



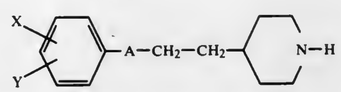
**4,294,841**

## DERIVATIVES OF 1-PHENYL 3-(4-PIPERIDYL) 1-PROPANONE USABLE AS DRUGS

**Alain A. Champseix, Forges les Bains, and Gerard R. Le Fur, Plessis Robinson, both of France, assignors to Pharmindustrie, Gennevilliers, France**

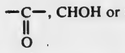
**Filed Nov. 27, 1979, Ser. No. 97,772**
**Claims priority, application France, Dec. 5, 1978, 78 34185**
**Int. Cl.³ A61K *31/445;* C07D *211/32***
**U.S. Cl. 424—267** **8 Claims**

1. A pharmaceutical composition, particularly useful as an antiarhythmic and for the treatment of states of depression and anxiety, which contains as an active agent a pharmaceutically effective amount of a compound corresponding to the formula:



(I)

wherein X and Y are the same or different and represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, alkylthio containing 1 to 4 carbon atoms, trifluoromethyl, hydroxy, amino, monoalkylamino containing 1 to 4 carbon atoms or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl, and A represents



or a salt of said compound with a pharmaceutically acceptable acid, in a pharmaceutically acceptable carrier.

4. A chemical compound corresponding to formula (I) of claim **1**, wherein A is $CH_2$, Y is hydrogen or halogen or alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, alkylthio containing 1 to 4 carbon atoms, trifluoromethyl, hydroxy, amino, monoalkylamino containing 1 to 4 carbon atoms, or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl and X is halogen or alkylthio containing 1 to 4 carbon atoms, alkoxy containing 2 to 4 carbon atoms, trifluoromethyl, hydroxy, amino or monoalkylamino containing 1 to 4 carbon atoms or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl.

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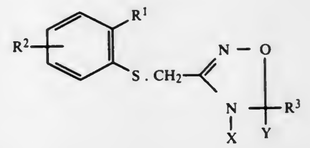
**4,294,842**

## ANTI-PROTOZOAL OXADIAZOLE DERIVATIVES

**John B. Weston, Tring, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Filed Jul. 12, 1979, Ser. No. 56,997**
**Claims priority, application United Kingdom, Jul. 13, 1978, 29818/78**
**Int. Cl.³ A61K *31/42;* C07D *271/06***
**U.S. Cl. 424—272** **7 Claims**

1. A compound of the formula (I)



(I)

wherein

$R^1$ is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy or nitro;

each $R^2$ is the same or different and is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy, aryloxy, alkylthio, arylthio, amino, substituted amino, cyano, nitro or together with an adjacent group $R^2$ a residue $—CH=CH—CH=CH—$;

or $R^1$ and one $R^2$ together form a residue $—CH=CH—CH=CH—$;

X and Y together represent a bond or are both hydrogen;

$R^3$ is selected from the group consisting of hydrogen, lower alkyl, aryl, and a group $Ar—S.CH_2—$; and

Ar is phenyl optionally substituted with one, two or three substituents which may be the same or different, and acid addition salts thereof.

7. A method for the treatment of a protozoal infection in animal, including man, comprising administration of a non-toxic antiprotozoal-effective amount of a compound as defined in any one of claims **1** to **4**.

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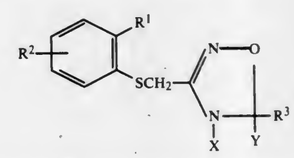
**4,294,843**

## ANTI-PROTOZOAL OXADIAZOLE DERIVATIVES

**John B. Weston, Tring, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Filed Jul. 12, 1979, Ser. No. 56,998**
**Claims priority, application United Kingdom, Jul. 13, 1978, 29817/78**
**Int. Cl.³ A61K *31/42;* C07D *271/06***
**U.S. Cl. 424—272** **17 Claims**

1. A compound of the formula (I):



(I)

wherein $R^1$ is selected from the group consisting of amino or substituted amino;

each $R^2$ is the same or different, in one or more of the 3, 4, 5 or 6 positions and is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy, alkylthio, arylthio, amino, substituted amino, cyano or nitro;

X and Y together represent a bond or X and Y are both hydrogen;

$R^3$ is selected from the group consisting of hydrogen, lower alkyl, aryl, and a group $—SCH_2Ar$; and

Ar is phenyl, optionally substituted with one, two or three substituents which may be the same or different;

and acid addition salts thereof.

8. A method for the treatment of a protozoal infection in an animal including man, comprising administration of a non-toxic, anti-protozoal effective amount of a compound as defined in any one of claims **1** to **5**.

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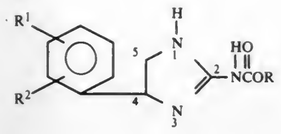
**4,294,844**

## USE OF 4,5-DIHYDRO-2-LOWER ALKOXYCARBONYLAMINO-4-PHENYL IMIDAZOLES AND SUBSTITUTED PHENYL DERIVATIVES THEREOF AS ANTI-HYPERTENSIVE AGENTS

**George S. Harris, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Filed Jun. 4, 1979, Ser. No. 44,900**
**Int. Cl.³ A61K *31/415***
**U.S. Cl. 424—273 R** **5 Claims**

1. A method for lowering the blood pressure in a hypertensive human being which comprises administering to said human being a therapeutically effective hypotensive amount of a compound chosen from those represented by the formula



(I)

wherein
R is lower alkyl;
$R^1$ is hydrogen, lower alkyl, hydroxy, lower alkoxy, fluoro, chloro, bromo, iodo or trifluoro methyl; and
$R^2$ is hydrogen or is a substituent which is identical to the $R^1$ substituent, and wherein $R^1$ and $R^2$ can be at any position on the phenyl ring or $R^1$ and $R^2$ together form methylenedioxy and are at adjacent carbon atoms on the phenyl ring, and the pharmaceutical salts thereof.

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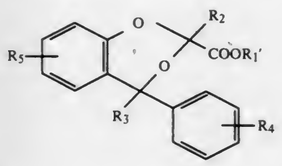
**4,294,845**

## 1,3-BENZODIOXIN DERIVATIVES

**Daniel Humbert, Fontenay-sous-Bois; Francois Clemence, Paris, and Michele Dagnaux, Fontenay-sous-Bois, all of France**

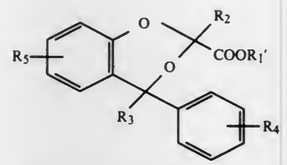
**Continuation-in-part of Ser. No. 847,776, Nov. 2, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,431**
**Claims priority, application France, May 3, 1978, 78 13094**
**Int. Cl.³ A61K** *31/335;* **C07D** *319/08*
**U.S. Cl. 424—278 Q** **30 Claims**

1. A compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



wherein $R_1'$ is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, $-NH_4$, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminolakyl with alkyls of 1 to 4 carbon atoms, $R_2$ is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, $R_3$ is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and $R_4$ and $R_5$ are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts when $R_1'$ is dialkylaminoalkyl and an inert pharmaceutical carrier.

21. A method of inducing hypolipemiant activity in warm-blooded animals comprising administering a warm-blooded animals an hypolipemiantly effective amount of at least one compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



wherein $R_1'$ is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, $-NH_4$, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminoalkyl with alkyls of 1 to 4 carbon atoms, $R_2$ is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, $R_3$ is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and $R_4$ and $R_5$ are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts where $R_1'$ is dialkylaminoalkyl.

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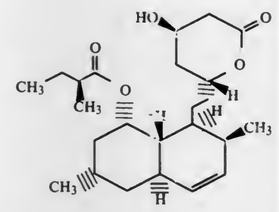
**4,294,846**

## HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PRODUCTS OF PREPARATION

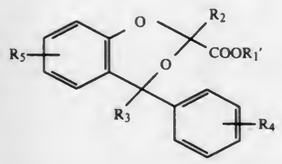
**George Albers-Schonberg, Princeton, N.J.; Henry Joshua, Staten Island, N.Y., and Maria B. Lopez, Elizabeth, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 77,807, Sep. 21, 1979, abandoned. This application May 28, 1980, Ser. No. 154,157**
**Int. Cl.³ C07D** *309/30;* **A61K** *31/365*
**U.S. Cl. 424—279** **2 Claims**

1. A compound, insubstantially pure form, with structural formula:



11. An hypolipemiant composition comprising an nypolipemiantly effective amount of at least one compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



wherein $R_1'$ is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, $-NH_4$, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminolakyl with alkyls of 1 to 4 carbon atoms, $R_2$ is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, $R_3$ is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and $R_4$ and $R_5$ are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts where $R_1'$ is dialkylaminoalkyl with the proviso that $R_2$ and $R_3$ are not simultaneously hydrogen.



**4,294,847**

## 8-AMINOALKYL-4-ALKYLISOPSORALENS

**Kurt D. Kaufman, Kalamazoo, Mich., assignor to Thomas C. Elder, Inc., Hamilton, Ind.**

**Filed Jul. 29, 1980, Ser. No. 173,384**
**Int. Cl.³ C07D** *493/04;* **A61K** *31/365*
**U.S. Cl. 424—279** **10 Claims**

1. 4-loweralkyl-8-primaryaminoloweralkylisopsoralen or a non-toxic and pharmacologically-acceptable salt thereof.

5. The method of effecting photochemical sensitivity on the skin of a mammal comprising the step of orally or topically administering to the said mammal an effective photosensitizing dose of a compound of claim 1.

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**4,294,848**

## THIOCYANO-CONTAINING POLYOXYALKYLENES

**David J. Tracy, Lincoln Park; Lindley S. Wood, Montclair, and Paritosh M. Chakrabarti, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.**

**Filed Jul. 31, 1980, Ser. No. 174,291**
**Int. Cl.³ A01N** *47/48;* **C07C** *161/02*
**U.S. Cl. 424—302** **11 Claims**

1. A thiocyano-containing polyoxyalkylene product having the formula:

$$NCS—(AO)_x—(BO)_y—(CO)_z—DE$$

wherein E is halogen or —SCN, A, C and D represent lower alkylene of 2 to 4 carbon atoms; B is alkylene of 2 to 8 carbon atoms; y and z are each integers having a value of from 0 to 50 and x is an integer having a value of from 2 to 50; and intermixtures of said thiocyano-containing polyoxyalkylene compounds.

10. The process of contacting a site of infestation of bacteria, fungi or a nematode with between about 0.05 and about 20 weight % of the product of claim 1 to arrest said infestation.

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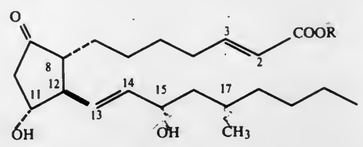
**4,294,849**

## PROSTAGLANDIN ANALOGUES

**Masaki Hayashi, Takatsuki; Sadahiko Iguchi, Otsu; Takanori Okada, Ibaraki, and Akiyoshi Kawasaki, Osaka, all of Japan, assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Jan. 24, 1980, Ser. No. 114,804**
**Claims priority, application Japan, Jan. 29, 1979, 54-8904**
**Int. Cl.³ C07C** *177/00;* **A61K** *31/557*
**U.S. Cl. 424—305** **11 Claims**

1. A prostaglandin analogue of the general formula:



VI

(wherein R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, the wavy line ∿∿ indicates attachment of α- or β-configuration or a mixture thereof, and the double bonds between $C_2$–$C_3$ and $C_{13}$–$C_{14}$ are trans), and cyclodextrin clathrates of such acids and esters, and when R represents a hydrogen atom, non-toxic salts of such acids.

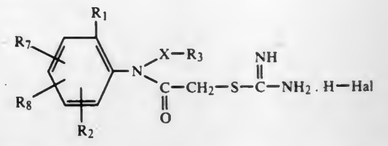
**4,294,850**

## FUNGICIDAL ACYLANILIDES

**Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

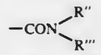
**Division of Ser. No. 923,604, Jul. 11, 1978, Pat. No. 4,206,228, which is a division of Ser. No. 723,826, Sep. 16, 1976, Pat. No. 4,151,299, which is a continuation of Ser. No. 565,037, Apr. 4, 1975, abandoned. This application Dec. 7, 1979, Ser. No. 101,355**
**Claims priority, application Switzerland, Apr. 9, 1974, 4995/74; Mar. 14, 1975, 3259/75**
**Int. Cl.³ A01N** *37/10;* **C07C** *149/43*
**U.S. Cl. 424—309** **12 Claims**

1. A fungicidal composition which contains as active substance a fungicidally effective amount of a compound of the formula



wherein
$R_1$ represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,
$R_2$ represents hydrogen, alkyl of 1 to 3 carbon atoms, alkkoxy of 1 to 4 carbon atoms or halogen,
$R_7$ represents hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,
$R_8$ represents hydrogen or methyl,
the total number of carbon atoms of the substituents $R_1$, $R_2$, $R_7$ and $R_8$ in the phenyl ring not exceeding 8,
X represents $—CH_2—$ or

$R_3$ represents —COOR′ or



wherein each of R′, R″ and R‴ independently represents hydrogen, methyl or ethyl, and
Hal represents a halogen anion,
together with suitable carriers and optionally other agents which promote the application thereof.

7. A compound according to claim 1.

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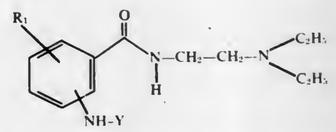
**4,294,851**

## AMINOBENZOIC ACID DERIVATIVES

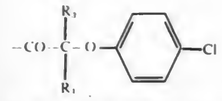
**Gunter Metz, Auf dem Rucken 29, and Manfred Specker, Weilerhalde 32, both of Blaubeuren, Fed. Rep. of Germany**

**Filed Jun. 27, 1978, Ser. No. 919,747**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730174**
**The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.**
**Int. Cl.³ A61K** *31/17, 31/165;* **C07C** *101/00, 103/78*
**U.S. Cl. 424—311** **2 Claims**

1. Aminobenzoic acid compounds of the formula:



wherein $R_1$ is hydrogen, chlorine, hydroxy, acetoxy or $C_1$—$C_3$—alkoxy; Y is the group:



wherein $R_3$ and $R_4$ are hydrogen or methyl and their acid addition salts.

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**4,294,852**

## SKIN TREATING COMPOSITIONS

**Richard H. Wildnauer, East Brunswick, and William T. Humphries, Pennington, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.**

**Continuation-in-part of Ser. No. 411,939, Nov. 1, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 607,171**

**Int. Cl.³ A61K** *31/19*

**U.S. Cl. 424—317** **13 Claims**

1. A skin treating composition comprising (a) a major amount of an aqueous phase comprising water having dissolved therein from about 0.1 to about 35% by weight of said composition of an alcohol selected from the group consisting of n-propanol and the monohydric aliphatic alcohols having from 4 to 6 carbon atoms, and an effective amount, sufficient to adjust the pH of said composition to a pH within the range of about 2 to about 6.5, of an organic acid having from 2 to about 10 carbon atoms selected from the group consisting of the aliphatic mono-, di- and tri-carboxylic acids and the derivatives of said acids which are substituted at one or both of the alpha and beta carbons with a hydroxyl or keto group; and (b) no more than about 15% by weight of the total composition of a lipid phase.

5. The composition of claim 1, further comprising an effective amount of a topically active pharmaceutical compound.

8. The composition of claim 5, wherein said pharmaceutical compound is retinoic acid.

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**4,294,853**

## BIOCIDAL ADDITIVE FOR CUTTING FLUIDS

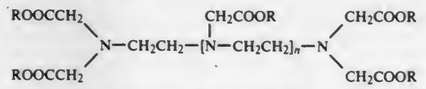
**John W. Williams, Vallejo, Calif.; Robert A. Smith, Lindenhurst, and Francis W. Arbir, Itasca, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Continuation-in-part of Ser. No. 48,202, Jun. 13, 1979, abandoned. This application Jun. 3, 1980, Ser. No. 156,141**

**Int. Cl.³ A01N** *37/12*

**U.S. Cl. 424—319** **12 Claims**

1. A mixture for use as a biocidal additive to industrial cutting fluids consisting essentially of 1 part by weight of 1,1-diiododimethyl sulfone and between 0.5 and 250 parts by weight of a chelating agent



wherein R is hydrogen, an alkali metal cation or ammonium, and n is 0 or 1.

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**4,294,854**

## PHARMACEUTICAL COMPOSITIONS

**Graham J. Durant; Charon R. Ganellin, and Margaret R. Vickers, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England**

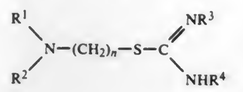
**Division of Ser. No. 853,773, Nov. 21, 1977, Pat. No. 4,205,071, which is a continuation-in-part of Ser. No. 795,983, May 11, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,836**

**Claims priority, application United Kingdom, May 14, 1976, 19994/76**

**Int. Cl.³ A61K** *31/33, 31/155, 31/495*

**U.S. Cl. 424—326** **4 Claims**

1. A method of producing immunosuppressant activity by administering to an animal in need thereof an effective amount of an isothiourea of the formula:



wherein

n is 2, 3 or 4;

$R^1$ and $R^2$, which may be the same or different, are lower alkyl; and

$R^3$ and $R^4$, which may be the same or different, are lower alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

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**4,294,855**

## EMOLLIENT AND/OR DYED PRILLED UREA BATH BEAD COMPOSITION

**Donald C. Wood, Des Plaines, and Robert L. McLaughlin, Wilmette, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.**

**Filed Nov. 26, 1975, Ser. No. 635,282**

**The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.**

**Int. Cl.³ A61K** *7/50*

**U.S. Cl. 424—358** **9 Claims**

1. A bath bead composition comprising at least 50% by weight of beads of prilled urea, said beads having absorbed therein from 0.5–10% by weight of an oily emollient, and said beads being dyed with water soluble dye.

5. A bath bead composition comprising at least 50% by weight of beads of prilled urea, said beads having absorbed therein from 0.5–10% by weight of an oily emollient, and from 2–15% by weight of a foaming anionic surfactant being present in said composition.

9. A method of producing a dyed bath bead composition comprising mixing urea beads with water soluble dye in the form of a dry powder, said urea beads containing absorbed or adsorbed water to pick up said water soluble dye.

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**4,294,856**

## PROCESS FOR MANUFACTURE OF ARTIFICIAL MILK REPLACER FOR RAISING INFANT PIGS AND OTHER INFANT ANIMALS

**Toyosuke Kinumaki; Takehiko Watanabe, both of Yokohamashi; Kisaburo Sugii, Hasudashi, and Shigeo Iseki, Tokyoto, all of Japan, assignors to Tokai Regional Fisheries Research Laboratory, Tokyo, Japan**

**Filed Jan. 4, 1977, Ser. No. 759,491**

**Int. Cl.³ A23L** *1/33*

**U.S. Cl. 426—7** **5 Claims**

1. A process for manufacturing artificial milk replacer for raising infant pigs and other infant animals comprising the steps of:

crushing meat and viscera of fish and shell fish to form a pulp;

digesting said pulp with protease;

heating the digested pulp to inactivate the protease,

removing the solid matter and suspended particles successively by screening, centrifuging, and filtering the digested pulp to obtain a liquid;

defatting the liquid with solvent;

condensing the defatted liquid; and

reducing the condensed liquid to a powder by spray-drying.



**4,294,857**

## DOG FOOD COMPOSITIONS OF IMPROVED PALATABILITY TO DOGS

**Mary L. Fuller, Pacific, Mo., assignor to Ralston Purina Company, St. Louis, Mo.**

**Filed Dec. 5, 1979, Ser. No. 100,600**

**Int. Cl.³ A23K** *1/00*

**U.S. Cl. 426—99** **43 Claims**

1. A dog food composition having greater palatability to dogs than the same composition without the palatability enhancer, comprising a nutritionally balanced mixture of proteinaceous and farinaceous ingredients, and an added palatability enhancing 0.0001 to 0.01% by weight amount of linalool.

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**4,294,858**

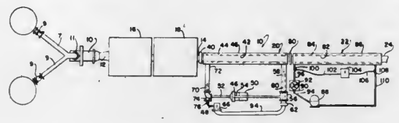
## SELF-SURFACED MEAT PRODUCT MANUFACTURING METHOD AND APPARATUS

**Rex E. Moule, 370 Grant Ave., Satellite Beach, Fla. 32937**

**Filed Mar. 27, 1980, Ser. No. 134,605**

**Int. Cl.³ A23B** *4/00*

**U.S. Cl. 426—241** **19 Claims**



1. The method for preparing a self-surfaced congealed meat product comprising storing emulsified product in a container, forcing the emulsified product from the container, forcing the emulsified product through a tube at a predetermined rate against a back pressure, wherein back pressure is created by laterally constraining the product as it moves through the tube, passing microwave energy through the tube and into the product, continuing forcing of the product through the tube and continuing passage of microwave energy through the tube and into the product, thereby congealing the product while the product remains under pressure, heating the tube to temperature sufficient to melt materials on the outer surfaces of the product, conducting heat through the tube to outer surfaces of the product thereby forming a self-skin on the product while the product remains under pressure, subsequently cooling the tube and cooling the outer surfaces of the product while the product continually passes through the tube, thereby solidifying materials in the outer surfaces of the product and completing the forming of a self-skin, and releasing the product from the tube.

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**4,294,859**

## PROCESS FOR PACKAGING FOOD

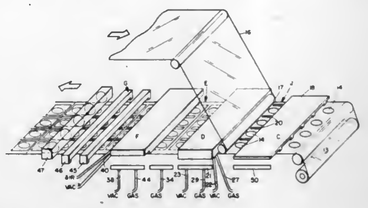
**Burton R. Lundquist, Highland Park, Ill., and Thomas Macherione, Mesa, Ariz., assignors to Armour and Company, Phoenix, Ariz.**

**Continuation of Ser. No. 568,016, Apr. 14, 1975, abandoned. This application Nov. 15, 1979, Ser. No. 94,380**

**Int. Cl.³ B65B** *31/04*

**U.S. Cl. 426—410** **12 Claims**

1. A process for packaging foods comprising passing a unit of food between a top film and a bottom film into an open first chamber, said bottom film having an opening therein to one side of said unit, withdrawing air from said first chamber through a passage which is open at a position below said opening, whereby pressure within said chamber is reduced, sealing said top and bottom films along a line which extends about said unit and encloses said opening, introducing a gas which is substantially free of oxygen through a passage which opens at a position under said opening whereby to pass said gas upwardly through said opening and into the enclosure between said films until the presssure within said chamber is approximately that of the atmosphere surrounding said chamber, opening said chamber, passing said unit with said enclosure out of said chamber to a position in which a nozzle engages said opening, passing gas which is substantially free of oxygen through said nozzle and into said enclosure to flush said enclosure, passing said unit which has been flushed within said enclosure into an open second chamber, closing said second



chamber, withdrawing gas from said second chamber through an outlet passage which is open at a position under said opening to draw gas through said opening and out of said second chamber through said outlet passage, and sealing said top and bottom films along a line extending about said unit and excluding said opening.

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**4,294,860**

## REFRIGERATING MEAT PASTE

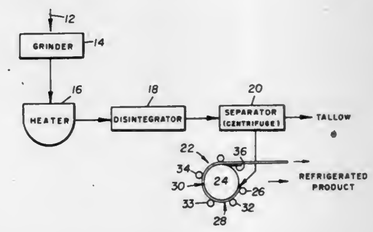
**Eldon N. Roth, 99 Madera Ct., San Ramon, Calif. 94583**

**Continuation-in-part of Ser. No. 970,579, Dec. 18, 1978, abandoned, which is a continuation of Ser. No. 849,166, Nov. 7, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,498**

**The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.**

**Int. Cl.³ A23B** *4/06;* **A23L** *1/31*

**U.S. Cl. 426—417** **19 Claims**




17. In a process for treating a protein-containing meat product having a high fat content in order to first recover a substantial portion of the fat and then refrigerate remaining protein-containing solids in order to limit bacterial growth, the steps comprising,

heating the meat product in order to render and separate a substantial portion of the fat from the remaining protein-containing solid material,

forming the remaining solid material into a viscous paste,

refrigerating a cylindrical heat transfer surface of a rotating drum to a preselected temperature,

applying the viscous paste onto the heat transfer surface to form a sheet of the viscous paste on the heat transfer surface, the relatively high temperature of the viscous paste and the relatively low temperature of the heat transfer surface being selected so that, upon application of the viscous paste to the heat transfer surface, the relatively high temperature of the viscous paste is capable of causing congealed or frozen liquid at an interface between the heat transfer surface and the viscous paste to initially melt, the relatively low temperature of the heat transfer surface

immediately thereafter causing liquid components at the interface to form a congealed or frozen solid in order to cause adhesion of the viscous paste to the heat transfer surface, compressing the viscous paste sheet in order to improve heat transfer characteristics throughout its thickness,

cooling the viscous paste upon the heat transfer surface of the rotating drum, and

subsequently removing the viscous paste from the heat transfer surface in a frozen condition.

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**4,294,861**

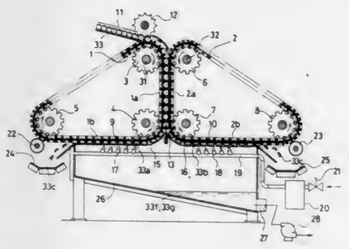
## METHOD OF SEPARATING AND TAKING OUT PULP FROM CITRUS FRUITS

**Yasushi Ifuku; Hirofumi Uchiyama, both of Wakayama, and Masayuki Hayashi, Komaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Prefectural Economic Federation of Agricultural Co-operatives, Wakayama, both of, Japan**

**Continuation of Ser. No. 17,853, Mar. 6, 1979. This application Jun. 27, 1980, Ser. No. 163,554**

**Int. Cl.³ A23L** *2/26*

**U.S. Cl. 426—475** **7 Claims**



1. A method of continuously processing citrus fruits to separate the pulp and juice from said fruit which comprises the steps of:

1. dividing the fruit into pieces;

2. Supporting said fruit pieces between an endless chain and a perforated net wherein said net is between said fruit pieces and a plurality of fluid injection nozzles which are directed toward the fruit's exposed pulp;

3. Continuously moving the fruit pieces in a linear path along the net with the endless chain; and

4. injecting fluid from said fluid injection nozzles into said fruit pieces while, said fruit pieces are moving along the net, to separate said pulp and juice from said fruit, said pulp and juice passing through said net.

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**4,294,862**

## PROCESS FOR THE PRODUCTION OF PASTRY AND FLAKY PASTRY-LIKE PRODUCTS

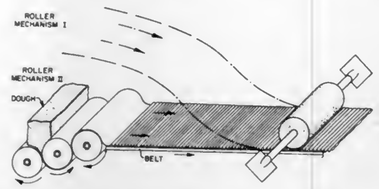
**Gerhard Wilke, Holderlinweg 1, 6900 Heidelberg, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 76,994, Sep. 19, 1979, which is a continuation of Ser. No. 873,889, Jan. 31, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 138,849**

**Int. Cl.³ A21C** *9/08;* **A21D** *13/08*

**U.S. Cl. 426—502** **9 Claims**

1. A process for producing pastry and flaky pastry-like products from a starting mixture, comprising subjecting said mixture to rollers arranged in series, each succeeding roller moving faster than the preceding roller, while precisely controlling within a range of 1° C. the temperature of said rollers at a low temperature of 3° C. to 20° C., producing a fleece-like film on the last of said rollers, thereafter conducting said fleece-like film to a belt, including adjusting the ratio of the linear speed of said belt to the rotational speed of said last roller




for imparting a mechanical undulating effect to said fleece-like film, and drying said film.

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**4,294,863**

## FLAVORING WITH MIXTURE OF NOR-METHYL JASMONATE AND DIHYDRO-NOR-METHYL JASMONATE

**Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Division of Ser. No. 106,158, Dec. 21, 1979, abandoned. This application Jun. 5, 1980, Ser. No. 156,688**

**Int. Cl.³ A23L** *1/235*

**U.S. Cl. 426—538** **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a guava flavored foodstuff comprising the step of adding to said foodstuff, from 0.1 up to 0.5 ppm of a mixture of nor-methyl jasmonate and dihydro-nor-methyl jasmonate, the weight ratio of said nor-methyl jasmonate:dihydro-nor-methyl jasmonate being 50:50, produced by the process of hydrogenation of nor-methyl jasmonate in the presence of a hydrogenation catalyst selected from the group of Raney Nickel, Palladium-on-Carbon and Palladium-on-Calcium Carbonate at a temperature in the range of from about 10° C. up to about 100° C.; a hydrogen pressure in the range of from about 5 psig up to about 80 psig, the concentration of catalyst based on the weight of starting material being from about 0.1% up to about 10%.

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**4,294,864**

## PREPARATION OF HIGH-RATIO CAKES USING UNTREATED WHEAT FLOUR

**Karel Kulp, and William J. Hoover, both of Manhattan, Kans., assignors to The American Institute of Baking, Manhattan, Kans.**

**Filed Jun. 4, 1979, Ser. No. 45,347**

**Int. Cl.³ A21D** *10/04*

**U.S. Cl. 426—549** **12 Claims**

1. A high-ratio cake batter composition, comprising:

a quantity of wheat flour, said flour being free of treatment, including chlorination and heat treatment, for rendering the flour usable in high-ratio cake batter;

at least about 110% of a sweetening agent;

from about 4 to 35% of protein taken from the group consisting of proteins found in rye, soy, cottonseed, peanut, pea, egg whites, milk, whey, wheat protein concentrate and mixtures thereof; and

from about 5 to 15% of unmodified starch,

said percentage ranges being stated in terms of flour weight basis wherein the quantity of said wheat flour is taken as 100% by weight.



**4,294,865**

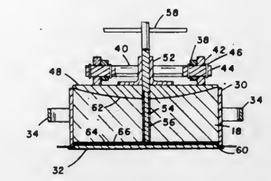
## PROCESS FOR PREPARING BEEF FOR USE ON A VERTICAL ROTISSERIE

**James H. Coroncos, 11335 Frederick Rd., West Friendship, Md. 21794**

**Continuation of Ser. No. 53,580, Jun. 28, 1979, abandoned, which is a division of Ser. No. 917,077, Jun. 19, 1978, Pat. No. 4,245,373. This application Oct. 29, 1980, Ser. No. 203,576**

**Int. Cl.³ A23L** *1/31*

**U.S. Cl. 426—646** **10 Claims**



1. A process for preparing beef for use on a vertical rotisserie, comprising:

selecting a quantity of beef to be processed from a beef carcass in a blend between very lean beef and partially fat beef;

removing a portion of the fat from those partially fat parts of selected beef;

cutting said beef into small pieces for grinding in a mechanical grinder;

grinding said small pieces of beef in said mechanical grinder and then regrind the ground meat a second time in said mechanical grinder;

preparing a mixture of additive ingredients;

spreading out the ground beef on a wide working surface, and then spreading said additive ingredients evenly over the spread out beef;

kneading the combination of ground beef and additive ingredients until said additive ingredients are thoroughly and evenly mixed throughout the ground beef;

lubricating interior surfaces of beef unit mold and thereafter successively place lifting disc, sheet of beef unit wrapping material, and beef unit mold on base of beef compressing device centered on mold centering section of beef compressing device, said mold interfacing in locating groove in base of beef compressing device, place measured portion of said combination of ground beef and additive ingredients into said mold;

operating beef compressing device to move compressor plate of beef compressing device into said beef unit mold to compress said combination of ground beef and additive ingredients mass into said mold and to compress until substantially all entrapped air is squeezed out of said combination of ground beef and additive ingredients, said compressor plate forming a concave spherically arcurate depression across the uppermost surface of the compressed mass;

placing skewer sleeve on mandrel and insert skewer sleeve and mandrel through guide collar and compressor plate aperture and force combined skewer sleeve and mandrel into compressed meat unit;

removing said mandrel, thereby leaving said skewer sleeve embedded within said compressed meat unit;

operating said compressing device to remove said compressor plate of said compressing device from said mold, thereby permitting said concave spherically arcurate depression across the uppermost surface of the compressed mass to expand to an essentially level configuration;

removing said mold from compressed meat unit;

wrapping meat unit and said skewer sleeve with said wrapping material; and

lifting wrapped said meat unit on said lifting disc and place in freezer.

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**4,294,866**

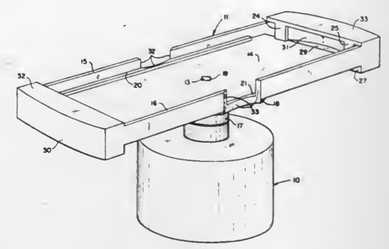
## METHOD FOR PRODUCING MONOCELLULAR LAYERS OF CELL-CONTAINING BIOLOGICAL FLUID

**Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Nov. 6, 1980, Ser. No. 204,564**

**Int. Cl.³ B44D** *1/02*

**U.S. Cl. 427—2** **13 Claims**



1. A method of producing a monocellular layer of cell-containing biological fluid on a microscope slide or the like, which method comprises the steps of depositing a sample of the fluid on a surface of a microscope slide or the like, inverting said slide so that the sample-bearing surface thereof faces downwardly, and then spinning said slide about a vertical axis normal to said surface.

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**4,294,867**

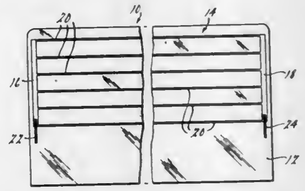
## METHOD FOR DEVELOPING A PATTERN ON A CERAMIC SUBSTRATE

**Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 15, 1980, Ser. No. 178,416**

**Int. Cl.³ B05D** *5/12*

**U.S. Cl. 427—96** **6 Claims**



1. A method for developing a pattern on a ceramic substrate, the pattern being formed of a material which is electrically conductive, which method comprises the steps of:

depositing on the ceramic substrate in a desired pattern a thin layer of a heat fusible material which contains a current conducting base metal in granular form;

depositing as an encasing layer over said pattern formed of heat fusible material an oxygen barrier material containing an oxygen getting material, said oxygen barrier material being non-heat fusible and nonreactive with said heat fusible material;

heating in an oxygen containing ambient the ceramic substrate along with said heat fusible material and said oxygen barrier material supported on the ceramic substrate, the heating being to a temperature sufficient to permit said heat fusible material to fuse to the ceramic substrate, said oxygen barrier material protecting said granular, current conducting base metal of said fusible material from oxida-

tion by physically blocking out oxygen and by chemically providing an oxygen getting material which will react with any oxygen which does manage to penetrate into said oxygen barrier material;

cooling the ceramic substrate along with the now fused heat fusible material and any remaining oxygen barrier material supported on the ceramic substrate to room temperature; and

removing any of said remaining oxygen barrier material from the ceramic substrate.

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**4,294,868**

## PROCESS FOR CONTINUOUSLY DEPOSITING A LAYER OF A SOLID MATERIAL ON THE SURFACE OF A SUBSTRATE HEATED TO A HIGH TEMPERATURE

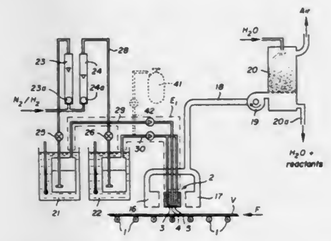
**Reinhard Kalbskopf, Onex, and Otto Baumberger, Carouge, both of Switzerland, assignors to Societa Italiana Vetro-Siv-S.p.A., San Salvo, Italy**

**Filed Jan. 31, 1980, Ser. No. 117,086**

**Claims priority, application Switzerland, Feb. 14, 1979, 1412/79**

**Int. Cl.³ B05D *1/34*; C03C *17/245***

**U.S. Cl. 427—109** **11 Claims**



1. A process for continuously depositing on the surface of a substrate heated to high temperature a layer of a solid material resulting from the reaction of at least two reactants selected from gaseous reactants and reactants diluted in a gas, which process comprises forming discrete laminar streams of each reactant and projecting these streams on said substrate by bringing the streams together in reciprocal tangential contact, while effecting relative displacement of said streams and the substrate in such a manner that said streams are applied successively to different regions of the substrate, characterised in that each said stream has the form of rectilinear gas curtains, the transverse profile of each said stream converging towards an imaginary edge common to all the said streams, that these curtains and the substrate are disposed in such a manner that said edge is substantially in the plane of the said surface of the substrate, that the said substrate and said curtains are displaced relative to each other in a direction substantially perpendicular to the said common edge in such a manner that the said edge remains substantially in the plane of the said surface of the substrate, that the gases evolving from the reaction which results from the impact of said stream on the substrate are compelled to flow above a predetermined portion of this substrate extending on each side of said edge, and that these gases are evacuated at the extremity of said substrate portion located opposite the said imaginary common edge of said curtains.

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**4,294,869**

## METHOD FOR COATING PIPELINE

**Christian C. Bassompierre-Sewrin, Embrun, France, assignor to Martech International, Inc., Houston, Tex.**

**Filed Sep. 26, 1979, Ser. No. 79,181**

**Int. Cl.³ B05D *3/12***

**U.S. Cl. 427—177** **17 Claims**

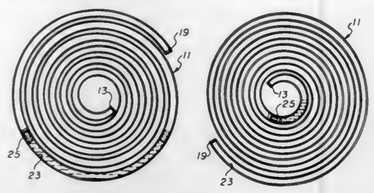
1. In a method for coating an elongate pipeline prior to the laying for inhibiting corrosion wear on the interior thereof comprising the steps of:

reeling the pipeline onto a spool,

installing a pig into the pipeline adjacent a first end thereof and closing that end and also the second end,

introducing coating material into the pipeline between the pig and the second end in sufficient quantity to coat the interior of the pipeline to a predetermined thickness,

rotating the pipeline on its reel in a first direction, and



introducing a sufficient air pressure into the pipeline between the pig and said first end to cause the pig to move through the pipeline in a direction opposite to the direction of rotation, thus causing the interior of the pipeline to be coated with the coating material that is caused to move therethroughout by gravitational force as the pipeline rotates, the pig moving to smooth the coated pipeline surface as it traverses the walls thereof.

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**4,294,870**

## METHODS AND DEVICE FOR CLADDING ELONGATED OBJECTS SUCH AS WIRES AND THE LIKE WITH POWDERED MATERIAL

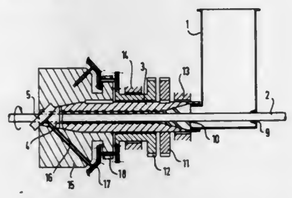
**Walter Hufnagl, Loininetstr. 9, 8 Munich, Fed. Rep. of Germany, and Peter Kotaucaek, We. Sperlertz 58, 7030 Wien, Austria**

**Division of Ser. No. 958,882, Nov. 8, 1978. This application Mar. 31, 1980, Ser. No. 135,623**

**Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750369**

**Int. Cl.³ B05D *3/12***

**U.S. Cl. 427—189** **3 Claims**



1. A method of cladding elongated objects such as wires and the like with a powdered material, comprising the steps of sprinkling the object to be clad with the powdered material by passing the object through a storage container; continuously feeding the object in its axial direction through a rotary internal worm conveyor having an outlet provided with a nozzle for continuously applying a layer of powdered material onto the surface of the advancing object during the feeding operation; and roll pressing said applied layer to the surface of the object in its path through a set of pressing rollers, the roll pressing being applied to said layer in a direction forming with said axial direction an acute angle to thereby obtain said elongated object the compacted powdered layer with bonded portions having spiral-like form and overlapping each other.



**4,294,871**

## METHOD FOR DEPOSITING A LAYER ON THE INSIDE OF CAVITIES OF A WORK PIECE

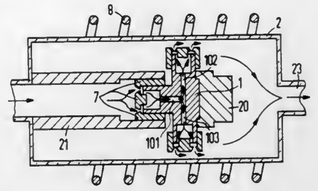
**Konrad Hieber, and Manfred Stolz, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 897,349, Apr. 18, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 71,685**

**Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718518**

**Int. Cl.³ C23C *11/00***

**U.S. Cl. 427—237** **8 Claims**



1. A method for depositing a layer of material of substantially uniform thickness on the inside of cavities of a workpiece having at least two internal cavities of differing inside diameter by chemical deposition from the gaseous phase, comprising heating the parts of said workpiece to be provided with said layer; conducting a gas stream containing the components of the material to be deposited along the surface of said parts in a substantially laminar flow by provision of a flow profiler at least approximately fitted to the shape of the workpiece and precipitation of said material from the gaseous phase at a pressure of less than $10^4$ N/m$^2$, whereby said flow profiler is designed and fitted to said workpiece so as to cause said gas stream to flow uniformly past the parts of said workpiece and to cause the resistance to flow of said gas stream from each of said individual internal cavities to be of approximately the same magnitude.

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**4,294,872**

## METHOD AND AN APPARATUS FOR COATING A WEB WITH A COATING COMPOSITION

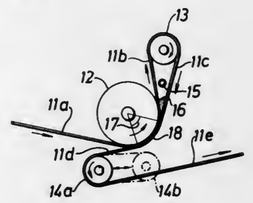
**Mats O. Kullander, Säffle, Sweden, assignor to Billerud Uddeholm AB, Säffle, Sweden**

**Filed Mar. 21, 1980, Ser. No. 132,792**

**Claims priority, application Sweden, Sep. 22, 1978, 7809998**

**Int. Cl.³ B05D *3/12*; B05C *3/02, 3/12***

**U.S. Cl. 427—358** **13 Claims**



1. A method of coating a continuously conveyed web with a coating composition, comprising the steps of:

applying a coating composition in excess to a first zone of the continuously conveyed web;

providing a backing support for one of the first zone and a second, uncoated zone of the web; and

deflecting the other of the first and second zones of the web into contact with said one zone without providing a backing support for said other zone, to thereby form a contact zone such that the uncoated second zone of the web wipes excess coating composition from the coated first zone of the web.

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**4,294,873**

## MANUFACTURE OF PAPER HAVING A HIGH DRY STRENGTH AND A LOW WET STRENGTH

**Juergen Hartmann, Ludwigshafen; Joachim Stedefeder, Lampertheim; Walter Denzinger, and Sigberg Pfohl, both of Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jan. 3, 1980, Ser. No. 109,315**

**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903218**

**Int. Cl.³ B05D *3/02*; B32B *23/08, 27/10***

**U.S. Cl. 427—391** **5 Claims**

1. A process for the manufacture of paper having a high dry strength and a low wet strength which comprises treating the surface of paper with an aqueous solution of a water-soluble alkaline earth metal salt or a mixture of a water-soluble alkaline earth metal salt and an alkali metal salt, the ratio of alkaline earth metal salts to alkali metal salts being 30–50:70–50, of a polymer selected from the group consisting of homopolymer of acrylic acid, homopolymer of methacrylic acid, acrylic acid/acrylamide copolymer, acrylic acid/acrylonitrile copolymer, acrylic acid/methacrylic acid/acrylamide copolymer and acrylic acid/acrylamide/methacrylamide copolymer;

which has a viscosity of from 5 to 100 mPas (measured in a Brookfield viscometer at 20 revolutions per minute) in 2% by wt. strength aqueous solution at 20° C., and drying the paper.

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**4,294,874**

## SILICATE-CONTAINING LATEX COATING COMPOSITIONS

**Mark J. Howe, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jul. 23, 1979, Ser. No. 59,825**

**Int. Cl.³ B05D *1/18, 3/02***

**U.S. Cl. 427—393** **9 Claims**

1. A method of filling wood or a wood-like product, comprising the steps of:

(a) applying a latex composition to the wood or wood-like product wherein the composition has a film-forming solids content of at least about 2.5 percent and consists essentially of:

(1) an alkali metal silicate, and

(2) a synthetic polymeric latex selected from the group consisting of styrene-butadiene copolymers, vinyl chloride-alkylene copolymers and mixtures thereof,

wherein, as film-forming solids, the silicate is present in an amount of from about 15 percent to about 40 percent and the latex is present in an amount of from about 60 percent to about 85 percent; and

(b) drying the coated product of step (a) so as to remove water and cure the composition to produce the filled wood or wood-like product.

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**4,294,875**

## INSULATION PANEL

**Arthur G. Schramm, 8780 E. McKellips Rd., Space 125, Scottsdale, Ariz. 85257**

**Continuation-in-part of Ser. No. 937,266, Aug. 31, 1978, abandoned. This application Apr. 3, 1979, Ser. No. 26,668**

**Int. Cl.³ B32B *3/12***

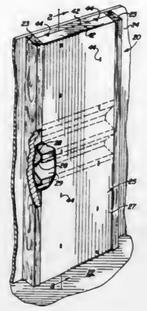
**U.S. Cl. 428—72** **4 Claims**

1. The thermal insulation structure comprising:

a front sheet, a back sheet, a pair of side sheets, a top sheet and a bottom sheet forming an envelope defining a space which is substantially a rectangular parallelepiped, said front, back and side sheets having a length and a width, the length of said front, back and side sheets being substan-

tially equal, the width of the front and back sheets being substantially greater than the width of the side sheets;

substantially rigid panel means having edges mounted in said space for dividing said space into a plurality of substantially regular equilateral triangular prismatic closed compartments having lateral edges defined by said rigid panel



means, edges of said rigid panel means defining lateral edges of said compartments and being secured to the front and back sheets of said envelope, said lateral edges of the compartments being substantially perpendicular to the side sheets; and

a plurality of individual granules of a cellulose material substantially filling said compartments.

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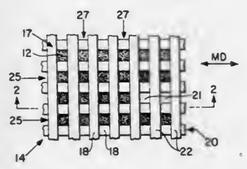
**4,294,876**

## TUFTED MATERIAL HAVING A LAMINATED FILM PRIMARY TUFTING SUBSTRATE

**James B. Camden, Newcastle Upon Tyne, England, and Kenneth D. Vinson, Bartlett, Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 34,059, Apr. 27, 1979, abandoned. This application May 1, 1980, Ser. No. 145,414**
**Int. Cl.³ B32B** *27/16*
**U.S. Cl. 428—95** **7 Claims**



1. A tufted material comprising:

(a) tuft strand elements arranged in substantially orthogonally related sets of rows, and

(b) a primary tufting substrate having needle holes therethrough and through which said tuft strand elements extend, said substrate comprising a bonded laminate having a plurality of layers of nonwoven materials, including two oppositely disposed surface layers, said substrate comprising first and second layers of uniaxially molecularly oriented polymeric material of substantially uniform thickness, each of said first and second layers having been drawn sufficiently to induce splitting parallel to its direction of molecular orientation upon penetration, said layers being split on both sides of each of the needle holes whereby each pair of adjacent rows of tuft portions in a direction which is parallel to the molecular orientation of one of said layers defines an elongate segment of primary tufting substrate in the layer, said segment being substantially uninterrupted between the adjacent pair of rows of tuft portions,

(1) said first layer located intermediate said surface layers and having the direction of molecular orientation thereof parallel to the tufting machine direction,

(2) said second layer having the direction of molecular orientation substantially at right angles to that of said first layer,

(3) said surface layers of said bonded laminate being made of materials other than uniaxially molecularly oriented polymeric material having a direction of molecular orientation which is parallel to the tufting machine direction.

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**4,294,877**

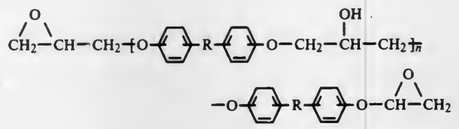
## EPOXY IMIDE COMPOSITIONS

**William F. Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Division of Ser. No. 27,444, Apr. 5, 1979, which is a continuation-in-part of Ser. No. 848,638, Nov. 4, 1977, abandoned. This application Jun. 6, 1980, Ser. No. 157,454**
**Int. Cl.³ C08L** *63/00;* **B32B** *15/14, 27/04*
**U.S. Cl. 428—209** **18 Claims**

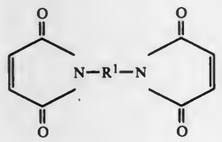
1. A product comprising a fibrous substrate impregnated with a composition comprising 20–80% by weight of a reaction product and 20–80% of a nonamide solvent for the reaction product having a dispersion solubility parameter of 7.2–10.5, a polar solubility parameter of 3–9.5 and a hydrogen bonding solubility parameter of 0–5.5; wherein the reaction product consists essentially of

(a) an epoxy resin of the formula



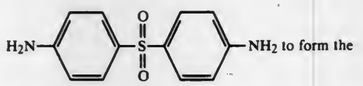
wherein R is an alkylene group of 1–4 carbon atoms, n is a positive integer; and the resin having an epoxide equivalent of about 150–1000; and

(b) a bismaleimide of the formula



wherein (a) and (b) are reacted at 115°–135° C. for about 0.5–2 hours and subsequently contacting the product of (a) and (b) with

(c) a diamine of the formula



reaction product; wherein the molar ratio of bismaleimide to diamine is about 0.6–0.8.

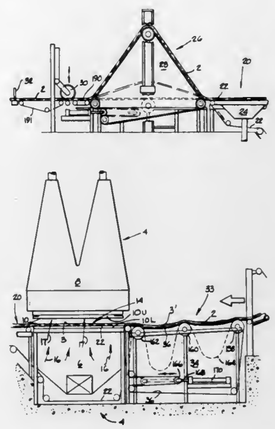


**4,294,878**

## PROCESS FOR RAPID ANNEALING OF REFRACTORY FIBER BODIES AND LAMINATED BODY PRODUCED BY PROCESS

**Richard N. Cunningham, Littleton, Colo., and Romain E. Loeffler, deceased, late of Littleton, Colo. (by Carolyn R. Loeffler, personal representative), assignors to Johns-Manville Corporation, Denver, Colo.**

**Filed Sep. 7, 1979, Ser. No. 73,412**
**Int. Cl.³ B32B** *7/02*
**U.S. Cl. 428—212** **15 Claims**



1. A process for annealing of a body of refractory fiber which comprises passing air at a temperature in the range of from about 750° F. to about 1400° F. through said body for a period of from about 5 to about 200 seconds while maintaining said body with a predetermined dimension in the direction of air flow.

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**4,294,879**

## FIBROUS INSULATION MAT WITH ANTI-PUNKING BINDER SYSTEM

**Patricia A. McHenry, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.**

**Filed Dec. 4, 1980, Ser. No. 212,928**
**Int. Cl.³ D04H** *1/58*
**U.S. Cl. 428—288** **5 Claims**

1. Fibrous insulation comprising a mass of glass fibers bonded with a binder system in an amount which lies between about 1 to 20% loss-on-ignition, said binder comprising a water soluble phenolicformaldehyde resin mixed with a water soluble urea-formaldehyde resin, the urea-formaldehyde resin content in said binder system comprising an amount of about 5 to 50% by weight of the binder solids content, said urea-formaldehyde resin comprising about 59% urea, about 19% formaldehyde and about 22% water by weight.

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**4,294,880**

## FOAMED POLYURETHANE ARTICLES WITH SKIN AND A METHOD FOR PRODUCING THE SAME

**Masazo Nishida, Toyota, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan**

**Filed Aug. 10, 1979, Ser. No. 65,748**
**Claims priority, application Japan, Aug. 11, 1978, 53/98446**
**Int. Cl.³ B29D** *27/04*
**U.S. Cl. 428—315** **7 Claims**

1. A method of producing a molded polyurethane article having a foamed polyurethane core member and a polyurethane surface skin layer formed as an integral unit, consisting essentially of the steps of spraying the inner surface of a foaming mold with a polyurethane composition to prepare a surface skin layer in the mold, pouring a foamable polyurethane solution into said mold and causing the polyurethane to foam and cure, thereby forming said integral unit, wherein the polyurethane composition used for the polyurethane surface skin layer is a two-part system consisting of (1) an organic polyisocyanate, and (2) polyols mixed with an aliphatic or equivalent aliphatic aromatic primary diamine in which the amino groups are attached to an aliphatic side chain, whereby in advance of the formation of the surface skin layer, an initial reaction product of said organic polyisocyanate and said aliphatic or equivalent aliphatic aromatic primary diamine having thixotropic properties is caused to be formed on the inner surface of the foaming mold; said reaction product being formed during the spray operation in which said two component polyurethane system is sprayed from a spray-coating apparatus used for two-component spraying and whereby the reaction product is formed in the mixing chamber.

7. A molded polyurethane article having an inner foamed polyurethane core member and a polyurethane surface skin layer of a uniform thickness produced by the method of claims 1 or 2.

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**4,294,881**

## COATED GLASS ARTICLE

**John H. Meyer, Milford, and Salvatore Guerra, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Jul. 2, 1980, Ser. No. 165,427**
**Int. Cl.³ B32B** *17/06, 27/20, 27/30*
**U.S. Cl. 428—334** **12 Claims**

1. As an article of manufacture having transmission capabilites above 70%;

a glass substrate having at least first and second surfaces;

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 70 angstroms to about 120 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 60 to 70% cobalt, 12 to 18% chromium, and 16 to 24% iron; and

a protective layer over said coating.

5. As an article of manufacture having transmission capabilities above 70%;

a glass substrate having at least first and second surfaces

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 75 angstroms to about 110 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 63 to 68% cobalt, 14 to 16% chromium, and 17 to 20% iron; and

a protective layer over said coating.

9. As an article of manufacture having transmission capabilities above 70%;

a glass substrate having at least first and second surfaces;

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 80 angstroms to about 100 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 65 to 66% cobalt, 14.5 to 15.5% chromium, and 18.5 to 19.5% iron; and

a protective layer over said coating.

4,294,882

## HEAT-SEALABLE ANTISTATIC POLYPROPYLENE FILMS

William J. Andrews, Taunton; David J. C. Espley, and William J. M. Philpott, both of Bridgewater, all of England, assignors to British Cellophane Limited, Somerset, England

Filed Aug. 23, 1979, Ser. No. 69,089
Claims priority, application United Kingdom, Sep. 19, 1978, 37295/78
Int. Cl.[3] B32B *27/08;* B29C *19/00;* B32B *27/00*
U.S. Cl. 428—349 17 Claims

1. A method for the manufacture of an oriented heat-sealable antistatic polypropylene film comprising applying to one or both sides of a base polypropylene film a layer of a heat-sealable olefinic polymer capable of forming a heat-seal below 140° C., the olefinic polymer layer containing between 0.2 and 10% by weight of an antistatic agent comprising an anionic hydrocarbyl sulphonate, and stretching the combination in one or more directions under stretch orientatable conditions.

12. An oriented heat-sealable antistatic polypropylene film comprising a base polypropylene film having on one or both surfaces a layer of an olefinic polymer capable of forming a heat-seal below 140° C., the olefinic polymer layer containing between 0.2 and 10% by weight of an antistatic agent comprising an anionic hydrocarbyl sulphonate.

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4,294,883

## STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Div. of American Hoechst Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 715,719, Aug. 19, 1976, Pat. No. 4,179,543. This application Aug. 17, 1979, Ser. No. 67,294
The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.
Int. Cl.[3] D02G *3/00*
U.S. Cl. 428—361 7 Claims

1. A synthetic polymeric staple fiber, said fiber having a length in a range of from about ¼ to about 3 inches and having a finish thereon comprising:

(a) an ethoxylated primary emulsifier containing at least five moles of ethylene oxide and having a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent aqueous solution of same at about 25 degrees Centigrade; p0 (b) a lubricant for said fiber;

(c) a secondary emulsifier for said lubricant, said secondary emulsifier being compatible with said primary emulsifier; and

(d) an anionic constituent, said finish being present on the fiber in an amount of at least 0.1 percent based on fiber weight and exhibiting a low foaming propensity and being conducive to good fiber bondability in the presence of a chemical binder.

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4,294,884

## ACRYLIC FIBER HAVING IMPROVED BASIC DYEABILITY AND METHOD FOR MAKING THE SAME

Hartwig C. Bach, and Helmuth E. Hinderer, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 6, 1980, Ser. No. 157,128
Int. Cl.[3] D02G *3/00*
U.S. Cl. 428—364 3 Claims

1. A wet spun fiber composed of an acrylic polymer formed from monomers at least one of which is a sulfonated vinyl monomer, wherein said polymer contains 0.5 to 25 weight percent of an additive polymer dispersed therein, said additive polymer being selected from the group consisting of cellulose triacetate, polymethyl methacrylate, polyvinyl chloride, a polyamide of hexamethylenediamine with 1,1,3-trimethyl-5-carboxy-3-(p-carboxyphenyl) indane and a polyamide of hexamethylenediamine with isophthalic acid.

4,294,885

## SURFACE-MODIFIED PIGMENT OF NATURAL KAOLIN MATERIAL AND A PROCESS OF PRODUCING SAME

Olof Sunden, Lidingö, Sweden, assignor to EKA AB, Surte, Sweden

Filed May 14, 1980, Ser. No. 149,769
Claims priority, application Sweden, Jun. 1, 1979, 7904814
Int. Cl.[3] B32B *5/16, 9/00*
U.S. Cl. 428—404 5 Claims

1. A surface-modified pigment of natural kaolin material intended for use as a pigment in paper and coats of paint, characterised in that it has on its pigment particles precipitated primary and secondary layers bonded to one another by hydrogen or ion bonding, the primary layer consisting of anionic $Al_2O_3$—$SiO_2$ hydrate gel having a molar ratio of $SiO_2$:$Al_2O_3$ of from 3 to 30, preferably from 8 to 15, and being present in an amount corresponding to from 2 to 15% by weight of $SiO_2$, based upon the original quantity of kaolin material, and the secondary layer consisting of a polymeric binder which is included in a quantity of at least 2% by weight, based upon the original quantity of kaolin material.

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4,294,886

## TRANSPARENCIES PRODUCED FROM EPOXY RESINS CURED WITH ADDUCTS OF TRIMETHOXYBOROXINE AND BENZYL ALCOHOL

John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 28, 1979, Ser. No. 70,390
Int. Cl.[3] C08G *59/40*
U.S. Cl. 428—412 11 Claims

1. A transparent composition having resistance to intense heat, comprising:

a transparent blend having (a) from 80 parts to about 100 parts of an epoxy resin;

(b) from 7.5 parts to about 30 parts of trimethoxyboroxine; and

(c) from 1 part to about 10 parts of a phenyl substituted alkyl alcohol.

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4,294,887

## PRODUCTION OF COATING FILMS FROM AUTOXIDIZABLE MATERIALS AND COATING COMPOSITIONS CAPABLE OF PRODUCING SUCH FILMS

Peter F. Nicks, Maidenhead, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sep. 18, 1979, Ser. No. 76,726
Claims priority, application United Kingdom, Sep. 27, 1978, 38332/78
Int. Cl.[3] B32B *27/40*
U.S. Cl. 428—423.1 11 Claims

1. A method of preparing a cured coating film by applying to a substrate a liquid coating which is free from metal catalyst and which comprises

(a) a film-forming material comprising moieties of an ethylenically unsaturated fatty acid containing at least two ethylenically unsaturated groups, said film-forming material being selected from the group consisting of oil-modified alkyd resins, oil-modified addition polymers of ethylenically unsaturated monomers, epoxy esters of ethylenically unsaturated fatty acids, oil-modified polyurethane oils and oil-modified polyurethane alkyds, and

(b) an acid which is fully dissociated when in the presence of water, said acid being selected from the group consisting of a sulphonic acid, hydrochloric acid and sulphuric acid,

and thereafter exposing the coating to oxygen until fully cured, the acid functioning to catalyze autoxidation of component (a).

10. A cured coating film prepared by the method of claim 1, said film being supported on a substrate.

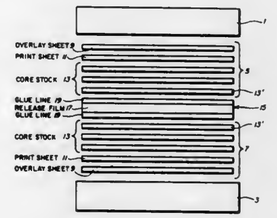


4,294,888

## RELEASE MEDIUM HAVING TRANSFERRABLE GLUE LINES

Christo Antonio, Princeton, and Wyman F. Uhl, Sterling, both of Mass., assignors to Litton Business Systems, Inc., New York, N.Y.

Continuation of Ser. No. 922,191, Jul. 5, 1978, abandoned, which is a continuation of Ser. No. 780,850, Mar. 24, 1977, abandoned, which is a division of Ser. No. 521,054, Nov. 5, 1974, Pat. No. 4,030,955. This application Apr. 24, 1979, Ser. No. 32,759
Int. Cl.[3] B32B *27/08, 27/30*
U.S. Cl. 428—451 4 Claims




1. A release medium adapted to separate laminates during heat and pressure consolidation comprising a self-sustaining film material which will not soften or become tacky during said heat and pressure consolidation, said film material having its opposite surfaces coated with a glue adherable layer containing at least 40% polyvinyl alcohol on a dry solid basis and positionable between the backmost surfaces of the laminates, said polyvinyl alcohol being water insolubilized, said glude adherable layers being transferable to the backmost surfaces of said laminates during consolidation of said laminates.

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4,294,889

## RESIN COMPOSITIONS AND HEAT-SEALABLE COMPOSITE BIAXIALLY-STRETCHED FILMS

Fukashi Hashimoto, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,673
Int. Cl.[3] B32B *27/08*
U.S. Cl. 428—515 9 Claims

1. A biaxially-stretched polypropylene composite film comprising a biaxially-stretched film of a crystalline polypropylene and a monoaxially-stretched or biaxially-stretched film of a resin composition bonded in laminated state to at least one surface of the crystalline polypropylene film, the resin composition comprising:

from 96 to 50 percent of a propylene copolymer (a), which is a member selected from the group consisting of

($a_1$) ethylene-propylene random copolymers each of an ethylene component content of 1.5 to 10 percent,

($a_2$) ethylene-propylene-butene-1 random copolymers each of an ethylene component content of 0 to 5 percent, a butene-1 component content of 8 to 30 percent, and a propylene component content of 92 to 65 percent, and

from 3 to 30 percent of a polybutene-1- (b); and

from 1 to 20 percent of an ethylene-propylene-butene-1 random random copolymer (c) of a propylene component content of 0.5 to 3 percent and a butene-1-component content of 2 to 10 percent, of a density of 0.915 to 0.935 g./cm.[3], and of a melting point of 115° to 125° C.,

all quantities expressed in percent being by weight, and in which the melt flow rate of said propylene copolymer (a) is about 1 to 30 g./10 min., the melt flow rate of said polybutene-1 (b) is about 5 to 50 g./10 min. and the melt flow rate of said ethylene-propylene-butene-1 copolymer (c) is about 2 to 50 g./10 min., with the proviso that at 180°-300° C. the melt flow rate of propylene copolymer (a) is equal to or less than those of polybutene-1 (b) and ethylene copolymer (c).

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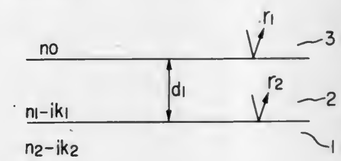
4,294,890

## METHOD FOR PREVENTING REFLECTION

Susumu Ito, Tokyo; Noboru Sugawara, Sagamihara, and Sayoko Amano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,655, Feb. 27, 1979, abandoned, which is a continuation of Ser. No. 856,734, Dec. 1, 1977, abandoned, which is a continuation of Ser. No. 641,265, Dec. 16, 1975, abandoned. This application Dec. 10, 1979, Ser. No. 102,312
Claims priority, application Japan, Dec. 23, 1974, 49/147843
Int. Cl.[3] B32B *15/20, 15/04;* C23C *13/02, 13/04*
U.S. Cl. 428—641 7 Claims




1. A coating having anti-reflection characteristics within a visible range, comprising:

an aluminum layer vapor-deposited on a substrate to a film thickness preventing the transmission of light therethrough under a pressure of $2\times10^{-5}$ Torr. or below, and

a silicon layer having a film thickness of the order of 300 A vapor-deposited on said aluminum layer under a pressure of $2\times10^{-5}$ Torr. or below.

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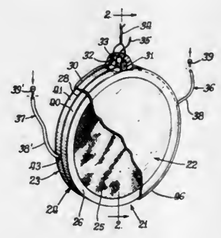
4,294,891

## INTERMITTENTLY REFUELABLE IMPLANTABLE BIO-OXIDANT FUEL CELL

Shang J. Yao; Huei Y. Sun Yao, both of Upper St. Clair, and Sidney K. Wolfson, Jr., Fox Chapel, all of Pa., assignors to The Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,709
Int. Cl.[3] H01M *8/16*
U.S. Cl. 429—2 14 Claims



1. A biologically acceptable, implantable, bio-oxidant fuel cell comprising in operative combination:

(a) at least one anode assembly;

(b) at least one cathode assembly;
(c) a fuel/electrolyte chamber defined between said anode and said cathode assemblies for receiving an externally supplied fuel;
(d) an electrical lead attached to each of said anode and cathode assembly to provide electrical output to a prosthesis;
(e) a biologically acceptable, oxygen permeable membrane disposed substantially in contact with said cathode assembly so that said membrane lies between said cathode and body tissue, said membrane being adapted to permit endogenous tissue $O_2$ as a biological oxidant to diffuse into said cell from said body tissue;
(f) a fuel/electrolyte composition disposed in said fuel/electrolyte chamber; and
(g) said fuel/electrolyte composition having a high concentration ratio of fuel to endogenous tissue $O_2$ diffusing through said membrane into said cell.

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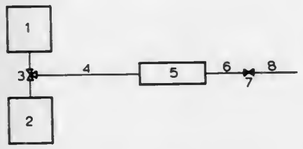
**4,294,892**

## METHOD FOR THE OPERATION OF A FUEL CELL

**Marinus Alfenaar, Schinnen, Netherlands, assignor to Electrochemische Energieconversie, N.V., Mol, Belgium**

**Filed May 1, 1980, Ser. No. 145,843**
**Claims priority, application Netherlands, May 2, 1979, 7903426**
**Int. Cl.³ H01M *8/04***
**U.S. Cl. 429—13** **12 Claims**




1. A method for operating a fuel cell with a porous gas diffusion electrode to which an oxidizing or reducing gas is fed, wherein the concentration level of the oxidizing or reducing gas, calculated as molecular oxygen or hydrogen respectively, in the gas phase in situ of the electrode in question is temporarily brought to a reduced level the terminal voltage being reduced to below 10% of its original value, the overall pressure of the gas phase in situ of this electrode being substantially maintained and the power offtake is continued for at least the period during which the concentration level is reduced.

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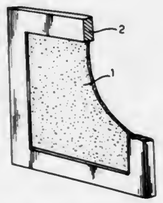
**4,294,893**

## GRAPHITE-RESIN COMPOSITE ELECTRODE STRUCTURE, AND A PROCESS FOR ITS MANUFACTURE

**Giuliano Iemmi, Turin, and Diego Macerata, Pinerolo, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy**

**Filed May 21, 1979, Ser. No. 41,050**
**Int. Cl.³ H01M *4/96, 4/62*; C25B *11/12***
**U.S. Cl. 429—42** **2 Claims**




1. A press-formed fuel cell electrode comprising an electrically conductive porous plate portion contoured by an electrically conductive compact carrier frame portion integral with said plate portion, the structure of each of said portions being formed by resin-bonded particles of a conductive carbon, the bonding resin being a cross-linked polyimide resin in an amount of 15–50% while the carbon particles are correspondingly in an amount of 85–50% on the joint weight of the carbon particles and resin, and wherein the porous plate portion has been obtained by a process comprising pressing at cross-linking temperature a particulate mixture of (a) particles of a prepolymer of said polyimide resin filled with said carbon particles and (ii) particles of a pore-forming agent removable by volatilization or leaching, one face of the porous plate portion being coated with sintered particles of polytetrafluoroethylene rendering said face hydrophobic.

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**4,294,894**

## TRANSPARENT TOOTHPASTE HAVING A MEDICINAL ACTION AND PROCESS FOR ITS PRODUCTION

**Enzo Vellucci, Rome, Italy, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Continuation of Ser. No. 3,565, Jan. 15, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 121,933**
**Int. Cl.³ A61K *9/16, 9/18, 7/22*; B65D *81/24***
**U.S. Cl. 424—49** **14 Claims**

1. A process for the preparation of a toothpaste which comprises:
(a) preparing under heat a gelled basic mass comprising a gel, and a polyglycolic vehicle;
(b) adding to said gelled mass, while heating, de-ionized water containing buffer and then sodium chloride as a saline electrolyte in amounts ranging from 0.5 to 20% by weight of the entire toothpaste composition;
(c) cooling said mixture from (b) and adding thereto de-ionized water, silica thickening compound and amorphous silica gel, which is in finely divided form and has an average particle size ranging from about 2 to about 20 microns and a surfacial development of within the range of from 600 to 800 $m^2/g$, in amounts ranging from 5 to 50% by weight with respect to the entire toothpaste composition, and stirring until a uniform single phase is attained, and
(d) cooling to room temperature, deaerating until a uniform transparent paste is free from clouds and bubbles to obtain said toothpaste and packaging it in unlined aluminum tubes.

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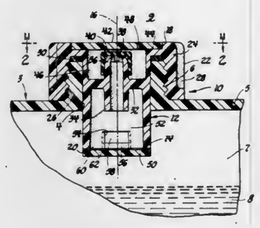
**4,294,895**

## BATTERY VENT CAP FOR PREVENTING ELECTROLYTE FOAM ESCAPE

**Larry P. Atkins, Daleville, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jul. 10, 1980, Ser. No. 168,276**
**Int. Cl.³ H01M *2/12***
**U.S. Cl. 429—84** **5 Claims**



1. A vent device for releasing gases formed in a battery container while preventing the escape of electrolyte that may be carried with the gas in the form of foam, said vent device comprising;
a housing comprising a cylindrical side wall and transverse walls defining a compartment, said housing being adapted to be vertically mounted in the container such that the then lower transverse wall lies inside the container,
a gas passage adapted for venting the compartment to outside the container,
at least one opening in the housing side wall spaced apart from the lower transverse wall and adapted to connect the compartment to inside the container for admitting gases and foam, and
a reservoir within the compartment between the opening and the lower end wall and containing an antifoam agent, said reservoir, gas passage and opening defining a gas-foam flow path through the compartment such that foam entering the compartment through the opening spills into the reservoir whereupon the agent dissipates the foam and foam-free gas flows to the gas passage unimpeded by the agent.



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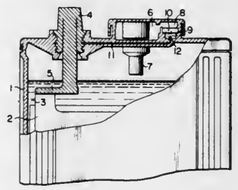
**4,294,896**

## BATTERY WITH FLAME INTERCEPTING FILTER AND GROUNDING LEAD

**Masahiro Ueda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Aug. 8, 1980, Ser. No. 176,349**
**Claims priority, application Japan, Aug. 29, 1979, 54-119576[U]**
**Int. Cl.³ H01M *2/12***
**U.S. Cl. 429—86** **9 Claims**



1. An electrical storage battery, comprising;
a battery casing formed with a gas venting exhaust passage which communicates the interior of the battery casing to the exterior thereof;
a flame intercepting filter located at an intermediate portion of the gas venting exhaust passage and extending thereacross so as to define a passage portion on the exterior side of the flame intercepting filter;
and a means for substantially electrically grounding in the vicinity of a part of said exterior side passage portion.

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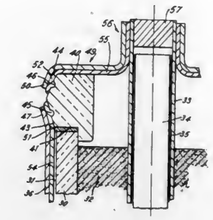
**4,294,897**

## SEALING OF CERAMIC ELECTROLYTE TUBES IN ELECTROCHEMICAL CELLS

**Peter J. Bindin, Runcorn, England, assignor to Chloride Silent Power Limited, London, England**

**Division of Ser. No. 902,528, May 3, 1978, Pat. No. 4,215,466. This application Mar. 25, 1980, Ser. No. 133,723**
**Claims priority, application United Kingdom, May 5, 1977, 18870/77**
**Int. Cl.³ H01M *2/08***
**U.S. Cl. 429—104** **12 Claims**

1. An electrochemical cell having a ceramic electrolyte tube closed at one end and separating anodic and cathodic reactants, wherein an annular element of ceramic material is sealed with glass to the open end of the electrolyte tube, said annular element having shaped external surfaces such that, over these surfaces, the diameter of the element decreases from a maximum diameter intermediate the ends of the element to minimum diameters at or near the respective ends of the element, soft metal over said shaped surfaces and outer metal elements around said shaped surfaces and secured thereto by the soft metal, one of said metal elements forming part of a housing enclosing the electrolyte tube and the other of the metal elements forming a top closure extending at least partly across the top of said annular ceramic element.



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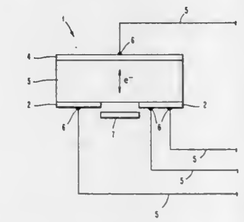
**4,294,898**

## SOLID STATE BATTERY

**Allan M. Hartstein, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 5, 1980, Ser. No. 146,965**
**Int. Cl.³ H01M *6/18***
**U.S. Cl. 429—104** **8 Claims**



1. A solid state rechargeable battery comprising at least three layers including a first layer consisting essentially of an alkali metal-containing electrode in the solid state, a second solid electrolyte layer adjacent said first layer, and a third layer adjacent said second solid electrolyte layer consisting essentially of intercalation graphite adapted to accept ions of the alkali metal from the first layer, wherein said third layer is free from materials which interface to an undesirable extent with the ability of the graphite to intercalate the ions of said alkali metal therein, and wherein the C-axis of the solid electrolyte and at least a portion of the C-axis of said graphite layer are perpendicular to the flow of the alkali metal ions in the battery.

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**4,294,899**

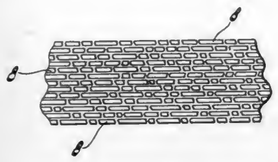
## PTFE-BOUND TALC SEPARATORS FOR SECONDARY ZINC ALKALINE BATTERIES

**Romeo R. Witherspoon, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed May 1, 1980, Ser. No. 145,595**
**Int. Cl.³ H01M *2/16***
**U.S. Cl. 429—206** **5 Claims**

1. A secondary zinc alkaline battery comprising a zinc electrode, a counterelectrode and a microporous separator between said electrodes for preventing zinc dendrite bridging between said electrodes, said separator having a first face adjacent said zinc electrode and a second face adjacent said counterelectrode and comprising a multiplicity of overlapping talc platelets randomly distributed throughout a fibrillated polytetrafluoroethylene binder, said platelets being oriented

such that the face of the platelets substantially parallel the faces of the separator and being microspaced one from the other



such as to define a tortuously-pathed network of interconnected pores extending between the faces of said separator.

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**4,294,900**

## PROCESS OF PRODUCING MULTICOLOR OPTICAL FILTERS

**Toshiaki Aono, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Feb. 22, 1980, Ser. No. 123,610**
**Claims priority, application Japan, Feb. 23, 1979, 54-20265**
**Int. Cl.³ G03C *7/00*; G03F *5/00***
**U.S. Cl. 430—7** **8 Claims**

1. A process of producing a multicolor optical filter which comprises:

exposing a multilayer color photographic material comprising: (**1**) a silver halide emulsion layer containing a colored coupler (**1***b*) colored cyan, magenta or yellow and forming a dye having one of the other two principal colors by coupling reaction with the oxidation product of an aromatic primary amine color developing agent, and (**2**) a silver halide emulsion layer (**2**) containing a silver halide emulsion (**2***a*) having a sufficiently high sensitivity that upon exposure that does not produce an image in emulsion layer (**1**) upon development, an image is produced in emulsion layer (**2**) and containing a colored coupler (**2***b*) having the same color as that of the dye formed by the coupling reaction of the colored coupler (**1***b*) in emulsion layer (**1**) and forming a cyan, magenta or yellow dye other than the color of the colored coupler (**1***b*) or the color of the dye formed by coupling reaction of the colored coupler (**1***b*);

said exposure being such that a portion of the material is unexposed and no image-wise development occurs in the silver halide emulsion layer (**1**) or (**2**), a portion is exposed in an amount sufficient to increase the coupling color density of the silver halide emulsion layer (**2**) and no image-wise development occurs in silver halide emulsion layer (**1**), and the remaining portion is exposed in an amount sufficient to produce image-wise development of the silver halide emulsion layer (**1**); and

processing the color photographic material in color developer containing an aromatic primary amine color developing agent.

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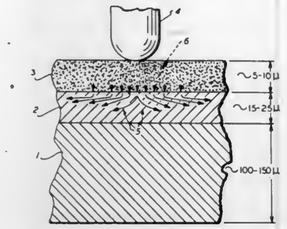
**4,294,901**

## THERMOREMANENT MAGNETIC IMAGING MEMBER AND SYSTEM

**Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 3, 1980, Ser. No. 203,207**
**Int. Cl.³ G03G *19/00***
**U.S. Cl. 430—39** **10 Claims**




1. A magnetic imaging process comprising:

(a) providing a thermoremanent magnetic imaging member comprising a substrate, an electrically conductive layer over said substrate, and an electrically resistive layer over said conductive layer wherein said resistive layer comprises aligned magnetic particles and electrically conductive particles dispersed in a polymer binder;

(b) forming a latent magnetic image on said imaging member by heating selected portions of said imaging member to about the Curie temperature of said magnetic particles and allowing the heated portions of said imaging member to cool in the presence of an externally applied magnetic field;

(c) developing said latent magnetic image by contacting said imaging member with a magnetic toner composition comprising a fusible resinous component and a magnetically attractable component;

(d) transferring the developed image to a receiving member; and

(e) fixing the transferred image to said receiving member.

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**4,294,902**

## IMAGE FORMATION METHOD HAVING TRANSLUCENT PARTICLES CONTAINING A COLORING AGENT AND A COLORLESS DYE FORMER

**Yuji Takashima, Osaka; Eisuke Ishida, Nara; Hisanori Nishiguchi, Neyagawa, and Kimiaki Yoshino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 741,022, Nov. 11, 1976, abandoned.**
**This application Aug. 17, 1978, Ser. No. 934,503**
**Claims priority, application Japan, Nov. 12, 1975, 50-136505; Nov. 12, 1975, 50-136506; Nov. 12, 1975, 50-136507**
**Int. Cl.³ G03G *13/08, 13/16***
**U.S. Cl. 430—45** **10 Claims**

1. Image formation method comprising steps of:

a. imparting a charge to a photoconductive member combined with an electrically conductive support member;

b. spreading on the surface of the charged photoconductive member a mixture of particles comprising at least one type of non-photoconductive, translucent particles containing a coloring agent and a colorless dye which is capable of developing a color different from that transmitted by said translucent particles;

c. causing said translucent particles to electrostantially adhere to said surface through electrostatic attraction;

d. subjecting the charged photoconductive member bearing said translucent particles to light image exposure through said translucent particles, thereby selectively weakening and attenuating the charge on a portion of said photoconductive member below said translucent particles through which the light of said light image has passed, whereby the electrostatic attraction of said particles to said photoconductive member is selectively weakened in relation to the degree of said light exposure;

e. exerting a force on said translucent particles to remove those translucent particles with selectively weakened attraction for said photoconductive member and to thereby obtain a particle image; and

f. bringing said particle image into close contact with a color developing agent which develops said colorless dye into a color different from that transmitted by said translucent particles.

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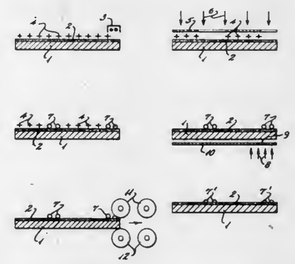
**4,294,903**

## PROCESS FOR ELECTROSTATICALLY DEVELOPING AND PRESSURE-FIXING A REVERSED IMAGE INCLUDING CHARGE DISSIPATION PRIOR TO FIXING

**Donald Kings, Saint Nicolas d'Aliermont, and Pham K. Quang, Dieppe, both of France, assignors to Rhone Povlenc Systemes, Creteil, France**

**Filed Jun. 31, 1980, Ser. No. 174,130**
**Claims priority, application France, Aug. 8, 1979, 79 20264**
**Int. Cl.³ G03G *13/22***
**U.S. Cl. 430—98** **5 Claims**



1. In an electrophotographic copying process for obtaining a reversed image of an original negative transparency by uniformly electrostatically charging a copying paper, dissipating the electrostatic charges in selected areas corresponding to the transparent areas of the original negative, developing the copying paper by depositing toner on the selected areas and fixing the toner by passing the copying paper between metal pressure rollers,

the improvement comprising,

dissipating the remaining uniform electrostatic charge on the copying paper after the development step but before the fixing step.

2. The process of claim 1 in which the copying paper comprises a support and a photoconductive layer on said support, wherein the dissipation of the remaining uniform electrostatic charge is obtained by illuminating the support.

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**4,294,904**

## INDUCTIVE DEVELOPMENT MATERIALS FOR A MAGNETIC DEVELOPMENT PROCESS

**Joseph Mammino, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 21, 1979, Ser. No. 96,593**
**Int. Cl.³ G03G *13/09***
**U.S. Cl. 430—122** **8 Claims**

1. A magnetic brush inductive development process comprising the steps of providing an electrostatographic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting the recording surface with an electrostatographic developer mixture comprising electrically conductive carrier particles and a finely-divided toner composition, said toner composition comprising a colorant, a thermoplastic resin, a magnetic or magnetically attractable material, present in an amount of from about 10% to about 80% by weight, and being selected from the group consisting of magnetite, ferrites, iron, and nickel, and a triboelectric charging-enhancing material dispersed in the toner composition, present in an amount of between about 0.25% to about 15% by weight, and selected from the group consisting of alkyl pyridinium compounds, long chain hydrazinium compounds, quaternary ammonium compounds, and fluorosurfactants comprising ionic solubilizing groups linked to highly branched perfluoro groups, said toner composition being characterized as possessing triboelectric charging properties such that it is charged to a level of from about 15 microcoulombs per gram to about 30 microcoulombs per gram of toner composition, a resistivity of at least $10^{14}$ ohm-cm, and promotes homogeneous mixing of said toner composition with said carrier particles thereby improving transport of the toner particles and avoiding clumping of the toner particles, whereby at least a portion of said finely-divided toner composition is attracted to and deposited on said recording surface in conformance with said electrostatic image.

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**4,294,905**

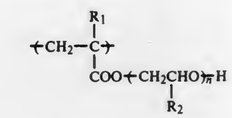
## LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATE AND COMPOSITIONS THEREFORE WITH MULTIPLE RESINS

**Yoshio Okishi; Akinobu Koike, and Shizuo Miyano, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jun. 18, 1979, Ser. No. 49,246**
**Claims priority, application Japan, Jun. 16, 1978, 53-72787**
**Int. Cl.³ G03C *1/60, 1/52*; G03F *7/08***
**U.S. Cl. 430—175** **27 Claims**

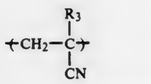
1. A light-sensitive lithographic printing plate comprising a support having provided on at least one surface thereof a light-sensitive layer comprising a light-sensitive component, a first resin and a second resin having poor compatibility with said first resin, said first resin including side chains which are compatible with said second resin and said first resin selectively accumulating at the outermost surface of said light-sensitive layer to impart higher oleophilicity thereto whereby the outermost surface of said light-sensitive layer exhibits higher oleophilicity than the balance of the light-sensitive layer, wherein said light-sensitive layer comprises:

(a) as said first resin, a copolymer having repeating units of the formulae (I) and (II):




(I)

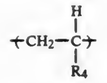
wherein $R_1$ represents a hydrogen atom or a methyl group, $R_2$ represents a hydrogen atom, a methyl group, an ethyl group or a chloromethyl group, and n represents an integer of 1 to 10;




(II)

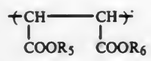
wherein $R_3$ represents a hydrogen atom or a methyl group and having an acid value of about 10 to 100;

(b) as said second resin, a copolymer having repeating units of the formulae (III) and (IV):



(III)

wherein $R_4$ represents a hydrogen atom, a methyl group, an ethyl group, a methoxy group, an ethoxy group or an aryl group;



(IV)

wherein $R_5$ represents a hydrogen atom, a methyl group or an ethyl group, and $R_6$ represents an alkyl group or an aryl group; and

(c) a diazo compound, as said light-sensitive component.

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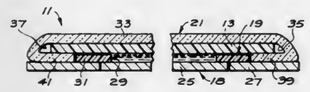
**4,294,906**

**INSTANT PROCESSING SLEEVE**

**Philip D. Bechle, Rochester, and Joseph A. Roth, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 140,072**
**Int. Cl.³ G03C *1/48***
**U.S. Cl. 430—207** **6 Claims**




1. A processing sleeve for receiving photographic film processable by a fluid to form an imagewise distribution of material for transfer by diffusion from the film to an image-receiving sheet; said sleeve comprising:

an image-receiving sheet including means for accepting and immobilizing the diffusion material from the film to form a visible image in the receiving sheet;

sheet means, superposed with said receiving sheet, including a generally flat section and doubled over portions, said portions and said flat section forming channels for slidably receiving the film into juxtaposition with said receiving sheet with the film between the portions and the flat section whereby the film is spaced from the receiving sheet; and

means for supplying the processing fluid between the received film and said receiving sheet to process the film and bring about the transfer of the diffusion material to said receiving sheet with the doubled over portions assisting in establishing a predetermined depth of the processing fluid between the received film and said receiving sheet.

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**4,294,907**

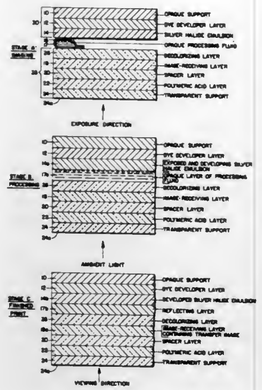
**IMAGE-RECEIVING ELEMENTS**

**Irena Y. Bronstein-Bonte, Newton; Edward P. Lindholm, Boston, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Apr. 24, 1980, Ser. No. 143,281**
**Int. Cl.³ G03C *5/54, 1/40***
**U.S. Cl. 430—213** **11 Claims**

1. An image-receiving element for use in a diffusion transfer process, said image-receiving element comprising, in sequence, a transparent support, an image-receiving layer for a diffusible image-providing material, and a layer adapted to decolorize a pH-sensitive phthalein dye in aqueous alkaline solution, said decolorizing layer comprising a polyoxyalkylene decolorizing agent hydrogen bonded with at least one other polymer.

2. An image-receiving element as defined in claim 1 wherein said diffusible image-providing material is a dye and said image-receiving layer contains a mordant.




3. An image-receiving element as defined in claim 2 wherein said mordant contains quaternary ammonium moieties.

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**4,294,908**

**PHOTORESIST COMPOSITION CONTAINING MODIFIED CYCLIZED DIENE POLYMERS**

**Yoshiyuki Harita, Kawasaki; Yoichi Kamoshida, Yokohama, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan**

**Filed Apr. 2, 1980, Ser. No. 136,477**
**Claims priority, application Japan, Apr. 24, 1979, 54-50694**
**Int. Cl.³ G03C *1/68***
**U.S. Cl. 430—286** **15 Claims**

1. A photoresist composition comprising a cyclized product obtained by contacting a conjugated diene polymer or copolymer having sites of unsaturation in the main chain or side chains with a fluorine-containing substituted sulfonic acid compound of the formula:

$$CF_nH_{3-n}SO_3R \text{ or } CF_nH_{3-n}SO_2X$$

wherein R is hydrogen, alkyl or $CF_nH_{3-n}SO_2$, X is halogen, and n is 1, 2 or 3, in an inert solvent, and a photosensitive crosslinking agent soluble in an organic solvent.

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**4,294,909**

**PHOTOSENSITIVE NEGATIVE-WORKING TONING PROCESS**

**Ross A. Lee, Webster, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

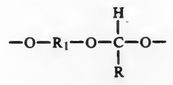
**Filed Dec. 26, 1979, Ser. No. 106,401**
**Int. Cl.³ G03C *5/04***
**U.S. Cl. 430—291** **10 Claims**

1. A process for preparing negative tonable images which comprises exposing imagewise a photosensitive element comprising a support bearing a layer of a negative-working tonable photoimaging composition which comprises

(a) at least one organic polymeric binder taken from the group consisting of polyvinylformal, polyvinylpyrrollidone, polyacrylate, cellulose acetate, polymethacrylate, and polyvinyl acetate;

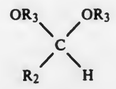
(b) a photosensitizer which upon absorption of actinic radiation is capable of generating an acid; and at least one acetal compound taken from the group of





(c) (1)

wherein R is hydrogen, alkyl of 1 to 18 carbon atoms, phenyl and substituted phenyl, and $R_1$ is taken from the group of alkylene of 2 to 12 carbon atoms and heteroalkylene of 2 to 12 carbon atoms, and



(2)

wherein $R_2$ is alkyl of 1 to 18 carbon atoms, furyl, substituted furyl, phenyl, substituted phenyl, naphthyl, and substituted naphthyl, $R_3$ is alkyl of 1 to 18 carbon atoms, and $OR_3$ when taken together form a 5, 6 or 7 membered ring, the polymeric binder (a) being plasticized by the decomposition product of one of compound (c) (1), compound (c) (2) or the combination of compounds (c) (1) and (2), and toning the exposed image areas of said element.

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**4,294,910**

**PRINTING PLATES**

**Hans Wielinga, Hilversum, Netherlands, assignor to Vickers Limited, London, England**

**Continuation of Ser. No. 781,102, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 593,697, Jul. 7, 1975, abandoned. This application Aug. 11, 1980, Ser. No. 177,283**
**Claims priority, application United Kingdom, Jul. 8, 1974, 30264/74**
**Int. Cl.³ G03F *7/02;* G03C *5/00***
**U.S. Cl. 430—302** **11 Claims**

1. A method of processing a pre-sensitized radiation sensitive plate which method comprises

(i) image-wise exposing to radiation a pre-sensitized radiation sensitive plate, said plate being adapted for the manufacture of a lithographic printing plate or a printed circuit or an integrated circuit, and said plate comprising a metallic substrate and a radiation sensitive layer comprising an organic photosensitive compound, so that said radiation sensitive layer includes areas exposed to radiation and areas not exposed to radiation, said areas being of differing solubility and comprising a more-soluble area,

(ii) thereafter developing the image-wise exposed radiation sensitive layer by selectively removing said layer from said more-soluble area and revealing the substrate underlying said more-soluble area,

(iii) thereafter treating the plate with an aqueous solution to provide a water-soluble layer overlying the revealed substrate and the previously-exposed radiation sensitive layer not removed during said developing step, said water-soluble layer being formed by applying to said plate an aqueous solution of at least one water-soluble salt selected from the group consisting of a sodium dodecyl phenoxy benzene disulphonate, a sodium salt of an alkylated naphthalene sulphonic acid, a disodium salt of methylene dinaphthalene sulphonic acid, a sodium salt of a sulphonated alkyldiphenyl oxide, a sodium dodecyl benzene sulphonate, lithium nitrate, and mixtures thereof,

(iv) thereafter burning-in said plate to adapt said plate for lithographic printing, or printed circuit or integrated circuit said burning-in being conducted in the presence of scum-forming contaminants, and

(v) removing said water-soluble layer from said plate with water, thereby removing scum-forming contaminants from the area of the revealed substrate of said plate.

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**4,294,911**

**DEVELOPMENT OF LIGHT-SENSITIVE QUINONE DIAZIDE COMPOSITIONS USING SULFITE STABILIZER**

**John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 18, 1979, Ser. No. 49,765**
**Int. Cl.³ G03C *5/34;* G03F *7/08;* B05D *3/06***
**U.S. Cl. 430—326** **23 Claims**

1. A method of developing an image-wise-exposed layer of a light-sensitive quinone diazide composition comprising contacting said layer with an alkaline developing composition to remove exposed areas of said layer, said developing composition comprising an aqueous solution containing a quaternary alkanol ammonium hydroxide developing agent, in a sufficient concentration to remove exposed areas of said layer, and a stabilizing concentration of a sulfite.

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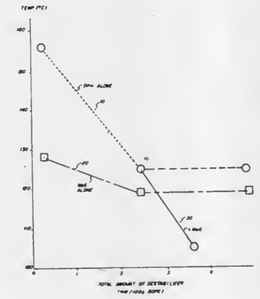
**4,294,912**

**THERMALLY RESPONSIVE COBALT(III) COMPLEX IMAGING COMPOSITIONS HAVING LOWERED ACTIVATION TEMPERATURES**

**Anthony Adin, Rochester; John W. Boettcher, Ontario, and James C. Fleming, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 17, 1980, Ser. No. 169,703**
**Int. Cl.³ G03C *1/02***
**U.S. Cl. 430—341** **32 Claims**



1. In a dye-forming composition including

a thermally-activatible precursor composition including a cobalt(III) complex containing releasable ligands;

an amplifier that reacts with either cobalt(II) or released ligands to form an agent for conversion of cobalt(III) to cobalt(II) and the release of ligands;

a first destabilizer compound which when heated with said amplifier for a specified time causes conversion of said cobalt(III) complex to cobalt(II) and released ligands; and

a dye-former capable of generating a dye in response to said conversion of the cobalt complex;

the improvement wherein said composition further includes a second destabilizer compound different from said first destabilizer compound which, when heated with said amplifier for said time without said first compound, converts said cobalt(III) complex to cobalt(II) and released ligands, said first and second destabilizer compounds together being present in admixture in respective individual amounts that provide an initiation temperature for the conversion of said complex at said specified heating time that is lower than the initiation temperatures that result when either of said destabilizer compounds is used alone in said respective individual amount.

**4,294,913**

## INFORMATION CARRIERS, METHOD OF FORMING AND COPYING SAID CARRIERS

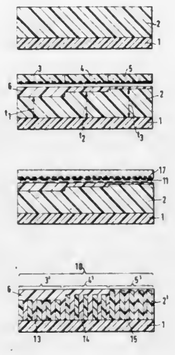
**Roland Moraw, and Renate Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Division of Ser. No. 861,491, Dec. 16, 1977. This application Aug. 7, 1979, Ser. No. 64,645**

**Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657246**

**Int. Cl.³ G03C *7/00***

**U.S. Cl. 430—396** **15 Claims**



1. A process for producing an original of an information carrier for use in zero order diffraction color projection which comprises the steps of:

(a) exposing a recording layer, mounted on a carrier, through separate color separation originals to form relief part-images, each relief part-image corresponding to a different projection color, said originals being transparent in the areas of the particular projection colors of the individual color separation originals each of said relief part-images of the projection color adjoining one another without overlap and having a depth corresponding to one of the particular projection colors;

(b) exposing the entire portion of said recording layer to be utilized in carrying information to a grating pattern without intervening development to provide a structure in which the recording layer is exposed through to said carrier;

(c) said image-wise exposure through each individual color separation original provided with an energy density equal to that required to obtain the individual projection color; and

(d) developing said exposed recording layer.

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**4,294,914**

## PHOTOGRAPHIC BLEACH COMPOSITIONS AND METHODS OF PHOTOGRAPHIC PROCESSING

**John R. Fyson, London, England, assignor to Eastman Kodak Company, Rochester, N.Y.**

**PCT No. PCT/GB79/00152, § 371 Date May 14, 1980, § 102(e) Date May 2, 1980, PCT Pub. No. WO80/00624, PCT Pub. Date Apr. 3, 1980**

**PCT Filed Sep. 14, 1979, Ser. No. 192,952**

**Claims priority, application United Kingdom, Sep. 14, 1978, 36816/78**

**Int. Cl.³ G03C *5/32, 5/38, 5/44, 5/52***

**U.S. Cl. 430—418** **15 Claims**

1. A method of processing a photographic color material comprising the step of bleaching or bleach-fixing said material with a composition comprising, as the bleaching agent, a ferric complex of an alkyliminodiacetic acid, the alkyl group of which contains from 1 to 6 carbon atoms.

10. An aqueous photographic bleaching solution containing a water-soluble halide and, as the bleaching agent, a ferric complex of an alkyliminodiacetic acid, the alkyl group of which contains from 1 to 6 carbon atoms.

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**4,294,915**

## SILVER HALIDE DEVELOPING AGENTS

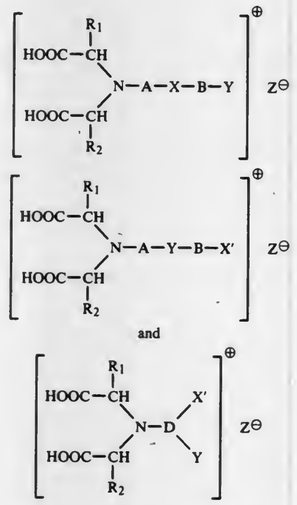
**Elbert M. Idelson, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 89,555, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 1,447, Jan. 8, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 168,642**

**Int. Cl.³ G03C *5/30***

**U.S. Cl. 430—441** **6 Claims**

1. A photographic method which comprises treating an exposed silver halide emulsion with an aqueous alkaline processing composition containing a silver halide developing agent which is represented by a formula selected from the group consisting of



and



wherein $R_1$ and $R_2$ are each H or when taken together represent the carbon atoms necessary to complete a five or six member heterocyclic moiety; X and X′ are each radicals containing an onium group; Y is a hydroquinonyl group; A and B are each alkylene having from 1 to 6 carbon atoms with the proviso that the sum of the carbon atoms of A and B is not greater than 8; D is a saturated aliphatic radical having up to 6 carbon atoms; and Z is an anion.

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**4,294,916**

## PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING A DYE FILTER OR A DYE ANTI-HALATION LAYER

**Stephen R. Postle, Brentwood, and Alexander Psaila, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland**

**Filed Apr. 30, 1980, Ser. No. 145,174**

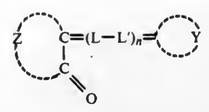
**Claims priority, application United Kingdom, May 22, 1979, 17692/79**

**Int. Cl.³ G03C *1/84***

**U.S. Cl. 430—522** **8 Claims**

1. Photographic silver halide material which comprises in at least one layer a solid dispersion of at least one water-insoluble dye of the general formula





(I)

wherein L and L′ each represent an optionally substituted methine group, n is 0, 1 or 2, Z represents the atoms necessary to complete an optionally substituted pyrazolone, hydroxypyridone, barbiturate, thiobarbiturate, dimedone or indan-1, 3-dione, Y represents the atoms necessary to complete an optionally substituted benzimidazole, benzoxazole, benzthiazole, benzselenazole, indole, lepidinole or quinole, at least one of the rings Z and Y being substituted by a —COOH group or being substituted by a group which comprises a —COOH group, in a binder.

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**4,294,917**

## PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING A DYE FILTER OR A DYE ANTI-HALATION LAYER

**Stephen R. Postle, Brentwood, and Alexander Psaila, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland**

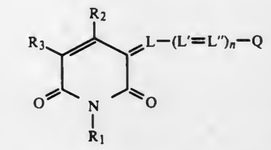
**Filed Apr. 30, 1980, Ser. No. 145,175**

**Claims priority, application United Kingdom, May 22, 1979, 17693/79**

**Int. Cl.³ G03C *1/84***

**U.S. Cl. 430—522** **6 Claims**

1. Photographic silver halide material which comprises in at least one layer a solid dispersion of a water-insoluble dye of the formula



(I)

wherein each of L, L′ and L″ are an optionally substituted methine group, n is 0 or 1, Q is phenyl or phenyl substituted by halogen, hydroxy or di-lower-alkylamino, or benzimidazole, benzoxazole, benzthiazole, benzselenazole, lepidinole, quinole or indole which are unsubstituted or substituted by halogen, cyano, nitro or lower alkyl, $R_1$ represents a hydrogen atom or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical or an optionally substituted amino group, $R_2$ represents a hydrogen atom or a hydroxy, amino, —CN, —$COOR^1$, —$CONR^1R^2$ or —$COR^1$ group or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical, and $R_3$ represents hydrogen, a —CN, —$COOR^3$, —$CONR^3R^4$, —$SO_3H$, —$SO_3^\ominus$ or —$COR^3$ group, where $R^1$, $R^2$, $R^3$ and $R^4$ each independently represent a hydrogen atom or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical, in a binder.

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**4,294,918**

## COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

**Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jul. 14, 1980, Ser. No. 168,917**

**Claims priority, application Japan, Jul. 12, 1979, 54-88440**

**Int. Cl.³ G03C *1/40***

**U.S. Cl. 430—553** **16 Claims**

1. A color photographic silver halide light-sensitive material containing a colorless photographic cyan color-forming coupler having, in a position for coupling with the oxidation product of an aromatic primary amine developing agent, as a coupling-off group, at least one alkoxy group substituted with a sulfinyl group represented by the formula (I)

—O—R—SO—$R_1$ (I)

wherein R represents a saturated or unsaturated divalent aliphatic group containing from 1 to 10 carbon atoms which may be straight or branched chain and may be substituted; and $R_1$ represents a substituted or unsubstituted straight or branched chain alkyl group, an alkenyl group, an aralkyl group, an aralkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group; and said heterocyclic group being connected with a sulfinyl group on the position of a carbon atom of the heterocyclic group.

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**4,294,919**

## DIRECT POSITIVE SILVER HALIDE LIGHT-SENSITIVE MATERIAL

**Nobuyuki Tsujino, and Shigeo Hirano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

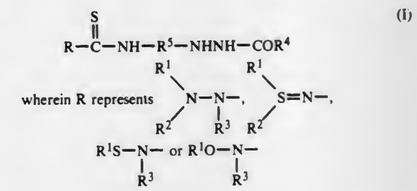
**Filed Jun. 6, 1980, Ser. No. 156,949**

**Claims priority, application Japan, Jun. 6, 1979, 54-70854**

**Int. Cl.³ G03C *1/36***

**U.S. Cl. 430—559** **20 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having coated thereon an internal latent image emulsion layer which contains a light-sensitive silver halide of the type that is not previously fogged and a hydrophilic colloid layer, at least one of said layers containing a compound represented by the formula (I) in an amount which gives a suitable maximum density when the light-sensitive material is developed by a surface developing solution



(I)

wherein R represents

wherein $R^1$ represents $R^6$ or $R^6CO$—; and $R^6$ represents an aliphatic group, an aromatic group, a heterocyclic aromatic group or hydrogen; $R^2$ and $R^4$, which may be the same or different, each represents an aliphatic group, an aromatic group, a heterocyclic aromatic group or hydrogen; or $R^1$ and $R^2$ together can form a ring; $R^3$ represents hydrogen or an aliphatic group; $R^5$ represents Y or X—A—Y wherein X and Y, which may be the same or different, each represents a divalent aromatic group, and A represents a divalent connecting group selected from —CONH—, NHCONH—, —$SO_2NH$—, —B—CONH— and —B—$SO_2NH$— wherein B represents —E—, —O—E— or —S—E— wherein the O and S is bonded to X; and E represents a divalent aliphatic group.

**4,294,920**

## PHOTOGRAPHIC SILVER HALIDE EMULSION

**Günter Helling, Siegburg; Wilhelm Saleck, Bergisch-Gladbach, and Peter Bergthaller, Cologne,all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 32,555, Apr. 23, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 212,890**

**Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818678**

**Int. Cl.³ G03C** *1/02, 1/72*

**U.S. Cl. 430—569** **6 Claims**

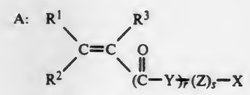
1. A light sensitive photographic silver halide emulsion containing silver halide particles dispersed in a hydrophilic colloid binder composition wherein the improvement comprises

the binder composition contains 500 mg to 500 g per mol of the silver halide and up to 100% of the binder composition of a polymer

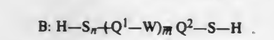
wherein the polymer used contains recurring units of compound A

with recurring units of compound B, said compound B being in an amount of 0.01 to 20% by weight of said polymer, and said polymer having an S-atom in the main chain, which compounds A and B correspond to the following formulae:

Formulae A and B



A: $R^1$, $R^3$, $C{=}C$, $R^2$, $(C{-}Y\frac{}{r}(Z)_s{-}X$



B: $H{-}S_n{+}Q^1{-}W)_{\overline{m}}Q^2{-}S{-}H$

in which

$R^1$, $R^2$ and $R^3$ which may be the same or different, represent hydrogen or substituted or unsubstituted alkyl or aryl;

Y represents oxygen or $-NR^4-$;

$R^4$ represents hydrogen or alkyl, in particular with 1 to 4 carbon atoms;

Z represents a substituted or unsubstituted alkylene or a substituted or unsubstituted arylene;

X represents $NR^1R^2$, H, OH, $SO_3H$, $PO_3H$, COOH or a heterocyclic group;

$Q^1$ and $Q^2$ which may be the same or different represent a substituted or unsubstituted alkylene or arylene group or a heterocyclic group;

W represents oxygen or sulphur and

n, m, r and s which may be the same or different, represent 0 or 1;

the said polymer being a peptizing agent, and, the remainder of the binder composition being made up with protective colloid.

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**4,294,921**

## METHOD OF HARDENING GELATIN

**Jun Yamaguchi; Takashi Naoi; Hidefumi Sera; Kunio Ishigaki, and Masasi Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

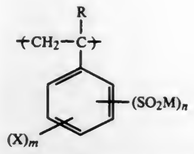
**Filed Jun. 23, 1980, Ser. No. 162,235**

**Claims priority, application Japan, Jun. 22, 1979, 54-78686**

**Int. Cl.³ G03C** *1/30;* **C08L** *89/00;* **B01J** *13/02*

**U.S. Cl. 430—621** **9 Claims**

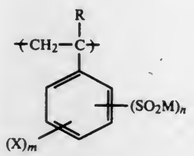
1. A method of hardening gelatin in which said gelatin is hardened by both a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of the formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

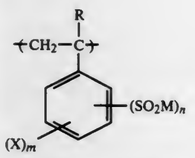
8. In a photographic material containing a gelatin emulsion layer, the improvement wherein said gelatin is hardened with a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of the formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

9. In a method for forming microcapsules by co-acervating gelatin and hardening the gelatin wall, the improvement which comprises hardening said gelatin wall using both a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

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**4,294,922**

## METHOD FOR MONITORING PREGNANCY IN MILK-PRODUCING DOMESTIC ANIMALS

**Robert B. Heap, Cambridge, England, assignor to National Research Development Corporation, London, England**

**Filed Dec. 20, 1979, Ser. No. 105,604**

**Claims priority, application United Kingdom, Dec. 29, 1978, 50234/78**

**Int. Cl.³ G01N** *33/54;* **C12Q** *1/44*

**U.S. Cl. 435—7** **17 Claims**

1. A method for diagnosing pregnancy in a milk-producing domestic animal, comprising determining the concentration of oestrogen conjugates contained in a sample cmprising whole milk or a fraction thereof of the animal and comparing said concentration with the average concentration of oestrogen conjugates in the milk of a non-pregnant similar animal of the same species, whereby a significantly higher concentration in said sample than said average concentration indicates that said animal is pregnant.



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**4,294,923**

## SUBSTRATES AND METHOD FOR DETERMINING ENZYMES

**Robert E. Smith, 574 Escondido Cir., Livermore, Calif. 94550, and Eugene R. Bissell, 101 Via Lucia, Alamo, Calif. 94507**

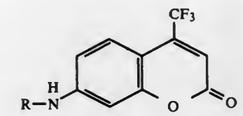
**Filed Apr. 23, 1979, Ser. No. 32,444**

**Int. Cl.³ C12Q** *1/38, 1/36*

**U.S. Cl. 435—23** **14 Claims**

1. A method for determining the presence of an enzyme in an enzyme-containing analyte, comprising:

(a) contacting the analyte with a substrate which can be hydrolyzed by said enzyme to liberate 7-amino-4-trifluoromethylcoumarin, said substrate having the formula



wherein R is an amino acid, a peptide, an amino acid which has been reacted with a blocking group, or a peptide, the terminal amino acid of which has been reacted with a blocking group, thereby forming an analyte-substrate mixture;

(b) incubating the analyte-substrate mixture under enzyme-hydrolyzing conditions to form an enzyme hydrolyzate; and

(c) fluorometrically or spectrophotometrically determining the presence of 7-amino-4-trifluoromethylcoumarin in the enzyme hydrolyzate.

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**4,294,924**

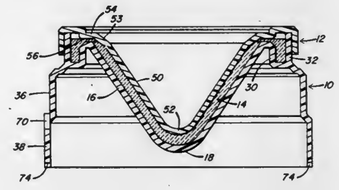
## METHOD AND CONTAINER FOR GROWTH OF ANAEROBIC MICROORGANISMS

**Pasquale L. Pepicelli, Chelmsford; George F. Lyman, N. Andover, and Robert A. Mavilia, Braintree, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.**

**Filed Feb. 25, 1980, Ser. No. 123,966**

**Int. Cl.³ C12Q** *1/24;* **C12M** *1/22, 1/16*

**U.S. Cl. 435—30** **16 Claims**



1. A container for culturing anaerobic microorganisms comprising:

a base having a cone-shaped dish and a surrounding trough with a shoulder joining them together,

a downwardly extending sleeve forming part of the base and surrounding the dish and having its lower edge extending below the bottom of the dish so that the base can be supported on a flat surface by the lower edge of the sleeve,

and a cover having a cone-shaped closure wall and a surrounding flange and down turned rim portion, said flange being sized to overlie and be closely spaced from the shoulder of the base and the rim portion sized to overlie the trough when the cover is placed on the base, the space between the shoulder and flange defining a narrow gap which may be sealed by agar spread between them,

said cone-shaped closure wall lying adjacent the cone-shaped dish of the base when the cover is in place on the base and defining a closed chamber of a preselected volume between them.

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**4,294,925**

## MONENSIN URETHANE DERIVATIVES PRODUCED BY STREPTOMYCES

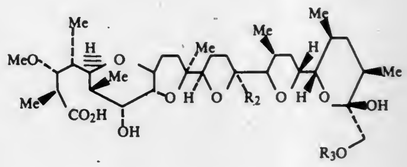
**Chao-Min Liu, and John Westley, both of Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Division of Ser. No. 77,415, Sep. 20, 1979, Pat. No. 4,263,427, which is a continuation-in-part of Ser. No. 964,564, Nov. 29, 1978, abandoned. This application Nov. 10, 1980, Ser. No. 205,478**

**Int. Cl.³ C12P** *19/26, 17/16*

**U.S. Cl. 435—84** **1 Claim**

1. A process to produce a compound of the formula



wherein $R_2$ is methyl or ethyl and $R_3$ is $-CONHR_4$ wherein $R_4$ is phenethyl which comprises cultivating a strain of Streptomyces selected from the group consisting of Streptomyces sp. X-14667, NRRL 11336, Streptomyces sp. X-14573, NRRL 11337 and Streptomyces sp. X-14575, NRRL 11338 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the end product from said solution.

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**4,294,926**

## HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION

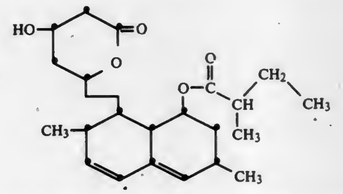
**Richard L. Monaghan, Somerset; Alfred W. Alberts, Short Hills; Carl H. Hoffman, Scotch Plains, and George Albers-Schonberg, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 48,946, Jun. 15, 1979, Pat. No. 4,231,938. This application Jan. 23, 1980, Ser. No. 114,458**

**Int. Cl.³ C12P** *7/26, 17/06*

**U.S. Cl. 435—125** **3 Claims**

1. A process of producing a compound of the formula:



or its corresponding free acid which comprises fermenting a microorganism of the genus *Aspergillus terreus* and isolating the product thereof.

**4,294,927**

## GENETIC PROCESS FOR THE PREPARATION OF ANTIBIOTIC-PRODUCER MICROMONOSPORA STRAINS

**Lajos Alföldi; Katalin Balint nee Fodor; Csaba Kari; Istvan Török, all of Szeged; György Szvoboda, Budapest; Tibor Lang, Budapest; Istvan Gado, Budapest, and Gabor Ambrus, Budapest, all of Hungary, assignors to Gyogyszerkutato Intezet, Budapest, Hungary**

**Filed Nov. 8, 1979, Ser. No. 92,554**

**Claims priority, application Hungary, Nov. 13, 1978, G0 1430**

**Int. Cl.³ C12N *15/00***

**U.S. Cl. 435—172** **9 Claims**

1. A process for preparing an antibiotic-producing Micromonospora strain having modified genetic material, which comprises preparing, following cultivation in a glycine medium, a protoplast suspension of each of two genetically different mutants of antibiotic-producing Micromonospora with lysozyme, under osmotically buffered conditions ensured by sucrose, combining the two suspensions thus obtained in the presence of polyethylene glycol, incubating at room temperature, suspending the resulting fused protoplasts in soft agar, then plating the suspended protoplasts on an agar plate containing sucrose, proline and inorganic salts, incubating the plated protoplasts for 20 to 30 days, selecting all colonies from the regenerated colonies which are sure to have genetic material different from that of said two mutants, and, prior to fusion, heat-inactivating the protoplasts of one of said mutants by heating them at 55° C. for three hours, thereby to permit the genetic material of the non-heated protoplasts to be transferred into the cytoplasm of the heat-inactivated protoplasts.

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**4,294,928**

## DENITRIFICATION OF A GAS STREAM

**Andree E. Tamony, Antioch, and Charles R. Youngson, Jr., Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 8, 1980, Ser. No. 176,439**

**Int. Cl.³ B01D *53/34***

**U.S. Cl. 423—235** **1 Claim**

1. A process for removing $NO_x$ from a gas stream wherein at least part of the $NO_x$ is present as nitric oxide which comprises (a) mixing more than one molecular proportion of chlorine per molecular proportion of said nitric oxide with the gas stream, (b) subsequently contacting the resulting mixture of gases with aqueous hydrochloric acid at a temperature of from about 10° C. to about 50° C. for a time sufficient to oxidize a substantial proportion of the nitric oxide present, and (c) scrubbing the gas stream exiting from step (b) with a mixture of aqueous sodium hydroxide and sodium hypochlorite at a temperature of from about 30° C. to about 50° C.

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**4,294,929**

## PRODUCTION OF EDIBLE PROTEIN SUBSTANCES

**Gerald L. Solomons, High Wycombe, and Gerald W. Scammell, Chinnor, both of England, assignors to Ranks Hovis McDougall Limited, London, England**

**Continuation of Ser. No. 711,964, Aug. 5, 1976, Pat. No. 4,061,781, which is a continuation of Ser. No. 414,102, Nov. 8, 1973, abandoned, which is a continuation of Ser. No. 140,303, May 4, 1971, abandoned. This application Dec. 5, 1977, Ser. No. 857,591**

**Claims priority, application United Kingdom, May 14, 1970, 23452/70; Jun. 24, 1970, 30584/70**

**The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.**

**Int. Cl.³ C12N *1/14*; C12R *1/77***

**U.S. Cl. 435—254** **9 Claims**

1. Biologically pure fungal culture containing a strain of *Fusarium graminearum* Schwabe I.M.I. 145425 or a mutant or variant thereof in a culture medium in which this strain is present in a culture medium containing or being supplied with nutrients or additives necessary for the sustenance and multiplication of the strain, the medium having a pH between 3.5 and 7 and the temperature of the medium being maintained at a precise value within the range of between 25° and 34° C.

4. A biologically pure culture of the microorganism *Fusarium graminearum* Schwabe, having the identifying characteristics of IMI 145425, said culture being capable of producing proliferation of said microorganism in a recoverable quantity upon fermentation in a culture medium containing essentially growth-promoting nutrient substances, wherein said proliferated organism comprises an edible protein-containing substance possessing a high net protein utilization value of at least 65 based on the α-amino nitrogen.

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**4,294,930**

## PROCESS FOR IMPROVING THE RECOVERY OF MICROBIAL CELL BIOMASS

**Jeffrey T. Barach, and Leslie Bluhm, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Aug. 22, 1979, Ser. No. 68,876**

**Int. Cl.³ C12N *1/02***

**U.S. Cl. 435—261** **4 Claims**

1. A process for recovering chain-forming microorganisms from a culture broth with improved yield, consisting essentially of subjecting a culture broth containing chain-forming microorganisms to shearing conditions in apparatus selected from the class consisting of high speed dispersers, homogenizers and sonic oscillators sufficient to shorten the chain length of said microorganisms and thereby substantially reduce the packed cell volume thereof, and then recovering said microorganisms from said culture broth by centrifugation.

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**4,294,931**

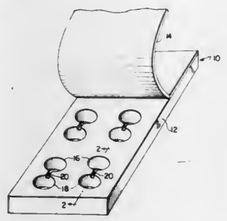
## DEVICE FOR CONDUCTING MICROBIOLOGICAL RADIORESPIROMETRIC ASSAYS

**Gilbert V. Levin, Annapolis, and Patricia A. Straat, Baltimore, both of Md., assignors to Biospherics Incorporated, Rockville, Md.**

**Filed Dec. 26, 1979, Ser. No. 107,383**

**Int. Cl.³ C12M *1/20***

**U.S. Cl. 435—301** **8 Claims**




1. A device for conducting a microbological radiorespirometric assay under aerobic or anaerobic conditions which device comprises a support member which includes a plurality of pairs of chambers, one chamber in each said pair containing a radioactive labeled substrate which is capable of being metabolized by at least some microorganisms to yield a radioactive gas, the other chamber in each said pair containing a means for collecting radioactive gas, the two chambers in each pair being in communication with each other by means of a passageway, said passageway opening into each of said chambers at the upper portion thereof, and closure means for closing said chambers and said passageway, said passageway being situated in said support member or in said closure means.



**4,294,932**

## METHANATION PROCESS

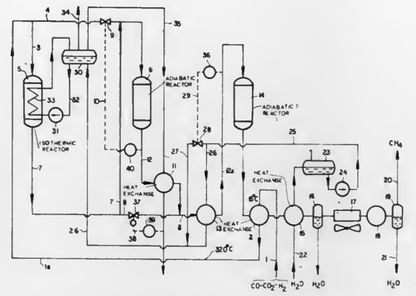
**Reiner Lohmüller, Munich; Helmut Schneider, Grünwald, and Allan Watson, Ottobrunn, all of Fed. Rep. of Germany, assignors to Linde AG, Wiesbaden, Fed. Rep. of Germany**

**Continuation of Ser. No. 875,903, Feb. 7, 1978, abandoned. This application Aug. 8, 1979, Ser. No. 64,831**

**Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705151**

**Int. Cl.³ C10K *3/04***

**U.S. Cl. 518—706** **1 Claim**




1. A process for carrying out a strongly exothermic catalytically promoted chemical reaction to form methane, comprising the steps of:

forming reactant-gas mixture of at least two components capable of undergoing catalytically promoted exothermic reaction, said components consisting essentially of hydrogen and carbon oxide;

subdividing said reactant-gas mixture into two streams;

passing a first of said streams of said reactant-gas mixture into contact with a catalyst in an adiabatic exothermic methanization reaction stage without heating the latter or abstracting heat from the latter to produce a first product mixture;

passing the second of said streams of said reactant-gas mixture through an isothermal exothermic methanization reaction stage into contact with a catalyst capable of promoting said reaction to produce a second product mixture while abstracting heat from said isothermal reaction stage to maintain a substantially constant temperature therein; and

controlling the distribution of said reactant-gas mixture between said streams in response to the temperature of said first product mixture to prevent excessive temperatures from developing in said adiabatic reaction stage, portion of said second product mixture being passed through said adiabatic reaction stage.

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**4,294,933**

## PROCESS FOR THE PRODUCTION OF AN ION EXCHANGE MEMBRANE

**Kunio Kihara; Hideo Toda, both of Ami; Eiki Yasukawa, Tsuchiura; Toshiaki Ishibashi, Ami, and Taketoshi Tokita, Tsuchiura, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan**

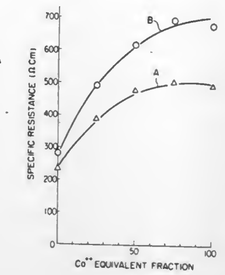
**Filed Jul. 5, 1979, Ser. No. 54,883**

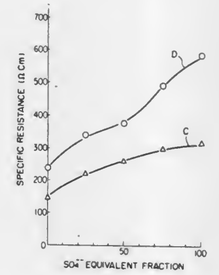
**Claims priority, application Japan, Jul. 13, 1978, 53-84590**

**Int. Cl.³ C25B *13/00***

**U.S. Cl. 521—27** **26 Claims**

1. A process for the production of a heterogeneous ion exchange membrane in which an ion exchange resin fine powder is dispersed in a thermoplastic resin, which process comprises kneading a silane-modified polyolefin resin selected from the group consisting of silane-grafted polyolefin resins and vinylsilane-copolymerized polyolefin resins, and an ion exchange resin fine powder, extruding the mixture to form a membrane and then subjecting the resulting membrane to a treatment with hot water.

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**4,294,934**

## PROCESS FOR THE PRODUCTION OF ELASTIC, OPTIONALLY CELLULAR, POLYURETHANE UREAS

**Gerhard Grögler; Jürgen Schwindt; Otto Ganster; Hans-Joachim Meiners, all of Leverkusen, and Hans-Dieter Ruprecht, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jun. 30, 1980, Ser. No. 164,752**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928182**

**Int. Cl.³ C08G *18/76, 18/22, 18/18***

**U.S. Cl. 521—160** **4 Claims**

1. In a process for the production of polyurethane urea elastomers having a gross density of more than 200 kg/m³ comprising: casting a reaction mixture of

(A) an isocyanate prepolymer produced from

(a) 1 mole of a compound containing at least 2 Zerewitinoff-active hydrogen atoms and having a molecular weight of from 400 to 10,000 and

(b) 2 to 10 moles of diisocyanatodiphenylmethane,

(B) an aromatic diamine, and

(C) 0 to 50 mole percent, based on component (B), of a polyol having a molecular weight of from 62 to 6000, the equvalent ratio between component (A) and components (B)+(C) amounting to between 0.9:1 and 1.3:1,

into a mold, hardening the reaction mixture in the mold and subsequently removing it from the mold, the improvement wherein said isocyanate prepolymer (A) has been produced using an isomer mixture comprising:

from 15 to 80 mole percent of 2,4'-diisocyanatodiphenylmethane,

from 20 to 85 mole percent of 4,4'-diisocyanatodiphenylmethane, and

from 0 to 20 mole percent of 2,2'-diisocyanatodiphenylmethane.

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**4,294,935**

## METHOD OF PRODUCING ETHYLENE-VINYL ALCOHOL COPOLYMER FILM

**Yuji Kodera; Kyoichiro Ikari, and Shunji Miyake, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan**

**Filed Dec. 19, 1979, Ser. No. 105,412**

**Claims priority, application Japan, Dec. 29, 1978, 53-161912; Aug. 22, 1979, 54-107569**

**Int. Cl.³ B29C** *17/02, 25/00;* **C08F** *16/06;* **C08L** *29/04*

**U.S. Cl. 525—60** **14 Claims**

11. A method of producing an ethylene-vinyl alcohol copolymer film, which comprises: biaxially or multiaxially stretching a nonstretched ethylene-vinylalcohol copolymer film having a moisture content of not more than 3.5%, said ethylene-vinyl alcohol copolymer having an ethylene content of 20 to 55 mole % and a saponification degree of not less than 96 mole %, and said stretching being conducted within a temperature range of 50° to 150° C. to such an extent that the film is expanded to an area 4 to 20 times the original area; and heat treating said stretched film at a temperature in the range between 100° C. and a temperature lower than the melting point of said copolymer by 10° C.

14. The ethylene-vinylalcohol copolymer film produced by the process of claim 11.

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**4,294,936**

## ADHESIVE COMPOSITIONS

**Ralf Korpman, Bridgewater, N.J., assignor to Permacel, New Brunswick, N.J.**

**Continuation-in-part of Ser. No. 54,541, Jul. 5, 1979, abandoned. This application May 5, 1980, Ser. No. 142,691**

**Int. Cl.³ C08L** *9/06*

**U.S. Cl. 525—93** **10 Claims**

1. A pressure-sensitive adhesive composition comprising a synthetic thermoplastic rubbery block copolymer, a non-rubbery polymer and a tackifier resin, wherein said rubbery block polymer is a copolymer of an alkenylarene A block and an aliphatic diene B block in which the alkenylarene is a polymer of styrene, a ring lower alkyl substituted styrene, a ring phenyl lower-alkyl substituted styrene, a ring (lower alkyl substituted) phenyl lower alkyl substituted styrene or a ring cyclohexyl substituted styrene and the aliphatic diene is a conjugated lower aliphatic diene of from 4 to 6 carbon atoms inclusive and said non-rubbery polymer is a copolyester, said copolyester being a polymer of at least two different ester units, each ester unit being a condensation product of a dicarboxylic acid and an alkylene diol of from 2 to 6 carbon atoms; and wherein for every 100 parts of rubbery block copolymer there is employed from about 5 to about 50 parts of the non-rubbery polymer and from about 20 to about 150 parts of tackifier resin.

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**4,294,937**

## IMPACT POLYMERS

**Richard O. Whitehead, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Jun. 18, 1979, Ser. No. 49,840**

**Int. Cl.³ C08L** *9/06, 53/02*

**U.S. Cl. 525—99** **6 Claims**

1. A graft copolymer composition having improved toughness consisting essentially of:

(a) from about 4 to about 12 parts by weight of a mixture of a polybutadiene elastomer and a styrene-butadiene two-block copolymer in a weight ratio of styrene-butadiene two-block copolymer to polybutadiene elastomer of about 2:80 to about 4:80, where the average molecular weight of the styrene block of the block copolymer is between about 100,000 and about 150,000, and the average molecular weight of the butadiene block of the block copolymer is between about 30,000 and about 60,000; and

(b) from about 96 to about 88 parts by weight of a polymerized styrene.

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**4,294,938**

## THERMAL STABILIZATION OF POLYALKYLENE TEREPHTHALATE RESIN COMPOSITIONS

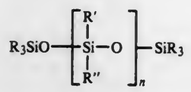
**Charles E. Berr, Wilmington, Del., and Edward J. Deyrup, Northeast, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Feb. 15, 1980, Ser. No. 122,063**

**Int. Cl.³ C08L** *67/02, 23/26*

**U.S. Cl. 525—101** **9 Claims**

1. A molding composition comprising (a) polyalkylene terephthalate having an inherent viscosity of at least 0.4 wherein the alkylene moiety contains 2–4 carbon atoms, (b) 0–50% by weight of reinforcing material, said weight based on polyalkylene terephthalate and reinforcing material, (c) 1–25% by weight of an ionic hydrocarbon copolymer of an α-olefin of 2–5 carbon atoms and an α,β-ethylenically unsaturated carboxylic acid of 3–5 carbon atoms in which the carboxyl groups have been partially neutralized with metal cations, said weight based on polyalkylene terephthalate and copolymer, and (d) 0.1–5% by weight of a silicone resin of the general formula



wherein R is lower alkyl or phenyl, R′ and R″ are each independently a hydrocarbyl group of 1–20 atoms and one of R′ and R″ can be hydrogen, and n is an integer of between about 5 and 500, said weight based on polyalkylene terephthalate and silicone resin.

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**4,294,939**

## COATING COMPOSITION

**Eiji Taniguchi; Susumu Akagi, both of Ichihara, and Seiichi Torimitsu, Chiba, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Continuation of Ser. No. 930,407, Aug. 2, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 186,158**

**Int. Cl.³ C08L** *63/00*

**U.S. Cl. 525—118** **4 Claims**

1. An organic solvent-based coating composition comprising:

(I) a water-insoluble polymeric cross-linkable basic nitrogen atom-containing acrylic component comprising at least one film-forming acrylic copolymer containing basic nitrogen atoms, in which component there are present, based on the weight of said component:

(a) 2 to 10% by weight of polymerized units derived from at least one basic nitrogen atom-containing acrylate selected from the group consisting of di($C_{1-2}$alkyl-)amino $C_{1-3}$alkyl acrylates and methacrylates,

(b) 0.5 to 5% (B%) by weight of polymerized units derived from at least one acrylic amide selected from the group consisting of acrylamide and methacrylamide,

(c) 0.5 to 20% (C%) by weight of polymerized units derived from at least one hydroxyl-containing acrylic monomer selected from the group consisting of hydroxy $C_{2-4}$alkyl acrylates and methacrylates,

(d) 35 to 95% by weight of polymerized units derived from at least one alkyl acrylate selected from the group consisting of $C_{1-4}$alkyl acrylates and methacrylates, and

(e) 0 to 50% by weight of polymerized units derived from one or more other copolymerizable ethylenically unsaturated monomers, said percentages A, B and C satisfying the relation:



$$\frac{14 - A}{4} \leqq B + C \leqq 28 - 2A \text{, and;}$$

(II) a cross-linking component comprising at least one polyepoxide compound having an epoxy equivalent of not more than 400 and containing at least two epoxy groups per molecule, said cross-linkable component (I) and cross-linking component (II) being present in said composition so that the ratio by gram atom of the basic nitrogen atom in said component (I) to the epoxy oxygen atom in said component (II) falls within the range of between 0.3 and 3.0.

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**4,294,940**

## RESIN COMPOSITION FOR ELECTROCOATING

**Minoru Hino; Takao Oshima, both of Takatsuki; Kazuo Hayatsu, Ibaraki; Michio Yamamoto, Takatsuki, and Seimei Yasui, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Jan. 9, 1980, Ser. No. 110,688**

**Claims priority, application Japan, Jan. 12, 1979, 54-2525; Jul. 19, 1979, 54-92202; Aug. 23, 1979, 54-108016**

**Int. Cl.³ C08G** *18/80, 18/62;* **C25D** *13/06*

**U.S. Cl. 525—124** **10 Claims**

1. A resin composition for electrocoating, which comprises

(I) a reaction product (G) of 100 parts by weight of an epoxy compound (E) and 5 to 200 parts by weight of a partially esterified and/or partially amidated product (D) which is obtained by partially esterifying and/or partially amidating an adduct (A) of a conjugated diene polymer having a number average molecular weight of 150 to 50,000 with an α,β-unsaturated dicarboxylic acid or its anhydride, wherein said α,β-unsaturated dicarboxylic acid or its anhydride is used in an amount such that the content of the dicarboxylic acid in the adduct (A) becomes 5 to 25% by weight based on the total weight of the adduct (A), with an alcoholic hydroxy group-containing compound (B) and/or a primary or secondary monoamine (C), respectively, said compound (B) and monoamine (C) being used in an amount such that the sum of the molar number of the compound (B) and that of the monoamine (C) becomes 0.7 to 1.2 mol per 1 mol of the α,β-unsaturated dicarboxylic acid or its anhydride, and

(II) a completely blocked organic polyisocyanate in an amount of 5 to 200 parts by weight to 100 parts by weight of the reaction product (G), said mixture of the reaction product (G) and the completely blocked organic polyisocyanate being neutralized.

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**4,294,941**

## COMPATIBLE LOW SHRINK RESIN SYSTEMS

**Gwilym E. Owen, Jr., Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Dec. 14, 1979, Ser. No. 103,751**

**Int. Cl.³ C08L** *67/06*

**U.S. Cl. 525—170** **8 Claims**

1. A compatible, moldable composition comprising a thermoplastic resin, a thermosetting resin and a monomer,

a. said thermoplastic resin comprising the terpolymer of vinyl-acetate, methylmethacrylate and acrylic acid;

b. said thermosetting resin comprising an unsaturated polyester produced by the interreaction of propylene glycol, dipropylene glycol, maleic anhydride and adipic acid, the sum of the weight of said dipropylene glycol and said adipic acid comprising not less than about 31.6 percent by weight of the weight of the theoretical yield of the polyester product; and ,

c. said thermoplastic resin comprising from about 7 to about 18 weight percent of said composition, said thermosetting resin comprising from about 31 to about 55 weight percent of said composition and said monomer comprising from about 27 to about 61 weight percent of said composition.

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**4,294,942**

## RUBBERY COPOLYMERS OF 2,3-DIMETHYL 1,3-BUTADIENE

**James N. Henderson, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Continuation of Ser. No. 3,835, Jan. 16, 1979, abandoned, which is a continuation of Ser. No. 915,682, Jun. 14, 1978, abandoned, which is a continuation of Ser. No. 825,318, Aug. 17, 1977, abandoned, which is a continuation of Ser. No. 775,125, Mar. 7, 1977, abandoned. This application Feb. 14, 1980, Ser. No. 121,626**

**Int. Cl.³ C08F** *297/02*

**U.S. Cl. 525—314** **5 Claims**

1. Stress crystallizable tapered block copolymers of 2,3-dimethyl-1,3-butadiene and butadiene or isoprene in which the 2,3-dimethyl-1,3-butadiene content ranges from about 20 to about 80 mole percent, characterized in that the said tapered block copolymers have one terminal segment of the block made up almost entirely of 2,3-dimethyl-1,3-butadiene units and the other terminal segment made up almost entirely of units of the other diene, either butadiene or isoprene, between these relatively pure terminal blocks is a central segment of gradually changing composition made up of both 2,3-dimethyl-1,3-butadiene units and units of the other diene, 1,3-butadiene or isoprene, said copolymers being further characterized in that the microstructure of the 2,3-dimethyl-1,3-butadiene segments range from about 55 to about 65 percent trans-1,4 and does not exceed about 20 percent 1,2-microstructure.

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**4,294,943**

## PROCESS FOR PREPARING FLUORINE-CONTAINING POLYMERS HAVING CARBOXYL GROUPS

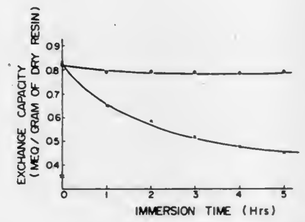
**Yasuharu Onoue, Tokyo; Toshikatsu Sata, Tokuyama; Akihiko Nakahara, Tokuyama, and Junichi Itoh, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan**

**Division of Ser. No. 898,950, Apr. 21, 1978, Pat. No. 4,200,711. This application Nov. 28, 1979, Ser. No. 92,339**

**Claims priority, application Japan, Apr. 25, 1977, 52-46861; Dec. 19, 1977, 52-152694**

**Int. Cl.³ C08F** *8/06*

**U.S. Cl. 525—358** **14 Claims**




1. A process for preparing a fluorine-containing polymer having carboxyl groups, which comprises subjecting a solid fluorine-containing polymer having sulfonyl halide groups bonded thereto as pendant groups to an oxidation reaction at a temperature of 50° to 250° C. in the presence of a vapor of an organic compound at least having a carbon-hydrogen bond and an oxidizing agent in vapor form.

**4,294,944**

## FLAME RETARDANT ANTISTATIC ADDITIVES AND ANTISTATIC FIBERS

**David D. Newkirk, Beaverton, Oreg.; Robert B. Login, Middletown, Pa., and Basil Thir, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.**

**Division of Ser. No. 746,723, Dec. 2, 1976, Pat. No. 4,229,554. This application Nov. 13, 1979, Ser. No. 94,032**

**Int. Cl.³ C08L *63/00***

**U.S. Cl. 525—423** **7 Claims**

1. A flame-retardant, antistatic synthetic polymeric fiber which is the product of the process of dispersing in said fiber about 1 percent to about 12 percent by weight of a polymer composition which is the reaction product of a polyoxyalkylene compound with a halogenated aliphatic or aromatic diacid, anhydride or acid halide thereof or a diol.

2. The flame-retardant antistatic fiber of claim 1 wherein said fiber is a polyamide fiber.

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**4,294,945**

## REDUCTION OF SCALE FORMATION DURING VINYL CHLORIDE POLYMERIZATION WITH TIN MERCAPTIDES

**Chung H. Wei, Bolton, Mass., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Apr. 21, 1980, Ser. No. 142,294**

**Int. Cl.³ C08F *2/44, 2/38, 2/18***

**U.S. Cl. 526—74** **10 Claims**

1. A process for the suspension polymerization of vinyl chloride which comprises polymerizing vinyl chloride monomer in an aqueous suspension polymerization medium in the presence of an effective amount of a composition consisting essentially of an organotin mercaptide having the formula $R_mSn(SR')_{4-m}$, where m is an integer from 1 to 3, $R_m$ is a hydrocarbon group, and R' is selected from the group consisting of $R_m$ and $-C(O)R_m$, and an epoxidized vegetable oil, during a substantial portion of the reaction, to lessen the amount of polymer scale formation from the polymerization reaction.

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**4,294,946**

## LOW RESIDUAL MONOMER α-METHYLSTYRENE-ACRYLONITRILE COPOLYMERS AND ABS BLENDS THEREFROM

**Hiroyuki Minematsu, Niihama; Kojiro Matsumoto, Takarazuka; Tadashi Saeki, and Akira Kishi, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan**

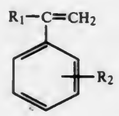
**Continuation-in-part of Ser. No. 100,763, Dec. 6, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,203**

**Claims priority, application Japan, Dec. 6, 1978, 53-151807; Dec. 6, 1978, 53-151808; Rep. of Korea, Dec. 6, 1979, 79-4310[U]**

**Int. Cl.³ C08F *2/22, 2/26***

**U.S. Cl. 526—80** **6 Claims**

1. A process for preparing a thermoplastic resin having high heat resistance by emulsion polymerization of a monomer mixture consisting essentially of α-alkylstyrene compound of the formula:



wherein $R_1$ is $C_1$–$C_3$ alkyl and $R_2$ is hydrogen, $C_1$–$C_3$ alkyl or halo($C_1$–$C_3$)alkyl and an unsaturated nitrile in a weight proportion of 65:35 to 80:20 in the presence of a radical initiator, characterized in that the whole amount of the α-alkylstyrene compound and 10 to 99% by weight of the unsaturated nitrile on the basis of its total amount are first subjected to polymerization and, after the polymerization, the remaining portion of the unsaturated nitrile is added to the reaction mixture and the resultant mixture is subjected to further polymerization until the polymerization is substantially completed.

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**4,294,947**

## PROCESS FOR THE PRODUCTION OF POWDERY, THERMOPLASTIC COPOLYMERS FROM ETHYLENE AND BUTENE-(1)

**Klaus Doerk, Gladbeck; Klaus Koch, Kirchhellen; Horst Banke, Dorsten, and Bernhard Toben, Schermbeck, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Herne, Fed. Rep. of Germany**

**Filed Nov. 1, 1979, Ser. No. 90,408**

**Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847986**

**Int. Cl.³ C08F *2/14, 4/76***

**U.S. Cl. 526—119** **17 Claims**

1. A process for the production of a copolymer of ethylene and butene-(1) which comprises:

copolymerizing a mixture of ethylene and butene-(1) at 50°–95° C. and 10–100 bar in the presence of a catalyst which comprises (1) the reaction product of a chlorine and/or alkoxy-containing vanadyl (V) compound and an organic aluminum compound selected from the group consisting of ethylaluminum dichloride, diethylaluminum chloride, isobutylaluminum dichloride, diisobutylaluminum chloride and mixtures thereof, and (2) an aluminum alkyl activating compound therefor selected from the group consisting of aluminum trialkyls, alkyl aluminum sesquichloride, alkyl aluminum dichloride, and mixtures thereof;

wherein the polymerization reaction is carried out in a solvent which comprises liquid butene-(1); thereby

obtaining a fluid powdery copolymer having a density up to about 0.930 g/cm³.

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**4,294,948**

## PROCESS FOR PREPARING OLEFIN POLYMERS OR COPOLYMERS, AND CATALYST FOR USE IN SAID PROCESS

**Akinori Toyota, Iwakuni; Ken Yoshitugu, Ohtake, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan**

**Continuation of Ser. No. 880,584, Feb. 23, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,317**

**Claims priority, application Japan, Mar. 4, 1977, 52-22754**

**Int. Cl.³ C08F *4/02, 10/06***

**U.S. Cl. 526—125** **7 Claims**

1. A process for preparing an olefin polymer or copolymer by polymerizing or copolymerizing an olefin containing at least 3 carbon atoms which may contain at most 10 mole% of ethylene and/or a diene, at a temperature of about 0° to about 300° C., and a pressure of about 1 to about 7 kg/cm², in the presence of a catalyst composed of (A) a solid titanium catalyst component obtained by reacting a solid magnesium compound derived from (i) a halogen-containing magnesium compound, (ii) an active hydrogen-containing organic compound, (iii) an organic acid ester and (iv) an organometallic compound of metal of Groups II to III of periodic table, with a titanium compound, and (B) an organoaluminum compound; characterized in that the solid titanium catalyst component (A) is prepared by

(1) reacting a mechanically pulverized product of an aromatic carboxylic acid ester containing up to 20 carbon atoms, and a halogen-containing magnesium compound selected from the group consisting of magnesium dihalides, magnesium alkyl halides, magnesium alkoxy halides and magnesium phenoxy halides, said mechanically pulverized product being obtained by milling at a temperature of about 0° to about 100° C. during the period of about 1 hour to about 10 days, with an active hydrogen-containing organic compound selected from the group consisting of aliphatic alcohols containing 1 to 8 carbon atoms, alicyclic alcohols containing 5 to 12 carbon atoms, aromatic alcohols containing 7 to 8 carbon atoms, and phenols containing 6 to 18 carbon atoms, in the absence of mechanical pulverization,

(2) reacting the resulting reaction product with an organometallic compound of a metal of Groups II to III of the periodic table selected from the group consisting of:

(a) organoaluminum compounds of the formula

$$R/mAl(OR^2)_nH_pX_q$$

wherein $R^1$ and $R^2$ are identical to, or different from, each other and represent an alkyl group containing 1 to 8 carbon atoms, X represents a halogen atom, m is more than 0 but not more than 3 ($0<m\leqq 3$), n is at least 0 but less than 3 ($0\leqq n<3$), p is at least 0 but less then 3 ($0\leqq p<3$), q is at least 0 but less than 3 ($0\leqq q<3$), and $m+n+p+q=3$, and

(b) compounds of the formula

$$R^1R^3M^2$$

wherein $R^1$ is as defined above, $R^3$ is the same as $R^1$ or represents a halogen atom, and $M^2$ represents magnesium, in the absence of mechanical pulverization, and

(3) washing the resulting solid reaction product with an inert organic solvent, reacting the washed solid reaction product with a titanium compound of the formula

$$Ti(OR)_rX_{4-r}$$

wherein R represents a hydrocarbon group, X represents a halogen atom, and r is a number of 0 to 4 ($0\leqq r\leqq 4$), in the absence of mechanical pulverization, and separating the solid from the reaction system, wherein the molar ratio of the organic acid ester and halogen-containing magnesium compound is from about 0.01 to 1 less than 1 to 1; the ratio of the mechanically pulverized product to the active hydrogen-containing organic compound is from about 0.01 to about 10 moles of organic compound per magnesium atom in the pulverized product; and the amount of the organometallic compound of a metal of Groups II to III of the periodic table is from about 0.01 moles to about 10 moles per mole of the active hydrogen-containing compound.

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**4,294,949**

## NOVEL POLYMERIC COMPOUNDS

**Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 924,417, Jul. 13, 1978, Pat. No. 4,210,612. This application Jan. 25, 1980, Ser. No. 115,277**

**Claims priority, application Switzerland, Jul. 19, 1977, 8915/77**

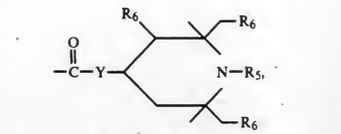
**Int. Cl.³ C08F *226/06***

**U.S. Cl. 526—262** **12 Claims**

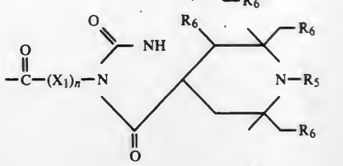
1. A copolymer of a compound which carries N-heterocyclic rings in a side position and has the recurring structural unit of the formula I

(I)

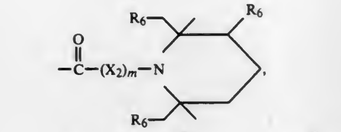
in which $R_1$ is a group, containing an N-heterocyclic ring, of the formulae II, III, IV and V



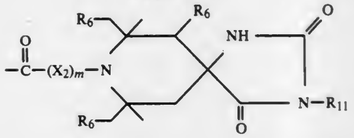
(II)



(III)

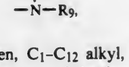


(IV)

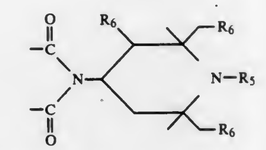


(V)

in which $R_5$ is hydrogen, oxyl, $C_1$–$C_{18}$ alkyl, 2-hydroxyethyl, 2-hydroxypropyl, $C_3$–$C_8$ alkenyl, $C_3$–$C_6$ alkynyl, $C_7$–$C_{12}$ aralkyl, $C_2$–$C_{21}$ alkoxyalkyl, an aliphatic acyl group having 1–4 C atoms or one of the groups $-CH_2COOR_7$ or $-COOR_8$, in which $R_7$ is $C_1$–$C_{12}$ alkyl, $C_3$–$C_8$ alkenyl, phenyl, $C_7$–$C_8$ aralkyl or cyclohexyl and $R_8$ is $C_1$–$C_{12}$ alkyl, phenyl, benzyl or cyclohexyl, and $R_6$ is hydrogen or $C_1$–$C_4$ alkyl and Y is —O— or



in which $R_9$ is hydrogen, $C_1$–$C_{12}$ alkyl, $C_7$–$C_{12}$ aralkyl or cyclohexyl, and $X_1$ is a group of the formula $-O-CH(R_{10})-CH_2-$ (VI) or denotes $-O-CH_2-CH_2-CH_2-$, in which $R_{10}$ is hydrogen, methyl, ethyl, phenoxymethyl or phenyl, and n is 0 or 1, and $X_2$ is a group of the formula VI, in which $R_{10}$ is as defined above, or a group of the formula $-O-CH_2-CH(OH)-CH_2-$ (VII), and m is 0 or 1, and $R_{11}$ is $C_1$–$C_{18}$ alkyl or is cyclohexyl, phenyl or benzyl which are unsubstituted or substituted by $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkoxy, and $R_2$ is hydrogen or $C_1$–$C_4$ alkyl, and, if $R_2$ and $R_4$ are hydrogen, $R_1$ and $R_3$ together form a group of the formula VIII



(VIII)

in which $R_5$ and $R_6$ are as defined above and $R_3$ is hydrogen or $C_1$–$C_2$ alkyl and $R_4$ is hydrogen or methyl, with a compound containing at least one polymerisable double bond, the molar ratio of the component of the formula I to the co-component being up to 1:10.

**4,294,950**

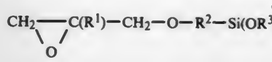
## COATING COMPOSITION COMPRISING HYDROLYZATES FROM SILANE COMPOUNDS

**Hirohisa Kato, Aichi, Japan, assignor to Ito Optical Industrial Co., Ltd., Gamagori, Japan**

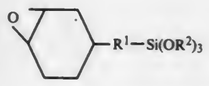
**Filed Jan. 30, 1980, Ser. No. 116,946**
**Claims priority, application Japan, Feb. 16, 1979, 54-17716**
**Int. Cl.³ C08G *77/06***
**U.S. Cl. 528—14** **7 Claims**

1. A coating composition comprising:

(A) at least one hydrolyzate selected from the group consisting of a hydrolyzate of a silicon compound of the general formula



wherein $R^1$ is hydrogen or $CH_3$, $R^2$ is alkylene of 1–4 carbon atoms, and $R^3$ is alkyl of 1–4 carbon atoms, and a hydrolyzate of a silicon compound of the general formula



wherein $R^1$ is alkylene of 1–4 carbon atoms and $R^2$ is alkyl of 1–4 carbon atoms;

(B) a compound selected from the group consisting of unsaturated and saturated polyvalent carboxylic acids and anhydrides thereof; and

(C) a curing agent.

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**4,294,951**

## RAPID CURING POLYURETHANE ELASTOMER PREPARED FROM A DIPHENYLMETHANEDIISOCYANATE BASED LIQUID PREPOLYMER AND A CURING AGENT CONTAINING A POLYTETRAMETHYLENE ETHER GLYCOL, A DIOL AND AN ORGANOMETALLIC CATALYST

**Toshio Sugita, Yokohama; Hiroaki Sakaguchi, Ashiya; Hisanobu Tsuda, Kamakura, and Tsuyoshi Suzuki, Kawasaki, all of Japan, assignors to Mitsui-Nisso Corporation, Tokyo, Japan**

**Filed Jul. 14, 1980, Ser. No. 168,482**
**Int. Cl.³ C08G *18/72***
**U.S. Cl. 528—55** **13 Claims**

1. A rapid curing polyurethane elastomer, said elastomer being prepared by a process comprising mixing:

A. a prepolymer which is liquid at room temperature and which is prepared by reacting:

1. about 4 to about 6 equivalents of a mixture of diphenylmethanediisocyanate and a carbodiimide modified material of said diisocyanate, said modified material being liquid at room temperature, with

2. about one equivalent of polytetramethylene ether glycol having a mean molecular weight of from about 650 to about 2000, or with about one equivalent of a mixture of said polytetramethylene ether glycol and an aliphatic diol having a molecular weight less than about 250, and

B. a curing agent consisting essentially of a mixture of about one equivalent of said polytetramethylene ether glycol, about one to about four equivalents of a diol having a molecular weight less than about 250 as a chain-elongating agent, and an organometallic catalyst,

the weight ratio of the prepolymer to the curing agent being such that the NCO/OH equivalent ratio is about 1.00 to about 1.10.

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**4,294,952**

## POLYAMIDE-IMIDE RESIN AND ITS PRODUCTION

**Yoshiyuki Mukoyama, Hitachi, and Toniichi Sakata, Katsuta, both of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan**

**Filed Nov. 16, 1979, Ser. No. 94,938**
**Claims priority, application Japan, Nov. 30, 1978, 53-148820; Dec. 28, 1978, 53-164753; Mar. 22, 1979, 54-33921**
**Int. Cl.³ C08G *18/73, 18/74, 18/75, 18/76***
**U.S. Cl. 528—67** **16 Claims**

1. A polyamide-imide resin obtained by reacting in a cresol type solvent a polyisocyanate containing isocyanurate rings, an aromatic diisocyanate, a lactam and a polycarboxylic acid containing at least one acid anhydride group at a temperature of 160° to 230° C., said polyisocyanate being used in an amount of 1 to 30 equivalent % based on the total isocyanate equivalent and said lactam being used in an amount of 20 to 80 equivalent % based on the total isocyanate equivalent; with the amounts of the isocyanate and the acid being 1.5 to 0.71/1 in terms of a ratio of the carboxyl group and the acid anhydride group to the isocyanate group.

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**4,294,953**

## PROCESS FOR PREPARING A BRANCHED POLYCARBONATE

**Clayton B. Quinn, and William Hilakos, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.**

**Filed May 31, 1979, Ser. No. 44,040**
**Int. Cl.³ C08G *63/62***
**U.S. Cl. 528—128** **7 Claims**

1. A process for producing a thermoplastic, randomly branched polycarbonate substantially free of cross-linking which consists essentially of reacting, at a pH of about 9 to 12, a carbonate precursor, a dihydric phenol, and a dianhydride branching agent, to thereby produce a thermoplastic randomly branched polycarbonate.

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**4,294,954**

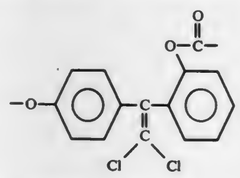
## POLYCARBONATE COPOLYMERS

**Charles M. Orlando, Schenectady, and George R. Loucks, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 13, 1979, Ser. No. 103,215**
**Int. Cl.³ C08G *63/62***
**U.S. Cl. 528—174** **2 Claims**

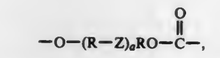
1. Polycarbonates consisting essentially of about

(a) 5 to 70 mole percent of carbonate units of the formula,



chemically combined with about

(b) 95 to 30 mole percent of carbonate units of the formula,



where R is a $C_{(6-13)}$ divalent aromatic organic radical, Z is a member selected from —S—, —O—,

and a $C_{(4-8)}$ cycloaliphatic radical and a is equal to 0 or 1.

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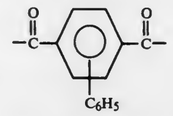
**4,294,955**

## POLYMERS FROM PHENYLTEREPHTHALIC ACID

**John F. Harris, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

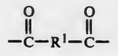
**Filed Dec. 10, 1979, Ser. No. 102,040**
**Int. Cl.³ C08G *63/18***
**U.S. Cl. 528—176** **7 Claims**

1. A fiber forming melt-spinnable (co)polyester consisting essentially of units having the structural formulas



(1)

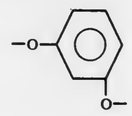
or a combination of (1) and up to 50 mol % of



(2)

wherein $R^1$ is 1,4-phenylene, 2,6-naphthalene, 4,4'-biphenylene or mixtures thereof, and

(3) —O—$R^2$—O— wherein $R^2$ is 1,4-phenylene, 2,6-naphthalene, 1,4-naphthalene, 4,4'-biphenylene or mixtures thereof or a combination of (3) with up to 20 mol % of



based on the total mols of dioxy units present.

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**4,294,956**

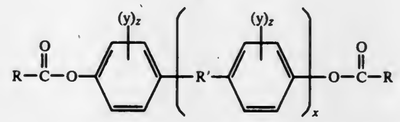
## PROCESS FOR PREPARING POLYARYLATES IN THE PRESENCE OF A DIPHENYL ETHER

**Mitchell H. Berger, Somerville; Peter J. Gill, North Brunswick, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Aug. 27, 1979, Ser. No. 69,818**
**Int. Cl.³ C08G *63/18, 63/28, 63/66***
**U.S. Cl. 528—179** **17 Claims**

1. A process for preparing a polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 gl/gm, which process comprises reacting:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms, or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene radical having up to and including 9 carbon atoms, O, S, SO, $SO_2$, CO, x is 0 or 1; with

(b) at least one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of a diphenyl ether compound, at a temperature of from about 260° to about 350° C., said reaction being conducted in the absence of catalyst.

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**4,294,957**

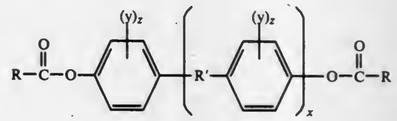
## PROCESS FOR PREPARING POLYARYLATES

**Mitchell H. Berger, Somerville; Louis M. Maresca, Belle Mead, and Markus Matzner, Edison, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Aug. 27, 1979, Ser. No. 69,819**
**Int. Cl.³ C08G *63/46, 63/18***
**U.S. Cl. 528—179** **15 Claims**

1. A process for preparing polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/gm and improved color which process comprises reacting, at a temperature of from about 260° to about 350° C.:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene, or cycloalkylidene radical having up to and including 9 carbon atoms, O, S, SO, $SO_2$, CO, x is 0 or 1; with

(b) at least one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of at least one cycloaliphatic, substituted aromatic or heteroaromatic compound, which compounds contain at least one benzylic and/or tertiary hydrogen atom, and have a boiling point of about 150° to about 350° C. at atmospheric pressure.

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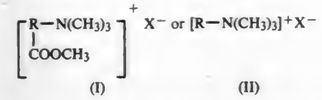
**4,294,958**

## WATER-SOLUBLE SALTS OF TRIMETHYLAMMONIUM DERIVATIVES OF POLYENE MACROLIDE ANTIBIOTICS AND THE PREPARATION THEREOF

**Leonard Falkowski, Gdansk; Barbara Stefanska, Gdansk-Oliwa; Jan Zielinski, Gdansk-Oliwa; Elzbieta Troka, Gdansk-Oliwa; Jerzy Golik, Sopot; Pawel Kolodziejczyk, Gdansk-Wrzeszcz; Andrzej Jarzebski, Gdansk; Emilia Cybulska, Gdansk-Oliwa, and Edward Borowski, Gdansk-Wrzeszcz all of Poland, assignors to Politechnika Gdanska, Gdansk, Poland**

**Filed Jul. 25, 1979, Ser. No. 60,427**
**Claims priority, application Poland, Jul. 19, 1978, 208519**
**Int. Cl.³ C07H *17/08***
**U.S. Cl. 536—17 R** **4 Claims**

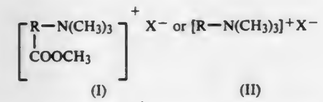
1. An antibiotically-active water-soluble salt of a trimethylammonium derivative of a polyene macrolide having the general formula:



(I) (II)

wherein R is the residue of a polyene macrolide selected from the group consisting of nystatin, polyfungin, amphotericin B, candicidin, pimaricin, trichomycin, levorin, rimocidin, candidin, aureofacin, perimycin and mycoheptin, and X is an anion of a salt selected from the group consisting of methylsulphate, sulphate, chloride, phosphate and acetate.

2. A process for the preparation of an antibiotically-active water soluble-salt of a trimethylammonium derivative of a polyene macrolide having the general formula:



(I) (II)

wherein R is the residue of a polyene macrolide selected from the group consisting of nystatin, polyfungin, amphotericin B, candicidin, pimaricin, trichomycin, levorin, rimocidin, candidin, auerofacin, perimycin and mycoheptin, and X is an anion of a salt selected from the group consisting of methylsulphate, sulphate, chloride, phosphate and acetate, which comprises reacting a solution of the polyene macrolide in an organic solvent with dimethylsulphate in the presence of a neutralizing agent at room temperature with continuous stirring until the reaction is substantially complete, precipitating the resulting methylsulphate of N,N,N-trimethyl polyene macrolide methyl ester of formula (I) or methylsulphate of N,N,N-trimethyl polyene macrolide of formula (II) by the addition of ethyl ether, dissolving the precipitate in butanol, washing the organic solvent with water and concentrating under reduced pressure the resulting solution of the desired product of formula (I) or (II) in the form of the methylsulphate salt thereof.

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**4,294,959**

## SELECTIVELY PROTECTED 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS AND THEIR PRODUCTION

**Eckart Voss, Cologne; Uwe Petersen, Leverkusen, and Peter Stadler, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

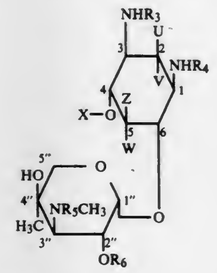
**Filed Sep. 10, 1979, Ser. No. 74,047**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 28409076**

**Int. Cl.³ C07H** *17/00, 15/22*

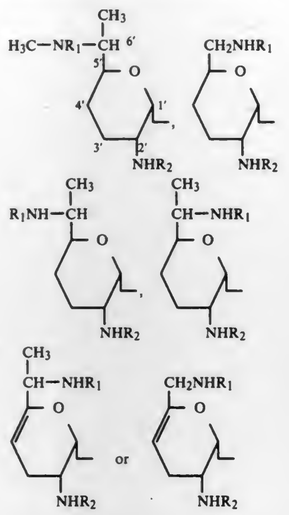
**U.S. Cl. 536—17 R** **11 Claims**

1. A compound of the formula



in which

X denotes a radical of the formula



U, V, W and Z independently denote a hydrogen atom or a hydroxyl group,

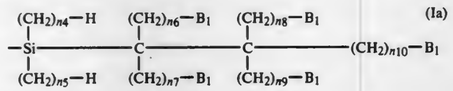
U, V, and W and Z not simultaneously denoting OH,

$R_1$, $R_2$, and $R_3$ denote —CO—A,

$R_4$ denotes a hydrogen atom,

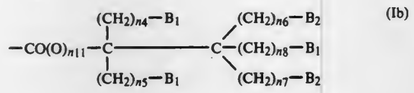
$R_5$ denotes a radical —$SR_7$ and

$R_6$ denotes a hydrogen atom or a space-filling substituent which can be split off of the formula



(Ia)

or



(Ib)

in which

$n_4$, $n_5$, $n_6$, $n_7$, $n_8$, $n_9$ and $n_{10}$ are independently 0, 1, 2 or 3,

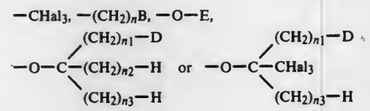
$n_{11}$ is 0 or 1,

$B_2$ has any of the meanings given for B or denotes a $C_1$ to $C_5$ alkoxy or $C_3$ to $C_5$ alkenyloxy group and

$B_1$ has any of the meanings given for B,

and in which

A denotes a radical of the formulae



wherein

B and D denote a hydrogen atom or a phenyl group which is optionally monosubstituted or disubstituted by nitro, halogen, $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy or phenyl,

E denotes a phenyl group which is optionally monosubstituted or disubstituted by nitro, halogen, $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy or phenyl,

n is 0, 1, 2, 3, 4 or 5,

$n_1$, $n_2$ and $n_3$ are independently 0, 1, 2, 3, 4 or 5,

Hal denotes a fluorine, chlorine or bromine atom and

$R_7$ denotes a phenyl, diphenylmethyl or triphenylmethyl group which is optionally monosubstituted to trisubstituted by $CF_3$, $NO_2$, $C_1$ to $C_4$ alkyl, $C_1$ to $C_4$ alkoxy- ($C_1$ to $C_4$ alkoxy )-carbonyl or phenyl or monosubstituted to pentasubstituted by halogen.

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**4,294,960**

## 7-[2-(2-AMINOTHIAZOL-4-YL)-2-CYCLOPENTYLOXYIMINOACETAMIDO]-3-CEPHEM-4-CARBOXYLIC ACID (SYNISOMER)

**Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, Iwami, and Kiyoshi Tsuji, Nagai-cho-naka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 886,340, Mar. 14, 1978. This application Feb. 21, 1980, Ser. No. 123,481**

**Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Nov. 11, 1977, 42315/77**

**Int. Cl.³ C07D** *501/22*

**U.S. Cl. 544—22** **1 Claim**

1. The compound 7-[2-(2-aminothiazol-4-yl)-2-cyclopentyloxyiminoacetamido]-3-cephem-4-carboxylic acid (syn isomer).

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**4,294,961**

## BENZOTHIAZINE 1,1-DIOXIDES

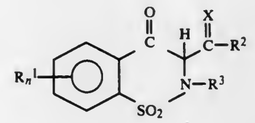
**Ernest Spitzner, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.**

**Filed Apr. 7, 1980, Ser. No. 137,869**

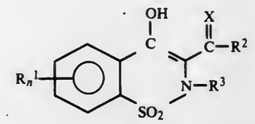
**Int. Cl.³ C07D** *279/02*

**U.S. Cl. 544—49** **16 Claims**

1. Benzothiazine-1,1-dioxide compounds having in their 4-keto form, the structure



the corresponding enol of which has the structure:



wherein

X represents a radical selected from the group consisting of oxo and oxime;

$R^1$ and $R^3$ are hydrogen or an alkyl, alkenyl, aralkyl, alkaryl or alkenylaryl radical containing from 1 to about 20 carbon atoms;

n represents zero or an integer from 1 to 4;

$R^2$ is an alkyl, alkenyl, alkaryl or alkenylaryl radical containing from 1 to about 20 carbon atoms,

and provided that at least one of $R^2$ and $R^3$ contain at least 8 carbon atoms, said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible liquid hydrocarbon solvents.

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**4,294,962**

## CONTINUOUS PROCESS FOR THE MANUFACTURE OF CYANURIC ACID

**Elizabeth A. Bagnall, Morrisville, Pa.; Basil A. Guiliano, Plainsboro, and Henry A. Pfeffer, III, Mercerville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Jun. 25, 1980, Ser. No. 162,718**

**Int. Cl.³ C07D** *251/32*

**U.S. Cl. 544—192** **15 Claims**

1. A continuous process for the manufacture of a substantially pure cyanuric acid by pyrolysis of a compound selected from the group consisting of urea and biuret dissolved in an inert solvent which comprises the steps of:

(a) circulating, at high velocity a reaction mixture comprising a solution of a compound selected from the group consisting of urea and biuret dissolved in an inert solvent through a loop between a heat exchanger and a forced circulation evaporative crystallizer body that contains a reservoir of the reaction mixture at the bottom thereof;

(b) introducing the circulating reaction mixture into the evaporative crystallizer body below the surface level of said reservoir in a manner to maximize the surface area of the reaction mixture as it enters the crystallizer;

(c) adding sufficient heat at the heat exchanger to maintain the circulating reaction mixture at a temperature within the range of about 180° C. to about 250° C.;

(d) crystallizing cyanuric acid from the reaction mixture as it circulates between the heat exchanger and the evaporative crystallizer body to form a slurry of cyanuric acid crystals;

(e) removing ammonia at a reduced pressure from the reaction mixture in the evaporative crystallizer body;

(f) removing a portion of the slurry of cyanuric acid crystals and the reaction mixture as it circulates;

(g) separating cyanuric acid crystals from said reaction mixture;

(h) returning the separated reaction mixture in the preceeding step to a feed tank;

(i) adding a compound selected from the group consisting of urea and biuret and an inert solvent to said feed tank to maintain the desired concentration of said compound in the reaction mixture, and

(j) adding the reaction mixture from the feed tank to the circulating reaction mixture to maintain the desired surface level in the evaporative crystallizer body.

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**4,294,963**

## POLYALKYLPIPERIDINE DERIVATIVES OF S-TRIAZINE

**Jean Rody, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

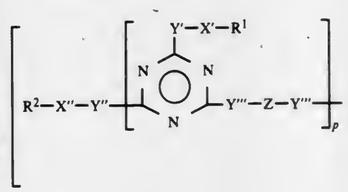
**Continuation-in-part of Ser. No. 8,135, Jan. 31, 1979, abandoned. This application Jul. 16, 1979, Ser. No. 57,673**

**Claims priority, application Switzerland, Feb. 8, 1978, 1402/78**

**Int. Cl.³ C07D** *401/12, 401/14*

**U.S. Cl. 544—198** **5 Claims**

1. A compound of the formula



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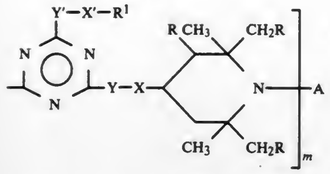
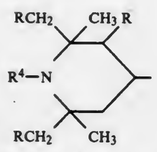
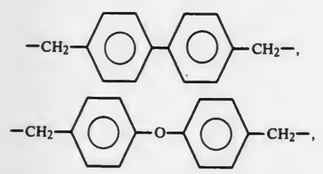


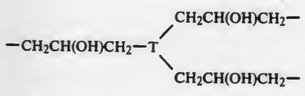
wherein m is 2, 3, or 4, p is 0 or 1, X, X' and X'' represent a direct bond, $C_1$–$C_4$ alkylene or —$OCH_2CH_2CH_2$—, the O of which is not bonded to Y, Y' or Y''; Y, Y', Y'' and Y''' represent —O—, —S—, —NH— or —$NR^3$—, Z represents $C_2$–$C_{12}$ alkylene, $C_4$–$C_{20}$ alkylene interrupted by —O—, —S—, —NH— or —$NR^3$—, xylylene, $C_6$–$C_{12}$ arylene or -phenylene-Q'-phenylene-, wherein Q' is —$CH_2$—, $>C(CH_3)_2$, —$SO_2$— or —O—, R represents hydrogen or $C_1$–$C_4$ alkyl, $R^1$, $R^2$ and $R^3$ represent $C_1$–$C_{12}$ alkyl, $C_2$–$C_8$ alkoxyalkyl, $C_2$–$C_4$ hydroxyalkyl, $C_5$–$C_{12}$ cycloalkyl, $C_7$–$C_{12}$ aralkyl, $C_3$–$C_{18}$ alkenyl, $C_6$–$C_{10}$ aryl, phenyl which is substituted by (1) one or two $C_1$–$C_8$ alkyl groups, (2) hydroxy, (3) $C_1$–$C_4$ alkoxy, (4) one or two $C_1$–$C_8$ alkyl groups and hydroxy or (5) one or two $C_1$–$C_8$ alkyl groups and $C_1$–$C_4$ alkoxy, or represent a polyalkylpiperidinyl group of the formula



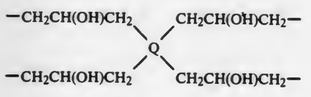
$R^4$ represents hydrogen, O, $C_1$–$C_{12}$ alkyl, allyl or benzyl,
A if m is 2, represents $C_2$–$C_{12}$ alkylene, xylylene or a radical of the formula —$CH_2$—C≡C—$CH_2$—,



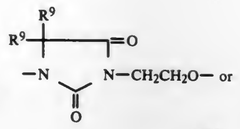
—$CH_2$—COO—$R^5$—OOC—$CH_2$—, —$CH_2$—CH(OH)—$CH_2$— or —$CH_2CH(OH)CH_2$—D—$CH_2CH(OH)CH_2$—, or if m is 3, represents a group of the formula

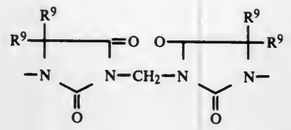


and, if m is 4, represents a group of the formula

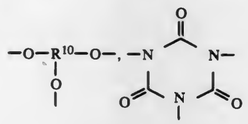


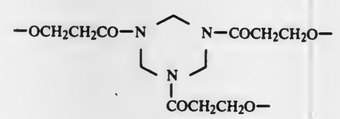
$R^5$ represents $C_2$–$C_8$ alkylene, $C_4$–$C_8$ oxaalkylene or cyclohexylene,
D represents a divalent radical of the formula —O—$R^6$—O—, —O—C(O)—$R^7$—C(O)—O—, —$OCH(R^8)CH_2O$—$R^6$—$OCH_2CH(R^8)O$— or

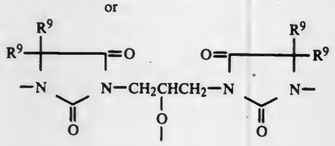




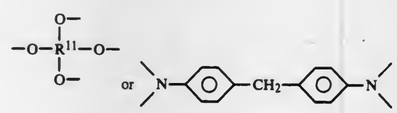
$R^6$ represents $C_2$–$C_{12}$ alkylene, $C_6$–$C_{12}$ cycloalkylene, $C_6$–$C_{12}$ arylene or -phenylene-$Z_1$-phenylene-, wherein $Z_1$ represents —$CH_2$—, $>C(CH_3)_2$, —$SO_2$— or —O—,
$R^7$ represents a direct bond, $C_1$–$C_{12}$ alkylene or $C_6$–$C_{12}$ arylene,
$R^8$ and $R^9$ are hydrogen or $C_1$–$C_4$ alkyl,
T represents a trivalent radical of the formulae







$R^{10}$ represents a trivalent aliphatic hydrocarbon radical of 3 to 10 carbon atoms,
Q represents a quadrivalent radical of the formula



and
$R^{11}$ represents a quadrivalent aliphatic hydrocarbon radical of 4 to 10 carbon atoms.

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**4,294,964**

## 2-ARYL-1H-PERIMIDINES

**Ken Matsumoto, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

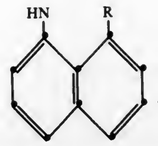
**Division of Ser. No. 944,434, Sep. 21, 1978, Pat. No. 4,224,326, which is a continuation-in-part of Ser. No. 861,732, Dec. 19, 1977, abandoned. This application Feb. 28, 1980, Ser. No. 125,738**

**Int. Cl.³ C07D** *239/70;* **A61K** *31/505*

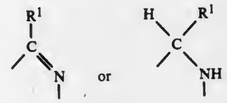
**U.S. Cl. 544—249** **4 Claims**

1. A compound of the formula





or a pharmaceutically-acceptable salt thereof, wherein R represents



and $R^1$ represents m- or p- $R^2$ phenyl wherein $R^2$ represents —$CF_3$, —$OCF_3$, —$SCF_3$, or —$OC_2F_5$.

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**4,294,965**

## BENZENE SULFONAMIDO PYRIMIDINE DERIVATIVES

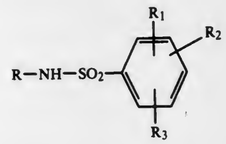
**Michael J. Virnig, Fridley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.**

**Division of Ser. No. 909,225, May 24, 1978, Pat. No. 4,210,759. This application Jan. 31, 1980, Ser. No. 117,229**

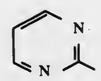
**Int. Cl.³ C07D** *239/69*

**U.S. Cl. 544—297** **8 Claims**

1. Compounds of the structure:



wherein R is a pyrimidine group of the structure:



and wherein $R_1$, $R_2$ and $R_3$, which may be the same or different, are selected from the group consisting of hydrogen and linear and branched chain alkyl and alkenyl containing from 1 to 20 carbon atoms, with the proviso that the sum of the carbon atoms in $R_1$, $R_2$ and $R_3$ is at least 8, said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible liquid hydrocarbon solvents.

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**4,294,966**

## PROCESS FOR INVERTING THE CONFIGURATION IN OPTICALLY ACTIVE COMPOUNDS

**Janos Zergenyi, Seltisberg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

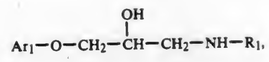
**Filed Jul. 16, 1979, Ser. No. 58,222**

**Claims priority, application Switzerland, Jul. 28, 1978, 8145/78**

**Int. Cl.³ C07D** *239/24, 241/10*

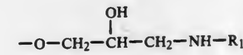
**U.S. Cl. 544—316** **1 Claim**

1. A process for inverting the configuration in an optically active compound of the formula

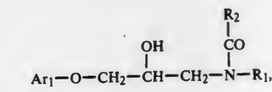


(I)

in which
$Ar_1$ represents 1-naphthyl, 3-lower alkylphenyl, 2-lower alkenylphenyl, 2-lower alkenyloxyphenyl, 4-lower alkanoylaminophenyl, 4-(2-lower alkoxy ethyl)-phenyl, pyrazin-2-yl, pyrimidin-2-yl, (1-pyrryl)-phenyl, 4-indolyl, 5-(2-lower alkoxy carbonylamino ethyl)pyridyl, 3-cyanopyridyl, 4-(benzimidazol-2-on)-yl, 4-(N'-cycloalkylureido)-phenyl, benzyloxyphenyl or hydroxyphenyl,
$R_1$ represents lower alkyl, phenyl-lower alkyl or phenoxy-lower alkyl, said compound of the formula I or R(+) configuration being converted into one of S(−) configuration, or said compound of the formula I of S(−) configuration being converted into one of R(+) configuration, said configuration inversion being concerned with the secondary alcohol group being present in the group

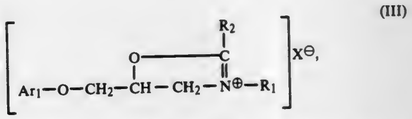


which comprises converting an optically active compound of the formula



(II)

having a R(+) or S(−) configuration, in which $R_2$ represents lower alkyl, phenyl-lower alkyl, phenoxy-lower alkyl or phenyl, and $Ar_1$ and $R_1$ have the meaning given, by treating with concentrated phosphoric acid or concentrated sulphuric acid for two hours in a temperature range of from approximately 50° to 200°, or with a chloride or bromide of such acids for 45 minutes in a temperature range of from −10° to 70° into an optically active compound of the formula



(III)

wherein $X^{\ominus}$ represents the anion of phosphoric acid or sulphuric acid or of chlorine or bromine, and hydrolysing a resulting compound of the formula III, optionally by way of the corresponding free base as intermediate, with aqueous mineral acids for 1–2 hours in a temperature range of from 0° to 120°, or with aqueous alkaline solutions for one hour in a temperature range of from 50° to 150° to form a compound of the formula I of a configuration opposite to that of the starting material used and, if desired, converting an acid addition salt of a compound of the formula I with mineral acids into the free compound, or converting a free compound of the formula I into a pharmaceutically acceptable, non-toxic acid addition salt with inorganic acids or with organic acids.

**4,294,967**

## N-ACYL-PIPERIDONE COMPOUNDS

**Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

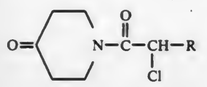
**Filed Sep. 8, 1980, Ser. No. 184,728**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938155**

**Int. Cl.³ C07D** *217/74;* **A01N** *43/40*

**U.S. Cl. 546—242** **3 Claims**

1. An N-Acyl-piperidone of the formula



(I)

wherein R is methyl or chloro.

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**4,294,968**

## METHOD FOR PREPARING α-PICOLINE FROM 5-OXOHEXANENITRILE

**Frederick C. Stone, and Gary G. Schupska, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 53,635, Jun. 29, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,512**

**Int. Cl.³ C07D** *213/08, 213/09*

**U.S. Cl. 546—251** **4 Claims**

1. In a method of preparing α-picoline comprising contacting under dehydrogenation conditions 5-oxohexanenitrile with a palladium dehydrogenation catalyst, the improvement wherein the catalyst is palladium on a carbon support.

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**4,294,969**

## PROCESS FOR PRODUCING 2-BROMO-3,5-DISUBSTITUTED PYRIDINES

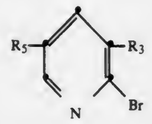
**John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 7,092, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 866,961, Jan. 4, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 167,577**

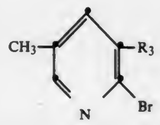
**Int. Cl.³ C07D** *213/55, 213/57*

**U.S. Cl. 546—286** **2 Claims**

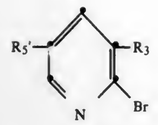
1. A process for preparing compounds of the formula



wherein $R_3$ is $COOC_2H_5$ or CN and $R_5$ is CHO or $—COOC_2H_5$ which comprises (1) reacting a compound of the formula



with N-Bromosuccinimide in the presence of a peroxide and U.V. light and (2) hydrolyzing the resultant compound of the formula



where $R_5$ is $—CH_2Br$, $—CHBr_2$ or $CBr_3$ using $AgNO_3$.

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**4,294,970**

## OXIDATION OF ALPHA-ALKYLATED, BENZYL-SUBSTITUTED 2-THIOPYRIDINE 1-OXIDES

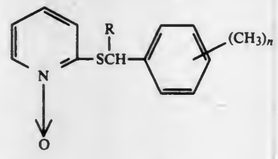
**Howard L. Plant, Milford, and Glenn S. Peterson, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.**

**Filed Feb. 4, 1980, Ser. No. 118,175**

**Int. Cl.³ C07D** *213/62*

**U.S. Cl. 546—294** **10 Claims**

1. A method of oxidizing alphaalkylated, benzyl-substituted 2-thio pyridine 1-oxides having the general formula



where R is alkyl having from 1 to 8 carbon atoms and n is 1 or 2, said method comprising reacting the compound to be oxidized with acetonitrile and hydrogen peroxide in a solvent for said compound selected from the group consisting of methanol, propanol and butanol, the pH of the reaction mixture being maintained at about 9.0 to about 9.5 with a metal hydroxide.

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**4,294,971**

## PREPARATION OF N-ARYLOXAZOLIDINE-2,4-DIONES

**Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

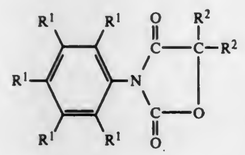
**Filed Mar. 6, 1980, Ser. No. 127,759**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913522**

**Int. Cl.³ C07D** *263/04*

**U.S. Cl. 548—226** **10 Claims**

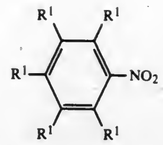
1. A process for the preparation of an N-aryloxazolidine-2,4-dione of the formula



I

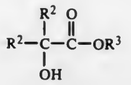
where the individual radicals $R^1$ and $R^2$ may be identical or different and each is hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical, the two radicals $R^2$ may also together be a methylene radical and $R^1$ may also be halogen or $—X—R^3$, where $R^3$ is an aliphatic radical and X is oxygen or sulfur, wherein a nitrobenzene of the formula





II

where $R^1$ has the above meaning, is reacted with a 2-hydroxycarboxylic acid ester of the formula



III

where $R^2$ and $R^3$ have the above meanings, and with carbon monoxide in the presence of selenium and a basic compound under superatmospheric pressure at an elevated temperature.

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**4,294,972**

## 1,2-DISUBSTITUTED OXO TRIAZOLIDINE

**Frederick Cassidy, and Alexander C. Goudie, both of Harlow, England, assignors to Beecham Group Limited, England**

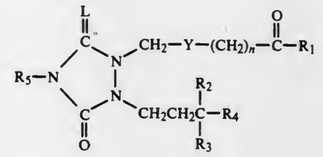
**Filed Jun. 14, 1979, Ser. No. 48,390**

**Claims priority, application United Kingdom, Jun. 15, 1978, 27060/78**

**Int. Cl.³ A61K** *31/41;* **C07D** *249/12*

**U.S. Cl. 548—264** **14 Claims**

1. A compound of the formula:



and salts thereof wherein

n is 4;

Y is $—CH_2CH_2—$;

L is O or S:

$R_1$ is alkyl of from 1 to 4 carbon atoms;

$R_2$ is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_3$ is hydroxy;

$R_4$ is alkyl of 1 to 9 carbon atoms; and

$R_5$ is alkyl of 1 to 6 carbon atoms.

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**4,294,973**

## PROCESS FOR THE PREPARATION OF DIACYLATED 4-IMIDAZOLIN-2-ONES

**Karl-Heinz Scholz; Willy Hartmann, and Hans-Georg Heine, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

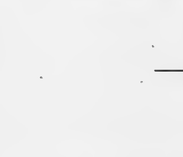
**Division of Ser. No. 884,520, Mar. 8, 1978, Pat. No. 4,238,618. This application Dec. 10, 1979, Ser. No. 101,610**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713431**

**Int. Cl.³ C07D** *233/70*

**U.S. Cl. 548—320** **6 Claims**

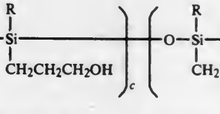
1. A process for the preparation of a diacylated 4-imidazolin-2-one of the formula



wherein

$R^1$ and $R^2$ independently represent hydrogen, alkyl, which can be substituted by a $C_{1-2}$ alkoxy radical or a halogen, cycloalkyl which can be $C_{1-4}$ alkyl substituted, aryl which can be $C_{1-4}$ alkyl or $C_{1-2}$ alkoxy or halogen substituted or alkoxy, the alkyl, cycloalkyl, aryl or alkoxy groups representing

$R^1$ and $R^2$ having up to 10 carbon atoms, which comprises contact a compound of the formula



wherein

$R^1$ and $R^2$ have the previously assigned significance with an equimolar amount of chlorine or sulphuryl chloride at a temperature from 20° to 150° C. in the presence of a peroxide, peracid ester or azoalkane radical forming agent or under ultra-violet light to monohalogenate the same and thereafter dehydrohalogenating the resultant monohalogenated product by:

A. Subjecting the monochlorinated product to a temperature of 100° to 250° C. at reduced pressure; or

B. contacting the same with a tertiary amine.

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**4,294,974**

## HYDROPHILIC SILICONE COMPOUNDS AND CONTACT LENSES CONTAINING POLYMERS THEREOF

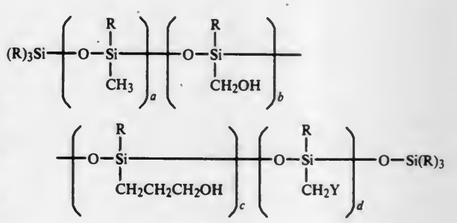
**Albert R. LeBoeuf, Framingham, Mass., assignor to American Optical Corporation, Southbridge, Mass.**

**Division of Ser. No. 8,301, Jan. 31, 1979, Pat. No. 4,261,875. This application Dec. 17, 1979, Ser. No. 104,259**

**Int. Cl.³ C07F** *7/08, 7/18*

**U.S. Cl. 556—440** **11 Claims**

1. A hydrophilic siloxane having the formula:



wherein R is an alkyl having 1 to 3 carbons, a+b+c+d=e, b=0 to e, c=0 to e, b+c>1, d=1 to 5, e=1 to 100, and Y is an organic group containing at least one >C=C<.

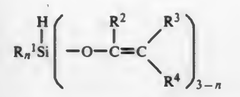
**4,294,975**

## HYDROALKENYLOXYSILANES

**Toshio Takago; Masatoshi Arai, and Koji Futatsumori, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan**

**Filed May 20, 1980, Ser. No. 151,696**
**Claims priority, application Japan, May 31, 1979, 54/67706**
**Int. Cl.³ C07F 7/04, 7/18**
**U.S. Cl. 556—482** **5 Claims**

1. A hydrogenalkenyloxysilane represented by the general formula



in which $R^1$ is a monovalent hydrocarbon group having from 1 to 8 carbon atoms, $R^2$, $R^3$ and $R^4$ are each independently a hydrogen atom or a monovalent hydrocarbon group having from 1 to 8 carbon atoms and n is a number of zero, 1 or 2.

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**4,294,976**

## PROCESS FOR PRODUCING BIPHENYL COMPOUNDS

**Hiroshi Itatani, Chiba; Hataaki Yoshimoto, Ichihara; Akinori Shiotani, Ichihara; Akiyoshi Yokota, Ichihara, and Motozoh Yoshikiyo, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan**

**Filed Aug. 31, 1979, Ser. No. 71,089**
**Claims priority, application Japan, Sep. 5, 1978, 53/108097**
**Int. Cl.³ C07C 69/76, 179/02, 15/14**
**U.S. Cl. 560—76** **11 Claims**

1. A process for producing a biphenyl compound, comprising dehydrogenatively dimerizing an aromatic monocyclic compound selected from the group consisting of benzene and substituted benzene compounds having 1 to 4 substituents attached to the benzene ring thereof, with molecular oxygen in the presence of oxalic acid together with a catalyst comprising at least one organic palladium salt, under a pressurized condition, and, isolating the resulting biphenyl compound from the reaction mixture.

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**4,294,977**

## PROCESS FOR PRODUCING AROMATIC CARBOXYLIC ACIDS

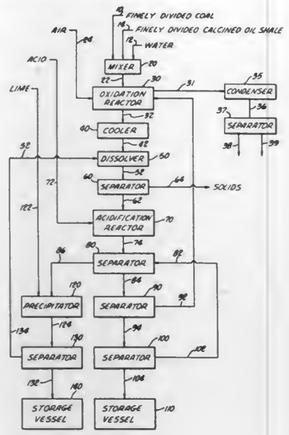
**Raymond A. Schep, Newport Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.**

**Continuation of Ser. No. 883,933, Mar. 6, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,401**
**Int. Cl.³ C07C 51/21**
**U.S. Cl. 562—407** **27 Claims**

8. A process for producing benzene carboxylic acid from coal comprising:

a. treating in an oxidation zone a mixture of coal, water, and calcined oil shale with oxygen, at a temperature of from about 200° to about 350° C., a pressure of from about 250 to about 2000 psig, and a reaction time of from about 10 minutes to about 3 hours, wherein the amount of said calcined oil shale is about 1 to about 10 parts by weight of said calcined oil shale per part by weight of said coal, to convert said coal to a benzene carboxylic acid salt thereby producing a second mixture containing dissolved therein said benzene carboxylic acid salt;

b. removing solids comprising said calcined oil shale from said second mixture thereby producing a solution;




c. treating said solution with an acid to convert said benzene carboxylic acid salt dissolved therein to a benzene carboxylic acid; and

d. recovering said benzene carboxylic acid thusly formed.

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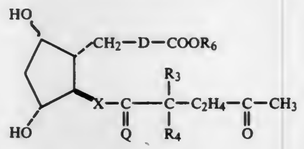
**4,294,978**

## 13,14-DIDEHYDRO-19-OXO-PGF$_2$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,000**
**Int. Cl.³ C07C 177/00**
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CH$_2$—,
(2) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CF$_2$—,
(3) cis—CH$_2$—CH=CH—CH$_2$—CH$_2$—, or
(4) trans—(CH$_2$)$_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-R$_5$ or $\alpha$-R$_5$:$\beta$-OH, wherein R$_5$ is hydrogen or methyl;
wherein R$_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH$_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH$_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH$_3$,
(k) —(p—Ph)—NH—CO—NH$_2$,
(l) —(p—Ph)—CH=N—NH—CO—NH$_2$,
(m) $\beta$-naphthyl,



(n) —CH$_2$—CO—R$_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R$_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R$_3$ and R$_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R$_3$ and R$_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

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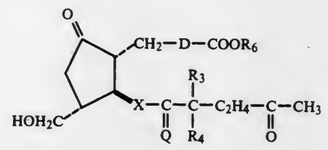
**4,294,979**

## 13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_2$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,005**
**Int. Cl.³ C07C 177/00**
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CH$_2$—,
(2) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CF$_2$—,
(3) cis—CH$_2$—CH=CH—CH$_2$—CH$_2$—, or
(4) trans—(CH$_2$)$_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-R$_5$ or $\alpha$-R$_5$:$\beta$-OH, wherein R$_5$ is hydrogen or methyl;
wherein R$_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g)—(p-Ph)—CO—CH$_3$,
(h)—(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH$_3$,
(i)—(p-Ph)—NH—CO—(p-Ph),
(j)—(p-Ph)—NH—CO—CH$_3$,
(k)—(p-Ph)—NH—CO—NH$_2$,
(l)—(p-Ph)—CH=N—NH—CO—NH$_2$,
(m) $\beta$-naphthyl,
(n)—CH$_2$—CO—R$_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R$_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R$_3$ and R$_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R$_3$ and R$_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH$_2$CH$_2$—.

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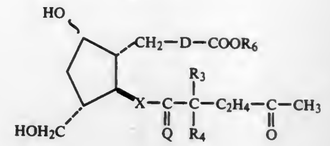
**4,294,980**

## 13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_1$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,010**
**Int. Cl.³ C07C 177/00**
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) (CH$_2$)$_3$—(CH$_2$)$_g$—CH$_2$—, or
(2) (CH$_2$)$_3$—(CH$_2$)$_g$—CF$_2$—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-R$_5$ or $\alpha$-R$_5$:$\beta$-OH, wherein R$_5$ is hydrogen or methyl;
wherein R$_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH$_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH$_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH$_3$,
(k) —(p—Ph)—NH—CO—NH$_2$,
(l) —(p—Ph)—CH=N—NH—CO—NH$_2$,
(m) $\beta$-naphthyl,
(n) —CH$_2$—CO—R$_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene
wherein R$_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R$_3$ and R$_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R$_3$ and R$_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH$_2$CH$_2$—.

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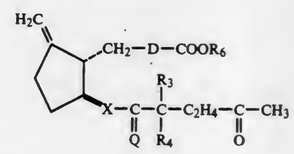
**4,294,981**

## 13,14-DIDEHYDRO-11-DEOXY-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,035**
**Int. Cl.³ C07C 177/00**
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-$R_5$ or α-$R_5$:β-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

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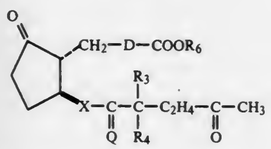
**4,294,982**
**13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGE$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,036**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three; wherein Q is α—OH:β—$R_5$ or α—$R_5$:β—OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—PH)—NH—CO—(p—Ph)—NH—CO—$Ch_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) β—naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

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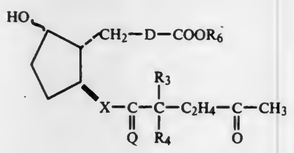
**4,294,983**
**13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGF$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Filed Mar. 20, 1980, Ser. No. 132,037**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three; wherein Q is α—OH:β—$R_5$ or α—$R_5$:β—OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene, wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

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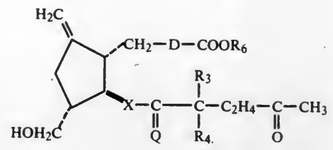
**4,294,984**
**13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,038**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula





wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-$R_5$ or α-$R_5$:β-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g)—(p—Ph)—CO—$CH_3$,
(h)—(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i)—(p—Ph)—NH—CO—(p-Ph),
(j)—(p—Ph)—NH—CO—$CH_3$,
(k)—(p—Ph)—NH—CO—$NH_2$,
(l)—(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) β—naphthyl,
(n)—$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

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**4,294,985**
**PRODUCTION OF THIOCARBOHYDRAZIDE ON A COMMERCIAL SCALE**
**Günther Cramm, Cologne, and Karl H. Blöcher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Continuation of Ser. No. 856,455, Nov. 30, 1977, abandoned. This application Jun. 15, 1979, Ser. No. 48,856**
**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658557**
**Int. Cl.$^3$ C07C *159/00***
**U.S. Cl. 564—18** **3 Claims**

1. In the production of thiocarbohydrazide by reacting hydrazine hydrate with carbon disulphide in the presence of water to form in a first stage hydrazinium dithiocarbazinate, subsequently thermally decomposing the hydrazinium dithiocarbazinate in a second stage to form thiocarbohydrazide, and recovering the thiocarbohydrazide from the reaction medium, the improvement which comprises effecting the entire reaction in the mother liquor of a preceding batch, carrying out the first reaction stage at a temperature between about 25° C. and 45° C., with injection of carbon disulphide below the surface of the reaction mixture carrying out the second stage at about 62° to 65° C. without prior isolation of the intermediate product; subsequently cooling the reaction mixture to about 20° to 25° C. and filtering off the thiocarbohydrazide formed, separating the amount of mother liquor in excess of that required for the next batch, and feeding the balance of the mother liquor to the next batch.

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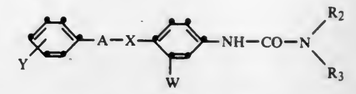
**4,294,986**
**NOVEL PARA-PHENYLALKOXY PHENYLUREA AND THIOUREA COMPOUNDS AND HERBICIDAL USE THEREOF**
**David M. Spatz, San Francisco, Calif., and Barrington Cross, Rocky Hill, N.J., assignors to American Cyanamid Co., Stamford, Conn.**
**Division of Ser. No. 51,584, Jun. 25, 1979. This application Apr. 24, 1980, Ser. No. 143,223**
**Int. Cl.$^3$ C07C *127/19*; A01N *9/20***
**U.S. Cl. 564—52** **7 Claims**

1. A compound of the formula:



wherein $R_2$ and $R_3$ each represent alkyl $C_1$-$C_4$ or alkoxy $C_1$-$C_4$; X is oxygen; A is a straight or branched, unsaturated, alkyl $C_2$-$C_8$ group; W is hydrogen or chlorine; and Y is hydrogen, halogen, alkyl $C_1$-$C_4$ or alkoxy $C_1$-$C_4$.

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**4,294,987**
**PROCESS FOR PREPARING METHYLENE DIANILINES**
**Richard A. Prather, and Nirad N. Shah, both of Houston, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.**
**Filed Dec. 31, 1979, Ser. No. 108,522**
**Int. Cl.$^3$ C07C *85/145***
**U.S. Cl. 564—331** **8 Claims**

1. In a process for the preparation of a mixture of di(aminophenyl)methane and oligomeric polymethylene polyphenyl polyamines the steps comprising:
reacting aniline and formaldehyde in a proportion of about 1.6 moles to about 8 moles of aniline per mole of formaldehyde in the presence of an acid catalyst at a temperature in the range of about 0° C. to about 55° C. until the formation of aminobenzylamines is substantially complete;
adjusting, if necessary, the proportions of aniline and water in the resulting reaction mixture so that the molar proportion of aniline to formaldehyde originally present in the reaction mixture is at least 4:1 and the amount of water is such that the concentration of acid catalyst is in the range of about 1 to about 8 percent by weight based on the total weight of the reaction mixture;
subjecting the resulting aqueous solution to extraction with an inert organic solvent;
separating the solvent and aqueous layers;
removing the solvent from said solvent extract by distillation under reduced pressure;
subjecting the residual mixture of amines to rearrangement to the corresponding mixture of di(aminophenyl)methane and oligomeric polymethylene polyphenyl polyamines by heating at a temperature in the range of about 60° C. to about 115° C. in the presence of a catalyst selected from the class consisting of strong acids, diatomaceous earth, clay and zeolite, provided that, when a strong acid is employed as catalyst, it is present in an amount substantially less than that employed in the initial condensation of the aniline and formaldehyde.

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**4,294,988**
**METHOD OF PREPARING 2,4-DIFLUOROANILINE**
**Roger J. Tull, Metuchen; Leonard M. Weinstock, Bellemead, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**
**Filed Oct. 31, 1977, Ser. No. 847,187**
**Int. Cl.$^3$ C07C *85/11***
**U.S. Cl. 564—417** **8 Claims**

1. A method of preparing 2,4-difluoroaniline comprising the steps of

(a) reacting 2,4,5-trichloronitrobenzene under anhydrous conditions with a fluorinating agent selected from NaF, KF, CsF, $C_{1-4}$ alkyl quaternary ammonium fluoride, and mixtures thereof, to form 2,4-difluoro-5-chloronitrobenzene; and

(b) hydrogenating the 2,4-difluoro-5-chloronitrobenzene with hydrogen in the presence of a catalyst to form 2,4-difluoroaniline.

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**4,294,989**

## METHYLCYCLOHEXYL-O-ANISYLPHOSPHINE

**William S. Knowles, St. Louis, and Milton J. Sabacky, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 122,116, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 36,471, May 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 758,603, Sep. 9, 1968, abandoned. This application Sep. 5, 1978, Ser. No. 939,568**

**Int. Cl.³ C07F *9/50***

**U.S. Cl. 568—13** **1 Claim**

1. Methylcyclohexyl-o-anisylphosphine.

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**4,294,990**

## ALKYL-POLYGLYCOL MIXED FORMALS AS FIBER PREPARATION AGENTS

**Rolf Kleber, Neu-Isenburg, and Siegfried Billenstein, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Mar. 19, 1979, Ser. No. 21,978**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812443**

**Int. Cl.³ D06M *13/18***

**U.S. Cl. 568—601** **2 Claims**

1. A polyglycol ether mixed formal of the formula

$$R_1—(OC_2H_4)_n—OCH_2OCH_2CH_2OR_2$$

in which $R_1$ is a linear or branched alkyl or alkenyl radical of from 8 to 22 carbon atoms, $R_2$ is a linear alkyl radical of from 1 to 4 carbon atoms and n is an integer of from 3 to 30.

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**4,294,991**

## PROCESS FOR MONOALKYLATION OF DIHYDRIC PHENOLS

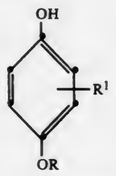
**Michael Bellas, Wigan, and Robert Cahill, Kirkby, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 904,683, May 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 748,036, Dec. 6, 1976, abandoned. This application Sep. 24, 1979, Ser. No. 78,123**

**Int. Cl.³ C07C *43/178, 43/00***

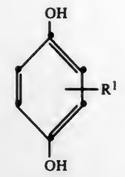
**U.S. Cl. 568—650** **16 Claims**

1. A process for the preparation of a monoalkyl ether having the formula



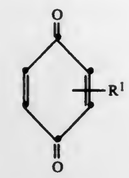
I

wherein R is an alkyl radical having 1 to 18 carbon atoms or $C_2H_5—O—CH_2CH_2—$ and $R^1$ is hydrogen or an alkyl radical having 1 to 4 carbon atoms, which comprises reacting a compound having the formula R-OH with a mixture of a compound having the formula



II

and a compound having the formula



III

in the presence of an acid dehydration catalyst, wherein the weight ratio of II:III is from 5:1 to 20:1.

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**4,294,992**

## PROCESS FOR THE PRODUCTION OF ALKYL ARYL ETHERS

**Graham K. Hughes, Hackettstown, N.J., assignor to The Southland Corporation, Dallas, Tex.**

**Filed Jan. 23, 1980, Ser. No. 114,601**

**Int. Cl.³ C07C *43/205***

**U.S. Cl. 568—632** **8 Claims**

1. A process for the production of an alkyl aryl ether comprising incrementally reacting an acid and an alkanol with a phenol at a rate of about 0.907–0.133 weight percent per minute of the acid and alcohol based on the weight of the phenol and continuously removing water formed as a by-product of said reaction, said reaction being carried out at an elevated temperature.

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**4,294,993**

## PURIFICATION OF BISPHENOL-A

**Ming K. Li, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 139,969**

**Int. Cl.³ C07C *37/70***

**U.S. Cl. 568—724** **5 Claims**

1. The method of recovering 2,2-bis(4-hydroxyphenyl) propane in a purified state from a mixture of the latter and impurities therein derived from the acid condensation of phenol and acetone, which process comprises (1) combining a mixture of (a) a preformed isolated adduct of phenol and the above-identified dihydroxydiphenyl propane and (b) impurities associated with (a), with sufficient toluene alone or with a mixture of toluene and water to form a homogeneous solution with the toluene, or a liquid-liquid mixture when water and toluene are used, the toluene being employed, on a weight basis, from 0.5 to 10 parts toluene per part adduct, (2) heating the mixture at a temperature of from 45°–125° C., (3) cooling the solution or liquid-liquid mixture to a temperature where the aforesaid dihydroxydiphenyl propane precipitates in a highly purified state, and (4) isolating the purified 2,2-bis(4-hydroxyphenyl) propane.



**4,294,994**

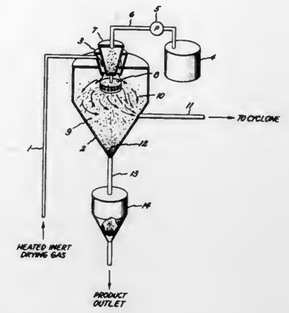
## PURIFICATION OF BISPHENOL-A

**Ming K. Li, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 21, 1980, Ser. No. 141,778**

**Int. Cl.³ C07C *37/70***

**U.S. Cl. 568—724** **4 Claims**




1. The method of recovering 2,2-bis(4-hydroxyphenyl) propane in a highly purified state which comprises subjecting a preformed isolated adduct of the aforesaid dihydroxydiphenyl propane and phenol containing at least 0.05%, by weight, of said adduct of acetone, to spray drying conditions at a temperature of from 50°–150° C. whereby the adduct is converted to the purified dihydroxydiphenyl propane and is recovered in a highly purified state and the acetone and phenol thereby produced are separately recovered.

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**4,294,995**

## METHOD AND CATALYST FOR MAKING BISPHENOL

**Gary R. Faler, and George R. Loucks, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 13, 1979, Ser. No. 103,095**

**Int. Cl.³ C07C *37/00*; C08F *112/08***

**U.S. Cl. 568—728** **2 Claims**

1. In a method of making bisphenol, based on the reaction between a ketone and a phenol in the presence of an effective amount of a sulfonated polystyrene cation-exchange resin in acid form modified by the neutralization of 5–25% of a cation-exchange capacity with a promoter in the form of a $C_2$–$C_4$ alkyl mercapto amine whereby the promoter is incorporated onto the cation-exchange resin backbone by an acid-amine salt ionic bond which is susceptible to excessive loss from the cation-exchange resin due to leaching as the result of the degradation of the acid-amine salt ionic bond during the use of the ion-exchange resin in phenol-ketone condensation reaction, the improvement which comprises utilizing as the cation-exchange resin, a sulfonated polystyrene having 5–25% of its cation-exchange capacity occupied by an organo mercapto amine covalently bonded to the cation-exchange backbone by nitrogen sulfur linkages.

2. A method in accordance with claim 1, where the bisphenol is bisphenol-A.

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**4,294,996**

## METHOD OF REDUCING FORMATION OF CHLORINATED DIOXINS IN MANUFACTURE OF CHLORINATED PHENOLS

**William H. Wetzel, Federal Way; Hsi-Lung Pan, Seattle; Robert J. Goodwin, Puyalup, and John E. Wilkinson, Gig Harbor, all of Wash., assignors to Reichhold Chemicals, Incorporated, White Plains, N.Y.**

**Filed Jun. 9, 1980, Ser. No. 157,447**

**Int. Cl.³ C07C *39/36, 39/27***

**U.S. Cl. 568—776** **15 Claims**

1. A process for producing polychlorinated phenols having reduced amount of chlorinated dioxin formed therein during processing comprising reacting at a temperature of from 10° C. to 190° C. (A) a phenol, which is at least one member selected from a group consisting of phenol and lower chlorophenols and mixtures thereof, (B) chlorine to form a reaction mixture in the presence of from about 0.005 to about 0.016 moles per mole of (A) used of an acid actalyst, said catalyst consisting essentially of aluminum chloride, ferric chloride, aluminum tris-butoxide, antimony chloride, stanous chloride, cuprous chloride, metallic aluminum powder, metallic antimony, metallic copper or mixtures thereof; the improvement consisting of adding to the reaction mixture from about 0.0001 to 0.5 moles per mole of (A) used of a dioxin inhibitor selected from the group consisting of:

Antimony pentachloride
Chromium dichloride
Chromium powder
Chromium sulfide
Cobalt metal
Gadolinium trichloride
Germanium tetrachloride
Hafnium tetrachloride
Indium chloride
Magnesium turnings
Manganese dichloride
Niobium chloride
Zirconium tetrachloride
Antimony powder
Bismuth trichloride
Chromium metal
Cobalt fluoride
Iridium chloride
Niobium pentachloride
Rhenium pentachloride
Rhodium trichloride
Samarium trichloride
Tantalum chloride
Tin powder
Tungsten hexachloride
Zinc fluoride
Rubidium trichloride

and mixtures thereof.

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**4,294,997**

## PROCESS FOR THE CONTROL OF PH IN THE ETHYNYLATION OF FORMALDEHYDE

**Albert M. Stock, LaPorte, and James D. Verbsky, Seabrook, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jul. 10, 1978, Ser. No. 923,371**

**Int. Cl.³ C07C *33/046***

**U.S. Cl. 568—855** **14 Claims**

1. In the process for the production of butynediol by contacting acetylene and formaldehyde in the presence of a particulate copper acetylide catalyst in an agitated aqueous medium in a continuous reaction at 60°–120° C., the improvement wherein the pH of the reaction mixture is maintained at from 5–8 by the incremental or continuous addition of an aqueous solution of an alkali metal hydroxide and an alkali metal carbonate at equivalent ratios of alkali metal hydroxide to alkali metal carbonate of 1:1–4:1.

**4,294,998**

## PREPARATION OF HIGH PURITY 1,4-BUTANEDIOL

**Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 920,123, Jun. 28, 1978. This application Jul. 31, 1980, Ser. No. 174,258**

**Int. Cl.³ C07C *29/78***

**U.S. Cl. 568—868** **13 Claims**

1. A process for purifying 1,4-butanediol, the process comprising

(a) crystallizing 1,4-butanediol from a crude liquid comprising

(1) 35–85%, by weight, of 1,4-butanediol and

(2) 2–15%, by weight, of impurities dissolved in tetrahydrofuran, by holding the liquid at a temperature of −10° C. to +10° C., to form a slurry of 1,4-butanediol crystals; and then

(b) separating the crystals from the crude liquid.

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**4,294,999**

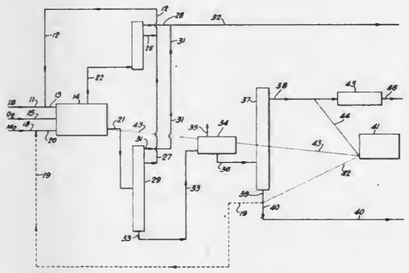
## PREPARING OXYGEN-CONTAINING FUEL WHEREIN TERTIARY BUTYL ALCOHOL IS THE MAJOR PRODUCT OF THE PROCESS

**Henry R. Grane, Springfield; John C. Jubin, Jr., Wallingford, and G. Richard Worrell, Media, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 45,454, Jun. 4, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,035**

**Int. Cl.³ C07C *29/50***

**U.S. Cl. 568—910** **2 Claims**



1. The method of preparing a motor fuel blending component which consists of:

maintaining in an oxidation zone a liquid consisting of dissolved isobutane and oxidate, said oxidate comprising dissolved byproducts, tertiary butyl hydroperoxide, and tertiary butyl alcohol, solubilized molybdenum catalyst in a concentration corresponding to from about 1 to about 1,000 parts per million of isobutane, while injecting into the liquid a gas comprising oxygen and while injecting into the liquid a mixture of recycled and fresh isobutane;

maintaining the liquid in said oxidation zone at a temperature within the range from 240° F. to 310° F. at a pressure adapted to maintain much of the isobutane in the liquid phase, said pressure being within the range from 200 to 1000 psig;

controlling product withdrawal rate and isobutane injection rate to provide a residence time within the range from about 3 to about 10 hours;

transferring from said oxidation zone a liquid stream, and directing said liquid stream through a debutanizing zone, to provide a debutanized liquid stream, and to provide a stream of isobutane recycled from the liquid, and to provide a withdrawn vapor stream comprising nitrogen, oxygen, carbon monoxide, and carbon dioxide;

transferring from said oxidation zone a vapor stream comprising nitrogen, oxygen, carbon monoxide, carbon dioxide, and isobutane, said vapor stream being subjected to partial condensation to provide a stream of isobutane recycled from a vapor zone of the oxidation zone, and to provide a withdrawn vapor stream comprising nitrogen, oxygen, carbon monoxide and carbon dioxide;

directing said debutanized liquid stream to a thermal decomposition zone maintained at a temperature within the range from about 260° F. to about 320° F. for from about 2 to about 8 hours to decompose a significant portion of the tertiary butyl hydroperoxide to form tertiary butyl alcohol and oxygen, and withdrawing a stream of oxygen from said decomposition zone;

transferring liquid from said decomposition zone for transfer to a distillation zone in which there is a distillate stream comprising acetone, methanol, and tertiary butyl alcohol which is taken overhead, and in which there is a residual liquid stream containing measurable amounts of tertiary butyl hydroperoxide, sufficient tertiary butyl alcohol to provide a unit weight ratio of tertiary butyl alcohol to tertiary butyl hydroperoxide greater than one, byproducts which are not completely codistilled with tertiary butyl alcohol, and molybdenum catalyst;

withdrawing said residual liquid stream;

subjecting said distillate stream to treatment in a peroxide clean-up zone, said treatment consisting of heating the liquid at from 375° F. to 475° F. for a time of from 1 minute to 10 minutes to provide a motor fuel blending component; and

withdrawing from the peroxide clean-up zone a motor fuel blending component product stream containing tertiary butyl alcohol as the major product of the process, said stream also containing methanol.



**4,295,000**

## ELECTRODE-POSITION CONTROL IN ARC FURNACES

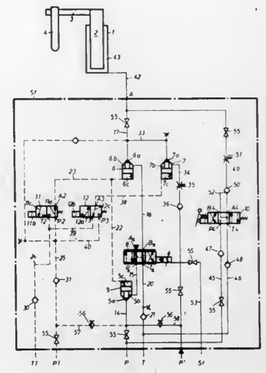
**Edgar Mark, Lohr, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany**

**Filed Jan. 10, 1980, Ser. No. 110,855**

**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901198**

**Int. Cl.³ H05B *7/156***

**U.S. Cl. 13—13** **5 Claims**



1. An electrode position control for arc furnaces comprising a hydraulically operated cylinder and piston unit having a cylinder chamber and a plunger piston extending into said cylinder chamber and connected to an electrode to be moved; a three-position control valve; a first pressure conduit connecting said control valve with a source of pressure fluid; a working conduit connecting said control valve with said cylinder chamber, said control valve being movable from a neutral position to a first operating position connecting said working chamber with a reservoir so that pressure fluid will flow out from said cylinder chamber to lower said electrode and a second operating position connecting said working conduit with a pressure source so that pressure fluid will flow into said cylinder chamber to raise said electrode; a first preselectable two-way valve movable between a closed and an open position in said first pressure conduit; a second preselectable two-way valve movable between an open and a closed position in said working conduit; a second pressure conduit connecting said chamber directly with said pressure source; a third preselectable two-way valve movable between an open and a closed position in said pressure conduit, and means cooperating with said two-way valves for moving said first and second two-way valves to said closed position while moving said third two-way vlave to said open position and vice versa.

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**4,295,001**

## ELECTRODE SEAL

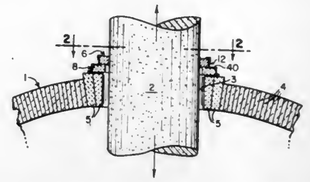
**Kenneth L. Britton, Claypool, Ariz., assignor to Inspiration Consolidated Copper Company, Inspiration, Ariz.**

**Filed Dec. 3, 1979, Ser. No. 99,632**

**Int. Cl.³ H05B *7/12***

**U.S. Cl. 13—17** **10 Claims**

1. An electrode seal for an electric furnace having at least one electrode movable into and out of said furnace through an opening in the furnace roof wherein said seal comprises a first ring including a plurality of radially slidable first refractory bricks partially overlying said opening and adapted to contact and seal with the periphery of said electrode, and contractions means for periodically exerting a contraction force on said first ring to slide said first refractory bricks radially inwardly towards said electrode until said first refractory bricks contact and seal with the periphery of said electrode and wherein said first refractory bricks are free to slide radially outwardly of said opening under force of engagement with the periphery of



said electrode during periods of time when said contraction means does not exert a contraction force on said first ring.

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**4,295,002**

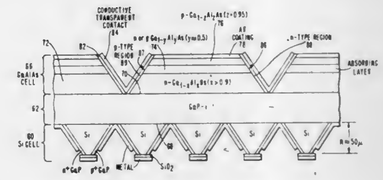
## HETEROJUNCTION V-GROOVE MULTIJUNCTION SOLAR CELL

**Terry I. Chappell, Amawalk, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 23, 1980, Ser. No. 161,820**

**Int. Cl.³ H01L *31/06***

**U.S. Cl. 136—244** **17 Claims**



1. A solar energy converter comprising:

a first solar cell comprising first multiple p-n heterojunctions in association with a first type of optically active semiconductor material on one side of an insulating substrate; and

a second solar cell comprising second multiple p-n heterojunctions in association with a second type of optically active semiconductor material on the opposite side of the insulating substrate;

said first type of semiconductor material is GaAlAs, said second type of semiconductor material is Si, and said insulating substrate is semi-insulating GaP.

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**4,295,003**

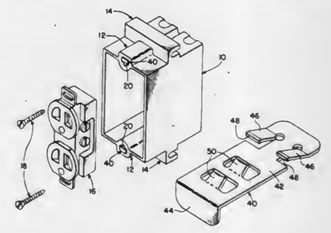
## THREADED SCREW MOUNTING MEANS

**Jesus Borja, Glenview, and Jack R. Halvorsen, Mt. Prospect, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Jan. 7, 1980, Ser. No. 110,055**

**Int. Cl.³ H02G *3/08***

**U.S. Cl. 174—53** **14 Claims**



1. A threaded screw mounting means including:

a screw mounting member;
a generally D-shaped bore hole open along its flat side formed in said mounting member;
an axially extending slot substantially parallel to and communicating with said D-shaped bore hole along said open flat side and extending laterally therefrom;
a substantially flat clip member complementary to and slidably received within said slot, said clip member including:
substantially planar head means at one end extending perpendicularly to the plane of the flat clip,
at least two yieldable arms struck from said clip member and extending angularly into said bore hole along said open flat side in a direction away from said head,
a pair of spaced yieldable leg members struck from adjacent the opposite edges of said clip and providing shoulder means in spaced opposition to said head, said leg members extending outwardly from the same side of the plane of said clip member as said at least two yieldable arms extend,
said slot and bore having a coterminous predetermined axial extent whereby when said clip member has been fully inserted said head bears against the outer one end of said mounting member and said leg members which flex during insertion into said slot snap outwardly after passage through said slot and bear against said mounting member adjacent said bore hole at its end opposite said outer end in locking engagement,
said at least two yieldable arms being deflectable when a screw threaded member is axially pushed into said bore hole from the outer end and engages said thread against retrograde axial movement while permitting adjustment of the screw, as well as removal, by appropriate rotation, said mounting member being counterbored adjacent said opposite end of said bore hole and slot to form abrupt shoulder means at said opposite end at least adjacent said slot and on opposite sides of said bore hole, said slot being tapered from said outer end toward said opposite end and terminating in parallel walls spaced apart a distance substantially equal to the effective thickness of said clip member for a limited axial distance adjacent the point where said slot communicates with said counterbore, said limited axial distance of said parallel walls gripping said clip member only in the region axially intermediate said yieldable arms and legs.

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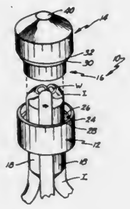
**4,295,004**
**WIRE CONNECTOR**
**William C. Dauser, Jr., North Muskegon, Mich., assignor to Lloyd A., Trustee Heneveld, Grand Rapids, Mich.**
**Filed Dec. 3, 1979, Ser. No. 99,624**
**Int. Cl.[3] H01R** *11/00*
**U.S. Cl. 174—87** **17 Claims**



1. A self-stripping solderless electrical connector comprising:
an elongated body of insulating material having wire receiving channels formed along at least a portion of its length;
a cap member having a conductive member fixed thereto, said cap member and said conductive member being adapted for positioning over and movable along a portion of said elongated body and said channels, said conductive member adapted to engage a plurality of insulated wire conductors positioned in said channels, cut through the insulation thereof, and engage wire conductors to provide an electrical connection therebetween upon movement of said cap member and conductive member along said elongated body.

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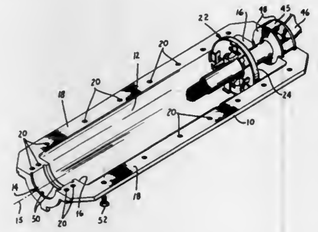
**4,295,005**
**CABLE SPLICE CLOSURE**
**Edgar E. Daugherty; Kenneth W. Jackson; Wesley W. Jones, and Naif T. Subh, all of Gwinnett, Ga., assignors to Western Electric Company, Inc., New York, N.Y.**
**Filed Oct. 17, 1979, Ser. No. 85,850**
**Int. Cl.[3] H02G** *15/113*
**U.S. Cl. 174—92** **7 Claims**



1. A telecommunications cable splice closure comprising a pair of elongated covers each having a generally semi-cylindrical interior wall extending radially about a closure axis from opposed ends of which wall two flat end walls extend approximately normally to said closure axis with each end wall defining an opening from which a closure end port extends; a pair of cable clamp supports having generally annular rims sized to be positioned about a cable within said cover interior walls in flush contact or in point contact with said end walls; and means for securing said pair of covers together about said pair of cable clamp supports; whereby during a splicing operation a cable clamp support may temporarily be positioned within the covers in point contact with a cover end wall clamped about a cable entering the closure through an end port at a skewed angle with respect to the closure axis and later be pulled into flush contact with the end wall as the cable is straightened into a position along the closure axis.

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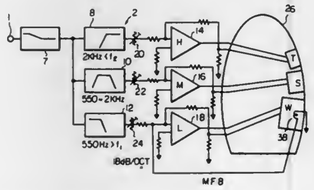
**4,295,006**
**SPEAKER SYSTEM**
**Mitsuaki Tanaka, and Hidetsugu Suzuki, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan**
**Filed Apr. 23, 1979, Ser. No. 32,229**
**Claims priority, application Japan, Apr. 24, 1978, 53-54248**[U]; Jul. 6, 1978, 53-93181[U]
**Int. Cl.[3] H04R** *1/28*
**U.S. Cl. 179—1 E** **19 Claims**



1. A speaker system comprising:



(a) a speaker enclosure having a diffraction characteristic;
(b) at least one speaker installed in said enclosure;
(c) a diffraction compensation circuit responsive to an input electrical audio signal for relatively elevating the level of the electrical signal at low frequencies so as to compensate for said diffraction characteristic of said speaker enclosure, said speaker being responsive to the output signal of said diffraction compensation circuit, said diffraction compensation circuit including a lowpass filter and an amplifier to exhibit a frequency characteristic opposite to said diffraction chacteristic.

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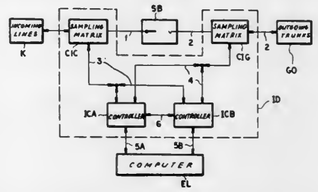
**4,295,007**
**LINE IDENTIFIER FOR SWITCHBOARDS**
**Luciano Astegiano, and Wouter M. D. van Veen, both of Turin, Italy, assignors to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy**
**Continuation-in-part of Ser. No. 953,163, Oct. 20, 1978, Pat. No. 4,252,998. This application Feb. 11, 1980, Ser. No. 120,545**
**Claims priority, application Italy, Oct. 21, 1977, 69356 A/77**
**Int. Cl.[3] H04M** *5/04, 15/00*
**U.S. Cl. 179—7 R** **17 Claims**



1. In a telecommunications system including a switchboard with multiplicity of incoming lines and a multiplicity of outgoing lines,
the combination therewith of a line identifier for monitoring switchboard activity and for establishing a communication link between a selected incoming line and a selected outgoing line in response to manual operations at said switchboard, said line identifier comprising:
first detector means connected to said switchboard for generating a signal coding the identity of a selected incoming line and for requesting the identification of a concomitantly selected outgoing line;
second detector means connected to said switchboard for generating a signal coding the identity of a selected outgoing line;
switching means coupled to said lines for connecting a selected incoming line to a concomitantly selected outgoing line upon the successful recognition thereof by said line identifier; and
control means operationally linked to said first detector means for decoding identification-request signals therefrom, to said second detector means for enabling same to emit a trunk-identifying signal upon the reception by said control means of a request signal from said first detector means, and to said switching means for activating same to connect a selected incoming line to a concomitantly selected outgoing line upon the decoding by said control means of a signal from said second detector means indicating such outgoing line.

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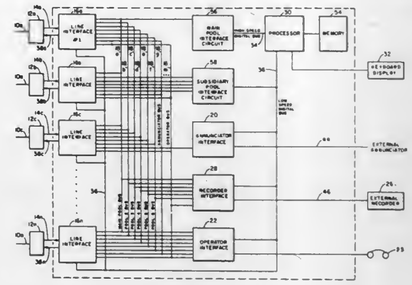
**4,295,008**
**TELEPHONE-CONFERENCING APPARATUS AND METHOD HAVING RESPONSE TALLYING**
**Avery R. Johnson, Milford, N.H.; Richard G. McGurk, Hull, Mass., and John M. Harrison, Epsom, N.H., assignors to Small World Exchange, Inc., Nashua, N.H.**
**Filed Mar. 23, 1979, Ser. No. 23,387**
**Int. Cl.[3] H04M** *3/22, 3/56*
**U.S. Cl. 179—18 BC** **8 Claims**



1. Telephone conferencing apparatus comprising
input means for concurrently receiving a plurality of incoming calls over an associated plurality of incoming telephone lines and responding to a caller-initiated signaling condition on any incoming line for conditioning that line for conference communication,
control means responsive to said input means for connecting said lines associated with said incoming calls to at least one conference grouping wherein any associated incoming line in the grouping provides communication with other lines in said grouping and wherein said grouping has the capacity of at least three incoming calls, said control means providing said connecting of each line, to such a conference grouping, independently of the connecting of other of said lines to a conference grouping,
monitor means operatively responsive to the incoming signal energy on each incoming line for generating electrical report signals distinct from incoming communication and indicating at least which of said lines carries incoming communication,
means for initiating a tally condition, and
tally means responsive to said monitor means and to said tally condition-initiating means for providing a summation of the number of lines having associated therewith reports signals during a selected time interval.

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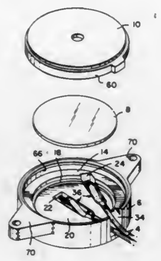
**4,295,009**
**PIEZOELECTRIC AUDIO TRANSDUCER MOUNTING AND ELECTRICAL CONNECTOR**
**Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**
**Filed Mar. 7, 1980, Ser. No. 128,331**
**Int. Cl.[3] H04R** *17/00*
**U.S. Cl. 179—110 A** **10 Claims**

1. Supporting and contacting means for a piezoelectric audio transducer comprising:
transducer housing means having a transducer-receiving recess therein which is dimensioned to receive said transducer, said recess having an inner end surface and having transducer-supporting surface portions for supporting peripheral portions of said transducer, said transducer supporting surface portions being spaced from said inner end surface,
first and second terminal-receiving wells in said inner end surface, each of said wells having a terminal-supporting floor and having sidewalls extending from said inner end surface to said terminal-supporting floor,
first and second contact terminal in said wells, each of said

terminals having an elongated generally channel-shaped frame section comprising a web and terminal sidewalls extending from said web, said web being on said floor and said terminal sidewalls being against said well sidewalls,

an elongated spring struck from said web along the length thereof, said spring extending obliquely from said web at an acute angle and having a contact portion which is normally elevated above said inner end surface and above said transducer supporting surface portions,



conductor means extending from said web at each end thereof and externally of said housing means and

clamping means for clamping said transducer in said recess with peripheral portions thereof on said transducer supporting surfaces whereby, upon placement of said transducer in said recess, and clamping said transducer against said transducer supporting surface portions, said contact springs are flexed towards said webs of said terminals and are thereby placed in preloaded resilient contact with said transducer.

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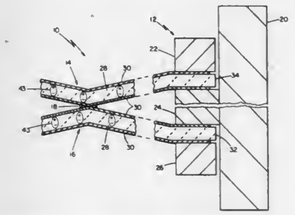
**4,295,010**

## PLURAL PIEZOELECTRIC POLYMER FILM ACOUSTIC TRANSDUCER

**Preston V. Murphy, Geneva, Switzerland, assignor to Lectret S.A., Geneva, Switzerland**

**Filed Feb. 22, 1980, Ser. No. 123,719**
**Int. Cl.[3] H04R** *17/00*
**U.S. Cl. 179—110 A** **15 Claims**



1. An acoustic transducer comprising:

a hollow support member, and

a plurality of metal-coated piezoelectric polymer films to act as an oscillator, said films being

spaced apart at their peripheries,

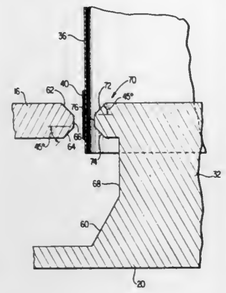
mounted at said peripheries to said support member, and physically connected to at least one adjacent film near their centers.

**4,295,011**

## LINEAR EXCURSION-CONSTANT INDUCTANCE LOUDSPEAKER

**Dana B. Hathaway, Amesbury, Mass., assignor to Epicure Products Inc., Newburyport, Mass.**

**Filed Sep. 11, 1979, Ser. No. 74,507**
**Int. Cl.[3] H04R** *9/06*
**U.S. Cl. 179—115.5 VC** **19 Claims**



1. A loudspeaker, comprising:

a frame,

a speaker cone attached at its widest portion to the frame,

a hollow cylindrical voice coil attached to the narrow portion of the cone and having a winding formed on the end of the voice coil distal said cone, said winding having no more than two layers and forming a coil, and

means attached to said frame for generating a focused magnetic field, said field being formed to surround said voice coil and being focused onto said coil winding, said focused magnetic field being formed as a cylinder having a height less than the height of said winding;

said means for generating said focused magnetic field comprising a center pole extending upwards inside of said hollow voice coil, and a bottom plate affixed to said center pole at an end thereof distal from said hollow voice coil, said center pole having a midsection and a portion of gradually increasing diameter, said diameter gradually increasing from said midsection through said portion of gradually increasing diameter to said end of said center pole distal said hollow voice coil, whereby to add increased magnetizable mass to said center pole.

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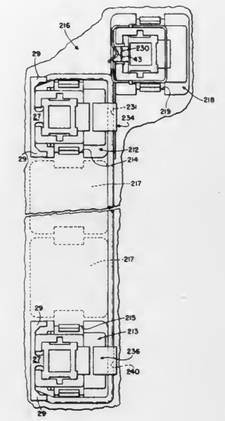
**4,295,012**

## SECRETARIAL SHIFT MECHANISM FOR AN ELECTRIC KEYBOARD

**Robert J. Keeler, Elmhurst, and Stanley E. Filipiak, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Feb. 4, 1980, Ser. No. 118,038**
**Int. Cl.[3] H01H** *9/20*
**U.S. Cl. 200—5 B** **8 Claims**

1. A keyboard mechanism comprising a shift keyswitch and a shift lock keyswitch positioned adjacent said shift keyswitch wherein each of said keyswitches comprises a switching means, a housing with a base for said switching means, an actuating member in the form of a plunger within said housing mounted for movement relative to said housing base from an initial undepressed position to a depressed position for actuating said switching means when said actuating member is in said depressed position, resilient means for returning said actuating member to its undepressed position and wherein said mechanism further comprises a ledge formed on said actuating member of said shift lock keyswitch, locking means which is resiliently biased toward said ledge and which engages said ledge so as to hold said actuating member of said shift lock keyswitch in its depressed position when said actuating member of said shift keyswitch is in its undepressed position, but which does not engage said ledge when said actuating member of said shift lock keyswitch is in its undepressed position and said actuating member of said shift keyswitch is depressed, rotatable release means connected to said locking means and an actuator bar operable exteriorly of said housing and including an arm connected to said actuating member of said shift keyswitch which is constructed to engage said rotatable release means when said



actuating member of said shift keyswitch is depressed and said actuating member of said shift lock keyswitch is held in its depressed position in a manner which causes said rotatable release means to rotate sufficiently far to allow said locking means to be withdrawn clear of said ledge which in turn allows said actuating member of said shift lock keyswitch to be returned to its initial undepressed position by said resilient means of said shift lock keyswitch.

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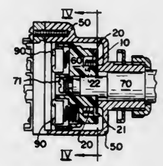
**4,295,013**

## IGNITION SWITCH

**Millard E. Gage, Otego, and Derek J. Landers, Sidney Center, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed May 12, 1980, Ser. No. 149,108**
**Int. Cl.[3] H01H** *21/62*
**U.S. Cl. 200—11 C** **2 Claims**



1. In combination with a switch of the type having: a housing which includes an internal shoulder; a rotor which includes a central passage and an annular recess located at one end and spaced from said central passage, said recess including a inner wall and an outer wall; means for mounting said rotor for radial movement within said housing, said means including a shaft disposed in said rotor central passage and connected to said rotor; at least one electrical contact mounted on the other opposite end of said rotor; a coil spring mounted in the annular recess of said rotor; means for attaching one end of said spring to said rotor; and a plate connected to the other opposite end of said spring, said plate having an extended portion adapted to engage said housing shoulder when said rotor is rotated a predetermined distance, the improvement wherein:

the retainer plate includes a tab projecting from the surface of said plate in the direction of said spring and located adjacent the inner diameter of the first winding of said spring, whereby when said rotor is rotated a predetermined distance the extended portion of said plate engages said housing shoulder and further rotation of said rotor causes said rotor to wind said spring which compresses inwardly, further causing the tab on said plate to engage the first winding of said spring as it compresses to prevent the first winding of said spring from engaging the inner wall of said recess.

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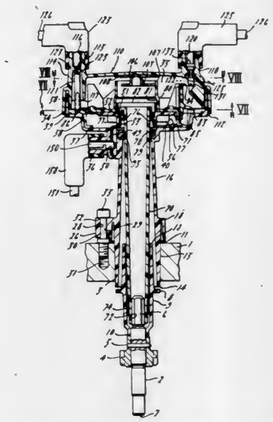
**4,295,014**

## IGNITION DISTRIBUTOR WITH INTEGRAL COMMON ELECTRODE, SHAFT BEARING AND HIGH VOLTAGE TERMINAL CONNECTOR

**David H. Fox, Ann Arbor, and Charles C. Kostan, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 14, 1979, Ser. No. 103,675**
**Int. Cl.[3] H01H** *19/00*
**U.S. Cl. 200—19 R** **4 Claims**



1. A high voltage commutation distributor for an internal combustion engine comprising:

a distributor base for mounting on said engine, defining a shaft housing and a portion of an electrical commutation cavity;

a distributor cap for mounting on said base and defining the remaining portion of said commutation cavity;

means defining a plurality of spark plug terminal connectors mounted within said commutation cavity;

a rotor driveshaft formed of electrically insulative material mounted within said shaft housing and being rotationally driven by said engine;

unitary structure means mounted on said base within said cavity and formed entirely of an electrically conductive material for providing both a common high voltage conductor means and means for mounting said driveshaft in said base for rotation about a central axis therein; and

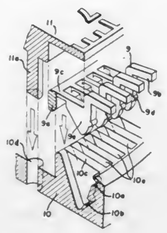
means defining a rotor element mounted on said rotor driveshaft for providing electrical commutation between said common high voltage conductor means and respective ones of of said spark plug terminal connectors.

**4,295,015**

## REPEAT TYPE TIME SWITCH

**Ichiroh Fujiwara; Yoshiaki Motoki; Toshinori Inoue, and Kazuma Fukuoka, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 6, 1979, Ser. No. 73,133**
**Claims priority, application Japan, Sep. 14, 1978, 53-112930**
**Int. Cl.³ H01H *7/00***
**U.S. Cl. 200—38 R** **3 Claims**



1. A time switch comprising:

a cradle substantially in the form of a disk and rotatable about an axis;

a plurality of circumferentially spaced axial depressions on one axial surface of said cradle, said depressions being separated by partitions and including radially outwardly located depression walls including two detent means;

an annular element fixable adjacent said surface and concentric with said disk, said annular element being radially inward relative to said depressions;

a radially extending change over pawl for each of said depressions and each said pawl having substantially the same circumferential width as one of said depressions, each of said pawls having a radially inward end fixed to said annular element by an elastically deformable connecting means, a radially outward end adapted to selectively engage a switch element and an intermediate portion inserted in one of said depressions and having a surface including means selectively engageable with one of said detent means;

whereby said depression substantially encloses all of said pawl except for said radially outward end and said partitions prevent distortion of said pawls in the circumferential direction.

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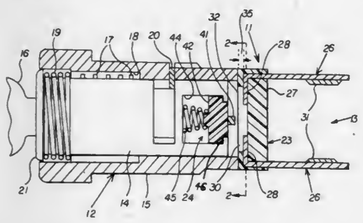
**4,295,016**

## GARAGE DOOR LOCK

**John H. Cantlin, Lincoln, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.**

**Filed Dec. 14, 1979, Ser. No. 103,532**
**Int. Cl.³ H01H *27/06***
**U.S. Cl. 200—44** **9 Claims**



1. A lockable electrical switch comprising:

a lock shell;

a cylindrical plug mounted within said shell for rotary movement between locked and unlocked positions and for axial movement between active and inactive positions, said plug defining a keyway and a plurality of tumblerways intersecting therewith;

tumbler means movably mounted in said tumblerways, said tumbler means operatively engaging said shell and said plug so as to prevent relative rotation therebetween in the absence of a proper key in said keyway;

a movable contact means mounted for movement with said plug; and

stationary assembly means comprising stationary contact means shaped and arranged so as to be engaged by said movable contact means with said plug in both said unlocked and active positions and to be disengaged therefrom with said plug in either of said locked or inactive positions, said stationary assembly means further comprising an insulator body defining both an internal cavity retaining said stationary contact means and an opening communicating with said cavity, said opening having a periphery with dimensions that permit entry into said cavity of said movable contact with said plug in said unlocked position and obstruct entry thereof with said plug in said locked position.

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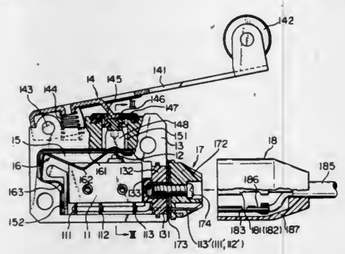
**4,295,017**

## LIMIT SWITCH

**Isoo Kashima; Masami Mishina, both of Watarai; Yosio Takase, Matsuzaka, and Katsumi Maruchi, Tsu, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Mar. 6, 1980, Ser. No. 127,885**
**Claims priority, application Japan, Mar. 6, 1979, 54-285131[U]**
**Int. Cl.³ H01H *3/16***
**U.S. Cl. 200—47** **20 Claims**



1. In a limit switch comprising a switching means having a push-button for actuating said means, a housing having an interior space for housing said switching means, means provided to communicate said interior space with the exterior of said housing for operating said push-button to actuate the switching means by transmitting an externally given operating force to the push-button, means cooperating with said operating means for absorbing said operating force applied sequentially after an actuation of the switching means, the combination comprising a first spring means fixed at one end within said interior space of the housing and extended at the other end to be engageable with the push-button, said the other end of said first spring means providing a first biasing force acting substantially in the same direction as said operating force, and a second spring means fixed at one end within said interior space of the housing and extended at the other end to a position adjacent said the other end of said first spring means to provide thereto a second biasing force in a direction opposite to the operating force for normally restraining the other end of the first spring means from engaging the push-button against said first biasing force, said second spring means engaging said operating means to act as said absorbing means and releasing said restraint to the other end of the first spring means in response to the operating force applied through the operating means to allow the first spring means to engage and operate the push-button with the first biasing force.



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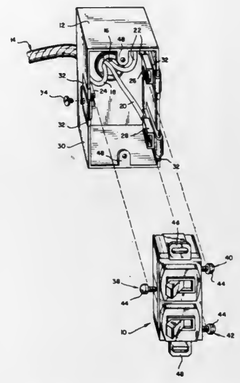
**4,295,018**

## ELECTRICAL HOUSING AND SWITCH BOX

**Dominick Borrelli, 2243 Cropsey Ave., Brooklyn, N.Y. 11214**

**Filed Apr. 28, 1980, Ser. No. 144,386**
**Int. Cl.³ H01R *33/30***
**U.S. Cl. 200—51.09** **5 Claims**



1. An electrical switch assembly comprising a housing having first and second openings therein, and adapted to receive a plurality of electrical wires internally thereof through said first opening, a plurality of electrically conductive contacts mounted on said housing adjacent said second opening, said contacts having means for receiving the said wires, each contact receiving a different one of said wires; a switch box for electrically connecting and disconnecting said wires, said switch box having a plurality of electrical connector means thereon, each of said contacts having a connector receiving opening therein for receiving and partially enclosing one of said connector means when the switch box is pushed into said housing, each connector being shaped to engage said opening.

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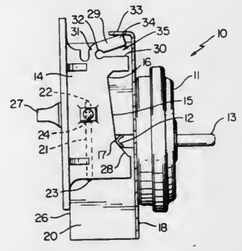
**4,295,019**

## WATER LEVEL CONTROL DEVICE AND METHOD OF MAKING THE SAME

**Thomas M. Buckshaw, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Oct. 24, 1979, Ser. No. 87,753**
**Int. Cl.³ H01H *35/34***
**U.S. Cl. 200—61.2** **12 Claims**



1. In a water level control device having a cam follower for setting the desired water level setting for said control device and a movable cam means having a cam surface engaging said cam follower to set the same in desired positions, said cam surface having a reset portion for resetting said control device when said reset portion is disposed against said cam follower, said control device having a spring means that cooperates with said cam means to tend to move said cam means from its resetting position when said reset portion is disposed against said cam follower, the improvement wherein said spring means is integral and homogeneous with said cam means whereby said cam means and said spring means comprises a one-piece homogeneous structure.

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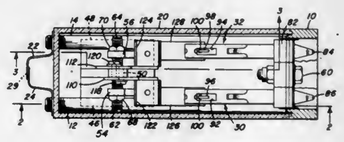
**4,295,020**

## ELECTRICAL SWITCH MECHANISM

**James Heydweiller, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 106,568**
**Int. Cl.³ H01H *35/14***
**U.S. Cl. 200—61.45 R** **11 Claims**



1. A switch mechanism which comprises at least a first set of switch contacts which are moveable with respect to each other between make and break positions where said contacts are in contact and apart respectively, an axle, a pendulum pivotally moveable about said axle with respect to the vertical in first and second opposite directions in response to deceleration and acceleration events in said opposite directions, an arm mounted on said pendulum for actuating said contacts when said pendulum moves a predetermined distance in one of said opposite directions in response to the occurrence of a predetermined level of one of said acceleration and deceleration events which is applied to said mechanism, means pivotally supporting said arm on said pendulum and for adjusting the position of said arm on said pendulum to selected different inclinations with respect to the vertical for selecting said predetermined level of said one event upon occurrence of which said first set of contacts is actuated to said other position thereof.

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**4,295,021**

## ELECTROMAGNETIC ARC EXTINCTION APPARATUS FOR SWITCHGEAR

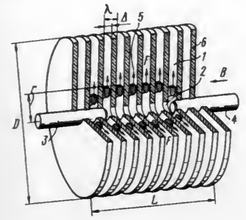
**Erik I. Asinovsky, 16 Parkovaya ulitsa, 49, korpus 1, kv. 78; Anatoly A. Afanasiev, Ljubertsy, ulitsa Shosseinaya, 10, kv. 137; Evgeny P. Pakhomov, Yakhromskaya ulitsa, 3, korpus 2, kv. 30; Vladimir A. Zeigarnik, Bolshoi Tishinsky pereulok, 41, kv. 9, all of Moscow, and Ivan M. Yartsev, ulitsa Teatralnaya, 27, korpus 3, kv. 28, Dolgopruday, Moskovskaya oblast, all of U.S.S.R.**

**Filed Jan. 19, 1979, Ser. No. 4,669**
**Int. Cl.³ H01H *33/06***
**U.S. Cl. 200—147 R** **9 Claims**

1. An electromagnetic arc extinction apparatus for switchgear, comprising:

an arc chamber defined by an electrically insulating material and having a cavity extending along a helix so as to allow a quenching arc in the form of a helix to be moved in a radial direction, said cavity having a pitch which is at least 10 times smaller than the diameter of the arc chamber measured over the cross-section thereof;

an axial channel extending axially through said arc chamber; and



two electrodes at least in part situated in said axial channel and arranged in alignment with the axis of said arc chamber and adapted to form said quenching arc.

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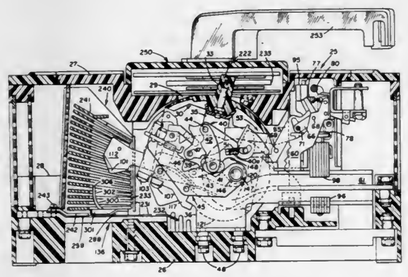
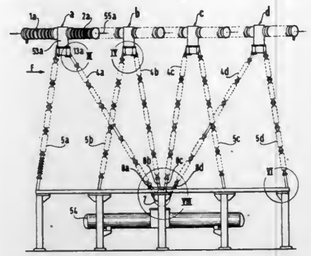
**4,295,022**
**TRIFURCATED ARC RUNNER**
**Charles T. Robins, Swarthmore, Pa., assignor to Gould Inc., Rolling Meadows, Ill.**
**Filed Mar. 15, 1979, Ser. No. 20,767**
**Int. Cl.³ H01H** *33/20*
**U.S. Cl. 200—147 R** **10 Claims**



1. A circuit breaker including an elongated conducting strap having first and second ends; stationary contact means mounted on said strap and positioned in front of a first face thereof at said first end; said stationary contact means including a stationary arcing contact section and a stationary main contact section positioned closer to said first end than said stationary arcing contact section; movable contact means including movable arcing and main contact sections operable into and out of engagement with the respective stationary arcing and main contact sections; arc chute means to receive and extinguish electric current arcs drawn between said movable and stationary contact means upon separation thereof; said arc chute means being positioned in front of said first face and interposed between said stationary contact means and said second end; arc runner means in front of said first face and in electrical contact with said stationary arcing contact section and extending therefrom toward said second end; said arc runner means including at its end remote from said stationary main contact section a plurality of transversely spaced sections for dispersing various arc sections into different regions of said arc chute means.

**4,295,023**
**GAS-BLAST CIRCUIT-BREAKER**
**Edmond Thuries, Pusignan; Pierre Vernat, and Roger Sauvat, both of Villeurbanne, France, assignors to Delle-Alsthom, Villeurbanne, France**
**Filed Jun. 13, 1979, Ser. No. 48,120**
**Int. Cl.³ H01H** *33/14, 33/82*
**U.S. Cl. 200—148 R** **5 Claims**



1. A gas-blast circuit-breaker, said circuit-breaker including for each pole, a horizontal base, a control box, an actuator chamber secured to said base, a plurality of groups of arc-extinguishing chambers, each group including at least two arc-extinguishing chambers, each arc-extinguishing chamber including an opening unit and a closing unit, arc-extinguishing chambers being electrically connected in series, each group including a support assembly, said support assembly comprising a plate, said control chamber fixed to said plate, said arc-extinguishing chambers being fixed to said control chamber and opening thereto, two insulating pillars extending between said plate and said base and being secured to said base, said column being fixed at one end to said plate and communicating through said plate with the interior of said arc-extinguishing chamber via said control box, said column being abutting at its other end to said actuator chamber and being secured thereto and communicating with the inside of said actuator chamber, said hollow column including rod means extending longitudinally interiorly thereof and controlling said opening and closing units, a compressed gas source connected to said actuator chamber for supplying compressed air via said actuator chamber and said hollow insulated column to said arc-extinguishing chambers and said actuator chamber including means for imparting simultaneous axial movement of said rod means so as to simultaneously open and close all of said opening and closing units of said plurality of groups of arc-extinguishing chambers.

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**4,295,024**
**SPRING BIASED ENERGY ABSORBER FOR VACUUM SWITCH CONTACT SHAFTS**
**Eugene L. Kamp, Fulton, Mo., assignor to A. B. Chance Company, Centralia, Mo.**
**Filed Sep. 24, 1979, Ser. No. 78,094**
**Int. Cl.³ H01H** *3/60*
**U.S. Cl. 200—288** **4 Claims**

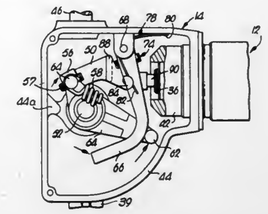
1. In an electrical switch including a pair of electrical contacts, soft metal, deformable shafts respectively supporting said contacts, and spring-loaded means for selective opening and closing of the contacts as desired and for creating a predetermined static closing force between said contacts when the contacts are in a closed condition, including opening and closing apparatus operatively coupled to at least one of the shafts, the improvement comprising structure for slowing the relative closing speed of said contacts prior to the instant of impact between said contacts for absorbing a part of the impact force developed during closing of said contacts, and without substantially lessening said static closing force between the contacts when the contacts are closed, said structure including

an elongated arm presenting an engagement surface;



means supporting said arm for pivoting movement thereof and in a location proximal to said closing apparatus; and

means associated with said arm for biasing the arm to a disposition where said surface is in the path of said closing apparatus during closing of said contacts for causing said



apparatus to engage and pivot said arm immediately prior to closing of said contacts,

the distance between the pivot axis of said arm and said engagement surface being substantially less than the overall length of said arm.

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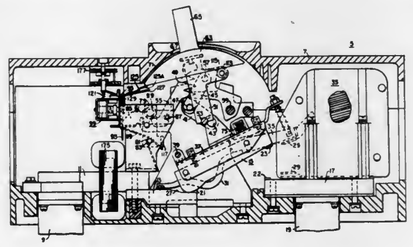
**4,295,025**
**CIRCUIT BREAKER WITH ELECTROMECHANICAL TRIP MEANS**
**William E. Beatty, Jr., Beaver Falls, and James P. Ellsworth, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**
**Filed Jun. 6, 1980, Ser. No. 156,961**
**Int. Cl.³ H01N** *3/60;* **N01N** *9/20*
**U.S. Cl. 200—288** **1 Claim**



1. A circuit interrupter, comprising:

(a) housing means;

(b) contact means disposed within said housing means for being actuated to an opened state;

(c) manual actuating means disposed in said housing means to be moved to actuate said contact means;

(d) electromechanical trip means disposed in said housing means to be electromechanically moved to actuate said contact means and to provide an associated trip indication; and

(e) shock absorbing means generally comprised of a leaf spring connected to said electromechanical trip means so it is disposed to absorb the shock and vibration when said manual actuating means is manually operable to open and close said contacts.

**4,295,026**
**SWITCH ADAPTER MECHANISM**
**Allen C. Williams, and Barbara J. Williams, both of 322 W. Jefferson Ct., Vernon Hills, Ill. 60061**
**Filed Nov. 5, 1979, Ser. No. 91,378**
**Int. Cl.³ H01H** *3/04*
**U.S. Cl. 200—331** **5 Claims**

1. Apparatus for use with a wall mounted switch of the type having an outlet box including at least one fastening aperture adapted for receiving a cover plate mounting screw and a vertically moveable operating level for turning the switch on and off, said apparatus comprising:

an elongate cover plate having an upper portion disposed overlying said outlet box and a lower portion depending therefrom, said upper portion including at least one mounting aperture adapted for receiving said mounting screw for stationarily securing said cover plate to said outlet box and an opening receiving said operating level for allowing local manual operation of said switch, said lower portion including a plurality of vertically spaced longitudinal slots;

an elongate slide plate interposed between the wall and said cover plate, said slide plate including at least one longitudinal guide slot receiving said mounting screw for allowing limited vertical displacement of said slide plate relative to said cover plate, an opening receiving said lever for operating said switch in response to vertical movement of said slide plate, and a plurality of apertures each displaceable in a locus underlying a respective one of said cover plate longitudinal slots in response to vertical movement of said slide plate; and

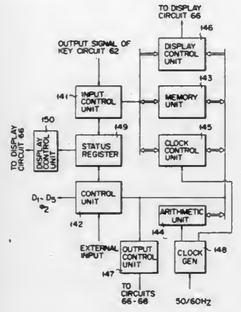
a single horizontally disposed operating member passing through a selected one of said cover plate longitudinal slots and snugly engaging the associated one of said slide plate apertures, said slide plate being moveable for operating said switch in response to vertical displacement of said operating member from an adjustable height above the floor corresponding to said selected cover plate longitudinal slot while said cover plate is maintained in a stationary orientation.

**4,295,027**

## MICROWAVE OVENS WITH PROGRAMMABLE CONTROL

**Sadao Zushi, Fuji, and Yoshio Oida, Funabashi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan**

**Continuation of Ser. No. 887,221, Mar. 16, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 113,050**
**Claims priority, application Japan, Mar. 18, 1977, 52-30106; Mar. 18, 1977, 52-30107; Mar. 18, 1977, 52-30108**
**Int. Cl.³ H05B 9/06**
**U.S. Cl. 219—10.55 B** **15 Claims**




1. A microwave oven comprising:
a casing;
a heating chamber provided in the casing;
a door provided at an opening of the heating chamber;
a magnetron for supplying a microwave energy to the heating chamber;
a source circuit for energizing the magnetron;
key means provided at the front panel of the casing and including numeral keys, function keys including a time key for setting or changing at least a selected cooking time, a temperature key for setting or changing selected temperature in a cooking operation, a power level key for setting or changing power levels which control cooking speed, a "heat & hold" key for setting a temperature level to be held for a selected time period, a memory key for selecting more than one stage of cooking operations prior to starting the oven so that cooking automatically progresses from one stage to the next, a start key for starting a selected cooking operation and a clear key for stopping oven operation and clearing a prior selected cooking operation;
digital control logic means for encoding an operation condition determined in response to the operation of the function keys and numeral keys in said key means selectively operated by users, which comprise a key circuit and an input control unit including a key encoder for encoding an output signal of said key circuit and a key ROM supplied with the output of said key encoder;
memory means having at least three memory areas for memorizing the encoded operation condition regarding the time, temperature and power level encoded by the digital control logic means, respectively;
display means for displaying digitally the operation condition encoded by said digital control logic means;
operation means for initiating an operation in response to the operation of said start key to energize said magnetron based on the operation condition memorized in said memory means, which includes an oscillator, a timing signal generator supplied with the output of said oscillator, and a main ROM connected to memorize a predetermined program, a status register connected to said key ROM and said main ROM, a first display control unit connected to receive the output of said status register, a second display control unit connected to said memory means, a display circuit for supplying the outputs of said first and second display control units to said display means;
said second display control circuit comprising a control gate with controls interchange of data between said key ROM and said main ROM, a display register and a half adder which are supplied with the output of said control gate, a latch circuit supplied with the output of said display register, and a segment decoder for decoding the output of said latch circuit; and
control means for controlling said source circuit in response to an output signal of said operation means.

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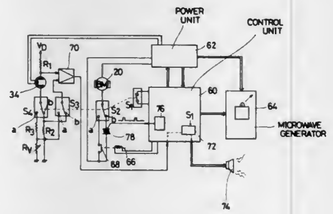
**4,295,028**

## COMBINATION OF GAS SENSOR CONTROLLED COOKING UTENSIL AND GAS LEAK ALARM

**Takeshi Tanabe, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Feb. 21, 1980, Ser. No. 123,278**
**Claims priority, application Japan, Feb. 23, 1979, 54-21061**
**Int. Cl.³ H05B 6/68**
**U.S. Cl. 219—10.55 B** **4 Claims**




1. A combined cooking utensil and gas leak alarm comprising:
an oven cavity;
a cooking energy source for conducting the cooking operation of a foodstuff disposed in said oven cavity;
a blower fan system for introducing a fresh air into the oven cavity and exhausting gas from said oven cavity;
a gas sensor disposed in a path of the gas developed from said oven cavity for detecting the gas concentration;
a control circuit for controlling the operation of said cooking energy source in response to an output signal derived from said gas sensor when said combined cooking utensil and gas leak alarm is placed in a cooking operation mode;
a monitor circuit for detecting an ambience gas concentration through the use of said gas sensor when said combined cooking utensil and gas leak alarm is placed in a gas leak alarm operation mode, said monitor circuit developing an alarm instruction output when the ambience gas concentration exceeds a preselected value; and
an alarm system responding to said alarm instruction output derived from said monitor circuit.

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**4,295,029**

## BATTERY STRAP CONNECTION WELDING METHOD

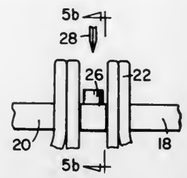
**Toshio Uba, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.**

**Division of Ser. No. 43,203, May 29, 1979, Pat. No. 4,241,151. This application May 27, 1980, Ser. No. 153,346**
**Int. Cl.³ B23K 9/225, 9/16**
**U.S. Cl. 219—75** **4 Claims**

1. A method for forming a unitary welded connection between collector tabs of electrode plates and a strap having at least one projecting leg, in a lead electrochemical cell, normally subject to variations in collector tab height relative to the leg contributing to the problem of forming an unsatisfactorily high percentage of "bridge welds", comprising the steps of:



positioning the leg between a plurality of adjacent collector tabs having a thin cross section relative to the leg, and the tabs extending upwardly above the leg and a boss being provided on the upper surface of the leg, whereby the boss is sandwiched in close proximity to the adjacent upwardly extending collector tabs;
juxtaposing mold means having a high thermal conductivity against the sides of the collector tabs; and




supplying an electrode arc employing an inert-gas-shielded, non-consumable electrode to the weldable surface (comprising collector tabs, leg and included boss) to cause upwardly extending portions of the collector tabs, and at least a portion of the boss, to melt and flow together into a fused mass without the use of lead filler rods, the flow being contained by the mold means.

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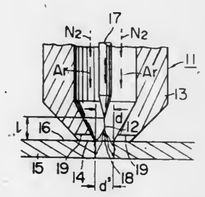
**4,295,030**

## PLASMA-ARC CUTTING METHOD

**Naoyoshi Hosoda, 2-20-18, Denenchofu, Ota-ku, Tokyo, and Takeshi Hosoda, 2-22-7, Wakabayashi, Setagaya-ku, Tokyo, both of Japan**

**Continuation of Ser. No. 884,682, Mar. 8, 1978, abandoned. This application Sep. 19, 1979, Ser. No. 76,821**
**Claims priority, application Japan, Mar. 8, 1978, 53-34732**
**Int. Cl.³ B23K 9/16**
**U.S. Cl. 219—121 PH** **3 Claims**




1. A plasma-arc cutting method comprising:
contacting the end of an electrically conductive nozzle having a downwardly tapering lower end portion having a reduced inside nozzle diameter, with a base metal;
after said contacting, bringing a central electrode surrounded in spaced concentric relation by said nozzle towards the surface of said base metal in a flow of a first inert gas resulting in striking an arc on a first anode point on said base metal while said electrode is away from said base metal;
adding a second inert gas to the flow of said first inert gas;
changing the distance between the electrode and said base metal from a first distance employed while striking an arc between said electrode and said base metal to a second distance employed while cutting said base metal with said arc, said first distance being less than said second distance;
whereby said nozzle and said base metal are at the same electric potential while said base metal is being cut and an opening approximately equal in diameter to said reduced inside nozzle diameter is cut through said base metal.

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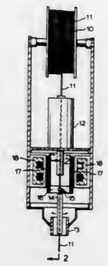
**4,295,031**

## ARC WELDING APPARATUS WITH OSCILLATING ELECTRODE

**Richard A. Roen, Edmonton, Canada, assignor to The Research Council of Alberta, Edmonton, Canada**

**Continuation of Ser. No. 895,266, Apr. 10, 1978, Pat. No. 4,177,373. This application Jul. 10, 1979, Ser. No. 56,294**
**Claims priority, application United Kingdom, Aug. 3, 1977, 32626/77**
**The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.**
**Int. Cl.³ B23K 9/12**
**U.S. Cl. 219—125.12** **4 Claims**



1. Arc welding apparatus for use with a consumable electrode to form a weld between metal surfaces separated by a gap comprising, in combination, a welding torch, means for moving a consumable electrode through said torch and into said gap, means for moving the tip of said electrode along a predetermined path longitudinally of said gap, means for oscillating said electrode back and forth across said predetermined path, and means for applying an impact force to said electrode at the end of each half cycle of oscillation of said electrode to interrupt its movement and impel molten metal onto the one of the surfaces towards which said electrode was moving before impact, said welding torch including pivotably mounted electrode guide means for said electrode, said electrode passing through and contacting said guide means, said means for oscillating said electrode back and forth across said predetermined path including means for moving said electrode guide means, said means for moving said electrode guide means including electromagnetic means and armature means operably associated therewith and adapted to be magnetically attracted to said electromagnetic means when said electromagnetic means are energized, one of said electromagnetic means and said armature means being operably associated with said guide means, and means for energizing said electromagnetic means.

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**4,295,032**

## PROCESS FOR BALANCING A CRANKSHAFT

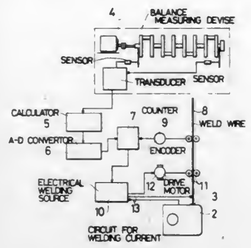
**Takeshi Sasaki, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,876**
**Claims priority, application Japan, Dec. 11, 1978, 53/151933**
**Int. Cl.³ B23K 9/04; G01M 1/16**
**U.S. Cl. 219—137 R** **1 Claim**

1. In a process for balancing a crankshaft having pin portions and associated balancing weight parts counterbalancing said pin portions, and which includes the step of welding masses of welding wire to the balancing weight parts to compensate for imbalance of the crankshaft, the improvement comprising the steps of:
electronically sensing and obtaining an analog signal of the extent of imbalance in said crankshaft,
converting said analog signal to digital form,
feeding said digital signal to an electronic counter to count-up said counter,
employing said counter when other than in null condition to

activate a welding current supply and to activate a feed for welding wire,

obtaining a digital signal representative of the length and thus of the weight of the welding wire fed by said feed, and




supplying said signal representative of the length of the welding wire to said counter to progressively count-down said counter to a null condition and to deactivate said welding current supply and said feed.

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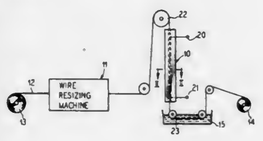
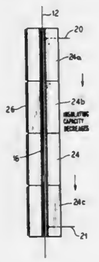
**4,295,033**

## ANNEALING OVEN

**Hakan O. Lindgren, and Bengt Magnusson, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal Aktiebolag, Hallstahammar, Sweden**

**Filed Jul. 12, 1978, Ser. No. 923,968**
**Claims priority, application Sweden, Jun. 20, 1977, 7707127**
**Int. Cl.³ H05B *3/40***
**U.S. Cl. 219—388** **4 Claims**



1. An annealing oven for wire and the like, comprising:

(a) a tubular elongated heater, open at both of its ends, there being a wire-receptive passage extending between said ends, said heater being made of an electrical resistance alloy, said alloy being essentially molybdenumdisilicide;

(b) a pair of electrical terminals connected to said heater at longitudinally spaced points;

(c) guide structure at each end of said heater and disposed to keep moving wire in said passage out of contact with said heater; and

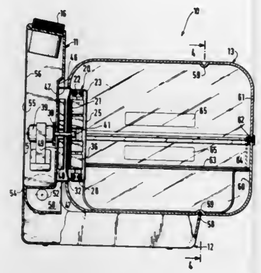
(d) at least one pair of sections of heat insulating material surrounding said heater, said sections being selectively movable, without disassembly, with respect to each other for regulating oven temperature.

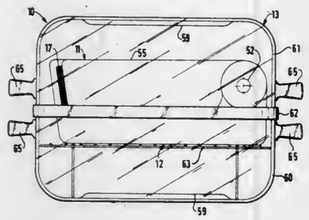
**4,295,034**

## HOT AIR GRILL

**Jurgen Assmann, Michelbach, Fed. Rep. of Germany, assignor to Grossag GmbH, Fed. Rep. of Germany**

**Filed Dec. 5, 1978, Ser. No. 966,571**
**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754208**
**Int. Cl.³ A37J *37/00*; A21B *1/22***
**U.S. Cl. 219—400** **25 Claims**





1. A portable hot air grill comprising a two-part base comprising a horizontal base portion and a vertical base portion foldably interconnected with one another, an electric motor mounted on said vertical base portion and having a horizontal shaft, a heating assembly projecting from said vertical base portion over said horizontal base portion and comprising a heater fan mounted on said motor shaft and an electric heating element in position to heat air blown by said fan, and a removable casing for receiving food stuff to be cooked, said horizontal base portion including means for removably supporting said casing thereon, and said casing being supported by removably resting by gravity on said horizontal base portion and having front, back, side, top and bottom walls of which at least said top wall is at least in part transparent, said back wall being unitary with said front and side walls and having an opening of a size and shape to receive said heating assembly when said casing rests on said horizontal base portion, said casing comprising at least two complementary, separable superposed parts which meet in a horizontal plane and have interfitting rim portions positioning said parts relative to one another when assembled one over another, said horizontal base portion and said casing having interfitting portions for positioning said casing in predetermined position on said horizontal base portion to receive said heating assembly through said opening said base being of a size to be received in said casing when in a folded-up condition.

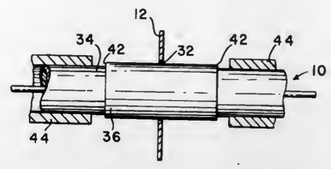


**4,295,035**

## DOUBLE-GRIP MOUNTING MEANS FOR SHEATHED HEATING ELEMENTS

**Lester D. Drugmand, Arnold, Md., assignor to Electro-Therm, Inc., Laurel, Md.**

**Filed Sep. 10, 1980, Ser. No. 185,994**
**Int. Cl.³ H05B *3/06***
**U.S. Cl. 219—536** **6 Claims**




1. A double-grip mounting assembly for securing a sheathed metallic electric heating element to a metallic bracket having an aperture thereon, comprising in combination,

a sheathed metallic electric heating element including a linear portion disposed within the aperture of said bracket,

a tubular metallic insert of relatively thin material disposed within the aperture of said bracket and in surrounding relation to said heating element linear portion,

said insert including integrally therewith;

two radially outwardly extending flange-like portions, each one being disposed in snug axial relation and in direct contact with both sides of the said bracket adjacent to said aperture thereby to axially grip the bracket therebetween,

an axially extending tubular portion in surrounding concentric relation to said heating element connecting the radially inner extremity of said flange-like portions,

said flange-like portions respectively merging into axially adjacent reversely extending radially inwardly directed terminal flanges, with said terminal flanges in snug axial relation and in partial direct contact with the respective flange-like portions, and slightly flared at the bottom,

said terminal flanges at their radially inner extremities defining openings of lesser effective diameter than said insert tubular portion, thereby to mechanically engage the periphery of said sheathed metallic heating element and secure the bracket thereto in double-gripped relation.

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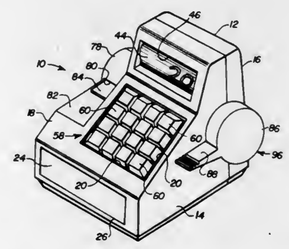
**4,295,036**

## TOY CASH REGISTER

**Kwok W. Tsui, Wanchai, Hong Kong, assignor to Arco Industries Ltd., Hong Kong**

**Filed Apr. 25, 1980, Ser. No. 143,850**
**Int. Cl.³ G07G *1/00***
**U.S. Cl. 235—1 E** **10 Claims**



1. A toy cash register comprising in combination, a shell-like housing provided with an upstanding rear hollow portion and a forwardly and downwardly sloping upper surface section extending forwardly therefrom and positioned over a lower compartment, said sloping surface having a relatively large opening therein, a cash drawer slidable into and from a front opening in said lower compartment, latch means normally engaging complementary retaining means on said drawer within said compartment and spring means in said housing engaging said drawer to project it forwardly from said compartment when said latch is released, a rotatable register drum having money indicating indicia thereon enclosed within said upstanding rear hollow portion of said housing and operable about a horizontal axis therein, viewing means in a forward face of said upstanding rear portion of said housing within which indicia on said drum are viewable, a unitary cash key-simulating member having an area similar in size to said opening in said sloping surface and comprising a plurality of simulated cash keys upstanding thereon in fixed relation to each other in a bank arrangement and actuating means thereon extending from one end of said member into said upstanding portion of said housing and engageable with said rotatable register drum to rotate it, means pivotally connecting the opposite end of said key-simulating member to said housing for actuation thereof by depressing said member downwardly to effect rotation of said register drum, a release key pivotally supported by said housing and including means engageable with said latch means to disengage the same from said drawer and permit said spring means to project it to open position, and receipt-simulating member slidable forwardly through an opening in said housing upon actuation of said release key.

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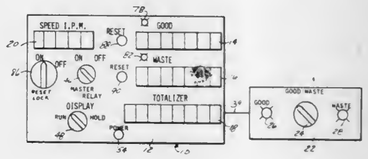
**4,295,037**

## PRODUCTION COUNTER APPARATUS

**Gary L. Miller, 16497 Terra Bella, Mt. Clemens, Mich. 48044**

**Filed Apr. 23, 1979, Ser. No. 32,124**
**Int. Cl.³ G06M *3/08*; G07C *3/10***
**U.S. Cl. 235—92 PD** **6 Claims**




1. Counting apparatus for a production machine producing parts having a plurality of distinct states, said counting apparatus comprising:

means for detecting the production of a part:

first switch means, responsive to operator selection, for selecting between each of said plurality of distinct states of said produced part;

a plurality of electronic counter means, each responsive to said detecting means and said first switch means, for respectively counting the number of occurrences of one of said distinct states of said produced parts; and

a plurality of display means, each responsive to one of said counter means, for displaying the current number of occurrences of one of said distinct states of said produced part;

second switch means switchable between first and second positions; and wherein

each counter means is responsive to said second switch means to hold the output signals transferred from said counter means to said display means at the state present when said second switch means is switched to said first position;

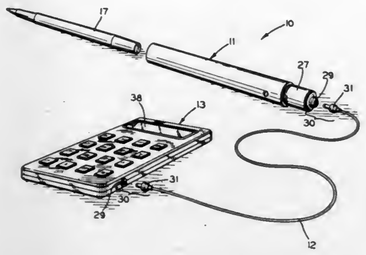
each of said counter means continuing to count the number of parts produced of a particular distinct state after said second switch means is switched to said first position so as to provide to the display means the total number of parts produced of a particular distinct state when said second switch means is switched to said second position.

**4,295,038**

## MARKING AND COUNTING PROBE ASSEMBLY

**Paul H. Kreinbrink, Temperance, Mich., and David C. Neiman, Waterville, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed Oct. 10, 1979, Ser. No. 83,407**
**Int. Cl.³ G06M** *11/00*
**U.S. Cl. 235—92 PK** **11 Claims**




1. A probe assembly for initiating electrical signals in seriatim for use in a counting apparatus comprising:

a. an elongated tubular housing having a transverse wall separating it into top and bottom sections, said sections being axially aligned;

b. a switch disposed in said top section for initiating electrical signals and including an axially extending plunger pin;

c. means disposed in said bottom section for operating said switch, said operating means including an axially reciprocal piston coaxially aligned with said plunger pin and engageable therewith for movement as a unit, said piston including an axial bore; and

d. a marking stylus detachably mounted within said bore to move with said piston, said stylus extending beyond the end of said elongated housing.

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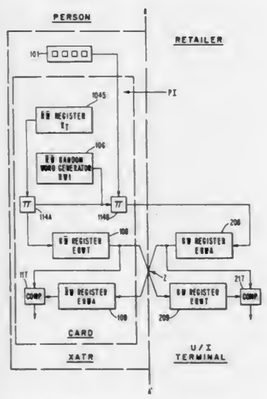
**4,295,039**

## METHOD AND APPARATUS FOR ACHIEVING SECURE PASSWORD VERIFICATION

**Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 3, 1979, Ser. No. 99,797**
**Int. Cl.³ G06K** *5/00, 19/06;* **H04Q** *9/00;* **G06F** *7/00*
**U.S. Cl. 235—380** **18 Claims**




1. A personal identification system including the combination of a credit card-like device (CARD) to be presented by the holder of the CARD (Person), a Utilization Terminal (U/I Terminal) to which the CARD is presented for identification purposes, and a data interface for the exchange of predetermined data between the CARD and the U/I Terminal,

said CARD including means for permanently storing a secret key, $K_T$, unique to said person,

said combination further including,

encryption means comprising at least one key-controlled block-cipher encryption device located in said CARD,

a keyboard at which the person may enter a secret key, $K_A$, at least one random word generator for supplying a data input word for encryption by said encryption means,

said encryption means being operable to encrypt a random word supplied by the random word generator under the stored key, $K_T$, and also being operable to encrypt the same random word under said secret key, $K_A$, entered by the person at said keyboard, said encryption means utilizing identical encryption algorithms for each encyption operation,

first comparison means in said Terminal for comparing the results of said first and second encryption operations and means for indicating a successful comparison.

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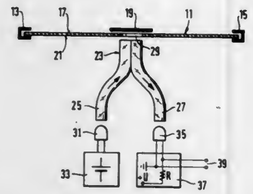
**4,295,040**

## DETECTOR ARRANGEMENT FOR DATA-CARD READERS

**Daniel Berthier, Eybens, France, assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Feb. 1, 1979, Ser. No. 8,306**
**Int. Cl.³ G06K** *7/10, 7/14*
**U.S. Cl. 235—458** **1 Claim**




1. A card reader for reading cards marked either by holes or by writing and providing an output indicative not only of the presence or absence of a mark but of the type of mark as well, the card reader comprising:

a light source emitting light toward a principal surface of a card to be read;

a reflective surface having a reflective power greater then that of the unmarked surface of the card and located parallel to an opposite surface of the card, for reflecting light reaching the reflective surface via a hole in the card back through the hole;

an optical detector for receiving light of a first intensity reflected from marks indicated by writing on the card, light of a second intensity greater than the first reflected from the unmarked surface of the card, and light of a third intensity greater than the second reflected from the reflective surface through marks indicated by holes in the card, and for producing a sense signal whose amplitude is indicative of the amount of light reaching the optical detector; and

level detection means coupled to the sense signal for producing an output signal having three distinct values respectively indicative of the presence of a mark produced by a hole, the presence of a mark produced by writing, and the absence of a mark.

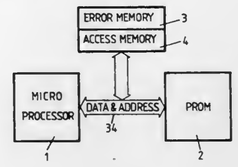


**4,295,041**

## DEVICE FOR THE PROTECTION OF ACCESS TO A PERMANENT MEMORY OF A PORTABLE DATA CARRIER

**Michel Ugon, Saint-Ouen, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), France**

**Continuation-in-part of Ser. No. 936,694, Aug. 25, 1978, Pat. No. 4,211,919. This application Apr. 7, 1980, Ser. No. 137,973**
**Claims priority, application France, Aug. 26, 1977, 77 26107; Jul. 2, 1979, 79 17171**
**Int. Cl.³ G06K** *19/06*
**U.S. Cl. 234—487** **4 Claims**




1. A portable data carrier for storing and processing data, comprising:

a microprocessor;

a protected memory to which access is to be protected;

an access memory element of the electrically alterable read only memory type and an error memory element of the electrically alterable read only memory type;

said microprocessor including internal first elements for reading and writing in said protected memory, second elements for receiving external data to be written in said protected memory, and third elements for externally transmitting data read from said protected memory; and

said internal first elements including means for checking an enabling key received from a device external to said carrier, means for storing an error bit in said error memory element when the enabling key is incorrect, and means for storing an access bit in said access memory element when the enabling key is correct.

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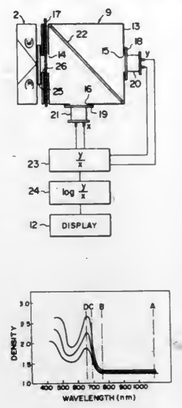
**4,295,042**

## METHOD OF AND DEVICE FOR MEASURING CHLOROPHYLL OF LIVING LEAVES

**Shigeru Watanabe, Tokyo, and Tatsuo Kuzunuki, Minamiashigara, both of Japan, assignors to Fuji Photo Film Co. Ltd., Minamiashigara, Japan**

**Filed Sep. 17, 1979, Ser. No. 76,475**
**Claims priority, application Japan, Sep. 18, 1978, 53/114364**
**Int. Cl.³ G01J** *3/34*
**U.S. Cl. 250—226** **6 Claims**

1. A method for measuring the amount of chlorophyll contained in a leaf of a plant comprising the steps of causing light from a light source to pass through a leaf of a plant, dividing the light which has passed through the leaf into the first component of a shorter wavelength the amount of which changes with the amount of chlorophyll contained in the leaf and the second component of a longer wavelength the amount of which does not change with the amount of chlorophyll contained in the leaf, and measuring the amount of both the components at the same time to determined the amount of chlorophyll contained in the leaf based on the difference between said amount of both the components.

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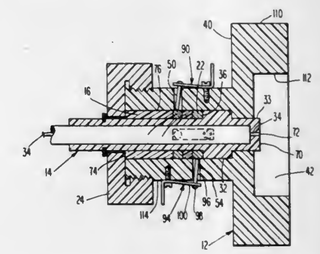
**4,295,043**

## FIBER OPTIC CABLE CONNECTOR

**Jules A. Eibner, Dresher, and Franz X. Kanamuller, Glenside, both of Pa., assignors to Sperry Corporation, New York, N.Y.**

**Filed Dec. 13, 1979, Ser. No. 103,270**
**Int. Cl.³ G02B** *5/14*
**U.S. Cl. 250—227** **7 Claims**




1. A connector which connects an optical cable to an electrical circuit, comprising:

a cable holder body;

a connector housing means formed to accept said cable holder body within and formed to locate a first end of said cable holder body in close proximity to a portion of said electrical circuit, said connector housing means being further formed to have access means;

a length indication means for selecting a value of a predetermined parameter of said electrical circuit when said length indication means is connected to said electrical circuit, said value being related to the length of said optical cable, said length indication means disposed between a section of said cable holder body and said connector housing means and accessible from without through said access means; and

electrically conducting contact means attached to said connector housing means and formed to electrically connect said length indication means to said electrical circuit.

**4,295,044**

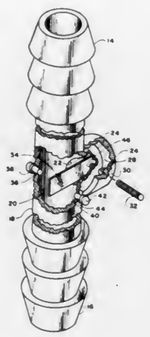
## BEVERAGE FLOW SWITCH

**Kenneth W. Anderson, Fremont, Calif.; Brent Summerhays, Logan, Utah, and Verl O. Cazier, Lander, Wyo., assignors to Electronic Systems Engineering, Inc., Logan, Utah**

**Continuation of Ser. No. 927,200, Jul. 24, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,273**

**Int. Cl.³ G01D** *5/34*

**U.S. Cl. 250—229** **9 Claims**



1. A flow switch comprising

vertical conduit means having a lower, inlet means and an upper, outlet means;

a light path transecting the conduit means;

an open chamber extending outwardly from a side of the vertical conduit means and having an open end and a closed end with the open end providing an unobstructed opening into the vertical conduit means;

a stop means in the lower side of the open end of the open chamber;

pivotal mounting means in the open chamber adjacent the closed end of the open chamber;

an actuator arm pivotally mounted on the pivotal mounting means and extending into the vertical conduit means and resting against the stop, the actuator arm thereby extending horizontally into the vertical conduit means in obstruction of the light path, the actuator arm thereby being adapted to be moved upwardly from obstruction of the light path by flow of a liquid upwardly through the vertical conduit means between the lower, inlet means to the upper, outlet means, the actuator arm being adapted to be urged downwardly against the stop and across the light path by gravitational forces;

a light source on a first side of the vertical conduit means for transmitting light into the light path;

light detector means on a second side of the vertical conduit means for detecting light transmitted through the light path as the actuator arm is moved upwardly from obstruction of the light path as a result of upward light flow through the vertical conduit means; and

circuit means for electronically amplifying an electronic signal generated by the light detector means as a function of liquid flow through the vertical conduit means.

**4,295,045**

## BACKGROUND COMPENSATION TYPE PLUTONIUM AIR MONITOR

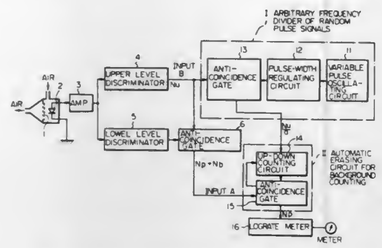
**Kentaro Minami, Oaraimachi, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan**

**Filed Apr. 8, 1980, Ser. No. 138,406**

**Claims priority, application Japan, Apr. 28, 1979, 54-52030**

**Int. Cl.³ G01V** *5/00;* **G01T** *1/18*

**U.S. Cl. 250—255** **2 Claims**




1. A background compensating plutonium air monitor comprising:

a detector for producing electrical signals in response to the incidence of radiation;

an upper level discriminator and a lower level discriminator, each responsive to said electrical signals and each having an output, wherein the output of the upper level discriminator has a higher rate than the output of the lower level discriminator;

an anti-coincidence gate connected to the output of both the upper level discriminator and the lower level discriminator and having an output;

an arbitrary freqency divider for frequency dividing signals from the upper level discriminator and having an output; and

an automatic erasing circuit connected to the output of said anti-coincidence gate and the output of said arbitrary frequency divider wherein the signals from the output of the arbitrary frequency divider are combined with the signals from the output of the anti-coincident circuit so as to erase background signals from the output of the anti-coincidence gate.

**4,295,046**

## MASS SPECTROMETER

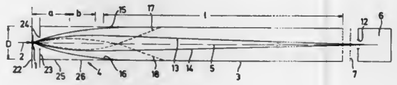
**Karl Grüter, Brauweiler, and Jürgen Leineweber, Cologne, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany**

**Continuation of Ser. No. 722,415, Sep. 13, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,829**

**Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540505**

**Int. Cl.³ B01D** *59/44;* **H01J** *49/00*

**U.S. Cl. 250—287** **6 Claims**



1. A transit time mass spectrometer for analyzing ions produced by pulsed laser radiation and having different energies, comprising, in combination:

(a) means forming a drift path to be traversed by the ions in a predetermined direction, said drift path comprising a cyclindrical section having an input end and an output end;



(b) an ion detector arranged downstream of said output end and having an entrance opening;

(c) an electrostatic lens system for focussing as well as for accelerating the ions and including a plurality of electrodes, including three which are in the form of cylindrical sections, one of said three electrodes being constituted by said cylindrical section serving as said drift path and the other two of said sections being arranged upstream of said input end, said lens system being a means for focussing onto said entrance opening only those ions which have a predetermined energy interval lying in the region of the maximum energy distribution;

(d) means for holding an ion-emitting test specimen which is to be subjected to the laser radiation, said holding means being constituted by that electrode of said lens system which is the furthest upstream of the input end of the drift path; and

(e) means forming an aperture diaphragm arranged between an ion-emitting test specimen which is held by said holding means and the next downstream cylindrical section, said diaphragm having an aperture which is as small as possible without impairing the ion flow, said diaphragm being at the same potential as said next downstream cylindrical section.

**4,295,047**

## EMISSION COMPUTED TOMOGRAPH

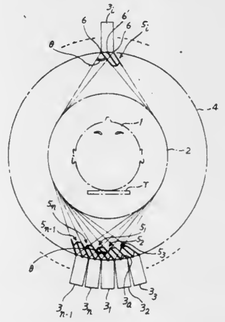
**Kenichiro Koga; Yoshiharu Hirose, both of Kyoto; Iwao Kanno, Akita; Kazuo Uemura, Akita, and Shuichi Miura, Akita, all of Japan, assignors to Shimadzu Corporation, Japan**

**Filed Jan. 16, 1980, Ser. No. 112,787**

**Claims priority, application Japan, Jan. 23, 1979, 54-7390**

**Int. Cl.³ G01T** *1/20;* **G21K** *1/04*

**U.S. Cl. 250—363 S** **9 Claims**



1. An emission computed tomograph comprising: means for supporting an object to be examined at a predetermined position, said object having taken therein a radionuclide that emits penetrating radiation such as X- or gamma radiation; a plurality of radiation detectors; means for supporting said detectors side by side along a circle about said predetermined position so that the radiation incident planes of said detectors face said object so as to receive radiation from said objects the position of each of said detectors being stationary relative to said object; a plurality of collimators; means for supporting said collimators between said predetermined position and said detectors so that each of said collimators is disposed in front of one of said detectors; each of said collimators comprising a pair of thin main plates made of a material capable of blocking penetration of said radiation therethrough, said main plates extending radially inwardly of said circle so as to define the direction in which said radiation from said object is incident on said radiation incident plane of said detector, and said main plates having an axis of rotation at a border between said radiation incident planes of each adjacent two of said detectors so that said main plates are swingable about said respective axes over a predetermined angle sufficient to cover the whole of said object; and means for causing said main plates of all said collimators to synchronously swing in the same direction and at the same angular speed thereby to scan the whole of the area in which the tomographic image of said object is to be reconstructed.

**4,295,048**

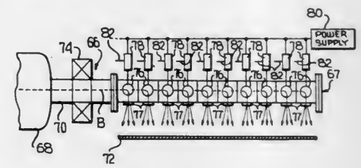
## METHOD AND SYSTEM FOR SCANNING A BEAM OF CHARGED PARTICLES TO CONTROL IRRADIATION DOSAGE

**Marshall R. Cleland, 9 Mohegan Pl., Huntington Station, N.Y. 11746, and Howard F. Malone, Sr., 35 Third Ave., Massapequa Park, N.Y. 11762**

**Filed Apr. 28, 1980, Ser. No. 145,061**

**Int. Cl.³ G01K** *1/08;* **G01N** *23/00*

**U.S. Cl. 250—398** **29 Claims**




1. A system for controlling the scanning of a beam of charged particles across a conveyor path to produce selective radiation dose at various locations comprising

particle accelerator means for producing a beam of charged particles;

deflecting means controllably operable to deflect said beam to a plurality of discrete positions across the conveyor path; and

control means coupled with said deflecting means to maintain said beam at each said discrete position for a preselected time in accordance with the radiation dose required at each said discrete position.

**4,295,049**

## X-RAY DIAGNOSTIC GENERATOR WITH AN INVERTER SUPPLYING THE HIGH-TENSION TRANSFORMER

**Otto Ebersberger, Erlangen, and Werner Kuehnel, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Feb. 1, 1980, Ser. No. 117,549**

**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908767**

**Int. Cl.³ H05G** *1/32*

**U.S. Cl. 250—409** **10 Claims**

1. An x-ray diagnostic generator comprising

an inverter having an input and an output and having a controllable frequency of operation,

a high tension transformer having an input connected with the output of the inverter, and having an output,

a high tension rectifier having an input connected with the output of the high tension transformer, and having an output,

high tension capacitors connected at the output of the high tension rectifier,

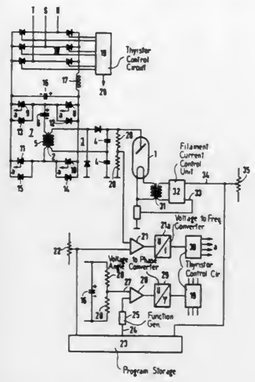
control loop means for receiving respective pairs of set point value signals in accordance with respective settings of x-ray tube voltage and current, and operable for sensing actual value signals in accordance with actual values of x-ray tube voltage and current and for controlling x-ray tube voltage and current to minimize errors between the settings of x-ray tube voltage and current, and the actual values thereof,

said control loop means comprising x-ray tube voltage con-

trol means (**7**, **20**, **21**, **21***a*, **30**) connected with said inverter and operable to control inverter frequency to minimize the error between an x-ray tube voltage set point value signal and an x-ray tube voltage actual value signal, and

direct current supply means (**16-19**) connected with the input of said inverter (**7**) and operable for controlling the voltage supplied to said inverter,

program storage means (**23**) for supplying an optimum value signal in accordance with an optimum value of inverter




input voltage for each pair of settings of x-ray tube voltage and current to be received by said control loop means, and

inverter input voltage control means (**24-29**) connected with said direct current supply means (**16-19**) for setting the voltage supplied to said inverter (**7**) and connected with said storage means (**23**) and responsive to the optimum value signal therefrom to set the inverter input voltage at an optimum value during an operation of said generator with corresponding settings of x-ray tube voltage and current.

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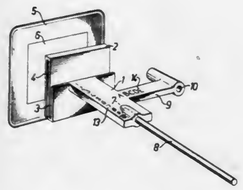
**4,295,050**

## INSTRUMENT FOR POSITIONING AN X-RAY CAMERA IN DENTAL X-RAY PHOTOGRAPHY

**Sigurd Linden, Teatergatan 4, Linköping, Sweden**

**Filed Feb. 15, 1980, Ser. No. 121,880**
**Claims priority, application Sweden, Feb. 27, 1979, 7901788**
**Int. Cl.³ A61B** *6/14*
**U.S. Cl. 250—479** **6 Claims**



**1**. An instrument for positioning the X-ray camera relatively the object and the X-ray film when taking X-ray photographs of teeth or adjacent tissues, comprising a plate-like member which at its one end, during the exposure of the film located inside the object as related to the camera, has a support for holding the film in a plane perpendicular to the longitudinal axis of said plate-like member, the outer end portion of the plate-like member being arranged, during exposure of the film, to be located outside the row of teeth of the patient and having a laterally extending arm-like portion located perpendicularly to the plate-like member and coplanar therewith, means being arranged to receive a guide pin in a position where its longitudinal axis is parallel to that of said plate-like member and said guide pin protrudes outside the oral cavity of the patient, whereby the optical axis of the X-ray camera objective can be positioned relatively said pin and, thence, relatively the film.

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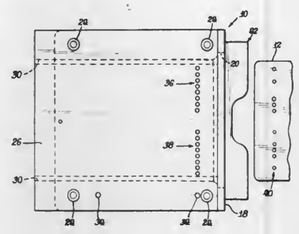
**4,295,051**

## OPTICAL CARD READER

**Fredy E. Graf; William M. Mahler, and Howard J. Malan, all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.**

**Filed May 21, 1979, Ser. No. 40,571**
**Int. Cl.³ G06K** *7/10*
**U.S. Cl. 250—569** **11 Claims**



**1**. An on-the-fly optical card reader for use with processing means for decoding multibit data words from a card as it is inserted therein and providing digital output signals corresponding to the data words encoded on the card, comprising:

frame means for supporting components of the reader and for mounting said reader;

guide means associated with the frame means for slidingly receiving and positioning the card to be decoded;

means for optically reading one row having at least two of said multibit digital encoded data words from said cards, said reading means being adapted to sequentially read each row of said data words as said card is inserted in said reader, said reading means being adapted to read at least two data words per row with the bits of each data word being adjacent one another and said words being separate from one another at specific locations along said row, said reading means generating digital signals corresponding to said data words and providing the digital signals of a complete one of the two or more data words at the output of said card reader in response to a control signal identifying a single data word location being selectively applied thereto.

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**4,295,052**

## CIRCUIT FOR MOTOR VEHICLES

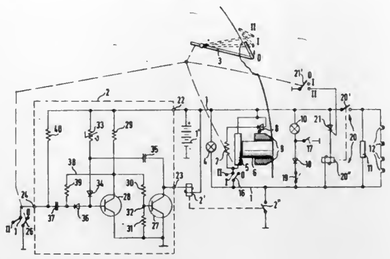
**Franz Jochmann, Munich, and Helmar Jedeck, Oberschleissheim, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Mar. 21, 1979, Ser. No. 22,632**
**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812721**
**Int. Cl.³ B60R** *27/00*
**U.S. Cl. 307—10 R** **18 Claims**

**1**. A circuit arrangement for motor vehicles comprising circuit means responsive to operation of an actuating means of the motor vehicle for being energized, the actuating means including an actuating device of at least one of a door and flap lock of the motor vehicle, timer means responsive to the operation of the actuating device for providing a predetermined switching period, the circuit means being responsive to the elapse of the predetermined switching period of the timer means for being automatically de-energized, the circuit means



including at least one of a door and flap lock heater and at least one additional load means, the at least one additional load



means being energized in response to the actuating means enabling opening of the motor vehicle.

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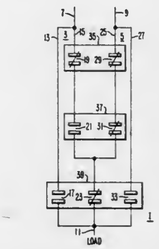
**4,295,053**

## ELECTRIC CONTROL SYSTEM WITH MECHANICAL INTERLOCK

**George N. Kovatch, Monroeville, and James B. Wallace, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Oct. 23, 1979, Ser. No. 87,365**
**Int. Cl.³ H02J** *9/06*
**U.S. Cl. 307—64** **7 Claims**




**1**. An electric control system for switching between supply lines extending to a load, comprising an isolation switching structure, a transfer switching structure, and a bypass switching structure; the isolation switching structure including first and second control devices, the transfer switching structure including third and fourth control devices, the bypass switching structure including fifth, sixth and seventh control devices, all of the control devices having contact carriers operable between open and closed circuit conditions; an emergency supply line including a first of two parallel paths extending to a load with one path including the first, third, and sixth control devices in series and with the other path including the fifth control device; a normal supply line including a second of two parallel paths extending to the load with one path including the second, fourth, and sixth control devices in series and with the other path including the seventh control device; and the bypass switching structure including interlock means including levers between the fifth, sixth, and seventh control devices for preventing closing of two control devices when one is previously closed.

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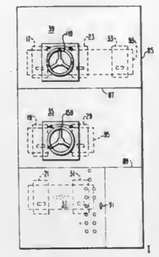
**4,295,054**

## ELECTRIC CONTROL SYSTEM WITH ROTARY MECHANICAL INTERLOCK AND TIMING MECHANISM

**George N. Kovatch, Monroeville; George S. Bettencourt, Murrysville, and Otto H. Soles, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Oct. 23, 1979, Ser. No. 87,366**
**Int. Cl.³ H02J** *9/00*
**U.S. Cl. 307—80** **6 Claims**



**1**. An electric control system for switching between two current supply lines extending to a load, comprising an isolation switching structure, a transfer switching structure, and a bypass switching structure; the isolation switching structure including first and second control devices, the transfer switching structure including third and fourth control devices, the bypass switching structure including fifth, sixth, and seventh control devices, all of the control devices being operable between open and closed circuit conditions; one of the current supply lines including a first of two parallel paths extending to the load with one path including the first, third, and sixth control devices in series and with the other path including the fifth control device; the other of the current supply lines including a second of two parallel paths extending to the load with one path including the second, fourth, and sixth control devices in series and with the other path including the seventh control device, the bypass switching structure including interlock timing means between the fifth, sixth, and seventh control devices for preventing simultaneous closing of one control device when another of the control devices is closed.

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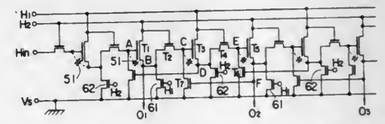
**4,295,055**

## CIRCUIT FOR GENERATING SCANNING PULSES

**Iwao Takemoto, Kodaira; Norio Koike, Tokyo; Shinya Ohba; Haruhisa Ando, both of Kokubunji; Masaaki Nakai, Hachioji; Syoji Hanamura; Ryuichi Izawa, both of Kokubunji; Masaharu Kubo; Masakazu Aoki, both of Hachioji, and Shuhei Tanaka, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Jun. 6, 1979, Ser. No. 46,028**
**Claims priority, application Japan, Jun. 12, 1978, 53/69793**
**Int. Cl.³ H03K** *21/00*
**U.S. Cl. 307—221 C** **29 Claims**




**1**. A circuit for generating scanning pulses comprising a plurality of stages of basic circuits connected in series, said each basic circuit comprising first, second and third insulated gate field-effect transistors (MISTs) each of which has first and

second terminals each being either of source and drain terminals and a gate terminal, said first terminal of said first MIST being used as a clock pulse-applying terminal, said gate terminal of said first MIST being used as an input terminal, said second terminal of said first MIST and said first terminal and said gate terminal of said second MIST being connected and used as a scanning pulse output terminal, said second terminal of said second MIST and said first terminal of said third MIST being connected and used as an output terminal, said second terminal of said third MIST being used as a ground terminal, said gate terminal of said third MIST being used as a feedback input terminal.

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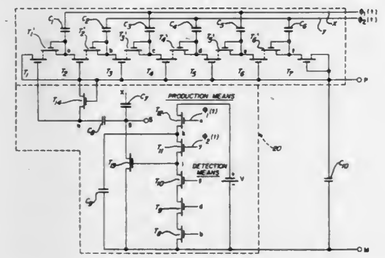
**4,295,056**

## INTEGRATED FREQUENCY DIVIDER

**Jacob Luscher, Venthone, Switzerland, assignor to Ebauches S.A., Switzerland**

**Filed Jul. 2, 1979, Ser. No. 54,230**
**Int. Cl.³ H03K** *21/00, 5/13*
**U.S. Cl. 307—221 C** **10 Claims**



1. A frequency divider circuit for two periodic signals in phase opposition comprising, integrated in a semi-conductor substrate, a first shift register comprising a plurality of transistors and capacitors which form a plurality of cells connected one after the other, each cell being constituted by two identical stages which are connected in series and are supplied, in use, by the two periodic signals respectively, first detection means for detecting a particular state of the register, and first production means, responsive to the detecting of the said state to produce a first signal with a frequency which is a sub-multiple of that of the said periodic signals, and wherein each stage of the shift register comprises an MOS transistor structure which has two principal electrodes respectively forming the input and output of the stage and two control electrodes, one of which is, in operation, connected to a bias source and the other of which is connected to the output principal electrode, and a capacitor, one plate of which is connected to the said output electrode and the other plate of which receives one of the said periodic signals.

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**4,295,057**

## DUAL SIGNAL CONTROL SYSTEM

**Thomas E. Hendrickson, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 8, 1979, Ser. No. 92,785**
**Int. Cl.³ H03K** *5/22, 5/00*
**U.S. Cl. 307—231** **16 Claims**

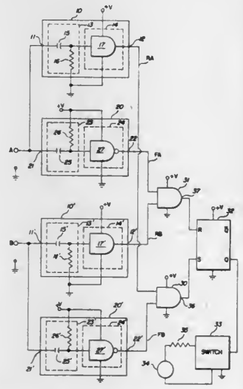
1. An electronic switching circuit receiving first and second control signals, said electronic switching circuit being capable of providing a logic output signal having a phasing of value changes therein similar to that phasing of changes in value of a selected one of said first and said second control signals for those changes of said selected signal which are sufficient in magnitude and rate of change, but only for each such change in said selected signal which is accompanied by a change of value in an opposite direction in that remaining one of said first and second control signals occurring sufficiently concurrently therewith, said electronic control circuit comprising:

a first rising signal detector having an input region for receiving said first control signal, and having an output region, said first rising signal detector being capable of providing an output indication at said output region if said first control signal has an increase in value which exceeds a selected magnitude and also exceeds a selected rate of increase;

a second rising signal detector having an input region for receiving said second control signal, and having an output region, said second rising signal detector being capable of providing an output indication at said output region if said second control signal has an increase in value which exceeds a selected magnitude and also exceeds a selected rate of increase;

a first falling signal detector having an input terminal for receiving said first control signal, and having an output region, said first falling signal detector being capable of providing an indication at said output region if said first control signal has a decrease in value which exceeds a selected magnitude and also exceeds a selected rate of decrease;

a second falling signal detector having an input region for



receiving said second control signal, and having an output region, said second falling signal detector being capable of providing an indication at said output region if said second control signal has a decrease in value which exceeds a selected magnitude and also exceeds a selected rate of decrease; and

a logical sorting means having a first input connected to said first rising signal detector output region, a second input electrically connected to said second rising signal detector output region, a third input electrically connected to said first falling signal detector output region, and a fourth input electrically connected to said second falling signal detector output region, and with said logic sorting means having an output region, said logic sorting means being capable of providing said electronic switching circuit logic output signal at said logical sorting means output region in a first state when output indications occur substantially concurrently at said first rising signal detector output region and said second falling signal detector output region, and of providing said electronic switching circuit logic output signal at said logical sorting means output region in a second state when output indications occur substantially concurrently at said first falling signal detector output region and said second rising signal detector output region.

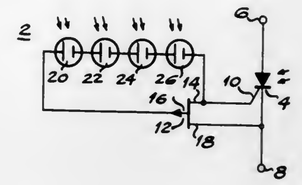


**4,295,058**

## RADIANT ENERGY ACTIVATED SEMICONDUCTOR SWITCH

**Robert W. Lade, Charlotte Amalie, V.I.; Gordon B. Spellman, Mequon, Wis.; Stanley V. Jaskolski, Sussex, Wis.; Herman P. Schutten, Elm Grove, Wis., and James R. Jaeschke, Waukesha, Wis., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 7, 1979, Ser. No. 46,568**
**Int. Cl.³ H03K** *17/72, 17/94, 17/687*
**U.S. Cl. 307—252 A** **29 Claims**



1. A radiant energy activated semiconductor switching device comprising in combination:

a semiconductor switch having a plurality of alternating conductivity type regions, including a pair of end regions and a middle control region, and switchable from a low current OFF state to a high current ON state between said end regions by a triggering signal applied to said control region;

normally conductive variable conductance means connected between said control region and one of said end regions of said switch, said variable conductance means having a control terminal for varying the conduction value thereof between a conductive state and a state having greater conductivity, said normally conductive variable conductance means being conductive when no potential is applied to said control terminal and being less conductive when potential is applied to said control terminal, the requisite magnitude of said triggering signal decreasing as the conduction of said variable conductance means decreases; and

transducer means connected to said control terminal of said variable conductance means and responsive to impinging radiant energy to develop an electrical bias potential which biases said variable conductance means and decreases the conduction value thereof.

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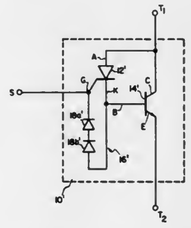
**4,295,059**

## HIGH GAIN LATCHING DARLINGTON TRANSISTOR

**Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 30, 1979, Ser. No. 25,383**
**Int. Cl.³ H03K** *17/12, 17/60, 17/72*
**U.S. Cl. 307—253** **2 Claims**



1. A high gain latching Darlington transistor having increased dv/dt capability comprising:

(a) a four-layer PNPN semiconductor switching device having a gate, a cathode, and an anode electrode, said four-layer PNPN semiconductor switching device conducting current through the anode-cathode portion thereof in accordance with the polarity of the gating pulse signals applied to said gate electrode;

(b) a load transistor having a base, a collector, and an emitter electrode, said load transistor coupled in Darlington configuration to said four-layer PNPN semiconductor switching device, said load transistor conducting substantial load current through the collector-emitter portion thereof in response to current conduction through said four-layer PNPN semiconductor switching device; and

(c) first and second diodes coupled in inverse series aiding fashion between the gate electrode of said 4-layer PNPN semiconductor and the junction of said 4-layer PNPN semiconductor and said load transistor base electrode.

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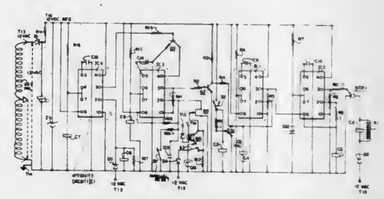
**4,295,060**

## SOLID STATE TRIGGERING CIRCUIT

**Richard S. McGehee, 1509 Crawford La., Hanover Park, Ill. 60103**

**Filed Sep. 20, 1979, Ser. No. 77,347**
**Int. Cl.³ H03K** *3/284, 3/42*
**U.S. Cl. 307—273** **10 Claims**



1. An electronic triggering circuit comprising: light sensing circuit means for providing a first electrical signal responsive to a predetermined interruption of light exposure, RC time delay circuit means having discharging capacitor means and providing an electrical output signal following a predetermined time delay from the receipt of an electrical input signal, said predetermined time delay provided by the electrical discharge of said discharging capacitor means, first monostable electronic circuit means connected to receive the first electrical signal of the light sensing circuit means and being activated thereby for providing a predetermined ON time period and further providing a first electrical output signal during the ON time period comprising the electrical input signal to the RC time delay circuit means, said first monostable circuit means including RC time constant means with charging capacitor means biasing the first monostable circuit means after a first predetermined charging time period to switch to an OFF electrical state whereby the first electrical output signal is discontinued, the first predetermined charging time period of the first monostable circuit means exceeding the discharging time period for the RC time delay circuit means, second monostable electronic circuit means connected to receive as an input signal thereto the electrical output signal from the RC time delay circuit means, said second monostable circuit means having a predetermined ON time period and providing a second electrical output signal during the ON time period, and including RC time constant means with charging capacitor means biasing the second monostable circuit means after a second predetermined charging time period to switch to an OFF electrical state whereby the second electrical output signal is discontinued, and third monostable electrical circuit means connected to receive as an input signal thereto the second electrical output signal from the second monostable circuit means, said third monostable circuit means having a predetermined ON time period and providing a third electrical output signal during the ON time period, and including RC

time constant means with charging capacitor means biasing the third monostable circuit means after a third predetermined charging time period to switch to an OFF electrical state whereby the third electrical output signal is discontinued, and the second predetermined charging time period exceeding the third predetermined charging time period whereby the third monostable circuit means is disabled to provide said third electrical output signal during the continued charging time period for the second monostable circuit means, and the third electrical output signal comprising the electrical output triggering signal of the electronic triggering circuit.

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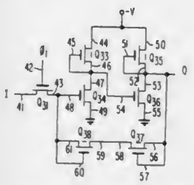
**4,295,061**

## LATCH CIRCUIT

**Saburo Tokoda; Koichiro Okumura, and Eiji Sugimoto, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Mar. 16, 1979, Ser. No. 21,281**
**Claims priority, application Japan, Mar. 16, 1978, 53/30773**
**Int. Cl.³ H03K** *5/26*
**U.S. Cl. 307—279** **6 Claims**



1. A circuit comprising a first inverter circuit having input and output terminals, means for applying an input signal to the input terminal of said first inverter circuit, a second inverter circuit having an input terminal coupled to the output terminal of said first inverter circuit and having an output terminal, and feed-back means coupled between said input terminal of the first inverter circuit and said output terminal of the second inverter circuit, said feed-back means including a first insulated-gate field-effect transistor having a drain, a gate and a source, the drain and gate of said first transistor being commonly coupled to the output of said second inverter circuit, and a second insulated-gate field-effect transistor having a gate, a drain and a source, the source of said second transistor being coupled to the source of said first transistor, the gate and drain of said second transistor being commonly coupled to the input terminal of said first inverter circuit.

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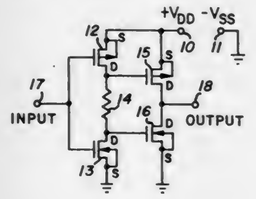
**4,295,062**

## CMOS SCHMITT TRIGGER AND OSCILLATOR

**Stephen K. Mihalich, Santa Clara, and Thomas S. W. Wong, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Apr. 2, 1979, Ser. No. 26,277**
**Int. Cl.³ H03K** *3/295, 3/354, 4/48*
**U.S. Cl. 307—279** **9 Claims**




1. A complementary metal oxide semiconductor trigger circuit having a non-inverting signal transfer characteristic that displays hysteresis, said circuit having first and second power supply rails connectible to a source of operating voltage and comprising:

a resistor having a value that is large with respect to the on resistance of an active transistor and having first and second terminals;

a first P channel transistor having a source coupled to said first supply rail, a drain coupled to said first resistor terminal, and a gate;

a second N channel transistor having a source coupled to said second supply rail, a drain coupled to said second resistor terminal, and a gate;

means for coupling said gates of said first and second transistors together to comprise an input terminal to said circuit;

a third P channel transistor having a source coupled to said first supply rail, a gate coupled to said drain of said first transistor, and a drain;

a fourth N channel transistor having a source coupled to said second supply rail, a gate coupled to said drain of said second transistor, and a drain; and

means for coupling said drains of said second and third transistors together to comprise an output terminal to said circuit whereby the output signal is responsive to the potential difference developed between said first and second resistor terminals to provide first and second logic state output signals, said first logic state being produced when said input terminal is operated at a potential that lies between the potential of said first supply rail and the threshold potential of said first transistor and said second logic state being produced when said input terminal is operated at a potential that lies between the potential of said second supply rail and the threshold potential of said second transistor.

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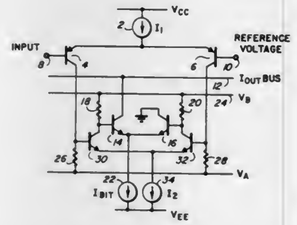
**4,295,063**

## FAST SETTLING DIGITAL TO ANALOG CONVERTER BIT SWITCH

**John J. Price, Jr., Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Jun. 28, 1979, Ser. No. 53,131**
**Int. Cl.³ H03K** *5/153, 17/02*
**U.S. Cl. 307—362** **2 Claims**




1. A current bit switch for use in a digital to analog converter for directing a bit current generated by a first current source to an output bus, comprising:

a first differential pair of switching devices for receiving a reference voltage and a digital input signal, said digital input signal capable of assuming first and second states;

a second differential pair of switching devices for directing said bit current onto said output bus when said input signal is in said first state;

a third differential pair of switching devices having an input coupled to said first pair and having an output coupled to said second pair for reducing overshoot caused by fast transitions of said input signals between said first and second states,

a second current source for supplying current to said first pair of switching devices; and a third current source coupled to said third pair of switching devices,

said first differential pair of switching devices comprising first and second emitter coupled transistors, said first transistor having a base coupled to said input signal and having a collector coupled to said third differential pair and said second transistor having a base coupled to a reference voltage and a collector coupled to said third differential pair,

said third differential pair comprising third and fourth emitter coupled transistors, the base of said third transistor coupled to the collector of said first transistor and to a first source of supply voltage and the collector of said third transistor coupled to a second source of supply voltage, the base of said fourth transistor coupled to the collector of said second transistor and to said first source of supply voltage and the collector of said fourth transistor coupled to said second source of supply voltage, the common emitters of said third and fourth transistors coupled to said third current source, and

said second differential pair comprising fifth and sixth emitter coupled transistors, said fifth transistor having a base coupled to the collector of said third transistor and to said second source of supply voltage and having a collector coupled to said output bus, and said sixth transistor having a base coupled to the collector of said fourth transistor and to said second source of supply and having a collector coupled to ground, the emitters of said fifth and sixth transistors coupled to said first current source, and

said first and second transistors being PNP transistors and said third, fourth, fifth and sixth transistors being NPN transistors.



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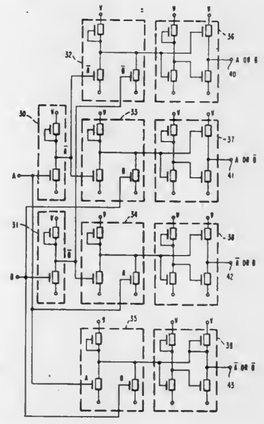
**4,295,064**

## LOGIC AND ARRAY LOGIC DRIVING CIRCUITS

**Stanley E. Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 30, 1978, Ser. No. 920,943**
**Int. Cl.³ H03K** *19/173, 19/20, 19/094*
**U.S. Cl. 307—468** **3 Claims**



1. A prearray logic section of a programmed logic array having a partitioning logic circuit wherein each logical input variable is combined and duplicated to provide a separate output for each of all possible logical combinations of all logical input variables and wherein each said output having a driver circuit comprising:

a first FET transistor having its source connected to the reference potential of said logic circuit and having its drain connected through a load device to a drive voltage;

means connecting the input to the gate of said first FET transistor;

a second and a third FET transistor of the type exhibiting no conduction in the "off" condition connected in series source-to-drain with said second FET transistor adjacent to the reference potential of said logic circuit and said third FET transistor adjacent to a drive voltage;

means connecting the output to the junction between said second and third series connected FET transistors;

means connecting the input to the gate of said third series connected FET transistor; and

means connecting the output of said first FET transistor to the gate of said second FET transistor.

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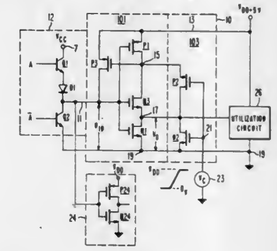
**4,295,065**

## LEVEL SHIFT CIRCUIT

**Peter K. Hsieh, Parsippany, and Richard M. Vaccarella, Raritan, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Aug. 13, 1979, Ser. No. 65,841**
**Int. Cl.³ H03K** *19/092, 19/094, 19/20*
**U.S. Cl. 307—475** **18 Claims**



1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

an input terminal adapted to receive input signals having either a first value approximately equal to the potential applied to said first power terminal or a second value equal to a voltage intermediate the voltages applied to said first and second power terminals;

a level shift control node, and an output node;

a first input signal responsive means including means connected between one of said first and second power terminals and said output node and between said output node and said level shift control node for clamping said one of said first and second terminals to said output node and said output node to said level shift control node for one value of input signal and decoupling said one of said first and second terminals from said output node and said output node from said level shift control node for the other value of input signal;

a second, normally non-conductive, input signal responsive means for clamping said level shift control node to said other one of said first and second power terminals for the other value of input signal; and

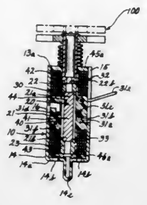
regenerative feedback means responsive to the voltage at said level shift control node for clamping said input terminal to said second power terminal in response to input signals of said second value.

**4,295,066**

## ELECTROMAGNETIC ACTUATOR

**C. F. Lloyd, Rexdale; Z. Leo Zalewski, Brampton, and Paul C. Brendle, Mississauga, all of Canada, assignors to CTS Corporation, Elkart, Ind.**

**Filed Jan. 11, 1980, Ser. No. 111,398**
**Int. Cl.³ H02K *33/12***
**U.S. Cl. 310—30** **10 Claims**



1. In an electromagnetic actuator, the combination comprising a housing of magnetizable material, a bobbin supported by the housing and provided with an interior bore, an armature supported in the interior bore for movement relative to the housing, the armature being provided with a magnet and a pair of spaced magnetic poles, the bobbin comprising a pair of bobbin sections, an inner rim and an outer rim secured to each of the bobbin sections, and means connecting the bobbin sections, the interior bore extending through the sections and the means connecting the sections, a radial bore being provided in the means connecting the sections and communicating with the interior bore to reduce resistance retarding movement of the armature, a coil carried by each of the bobbin sections and circumposing the armature, the coils being associated with the magnet poles, a first and a second wire end portion extending from each of the coils and disposed between the inner rims, the first wire end portion of each of the coils being electrically interconnected, and means securing the wire end portions to the bobbin.

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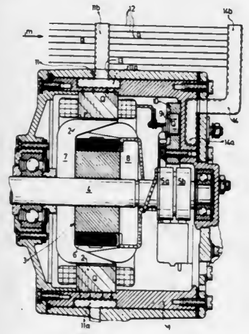
**4,295,067**

## COOLING APPARATUS FOR ELECTRICAL MACHINERY

**Georg Binder, Bechhofen, and Günter Wössner, Esslingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 7, 1979, Ser. No. 10,049**
**Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810222**
**Int. Cl.³ H02K *9/00***
**U.S. Cl. 310—52** **12 Claims**



1. In a d-c generator, particularly automotive alternator having
a housing (**1**);
a stator structure (**2**) having stator windings thereon located in the housing;
a rotor structure (**3**) including a rotor shaft (**4**) rotatably positioned within the housing to rotate with respect to the stator;
a heat pipe structure including
heat pipe cooling means (**11**, **14**, **15**, **18**, **21**, *21b*, **24**, *24'*, **30**, **34**, **36**) to cool the stator windings on the stator structure including means (*11a*, *14a*, *15a*, *18a*, *21a*, *24a*, *24a'*, *30a*, *34a*, *36a*) *36a'*, **41**, **42**, *41'*, *42'*) for forming an evaporation chamber and means (*11b*, *14b*, *15b*, *18b*, *21d*, *21f*, *24b*, **27**, *30b*, **33**, *36b*, **39**, *39'*) for forming a condensation chamber in fluid communication with said evaporation chamber,
and an evaporatable fluid contained in said chambers
and wherein, in accordance with the invention,
the evaporation chamber forming means (*11a*, *14a*, *15a*, *18a*, *21a*, *24a*, *24a'*, *30a*, *34a*, *36a*, *36a'*, **41**, **42**, *41'*, *42'*) are positioned adjacent the stator structure (**2**) and in heat transfer relation thereto;
the condensation chamber forming means are secured externally of the housing and in a location at which the temperature is low with respect to that of the stator windings;
a sequence of multiple and mutually communicating heat pipes is provided in communication with, and interconnecting said chambers;
and said shaft (**4**) consists of a fan-less or ventilator wheel-less construction.

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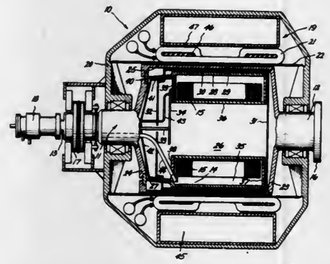
**4,295,068**

## CANTILEVERED FIELD WINDING SUPPORT FOR A SUPERCONDUCTING AC MACHINE

**Bruce B. Gamble, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed May 18, 1979, Ser. No. 40,172**
**Int. Cl.³ H02K *9/00***
**U.S. Cl. 310—52** **12 Claims**



1. In a superconducting electrical machine including a rotor comprising a shaft adapted to be driven in rotation about a longitudinal axis of the rotor, a hollow undriven shaft disposed concentrically with said driven shaft and a hollow axially central portion disposed concentrically with and attached to each of said shafts, and a torque tube and at least one superconducting winding disposed within said hollow central portion; a support means for said torque tube and said field winding comprising:
means for supporting said torque tube and said superconducting winding within said central portion and substantially concentrically with said rotor shafts in cantilever fashion from one of said shafts.

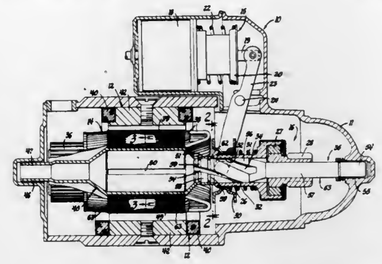


**4,295,069**

## ARMATURE SHAFT FOR A VEHICLE STARTER MOTOR

**David E. Givan, Anderson, and Charles R. Ashton, Middletown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 17, 1978, Ser. No. 897,109**
**Int. Cl.² H02K *7/00***
**U.S. Cl. 310—67 R** **3 Claims**



1. An armature shaft for a motor vehicle engine starter motor assembly of the type having an axially movable clutch and pinion drive assembly splined to the armature shaft for rotation therewith, the armature shaft comprising, in combination:
a tubular member having an open end and another end and being adapted to receive armature core laminations thereon; and
a solid cylindrical member having one end provided with at least one spiral spline groove adapted for engagement with the clutch and pinion drive assembly and another end, the other ends of the tubular and solid cylindrical members comprising the opposite ends of the armature shaft, the one end of the cylindrical member being received coaxially in the open end of the tubular member, the open end of the tubular member having at least one portion thereof radially staked into the spline groove, whereby the tubular and cylindrical members are joined to each other, the portions of the open end of the tubular member which are not radially staked into the spline groove being effective to provide an axial stop for the clutch and pinion drive assembly.

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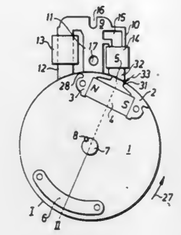
**4,295,070**

## MEANS FOR PROVIDING A MECHANICALLY DEFINABLE SELECTED TRIGGER INTERVAL IN A FLYWHEEL MAGNETO

**Sven H. Johansson, Amal, Sweden, assignor to Aktiebolaget Svenska Elektromagneter, Amal, Sweden**

**Filed Jun. 14, 1979, Ser. No. 48,685**
**Claims priority, application Sweden, Jun. 16, 1978, 7806971**
**Int. Cl.³ H02K *21/22***
**U.S. Cl. 310—70 R** **1 Claim**

1. A flywheel magneto in an electronic ignition circuit, including:
(a) a flywheel;
(b) a ferromagnetic core having in succession a first leg, a second leg, and a third leg, each leg terminating at the periphery of said flywheel;
(c) a trigger coil in said circuit and carried on said first leg, and a charging coil carried on said third leg;
(d) a pair of magnetic pole shoes and a permanent magnet disposed between said shoes and jointly molded into said flywheel, said pole shoes being disposed at the periphery of said flywheel in magnetic circuit with said permanent magnet, a first of said shoes, situated first in the direction of rotation of said flywheel, having such extent that its flux can coact with said first and second legs in one position, said first pole shoe having a notch underlying its leading edge for limiting initial flux transfer to said second leg, the leading edge of said one shoe being sharply defined, the leading edge of a second of said shoes, thereafter, coming to the first encountered edge of said first leg where the magnetic flux of said second shoe begins to coact with magnetic flux in said second leg;
(e) a first-encountered edge of each of said first and second legs being sharply defined and registering with the path of movement of said pole shoes; and



(f) the distance between said leading edges defining the duration of a triggering signal induced in said trigger coil, said signal beginning in response to said leading edge of said first shoe encountering the first-encountered edge of said second leg, and said signal ending in response to said leading edge of said second shoe encountering the first-encountered edge of said second leg.

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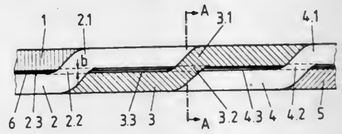
**4,295,071**

## LATTICE BAR FOR ELECTRICAL MACHINERY

**Ernst Kaspar, Birr, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Apr. 5, 1979, Ser. No. 27,408**
**Claims priority, application Switzerland, Apr. 6, 1978, 3691/78**
**Int. Cl.³ H02K *3/14***
**U.S. Cl. 310—213** **7 Claims**



1. In a lattice bar for electrical machinery comprised of a plurality of transposed flat copper conductors insulated from each other and having bending portions along their length, the improvement wherein a notch is provided in only one flat side of each transposed conductor, each notch extending approximately longitudinally of an extended edge of its respective transposed conductor over the entirety of the bending portion of the conductor.

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**4,295,072**

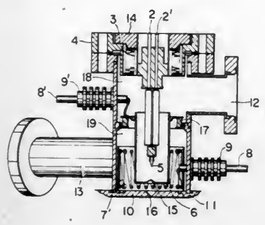
## FIELD EMISSION ELECTRON GUN WITH ANODE HEATER AND PLURAL EXHAUSTS

**Hideo Todokoro, Hinodemachi, and Yoshio Sakitani, Ohimachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 1, 1979, Ser. No. 8,259**
**Claims priority, application Japan, Feb. 8, 1978, 53-13722[U]**
**Int. Cl.³ H01J *7/16***
**U.S. Cl. 313—7** **7 Claims**

1. A field emission electron gun comprising:
a field emission cathode;
an anode having an aperture through which an electron beam emitted by said cathode can pass;

heating means for heating said anode;
a first chamber in which said cathode is disposed;
first exhaust means for evacuating said first chamber;



a second chamber adjoining said first chamber through said anode and in which said heating means is disposed, and
second exhaust means for evacuating said second chamber independently from said first chamber.

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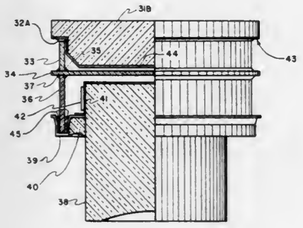
**4,295,073**

## MICROCHANNEL PLATE-IN-WALL STRUCTURE

**Charles F. Freeman, Springfield, and Kurt Villhauer, Annandale, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 28, 1978, Ser. No. 890,899**
**Int. Cl.³ H01J *43/22, 43/28***
**U.S. Cl. 313—105 CM** **9 Claims**



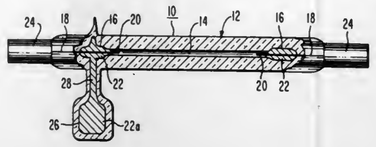
1. A microchannel plate-in-wall structure comprising:
a microchannel plate consisting of semiconducting glass, having anode and cathode surfaces and a plurality of electron multiplier channels therebetween;
at least one continuous thin planar electrode deposited on each of said surfaces, said electrode extending substantially to the edge of said plate as well as adjacent to and surrounding one end of at least one of said channels; and
a first hollow generally cylindrical glass wall section axially positioned normal to one of said surfaces and sealed with glass directly to said electrode and plate, said wall section at said surface having a minimum cross-section which encloses all of the ends of said channels at said one surface, and a maximum cross-section smaller than said one surface, whereby said one plate surface and each said one thin planar electrode it supports is divided into a pair of exposed portions which lie on opposite sides of said wall interconnected by a third portion sealed between said wall and said plate.

**4,295,074**

## MERCURY ARC LAMP HAVING COMMUNICATING MERCURY RESERVOIR

**Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Mar. 21, 1979, Ser. No. 22,617**
**Int. Cl.³ H01J *61/28, 61/30***
**U.S. Cl. 313—174** **5 Claims**



1. In a high pressure mercury discharge device including an envelope having a first internal bore including a pair of spaced apart regions, said envelope having lead-in conductors terminating in electrodes, said conductors being sealed in said envelope and extending through said regions, and having pools of mercury retained within said regions around said electrodes, the improvement comprising
at least one chamber having a reservoir of mercury therein, and a second integral bore communicating between said chamber and one of said regions, said chamber being substantially larger than second integral bore, said chamber being remote from said regions whereby said chamber can be selectively heated or cooled independently of said regions to vary the impedance of said device.

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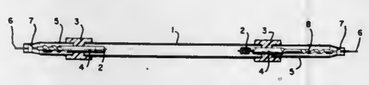
**4,295,075**

## ARC DISCHARGE LAMP HAVING CERAMIC ARC TUBE

**Edward A. Webb, Reading; John F. McKenna, Newburyport, both of Mass., and Frank B. Makar, Jr., Plaistow, N.H., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Dec. 14, 1979, Ser. No. 103,659**
**Int. Cl.³ H01J *17/16***
**U.S. Cl. 313—220** **5 Claims**



1. An arc discharge lamp comprising: a ceramic arc tube having an electrode at each end, each electrode being mounted on a support member; a ceramic cylinder at each end of the arc tube, the arc tube fitting inside one end of the ceramic cylinder and being sealed thereto; a ceramic adapter fitting into the other end of the ceramic cylinder and being sealed thereto; a lead-in wire extending into, and externally of, the ceramic adapter and being sealed thereto; the support member extending through the ceramic cylinder into the ceramic adapter and being sealed to the ceramic cylinder; and a spiral refractory-metal conductor disposed within the ceramic adapter and electrically connecting the support member to the lead-in wire.

5. The method of making an arc discharge lamp comprising the steps of: preparing an arc tube assembly including an arc tube, a ceramic cylinder sealed to the arc tube, a ceramic adapter sealed to the ceramic cylinder, and an electrode within the arc tube mounted on a support member extending into the adapter where it is connected to a lead-in wire extending externally of the adapter through a small clearance hole in a disc which is sealed to the adapter a short distance from the end thereof; disposing a glass bead around the lead-in wire at the end of the adapter; placing the arc tube assembly into a chamber and filling the chamber with a nonoxidizing gas to a predetermined pressure; heating the glas bead to its softening temperature; raising the pressure within the chamber; and heating the glass bead to its sealing temperature to effect a heremetic seal between the lead-in wire and the disc.



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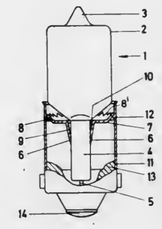
**4,295,076**

## ELECTRIC LAMP WITH CEMENTLESS ATTACHED BASE

**Fritz Eckhardt, Bolheim, and Walter Schönherr, Giengen, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen m.b.H., Munich, Fed. Rep. of Germany**

**Filed Mar. 20, 1979, Ser. No. 22,371**
**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814461**
**Int. Cl.³ H01K *1/46***
**U.S. Cl. 313—223** **12 Claims**



1. Electric lamp having
a bulb (2), a glass press stem (4) projecting from the bulb, and lead wires (5) projecting from the stem
in combination with a cylindrical lamp base shell (11) open at one end for insertion of the press stem and having internally projecting locating means (12) and
a generally smooth interior surface in the region between the open end and said locating means; and
means securing the bulb (2) to the lamp base shell (11) comprising;
a resilient disk-shaped element (7) formed with an upwardly bent notched or serrated edge (8) having serration points (8'), the points (8') of the notched or serrated edge being engaged against the generally smooth interior surface of the lamp base shell;
the disk-shaped element mechanically engaging the press stem essentially centrally of the disk-shaped element,
said lead wires being soldered to base contacts (14, 214) on the base shell.

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**4,295,077**

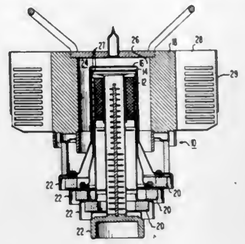
## CIRCUMFERENTIALLY APERTURED CYLINDRICAL GRID FOR ELECTRON TUBE

**Don R. Carter, Lancaster; Claude E. Doner, New Providence; Fred G. Hammersand, East Petersburg, and Joseph R. Tomcavage, Lancaster, all of Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Feb. 14, 1980, Ser. No. 121,530**
**Int. Cl.³ H01J *1/46, 21/10***
**U.S. Cl. 313—293** **7 Claims**

1. In a high power electron tube having a cathode, a cylindrical anode circumscribing said cathode and at least one tubular electrode disposed between said cathode and said anode, said electrode being formed from a cylindrical member closed at one end, said member having an outside diameter D, said member further having a plurality of first apertures extending therethrough, each of said first apertures having a length x and a width y, the improvement wherein said electrode comprises:
spurious oscillation control means including said first apertures, wherein said first apertures are circumferentially elongated, the length x, of said first apertures being greater than the width y, and wherein the length x of said first apertures is not greater than 0.55 times the diameter D, of said one electrode.

6. In a high power electron tube having a cathode, an anode and at least one tubular electrode disposed between said cathode and said anode, said tubular electrode being closed at one



end and having a plurality of apertures extending through the tubular portion thereof, the improvement comprising the apertures in said tubular electrode being circumferentially elongated, the length of said apertures being not greater than 0.55 times the diameter of said tubular electrode whereby spurious oscillations are controlled.

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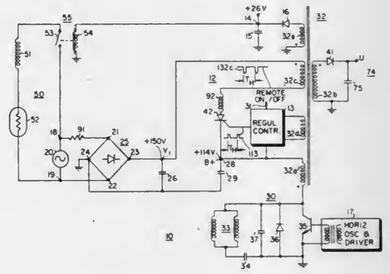
**4,295,078**

## COLOR TELEVISION RECEIVER DEGAUSSING CIRCUIT

**Paul C. Wilmarth, Noblesville, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed May 12, 1980, Ser. No. 148,088**
**Int. Cl.³ H04N *9/29***
**U.S. Cl. 315—8** **13 Claims**



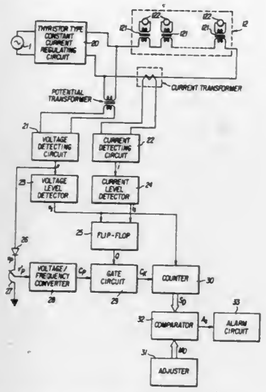
1. A degaussing arrangement, comprising:
a source of alternating polarity voltage;
a power supply coupled to said source for developing a supply voltage from said alternating polarity voltage;
a deflection generator coupled to said power supply and being energized by said supply voltage to develop a deflection rate voltage;
a transformer including first and second windings, said deflection rate voltage being applied to said first winding;
a degaussing winding; and
a relay including a coil coupled to said transformer second winding and subject to energization in response to application of said deflection rate voltage to said first winding and including switching means actuated by said coil energization for coupling said degaussing winding to said source of alternating polarity voltage to permit the flow of degaussing current.

**4,295,079**

## LAMP CIRCUIT WITH DISCONNECTED LAMP DETECTING DEVICE

**Kenichi Otsuka, Kodaira, and Yorio Hosokawa, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Mar. 25, 1980, Ser. No. 133,935**
**Claims priority, application Japan, Apr. 19, 1979, 54/47194**
**Int. Cl.³ H05B** *37/03*
**U.S. Cl. 315—130** **14 Claims**




1. A lamp circuit comprising:
a constant-current type AC power source;
a plurality of isolation transformers connected in series with the AC power source, each isolation transformer being coupled to an electric lamp;
means for detecting the rise of the output voltage waveform of the AC power source which exceeds a positive predetermined value which is sufficiently small with respect to the maximum level of the voltage signal and which is larger than a possible circuit induced noise level;
means for detecting the rise of the output current waveform of the AC power source which exceeds a positive predetermined value which is sufficiently small with respect to the maximum value of the current signal and which is larger than a possible circuit induced noise level;
means for performing a calculation utilizing as an input the output of said voltage detecting means and the output of said current detecting means;
means for comparing the output of said calculating means with a predetermined calculated value;
whereby the failure of at least one of said electric lamps coupled to said plurality of isolation transformers is detected.

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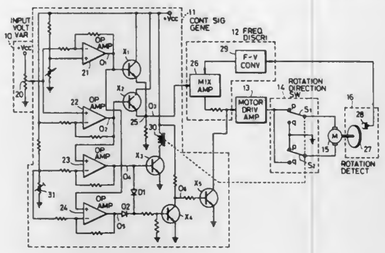
**4,295,080**

## SYSTEM FOR CONTROLLING ROTATIONAL DIRECTION SWITCHOVER AND FOR VARIABLY CONTROLLING ROTATIONAL SPEED OF MOTOR

**Mitsuo Fujita, and Koji Matsumura, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Nov. 15, 1979, Ser. No. 94,437**
**Claims priority, application Japan, Nov. 15, 1978, 53-139850**
**Int. Cl.³ H02P** *5/06*
**U.S. Cl. 318—257** **5 Claims**

1. A system for controlling a switchover of rotational directions and for variably controlling the rotational speed of a motor, said system comprising:
a motor capable of rotating in both a normal direction and a reverse direction;
means for switching over the rotational direction of said motor;
means for supplying a driving voltage to said motor, said motor rotating at a speed which depends upon the driving voltage;
a single voltage varying means for continuously varying a voltage; and
control signal generating means responsive to a variable voltage from said voltage varying means for generating a rotational control signal and a motor rotation stop signal for controlling said driving voltage supplying means and further for generating a rotational direction switchover




control signal for controlling said switchover means, the voltage of said rotation control signal produced by said control signal generating means decreasing as the variable voltage approaches a predetermined value, said rotation control signal reaching a minimum when the variable voltage coincides with the predetermined value, and increasing as the variable voltage goes beyond the predetermined value, the motor rotation stop signal being generated when the variable voltage decreases and reaches substantially the predetermined voltage, and the rotational direction switchover control signal being produced by said control signal generating means when the variable voltage is substantially at said predetermined voltage.

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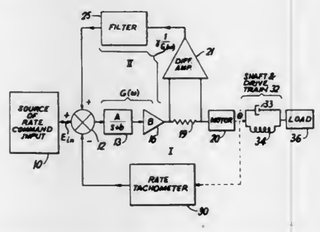
**4,295,081**

## LOAD ACTUATING SERVOMECHANISM WITH RESONANCE EQUALIZATION

**William J. Bigley, Jr., Scotch Plains, and Vincent J. Rizzo, Basking Ridge, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.**

**Filed Jan. 6, 1978, Ser. No. 866,394**
**Int. Cl.³ H02P** *5/00*
**U.S. Cl. 318—327** **6 Claims**




1. In combination in servomechanism apparatus for driving a load via coupling means characterized by a mechanical resonance at rates exceeding said resonance, summing means having first and second additive input ports, a subtractive input port and an output, a motor, a load, coupling means characterized by a mechanical resonance connecting said motor and said load, first network means connecting said output of said summing means and said motor, first negative feedback means



having an output connected to said subtractive input port of said summing means and an input responsive to said motor, monitoring means for monitoring the current consumed by said motor, and positive feedback network means having an input connected to said current monitoring means and an output connected to said first additive input port of said summing means for increasing the energization applied to said motor when said monitoring means senses an increasing current consumed by said motor to thereby overcome said mechanical resonance of said coupling means.

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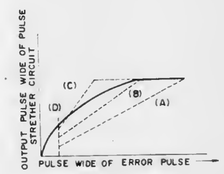
**4,295,082**

## PULSE WIDTH MODULATED SERVO CIRCUIT

**Masato Moto, and Seigo Ito, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan**

**Filed Mar. 6, 1980, Ser. No. 127,744**
**Claims priority, application Japan, Mar. 9, 1979, 54-26767**
**Int. Cl.³ G05B** *11/28*
**U.S. Cl. 318—599** **3 Claims**




1. A motor servo circuit comprising:
a first pulse generator for generating pulses having a pulse width adjusted by external signals and synchronized with input pulses;
a pulse width comparator for comparing output pulses from the first generator with the pulse width of the input pulses and generating pulses having a pulse width corresponding to a difference in the pulse width of both of these pulses when the pulse widths are different;
a pulse width stretcher for stretching an output of the pulse width comparator;
a second pulse generator for generating pulses having a predetermined pulse width at intervals of the generation of predetermined number of the output pulses of the pulse width comparator;
an adder for performing an OR of the output pulses of the pulse width stretcher and the second pulse generator; and
a motor driven by the output of the adder for adjusting the output pulse width of the first pulse generator in accordance with the rotation angle of the motor.

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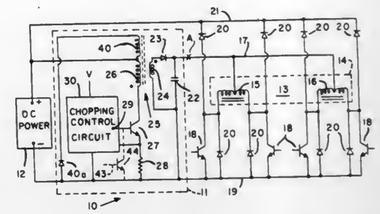
**4,295,083**

## PULSED ENERGY STEPPING MOTOR POWER CONTROL UNIT

**Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.**

**Filed Jul. 2, 1979, Ser. No. 54,311**
**Int. Cl.³ G05B** *19/40*
**U.S. Cl. 318—696** **26 Claims**

1. A power control unit for supplying power to a winding of a stepping motor, comprising a source of D.C. power, a capacitor, step-switching means for connecting the motor winding intermittently across the capacitor at a variable frequency that determines the motor's speed, thereby causing the capacitor to energize said winding as determined by the capacitor's charge and voltage and the impedance of said winding at the step-switching frequency, and means operable at a frequency independent of the frequency of said step-switching means for receiving pulses of energy up to a maximum amount of energy in each pulse from said D.C. source and for supplying pulses to said capacitor, said receiving and supplying means being responsive to the voltage of the capacitor to deliver to the capacitor amounts of pulse energy varying as a direct function of the capacitor voltage at least up to a predetermined frequency of said step-switching means.

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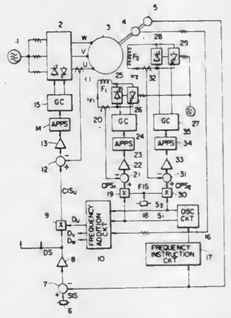
**4,295,084**

## CONTROL APPARATUS OF SYNCHRONOUS MOTOR HAVING THYRISTOR CONVERTER

**Hiroshi Nagase, Hitachi; Toshiaki Okuyama, Tokaimura; Yuzuru Kubota, Hitachi, and Katsunori Suzuki, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 5, 1979, Ser. No. 45,849**
**Claims priority, application Japan, Jun. 5, 1978, 53-66701**
**Int. Cl.³ H02P** *5/40*
**U.S. Cl. 318—719** **8 Claims**




1. A control apparatus of a synchronous motor having armature windings and perpendicular field windings, and a rotating shaft comprising: a frequency converter composed of thyristors to convert the frequency of an alternating current to supply the converted current to the armature windings of the synchronous motor; means for detecting the actual speed of the synchronous motor; means for detecting a position of the armature relative to the field; means for generating a speed instruction signal; means for rotationally exciting the field windings with alternating current; means for controlling the direction of the rotating magnetic field generated by the field windings which are excited with the alternating current, wherein the direction of the rotating magnetic field is controlled in accordance with the rotating direction of the rotary shaft of the synchronous motor as determined from the output of said actual speed detecting means; and means for controlling said frequency converter to regulate the amplitude of the converted current fed to the armature windings in accordance with a value proportional to a deviation between the speed instruction signal and the output of said speed detecting means and to regulate the frequency of the converted current in accordance with a sum of the output frequency of said position

detecting means and the frequency of the alternating current to the field windings.

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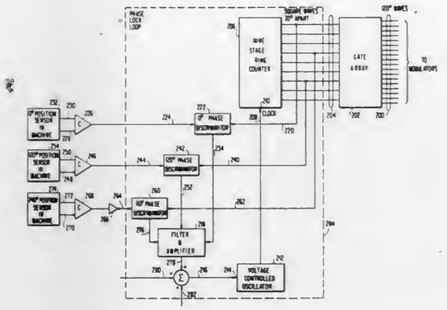
**4,295,085**

## PHASE LOCK LOOP COMMUTATION POSITION CONTROL AND METHOD

**David L. Lafuze, Endicott, N.Y., assignor to General Electric Company, Binghamton, N.Y.**

**Filed May 25, 1979, Ser. No. 42,432**
**Int. Cl.³ H02P** *5/28, 7/36*
**U.S. Cl. 318—721** **43 Claims**



1. A drive system for a multiphase DC field motor having a rotor and a stator windings for each machine phase, said drive system comprising:

(a) means for sequentially supplying electric power to said stator windings in response to gating signals generated in accordance with the position of the rotor with respect to such stator windings;

(b) means for generating gating signals for sequentially supplying electric power to said stator windings in accordance with a plurality of timing signals equal to the number of machine phases;

(c) means for generating said timing signals as a function of the position of said rotor comprising;

(d) means for furnishing a plurality of position signals as a function of the position of said rotor with respect to a plurality of preselected stator positions, said position signals being lesser in number than the number of stator windings;

(e) means for generating error signals proportional to phase difference between preselected ones of said timing signals and said positions signals;

(f) means for producing clocking signals as a function of said error signals;

(g) means for supplying said clocking signal to said means for generating timing signals;

(h) means for deriving additional timing signals representative of intermediate rotor positions from said clocking signals.

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**4,295,086**

## METHOD AND APPARATUS FOR DYNAMIC BRAKING IN A MOTOR CONTROL SYSTEM

**John H. Cutler, Roanoke; Paul M. Espelage, and Loren H. Walker, both of Salem, all of Va., assignors to General Electric Company, Salem, Va.**

**Filed Apr. 22, 1980, Ser. No. 142,696**
**Int. Cl.³ H02P** *3/22*
**U.S. Cl. 318—759** **24 Claims**

1. In a control for an alternating current electric motor having a stator and a rotor spaced from the stator by a gap across which motor flux is produced in response to an electrical current of variable magnitude and frequency through windings associated with said stator, said control comprising:

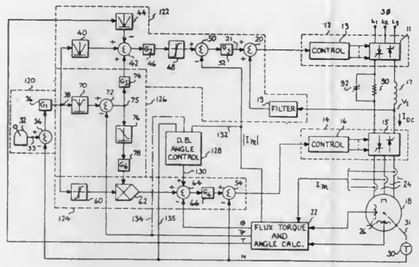
(a) a d.c. source for providing a direct current of variable magnitude;

(b) a power converter for supplying a variable frequency electrical current to said motor;

(c) a d.c. link for connecting said d.c. source to said power converter whereby said direct current of variable magnitude is supplied from said source to said converter, said d.c. link including a resistive element and switch means for selectively including and excluding said resistive element into and from said d.c. link;

(d) means to sense prescribed motor operating parameters and provide signals proportional thereto;

(e) control means for controlling said power converter to thereby control the frequency of said electrical current



supplied to said motor as a function of motor operating parameters;

(f) means to provide a braking signal designating a dynamic braking action of said motor; and,

(g) means responsive to said braking signal to:

(1) short circuit said d.c. source,

(2) render ineffective normal control of said control means,

(3) effect a braking control signal to said control means to thereby control the frequency of the electrical current supplied to said motor at a value determined by the value of a designated operating parameter, and

(4) subsequently, operating said switch means to thereby include said resistive element in said d.c. link.

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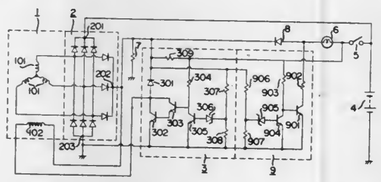
**4,295,087**

## CHARGE INDICATOR CIRCUIT FOR A BATTERY CHARGING SYSTEM

**Mitsuharu Morishita, and Yoshiyuki Iwaki, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 20, 1980, Ser. No. 151,734**
**Claims priority, application Japan, Jun. 12, 1979, 54/80275[U]**
**Int. Cl.³ H02J** *7/14, 7/24*
**U.S. Cl. 322—99** **1 Claim**



1. In a battery charging system comprising an alternating current generator having a field winding and an output winding, full-wave rectifier means rectifying an alternating current output of said output winding and having first and second rectified output terminals and a grounded terminal, a battery



connected to said first rectified output terminal of said rectifier means to be charged therefrom, a resistor connected between said second rectified output terminal and said grounded terminal of said rectifier means, and voltage regulator means connected serially with said field winding for regulating an output voltage of said generator to a first predetermined level by conducting and cutting off a current flowing through said field winding of said generator, said field winding of said generator being supplied from an output from the second rectified output terminal of said rectifier means through said voltage regulator;

a charge indicator circuit comprising a serial connection of a diode and a charge indicator lamp connected between said second rectified output terminal and said battery through a key switch, said diode having an anode and a cathode connected to said indicator lamp and said second rectified output terminal respectively, a detector and switching network including detecting means for detecting the output voltage of said second output terminal, and switching means which is connected between said anode of said diode and a ground terminal and is turned on by said detecting means to become conductive to energize said indicator lamp when said detecting means detects that the output voltage of said second output terminal becomes less than a second predetermined level which is lower than said predetermined level by a predetermined amount.

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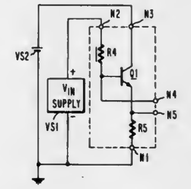
**4,295,088**

## TEMPERATURE-SENSITIVE VOLTAGE DIVIDER

**Max E. Malchow, Raritan Township, Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 968,443, Dec. 11, 1978. This application Jan. 18, 1980, Ser. No. 113,372**
**Int. Cl.³ G05F** *3/20*
**U.S. Cl. 323—313** **6 Claims**



1. A voltage divider comprising:

a first terminal for receiving a reference voltage;

a second teminal for receiving a voltage to be divided;

a third terminal, between which and each of said first and second terminals respective divided voltages are available;

a fourth terminal for receiving an operating voltage;

a first transistor with a collector region, with a base region formed by a first diffusion into its collector region, followed by a second diffusion thereinto, with an emitter region formed by said second diffusion with a collector electrode contacting its collector region ohmically and connecting to said fourth terminal, with a base electrode contacting its base region ohmically, and with an emitter electrode contacting its emitter ohmically, one of its base and emitter electrodes connecting to said third terminal;

a first resistor with a body formed by said first diffusion process in a body of semiconductive material formed by the same process as the collector region of said first transistor, with a first electrode contacting its body ohmically and connecting to said first terminal, and with a second electrode contacting its body ohmically at a different point than its first electrode does and connecting to the emitter electrode of said first transistor; and

a second resistor with a body formed by said first diffusion process in a body of semiconductor material formed by the same process as the collector region of said first transistor, and its body further formed by said second diffusion process, with a first electrode contacting its body ohmically and connecting to said second terminal, and with a second electrode contacting its body ohmically at a different point than its first electrode does and connecting to the base electrode of said first transistor.

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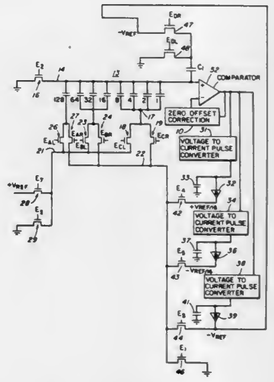
**4,295,089**

## METHODS OF AND APPARATUS FOR GENERATING REFERENCE VOLTAGES

**Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Jun. 12, 1980, Ser. No. 158,672**
**Int. Cl.³ H02J** *1/00;* **H03K** *13/02*
**U.S. Cl. 323—351** **32 Claims**



1. In a system utilizing a reference voltage V, a method for providing a precise reference voltage xV comprising the steps of

(a) applying said reference voltage V to one side of a first capacitor while the opposite side of said first capacitor is coupled to a point of reference potential;

(b) with said opposite side of said first capacitor coupled to an input terminal of a comparator, decoupling said opposite side of said first capacitor from said point of reference potential, permitting said opposite side to "float";

(c) applying said point of reference potential to said one side of said first capacitor while said opposite side of said first capacitor remains coupled to said input terminal of said comparator; converting an output of said comparator to a nominal reference voltage xV; applying said nominal reference voltage xV to one side of a second capacitor while the opposite side of said second capacitor is coupled to said input terminal of said comparator; and

(d) coupling all sides of said capacitors to said point of reference potential; and cyclically repeating the foregoing steps, wherein the ratio of the value of said first capacitor to the value of said second capacitor is x.

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**4,295,090**

## ELECTRONIC SELECTOR SWITCH PARTICULARLY FOR USE IN RADIOSONDES

**Jorma Ponkala, Helsinki, Finland, assignor to Vaisala Oy, Finland**

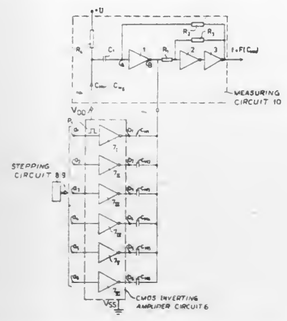
**Continuation of Ser. No. 950,546, Oct. 12, 1978. This application Dec. 4, 1979, Ser. No. 100,199**
**Claims priority, application Finland, Oct. 14, 1977, 773064**
**Int. Cl.³ G01R** *27/26, 19/26*
**U.S. Cl. 324—60 CD** **7 Claims**

1. An electronic selector switch for telemetrical use in measuring a plurality of impedances to be measured, said selector switch comprising

an impedance measuring circuit;

a plurality of CMOS inverting amplifiers each having an input and an output, the output of each of said amplifiers being connected to a corresponding one of the impedances to be measured; and

a stepping circuit connected to the inputs of said amplifiers for connecting a selected one of said inverting amplifiers and the corresponding one of said impedances to be measured in said impedance measuring circuit and connecting the remaining inverting amplifiers and impedances to be measured to a point at ground potential whereby said impedance measuring circuit measures said one of said impedances to be measured free from the influence of said remaining impedances to be measured, said impedance measuring circuit producing an output frequency proportional to the impedance measured.

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**4,295,091**

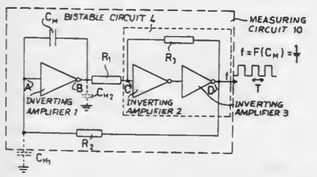
**CIRCUIT FOR MEASURING LOW CAPACITANCES**

**Jorma Ponkala, Helsinki, Finland, assignor to Vaisala Oy, Finland**

**Continuation of Ser. No. 950,547, Oct. 12, 1978. This application Dec. 4, 1979, Ser. No. 100,200**

**Int. Cl.³ G01R** *27/26, 19/26*

**U.S. Cl. 324—60 CD** **6 Claims**




1. A circuit for measuring low capacitances with the elimination of the influence of stray capacitances, said circuit comprising

an inverting amplifier having an input and an output;

a capacitance to be measured connected between the input and the output of the inverting amplifier;

a bistable circuit having an input connected to the output of said inverting amplifier, an output and an output frequency inversely proportional to the capacitance to be measured; and

a resistive feedback connected from the output of the bistable circuit to the input of the inverting amplifier.

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**4,295,092**

**APPARATUS FOR AND METHOD OF DETECTING AND MEASURING CORROSION DAMAGE IN PIPE**

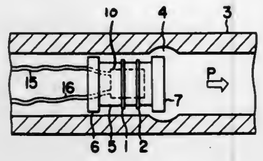
**Okiyoshi Okamura, Mitaka, Japan, assignor to Koa Oil Company, Limited, Ohte, Japan**

**Filed Nov. 3, 1978, Ser. No. 957,315**

**Claims priority, application Japan, Feb. 9, 1978, 53-13935; Feb. 9, 1978, 53-13936; Feb. 9, 1978, 53-13938**

**Int. Cl.³ G01R** *27/26;* **G01B** *5/28*

**U.S. Cl. 324—61 R** **25 Claims**




1. Apparatus for detecting corrosion damage to electrically conductive pipe, comprising:

(a) a movable conductive ring within said pipe; and

(b) means for moving said conductive ring longitudinally of said pipe;

said conductive ring and the wall of said pipe forming the electrodes of a varying electrical capacitance means such that the capacitance of said varying capacitance means changes whenever said movable conductive ring passes a corrosion portion of the inner pipe wall; and

(c) means electrically connected to said varying capacitance means for detecting the variations in its electrical capacitance.

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**4,295,093**

**SPECTRUM ANALYSERS**

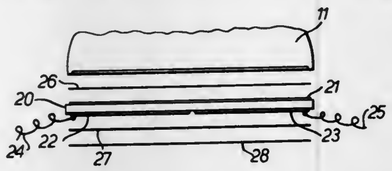
**John D. Middleton, Welwyn, England, assignor to Marconi Instruments Limited, Chelmsford, England**

**Filed Nov. 16, 1979, Ser. No. 95,098**

**Claims priority, application United Kingdom, Nov. 17, 1978, 44927/78**

**Int. Cl.³ G01R** *23/16*

**U.S. Cl. 324—77 B** **4 Claims**




1. A spectrum analyser including a monochrome cathode ray tube utilising a raster scanning pattern in which the lines of the raster are representative of different frequency components; a liquid crystal colour switch positioned immediately in front of the screen of the cathode ray tube and containing a thin film of liquid crystal material and two coloured polarised sheets, and selection means to selectively controlling the optical properties of the film so as to produce a display consisting of at least the two colours of said polarised sheets, and means for synchronising the operation of said selection means with the raster scanning pattern of the cathode ray tube.



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**4,295,094**

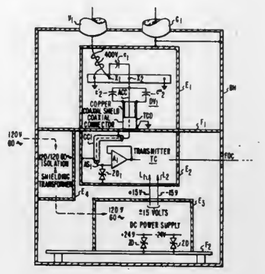
**HIGH VOLTAGE HIGH FREQUENCY ANALOG SIGNAL MEASURING SYSTEM**

**Victor F. Wilreker, and William H. Smith, both of Greensburg, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 30, 1979, Ser. No. 34,308**

**Int. Cl.³ G01R** *19/26, 15/04*

**U.S. Cl. 324—96** **11 Claims**




1. In a system for deriving a representation as a function of time of high frequency high voltage transients appearing on a high voltage power line, the combination of:

voltage divider means coupled to said power line at a point of measurement for deriving at low voltage at a first location a first analog signal representing said transients;

a first metallic enclosure surrounding said first location and connected to ground potential;

frequency modulation means disposed at a second location in close proximity to said first location and responsive to said first analog signal for frequency modulating said first analog signal and for converting the resulting frequency-encoded electrical signal into a frequency-encoded optical signal;

a second metallic enclosure at ground potential surrounding said frequency modulating means;

fiber optic means for transmitting said frequency-encoded optical signal out of said second enclosure onto a remote location; and

means at said remote location for converting said frequency-encoded optical signal into a second analog signal representative of said first analog signal.

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**4,295,095**

**APPARATUS AND METHOD FOR DETECTING THE LOCATION OF METALLIC OBJECTS HAVING ALTERNATING CURRENT PASSING THERETHROUGH**

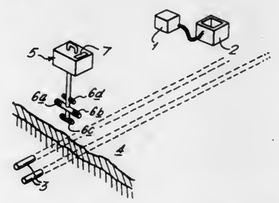
**Richard C. Thomas, Cramlington; Stewart M. Pegler, Wideopen, and Paul B. Cordes, North Shields, all of England, assignors to British Gas Corporation, London, England**

**Filed Mar. 20, 1979, Ser. No. 22,100**

**Claims priority, application United Kingdom, Jan. 29, 1979, 03083/79**

**Int. Cl.³ G01V** *3/11, 3/165*

**U.S. Cl. 324—326** **16 Claims**




1. Detector means for locating an elongated metallic object through which an alternating electrical current is passing, thereby producing an alternating magnetic field therearound, said detector means including

first, second and third magnetic field strength measuring means, said first and second magnetic field strength measuring means being positioned in a common plane which is perpendicular to a plane passing through the third magnetic field strength measuring means and said first and second magnetic field strength measuring means being equidistant from said plane passing through said third magnetic field strength measuring means and on opposite sides thereof,

first comparator means electrically connected to said first and second magnetic field strength measuring means to determine when the magnitudes of the field strengths measured thereby are equal,

second comparator means electrically connected to said first and second magnetic field strength measuring means to determine the larger field strength measurement therebetween,

third comparator means electrically connected to said third magnetic field strength measuring means and said second comparator means to determine when the field strength measurement from said third magnetic field measuring means is greater than the larger of the field strength measurements between the first and second magnetic field strength measuring means, and

indicator means electrically connected to said first comparator means and said third comparator means to indicate when the field strengths measured by the first and second magnetic field strength measuring means are equal and when the field strength of the third magnetic field strength measuring means is greater than the larger of the field strengths measured by either of said first and second magnetic field strength measuring means, said indicator means thus indicating when the detector means has been positioned such that the plane passing through said third magnetic field strength measuring means is coincident with a plane in which the elongated metallic object is located.

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**4,295,096**

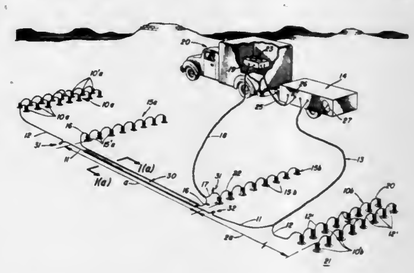
**ELECTRODE PROSPECTING METHOD PROVIDING CALCULABLE ELECTROMAGNETIC COUPLING FOR THE INDIRECT DETECTION OF HYDROCARBON RESERVOIRS**

**Ben K. Sternberg; Dale E. Miller, and Dhari S. Bahjat, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.**

**Filed Dec. 20, 1978, Ser. No. 971,177**

**Int. Cl.³ G01V** *3/06*

**U.S. Cl. 324—357** **11 Claims**




9. A method of electrical hydrocarbon prospecting to investigate a subsurface polarizable stratum which is indicative of the presence of a hydrocarbon deposit lower than the stratum wherein a first set of spaced electrode means is placed in the surface of the ground in electrical communication with said stratum, a second set of spaced electrode means is placed in the

surface of the ground in electrical communication with said stratum, with generating means coupled through second conductor means to said second set of electrode means, and a voltage measuring means coupled through a first conductor means to said first set of spaced electrode means, an improvement comprising:

(a) maintaining a calculable electromagnetic coupling between said first and second conductor means;

(b) measuring the current through said second conductor means to said second set of spaced electrical means; and

(c) recording in time synchronism voltage that is measured through said first conductor means from said first set of spaced electrical means by said voltage measuring means, and said measured current, whereby an anomaly indication of a hydrocarbon deposit can be ascertained by processing from the measured current and voltage and said calculable electro-magnetic coupling.

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**4,295,097**

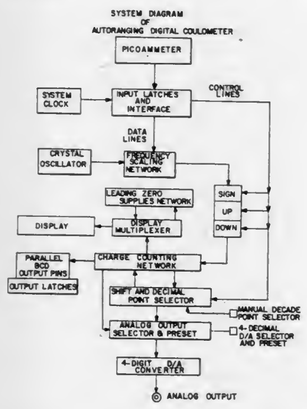
## BATTERY CAPACITY MEASURING METHOD AND APPARATUS

**Arthur H. Thompson, 14 Princeton Dr., New Providence, N.J. 07974, and Ricardo H. Ballester, Jamaica Estates, N.Y., assignors to Arthur H. Thompson, New Providence, N.J.**

**Filed May 7, 1979, Ser. No. 36,412**

**Int. Cl.³ H02J** *7/00*

**U.S. Cl. 324—429** **16 Claims**




1. A device for automatically testing an electrochemical cell, comprising:

(a) means for selectively charging and discharging current to and from said cell in predetermined discrete steps responsive to control circuitry means;

(b) means responsive to the current flowing from said cell, the output of which is capable of being interfaced with control circuitry means;

(c) means responsive to the voltage across said cell, the output of which is capable of interfacing with control circuitry means;

(d) means for measuring the current flowing through said means of paragraph (b) responsive to the current flowing from said cell, which is also capable of integrating said current and is further capable of being interfaced with control circuitry means;

(e) control circuitry means coupled to said means of a paragraph (a), whereby said control circuitry means selectively controls the state of charge or discharge of current to and from said cell in response to said means of paragraph (c).

**4,295,098**

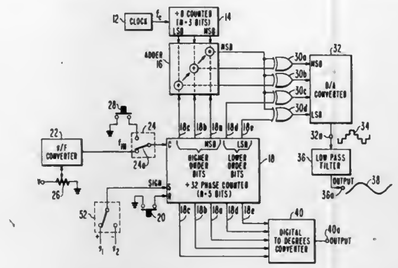
## DIGITALLY ADJUSTABLE PHASE SHIFTING CIRCUIT

**Albert T. Crowley, Gloucester Township, Camden County, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Dec. 19, 1979, Ser. No. 105,122**

**Int. Cl.³ H03L** *7/18;* **H03K** *13/02, 4/02, 3/017*

**U.S. Cl. 328—24** **6 Claims**




1. Apparatus for producing an alternating signal with a controllable phase shift, comprising in combination:

means producing a periodic signal having a given period;

divider means responsive to said periodic signal for producing a first digital signal changing as a function of said given period and manifested as a plurality of M bits;

means for storing a value indicative of the phase of said alternating signal and for producing, in accordance with said value, a second digital signal manifested as a plurality of N bits comprising M higher order bits and N-M lower order bits and having a control terminal receptive of a control signal for changing said value, where, $N \geqq M$;

means responsive to said first digital signal and second digital signal for adding ones of said M bits of said first digital signal with corresponding ones of said higher orders bits of said N bits to produce a most significant bit (MSB) and lower order bits;

means responsive to said added bits and lower order ones of said N bits for producing an analog alternating signal corresponding to the value of said added and lower order bits; and

means coupled to said means for storing a value for producing a control signal to change said stored value to thereby change the phase of said alternating signal.

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**4,295,099**

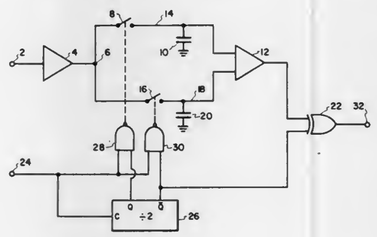
## PEAK DETECTOR

**Thomas E. Evans, Parker, Colo., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Sep. 5, 1979, Ser. No. 72,572**

**Int. Cl.³ H03K** *5/153*

**U.S. Cl. 328—151** **8 Claims**




1. A peak detector circuit comprising:



input signal terminal means for conpection to a source of analog signals,

a first and second sample holding means,

means connected to said input terminal means for applying successive samples of said analog signals to said first and second holding means alternately,

comparator means connected to compare the magnitude of said signals stored in said holding means to produce a phase change signal on the occurrence of a peak value of said analog signal, and

means connected to be responsive to said phase change signal from said comparator means to produce an output signal indicative of the occurrence of said peak value.

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**4,295,100**

## MICROPHONE AMPLIFIER, IN PARTICULAR FOR TELEPHONE SYSTEMS

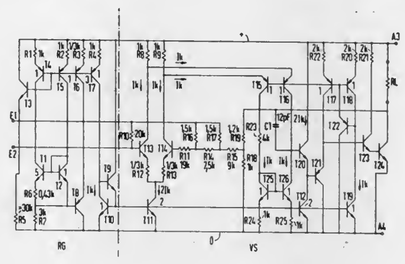
**Horst Kraemer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 1, 1979, Ser. No. 90,468**

**Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850792**

**Int. Cl.³ H03F** *3/45, 3/68*

**U.S. Cl. 330—257** **8 Claims**



1. In a microphone amplifier of the type providing common terminals on which an output signal is superimposed on its feed current, in which an input stage comprises an emitter resistance stabilized differential amplifier, an output stage comprising a two-transistor Darlington amplifier operating as a controlled voltage source, a negative feedback circuit connects the output and input stages, and a reference voltage source is connected to stabilize the operating point of the differential amplifier, the improvement therein comprising:

coupling means connecting the differential amplifier to the Darlington amplifier, including a symmetrically connected transistor coupling stage and a two-stage intermediate amplifier; and

current mirror circuits connected to said coupling stage and to the input stage for providing current symmetry therein.

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**4,295,101**

## CLASS AB PUSH-PULL QUASI-LINEAR AMPLIFIERS

**Arthur J. Leidich, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Dec. 10, 1979, Ser. No. 102,131**

**Int. Cl.³ H03F** *3/26*

**U.S. Cl. 330—262** **13 Claims**

1. A Class AB push-pull quasi-linear amplifier comprising:

input and output signal terminals;

first and second supply terminals for receiving an energizing potential therebetween;

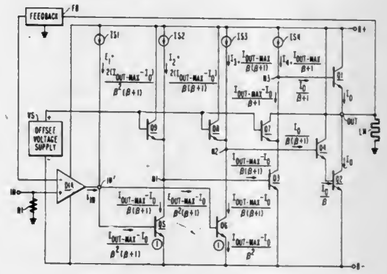
a first plurality, N in number, of transistors of a first conductivity type in a first sequential arrangement, each transistor having a respective base electrode, each having respective emitter and collector electrodes defining the ends of a respective principal current conduction path the conductivity of which is controlled by current applied to the base electrode of that transistor, and each exhibiting a current gain between its base electrode and one of its emitter and collector electrodes appreciably greater than unity;

a second plurality, N in number, of transistors of said first conductivity type in a second sequential arrangement, each transistor having a respective base electrode, each having respective emitter and collector electrodes defining the ends of a respective principal current conduction path the conductivity of which is controlled by current applied to the base electrode of that transistor, and each exhibiting a current gain between its base electrode and one of its emitter and collector electrodes substantially corresponding to said current gain exhibited by a respective one of the transistors in said first plurality, with which it is paired;

means for connecting said first plurality of transistors, in order of said first sequential arrangement, in a first direct-coupled cascade amplifier with a current gain that is substantially equal to the product of the current gains of said first plurality of transistors, including

means connecting said input signal terminal to the base electrode of the first transistor in said first sequential arrangement including

means connecting the principal conduction path of each transistor except the last in said first sequential arrangement to control the current flowing to the base elecrode of the following transistor in said first sequential arrangement, and including



a connection of the emitter electrode of the last transistor in said first sequential arrangement to said first supply terminal and

a connection of its collector electrode to said output signal terminal;

means for connecting said second plurality of transistors, in order of said second sequential arrangement, in a second direct-coupled cascade amplifier with a current gain that is substantially equal to the product of the current gains of said second plurality of transistors and that is opposite in sense to that of said first direct-coupled cascade amplifier, including

means connecting said input signal terminal to the base electrode to the first transistor in said second sequential arrangement, including

means connecting the principal conduction path of each transistor except the last in said second sequential arrangement to control the current flowing to the base electrode of the following transistor in said second sequential arrangement, at least one current-inverting one of these transistors having its collector electrode connected to the base electrode of the following transistor in said second sequential arrangement, and including

a connection of the emitter electrode of the last transistor in said second sequential arrangement to said output signal terminal and

a connection of its collector electrode to said second supply terminal; and

respective constant current generator means connected to the base electrode of each transistor in said first and second sequential arrangements which has connected to it the collector electrode of a preceding current-inverting transistor.

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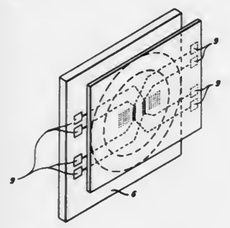
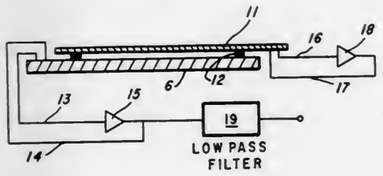
**4,295,102**

## SURFACE ACOUSTIC WAVE SENSOR SENSING CIRCUITS

**Gary D. Schmidt; Jerry L. Norris, and Donald F. Weirauch, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 28, 1979, Ser. No. 80,366**
**Int. Cl.³ G01B 7/16; H03B 5/18; H03H 9/25**
**U.S. Cl. 331—65** **8 Claims**






5. A strain sensing system comprising:

a first substrate having a surface acoustic wave array located thereon, and an amplifier coupled to said array to form a first oscillator circuit;

second substrate having a surface acoustic wave array located thereon, and an amplifier coupled to said array to form a second oscillator circuit;

means for physically locating said first substrate and said second substrate in proximity to each other such that a capacitive coupling is created between said SAW arrays for mixing the frequencies generated by said oscillator circuits, and for changing said capacitive coupling when either of said substrates is recipient of strain which alters the proximity of said SAW arrays;

circuit means for development of frequency difference of said oscillator circuits, in at least one of said oscillator circuits;

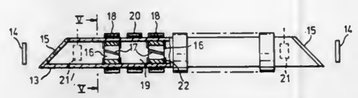
filter means for passage of said frequency difference only, coupled to said circuit means for development of frequency difference.

**4,295,103**

## METAL VAPOR LASER

**Ariold Ljudmirsky, 8L/26 Ramot, Jerusalem, Israel**

**Filed Mar. 23, 1978, Ser. No. 889,396**
**Int. Cl.³ H01S 3/097**
**U.S. Cl. 331—94.5 PE** **33 Claims**




1. A method of stimulating the emission of light in a laser, comprising the steps of:

disposing a plurality of solid electrically conductive bodies, each consisting at least in part of a vaporizable substance whose vapors are excitable to a radiation-emissive level, at spaced-apart sites in a substantially closed vessel of dielectric material;

simultaneously generating an electric current pulse by electromagnetic induction through the wall of said vessel in each of said bodies for vaporizing at least part of said substance; and

exciting the resulting vapors to the radiation-emissive level by subjecting said vapors to a high-intensity electric field.

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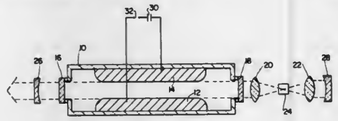
**4,295,104**

## LASER HAVING SIMULTANEOUS ULTRAVIOLET AND VISIBLE WAVELENGTHS

**Ralph L. Burnham, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 14, 1979, Ser. No. 94,125**
**Int. Cl.³ H01S 3/05**
**U.S. Cl. 331—94.5 C** **14 Claims**




1. A laser system operative in the visible region of the spectrum which comprises:

a first and second laser having a common optical cavity;

said first laser including a medium which possesses a high-gain UV transition and a low-gain visible transition disposed within a resonant second optical cavity;

said second laser including a high gain medium which is stimulated by UV radiation; and

said first laser further including means for extracting and directing the ultraviolet radiation from said second optical cavity into the high gain medium of said second laser;

whereby the stimulated emission of said second laser is amplified by the low-gain visible transition of said first laser to produce laser emission in the visible region of the spectrum in the common optical cavity.

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**4,295,105**

## SWITCHED-CAPACITOR MODULATOR

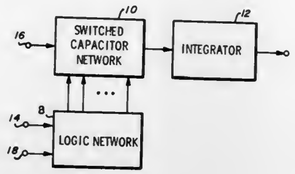
**John A. C. Bingham, Palo Alto, Calif., assignor to Racal-Vadic, Inc., Sunnyvale, Calif.**

**Filed Feb. 7, 1980, Ser. No. 119,374**
**Int. Cl.³ H03C 1/02; H03K 7/00**
**U.S. Cl. 332—9 R** **8 Claims**

1. A switched-capacitor modulator for modulating a carrier signal with a modulating signal to develop a modulated signal, said modulator comprising:

switching means including, a first input terminal for application of the modulating signal, a second input terminal for application of a plurality of switching signals, an output terminal for providing a sampled modulating signal, a primary capacitive means having first and second plates, and a plurality of binary switches responsive to the switching signals for connecting said first and second plates to said input and output terminals;






logic means responsive to the carrier signal and a clock signal having a frequency of at least four times the frequency of said carrier signal and operative to generate said switching signals; and

integrator means responsive to said sampled modulating signal and operative to provide the modulated signal.

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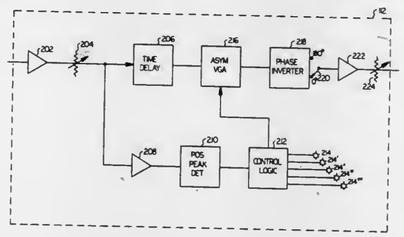
**4,295,106**

## METHOD AND MEANS FOR INTRODUCING ADDITIONAL ASYMMETRY INTO AUDIO WAVES

**Leonard Kahn, 137 E. 36 St., New York, N.Y. 10016**

**Filed Oct. 4, 1979, Ser. No. 81,631**
**Int. Cl.³ H03C 1/00; H03G 11/00; H03K 5/153**
**U.S. Cl. 332—37 R** **16 Claims**




1. Audio signal modulation equipment comprising an audio signal source, carrier wave generation means, and means for modulating carrier waves with the audio signal, the improvement which comprises;

means for converting an audio signal, having little or no asymmetry, to a wave having substantial asymmetry through which an audio signal from said audio signal source is passed and fed to the carrier wave modulating means,

said converting means, comprising a peak detector which detects the signal having the proper polarity to cause positive going envelope modulation, and,

means controlled by the peak detector for providing greater transmission for portions of the audio wave that produce positive going envelope modulation than portions of the audio wave that produce negative going modulation during periods when the peak detector provides an output above a predetermined level.

9. A detector for detecting the peak voltage of a wave comprising;

(a) a first rectification means with its input terminal coupled to the signal having the proper polarity to cause positive going envelope modulation,

(b) one or more additional rectification means,

(c) one or more time delay means through which at least a sample of said proper polarity signal is passed and if a plurality of delay means are provided said delay means connected so as to provide a total delay equal to the sum of the delays of the individual delay means,

(d) means for connecting the input terminals of the one or more rectification means (b) to the one or more output terminals of delay means (c),

(e) combining means connected to the output terminals of the rectification means (a) and rectification means (b), said combining means incorporating storage means having a capacity sufficient to maintain the level of the detected wave within a predetermined droop tolerance for a period of time equal to approximately T/D+T where T is the period of one complete alternation of the lowest frequency component of substantial level expected in the wave being detected and D is the number of time delay means (c).

11. A device for converting a substantially symmetrical wave into one substantially asymmetrical comprising;

means for splitting said wave into its positive and negative polarity segments,

two separate paths at least for some portion of the path to an associated transmitter's modulator for passing the two segments, said separate paths having different transmission characteristics both of which are essentially linear, but the path for the segment that causes positive going modulation being of higher transmission gain.

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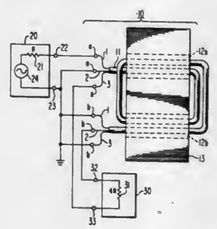
**4,295,107**

## IMPEDANCE TRANSFORMATION NETWORK

**Stewart M. Perlow, Marlboro, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jan. 31, 1980, Ser. No. 117,238**
**Int. Cl.³ H03H 7/38, 7/42**
**U.S. Cl. 333—25** **12 Claims**




1. Apparatus comprising:

first circuit for processing RF signals in a predetermined frequency range having a signal connection point and a signal reference point for signals developed at said signal connecting point of said first circuit;

a second circuit for processing RF signals in said predetermined frequency range having first and second signal connection points and a signal reference point for signals developed at said first and second signal connection points of said second circuit;

a trifilar wire configuration having three conductors substantially equally spaced with respect to one another throughout a predetermined length of said wire configuration between first and second ends, said predetermined length being substantially shorter than the wavelength of the highest frequency signal in said predetermined range, each of said conductors having first and second ends respectively connected to points respectively located at said first and second ends of said predetermined length, said first and second ends of said first conductor being connected to said signal connection and signal reference points, respectively, of said first circuit, said first end of said third conductor being connected to said first signal connection point of said second circuit, said second end of said second conductor being connected to said second signal connection point of said second circuit, and said

first end of said second conductor and said second end of said third conductor being connected to said signal reference point of said second circuit, there being no DC signal paths connected directly between said signal connection point of said first circuit and each of said first and second signal connection points of said second circuit; and

a ferrite member having a generally cylindrical shape with two apertures formed through it through which said trifilar wire configuration is wound, said apertures having lengths such that the substantial portion of said predetermined length is surrounded by ferrite material.

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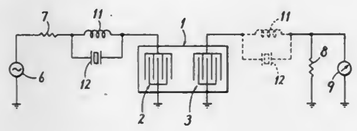
**4,295,108**

## FILTER CIRCUIT EMPLOYING SURFACE ACOUSTIC WAVE DEVICE

**Hideharu Ieki, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan**

**Filed Sep. 17, 1980, Ser. No. 188,226**
**Claims priority, application Japan, Sep. 25, 1979, 54/123343**
**Int. Cl.³ H03H** *9/64, 9/60*
**U.S. Cl. 333—193** **8 Claims**



1. A filter circuit located between an input and an output terminal, comprising:

a surface acoustic wave device having an input transducer and an output transducer acoustically coupled to each other and electrically connected to said input and output terminals, respectively;

a tuning coil connected in series between one said transducer and said terminal which is electrically connected thereto; and

a piezoelectric resonator connected in parallel with said tuning coil.

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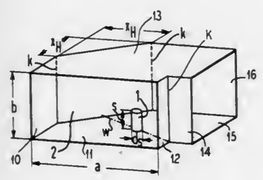
**4,295,109**

## RECTANGULAR WAVE GUIDE ELBOW BENT ACROSS THE NARROW SIDE WITH CAPACITIVE LOADING

**Eberhard Schuegraf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Dec. 10, 1979, Ser. No. 101,577**
**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856733**
**Int. Cl.³ H01P** *1/02*
**U.S. Cl. 333—249** **3 Claims**



1. A rectangular wave guide H-elbow bent across the narrow side of the wave guide and having an external corner symmetrically flattened with a conductive flattening plane, characterized in that the value $x_H/a$ of the corner flattening is selected so as to be greater than 0.73, whereby $x_H$ is the distance from the junction of the flattening plane with the narrow side (k) to the apex of the outer bend edge of a non-flattened elbow and "a" is the length of the broad side of the wave guide; and electrically conductive means (3) functioning as a capacitive load are provided in the wave guide elbow in the area of the geometrical median (w) of the bend, in that a conductive cross-bar (3) which extends between the flattening plane (2) to the inner bend edge (K) is provided as the capacitive load electrically conductive means.

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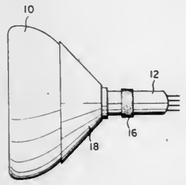
**4,295,110**

## ADJUSTING DEVICE FOR COLOR CATHODE RAY TUBE

**Tatsuo Uesaka; Hiroshi Sugahara, both of Amagasaki, and Takeo Fujimura, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 13, 1979, Ser. No. 47,993**
**Claims priority, application Japan, Jun. 24, 1978, 53/76644**
**Int. Cl.³ H01F** *1/00*
**U.S. Cl. 335—212** **3 Claims**



1. An adjusting device for a color cathode ray tube comprising:

a neck portion of a color cathode ray tube;

electron gun means disposed within said neck portion;

a magnetic member fixedly secured to an external surface of said neck portion and magnetized into a predetermined magnetization pattern;

wherein said predetermined magnetization pattern is effective for correcting the static convergence and color purity of electron beams emitted from said electron gun means;

wherein said magnetic member is magnetized after being fixedly secured to said external surface of said neck portion;

and wherein said magnetic member is formed of a magnetically anisotropic sheet-shaped magnet material having a magnetic easy axis perpendicular to said external surface of said neck portion.

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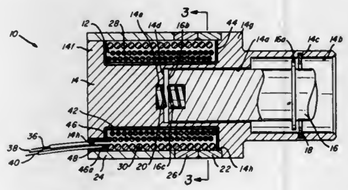
**4,295,111**

## LOW TEMPERATURE LATCHING SOLENOID

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and William S. Wang, Marina del Rey, Calif.**

**Filed Nov. 29, 1979, Ser. No. 98,568**
**Int. Cl.³ H01F** *3/00, 7/08*
**U.S. Cl. 335—256** **12 Claims**



1. Magnetically operable apparatus capable of operating in cryogenic environment comprising:

(a) plunger means, including magnetically responsive material, movable generally along a path between a first position and a second position;

(b) coil means generally circumscribing at least a portion of said path and positioned so that the center of said magnetically responsive material of said plunger means moves generally toward the center of said coil means as said plunger means moves toward said second position;

(c) a first coil segment, as part of said coil means, constructed of electrically conducting material; and

(d) a second coil segment, as part of said coil means, electrically connected in sequence with said first coil segment, and constructed of electrically conducting material with a temperature coefficient of resistivity lower than that of said first coil segment and

(e) the total resistance of the coil means remaining nonzero for all values of the temperature of the environment within which the apparatus is to be operated.



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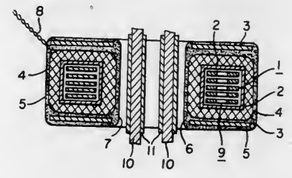
**4,295,112**

## RESIDUAL CURRENT TRANSFORMER

**Yoshito Yamada; Hiroshi Okumura, and Shoji Murakami, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,360**
**Claims priority, application Japan, Aug. 30, 1978, 53-105930; Dec. 15, 1978, 53-155454**
**Int. Cl.³ H01F** *15/04, 40/06*
**U.S. Cl. 336—84 M** **8 Claims**



1. A residual current transformer, comprising:

an annular core of magnetic material, said core including a continuous magnetic path within said core, said core including at least one portion wherein the longitudinal cross-section of said core is reduced with respect to the longitudinal cross-section of the remainder of said core;

a first annular shield of magnetic material positioned concentric with respect to said core and located in parallel with a first side thereof;

a second annular shield of magnetic material positioned concentric with respect to said core and located in parallel with a second side thereof; and

a secondary coil wound about the exterior of said annular core, said secondary coil being located between said annular core and said first and second annular shields.

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**4,295,113**

## SHEET-WOUND TRANSFORMER OR REACTOR

**Anders Björklund; Erik Persson, and Lars-Göran Virsberg, all of Vesteras, Sweden, assignors to Asea Aktiebolag, Vesteras, Sweden**

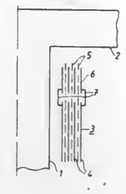
**Filed Aug. 11, 1980, Ser. No. 176,911**
**Claims priority, application Sweden, Aug. 14, 1979, 7906765**
**Int. Cl.³ H01F** *15/04*
**U.S. Cl. 336—84 M** **10 Claims**

1. A transformer or reactor comprising:

a core consisting of magnetic material and having at least one leg (1) and one yoke (2);

at least one winding (3) arranged substantially concentrically around said core leg, said winding being built up from a foil (4), spirally-wound in several turns, of a material having a high electrical conductivity and an insulating film (5) arranged between said turns;

a magnetic flux-controlling spirally-wound tape (6) of a highly permeable ferro-magnetic material being arranged axially outside each end of the winding and coaxially



therewith, the magnetic material in the tape being divided in such a manner that the ability of the tape to carry electric current in the longitudinal direction of the tape is considerably reduced; and connections (7) being arranged between the tape and the winding at the beginning and end of the tape.

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**4,295,114**

## THERMO-SWITCH

**Walter Pohl, Milan, Italy, assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jan. 28, 1980, Ser. No. 115,977**
**Claims priority, application Italy, Jan. 29, 1979, 19684 A/79**
**Int. Cl.³ H01H** *61/01*
**U.S. Cl. 337—3** **6 Claims**



1. An overload protective thermostat comprising:

(a) housing means;

(b) switch means disposed within said housing means, said switch means including a switch blade member mounted on a support for movement between positions making and breaking first and second spaced sets of circuit contacts;

(c) heat responsive service actuator means disposed within said housing means, said actuator means being operative in response to experiencing a predetermined service temperature to cause movement of said switch member for breaking said first set of electrical contacts;

(d) collapsible support means maintaining said switch member in a position such that said first and second sets of contacts are normally closed; and,

(e) means biasing said switch member against said support means in a direction tending to open said second set of contacts wherein upon said thermostat experiencing temperatures above a second predetermined level greater than said service temperature, said support means collapses permitting said bias means to open said second set of contacts irrespective of the condition of said first set of contacts;

(f) a first electrical terminal, operatively connected in series circuit arrangement with said first set of contacts and adapted for connection thereto externally of said housing means; and

(g) a second electrical terminal operatively connected in

series circuit arrangement with said second set of contacts and adapted for connections thereto externally of said housing means.

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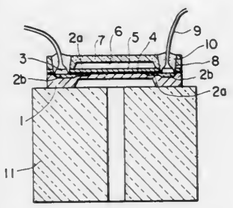
**4,295,115**
**SEMICONDUCTOR ABSOLUTE PRESSURE TRANSDUCER ASSEMBLY AND METHOD**

**Minoru Takahashi, Katsuta; Takahiko Tanigami, Mito; Kaoru Uchiyama, Katsuta; Hitoshi Minorikawa, Mito; Motohisa Nishihara; Kanji Kawakami, both of Katsuta; Seiko Suzuki, Hitachiota; Hiroaki Hachino, Hitachi, and Yutaka Misawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 4, 1979, Ser. No. 27,157**
**Claims priority, application Japan, Apr. 5, 1978, 53-39191**
**Int. Cl.³ G01L *1/22***
**U.S. Cl. 338—4** **13 Claims**




1. A semiconductor pressure transducer assembly comprising:
a silicon diaphragm assembly, on which a pressure sensitive diaphragm is formed;
piezoresistive elements diffused on the pressure sensitive diaphragm of said silicon diaphragm assembly, the resistance value of the piezoresistive elements varying depending on the strain appearing in the diaphragm;
conducting paths diffused on said silicon diaphragm assembly for electrical connection of said piezoresistive elements;
passivating layer covering the surface of said silicon diaphragm assembly, on which surface said piezoresistive elements and said conducting paths are diffused; and
a covering member of insulating material mounted on the surface of said silicon diaphragm assembly, characterized in that a layer of conductor is disposed between said passivating layer and said covering member, and said conductor layer and said covering member are bonded by Anodic Bonding method.

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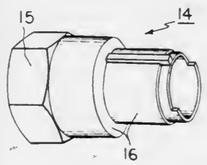
**4,295,116**
**PRESSURE TRANSDUCER**

**Vance D. Studlien, Stow, Mass., assignor to Bofors America, Inc., Edison, N.J.**

**Filed Dec. 5, 1979, Ser. No. 100,384**
**Int. Cl.³ G01L *1/22***
**U.S. Cl. 338—4** **16 Claims**




1. A fluid-pressure transducer comprising a substantially rigid single-piece body having a recess therein from an open end thereof which is closed at its bottom by a substantially flat uniform-thickness integral diaphragm, the outer side of said diaphragm being substantially coplanar with the end of a relatively thick and substantially rigid annular rim of said body about said diaphragm, said recess having pressure-fitting means near said open end for coupling said recess and the inner side of said diaphragm with a site of fluid pressures which are to be sensed, and said coplanar outer side of said diaphragm and end of said annular rim being substantially unobstructed by any portions of said body extending beyond the plane thereof, and a substantially flat foil electrical network including strain gages and relatively broad-area contact tabs and conductive paths bonded in insulated overlying relation to said coplanar outer side of said diaphragm and said end of said annular rim, said gages being disposed in overlying relation to said diaphragm and said contact tabs being disposed in overlying relation to said end of said annular rim, and means making external electrical circuit connections with said gages through said contact tabs.

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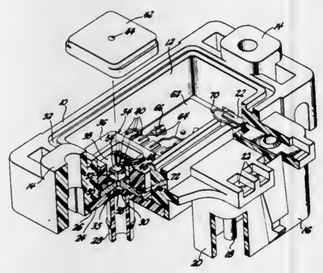
**4,295,117**
**PRESSURE SENSOR ASSEMBLY**

**Donald E. Lake, and John M. Hart, Jr., both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 11, 1980, Ser. No. 186,238**
**Int. Cl.³ G01L *1/22***
**U.S. Cl. 338—4** **3 Claims**



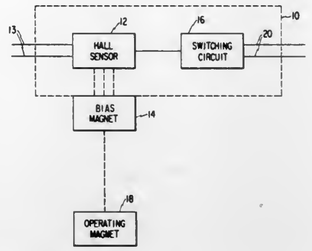
1. In a pressure sensor assembly, means for mounting a pressure sensor element in a housing to isolate the sensor element from stresses occurring in the housing, comprising
a hollow molded resin housing having an external opening, a flat surface surrounding the opening,
a glass base secured to the flat surface and covering the opening, the glass base and the housing having different thermal coefficients of expansion and being joined by a layer of soft resilient adhesive which inhibits stress transfer from the housing to the base, the glass base comprising a plate having an integral raised pedestal extending into the said opening whereby any stresses in the base are minimized in the pedestal due to the added rigidity in the region of the pedestal,
a glass support in the housing secured to the pedestal by a soft epoxy adhesive which inhibits the transfer of stress from the pedestal to the support, and
a silicon pressure sensor chip rigidly bonded to the glass support at a region spaced from the pedestal, the glass base and the glass support each having approximately the same thermal coefficient of expansion as the silicon chip,
whereby the cumulative effect of the several stress minimizing features is to isolate the silicon chip from thermal and other stresses induced in the housing or other parts of the assembly.



**4,295,118**
**LATCHING RELAY USING HALL EFFECT DEVICE**

**John A. Herr, Garwood, and Bruce R. Rogan, Somerville, both of N.J., assignors to The Singer Company, Stamford, Conn.**

**Filed May 21, 1980, Ser. No. 152,210**
**Int. Cl.³ H01L *43/04***
**U.S. Cl. 338—32 H** **6 Claims**




1. A latching switch comprising:
a Hall effect digital switching device including a Hall sensor for generating an output voltage proportional to magnet field strength and means responsive to the output voltage generated by said Hall sensor for providing a switching function;
a reversible bias magnet supported with a pole thereof contiguous said Hall sensor for generating at one polarity, a first output voltage providing a switching function and at a reverse polarity a second output voltage providing a converse switching function; and,
means for reversing the polarity of said reversible bias magnet.

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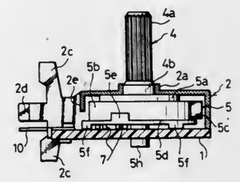
**4,295,119**
**ROTARY VARIABLE RESISTOR**

**Masao Kasashima, and Yoshizo Kubo, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Mar. 10, 1980, Ser. No. 128,941**
**Claims priority, application Japan, Mar. 12, 1979, 54-31478[U]**
**Int. Cl.³ H01C *10/32***
**U.S. Cl. 338—162** **3 Claims**

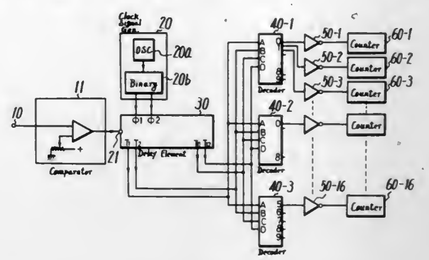



1. A rotary variable resistor having a substrate carrying a resistance element connected to terminal portions; a cover member fitting over said substrate and having an upper wall extending generally parallel thereto; and a rotor formed of a synthetic resin and carrying a conductive wiper adapted to slide across said resistance element during rotation of said rotor; said rotor having an upper shoulder adapted to bear against the inner surface of the upper wall of said cover, an elastic flange extending outwardly from the lower portion of said rotor and means including a plurality of legs extending downwardly from said flange and riding on said substrate for elastically deforming said flange upwardly to urge said upper shoulder into continous engagement with the inner surface of the upper wall of said cover.

**4,295,120**
**PATTERN DATA PROCESSING METHOD AND APPARATUS TO PRACTICE SUCH METHOD**

**Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan**

**Filed Aug. 27, 1979, Ser. No. 69,911**
**Claims priority, application Japan, Aug. 28, 1978, 53/104554**
**Int. Cl.³ G06K *9/46***
**U.S. Cl. 340—146.3 MA** **2 Claims**




1. Apparatus for processing patent data comprising:
a photo-electric conversion sensor including a screen on which a pattern to be recognized is applied said screen comprising a plurality of picture elements, said picture elements being divided into a plurality of picture element groups, each of said picture element groups comprising at least two adjacent horizontal and vertical picture elements;
comparator means for receiving an output signal from said photo-electric conversion sensor and producing white and black two value data signals;
means for delaying said white and black two value data signals; a clock signal generator means for producing a clock signal and applying said clock signal to said delay means so that said delay means delays said white and black two value signal at a speed equal to the scanning speed of said photoelectric conversion sensor to produce a delayed signal corresponding to each of said plurality of picture element groups;
a decoder means for decoding said delayed signal from said delay means; and,
means for counting a signal from said decoder means to produce data corresponding to said picture element groups.

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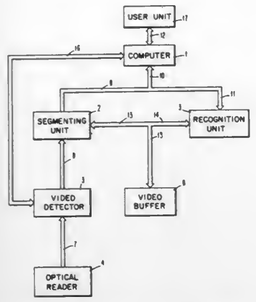
**4,295,121**
**DEVICE FOR OPTICAL CHARACTER READING**

**Mats A. Enser, Vändstigen; Lars O. Hallberg, Stalvägen, and Nils G. Stalberg, Jaktstigen, all of Sweden, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 19, 1979, Ser. No. 95,832**
**Claims priority, application Sweden, Jan. 16, 1979, 7900362**
**Int. Cl.³ G06K *9/34***
**U.S. Cl. 340—146.3 MA** **11 Claims**

1. Device for optical character reading comprising an optical reading unit, a video detector, a segmenting unit, a video buffer, a recognition unit, a user unit and a control computer, characterized in that said control computer **1** is adapted to receive horizontal and vertical information for detecting video patterns **20**, **21**, **22**, and **28** from the segmenting unit **2** and that said controlling computer **1** further is adapted to calculate coordinates for a start point **41**, **42** for a character to be recog-

nized, whereby the computer sends coordinate values for the start point to the recognition unit **3** and that the recognition




unit thereafter, starting from the starting point, recognizes a character and returns the recognition result to the computer.

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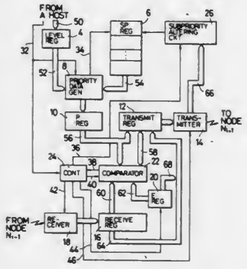
**4,295,122**

## BUS PRIORITY CONTROL METHOD IN LOOP BUS NETWORK SYSTEM

**Minoru Hatada; Kunio Hiyama, both of Sagamihara; Hirokazu Ihara, Machida, and Hisao Kuma, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 19, 1979, Ser. No. 86,443**
**Claims priority, application Japan, Oct. 30, 1978, 53-132656**
**Int. Cl.³ H04Q** *9/00*
**U.S. Cl. 340—147 LP** **17 Claims**




1. For use in a loop bus network comprising a plurality of processors and a loop bus for connecting said processors to one another and for transmitting data in the form of messages in a predetermined direction therealong among said processors in series, a loop bus priority control method for selectively assigning the bus use to one of said processors on a priority bus, comprising

(A) transmitting priority data to said bus from one or more of said processors when message transmission on said loop is desired by said processor or processors, said priority data including both a message level and a sub-priority level, said message level designating the kind of message to be transmitted with respect to a plurality of different kinds of messages that might be transmitted and said sub-priority level indicating the priority level of the respective processor for the designated message level, the sub-priority levels assigned to said processors being different in different message levels;

(B) receiving in said processors priority data from said bus; and

(C) enabling use of said bus by that processor whose transmitted priority data designates the highest message level without regard to sub-priority levels or designates the highest sub-priority level within the highest designated message level where the priority data transmitted by more than one processor designates the same highest message level.

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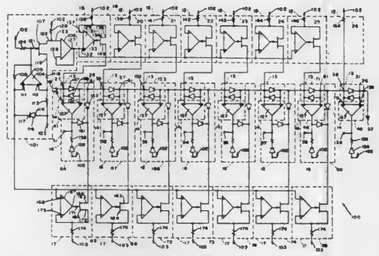
**4,295,123**

## ANALOG-TO-DIGITAL CONVERTER

**Samuel C. M. Reid, R.F.D. 2, Peppers Ferry Rd., Radford, Va. 24141**

**Filed Jul. 27, 1979, Ser. No. 61,509**
**Int. Cl.³ H03K** *13/02*
**U.S. Cl. 340—347 AD** **16 Claims**



1. An analog to digital converter for converting an analog signal into a digital equivalent, comprising:

a first stage having:

first positive fixed current source means for providing a first positive current;

first current direction controlled voltage drop means having an input for the reception of input current and an output, for producing a voltage drop between the input and the output that varies in polarity in response to the sign of the input current, the input being operably connected to said first positive fixed current source means and to the analog signal.

first comparator means for comparing the input signal with the output signal of said first current direction controlled voltage drop means;

first negative switched current source means for providing a first negative current; and

first current switch means operably connected to said first comparator means and further operably connected between said first negative switched current source means and the output of said first current direction controlled voltage drop means, for selectively connecting said first negative switched current source means to the output of said first current direction controlled voltage drop means; and

a second stage having:

second positive fixed current source means for providing a second positive current;

second current direction controlled voltage drop means having an input for the reception of input current and an output for producing a voltage drop between the input and the output that varies in polarity in response to the sign of the input current, the input being operably connected to said second positive fixed current sources means and to the output of said first current direction controlled voltage drop means, the output being operably connected to a ground; and

second comparator means for comparing the input signal with the output signal of said second current direction controlled voltage drop means.

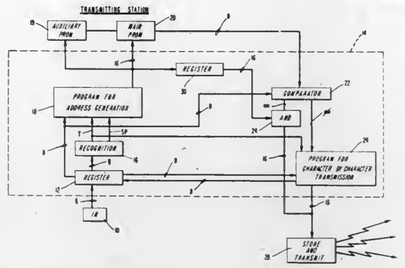


**4,295,124**

## COMMUNICATION METHOD AND SYSTEM

**Philip M. Roybal, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Aug. 13, 1979, Ser. No. 66,221**
**Int. Cl.³ H03K** *13/00;* **H04L** *3/00*
**U.S. Cl. 340—347 DD** **22 Claims**




19. A system for encoding and transmitting messages comprising words which are composed of characters coded in a code, comprising:

a register for receiving entry of a word to be encoded and transmitted, said entry being coded character by character in said code,

a code generation means for generating from the word entered in said register an address,

a memory having addresses and having words stored at said addresses, said memory being connected to receive the generaed address and to read out the corresponding word stored at said address,

means for comparing for identity the word read out by said memory and the word received in said register, and

means for transmitting the memory address of said word, if, and only if, the comparing means indicates identity.

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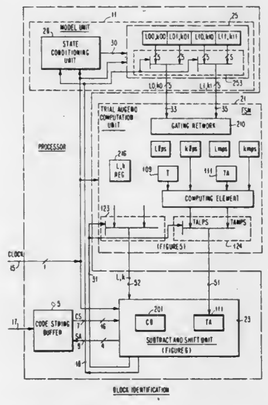
**4,295,125**

## METHOD AND MEANS FOR PIPELINE DECODING OF THE HIGH TO LOW ORDER PAIRWISE COMBINED DIGITS OF A DECODABLE SET OF RELATIVELY SHIFTED FINITE NUMBER OF STRINGS

**Glen G. Langdon, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 28, 1980, Ser. No. 143,986**
**Int. Cl.³ H03K** *13/24*
**U.S. Cl. 340—347 DD** **8 Claims**




7. An apparatus for recursively decoding an instantaneous FIFO binary arithmetic number string into a series of binary source symbols comprising:

first means (**23**) for generating a binary source symbol (**18**) by the magnitude comparison between a predetermined portion of an arithmetic code string applied thereto and an updated trial augend, said first means includes means (**202, 203**) responsive to a present integer-valued parameter for controlling the relative magnitude between the arithmetic code string and the updated trial augend; and means for generating a status signal (WASMPS, **31**) identifying the Boolean value of the previous bit decoded;

second means (**11**) responsive to the output signal for accessing K component/K candidate next integervalued control parameters (L**0**, k**0**; L**1**, k**1**; **25**) and

third means (**21**) including a memory for storing vector representations of the present and K next candidate control parameters and K next trial augends for K-way selecting and updating the trial augend from said candidates and applying them to said first means in predetermined displaced time relation to the next candidate control parameters applied to said third means.

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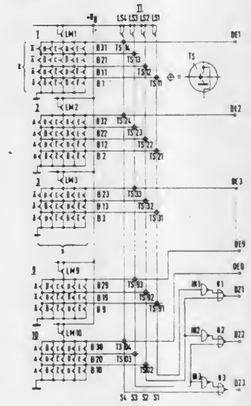
**4,295,126**

## MOS-BINARY-TO-DECIMAL CODE CONVERTER

**Dieter Holzmann, Freiburg, and Friedrich Schmidtpott, Hartheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.**

**Filed Oct. 2, 1980, Ser. No. 193,205**
**Int. Cl.³ G06F** *5/02*
**U.S. Cl. 340—347 DD** **1 Claim**




1. An MOS switching circuit for converting the code of an n-position binary number (n>3) into the code of the associated, at least two-place decimal number with the aid of MOS-gates which are controlled by the respective binary position signals or the complement thereof, corresponding to the binary positions of the binary number, said circuit comprising: a NOR-matrix (**1–10**) with s times z transistors arranged in a row- and column-wise manner (s=number of columns, z=number of rows), is provided for each of the ten digits in the units place (**DE1–DE0**) of the decimal numbers (**D1–D32**), in each NOR-matrix (**1–10**) the controlled current paths of the transistors of each row, hence the row transistors, are arranged in parallel with one another, and the controlled current paths of the transistors of each column, hence the column transistors, are arranged in series with one another, with the one end of each series arrangement being applied to the zero point of the circuit, and with the other end thereof, via a load transistor (**LM1–LM10**) which is common to all columns per NOR-matrix (**1–10**), being applied to the supply voltage ($+U_B$), the number of columns s of the respective NOR-matrix (**1–10**)

equals n, the number of rows z is in the utmost equal to the number (d) of the decimal decades (DK) contained in the decimal number range (DB) as represented by the n-position binary numbers (B1–B32), to each row of the ten NOR-matrices (1–10) there is assigned one of the binary numbers (B1–B32) in such a way that in each NOR-matrix the binary numbers (B1, B11, B21, B31, etc.) are combined with the same decimal units digit (DE1–DE0), i.e. in such a way that the row as applied to the zero point of the circuit belongs to the binary number (B1–B10) with this decimal units digit from the lowest decimal decade (DK1), that the row which is the next higher one in direction towards the common load transistor (LM1) belongs to the binary number (B11–B20) with the same decimal units digit from the next higher decimal decade (DK2), etc. up to the row applied to the load transistor (LM1) which belongs to the binary number (B31, B32) with the same decimal units digit from the highest decimal decade (DK4), to the gate electrodes of the row transistors in a row belonging to one individual binary number (B1–B32) there are to be applied the position signals (A, B, C, D, E) of this binary number or else the complement thereof (A, B, C, D, E) so that in this way all row transistors of this particular row are switched to the non-conducting state, moreover, there is provided a multiple-NOR-gate (11) having p columns (S1–S4), with p being equal to the number (d) of the decimal decades (DK1–DK4) as contained in the decimal number range (DB) of the binary numbers (B1–B32), to each column (S1–S4) there is equidirectionally assigned one decimal decade (DK1–DK4) (S1 DK1, etc.), and this particular column consists of transistors (TS . . . ) arranged parallel in relation to one another with their controlled current paths, arranged between one common load transistor (LS1–LS4) and the zero point of the circuit, the gate electrode of respectively one transistor (TS11–TS91) of the first column (S1) is applied to the output of the rows of the first nine NOR-matrices (1–9) associated with the first nine binary numbers (B1–B9), the gate electrode of respectively one transistor (TS02–TS92) of the second column (S2) is applied to the output of the rows of the ten NOR-matrices (1–10) as associated with the following ten binary numbers (B10–B19), the gate electrode of respectively one transistor (TS03–TS93) of the third column (S3), is applied to the output of the rows of the ten NOR-matrices (1–10) associated with the ten following binary numbers (B20–B29), etc., the gate electrode of respectively one transistor (TS04–TS24) of the last column (S4) is applied to the output of the rows of the ten NOR-matrices (1–10) associated with the remaining binary numbers (B30–B32), the output of the first column (S1) is applied via a first inverter (IN1) to the first input of a first decade-NOR-gate (N1) to the second input of which there is applied the output of the second column (S2), this output is applied via a second inverter (IN2) to the first input of a second decade-NOR-gate (N2), to the second input of which there is applied the output of the third column (S3), this output is applied via a third inverter (IN3) to the first input of a third decade-NOR-gate (N3), to the second input of which there is applied the output of the fourth column (S4), etc., up to reaching the highest decimal decade, at the output of the rows of the NOR-matrices (1–10) associated with the highest decimal decade (DK4 or DK3) there is to be taken off the signal for the digits (DE0–DE9) of the decimal units position (DE), and at the output of the decade-NOR-gate (N1–N3) there is to be taken off the signal for the digits (DZ1–DZ3) of the decimal-tens position (DZ), and all of the employed transistors are of the same conductivity type (n-channel or p-channel) as well as the same control type (depletion or enhancement type).

**4,295,127**

## INFORMATION DISPLAY DEVICE

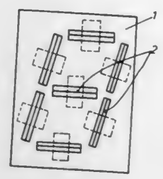
**Helmut Sautter, Ditzingen; Kurt Hurst, Stuttgart, and Rainer Schink, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Oct. 25, 1978, Ser. No. 954,639**

**Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747794**

**Int. Cl.³ G08B** *5/00*

**U.S. Cl. 340—373** **4 Claims**



1. Information display device having

a frame (1) furnishing a display surface;

a plurality of movable indicating elements (3, 13) arranged on said frame in segmental patterns representative of alphanumeric characters, and formed with at least two surface regions, one surface region having a visible aspect which essentially matches the visible aspect of the display surface and another, or other surface regions which have visible aspects contrasting with the visible aspect of the display surface, said indicating elements being movable to display respective surface regions so that, when any indicating element is in a first terminal position in which the visible aspects of the display surface and of the surface element matches, no display visible, but when the indicating element is in a second terminal position in which the visible aspects of the display surface and of the element differ, the element is visually recognizable,

and comprising

magnetic means (3, 4, 9) biassing said movable indicating element into one, or the other of said terminal positions and establishing the first and second positions as stable terminal positions;

control means (39–44, 46; 47, 57) to selectively place said elements in either of said stable first or second terminal positions to provide a selective display of alphanumeric characters;

electromagnetic operating means (3, 4, 7) including at least one permanent magnet (4) and one solenoid-electromagnet (7) located, respectively, on the display element and on the frame and being connected to and controlled by said control means to control movement of the display element between said stable first and second terminal positions;

said movable indicating elements are elongated, essentially rectangular plates (3);

the frame (1) is formed with an essentially V-shaped elongated groove, the longitudinal edge of said plate being fitted in the V-shaped groove and located adjacent the apex thereof;

said permanent magnet (4) acting on said plate to hold said plate in position in the absence of energization of said solenoid-electromagnet (7), energization of said solenoid electromagnet causing pivoting of said plate about a pivot axis adjacent the apex of the V to move the plate from one, to the other of said stable terminal positions.



**4,295,128**

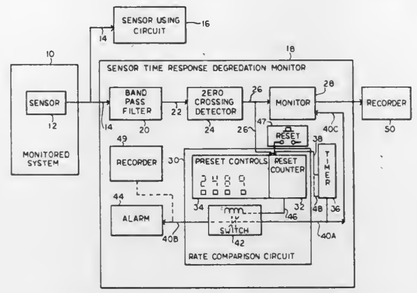
## APPARATUS FOR MEASURING THE DEGRADATION OF A SENSOR TIME CONSTANT

**Hashem M. Hashemian, Knoxville; Thomas W. Kerlin, Concord, and Belle R. Upadhyaya, Knoxville, all of Tenn., assignors to University of Tennessee Research Corp., Knoxville, Tenn.**

**Filed Mar. 26, 1979, Ser. No. 23,641**

**Int. Cl.³ G08B** *27/00*

**U.S. Cl. 340—506** **21 Claims**




1. A method for monitoring changes in the response time of a sensor while said sensor monitors fluctuations in a selected perameter comprising the steps of:

providing a sensor signal from said sensor being monitored, said sensor signal indicative of fluctuations of said selected parameter;

receiving said sensor signal and monitoring when the value of said sensor signal crosses a selected signal level;

determining the number of times said sensor signal crosses said selected level in a selected time period to obtain a crossing rate; and

comparing said crossing rate with a nominal crossing rate of determine a change in the response time of said monitored sensor.

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**4,295,129**

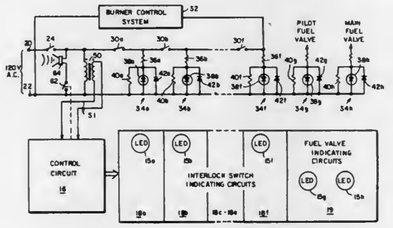
## SYSTEM CONDITION INDICATOR

**Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.**

**Filed May 7, 1979, Ser. No. 36,547**

**Int. Cl.³ G08B** *23/00*

**U.S. Cl. 340—520** **15 Claims**




1. For use with a burner control system including a plurality of interlock switches, a main fuel valve, and a pilot fuel valve, a system condition indicator comprising;

a plurality of interlock monitor means, equal in number to the number of interlock switches and each associated with and connected to respective ones of the plurality of interlock switches, for determining the absence of an AC power line signal at a terminal of the associated interlock switch and for providing an output signal representative thereof;

main monitor means associated with and connected to the main fuel valve for providing an output signal representative of the open or closed state of the main fuel valve;

pilot monitor means associated with and connected to the pilot fuel valve for providing an output signal representative of the open or closed state of the pilot fuel valve; and

detection means responsive only to the interlock monitor means output signals, the main monitor means output signal, and the pilot monitor means output signal, for detecting an abnormal condition in the interlock switches and fuel valves and for providing an indication, in response to a detected abnormal condition, of which of said valves and interlock switches was first to go to an abnormal condition;

wherein abnormal conditions include an open interlock switch, the main fuel valve going from an open state to a closed state, and the pilot fuel valve going from an open state to a closed state before the main fuel valve goes to an open state.

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**4,295,130**

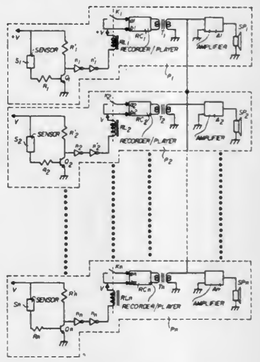
## AUDIO-VISUAL DISASTER ALERT SYSTEM

**Yang Tai-Her, No. 9-1, Tai-Ping St., Kung-Hua Li, Hsi-Hu Town, Chang Hua Hsien, Taiwan**

**Filed Jun. 18, 1979, Ser. No. 49,806**

**Int. Cl.³ G08B** *19/00*

**U.S. Cl. 340—524** **7 Claims**



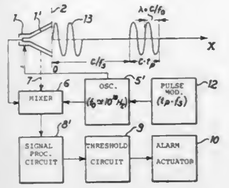

1. An audio/visual disaster alert system for a plurality of areas in a building or the like comprising, in combination, a disaster warning circuit in each of said areas, an associated source of electric power, each of said disaster warning circuits including sensing means responsive to a disaster for producing an out signal a normally inoperative tape recorder/player having an audio output for providing a taped message stating the location of the disaster and the disaster measures to be taken and a speaker connected to said tape recorder/player audio output, means responsive to said output signal from said sensing means in each of said areas for activating the associated tape recorder/player to provide an audio output, means for feeding the audio output of said activated tape recorder/player to the associated speaker in said area and means for interconnecting the audio output from said activated tape recorder/player to all of the speakers in said areas, whereby the message from said activated tape recorder/player is supplied to the speakers in all of said disaster warning circuits.

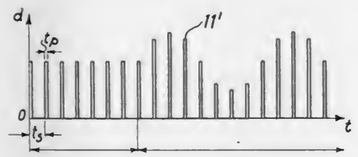
**4,295,131**

## LOW CONSUMPTION PULSES DOPPLER EFFECT INTRUSION SENSOR

**Maurizio Bonori, and Cafiero Franconi, both of Rome, Italy, assignors to AD.ELE. -Advanced Electronics- S.R.L., Rome, Italy**

**Filed Apr. 19, 1978, Ser. No. 897,776**
**Claims priority, application Italy, May 10, 1977, 49333 A/77**
**Int. Cl.³ G01S *13/56*; G08B *13/18***
**U.S. Cl. 340—554** **7 Claims**




1. An intruder alarm sensor for detecting, from the Doppler information of pulsed waves reflected from a target, the presence of a target moving at a speed within a range between a slowest target speed of interest and a fastest target speed of interest in the presence of stationary or periodic interference in a zone under surveillance defined by a maximum range, said intruder alarm sensor comprising:

a pulse modulated oscillator means for generating a pulse modulated oscillation signal at a predetermined carrier frequency having a pulse repetition frequency at least twice the Doppler frequency of the fastest target speed of interest and having a pulse width greater than a first predetermined period of time;

a first transducing means connected to said pulse modulated oscillator means for transmitting said pulse modulated oscillation signal for propagation as pulsed wave fields within the zone under surveillance, said first predetermined period of time being twice the period required for said pulsed wave fields to propagate a distance equal to the maximum range of the zone under surveillance;

a second transducing means for receiving pulsed wave signals reflected by a target within the zone of surveillance and for transforming said received pulsed wave signals into pulsed oscillatory electric signals having Doppler information corresponding to the relative motion between the target and said first transducing means;

mixing means connected to said pulse modulated oscillator means and said second transducing means for mixing said pulse modulated oscillation signal and said pulsed oscillatory electric signals for producing a detected pulse signal having said pulse repetition frequency and having amplitude modulation corresponding to said Doppler information, said detected pulse signal having a center frequency and an amplitude modulated bandwidth equal to twice the difference between the Doppler frequency of the fastest target speed of interest and the Doppler frequency of the slowest target speed of interest;

a processing means connected to said mixing means for demodulating said Doppler information which is amplitude modulated on said detected pulse signal for generating a Doppler information signal having an amplitude proportional to the value of said Doppler information;

a comparing means connected to said processing means for comparing said Doppler information signal with a predetermined threshold level for generating an alarm trigger signal when the level of said Doppler information signal exceeds said predetermined threshold level; and

an alarm actuating means connected to said comparing means for actuating an alarm when said comparing means generates said alarm trigger signal.

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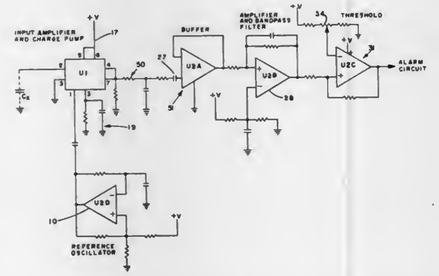
**4,295,132**

## CAPACITANCE INTRUSION DETECTION SYSTEM

**Charles F. Burney, and Marvin D. Laymon, both of Milpitas, Calif., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jul. 28, 1980, Ser. No. 172,602**
**Int. Cl.³ G08B *13/26***
**U.S. Cl. 340—562** **11 Claims**




1. An intrusion detection system for an object having a capacitance comprising

a charge pump having an input and an output,

a voltage source connected to said input,

said object being connected to said output of the charge pump,

means to cyclically switch said charge pump between first and second states whereby alternately to connect and disconnect said voltage source and said object for successively charging the latter,

storage means connected to said charge pump for producing a DC voltage proportional to the charge on said object,

bandpass filter means having a low cutoff frequency $f_1$ and a high cutoff frequency $f_2$,

capacitor means interconnecting said storage means and said filter means whereby changes in the capacitance of said object at a rate between $f_1$ and $f_2$ produce an output from said filter means, and

means responsive to the output of said filter means for producing an alarm.

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**4,295,133**

## APPARATUS TO INDICATE WHEN A PATIENT HAS EVACUATED A BED OR DEMONSTRATES A RESTLESS CONDITION

**Dwight A. Vance, 8709 E. 29th, Tulsa, Okla. 74129**

**Continuation-in-part of Ser. No. 794,041, May 5, 1977. This application Oct. 10, 1978, Ser. No. 949,969**
**The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—573** **11 Claims**

1. A monitoring system for a bed patient, comprising:

(a) a binary signal generating means adapted to indicate one of two possible positions of a body in a bed; and producing a first signal when said body is in a rest position in said bed; and a second signal when said body is out of said bed;

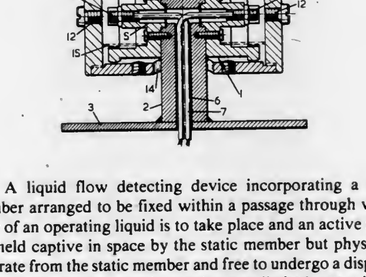
(b) signal processing means comprising:

(1) oscillator means actuated responsive to said second signal, said oscillator means comprising;

(i) a first and a second NAND gate;

(ii) one input lead from each gate connected to a selected terminal responsive to said second signal;

(iii) the output of said second gate connected through a capacitor and first resistor to the second input of said first NAND gates;



(iv) the output of said first NAND gate connected to the second input terminal of said second NAND gate;

(v) a series second resistor and third resistor connected between the output of said first NAND gate and the junction between said capacitor and said first resistor;

(2) counter means responsive to said oscillator means;

(3) latch means responsive to a selected count of said counter means;

(4) alarm means responsive to the setting of said latch means.



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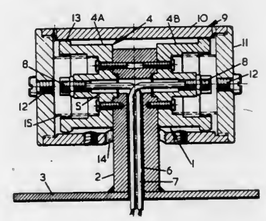
**4,295,134**

## LIQUID FLOW DETECTING DEVICE

**Anthony C. Fairlie-Clarke, Edinburgh, Scotland, assignor to Vickers Limited, London, England**

**Filed Jul. 11, 1979, Ser. No. 56,649**
**Claims priority, application United Kingdom, Jul. 12, 1978, 29638/78**
**Int. Cl.³ G08B *21/00*; G01F *15/06***
**U.S. Cl. 340—610** **10 Claims**



1. A liquid flow detecting device incorporating a static member arranged to be fixed within a passage through which flow of an operating liquid is to take place and an active member held captive in space by the static member but physically separate from the static member and free to undergo a displacement relatively to the static member to a limited extent in one particular direction at least and having an overall specific gravity substantially the same as that of the chosen operating liquid and proximity sensing apparatus operative to detect movement of the active member relative to the static member in the particular direction and issue a corresponding signal.

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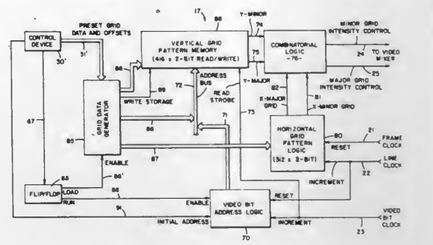
**4,295,135**

## ALIGNABLE ELECTRONIC BACKGROUND GRID GENERATION SYSTEM

**Josef Sukonick, 10395 Dempter Ave., Cupertino, Calif. 95014**

**Filed Dec. 18, 1978, Ser. No. 970,755**
**Int. Cl.³ G06F *3/14***
**U.S. Cl. 340—734** **31 Claims**




1. An alignable electronic background grid generation system for use with a raster-type video graphics display unit on which graphic data is displayed, comprising:

control means for supplying alterable grid pattern and offset data,

vertical grid pattern generation means, cooperating with said control means and synchronized with the display unit horizontal video scan, for providing in response to said alterable grid pattern data vertical grid pattern defining signals indicative of requisite background grid spots at horizontal picture element locations corresponding to desired vertical background grid lines specified by said grid pattern data,

horizontal grid pattern generation means, cooperating with said control means and synchronized with the display unit vertical line scan, for providing in response to said alterable grid pattern data horizontal grid pattern defining signals indicative of a desired horizontal grid line pattern specified by said grid pattern data, and

combinatorial logic means, cooperating with both said vertical and horizontal grid pattern generation means, for combining said provided vertical and horizontal grid pattern defining signals and producing as a result of said combination a set of grid intensity or color control signals,

said grid intensity control signals being supplied to said video gaphics display unit to be mixed with the other video signals defining said graphic data being displayed, said display unit thereby producing a composite display including both said graphic data and said background grid.

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**4,295,136**

## INDICATING APPARATUS, PARTICULARLY FOR VIBRATION ANALYZING EQUIPMENT

**Donn V. Stoutenburg, Westerville, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio**

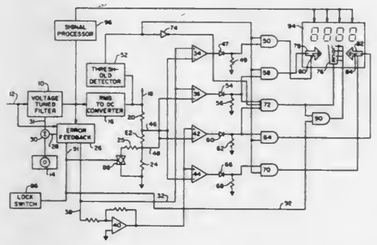
**Filed Sep. 17, 1979, Ser. No. 76,030**
**Int. Cl.³ G06F *3/14*; H04N *5/50***
**U.S. Cl. 340—753** **9 Claims**

1. Apparatus for facilitating the manual selection and read-out of the center frequency of an a.c. signal which corresponds with a characteristic amplitude comprising:

a tunable filter of a variety wherein the passband center frequency thereof is selectable as a function of a tuning input signal applied at a tuning input thereof, said filter receiving said a.c. signal and providing a filtered signal at an output;

error circuit means responsive to said a.c. signal and said filtered signal for deriving an error signal of magnitude and polarity corresponding to the relationship of said

tuning input and a frequency associated with said characteristic amplitude;
manually actuable means movable in first and second directions for deriving said input signal;
means for deriving first and second reference level signals including converter means responsive to said filtered signal for providing said reference level signals as d.c. voltages proportioned with said filtered signal; and
display means including:
first and second indicators, each being selectively energizable in correspondence with respective first and second said ranges of magnitudes of said error signal and each being energizable in correspondence with a first said polarity;
third and fourth indicators, each being selectively energizable in correspondence with respective third and fourth ranges of said magnitudes of said error signal and each



being energizable in correspondence with a second said polarity; and
fifth indicator means energizable when said filtered signal substantially corresponds with said center frequency;
electrical circuitry responsive to said error signal and said first reference level signal for energizing said first indicator in the presence of said first polarity and said first magnitude range, for energizing said second indicator in the presence of said first polarity and said second magnitude range, for energizing said third indicator in the presence of said second polarity and said third magnitude range, and for energizing said fourth indicator in the presence of said second polarity and said fourth magnitude range, and for energizing said fifth indicator substantially in the absence of said error signal, said second and fourth magnitude ranges being of lesser value than said first and second magnitude ranges.

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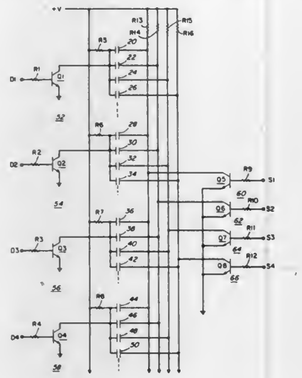
**4,295,137**

## ELECTROLUMINESCENT DISPLAY DRIVER SYSTEM FOR THIN-FILM ELECTROLUMINESCENT DEVICES REQUIRING ELECTRIC FIELD REVERSAL

**Paul O. Haugsjaa, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Jan. 7, 1980, Ser. No. 110,161**
**Int. Cl.³ G06F *3/14***
**U.S. Cl. 340—781** **15 Claims**

1. An electroluminescent display system comprising:
a plurality of thin-film electroluminescent elements each having a digit electrode and a segment electrode and having associated therewith a characteristic electroluminescent threshold voltage;
a set of digit driver means each selectively coupled to digit electrodes of the elements of said display and having an input terminal for receiving a digit control signal including precharging portions and addressing portions; and
a set of segment driver means each selectively coupled to segment electrodes of the elements of said display and having an input terminal for receiving a segment control signal including precharging portions and energizing portions which are simultaneous with the addressing portions of the digit control signal;
said set of digit driver means and said set of segment driver means being operative, during precharging portions of digit and segment control signals, to precharge the elements of said display by applying a first voltage to the digit electrode and a second voltage to the segment electrode of each element of said display, said first and second voltages having a difference therebetween which is greater in magnitude than said threshold voltage,
said set of digit driver means being further operative, during addressing portions of the digit control signal, to selec-



tively address elements of said display by applying said second voltage to the digit electrodes of the elements of said display which are to be addressed and by applying said first voltage to the digit electrodes of the elements of said display which are not to be addressed,
said set of segment driver means being further operative, during energizing portions of the segment control signal, to selectively energize elements of said display which are addressed by applying said first voltage to the segment electrodes of the elements which are to be energized and by applying said second voltage to the segment electrodes of the elements which are not to be energized.

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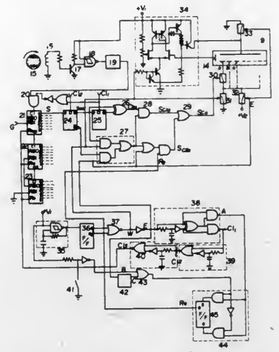
**4,295,138**

## COMBINED CONSTANT POTENTIAL AND CONSTANT VOLTAGE DRIVING TECHNIQUE FOR ELECTROCHROMIC DISPLAYS

**Hiroshi Nakauchi; Katubumi Koyanagi; Yasuhiko Inami, all of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Corporation, Osaka, Japan**

**Continuation of Ser. No. 873,504, Jan. 30, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 94,933**
**Claims priority, application Japan, Jan. 31, 1977, 52-10120; Feb. 4, 1977, 52-12350**
**Int. Cl.³ G06F *3/14*; G09F *9/32***
**U.S. Cl. 340—785** **9 Claims**

1. A method for driving an electrochromic display cell to exhibit electrochromic phenomenon at said display cell, said display cell including a counter electrode, a plurality of display electrodes and a reference electrode, said method comprising the steps of:
driving said electrochromic display cell by maintaining a constant potential at respective ones of said display electrodes relative to said reference electrode when it is desired to color said respective ones of said display electrodes despite variations in the amount of energizing current supplied to said counter electrode in response to increases and decreases in the number of said display electrodes having their display states changed thereby maintaining the degree of coloration of said respective ones of said display electrodes uniform; and
driving said electrochromic display cell by maintaining a constant voltage between said display electrodes and said



counter electrode when it is desired to bleach said respective ones of said display electrodes thereby maintaining the degree of bleaching of said respective ones of said display electrodes uniform.

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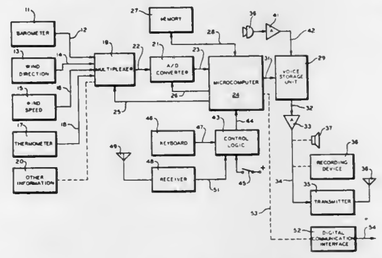
**4,295,139**

## METHOD FOR TRANSMITTING AIRPORT WEATHER INFORMATION

**Roberto Arpino, 4722 Shire Ridge Rd. West, Columbus, Ohio 43220**

**Filed May 7, 1979, Ser. No. 36,518**
**Int. Cl.³ G01W *1/10*; G01C *21/00***
**U.S. Cl. 340—870.01** **7 Claims**



1. A method of transmitting a plurality of types of real-time weather information to a remotely located receiver comprising the steps of:
a. generating a signal representing instantaneous weather information;
b. determining a real-time weather information value from said instantaneous weather information signal over a predetermined time interval;
performing said steps (a) and (b) for each one of said types of real-time weather information in sequence;
c. generating an address signal representing said real-time weather information value;
d. storing a plurality of signals representing real-time weather information messages;
e. generating the one of said message signals corresponding to the real-time weather information value in response to said address signal;
f. transmitting said one message signal to the receiver; and
performing steps (c) through (f) for each one of said types of real-time weather information in sequence.

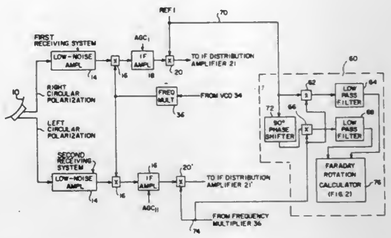


**4,295,140**

## FARADAY ROTATION MEASUREMENT METHOD AND APPARATUS

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Milton H. Brockman, Glendale, Calif.**

**Filed Dec. 21, 1979, Ser. No. 106,119**
**Int. Cl.³ H04B *7/00***
**U.S. Cl. 343—100 PE** **15 Claims**



1. In an rf receiver array having at least a first and second receiving system, said first receiving system having a reference signal for forming an IF signal and said second receiving system having a tracking feedback signal whose phase is related to the phase of a received signal, a measurement means for determining Faraday rotation of said received signal comprising:
a first phase detector;
a second phase detector;
means for providing said reference signal to said first phase detector;
means for providing said reference signal phase-shifted by a predetermined phase increment to said second phase detector;
means for providing said feedback signal to said first and second phase detectors;
first means for generating a plurality of first occurrence time signals when said first phase detector output defines a predetermined phase relationship between said reference signal and said feedback signal;
second means for generating a plurality of second occurrence time signals when said second phase detector output defines said predetermined phase relationship between said phase-shifted reference signal and said feedback signal;
third means for generating a plurality of cyclically occurring comparison signals having a cycle time related to an average time between a predetermined number of occurrence time signals from said first phase detector output signal; and
means for determining the phase relationship between said cyclically occuring comparison signals and said second occurrence time signals, said phase relationship being related to Faraday rotation of said received signal.

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**4,295,141**

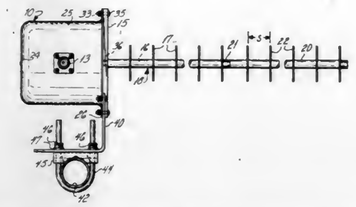
## DISC-ON-ROD END-FIRE MICROWAVE ANTENNA

**Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576**

**Continuation-in-part of Ser. No. 938,883, Sep. 1, 1978, abandoned. This application May 14, 1980, Ser. No. 149,664**
**Int. Cl.³ H01Q *13/28***
**U.S. Cl. 343—753** **12 Claims**

1. A plate-on-rod end-fire antenna comprising a launcher and end-fire radiator exhibiting close to optimum gain over a range of lengths between 3λ and 12λ where λ is the wavelength at the operating frequency, and having a principal axis adapted to be energized by the launcher at the non-radiating end of said radiator for the transmission of energy wavelength λ in the direction of the axis, the electrically active components of said radiator consisting of a plurality of substantially thin

identical electrically conductive round plates substantially uniformly spaced between 0.18λ and 0.23λ apart, along said axis, with the plane of the plates normal to said axis, to form an elongated radiator fitting within a circumscribing cylinder,



coaxial with said principal axis, the difference between the diameter of said cylinder and the diameter of an axial conductive support rod supporting said plates being greater than 0.23λ and less than 0.27λ.

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**4,295,142**

## CORRUGATED HORN RADIATOR

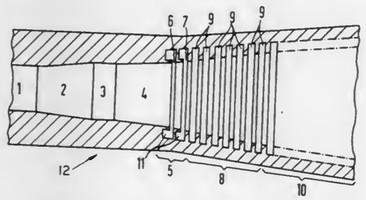
**Helmuth Thiere, Munich, and Werner Vallentin, Groebenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jul. 22, 1980, Ser. No. 171,143**

**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930932**

**Int. Cl.³ H01Q** *19/12, 13/02*

**U.S. Cl. 343—781 CA** **7 Claims**



**1**. A corrugated horn radiator in which a transition zone is inserted between a smooth-walled wave guide feed with a constant cross-section and a funnel radiator with a regularly periodic corrugation structure with a corrugation depth of less than a quarter wave length with reference to the lowest operating frequency, characterized in that, proceeding from the said wave guide feed (**1**), the transition zone consists of the following sections attached to one another in the following order:

(a) a uniformly expanding, smooth-walled wave guide section (**2**),

(b) a smooth-walled wave guide section (**3**) designed with a constant cross-section connected to wave guide section (**2**),

(c) a smooth-walled funnel section (**4**) connected to wave guide section (**3**) smoothly and bend-free and which continuously increases in diameter particularly exponentially, with respect to its cross-section dimension,

(d) a funnel section connected to wave guide section (**4**) smoothly and bend-free, continuously increasing in diameter, particularly exponentially, with respect to its cross-section dimension, said funnel section having a first matching adaptation zone (**5**) which consists of at least two successive corrugations (**6, 7**) which are dimensioned considerably narrower with respect to their widths than are the corrugations of the periodic corrugation structure (**10**) and are also suitably matched in width, which exceed in depth the corrugation depths in the periodic corrugation structure (**10**) and which are provided with ring-shaped openings (**11**) which extend in the direction toward the wave guide feed (**1**), said openings (**11**) being approximately one eighth a wave length deep with respect to the lowest operating frequency to be transmitted, and

(e) a uniformly increasing funnel section with respect to its cross-section dimension which has a second matching adaptation zone (**8**) which consists of a plurality of successive corrugations (**9**) with depths continuously graduated up to the depths of the regular corrugation structure (**10**).

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**4,295,143**

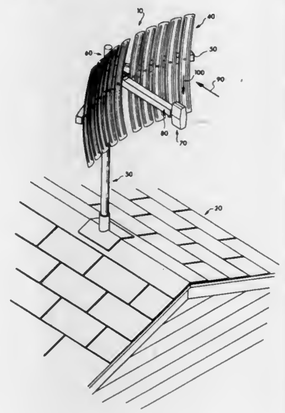
## LOW WIND LOAD MODIFIED FARABOLIC ANTENNA

**John R. Winegard, Evergreen; Carey W. Shelledy, Lakewood, and Keith B. Cowan, Arvada, all of Colo., assignors to Winegard Company, Burlington, Iowa**

**Filed Feb. 15, 1980, Ser. No. 121,696**

**Int. Cl.³ H01Q** *19/12, 15/20*

**U.S. Cl. 343—840** **24 Claims**



**1**. An improved modified and collapsible parabolic antenna for receiving incoming signals having low wind load characteristics mounted to a support, said antenna having means for sensing reflected signals in its focal area, said improved antenna comprising:

an elongated boom having two symmetrical half sections, said boom being further formed to follow a substantially parabolic orientation along its longitudinal axis,

a first and second series of reflector elements for reflecting said incoming signals to said sensing means, each of said series being mounted to one of said half sections of said boom, each of said first and second series of reflector elements comprising:

(a) a plurality of thin substantially elongated rectangular elements of equal length being formed in the substantial shape of a parabola along its longitudinal axis, and

(b) means for mounting the mid-section of each of said elements in a substantial perpendicular relationship to said boom at equal predetermined spaced distances from each other, said predetermined spaced distance being determined in a plane perpendicular to the path of said incoming signals, and

means releasably connectable to said support for mounting to one end of each of said boom half sections in the region of the vertex of said boom parabolic shape, said boom half sections being capable of pivoting in said mounting means from an outward position wherein said boom half sections form said parabolic shape to an inward position wherein said boom half sections are in substantial opposing parallel relationship.



**4,295,144**

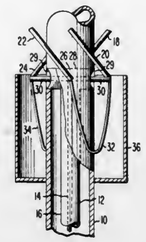
## FEED SYSTEM FOR A CIRCULARLY POLARIZED TETRA-COIL ANTENNA

**Joseph J. Matta, Cinnaminson, and Andrej Skalina, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 31, 1980, Ser. No. 136,155**

**Int. Cl.³ H01Q** *1/36*

**U.S. Cl. 343—895** **8 Claims**



**1**. An antenna comprising a central conductive mast, at least first and second conducting helices disposed about said mast, a conductive housing disposed proximate an end of said helices, a coaxial transmission line disposed within said mast, the inner conductor of said line extending into said housing and being coupled to said first helix, and a first belt line disposed in said housing and coupled between said helices and having a selected length to provide a selected phase shift between said helices and being folded to conserve space.

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**4,295,145**

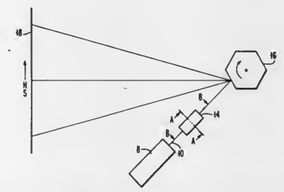
## ACOUSTO-OPTICALLY MODULATED LASER SCANNING ARRANGEMENT FOR CORRECTING FOR INTERFERENCE APPEARING THEREIN

**Milton R. Latta, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 29, 1978, Ser. No. 974,632**

**Int. Cl.³ G01D** *15/14*

**U.S. Cl. 346—108** **8 Claims**



**1**. An acousto-optically modulated light scanning system of the type wherein light from a laser beam is deflected in one direction by acousto-optical apparatus operating at a plurality of different frequencies and thereafter deflected in another direction by other optical apparatus for creating an image raster display in a multiple of scan lines spaced apart by a designated scan line spacing, which scanning normally would include undesirable effects of intermodulation products including spot overlap in said display,

said system comprising

laser apparatus for generating a beam of coherent light, acousto-optical modulating apparatus arranged for intercepting light from said laser apparatus and for deriving at least a plurality of beams that are individually modulatable, and for independently and simultaneously modulating said derived beams to form at least a plurality of sequentially modulated beams for creating a display, and

characterized by

said acousto-optically modulating apparatus being arranged for extending the angle between said individually and simultaneously modulated light beams by at least triple the angle at which said designated scan line spacing obtains on said display, and

said system being arranged simultaneously for projecting at least two of said simultaneously and individually modulated light beams onto said display in coincidence with at least two scan lines spaced apart at an integral number greater than two of intervals of said designated scan line spacing whereby simultaneous spot overlap is prevented for obviating distortion that otherwise would result from said intermodulation products.

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**4,295,146**

## DEVICE FOR MOVING AUTOMATIC DRAWING MACHINE TOOLS

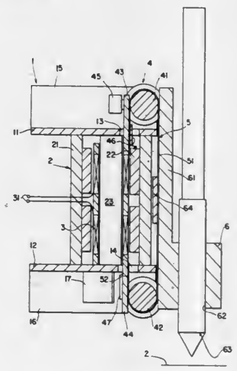
**Werner Cordes, Hamburg, Fed. Rep. of Germany, assignor to Aristo Graphic Systeme GmbH & Co. KG, Hamburg, Fed. Rep. of Germany**

**Filed Jun. 20, 1980, Ser. No. 161,477**

**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934273**

**Int. Cl.³ G01D** *15/16*

**U.S. Cl. 346—140 R** **11 Claims**



**1**. An improved device for translational movement of automatic drawing machine tools, comprising a frame capable of being connected to a drawing machine, and a permanent magnet system, wherein a controlling plunger is attached for free movement, with respect to said frame, and said plunger is connected to a tool carrier which accepts a writing tool, wherein further, an electromagnetic control coil (**3**) around said plunger, is interconnected to said tool carrier (**6**) by means of a mechanical linkage on said frame (**1**), to move said plunger and carrier in opposite directions.

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**4,295,147**

## JOSEPHSON DEVICES OF IMPROVED THERMAL CYCLABILITY AND METHOD

**Charles J. Kircher, Yorktown Heights; Hung-Chang W. Huang, Hopewell Junction, and Masanori Murakami, Yorktown Heights, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Feb. 1, 1980, Ser. No. 117,790**

**Int. Cl.³ H01L** *39/22*

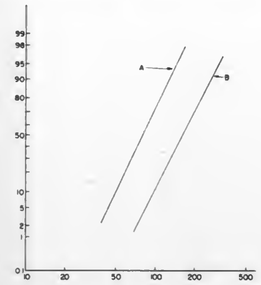
**U.S. Cl. 357—5** **23 Claims**

**1**. A tunnel device exhibiting Josephson tunneling current comprising:

(a) a first electrode comprised of at least one superconductor, the grain size of the said superconductor being $\leqq$100 nm;

(b) a tunnel barrier in contact with said first electrode com-

prised of an insulating layer and being sufficiently thin that Josephson current can tunnel therethrough; and




(c) a second electrode in contact with said tunnel barrier comprised of a superconductor.

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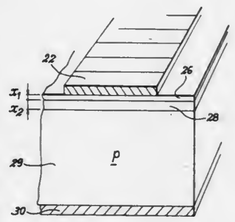
**4,295,148**

## METHOD OF FABRICATION OF ELECTROLUMINESCENT AND PHOTODETECTING DIODES

**Jean Marine, and Michel Ravetto, both of Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Mar. 21, 1979, Ser. No. 22,607**
**Claims priority, application France, Mar. 23, 1978, 78 08522**
**Int. Cl.³ H01L** *33/00, 31/00, 31/18*
**U.S. Cl. 357—17** **13 Claims**




1. A method of fabricating electroluminescent and photodetecting diodes, comprising

(a) providing a wafer of p-type ZnTe semi-conductor material;

(b) forming a compensated layer of thickness $x_j$ in a first surface of said wafer in such a manner as to provide insulation with high resistivity;

(c) implanting ions in the first surface with sufficient energy to form a trapping region of thickness $x_1$ and to form beneath said trapping region an insulating region of thickness $x_2$, with $x_1 < x_j$; and

(d) forming a metallic contact layer on a second surface of the wafer.

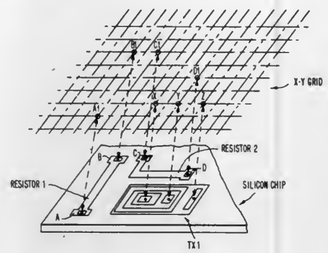
12. An electroluminescent and/or photodetecting diode of ZnTe comprising a substrate of p-type ZnTe, a trapping region at a surface of the substrate, a resistive region below said trapping region having a resistivity of the order of $10^7$ to $10^9$ cm, and an electrical surface contact.

**4,295,149**

## MASTER IMAGE CHIP ORGANIZATION TECHNIQUE OR METHOD

**John Balyoz, Hopewell Junction; Chi S. Chang, Wappingers Falls; Barry C. Fox, Poughkeepsie; John A. Palmieri, Wappingers Falls; Majid Ghafghaichi, Poughkeepsie; Teh-Sen Jen, Fishkill, and Donald B. Mooney, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 29, 1978, Ser. No. 974,576**
**Int. Cl.³ H01L** *27/10*
**U.S. Cl. 357—45** **6 Claims**




1. In an improved planar semiconductor integrated circuit chip structure, said chip structure having:

a surface from which a plurality of regions of different conductivity type extend into the chip to provide a plurality of electrically isolated functional circuits, each of said functional circuits including the required interconnected components to provide the function thereof;

at least one of said functional circuits being a transistor-transistor logic functional circuit, at least one of said functional circuits being an emitter coupled logic functional circuit, and at least one of said functional circuits being a Schottky-Transistor logic functional circuit;

an X pattern of equally spaced parallel conductors overlying and electrically insulated from said chip structure surface, said X pattern of conductors being minimally spaced one from another and selectively connected to at least selected certain ones of said functional circuits;

a Y pattern of equally spaced parallel conductors overlying and electrically insulated from said X pattern of parallel conductors, said Y pattern of conductors being selectively connected to at least selected certain ones of said functional circuits and at least certain conductors of said X pattern of conductors;

said X pattern of conductors and said Y pattern of conductors being orthogonal one to another and thereby geometrically manifesting an X, Y coordinate system;

said integrated circuit chip structure being characterized in that all connections between said X pattern conductors, said Y pattern conductors and said functional circuits exist in space only at X, Y intersections of said X-Y coordinate system geometrically manifested by said X and Y patterns of conductors.

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**4,295,150**

## STORAGE TRANSISTOR

**Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.**

**Filed Oct. 1, 1979, Ser. No. 80,869**
**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845328**
**Int. Cl.³ H01C** *29/78;* **G11C** *11/40*
**U.S. Cl. 357—54** **14 Claims**

1. A storage transistor, comprising:

a substrate formed of a semiconductor body having a plane surface;

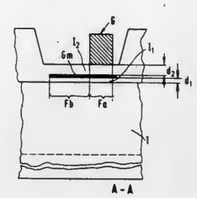
a source region formed in said surface;



a drain region formed in said surface and spaced from the source region forming a channel region therebetween;

a gate electrode disposed over said channel region;

a storage medium comprising a layer of semiconducting material, said storage medium having a first portion disposed between the gate electrode and channel region and a second portion extending from between the channel region and gate electrode, the ratio of the surface area of the second portion of the storage medium to the first portion of the storage medium being between 2 and 3;




a first partial gate insulator layer disposed between the storage medium and the channel region having a thickness ranging between approximately 100 and 200 A.U.; and

a second partial gate insulator layer disposed between the storage medium and the gate electrode and having a thickness ranging beween approximately 200 and 500 A.U., whereby a write or erase pulse may be applied to the gate electrode for storing or removing a charge into or from the storage medium respectively thereby displacing the threshold voltage and a read pulse may be applied to the gate electrode for scanning the magnitude of the threshold voltage.

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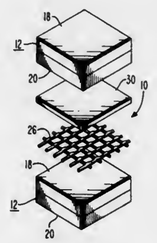
**4,295,151**

## METHOD OF BONDING TWO PARTS TOGETHER AND ARTICLE PRODUCED THEREBY

**Paul Nyul, New Holland, and Frederick R. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 14, 1980, Ser. No. 111,814**
**Int. Cl.³ H01U** *23/48*
**U.S. Cl. 357—68** **4 Claims**




1. An array of laser diodes comprising

a pair of laser diodes each being a body of semiconductor material having top and bottom surfaces and an edge surface from which light is adapted to be emitted, said diodes being arranged with the top surface of one being in spaced opposed relation to the bottom surface of the other,

an intermediate member between said opposed surfaces of the laser diodes and having a separate surface contacting each of said opposed surfaces of said laser diodes, said intermediate member having a plurality of openings therethrough, and

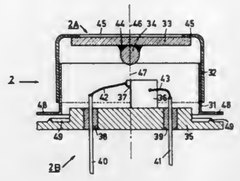
a bonding material in the openings in the intermediate member and adhered to the opposed surfaces of said diodes to secure the diodes together.

**4,295,152**

## OPTICAL COUPLER WITH A HOUSING PERMITTING ADJUSTMENT OF THE DISTANCE BETWEEN THE LIGHT SOURCE AND THE LENS

**Giok D. Khoe; Hendrikus G. Kock; Lambertus J. Meuleman, and Lodewijk J. Van Ruyven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 1, 1979, Ser. No. 44,611**
**Claims priority, application Netherlands, Jun. 19, 1978, 7806569**
**Int. Cl.³ H01L** *23/12, 23/02, 27/14*
**U.S. Cl. 357—74** **8 Claims**




1. An optical coupler comprising a support, a light source for emitting a beam of light mounted on said support, a tubular member affixed to said support, said tubular member being disposed about said source such that the longitudinal axis of said tubular member is generally coaxial with the axis of said beam so that said beam passes through said tubular member along the axis thereof, a holder having a cylindrical portion and a hole formed therethrough, said hole extending along the longitudinal axis of said cylindrical portion, a lens, means for supporting said lens on said holder adjacent one end of said cylindrical portion so that said lens is centered about the longitudinal axis of said hole, the end portion of said cylindrical portion opposite said one end being in telescoping engagement with said tubular member so that said axis of said cylindrical portion is coaxial with the axis of said tubular member and so that said holder and said lens supported thereon is displaceable relative to said tubular member and said support in a direction parallel to the longitudinal axes thereof thereby enabling the distance between said light source and said lens to be adjusted while maintaining the axis of said beam aligned with the center of said lens.

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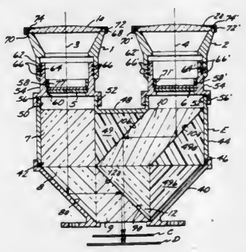
**4,295,153**

## STEREOSCOPIC APPARATUS AND METHOD OF USING SAME

**Stephen Gibson, 547 N. Beachwood Dr., Los Angeles, Calif. 90004**

**Filed Mar. 31, 1980, Ser. No. 135,471**
**Int. Cl.³ H04N** *9/54, 9/60*
**U.S. Cl. 358—3** **9 Claims**



1. In combination with a camera that includes a housing on which a lens assembly is removably supported by first means on the exterior thereof to record a two-dimensional of a scene

on light sensitive means on the interior of said housing, an apparatus that may replace said lens assembly and transform said camera to one that is capable of recording superimposed left and right hand perspective views of said scene that are of the same size on said light sensitive means and that impart a stereoscopic effect to a user when viewed through suitable filters and that appear as a conventional two-dimensional record when viewed without a filter, said apparatus including: p1 a. first and second lenses of the same focal length that are laterally spaced and lie in a common transverse plane that transmit first and second light rays that represent left and right hand perspective views of said scene;

b. first and second filter means to control the luminosity of said first and second rays relative to one another;

c. first and second light transmitting means through which said first and second light rays pass in first and second paths of substantially equal length;

d. an opaque housing that supports said first and second lenses, first and second filters, and first and second light transmitting means in such relationship that said first and second light rays as they emerge from said first and second light transmitting means provide real left and right hand perspective images of said scene that are super imposed; and

e. second means on said housing that removably secure said housing to said first means for said real left and right hand perspective images to be projected from said first and second light transmitting means onto said light sensitive means in said camera.

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**4,295,154**

## DIGITAL VIDEO AND AUDIO FILE SYSTEM

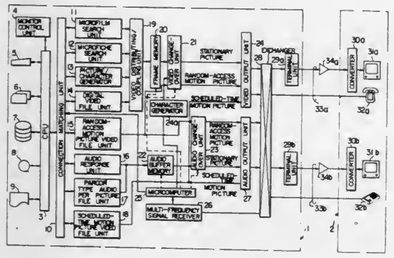
**Hidetoh Hata, Yokohama; Katsumi Haji, Narashino; Kazushige Sako, Tokyo; Yoji Shibata, Yokohama, and Masahiko Achiha, Iruma, all of Japan, assignors to Nippon Telegraph, Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan**

**Filed Aug. 3, 1979, Ser. No. 63,467**

**Claims priority, application Japan, Aug. 4, 1978, 53-94586; Aug. 4, 1978, 53-94588**

**Int. Cl.³ H04N 5/76**

**U.S. Cl. 358—4** **12 Claims**



1. A digital video file system comprising:

a high efficiency encoder circuit for converting an analog TV signal into a digital TV signal;

a buffer memory circuit for temporarily storing the digital TV signal;

a digital signal processing circuit coupled to the output of the buffer memory for reducing in the digital form a redundancy of the digital TV signal in the amplitude direction in a code differential manner;

a digital variable length encoding circuit coupled to the output of the digital signal processing circuit for generating a digital variable length output coded TV signal from the output signal of the digital signal processing circuit; and

a large-capacity digital recorder coupled to the digital variable length encoding circuit for recording the digital variable length output coded TV signals.

**4,295,155**

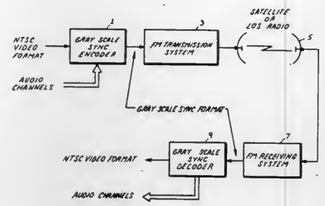
## GRAY SCALE SYNC VIDEO PROCESSING SYSTEM

**Harold F. Jarger, Rochelle Park, and Marvin L. Sassler, Wayne, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Jun. 8, 1979, Ser. No. 47,188**

**Int. Cl.³ H04J 9/32**

**U.S. Cl. 358—12** **39 Claims**




30. The method of processing a video signal with a picture component and a blanking component including the steps of:

eliminating the blanking component;

increasing the picture component simultaneously with said elimination step;

inserting synchronization in the video signal after the elimination step;

multiplexing audio information onto the video signal simultaneously with said synchronization step;

inserting color information into the synchronization;

placing the synchronization midway between the white and black extremities of the video signal;

reversing the polarity of alternating picture components; and

transmitting the resulting video signal.

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**4,295,156**

## METHOD FOR PRODUCING COLOR TELEVISION SIGNALS

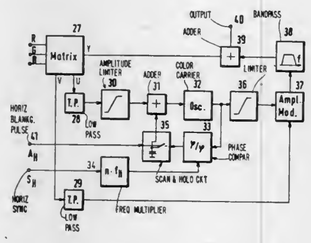
**Michael Hausdörfer, Mühtal, and Jürgen Heitmann, Seeheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 25, 1980, Ser. No. 124,478**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908273**

**Int. Cl.³ H04N 9/02**

**U.S. Cl. 358—12** **7 Claims**




1. A method of performing operations on a color television signal in a color television studio complex,

in which said color television signal is derived in analog form from a picture sensing means, said derived signal having a luminance component (Y) and a chrominance component (U, V), the chrominance component having a carrier frequency located in the upper frequency region of the luminance component,



said method comprising the steps of

converting said derived signal into a studio processing signal by

separating the chrominance component (U, V) from the luminance component (Y) to derive a chrominance component having the full-color information for the luminance component;

generating a studio carrier for the chrominance component which is outside of the frequency range of the luminance component and of higher frequency than said luminance component;

modulating said studio carrier with said chrominance component carrying the full-color information for the luminance component to form a studio chrominance signal component,

said studio chrominance signal component and said separate luminance component together forming said studio processing signal, in which said luminance component has a first frequency range and said studio carrier, modulated by the chrominance component, has a higher frequency range outside of said first frequency range;

performing said operations on the studio processing signal;

and then reconverting said studio processing signal in a form similar to that of the derived signal.

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**4,295,157**

## SIGNAL GENERATING CIRCUIT IN A COLOR TELEVISION SYSTEM

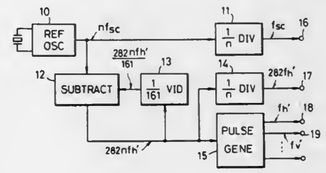
**Toyotaka Machida, and Yuichi Ikemura, both of Iwai, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Feb. 23, 1979, Ser. No. 16,541**

**Claims priority, application Japan, Feb. 25, 1978, 53/21228**

**Int. Cl.³ H04N 9/44**

**U.S. Cl. 358—17** **10 Claims**




1. A signal generating circuit in a colour television system, said circuit comprising:

first means for producing a signal of a frequency of nfsc;

second means for producing a signal of a frequency of 282 nf'h;

third means for frequency-dividing to 1/161 the signal of the frequency 282 nf'h to produce a signal of a frequency 282 nf'h/161, said second means producing the signal of the frequency 282 nf'h in response to the signal of the frequency nfsc and the signal of the frequency 282 nf'h/161 so that the relationship $(282\times162)\ nf'h=161\ nfsc$ is satisfied;

fourth means for frequency-dividing to 1/n the frequency nfsc of the signal from the first means thereby to produce the PAL-system chrominance sub-carrier wave signal of a frequency fsc; and

fifth means supplied with the output signal of the second means and producing an approximational signal of the PAL-system horizontal scanning frequency and an approximational signal of the PAL-system vertical scanning frequency respectively of frequencies f'h and f'v.

**4,295,158**

## DIGITAL FREQUENCY DIVIDER

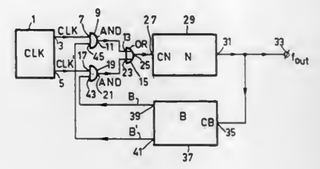
**Nico Nissen, Hamburg, Fed. Rep. of Germany; Sebastianus J. Op Het Veld, and Henri W. Schneider, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 942,470, Sep. 14, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,472**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742184**

**Int. Cl.³ H04N 9/44**

**U.S. Cl. 358—17** **6 Claims**




1. A digital frequency divider having a divider input for electrical input pulses and a divider output for an electrical output signal, comprising;

an N-position counter having a counter input and at least one counter output; said divider input being coupled to the counter input; said divider output being connected to said counter output;

a signal polarity switch;

a B-position auxiliary counter having an auxiliary counter input coupled to a counter output of said N-position counter;

an auxiliary counter output commanding said signal polarity switch;

a switch input coupled to said divider input;

a switch input coupled to the counter input of the N-position counter;

a delay circuit with a delay input for electrical delay pulses; said delay circuit delaying the action of said frequency divider for at least one-half period of a sequence of electrical input pulses at said divider input for each single delay pulse.

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**4,295,159**

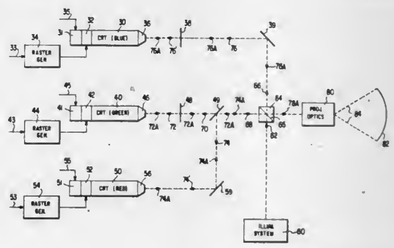
## LIGHT PROJECTION SYSTEM

**Jerome T. Carollo, and Joseph Barbarasch, both of Ormond Beach, Fla., assignors to General Electric Company, Syracuse, N.Y.**

**Filed Jun. 5, 1980, Ser. No. 156,685**

**Int. Cl.³ H04N 5/74**

**U.S. Cl. 358—22** **12 Claims**




1. In an electro-optical light projection system for displaying an image in which at least one selected target is portrayed in a manner differentiated from its background;

said system comprising:

at least one high resolution cathode ray tube including

means for generating an electron beam, a tube face responsive to said electron beam to provide a visible light image thereon, beam deflection means and beam intensity control means;

means for periodically applying base raster signals to said beam deflection means, said base raster signals being effective to cause said electron beam to scan through a base raster having a predetermined coarse spacing between successive base raster lines, said base raster covering at least the major portion of said tube face;

means concurrently operative with the application of said base raster signals for applying first control signals to said beam intensity control means representative of background information;

means for periodically applying mini-raster signals to said beam deflection means in alternation with said base raster signals, said mini-raster signals being effective to cause said electron beam to scan through a mini-raster having a predetermined close spacing between successive mini-raster lines, said mini-raster covering a restricted area within said base raster;

means concurrently operative with the application of said mini-raster signals for applying second control signals to said beam intensity control means representative of target information;

a source of collimated white light;

means for deriving polarized light from said collimated white light;

a liquid crystal light valve associated with said cathode ray tube and positioned to receive and reflect said polarized light, said light valve being responsive to the variable light image on said tube face modulate the polarization of the light beam reflected by said light valve;

a display screen; and

means for projecting said polarization-modulated light beam onto said display screen;

whereby a magnified, real time image is provided on said screen adapted to display said target on said mini-raster in high resolution detail, differentiated from the low resolution background displayed by said base raster.

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**4,295,160**

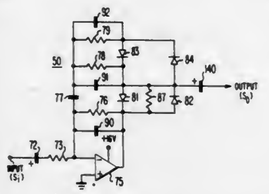
## SIGNAL PROCESSING CIRCUIT HAVING A NON-LINEAR TRANSFER FUNCTION

**William A. Lagoni, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Continuation of Ser. No. 38,100, May 11, 1979, abandoned. This application Sep. 25, 1980, Ser. No. 190,722**

**Int. Cl.³ H04N** *9/535*

**U.S. Cl. 358—31** **12 Claims**



1. A circuit for processing video signals, comprising:

a threshold conduction switching network having an input and an output;

an amplifier having an input terminal and an output terminal, said amplifier including an amplifier device having an input and an output, said output of said amplifier device being separate from said output terminal of said amplifier, with said threshold conduction switching network coupled therebetween;

a first feedback path between said output and input of said amplifier device, including a first impedance; and

a second feedback path between said output and input of said amplifier device, including a second impedance coupled between said amplifier output terminal and the input of said amplifier device, and said threshold conduction switching network having its input coupled to said output of said amplifier device and its output coupled to said output terminal; said switching network (a) exhibiting one conductive state in response to signal amplitudes of first magnitudes within a first range; and (b) exhibiting another conductive state in response to signal amplitudes of second magnitudes greater than said first magnitudes within a second range.

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**4,295,161**

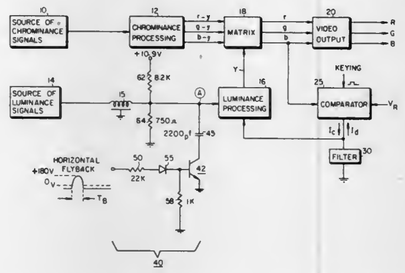
## KEYED NOISE FILTER IN A TELEVISION RECEIVER

**James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Apr. 21, 1980, Ser. No. 142,031**

**Int. Cl.³ H04N** *9/12*

**U.S. Cl. 358—34** **12 Claims**




1. In a television receiver including a video signal channel for processing an image representative video signal having periodically recurring image intervals, and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, apparatus comprising:

means for providing a reference signal representative of a desired image blanking level;

means coupled to said reference source and to said video channel for clamping said blanking level to a level proportional to said reference signal during said blanking intervals;

filter means; and

means for selectively coupling said filter means to said video channel prior to said clamping means during said blanking intervals to suppress high frequency signal including noise when present in said video channel, and for decoupling said filter means from said video channel during said image intervals.

12. In a color television receiver including a video signal transmission path for processing a color image representative video signal, said transmission path including a chrominance channel for processing a chrominance component of said video signal and a luminance channel for processing a luminance component of said video signal having periodically recurring image intervals and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, said luminance channel including signal delaying means for equalizing the signal processing transit time of said luminance channel with the signal processing transit time of said chrominance channel, apparatus comprising:

a source of reference signal;

a source of keying signals coincident with a portion of said blanking interval container said blanking level;

a comparator network responsive to said keying signals and having a first input coupled to said source of reference signal for sensing said reference signal, a second input coupled to said video signal transmission path at a first point for sensing said blanking level, and an output for providing a control signal in response to signal difference appearing between said first and second inputs and representative of a difference in magnitude between said blanking level and said reference signal;

means for coupling said control signal to said luminance channel at a second point in said video signal transmission path prior to said first point to form a closed loop with said video signal path, for varying said blanking level in a direction to reduce said signal differences to a minimum;

filter means; and

means for selectively coupling said filter to said video signal path between said delaying means and said comparator network during said blanking intervals to suppress high frequency signals including noise when present in said video signal path, and for decoupling said filter from said video signal path during said image intervals.



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**4,295,162**

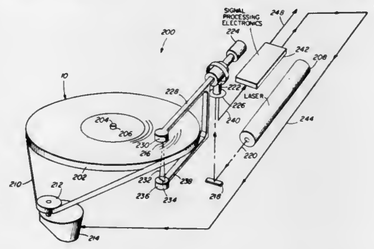
## READING ONE-DIMENSIONAL LINE IMAGE HOLOGRAMS OF A VIDEO FROM A DISC WITH A GUIDE TRACK

**W. John Carlsen, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Sep. 11, 1975, Ser. No. 612,381**

**Int. Cl.³ H04N** *5/86;* **G11B** *7/12, 17/02*

**U.S. Cl. 358—128.6** **42 Claims**




1. A holographic video disc playback system comprising means for rotating a holographic video disc about a center position at a predetermined rotational speed, the holographic video disc comprising

a record medium having a pair of generally planar parallel surfaces thereon and a means for indexing a center position on the record medium so that the center positions can be made coincident,

a first spiral guiding track formed in a surface of the record medium commencing at an outward portion and continuing inwardly at a predetermined rate per revolution of the record medium, and

a second spiral track formed in a surface of the record medium in an essentially constant spatial relationship to the first spiral guiding track, the second spiral track being comprised of a continuously disposed plurality of individual holograms, each successive hologram in the second spiral track being a hologram of a one-dimensional line image containing baseband video information in the radial direction for one successive horizontal television line interval, and each individual hologram being representative of an interference pattern formed by the intersection of a data beam and a reference beam, at least one of the beams having the baseband video information for one successive horizontal television line interval modulated thereon, both beams being focussed at an image plane lying beyond and parallel to the surfaces of the record medium,

an optical system for forming and delivering a reconstruction beam of light to an area fixed in space relative to the optical system and through the continuum of holograms passes, the reconstruction beam of light generally duplicating a selected one of the data beam and the reference beam at the hologram thereby reconstructing the other one of the data beam and the reconstruction beam utilized to form the individual hologram, the reconstructed one of the data beam and the reference beam being focussed at the image plane and containing the baseband video information for the one successive horizontal television line interval,

means for detecting the baseband video information for the successive horizontal television line interval and generating a baseband video electrical signal indicative thereof, which signal may be supplied to a television receiver, the means being at least partially positioned in the image plane where the reconstructed beam components are focussed, and

means for sensing the first spiral guiding track formed in a surface of the record medium and maintaining the reconstruction beam of light in a stable relationship thereto thereby maintaining the reconstruction beam of light in a stable relationship to the second spiral track, the predetermined rotational speed being such that the plurality of individual holograms are reconstructed and detected at a rate which is compatible with the television receiver so that a complete image is formed by the television receiver in its conventional manner.

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**4,295,163**

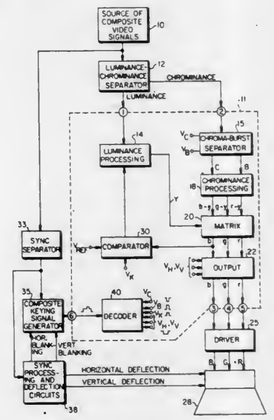
## KEYING SIGNAL GENERATOR RESPONSIVE TO PLURAL INPUT SIGNALS

**James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Jul. 2, 1980, Ser. No. 165,933**

**Int. Cl.³ H04N** *3/24, 5/18, 9/46, 9/535*

**U.S. Cl. 358—165** **10 Claims**




1. In a television receiver for processing a composite television signal comprising an image component and a horizontal image sync component occurring during periodic horizontal image blanking intervals, said receiver including means for deriving said sync component from said television signal; means for providing timing signals coincident with said horizontal blanking intervals; and keyed signal processing circuits; apparatus for generating a keying signal, comprising:

switching means responsive to said timing signals for providing an output keying signal during said horizontal blanking intervals;

means for coupling said output keying signal to said keyed signal processing circuits;

means coupled to said sync deriving means for developing a

bias voltage with a magnitude in accordance with the average output level of said sync deriving means; and

means for coupling said bias voltage to a control input of said switching means so that said switching means responds to said bias voltage and to said timing signals.

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**4,295,164**

## CIRCUIT FOR IMPROVING PICTURE QUALITY IN A TELEVISION RECEIVER

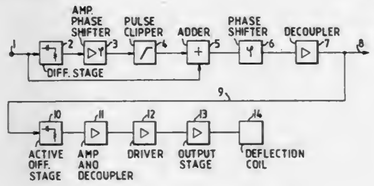
**Horst Rauser, Hemmingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany**

**Filed Feb. 15, 1980, Ser. No. 121,698**

**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906649**

**Int. Cl.³ H04N** *5/63*

**U.S. Cl. 358—166** **2 Claims**




1. A circuit for improving picture quality in a television receiver adapted to receive video signals, with light picture areas corresponding to a high video signal level bounded by inclined rising and falling edges, comprising, means for forming a differentiated video signal from the received video signal, means for adding the differentiated video signal to the falling edge of the received video signal in phase opposition to the received video signal, a terminal for receiving the video signal, a differentiation stage including said means for forming a differentiated video signal connected to said terminal for forming respective positive and negative pulses corresponding to the inclined rising and falling edges of the high video signal level, amplifier and phase shifter means connected to said differentiation stage for inverting said pulses, phase clipper means connected to said amplification and phase shifter means for clipping the negative pulse, and adder means including said means for adding connected to said pulse clipper means and to said terminal for adding the differentiated, inverted and clipped video signal from said pulse clipper means only to the falling edge of the received video signal from said terminal.

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**4,295,165**

## TELEVISION SIGNAL DISCRIMINATION SYSTEM IN A TELEVISION RECEIVER

**Yasuaki Watanabe, Kasukabe, and Teruaki Noda, Noda, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Feb. 19, 1980, Ser. No. 122,263**

**Claims priority, application Japan, Feb. 19, 1979, 54-18233**

**Int. Cl.³ H04N** *5/50*

**U.S. Cl. 358—193.1** **6 Claims**

1. In a television receiver provided with an electronic tuner for producing as output an intermediate-frequency signal whose synchronizing frequency is varied in response to an applied voltage and with means for detecting the output signal of the electronic tuner, the combination therewith of a television signal discrimination system comprising:

a first synchronizing signal separation circuit supplied with the output of said detection means and separating a vertical synchronizing signal;

a first integration circuit connected to the output side of the first synchronizing signal separation circuit;

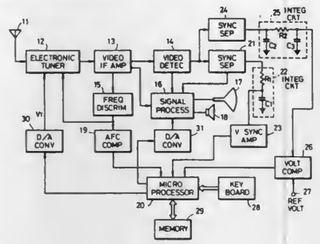
means for supplying a reference voltage;

means supplied with an output voltage of the first integration circuit and the reference voltage and operating to compare the magnitudes thereof;

a second synchronizing signal separation circuit supplied with the output of the detection means and separating a vertical synchronizing signal;

a second integration circuit connected to the output side of the second synchronizing signal separation circuit;

means for discriminating the frequency of the output of the electronic tuner; and




means for discriminating a normal television signal on the basis of the output of the voltage comparing means, the output of the second integration circuit, and the output of the frequency discriminating means,

the first synchronizing signal separation circuit and the first integration circuit producing, as output, different voltages, with the reference voltage as a borderline, depending on and distinguishing between the case where the output signal of the detection means is a normal television signal and the case where said output signal is a different spurious television signal.

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**4,295,166**

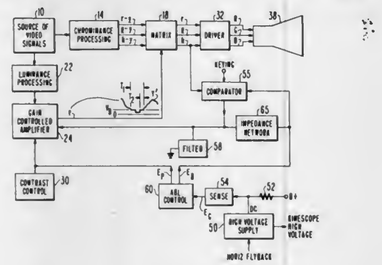
## FAILURE COMPENSATED AUTOMATIC KINESCOPE BEAM CURRENT LIMITER

**Robert L. Shanley, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.**

**Filed Feb. 5, 1980, Ser. No. 118,855**

**Int. Cl.³ H04N** *5/68*

**U.S. Cl. 358—243** **10 Claims**




1. In a system for processing an image representative video signal, said system including a video signal processing channel; and a kinescope for reproducing an image in response to video signals applied to said kinescope from said channel; apparatus for automatically limiting excessive beam currents conducted by said kinescope above a threshold level; said apparatus comprising:

means for deriving a signal representative of the magnitude of excessive kinescope beam currents above said threshold level;

charge storage means;

control means with an input coupled to said derived signal and an output coupled to said charge storage means via a first current conduction path, said control means normally being responsive to said derived signal for developing a proportional control signal on said charge storage means via currents conducted by said first current path in accordance with the magnitude of said derived signal in a normal control mode;

means for coupling said control signal to said video channel via a second current conduction path with a sense for modifying said video signal in a direction to limit kinescope current conduction above said threshold level in accordance with the magnitude of said control signal; and

means for modifying the charge on said charge storage means and thereby modifying said control signal and video signal to limit kinescope current conduction when excessive kinescope currents occur and normal operation of said control means is disrupted, said charge modifying means comprising

impedance means coupled to said charge storage means and to said signal deriving means, for defining an auxiliary current conduction path, independent of said first and second current paths, between said charge storage means and a circuit point exhibiting a voltage responsive to said derived signal, wherein the response of said circuit point voltage to said derived signal is such that (1) a given differential voltage relationship exists between the voltage developed on said charge storage means and the voltage at said circuit point when said control means operates in said normal control mode, thereby causing said auxiliary path to conduct a given level of current during said normal control mode, and (2) said voltage relationship changes and said current in said auxiliary path departs from said given level in response to said derived signal when excessive kinescope currents occur and normal operation of said control means is disrupted.



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**4,295,167**

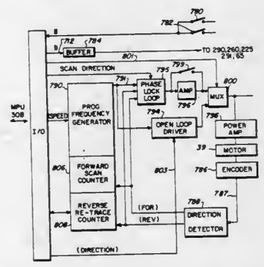
## CARRIAGE SPEED CONTROL FOR A RASTER SCANNER

**Douglas G. Wiggins, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 12, 1979, Ser. No. 84,203**

**Int. Cl.³ H04N** *1/04*

**U.S. Cl. 358—285** **13 Claims**




1. The method of bringing the carriage of a raster scanner to preselected scanning speed as represented by a predetermined operating frequency, the scanner including a drive motor for driving said carriage, the steps which comprise:

(a) at startup, setting a relatively low reference frequency;

(b) comparing said reference frequency with a control frequency representing velocity of said carriage;

(c) supplying power to said carriage drive motor to accelerate said carriage until said reference frequency and said control frequency are equal;

(d) incrementing said reference frequency in steps; and

(e) for each increment in said reference frequency, repeating steps b and c until said reference frequency equals said predetermined operating frequency.

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**4,295,168**

## METHOD AND SYSTEM TO OPTIMIZE RECORDING CONDITIONS IN MAGNETIC RECORDING SYSTEMS

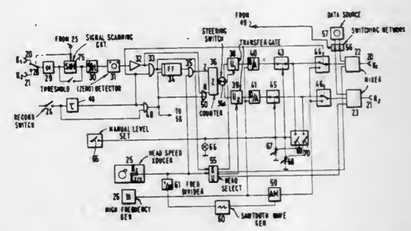
**Rolf Müller, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 6, 1978, Ser. No. 966,858**

**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758307**

**Int. Cl.³ G11B** *5/47, 27/36*

**U.S. Cl. 360—66** **20 Claims**




1. Method to essentially optimize recording current flow through a magnetic transducer head (**20, 21**) to obtain output signals of a desired signal level, and wherein signals are recorded on a predetermined track or track portion of magnetic tape (**1**) and the signals are thereafter read or reproduced from said track or track portion, comprising the steps of

providing a recording signal;

changing in increasing direction the signal level of the recording signal and recording said signal of increasing level on said track or track portion;

reading and reproducing the recorded signal from the track or track portion and deriving a reproduced electrical signal;

differentiating the reproduced signal with respect to the recording signal level;

and determing the recording signal level at a selected predetermined level of the differentiated signal.

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**4,295,169**

## CASSETTE LOADING AND UNLOADING DEVICE

**Mitsuo Iwata; Hajime Wada; Tomoyuki Iwasa, and Kunio Tsuchino, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan**

**Filed Oct. 19, 1979, Ser. No. 86,318**

**Claims priority, application Japan, Oct. 19, 1978, 53-130191**

**Int. Cl.³ G11B** *15/66, 23/06*

**U.S. Cl. 360—71** **8 Claims**

1. A cassette loading and unloading device adapted to be connected to an electric power source for loading and unloading a cassette comprising:

(a) guiding means, movable between an initial position and an inserted position, adapted to receive the cassette and guide it to an unloaded condition when moved to the initial position and to guide the cassette to a loaded condition when moved to the inserted position;

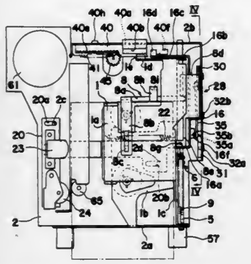
(b) first bias means for biasing the guiding means towards the initial position;

(c) an intake mechanism means operatively associated with the guiding means, and including second bias means having a greater biasing force than the first bias means for biasing the guiding means towards the inserted position, said intake mechanism adapted to forcibly draw the guiding means, when manually pushed to an intermediate

position between the initial and inserted positions, to the inserted position by the force of the second bias means;

(d) locking means, movable between a lock position and an unlock position, being moved into the lock position for restraining the guiding means in the inserted position, and being moved into the unlock position for releasing the guiding means to allow the first bias means to return the guiding means from the inserted position back to the initial position;

(e) a disabling means, operatively associated with the locking means, for disabling the intake mechanism means to disengage the second bias means from the guiding means when the locking means is moved to the lock position;



(f) actuating means, operatively associated with the locking means, adapted for connection to the electric power source for energization thereby, said actuating means being adapted to restrain the locking means in the lock position only when both the actuating means is energized by the power source and when the locking means is shifted to the lock position, whereby if the power from the power source is cut off when the cassette is in the loaded condition, the actuating means will be de-energized and cease restraining the locking means in the lock position, allowing the locking means to move from the lock position to the unlock position, and permitting the first bias means to return the guiding means back to the initial position to guide the cassette to the unloaded position.

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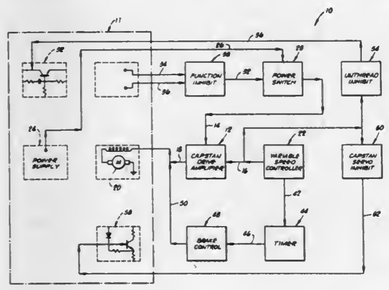
**4,295,170**

## VARIABLE TAPE SPEED FOR VIDEO RECORDERS

**David A. Weiszbrod, Moore, Okla., assignor to Mike A. Janko, Oklahoma City, Okla.**

**Filed Oct. 22, 1979, Ser. No. 87,429**
**Int. Cl.³ G11B** *15/46, 19/28*
**U.S. Cl. 360—73** **11 Claims**



1. A speed control adapted for use with a video tape recorder having a play mode, a record mode, a power supply providing a power signal, a capstan motor for driving the video tape in a forward direction, a reel stop detector which provides a command signal for causing the video tape to be unthreaded and returned to a video cassette, and a capstan servo amplifier which provides an output signal to the capstan motor for preventing the capstan motor from being operated below normal speed, the video tape recorder providing an output signal indicating the video tape recorder is in the play mode of operation, the speed control comprising:

a capstan drive amplifier adapted to receive the power signal and an input control signal, the capstan drive amplifier providing an output signal connectable to the capstan motor and the speed of the capstan motor being varied in response to the variations in the capstan drive amplifier output signal, the capstan drive amplifier output signal being controllably variable in response to the input control signal;

a variable controller, having an "on" position and an "off" position, the variable controller providing the controllably variable control signal, the variable controller control signal being connected to the capstan drive amplifier for controllably varying the output signal of the capstan drive amplifier;

an unthread inhibit receiving the output signal provided by the variable controller and providing an output shunt signal in response to receiving the output signal from the variable controller, the shunt signal being connectable to the reel stop detector in the video tape recorder for preventing the reel stop detector from providing the command signal; and

a capstan servo inhibit receiving the output control signal provided by the variable controller and providing and output disable signal in response to receiving the control signal, the output disable signal being connectable to the capstan servo amplifier in the video tape recorder to inhibit the capstan servo amplifier from providing the output signal to the capstan motor for preventing the capstan motor from operating below normal speed.

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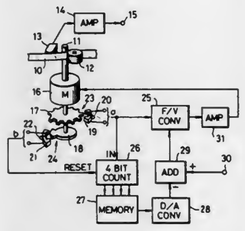
**4,295,171**

## SYSTEM FOR CONTROLLING ROTATION OF ROTATING STRUCTURE

**Akira Hirota, Chigasaki; Yoshiteru Kosaka, Kamakura, and Kazutaka Ashida, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Feb. 11, 1980, Ser. No. 120,287**
**Claims priority, application Japan, Feb. 13, 1979, 54-15226**
**Int. Cl.³ G11B** *15/54, 19/28*
**U.S. Cl. 360—73** **6 Claims**




1. A system for controlling the rotation of a rotating structure comprising:

means for detecting the rotation of the rotating structure;

means for repeatedly forming address signals for every revolution of the rotating structure in response to a detection output from the rotation detection means;

memory means in which control data responsive to deviations in the rotational peripheral speed of the rotating structure in each revolution thereof have been stored beforehand at addresses corresponding to said address signals, the address signals being supplied to the memory means, whereupon the data stored at the corresponding addresses are read out; and

control means for obtaining a control signal from the detection output of the rotation detecting means and the data thus read out from the memory means and accordingly controlling the rotation of the rotating structure.



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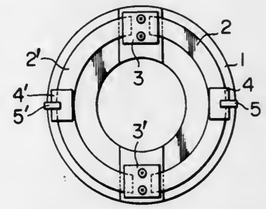
**4,295,172**

## ROTARY MAGNETIC HEAD APPARATUS

**Tetsuji Fukada, Nirakata, and Yukihiko Ise, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 8, 1979, Ser. No. 92,375**
**Claims priority, application Japan, Nov. 10, 1978, 53-139032; Nov. 27, 1978, 53-146928; Feb. 16, 1979, 54-17379**
**Int. Cl.³ G11B** *21/24, 5/56, 21/10*
**U.S. Cl. 360—109** **7 Claims**



1. A rotary support apparatus for magnetic heads which record and reproduce signals on magnetic tape, comprising two vibrators each of said vibrators supporting one of said heads, said vibrators formed respectively by bonding together two piezoelectric vibrator elements having a hemi-ring shape, the polarization axes of said elements being in parallel with the direction of the element thickness, said vibrators operating in a bending mode, and a cylindrical rotator supporting said vibrators.

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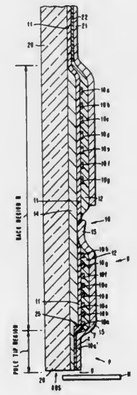
**4,295,173**

## THIN FILM INDUCTIVE TRANSDUCER

**Lubomyr T. Romankiw, Briarcliff Manor, and David A. Thompson, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 18, 1979, Ser. No. 83,182**
**Int. Cl.³ G11B** *5/12, 5/20, 5/22*
**U.S. Cl. 360—125** **6 Claims**



1. A thin film inductive transducer for recording and reading magnetic transitions on a selectable one of a plurality of tracks on a magnetic recording medium, said transducer being of the type comprising two layers of a magnetic material forming a yoke structure that is activated by a conductor coil characterized in that

said yoke structure adjacent its one end comprises a pole tip region including a portion which is of a predetermined substantially constant width and a preselected substantially constant thickness, said predetermined width not exceeding the width of a track on the medium, said pole tip region extending a relatively short distance normal to the magnetic medium, thereby to maximize resolution of transitions during recording, and

said yoke structure comprises a back region which joins said pole tip region and increases in width from said predetermined width and has a back gap adjacent its wider end, the thickness of the layers of magnetic material in said back region being greater than the thickness of those layers in said portion of said pole tip region, thereby to oppose saturation of the yoke structure with applied current and enhance efficiency of the transducer by increasing the cross-sectional area of the yoke structure.

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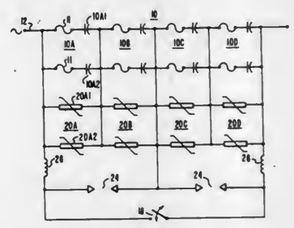
**4,295,174**

## MULTI-SERIES GROUP CAPACITOR BANK PROTECTION EQUIPMENT

**Charles A. Peterson, Van Buren, and Louis C. Grove, Jr., Bloomington, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 29, 1979, Ser. No. 43,531**
**Int. Cl.³ H02H** *7/16*
**U.S. Cl. 361—16** **7 Claims**



1. Capacitor apparatus comprising:

a plurality of capacitor units in a bank arranged in a plurality of series groups with a plurality of units in parallel with each other within each series group;

a fuse means connected with each capacitor unit; bypass means connected across a plurality of said series groups, said bypass means having a predetermined protection level sufficient to protect said capacitor units against transients to which said bank is subjected; and

voltage limiter means connected individually across each of said series groups and having a predetermined protection level higher than that of said bypass means, said voltage limiter means operable to temporarily bypass a series group upon one of said fuse means of one of said units clearing due to conditions not affecting said bypass means.

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**4,295,175**

## PILOT WIRE RELAY PROTECTION SYSTEM FOR ELECTRICAL DISTRIBUTION NETWORKS

**Daniel E. Cordray, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.**

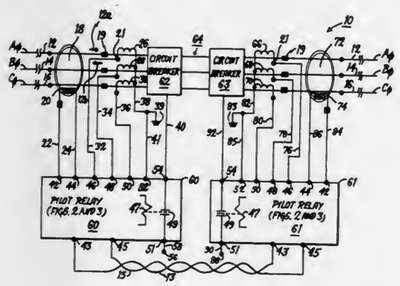
**Filed Apr. 21, 1980, Ser. No. 142,512**
**Int. Cl.³ H02H** *7/26*
**U.S. Cl. 361—69** **13 Claims**

1. A pilot wire relay protection system for protecting a section of a high voltage network located between first and second circuit breakers and comprising at least a first and a

second transmission line each constituting a phase of said network, said pilot wire relay protection system detecting and responding to phase-to-phase faults, phase-ground faults and phase-phase-ground faults that may occur within the protected section by detecting and responding to an excessive differential current existing between a first and a second end of said protected section, said pilot wire relay protection system comprises:

a plurality of current sensors each coupled to a transmission line and arranged into a first group located at the first end of said protected section for respectively developing coupled currents representative of the transmission-line currents flowing at said first end of said protected section and a second group located at the second end of said protected section for respectively developing coupled currents representative of currents flowing at the second end of said protected section;

said first and second groups of current sensors having at least a first, a second, and a third current sensor respectively coupled to the first, the second, and the combination of the first and second transmission lines, said third current sensor developing a coupled current representative of the sum of currents flowing within the first and the second transmission lines at said third current sensors, so that upon the occurrence of a phase to phase fault within said protected section causing a relatively high current to flow within said protected section, said coupled current from the third current sensor will be representative of the difference between the transmission-line currents at said third current sensor flowing toward and away from the location of the fault, and such that the coupled current from the third current sensor will be substantially unchanged by the relatively high current flowing within either of the transmission lines of said protected section during the phase to phase fault, whereby said third current sensors remain unaffected by said phase-phase fault and thus able to provide a coupled current representative of the currents flowing within said transmission lines upon a simultaneous or subsequent occurrence of a phase-ground fault within said protected section;




each of said first, second, and third current sensors having a first and a second terminal, said first and said second current sensors of each group further having their second terminal connected together;

a first pilot relay coupled to said first and second terminals of each of the current sensors of said first group;

a second pilot relay coupled to said first and second terminals of each of the current sensors of said second group;

each of said pilot relays being responsive to coupled current from its associated current sensors for generating a first output signal representative of the composite of the current coupled from its associated first, second, and third current sensors;

pilot wire means comprising first and second conductors for coupling said first output signals together;

each of said first and said second pilot relays having further means for generating a second output signal if the current flowing within said first and said second conductors and the voltage difference between said first and said second conductor exceed predetermined limits; and

means adapted to couple said second output signal of said first and said second pilot relays to said first and said second circuit breakers for causing said circuit breakers to disconnect the protected section from the remainder of the power network if the differential current between said first and said second ends of said protected section exceeds a predetermined limit.

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**4,295,176**

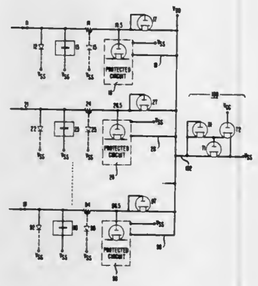
## SEMICONDUCTOR INTEGRATED CIRCUIT PROTECTION ARRANGEMENT

**Norman C. Wittwer, Oldwick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sep. 4, 1979, Ser. No. 72,139**

**Int. Cl.³ H02H** *9/04*

**U.S. Cl. 361—91** **8 Claims**



1. Semiconductor apparatus comprising an overvoltage protection arrangement for a multiplicity of MOSFET circuits (**16, 26, . . . 96**) integrated in a single semiconductor body at a first major surface thereof, characterized by means for connecting a node (**16.5, 26.5, . . . 96.5**) of each of said circuits through the high current path of an auxiliary transistor, ($T_1$), integrated in said semiconductor body to an electrode in wide area contact with a second opposed major surface of said body, and with a common reference voltage metalization line (**101**) connected (**18, 28, . . . 98**) to each said circuit for providing the reference voltage thereto, said means including a separate unidirectional current inhibiting device (**17, 27, . . . 97**) connected between each said node (**16.5, 26.5, . . . 96.5**) and the common line (**101**), the common line being connected through bidirectional current conducting means (**102**) to the high current path of the auxiliary transistor.

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**4,295,177**

## CONTROL CIRCUITS FOR SOLENOIDS

**Richard G. Woodhouse, and Peter H. Salway, both of Birmingham, England, assignors to Lucas Industries Limited, Birmingham, England**

**Filed Aug. 7, 1979, Ser. No. 64,644**

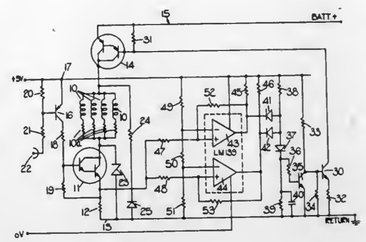
**Claims priority, application United Kingdom, Aug. 24, 1978, 34442/78**

**Int. Cl.³ F02D** *5/02;* **G05B** *11/01*

**U.S. Cl. 361—154** **7 Claims**

1. A solenoid control circuit comprising semi-conductor switch means and a current sensing element in series with the solenoid between a pair of supply terminals, initiating means for turning on said switch means to initiate current flow in the solenoid, first means sensitive to said current sensing element for turning off said switch means when the solenoid current reaches a first predetermined level and second means sensitive to said current sensing element for turning the switch means on and off to maintain the solenoid current at a second predetermined level lower than said first predetermined level, said second means sensitive to said current sensing element initially being overridden by said first means sensitive to the current sensing element, said semi-conductor switching means including two separate first and second switching devices controlled respectively by said initiating means and by said first and second current sensitive means.



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**4,295,178**

## ELECTRODE ARRANGEMENT WITH INDIVIDUALLY CONNECTABLE AND DISCONNECTABLE ELECTRODES

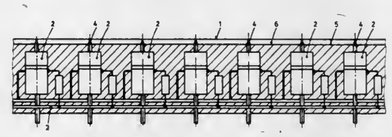
**Walter Spengler, Strehlgasse 23, CH-4105 Biel-Benken, Switzerland**

**Filed Dec. 10, 1979, Ser. No. 101,642**

**Claims priority, application Switzerland, Feb. 21, 1979, 1709/79**

**Int. Cl.³ H01T** *19/04*

**U.S. Cl. 361—220** **19 Claims**



1. In an electrode arrangement for applying or removing an electrostatic charge to or from a surface and comprising a plurality of electrodes adapted to apply to or receive from the surface an electrostatic charge, and insulating body means mounting the plurality of electrodes in a predetermined arrangement for positioning in operative association with the surface to which the charge is to be applied or from which the charge is to be removed, the improvement in said arrangement in which each of said electrodes comprises

an electrode point carried by said insulating body means and projecting outwardly therefrom and adapted to be positioned adjacent said surface,

contact means carried by said insulating body means in spaced relation to said electrode point and adapted to be connected to an electrical supply source or to ground, and

connecting means carried by said insulating body means for selectively connecting and disconnecting said electrode point and said contact means, said connecting means comprising an electrically conductive bridging member electrically connected to one of said electrode point and said contact means and mounted for movement between an active position in which said bridging member is in electrical contact with the other of said electrode point and said contact means to bridge the space therebetween and to provide for the flow of an electrical current therebetween and an inactive position in which said bridging member is spaced from the other of said electrode point and said contact means, means operably associated with said bridging member for selectively moving said bridging member between said active and inactive positions, and displaceable insulating means positioned in the path of travel of said bridging member from said inactive position to said active position for insulating said bridging member from the other of said electrode point and said contact means when said bridging member is in said inactive position while permitting movement of said bridging member to said active position.

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**4,295,179**

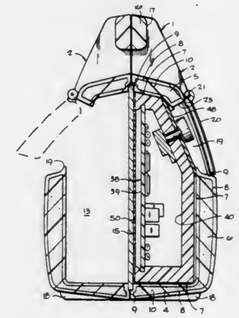
## ELECTRIC TEST EQUIPMENT HOUSING

**Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Dec. 18, 1979, Ser. No. 104,869**

**Int. Cl.³ H05K** *5/06*

**U.S. Cl. 361—331** **12 Claims**



1. A housing for electrical or electronic test equipment made from waterproof material, having inner and outer skin layers which are relatively resiliently movable upon application of pressure, defining a chamber for containing electrical or electronic test set equipment and comprising a closed top, two sidewalls and a base, a rear defining an opening to admit the equipment into the chamber, and a front wall defining an aperture to the chamber, and a flap on said housing for closing the aperture, the flap being hinged at an upper edge for upward hinging movement away from the aperture.

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**4,295,180**

## WALL MOUNTABLE HOUSING FOR PROGRAMMABLE THERMOSTAT

**Clifford W. Herron, 717 Via Bravo, Mesquite, Tex. 75150, and Robert J. Wunderlich, 961 Easton Pl., Dallas, Tex. 75218**

**Filed Jun. 4, 1980, Ser. No. 156,401**

**Int. Cl.³ H05K** *7/20*

**U.S. Cl. 361—383** **4 Claims**

1. A wall mountable housing having multiple members which, together, enclose the electronic components of a programmable thermostat having switching controls, keyboard, and display elements, said housing comprising:

a generally rectangular rear panel comprising: means for attaching said rear panel to said wall;

at least one aperture whereby control wires pass through the rear panel and into said housing;

a first hinge element at an edge of said panel; and

first detent dagger means whereby the rear panel is attachable to another housing member;

second detent dagger means whereby the electronic components are connectable to a housing member;

a generally rectangular face plate comprising:

third detent dagger means whereby the face plate is connectable to a housing member;

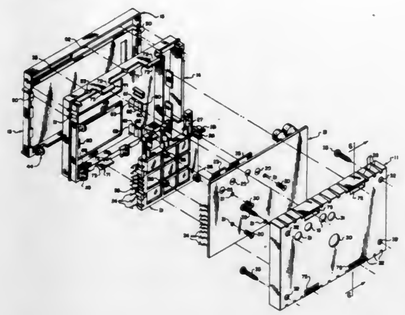
an aperture whereby the switching controls and display elements are accessible;

an aperture whereby the display elements are viewable; and

a second hinge element at an edge of said face plate;

a door whereby switching controls and keyboard of the programmable thermostat are protected, said door comprising:

latching means; and



a third hinge element at an edge of said door whereby, interacting with said first and second hinge elements, the door is pivotally connected to the attached face plate and rear panel;

a window whereby the display elements are protected and viewable; and

vents whereby air circulates through said housing.

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**4,295,181**

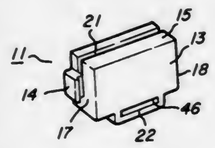
## MODULE FOR AN INTEGRATED CIRCUIT SYSTEM

**Richard R. Chang, Richardson; Gene A. Frantz, and William R. Hawkins, both of Lubbock, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jan. 15, 1979, Ser. No. 3,449**

**Int. Cl.³ H05K** *7/10*

**U.S. Cl. 361—395** **9 Claims**



1. A modular electronic device comprising:

(a) housing means of an insulative material defining an internal chamber, said housing means including parallel planar first and second major surfaces, side walls and end walls;

(b) one of said side walls having an elongated slot of predetermined width extending inwardly along the entire length of the side wall and along adjacent portions of the end walls and communicating with the internal chamber defined by said housing means;

(c) a side wall oppositely positioned from said elongated slot including an integral projection extending therefrom with an outwardly opening recess for receiving an implement to facilitate removal of said housing means from an installed position within an electronic apparatus; and

(d) electronic device means mounted within the internal chamber of said housing means and completely enclosed thereby, said electronic device means including electronic circuit means and a plurality of electrical contacts connected to said electronic circuit means for coupling said electronic circuit means to an external apparatus, said contacts being disposed in substantial alignment with the slot in said side wall of said housing means, said electronic circuit means and said plurality of electrical contacts being accessible from the exterior of said housing means only via the slot in said side wall, the width of said slot being sufficiently small so that the electronic circuit means and electrical contacts are not accessible to a human finger or other object of comparable or larger dimensions, thereby preventing wanton contact and tampering with the electronic circuit means and electrical contacts.

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**4,295,182**

## INTERCONNECTION ARRANGEMENTS FOR TESTING MICROELECTRONIC CIRCUIT CHIPS ON A WAFER

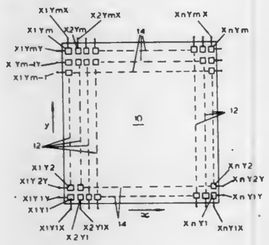
**Russell C. Aubusson, Broxbourne, and Richard J. Gledhill, London, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Continuation of Ser. No. 948,195, Oct. 2, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,035**

**Claims priority, application United Kingdom, Oct. 3, 1977, 40896/77**

**Int. Cl.³ H01L** *27/00*

**U.S. Cl. 361—400** **6 Claims**



1. In a circuit configuration for use in testing microelectronic circuit chips, said circuit configuration being of the type comprising a flat wafer having non-adjacent opposite physical edges and thereon within the region bounded by said physical edges oo, said wafer surface having thereon an array of microelectronic circuit chips to be tested, each of the chips on said wafer comprising a digital circuit which processes digital information and to transfer digital information and control signals from a set of input connections on the chip to one of a plurality of sets of output connections on the chip selected by a switching circuit within the digital circuit, each set of output connections being connected to input connections of an adjacent chip on said wafer in accordance with the operation of the switching circuit thereby to set up a chain of interconnected sound chips in said array or said surface on said wafer which extends from a selected sound first chip and which bypasses faulty chips on said wafer, the improvement wherein said circuit configuration includes electrical connections which directly connect an output connection of each chip immediately adjacent a first physical edge of the said flat wafer to the input connection of a different chip adjacent a second physical edge of the said flat wafer whereby all chips behave electrically as though the surface of said flat wafer were unbounded in a direction transverse to said first and second edges and whereby the said selected first chip in said chain of interconnected chips is located immediately adjacent one of the physical edges of said flat wafer.



**4,295,183**

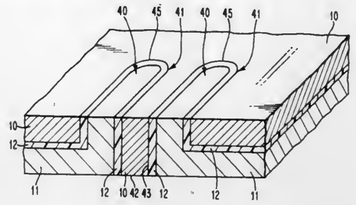
## THIN FILM METAL PACKAGE FOR LSI CHIPS

**Ekkehard F. Miersch, Boeblingen, Fed. Rep. of Germany, and Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 29, 1979, Ser. No. 53,497**

**Int. Cl.³ H05K** *1/16*

**U.S. Cl. 361—403** **7 Claims**



1. In an electronic chip carrier, a substrate with pad areas thereon for connection to a thin film, integrated circuit chip, a said chip connected to said pad areas, said substrate including a plurality of conductors coupled to said pad areas for electrical connection of said pads to various points, the improvement comprising connecting means for said chip to said pad areas by means of connections on the base of said chip, said conductors comprising a plurality of parallel conductive planar metallic sheets having large parallel surfaces with a layer of high dielectric material between adjacent ones of said sheets for providing high electrical capacitance and minimal inductive coupling therebetween, and at least one of said pads extending through at least one of said planar metallic sheets, each said pad being electrically insulated from said sheets through which it passes.

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**4,295,184**

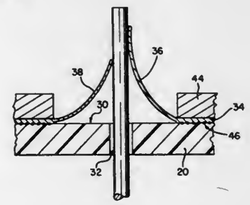
## CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

**Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Nashua, N.H.**

**Division of Ser. No. 934,702, Aug. 21, 1978, Pat. No. 4,223,435, which is a continuation-in-part of Ser. No. 808,808, Jun. 22, 1977, Pat. No. 4,107,836. This application Apr. 4, 1980, Ser. No. 137,449**

**Int. Cl.³ H05K** *1/18*

**U.S. Cl. 361—406** **11 Claims**



1. A circuit board comprising in combination:

a rigid dielectric carrier panel, said carrier panel having at least one aperture formed between opposite surfaces thereof;

at least one electrically conductive circuit formed of a resiliently flexible metal, secured at least in part to said dielectric carrier panel, said electrically conductive circuit having (i) at least one integral termination which essentially surrounds said at least one aperture in said panel, said termination including (ii) a pair of dissimilar size generally L-shaped fingers disposed inwardly for a distance from the edge of said aperture:

said termination including a frame section of cross-sectional thickness greater than the cross-sectional thickness of said electrically conductive circuit and a shoulder section of reduced cross-section thickness as compared with said frame section, said shoulder section having a plan area greater than that of said at least one aperture, said shoulder being secured to said dielectric panel at least in part; and

a dielectric material covering said conductive circuit patterns at least in part and secured to said dielectric panel, said dielectric material having (i) at least one aperture substantially corresponding in position to said at least one termination and (ii) overlaying and secured at least in part to said termination shoulder area.

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**4,295,185**

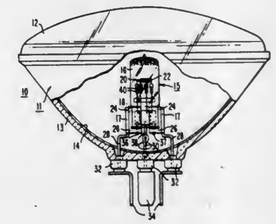
## FILAMENT MOUNT ASSEMBLY FOR MINIATURE INCANDESCENT LAMP, AND METHOD OF MANUFACTURE

**Jack Martin, Paramus, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 26, 1979, Ser. No. 79,150**

**Int. Cl.³ F21M** *3/30*

**U.S. Cl. 362—211** **10 Claims**



1. An electric incandescent lamp comprising;

a sealed light-transmitting envelope containing a refractory wire filament having a coiled body portion that is terminated at each end by an uncoiled leg,

a pair of substantially rigid lead-in conductors extending into said envelope and having end segments that are disposed in abutting end-to-end relationship with the respective legs of the filament and form therewith a pair of filament-conductor junctures, and

means electrically and mechanically coupling the filament legs to the associated abutting end segments of the lead-in conductors comprising a pair of sleeve-like members of stiff electrically-conductive material that are disposed in overlying bridging relationship with the respective filament-conductor junctures, said sleeve-like coupling members being fastened to the abutted parts of the filament legs and lead-in conductors in overlapped engagement therewith and thereby securely locking the filament and lead-in conductors in operative relationship.

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**4,295,186**

## SLIT ILLUMINATING DEVICE

**Muneharu Sugiura, Tokyo, and Seiji Sagara, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 948,399, Oct. 4, 1978, abandoned. This application Oct. 26, 1978, Ser. No. 954,760**

**Claims priority, application Japan, Oct. 12, 1977, 52-122172**

**Int. Cl.³ F21V** *7/12;* **G03B** *27/54*

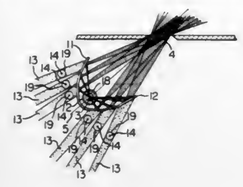
**U.S. Cl. 362—217** **3 Claims**

1. A slit illuminating device for an image reproduction apparatus, which comprises:

(a) an original support table having a slit portion for slit illumination of an original;

(b) a tubular shaped light source arranged with its longitudinal axis spaced a predetermined distance from and parallel to a reference line which extends along the length of said slit; and

(c) a multi-surfaced mirror partially surrounding said light source and comprising a plurality of planar mirrors provided on both sides of a plane defined by the longitudinal axis of said light source and the reference line, wherein the respective length of each planar mirror, when viewed in cross-section defined by a plane perpendicular to the



reference line, is such that it transmits an effective bundle of light, as if emitted from a corresponding enlarged virtual image of said light source, to said slit portion, the size of the enlarged image being determined in accordance with an acceptable deviation of said light source from a predetermined mounting position.

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**4,295,187**

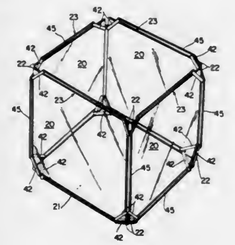
**ASSEMBLABLE CONTAINER**

**Norman S. Shemitz, Milford, Conn., assignor to Shem Safe Incorporated, Milford, Conn.**

**Continuation-in-part of Ser. No. 950,592, Oct. 12, 1978, Pat. No. 4,233,656. This application Feb. 27, 1980, Ser. No. 125,168**

**Int. Cl.³ F21V *1/06***

**U.S. Cl. 362—352** **13 Claims**



1. A support system for a container having a plurality of panels forming at least the sides and bottom of the container and connected together by the support system in a predetermined polyhedral configuration, each of the panels defining a plurality of corners; comprising, a plurality of collars, each collar being adapted to extend around a corresponding one of the panel corners, elastic connecting members connecting at least some of the collars together such that groups of opposing, adjacent collars on juxtaposed panels are connected together at their proximate ends by a said elastic member, and at least some of the said groups of collars are connected to other groups of collars which are spaced from the first said group by tensioned elastic members stretched between the said groups of collars, such that all of the collars are capable of being releasably held in place on their respective panels, to releasably hold all of the panels under the tension of the elastic members in the predetermined polyhedral configuration.

**4,295,188**

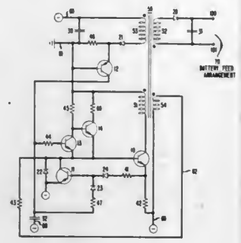
**CONVERTER CIRCUIT PROVIDING ISOLATION AND LOAD SENSING**

**James E. Brunssen, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 13, 1979, Ser. No. 103,271**

**Int. Cl.³ H02M *3/335***

**U.S. Cl. 363—21** **9 Claims**



1. A blocking oscillator converter comprising a transformer having: a primary winding circuit for connecting a DC source to current switching means; a secondary winding circuit for supplying a load; a tertiary winding circuit for regulating the voltage delivered to said load; and a drive winding circuit for operating said switching means

characterized by

means in said tertiary circuit for sensing current diverted from said secondary circuit and returned to said source, and

means, coupled to said means for sensing, for controlling the operation of said switching means in response to said current.

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**4,295,189**

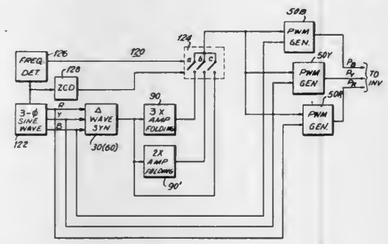
**APPARATUS AND METHOD FOR GENERATING WAVEFORMS WHICH ARE PARTICULARLY SUITABLE FOR A PWM-DRIVEN MOTOR**

**John T. Boys, Auckland, New Zealand, assignor to The University of Auckland, Auckland, New Zealand**

**Filed Dec. 4, 1979, Ser. No. 99,998**

**Int. Cl.³ H02M *1/08***

**U.S. Cl. 363—41** **32 Claims**



14. Apparatus for generating an n-phase pulse width modulated (PWM) waveform particularly adapted for energizing an n-phase electrical motor, wherein n is an integer, said apparatus comprising a source of n-phase sine wave signal, each phase having a fundamental frequency f, triangle waveform generating means for generating a triangle waveform of frequency mf from said n-phase sine wave signal wherein m is an integer, said triangle waveform having substantially linearly sloped, gradually increasing and decreasing edges, said triangle waveform generating means including detecting means for detecting when a segment of any of said n phases of said sine wave signal is within a predetermined angular amount from a reference crossing level, and selecting means for selecting successive ones of said detected segments to synthesize said triangle waveform; and n comparing means, a respective comparing means being provided for each phase for comparing said triangle waveform to an associated phase of said sine wave signal to produce a pulse transition at each intersection of said triangle waveform and said associated phase of said sine wave.



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**4,295,190**

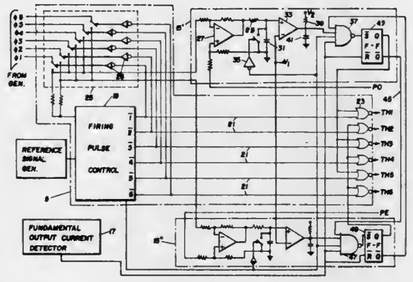
**BANK SELECTION IN NATURALLY COMMUTATED THYRISTOR CONTROLLED STATIC POWER CONVERTERS**

**Eric J. Stacey, Penn Hills, Pa., and Donal E. Baker, American Township, Lima County, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 19, 1979, Ser. No. 95,899**

**Int. Cl.³ H02M *5/27***

**U.S. Cl. 363—162** **13 Claims**



4. A converter for generating from a multiphase AC voltage source a desired output waveform to be applied to a load, said converter comprising:

a naturally commutated power circuit including a plurality of thyristors arranged in positive and negative banks inserted between the AC voltage source and the load, the thyristors in each thyristor bank being arranged in pulse groups interconnected by interphase transformers;

control means for firing said thyristors sequentially to generate said desired output waveform which is applied to said load;

means for determining which thyristor bank is carrying the load current;

means for determining when the current in each pulse group of the nonload current carrying bank goes to zero; and

means for inhibiting the firing of thyristors in each pulse group of the nonload current carry bank in response to zero current therethrough.

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**4,295,191**

**PROGRAMMABLE CONTROL SYSTEM**

**Worley C. Wilson, Ft. Lauderdale, Fla., assignor to Telemetry Controls, Inc., Miami, Fla.**

**Filed Feb. 14, 1980, Ser. No. 121,446**

**Int. Cl.³ G05B *19/04*; H01H *43/00***

**U.S. Cl. 364—104** **6 Claims**

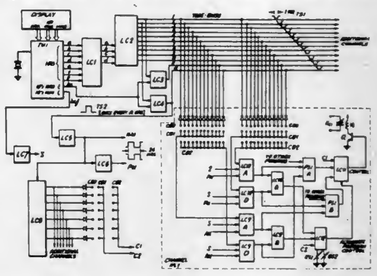
1. An electronic programmable system for controlling the operation of remotely located equipment comprising:

(a) time base generating means including means for cyclically providing a plurality of output timing signals corresponding to a predetermined number of equally spaced-apart points of a preselected time base;

(b) controllable data transfer means including first data transfer means and second data transfer means;

(c) programmable connection means including a plurality of controllable circuit paths operatively connected between said time base generating means and said first data transfer means and a plurality of controllable circuit paths operatively connected between said time base generating means and said second data transfer means, said programmable connection means including user-accessible panel means for receiving insertable program pins which effect actuation of selected ones of said controllable circuit paths thereby coupling selected ones of said output timing signals to said first data transfer means and to said second data transfer means;

(d) data transfer control means for selectively enabling said controllable data transfer means, said data transfer control means including means for generating a first data transfer control signal, a second data transfer control signal and a strobe signal, wherein said first data transfer control signal is coupled to said first data transfer means and said second



data transfer control signal is coupled to said second data transfer means and said strobe signal is coupled to said first and second data transfer means, said first data transfer means being enabled when said first data transfer control signal, said strobe signal and one of said coupled output timing signals are coincidently applied to said first data transfer means, said second data transfer means being enabled when said second data transfer control signal, said strobe signal and one of said coupled output signals are coincidently applied to said second data transfer means; and

(e) programmable switching means operatively connected to said controllable data transfer means and responsive to said transferred output timing signals including means for generating a switching control signal for controlling the operation of said remotely located equipment.

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**4,295,192**

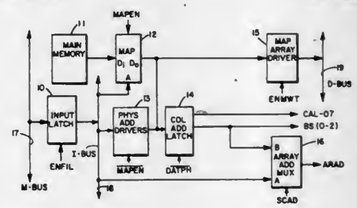
**ROW ADDRESS MEMORY MAP OVERLAP**

**Brewster J. Porcella, Tustin, Calif., assignor to Sperry Rand Corporation, New York, N.Y.**

**Filed Apr. 13, 1979, Ser. No. 29,697**

**Int. Cl.³ G11C *13/00***

**U.S. Cl. 364—200** **16 Claims**



1. A memory mapping apparatus comprising,

a source of original address information wherein said original address information is comprised of a specified number of bits;

memory map means connected to receive a first portion of said original address information directly from said source;

multiplexer means connected to receive a different portion of said original address information directly from said source;
memory means connected to said memory map means to concurrently supply memory information directly to said memory map means; and
means connected between said memory map means and said multiplexer means and operative to supply map information to said multiplexer means from said memory map means,
said multiplexer means providing new address information representative of said map information and said different portion of said original address information wherein said new address information includes mapped information from said memory via said memory map means.

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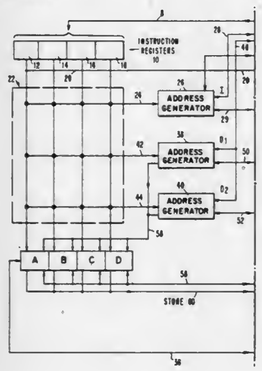
**4,295,193**
**MACHINE FOR MULTIPLE INSTRUCTION EXECUTION**
**James H. Pomerene, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed Jun. 29, 1979, Ser. No. 53,567**
**Int. Cl.³ G06F 7/00**
**U.S. Cl. 364—200** **6 Claims**




6. In apparatus for computing instructions of a given type compiled into groups of n, where n is an integer ≧4, instructions, with no more than one instruction being other than said given type and said one instruction being at a fixed position from one group to the next, with two data fetches and one branch instruction fetch and one store operation being permitted in a group, with any branch instruction fetch being the last instruction in the group, the combination comprising:
an instruction cache wherein said groups of n instructions including branch instructions are stored;
a data cache containing data necessary to perform said instructions;
an n stage register in which a group of n instructions at a time is stored from said instruction cache, with any instruction other than said given type being stored in a predetermined one of said n stages;
a first gating means responsive to the instruction stored in said predetermined one of said n stages for determining if the instruction is of said given type, and if so permitting same to be processed by said apparatus;
a second gating means responsive to each of said n instructions for determining which instructions, if any, contains a branch instruction fetch;
a third gating means responsive to each of said n instructions for determining which instruction, if any, contains a first data fetch;
a fourth gating means responsive to each of said n instructions for determining which instruction, if any, contains a second data fetch;
a group of general purpose registers in which addresses and data needed for executing said instructions are stored;
an instruction address generation means operative with said general purpose registers and responsive to said second gating means for initiating a branch instruction fetch from said instruction cache;
a first data address generation means operative with said data cache and general purpose registers and responsive to said third gating means for fetching addresses and data;
a second data address generation means operative with said data cache and general purpose registers and responsive to said fourth gating means for fetching addresses and data; and
n execution logic means, each operative with one of said n stages of said n stage register and said first and second data and address generators for concurrently executing the called for valid instructions of said given type including called for data fetches and store operations, if any, with the address and data called for by said store operation being provided to said data cache.

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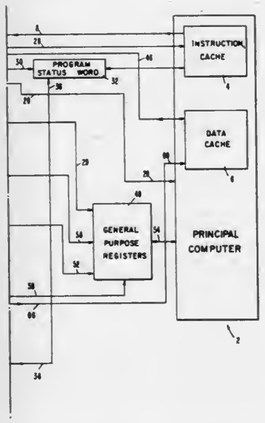
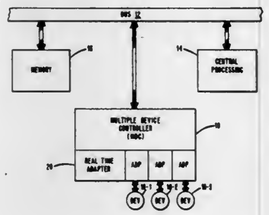
**4,295,194**
**ADAPTER UNIT FOR USE IN A DATA PROCESSING SYSTEM FOR PROCESSING A VARIETY OF REQUESTS**
**Boyd E. Darden, St. Petersburg, Fla., and Henry F. Hartley, Lowell, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**
**Filed Sep. 6, 1979, Ser. No. 73,056**
**Int. Cl.³ G06F 9/46**
**U.S. Cl. 364—200** **31 Claims**




1. A data processing system including a central processing unit and a controller coupled in common to a bus, said controller having a number of ports connected to a corresponding number of adapter units, one of said adapter units comprising:
a data bus;
an address bus;



microprocessing means coupled to receive task word commands from said controller coded to specify a number of time of day operations and including time of day information signals, said microprocessing means being coupled to said data and address buses;
random access memory means coupled to said data and address buses, said memory means being organized into a plurality of sections, each section having a plurality of locations, a first section corresponding to a first buffer, a second section corresponding to a second buffer, a third section corresponding to a third buffer and a fourth section corresponding to a timer control section;
a programmable read only memory means coupled to said data and address buses, said read only memory means including a plurality of locations for storing a plurality of timer control sequences for processing different ones of said commands;
free running time of day means for generating and storing time of day values, said time of day means being coupled to said data bus and operatively coupled to said address bus; and,
timer module means coupled to said microprocessing means and to said data and address buses, said module means including a number of programmable cyclic timer circuits, each timer circuit including control and counter registers operatively coupled to said address and data buses;
said microprocessing means being operative in response to one of said task commands to reference a first predetermined one of said plurality of timer control sequences for generating signals to load predetermined time of day information signals received from said controller required for executing the time of day operation specified by said command into a selected one of said buffers and for generating signals on said address and data bus lines for loading said timer control and counter registers of one of said timer circuits with control signals read out from said fourth section specifying a timer mode of operation and a predetermined time interval in accordance with said one command, said timer module means being conditioned by said control signals to generate an interrupt at the end of said predetermined time interval to said microprocessing means for detecting the completion of the time of day operation specified by said one command.

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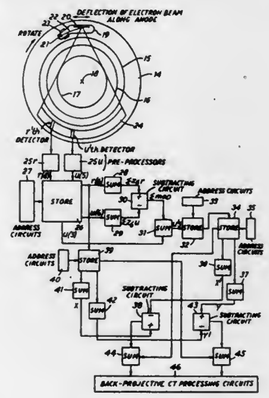
**4,295,195**
**RADIOGRAPHY**
**Godfrey N. Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England**
**Filed Oct. 24, 1979, Ser. No. 87,669**
**Claims priority, application United Kingdom, Oct. 24, 1978, 41710/78**
**Int. Cl.³ G06F 15/42; G01N 23/00**
**U.S. Cl. 364—414** **3 Claims**




1. A CT scanner including a source of a substantially planar, divergent spread of penetrating radiation, the radiation propagating across a patient position, detector means sensitive to the radiation and disposed to receive the radiation emergent from said patient position; the detector means including a plurality of detector devices arranged to receive radiation element from said patient position along respective, substantially linear paths and to generate respective electrical output signals indicative of the amounts of radiation so received, scanning means causing said source and said detector means to move angularly around the patient position about a common axis of rotation with the spread of radiation remaining in a plane intersected substantially orthogonally by said axis, and processing means for operating upon output signals generated by said detector means throughout the angular movement to generate a representation of the variation of attenuation of said radiation from place to place over said patient position and in the said plane; the scanning permitting said detector means to generate output signals relating to many sets of paths distributed across the patient position, each set being disposed at a respective attitude to the patient position and consisting of several sub-sets of paths, the radiation propagating along each path of any given sub-set being received by a respective detector device and that propagating along the paths of other sub-sets of the same set being received by different detectors; overlap zones existing between each pair of adjacent sub-sets wherein any two detector devices associated with the paths included in adjacent sub-sets receive radiation along several common paths, the processing means including components operating upon the respective signals generated by the two detector devices in respect of said common paths to generate a respective normalized signal, containing contributions from both detectors, in respect of each of said common paths; each of said normalized signals being generated by comparing output signals relating to different numbers of the paths in the overlap zone for common paths at different positions within the overlap zone, the number of paths involved in the comparison varying, across the overlap zone, from a minimum for common paths at one edge thereof through a maximum in the center thereof to a minimum at the other edge thereof.

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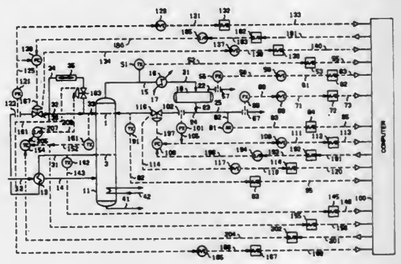
**4,295,196**
**FRACTIONAL DISTILLATION COLUMN CONTROL**
**Danny L. Furr, Broken Arrow, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**
**Filed Jul. 2, 1980, Ser. No. 165,463**
**Int. Cl.³ E01D 3/42**
**U.S. Cl. 364—501** **3 Claims**




1. Apparatus comprising:
a fractional distillation column means;
a first heat exchanger means;
means for supplying a feed stream through said first heat exchanger means to said fractional distillation column means;
means for withdrawing a pump around stream from a first upper portion of said fractional distillation column means and for passing said pump around stream through said first heat exchange means to a second upper portion of said

fractional distillation column means, wherein said second upper portion is above said first upper portion;
a first cooling means;
an overhead accumulator means;
means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column means and for passing said overhead vapor stream through said first cooling means to said overhead accumulator means;
means for withdrawing a liquid stream from said overhead accumulator means, for returning the first portion of the thus withdrawn liquid stream to a third upper portion of said fractional distillation column means as an upper external reflux, and for removing a second portion of the thus withdrawn liquid stream as a product stream, wherein said third upper portion is above said first upper portion;
means for manipulating the flow rate of said pump around stream;
means for manipulating the flow rate of said upper external reflux;
means for calculating a first signal representative of the actual flow rate of the internal reflux in an upper portion of said fractional distillation column means;
means for calculating a second signal representative of the flow rate of the internal reflux in the upper portion of said fractional distillation column means required to maintain a desired product specification for said product stream;
means for comparing said first signal and said second signal to thereby determine if the internal reflux flow rate in the upper portion of said fractional distillation column means should be increased or decreased;
means for determining if the flow rate of said pump around stream can be increased;
means for determining if the flow rate of said upper external reflux can be decreased;
means for calculating a third signal representative of the flow rate of said pump around stream required to make said first signal substantially equal to said second signal;
means for establishing a fourth signal representative of the highest desired flow rate of said pump around stream;
means for establishing a fifth signal representative of the flow rate of said upper external reflux required to make said first signal substantially equal to said second signal; and
means for establishing a sixth signal representative of the lowest desired flow rate of said upper external reflux, wherein the flow rate of said pump around stream is manipulated in response to said third signal and the flow rate of said upper external reflux is manipulated in response to said sixth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream can be increased or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux cannot be decreased, and wherein the flow rate of said pump around stream is manipulated in response to said fourth signal and the flow rate of said upper external reflux is manipulated in response to said fifth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream cannot be increased, or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux can be decreased.

**4,295,197**

## INFILTRATION-INFLOW SEWER LINE ANALYZER

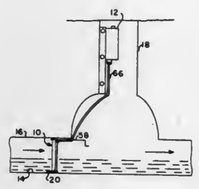
**Peter D. Petroff, 4102 Piedmont Dr., Huntsville, Ala. 35802**

**Division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application Dec. 17, 1979, Ser. No. 104,540**

**The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.**

**Int. Cl.³ G01F** *23/14*

**U.S. Cl. 364—510** **5 Claims**




1. A system of measurement of flow gains between ends of a sewer line, said line extending between an upstream manhole and a downstream manhole, and having a first sewer pipe with an exit end at the downstream manhole, and there being a second sewer pipe having an exit feeding said upstream manhole, comprising:
first and second monitoring assemblies, said first monitoring assembly being positioned in the end region of said first sewer pipe, and said second monitoring assembly being positioned in an end region of said second sewer pipe, and wherein each monitoring assembly comprises:
liquid level sensing means for sensing liquid level and providing as an output a signal which is a function of liquid level,
mounting means for mounting and positioning said liquid level sensing means in said end regions of said sewer pipes, and
sampling and recording means for periodically and synchronously, as between monitoring assemblies, and responsive to said liquid level sensing means, sampling and recording time identified said signals over a selected period of time;
conversion means responsive to selected recorded signals for converting said signals into liquid flow rates;
computation means responsive to said conversion means and dry and rainy day samples of values from each of said monitoring assemblies supplied said conversation means for (1) determining the difference between like timed, time of day, dry and rainy day flows from said first sewer pipe, (2) determining the difference between like timed, time of day, dry and rainy day flows from said second sewer pipe, and (3) determining the differences between said difference flows obtained as per (1) and (2) of this paragraph; and
control means for selectively fetching samples from said sampling and recording means and placing same in said conversion means, whereby readings and computations may be made at selected times, and thereby measurements may be made during rainfalls which are representative of inflow into said pipe, and measurements made following rainfalls are representative of infiltration into a said pipe.



**4,295,198**

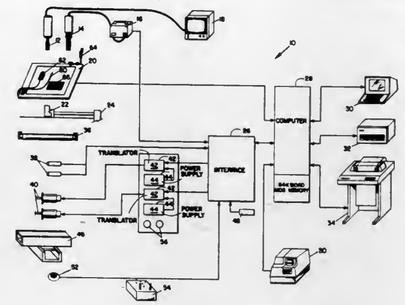
## AUTOMATIC PRINTED CIRCUIT DIMENSIONING, ROUTING AND INSPECTING APPARATUS

**Robert K. Copeland, Pennington, and Richard J. Dimaggio, Trenton, both of N.J., assignors to Cogit Systems, Inc., Princeton, N.J.**

**Filed Apr. 2, 1979, Ser. No. 26,436**

**Int. Cl.³ G05B** *19/42;* **H04N** *7/18*

**U.S. Cl. 364—515** **24 Claims**




22. An automatic inspecting apparatus for scanning a first object and comparing certain features of said first object to certain features of a second object, said apparatus comprising:
means for supporting said first object;
means for scanning said first object and producing a first set of scan data representative thereof;
processing means for processing said first set of scan data to detect said certain features of said first object, said processing means producing a first set of processed data representative of said features of said first object, said first set of processed data being smaller in volume than said first set of scan data;
comparison means for comparing said first set of processed data against a pre-stored second set of processed data representative of said certain features of said second object and producing an electrical output representative of said comparison; and,
reporting means for producing an output representative of the output from said comparison means.

**4,295,199**

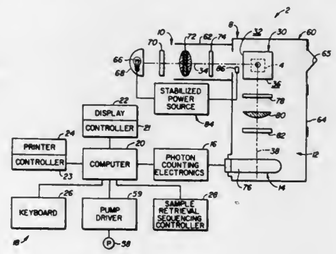
## AUTOMATIC FLUOROMETER AND DATA PROCESSOR FOR PERFORMING FLUORESCENT IMMUNOASSAYS

**Robert E. Curry, Novato, and Michael G. Simonsen, San Rafael, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.**

**Filed Oct. 22, 1979, Ser. No. 86,917**

**Int. Cl.³ G01N** *33/16*

**U.S. Cl. 364—555** **44 Claims**




1. A fluorescence immunoassay apparatus for quantitating relatively small amounts of a clinically significant composition comprising:
transparent means including a member constructed of a transparent material and defining therein a hollow cell for holding a liquid sample including fluorescent particles;
means for flowing the sample into and out of the cell including an inlet to and an outlet from the cell;
a sample probe;
intake tubing fluidly communicating the probe with the inlet;
discharge tubing fluidly communicating the outlet with a sample discharge point;
a pump located downstream of the outlet for intermittently flowing a sample from the probe to the cell, for maintaining the sample in the cell for a period of time, and for thereafter removing the entire sample from the cell and the intake tubing and replacing the removed sample with a fresh sample;
whereby the sample is not subjected to the flow inducing action of the pump until after it has passed the cell;
a light source for generating a stable light beam focused on the sample;
whereby the light beam causes fluorescent emissions by the particles in the sample, the intensity of which emissions is a function of the intensity of the light beam and the quantity of fluorescent particles in the sample; and
means in optical communication with the transparent means for detecting photons resulting from fluorescent emissions by the particles when excited by the light beam;
whereby the number of photons detected by the photon detecting means is a function of the number of fluorescent particles in the sample.

**4,295,200**

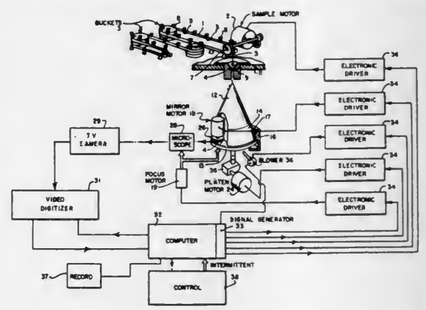
## AUTOMATIC PARTICLE ANALYZING SYSTEM

**Richard F. Johnson, Vero Beach, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 2, 1979, Ser. No. 90,787**

**Int. Cl.³ G01N** *15/02*

**U.S. Cl. 364—555** **14 Claims**




1. An automated system for analyzing particulate matter comprising:
a supply of said particulate matter,
a horizontally-disposed wheel-like platen,
means for feeding a portion of said supply particles to said platen,
means for distributing said portion in a single-file arrangement on the peripheral edge portion of the platen,
means for rotatably driving said platen,
means for scanning a frame area of said peripheral edge and for generating an electrical scan output, said scanned frame area being fixed relative to platen rotation, and
signal generating means operatively coupled to said scanned output and having an output coupled to said platen drive,

said generating means being operatively responsive to said scanned output for stopping said platen rotation when one of said particles is within said frame area whereupon a stationary particle is sequentially viewed and for resuming said rotation upon completion of said sequentially viewing whereupon another particle is carried into said frame area for viewing.

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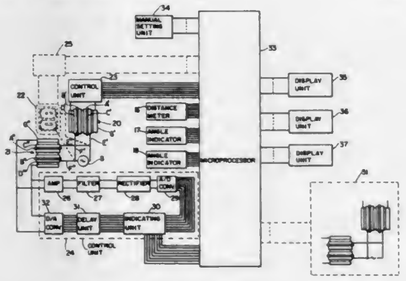
**4,295,201**

## ELECTRONIC DISTANCE-MEASURING INSTRUMENT

**Klas R. Wiklund, Täby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden**

**Filed Aug. 21, 1979, Ser. No. 68,440**
**Claims priority, application Sweden, Apr. 27, 1979, 7903749; Jun. 18, 1979, 7905325**
**Int. Cl.³ G01B 7/14**
**U.S. Cl. 364—561** **7 Claims**




1. An electronic distance measuring instrument comprising an electronic distance meter; vertical angle determining means for establishing at least one vertical angle; horizontal angle determining means for establishing the angle between the instrument and the horizontal plane; and calculating means for trigonometrical transformations of input signals received by the instrument, said horizontal angle determining means comprising a terrestrial magnetic field detector comprising at least two detector units which are fixedly mounted in the instrument and which are oriented in different directions so that at least two components of the magnetic flux in an instrument-based coordinate system can be established with the aid of the detector units; said calculating means including means for converting the components of the terrestrial magnetic field from the instrument-based coordinate system to an earth-based coordinate system using an input signal from the vertical angle determining unit; for calculating the direction of the terrestrial magnetic field in a horizontal plane; and for calculating the horizontal distance from fixed point to a measuring point based on the said input signals and the data obtained from said electronic distance meter.

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**4,295,202**

## HEXADECIMAL DIGIT SHIFTER OUTPUT CONTROL BY A PROGRAMMABLE READ ONLY MEMORY

**Thomas J. Joyce, Burlington, and David E. Cushing, Chelmsford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

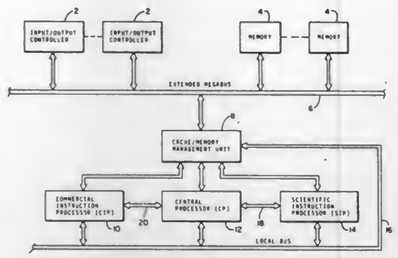
**Filed Nov. 9, 1979, Ser. No. 92,810**
**Int. Cl.³ G06F 7/48**
**U.S. Cl. 364—748** **20 Claims**

1. A shifter unit for performing scientific arithmetic operations comprising:

shifting means for receiving a mantissa and responsive to a plurality of shift signals for generating a plurality of shifter signals indicative of said mantissa shifted a number of positions specified by said shift signals;

multiplexer means coupled to said shifting means for receiving said shifter signals for transfer to an output;

read only memory means responsive to said plurality of shift signals for generating a plurality of enabling signals in a first state and a plurality of enabling signals in a second state, said multiplexer means being coupled to said read only memory means and responsive to said enabling sig-




nals in said first state for transferring said plurality of shifter signals, and responsive to said enabling signals in said second state for transferring characters having a value of ZERO to said output.

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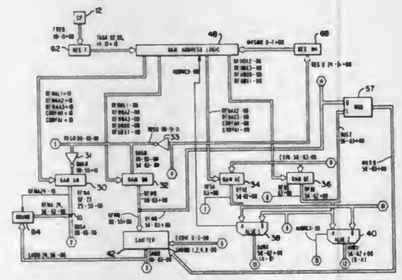
**4,295,203**

## AUTOMATIC ROUNDING OF FLOATING POINT OPERANDS

**Thomas F. Joyce, Burlington, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Nov. 9, 1979, Ser. No. 92,907**
**Int. Cl.³ G06F 7/48**
**U.S. Cl. 364—748** **7 Claims**



1. Apparatus for performing a scientific arithmetic rounding operation comprising:

memory means for storing a plurality of mantissas and generating a plurality of mantissa signals indicative of the binary value of said plurality of mantissas;

shifter means coupled to said memory means and responsive to a first plurality of mantissa signals for generating shifted mantissa signals;

arithmetic logic means coupled to said memory means and said shifter means and responsive to a second plurality of mantissa signals and said shifted mantissa signals for performing a predetermined arithmetic operation during a first cycle of operation for generating a plurality of result mantissa signals indicative of a binary result of said predetermined arithmetic operation and a normalization and an overflow signal, said plurality of result mantissa signals being stored in said memory means;

rounding means coupled to said arithmetic logic means for receiving a first signal and a second signal of said plurality of result mantissa signals, said rounding means being responsive to a rounding signal and a length signal in a first state for selecting said first signal, and said length signal in a second state for selecting said second signal for generating a round request signal;

control means coupled to said rounding means and responsive to said round request signal for generating a round control signal, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during a second cycle of operation;

said control means being further coupled to said arithmetic logic means and responsive to said normalization signal for initiating a normalization cycle during said second cycle of operation, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during said normalization cycle,

said control means being responsive to said overflow signal for initiating an overflow mantissa correction cycle during said second cycle of operation, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during said overflow mantissa correction cycle.

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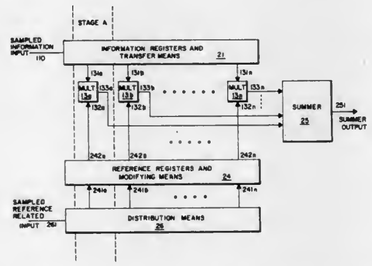
**4,295,204**

## PROGRAMMABLE CORRELATOR

**Drew E. Sunstein, 19 Parkhurst Dr., Nashua, N.H. 03060**

**Filed May 31, 1979, Ser. No. 44,392**
**Int. Cl.³ G06G 7/19**
**U.S. Cl. 364—824** **6 Claims**




1. A programmable correlator for correlating a sampled information signal with a programmable reference signal, such correlator comprising a plurality of correlator stages connected in cascade, each stage including:

(a) an information register, having an input for receiving at a given instant in time a sample of the information signal, a first output related to the signal stored in the register, and a second output also related to the signal stored in the register;

(b) a reference register, having an input for receiving a signal related to the programmable reference signal, and an output related to the stored signal;

(c) a multiplier, having a first input connected to the first output of the information register, a second input connected to the output of the reference register, and an output related to the product of the signals present at the multiplier's first input and its second input;

(d) first means, for transferring the sample of the information signal, from the second output of the information register in such stage, to the input of the information register in the next successive stage, such transfer being accomplished without undesirable amounts of changes in the signal stored in the reference register;

(e) second means, for summing the outputs of the multipliers in each stage; and

(f) third means, distinct from the reference register, for distributing one of a series of consecutive samples of a signal related to the reference signal to each reference register of the device, so that collectively the reference registers have received all samples in the series.

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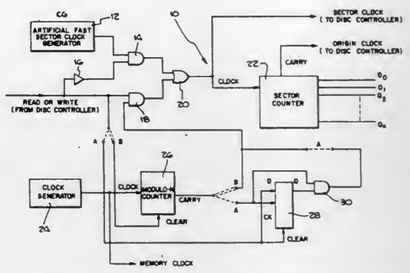
**4,295,205**

## SOLID STATE MASS MEMORY SYSTEM COMPATIBLE WITH ROTATING DISC MEMORY EQUIPMENT

**George H. Kunstadt, 4450 La Barca, Tarzana, Calif. 91356**

**Filed Oct. 16, 1978, Ser. No. 951,711**
**Int. Cl.³ G06F 3/00; G06G 7/48**
**U.S. Cl. 364—900** **6 Claims**




1. A mass memory system, having a plurality of memory modules, other than rotating disc memories, compatible with memory equipment employing a disc memory controller designed to operate only with rotating disc memories and in conjunction with a computer, said system comprising:

means connected to a disc memory controller for providing signals simulating origin and sector signals like those which are transmitted from a rotating disc memory system and for transmitting said signals to a disc memory controller; and

memory module selecting means for selecting one of said memory module for a read or write operation, said memory module selecting means being connected to said means for providing signals simulating origin and sector signals like those which are transmitted from a rotating disc memory system and also being connected to said plurality of memory modules and being responsive to cessation of said simulated origin and sector signals to select one of said memory module, whereby said memory equipment designed to operate only with rotating disc memories is usable with solid state memories having a plurality of memory modules other than rotating disc memories.

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**4,295,206**

## DOCUMENT SORTING METHOD

**John D. Cain, Kitchener, and Gary C. Lovie, Waterloo, both of Canada, assignors to NCR Canada Ltd.-NCR Canada Ltee, Mississauga, Canada**

**Filed Jun. 6, 1979, Ser. No. 45,820**
**Int. Cl.³ G06F 7/08**
**U.S. Cl. 364—900** **8 Claims**

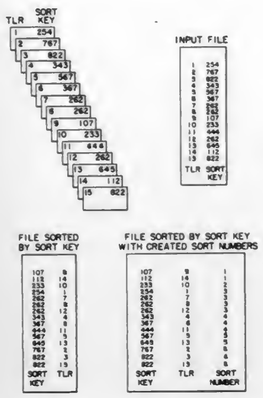
2. In a data processing system, a method of sorting a plurality of documents into selected pockets of a sorter comprising the steps of:

building a record file of data from said documents in physical sequential order with each document containing a sort key thereon,

determining the number of different sort keys for said documents by arranging the record file of data in sort key numerical order, those document records in the record file having the same sort key being arranged in physical sequence,

assigning sort numbers to said record file of data in a manner wherein all documents with the same sort key will have the same sort number when sequentially read for ascend-

ing order and incrementing the sort number in ascending numerical order upon encountering a descending physical sequence order, and




transporting said documents to said selected pockets identified by sort numbers assigned to said record file of data.

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**4,295,207**

## DATA PROCESSING APPARATUS FOR RECEIVING AND DECODING WORDS IN WHICH DATA IS ENCODED BY PHASE REVERSALS OR NON-PHASE REVERSALS OF A SIGNAL OF A PREDETERMINED FREQUENCY

**Martin L. Resnick, Chestnut Hill, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Nov. 14, 1979, Ser. No. 94,241**
**Int. Cl.³ G06F** *3/05, 5/00*
**U.S. Cl. 364—900** **21 Claims**

1. A data processing apparatus for receiving and processing coded words, each word including, in succession, a reference bit, a start bit, and additional bits, said bits being encoded within a corresponding number of bit periods by a predetermined number of cycles of a signal of a predetermined frequency, said start bit being reversed in phase with respect to the phase of the reference bit to represent a first logic value and each of the additional bits being either reversed in phase or not reversed in phase with respect to the preceding bit thereby to represent a first logic value or second logic value, respectively, said apparatus comprising:

an input arranged to receive each word;

first sampling means arranged to take successive samples of each word received at the input;

comparator means operative to compare samples taken by the first sampling means with frequency data representing a signal of the predetermined frequency and at least one approximation thereof;

first means operative when samples produced by the first sampling means compare with the frequency data of the comparator means to produce a condition indicating the reception of a reference bit;

second means operative following the aforesaid condition produced by the first means and when succeeding samples produced by the first sampling means do not compare with the frequency data of the comparator means to invert said samples;

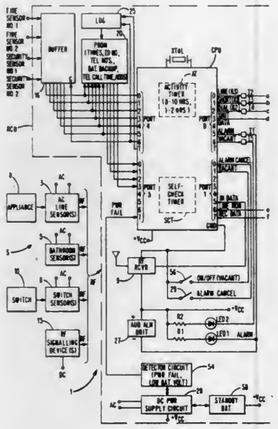
said comparator means being further operative to compare the inverted samples with the frequency data;

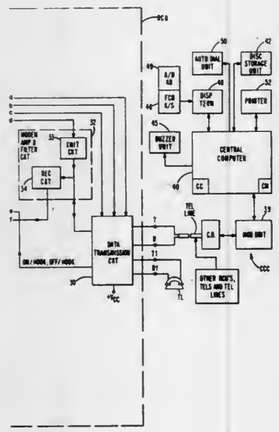
third means operative when inverted samples compare with the frequency data of the comparator means to produce a condition indicating a phase reversal corresponding to a start bit of the sampled word;

start means operative following the aforesaid condition produced by the third means to establish a count representing a predetermined time period the expiration of which corresponds to a predetermined point in the next bit period following the start bit period;

second sampling means arranged to alter the count established by the start means and operative at the expiration of the predetermined time period to take successive samples of the word at the input;

fourth means operative for each successive bit period following the start bit period to establish a count representing the aforesaid predetermined time period the expiration of which corresponds to the predetermined point in the next bit period;





said second sampling means being further operative to alter the count established by the fourth means and operative at the expiration of the predetermined time period to take successive samples of the word at the input;

fifth means arranged for each bit period following the start bit period and following the establishing of each count representing the predetermined time period by the fourth means to determine the phase of the bit in the previous bit period relative to the reference phase, and operative if the phase is different from the reference phase to invert the samples taken by the second sampling means and if the phase is the same as the reference phase to not invert the samples taken by the second sampling means;

said comparator means being further operative following each determination by the fifth means to compare the inverted or non-inverted samples of the fifth means with the frequency data;

sixth means operative if inverted or non-inverted samples of the fifth means in each bit period following the start bit period compare with the frequency data of the comparator means to produce an output of the second logic value;

seventh means operative if inverted or non-inverted samples of the fifth means in each bit period following the start bit period do not compare with the frequency data of the comparator means to invert the samples;

said comparator means being further operative to compare the inverted samples of the seventh means with the frequency data; and

eighth means operative if the inverted samples of the seventh means compare with the frequency data of the comparator means to produce an output of the first logic value.

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**4,295,208**

## SIGNALLING SYSTEM INCLUDING APPARATUS FOR GENERATING AND TESTING DATA AND COMMAND WORDS WITHIN FIRST AND SECOND MESSAGE INTERVALS

**Robert A. Norbedo, North Andover, and Martin L. Resnick, Chestnut Hill, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Nov. 14, 1979, Ser. No. 94,245**
**Int. Cl.³ G06F** *3/04, 11/30*
**U.S. Cl. 364—900** **17 Claims**

1. In a signalling system, apparatus comprising:

an input terminal;

an output terminal;

first means arranged during a first message interval to generate and apply data words in succession to the output terminal and to receive and test command words received in succession at the input terminal, each of said command words including flag data specifying the word as a command word, command data representing either a "send" command or a "retransmit" command, and other data, said first means comprising:

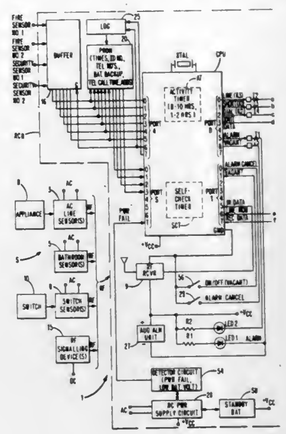
first test means operative to receive each command word at the input terminal and to test the command word to determine whether the word satisfies prescribed requirements of command words including whether the flag data specifies the word as a command word and the command data represents a "send" command or a "retransmit" command; and

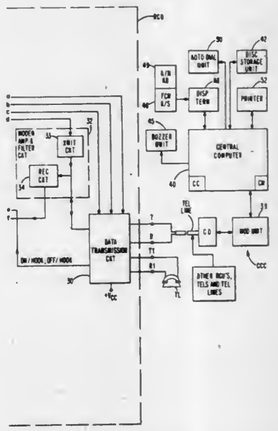
send/retransmit means operative if a command word tested by the first test means satisfies the prescribed requirements of a command word and represents a "send" command to generate and apply a data word to the output terminal, and operative if a command word tested by the first test means satisfies the prescribed requirements of a command word and represents a "retransmit" command to reapply the data word last applied to the output terminal back to the output terminal; and

second means arranged during a second message interval to receive and test data words received in succession at the input terminal and to generate and apply command words in succession to the output terminal, each of said data words including flag data specifying the word as a data word and other data, and each of the command words including command data representing either a "send" command or a "retransmit" command, said second means comprising:

second test means operative to receive each data word at the input terminal and to test the data word to determine whether the data word satisfies prescribed requirements of a data word including whether the flag data specifies the word as a data word; and

third means operative if a data word tested by the second test means satisfies the prescribed requirements of a data word to generate and apply a command word including command data representing a "send" command to the output terminal for requesting the next word, and operative if a data word tested by the second test means does





not satisfy the prescribed requirements of a data word to generate and apply a command word including command data representing a "retransmit" command to the output terminal for requesting the previous word.

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**4,295,209**

## PROGRAMMING AN IGFET READ-ONLY-MEMORY

**William B. Donley, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 28, 1979, Ser. No. 98,211**
**Int. Cl.³ G11C** *17/00, 11/40*
**U.S. Cl. 365—178** **2 Claims**

1. A programmed read-only-memory comprising:

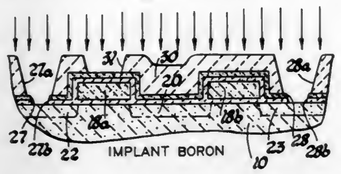
an array of programmable IGFETs on a semiconductor surface;

a silicon nitride coating on said surface, with apertures therein for electrically contacting all of said programmable IGFETs;

a glass coating on said silicon nitride coating, with apertures therein corresponding to said first-mentioned apertures

and additional apertures over channel regions of selected IGFETs;

said selected IGFETs having ion implanted channel regions




unaffected by gate operating voltage for said read-only-memory; and

conductors on said glass coating over said IGFETS through said first-mentioned and corresponding apertures.

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**4,295,210**

**POWER SUPPLY SYSTEM FOR MONOLITHIC CELLS**

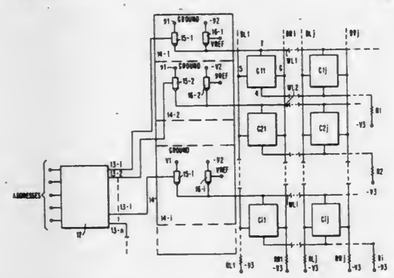
**Herve Beranger, Fontainebleau; Claude Marzin, Mennecy; Dominique M. Omet, Corbeil, and Jean-Luc Peter, Ris-Orangis, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 4, 1979, Ser. No. 71,826**

**Claims priority, application France, Nov. 30, 1978, 78 34434**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—227** **3 Claims**



1. In a monolithic memory having n word lines and an address decoder having n outputs, said monolithic memory being characterized by an improved bilevel powering system, said powering system including:

n discrete current switch circuit means;

each of said n current switch circuit means having an input and an output;

each of said n current switch circuit means having its input connected to a predetermined one of said n outputs of said address decoder and its output connected to a discrete one of said n word lines; and

each said current switch circuit means including, a first transistor having an emitter, base and collector and a second transistor having an emitter, base and collector, said base of said first transistor being connected to said input of said current switch circuit means, said collector of said first transistor being connected to a source of potential having a magnitude $|V1|$, said base of said second transistor being connected to a reference potential, said collector of said second transistor being connected to a source of potential having at magnitude of $|V2|$, where $|V1|<|V2|$, and said emitters of said first and second transistors being connected in common to the output of said current switch means.

**4,295,211**

**INERTIALLY RELEASED JETTISONABLE AIRBORNE BUOY**

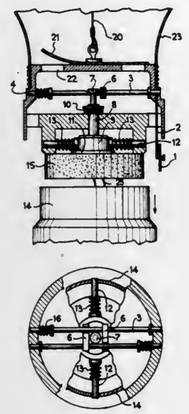
**Vito Suppa, and Daniel Viallet, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Feb. 22, 1980, Ser. No. 123,817**

**Claims priority, application France, Feb. 27, 1979, 79 05002**

**Int. Cl.³ H04B *1/59***

**U.S. Cl. 367—4** **7 Claims**



1. A radio buoy incorporating a hydrophone which can be jettisoned into the water from an aircraft and having two separate parts, an upper part containing a transmission antenna and the electronics associated therewith for transmitting the sound waves detected in water by the hydrophone, and supporting a float balloon protected by a casing, said balloon inflating during the fall of the buoy by means of a forced air intake established by the raising of openings in the form of scoops located at the bottom of the balloon, a lower diving part containing the hydrophone and its drum of wound suspension cable, whereby the hydrophone can be submerged at depths up to 2,000 meters, wherein the upper part of the buoy includes means operated by the raising of the scoops for unlocking the two separate parts of said buoy.

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**4,295,212**

**LINEAR ACOUSTIC ARRAY**

**Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 28, 1980, Ser. No. 115,643**

**Int. Cl.³ G01V *1/38*; H04R *1/44***

**U.S. Cl. 367—20** **8 Claims**

1. A flexible linear array for use in oceanography, said array comprising:

a braided mesh tube formed of a plurality of flexible strands defining a central lumen;

a plurality of instrumentation assemblies disposed within said tube at instrumentation stations spaced at predetermined distances from one another along the length thereof;

said tube being adapted to constrict only a limited amount to a predetermined minimum diameter when under linear tension so that said instrumentation assemblies are gripped by said tube while those portions of said lumen lying between said assemblies remain open while being of reduced diameter relative to the portions of said lumen containing said assemblies; and

conductor means of greater lengths than said distances interconnecting said assemblies and extending freely through said open, reduced diameter portions of said lumen without being gripped by said strands defining said reduced diameter portions, whereby said conductor means are free of said linear tension.

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**4,295,213**

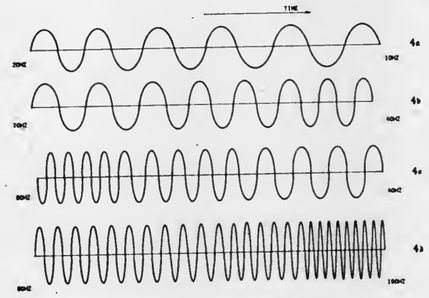
**COMPOSITE SEISMIC SIGNAL**

**Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.**

**Filed Oct. 9, 1979, Ser. No. 83,059**

**Int. Cl.³ G01V *1/143***

**U.S. Cl. 367—41** **8 Claims**



1. A method of generating a seismic signal of selected frequency content comprising:

generating simultaneously from substantially the same location a plurality of component swept sine wave seismic signals covering selected frequency segments within the frequency spectrum of said seismic signal of selected frequency content wherein said selected frequency segments do not substantially overlap in frequency content, said plurality of component swept since wave seismic signals including at least two signals substantially covering two of said frequency segments which are substantially contiguous in frequency content, the swept sine wave seismic signal substantially covering one of said two frequency segments sweeping in an ascending order of frequency and the swept sine wave seismic signal substantially covering the other of said two frequency segments sweeping in a descending order of frequency; and correlating the sum of said plurality of component swept sine wave seismic signals with the sum of the reflections of said plurality of component swept sine wave seismic signals.

**4,295,214**

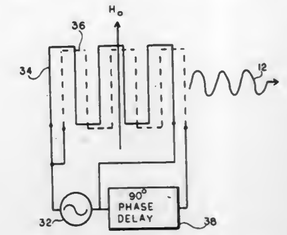
**ULTRASONIC SHEAR WAVE TRANSDUCER**

**Robert B. Thompson, Thousands Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Aug. 23, 1979, Ser. No. 68,988**

**Int. Cl.³ G01N *29/04***

**U.S. Cl. 367—140** **9 Claims**




1. A unidirectional electromagnetic acoustic transducer, comprising:

a first electrical conductor adapted to carry a first alternating current in a first current plane, said first current being conveyed by said first conductor at any instant in parallel and alternate directions spaced by a uniform amount;

a second electrical conductor adapted to carry a second alternating current 90° out of phase with respect to said first alternating current in a second current plane substantially coplanar with said first current plane, said second current being conveyed by said second conductor at any instant in parallel and alternate directions spaced by said uniform amount, said second conductor being parallel to but staggered from said first conductor by one half said uniform amount; and

a source of magnetic flux positioned to direct a static magnetic field parallel to said alternate directions.

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**4,295,215**

**SECOND HAND CORRECTION DEVICE FOR USE IN TIMEPIECES**

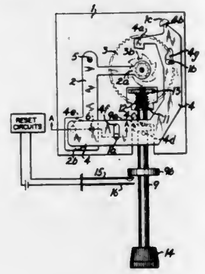
**Kiyoshi Kitai; Masuo Ogihara, and Kozo Chimura, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 27, 1979, Ser. No. 15,624**

**Claims priority, application Japan, Mar. 1, 1978, 53/23898**

**Int. Cl.³ G04B *27/02, 17/12, 27/00***

**U.S. Cl. 368—196** **7 Claims**




1. Second hand correction device in a timepiece having a second hand that regularly rotates in a particular direction, comprising, a second hand axis provided with a cam wheel fixed thereto and having a plurality of cams, a second hand correction member manually movable in a forward direction and a reverse direction and rotationally, control means for

controlling the forward and reverse direction movements of said second hand correction member such that, during forward movement of said correction member, said correction member is first rotated in a direction opposite to the regular direction of rotation of said second hand axis by said control means, and then said second hand correction member is engaged with one of said cams of said cam wheel, and thereafter during further forward movement said correction member is displaced by said control means in the direction of regular rotation of said second hand axis so as to forcibly rotate said cam wheel as said second hand correction member continues to move so as to advance a position of the second hand by an amount determined by the one of said cams of said cam wheel with which said second hand correction member is engaged.

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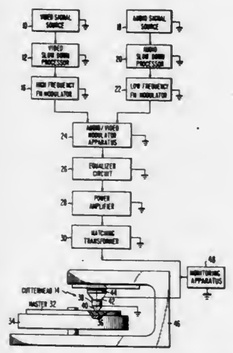
**4,295,216**

## APPARATUS FOR MEASURING THE CHARACTERISTICS OF A WIDEBAND ELECTROMECHANICAL RECORDING SYSTEM HAVING A TRANSFORMER

**Raymond L. Truesdell, Cherry Hill, and Michael D. Ross, Somerdale, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed May 30, 1980, Ser. No. 154,907**
**Int. Cl.³ H04N** *5/76;* **G11B** *27/36*
**U.S. Cl. 369—55** **9 Claims**



1. A monitoring apparatus for measuring a mechanical characteristic of a wideband electromechanical cutterhead in a system for recording signals within a given range of frequencies in a disc master, said system including a source for supplying said signals, said cutterhead being responsive to said signals for recording representations of said signals in said disc master when relative motion is established therebetween; said monitoring apparatus comprising:

means, connected to said source, for providing signals of a first polarity to a first signal path and for providing signals of polarity opposite to said first polarity to a second signal path;

said first signal path including said cutterhead and a sensing capacitor;

said second signal path including a balancing capacitor and said sensing capacitor;

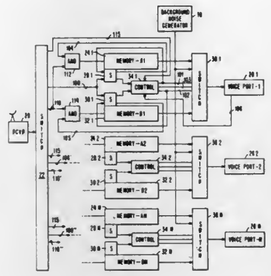
said balancing capacitor having a capacitance value such that the potential difference across said sensing capacitor is a substantial representation of said mechanical characteristic of said cutterhead.

**4,295,217**

## APPARATUS TO REDUCE THE EFFECT OF A MID-TALKSPURT FREEZE-OUT

**John W. Fennel, Jr., Olney; Robert J. Hallett, Adelphi, both of Md.; Stanley M. Head, and Constantine M. Melas, both of Los Gatos, Calif., assignors to IBM Corporation, Armonk, N.Y.**

**Filed Dec. 28, 1979, Ser. No. 108,076**
**Int. Cl.³ H04J** *3/16*
**U.S. Cl. 370—81** **4 Claims**



1. In a TDMA communication system having at least one transmission station where voice signals are digitized and transmitted over a communication link to a receiver having M voice ports, in no more than M time division multiplexed channels per frame period, apparatus for reducing the effects of voice channel freeze-out, comprising:

a first memory in said receiver having M storage locations each connected to said link for storing a respective one of said channels in the last received frame, each location having an input status bit to indicate whether the last access to the respective location was a write-in or a read-out operation, each respective location having an output switchably connected to a corresponding one of said M voice ports;

a second memory in said receiver having M storage locations each connected to said link for storing a respective one of said channels in the presently received frame, each location having an input status bit to indicate whether the last access to the respective location was a write-in or a read-out operation, each respective location having an output switchably connected to a corresponding one of said M voice ports;

a background noise generator in said receiver having an output switchably connected to each of said M voice ports;

control means in said receiver having an input connected to each of said input status bits in said first and second memories, having a first plurality of control outputs each connected to a respective one of said locations in said first memory for switchably connecting the output of each of said locations in said first memory to said corresponding voice port in response to the input status bit for the corresponding location in said second memory indicating that the respective channel in said present frame has not been stored, said control means including a second plurality of control outputs each connected to a respective one of said second memory locations, for switchably connecting the output of said background noise generator to said corresponding voice port in response to the input status bit for the corresponding location in said first and second memories indicating that the respective channel in said last frame and the respective channel in said present frame have not been stored;

whereby said corresponding voice port receives the corresponding last channel received when the corresponding present channel has not been received over said link, and receives a background noise signal when said corresponding channels from more than one consecutive frame are not received over said link.

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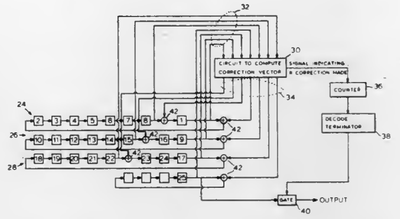
**4,295,218**

## ERROR-CORRECTING CODING SYSTEM

**Robert M. Tanner, Capitola, Calif., assignor to Regents of the University of California, Berkeley, Calif.**

**Filed Jun. 25, 1979, Ser. No. 51,416**
**Int. Cl.³ G06F** *11/10*
**U.S. Cl. 371—40** **10 Claims**



1. In self-correcting date transmitting apparatus wherein a selected member of a family of codewords is transmitted, thereafter received in a modified state, and then interpreted at the receiving end as being the member closest in appearance to the modified codeword, the method of transmitting and correcting data comprising the steps of:

(a) establishing the family of codewords by

(a1) selecting a connected bipartite undirected graph having a plurality of first nodes and a plurality of second nodes connected together by a plurality of edges and wherein none of said first nodes are connected to another of said first nodes and none of said second nodes are connected to another of said second nodes;

(a2) assigning a digit position for the codeword to each of said first nodes;

(a3) assigning subcode definitions to be associated with each of said first nodes;

(a4) assigning a set of values to be associated with selected ones of said second nodes such that as inputs to the ones of said first nodes connected to said selected ones of said second nodes said subcode definitions thereof are satisfied;

(a5) establishing said set of values from step (a4) in the digit sequence assigned in step (a2) as a member of the family of codewords; and,

(a6) repeating steps (a4) and (a5) for different sets of values until the desired number of members of the family have been established;

(b) placing the digits of each codeword as received following transmission in individual storage registers connected as inputs to test nodes corresponding to said first nodes of said graphs;

(c) testing the contents of said storage registers as inputs against said subcode definitions associated with said first node;

(d) using the contents of said storage registers as the received codeword is all said subcode definitions are satisfied, otherwise continuing to step (e);

(e) using the contents of said storage registers as the received codeword if a preselected number of corrective iterations have been tried, otherwise continuing to step (f); and,

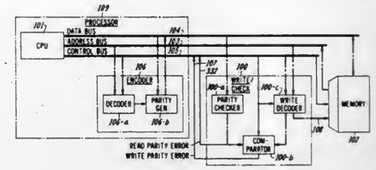
(f) modifying the contents of at least one of said storage registers which is connected as an input to one of said nodes which has its associated subcode definition unsatisfied and returning to step (c).

**4,295,219**

## MEMORY WRITE ERROR DETECTION CIRCUIT

**Don R. Draper, Lisle, and Peter Kusulas, Jr., Glen Ellyn, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Mar. 31, 1980, Ser. No. 135,248**
**Int. Cl.³ G06F** *11/10*
**U.S. Cl. 371—51** **4 Claims**



1. A data processing system comprising:

a processor (**109**) for generating data words comprising a plurality of bytes each having a plurality of data bits and check bits, for generating address signals defining memory data word locations, and for generating byte write signals identifying specific bytes of said data words;

control decoder means (**100-*c***) responsive to said byte write signals to selectively generate a write control signal for each byte identified by said byte write signals;

a memory arrangement (**102**) comprising a plurality of memory data word locations, each having a plurality of byte portions and responsive to said address signals and write control signals for storing said bytes into one of said memory data word locations;

transmission means interconnecting said processor, said control decoder and said memory arrangement for transmitting said data words, said address signals, and said byte write signals; and

checker means (**100-*a***) connected to said transmission means for generating a first output signal for each of said bytes whose bits have a predetermined arithmetic or logical relationship and for generating a second output signal for each of said bytes whose bits have some relationship other than said predetermined arithmetic or logical relationship; characterized in that

said processor further comprises a check bit generator (**106**) responsive to said byte write signals for generating said check bits such that for each byte identified by said byte write signals the bits have said predetermined arithmetic or logical relationship, and for all other bytes the bits have some relationship other than said predetermined relationship; and

said data processing system further comprises comparator means (**100-*b***) connected to said checker means and to said control decoder means responsive to said write control signals and said output signals for generating a write memory error signal if for one of said bytes both said write control signal and said second output signal are generated.

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**4,295,220**

## CLOCK CHECK CIRCUITS USING DELAYED SIGNALS

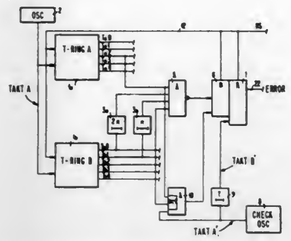
**Arnold Blum, Gechingen; Hellmuth R. Geng, Herrenberg; Hermann Schulze-Schoelling, Gaertringen, and Bernd Spaeth, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 29, 1979, Ser. No. 98,587**
**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853546**
**Int. Cl.³ H03K** *5/19;* **G06F** *1/04*
**U.S. Cl. 371—61** **15 Claims**

1. In a data processing system having a plurality of synchronized clocks therein, each of the clock outputs having a predetermined number of period signals in each cycle of operation,

apparatus for checking clock synchronization, said apparatus including:

(a) logic circuit means for receiving the time-based periodic signals from the clocks and for generating an output signal indicative of proper clock synchronization in response thereto;




(b) first circuit means connected between the clocks and said logic circuit means for applying a predetermined combination of the clock period signals to said logic circuit means; and

(c) second circuit means connected between said first circuit means and said logic circuit means for delaying at least one of the clock period signals before it is applied to said logic circuit means.

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**4,295,221**

**METHOD AND APPARATUS AT ONE-WAY OR TWO-WAY INFORMATION LINK TO EFFECT INTERFERENCE SUPPRESSION**

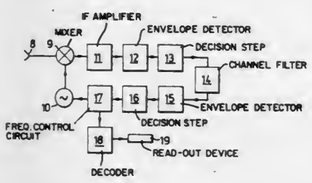
**Bengt Henoch, Hägersten, and Eilert Berglind, Bandhagen, both of Sweden, assignors to Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm, Stockholm, Sweden**

**Filed Apr. 18, 1978, Ser. No. 897,374**

**Claims priority, application Sweden, Apr. 28, 1977, 7704935**

**Int. Cl.³ H03K** *5/08, 7/06*

**U.S. Cl. 375—23** **9 Claims**




1. A method providing communication between first and second stations comprising the steps of providing a first pulse train containing certain information at said first station, chopping the pulses in said first pulse train at a constant pre-selected chopping frequency at said first station to develop a second pulse train, modulating said second pulse train onto a carrier signal at said first station, said carrier signal having a frequency tht is substantially higher than said chopping frequency, and said chopping frequency being individual to the communication link between said first and second stations to distinguish said link from other communication links, transmitting the thusly modulated carrier signal from said first station, receiving the transmitted carrier signal along with interference signals, if present, at said second station to provide a received signal, detecting the received signal at said second station to provide a detected signal having an intelligence signal component which contains said information and which has a pulse frequency corresponding to said pre-selected chopping frequency, filtering the detected signal at said second station to separate the intelligence signal component from other signal components of different frequencies and to thereby provide for the recovery of said intelligence signal component, and processing the recovered intelligence signal component following filtering to retrieve said information.

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**4,295,222**

**ARRANGEMENT FOR RESTITUTING THE CLOCK FOR A RECEIVER OF DATA TRANSMITTED BY PHASE MODULATION OF A CARRIER**

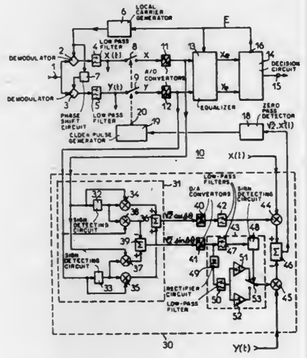
**Jean-Pierre H. Van Uffelen, Chevilly Larue, France, assignor to Telecommunications Radioelectriques et Telephoniques, Paris, France**

**Filed Feb. 8, 1980, Ser. No. 120,015**

**Claims priority, application France, Feb. 15, 1979, 79 03833**

**Int. Cl.³ H04L** *7/04*

**U.S. Cl. 375—106** **6 Claims**




1. An arrangement for restituting a clock included in the receiver of a system for the transmission of data by n-valent phase modulation of a carrier, and used to sample the demodulated signals formed by demodulation of the received signal with the modulating frequency by means of signals which are of the same phase and shifted 90° relative to a local carrier, this arrangement for restituting a clock comprising a circuit for controlling a local clock on the zero-passages of a signal characterized in that the circuit comprises local means to detect from the samples of said demodulated signals to which phase section, out of n possible phase sections of the transmitted signals, the phase of the received signal belongs at the sampling instants, and calculating means for forming the component which is of the same phase as, or the component which is shifted 90° relative to, the local carrier of a signal derived from the received signal by a phase shift $\Delta\theta$, so as to make its phase equal, at the sampling instants, to the centre phase of the said detected phase section, said component which is n phase with or shifted 90° relative to the local carrier constituting the signal whose zero transitions are used to control the local clock.

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**4,295,223**

**DIGITAL SIGNAL/NOISE RATIO AMPLIFIER APPARATUS FOR A COMMUNICATION SYSTEM**

**Harold B. Shutterly, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 25, 1979, Ser. No. 33,064**

**Int. Cl.³ H04B** *1/64;* **H04N** *7/16*

**U.S. Cl. 455—72** **5 Claims**

1. In a communication system including a transmitter, a receiver and a communication channel, a signal modifier apparatus associated with said transmitter comprising:

sampler means responsive to an input signal to be transmitted through said communication channel for deriving a

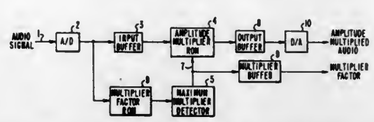


series of samples representative of a segment of said input signal;

analog-to-digital converter means for converting each sample to a digital sample value;

first means responsive to said digital sample values for subtracting a first predetermined digital value $M_1$ thereof to derive digital values representative of deviations of said input signal from said first predetermined value $M_1$;

second means for determining with said digital values representative of deviations a common factor K with $K>1$;




third means for multiplying each of said representative digital values by said common factor K to derive corresponding amplified digital values;

fourth means for adding a second predetermined digital value $M_2$ to each of said amplified digital values to derive corresponding augmented digital values;

digital-to-analog converter means for converting said augmented digital values into an intermediary analog signal;

said transmitter transmitting said intermediary analog signal through said communication channel.

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**4,295,224**

**TUNING INDICATOR APPARATUS FOR A FREQUENCY SYNTHESIZER TUNER**

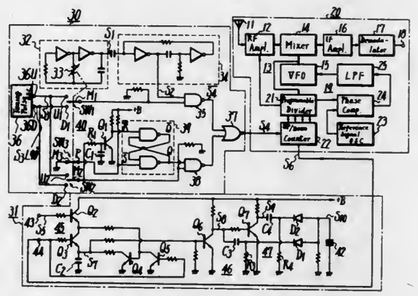
**Yoshinori Nishimura, Niiza; Kaoru Umeda, Kawasaki, and Hideo Harada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Aug. 14, 1979, Ser. No. 66,383**

**Claims priority, application Japan, Aug. 16, 1978, 53-99850**

**Int. Cl.³ H04B** *1/16*

**U.S. Cl. 455—156** **11 Claims**




1. Apparatus for indicating a changing tuning condition in a frequency synthesizer tuner of the type having a phase-locked loop including a reference oscillator, a variable frequency oscillator to produce a local oscillating signal, a programmable frequency divider coupled to the variable frequency oscillator for dividing the frequency of said local oscillating signal by a variable dividing ratio to produce a frequency-divided oscillating signal, a phase comparator for comparing the frequency-divided oscillating signal to the output of the reference oscillator to produce an error signal, and means for feeding back the error signal from the phase comparator to the variable frequency oscillator to adjust the frequency of the local oscillating signal and thereby adjust the tuning condition of the tuner, said apparatus comprising a source of counter pulses; counter means for counting counter pulses supplied thereto, said counter means being coupled to said programmable frequency divider to determine the dividing ratio thereof; manually operable slide switch means slidable in a first range to enable only a predetermined number of counter pulses to be supplied to said counter means and slidable in a second range to enable counter pulses to be supplied continually to said counter means; sensing means for sensing when the count of said counter means changes by a predetermined amount; and sound generating means for generating an audible sound indication in response to said sensed change in said count to indicate that said tuning condition has changed.

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**4,295,225**

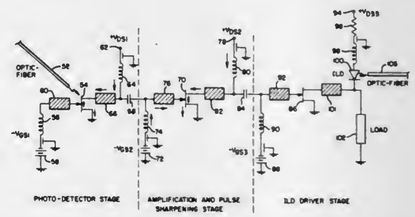
**FIBER OPTIC REPEATER**

**Jing-Jong Pan, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio**

**Filed Aug. 18, 1978, Ser. No. 934,885**

**Int. Cl.³ H04B** *9/00*

**U.S. Cl. 455—601** **10 Claims**




1. A fiber optic repeater comprising a photodetector circuit including an optic detecting MESFET coupled in said photodetector circuit to sense an optic input applied to the gate of said MESFET, an amplification and pulse sharpening circuit and a driver circuit connected in cascade with said photodetector circuit, said amplification and pulse sharpening circuit and said driver circuit each including a single MESFET.

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**4,295,226**

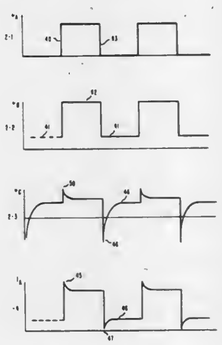
**HIGH SPEED DRIVER FOR OPTOELECTRONIC DEVICES**

**Leonard C. Dombrowski, Batavia, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jul. 2, 1980, Ser. No. 165,380**

**Int. Cl.³ H04B** *9/00*

**U.S. Cl. 455—618** **7 Claims**



1. A high speed driver for a unidirectional optoelectronic device (**13**), characterized by

means (**16, 30, 31, 32**) for biasing the device to draw a first prescribed steady-state current greater than zero when the

device is in a first state and a second prescribed steady-state current greater than the first prescribed current when the device is in a second state, and

means (35) for controlling the biasing means to cause the current drawn by the device momentarily to be a value less than that of the first prescribed current during a transition of the device from the second to the first state, thereby to simulate a negative current overdrive through the unidirectional drive.

# DESIGN PATENTS

## GRANTED OCT. 13, 1981

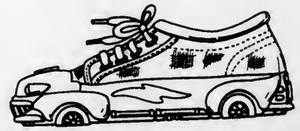
### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D32–049 | 261,217 |
| D34–001 | 261,218 |
| D32–073 | 261,219 |
| D32–021 | 261,266 |
| D32–021 | 261,267 |
| D32–032 | 261,268 |
| D28–035 | 261,316 |

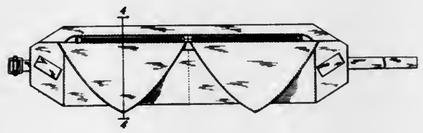
# DESIGNS

OCTOBER 13, 1981

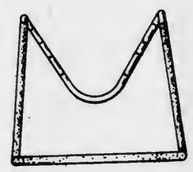
261,195
SHOE
Howard K. Weiss, New York, N.Y., assignor to Glen Shoe Company, New York, N.Y.
Filed Feb. 23, 1979, Ser. No. 14,747
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279



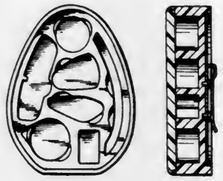
261,196
SPORTSMAN'S BELT
Robert P. Griffin, Orient, Iowa 50858
Filed Mar. 16, 1979, Ser. No. 21,075
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383



261,197
BELT ATTACHABLE HAMMER HOLDER OR THE LIKE
Donald Rowswell, 678 Lauderdale Ave., London, Ontario, Canada
Filed Jan. 15, 1979, Ser. No. 3,182
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

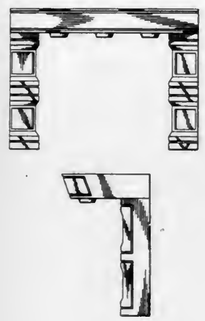


261,198
CONTAINER FOR CARRYING FIRST AID DATA AND EQUIPMENT
James Altadonna, 90 E. 2nd St., Deer Park, N.J. 11729
Filed Jun. 25, 1979, Ser. No. 27,403
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

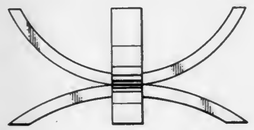


261,199
CANE
Allen W. Dockery, 900 Sypert, Carrizo Springs, Tex. 78834
Filed May 16, 1979, Ser. No. 39,788
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—7

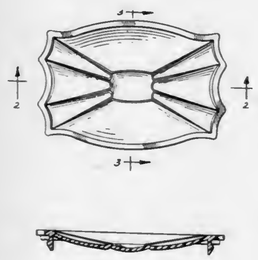
261,200
DISPLAY UNIT AND LIGHT FIXTURES THEREFOR
Jerry Shaw, 50 West Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Rd., both of, Akron, Ohio 44313
Division of Ser. No. 781,653, Mar. 28, 1977, Pat. No. Des. 253,143. This application Jan. 19, 1979, Ser. No. 4,903
Term of patent 14 years
Int. Cl. D20—*02;* D25—*02;* D26—*05*
U.S. Cl. D6—85



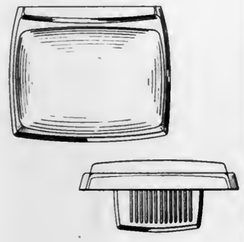
261,201
STAND
Jack E. Blake, P.O. Box 2102, Midland, Tex. 79701
Filed Apr. 4, 1979, Ser. No. 27,192
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



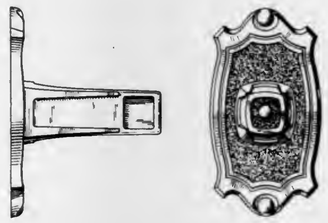
261,202
SOAP DISH FOR ATTACHMENT TO A FRAME
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,353
Term of patent 14 years
Int. Cl. D23—*02;* D7—*01*
U.S. Cl. D6—89



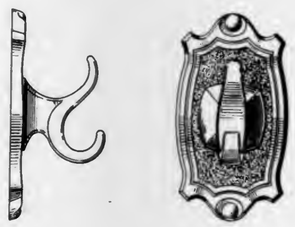
261,203
WALL MOUNTED SOAP DISH
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,358
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



261,204
TOWEL BAR SUPPORT POST
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,362
Term of patent 14 years
Int. Cl. D23—*02;* D8—*08*
U.S. Cl. D6—103



261,205
DOUBLE HOOK CLOTHES SUPPORT
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,361
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—122



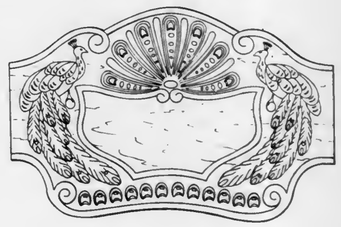


261,206
CHECK-OUT STATION ACCESSORY FRAME
Kenneth A. Lloyd, Jr., 10192 Orchard Park West Dr., Indianapolis, Ind. 46280
Filed Nov. 13, 1978, Ser. No. 960,002
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—143

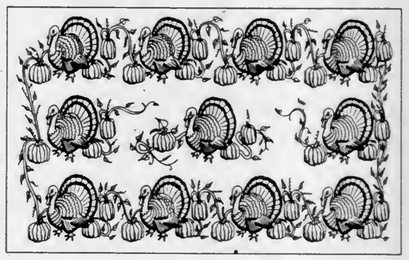
261,207
ROLL TOP WET BAR
Robert R. Robins, 721 N. Woodland, Minneapolis, Kans. 67467
Filed Dec. 3, 1979, Ser. No. 99,944
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—144

261,208
MIRROR
Richard J. Whiting, 66 Bonniebrook, Chatham, Ill. 62629
Filed Feb. 12, 1979, Ser. No. 11,450
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

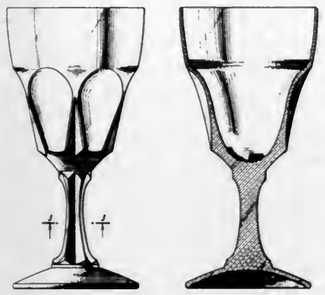
261,209
PANEL FOR A CHAIR BACK
David L. Lee, 1841 Port Margate Pl., Newport Beach, Calif. 92660, and Harry J. O'Connor, 26992 LaPaja, Mission Viejo, Calif. 92675
Filed Aug. 2, 1978, Ser. No. 930,585
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



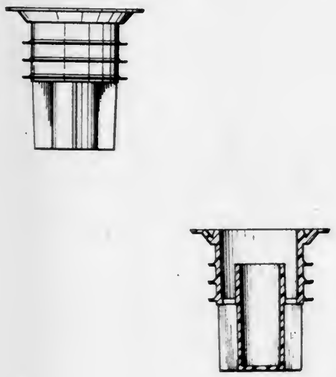
261,210
TABLECLOTH
Patricia Capanear, 102 Franklin Ave., Belleville, N.J. 07109
Filed Aug. 1, 1978, Ser. No. 930,084
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—286



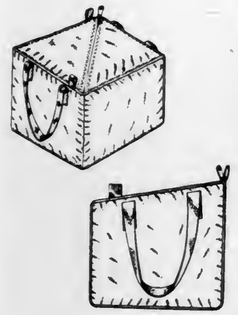
261,211
GOBLET OR SIMILAR ARTICLE
Jean-Jacques Durand, LaGarenne, 62510 Arques, France
Filed Jan. 3, 1980, Ser. No. 109,354
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—13



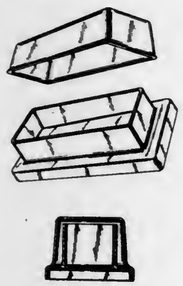
261,212
COMBINED FUNNEL AND POURING SPOUT
Frederick G. W. Mills, North Walsham, England, assignor to U.G. Closures & Plastics Ltd., England
Filed Jan. 25, 1979, Ser. No. 6,401
Claims priority, application United Kingdom, Jul. 28, 1978, 985662/78
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—68



261,213
INSULATED CARRIER FOR FOOD OR THE LIKE
Charles M. Perethian, Arroyo Grande, Calif.; Marcia L. Le Compte, and Bruce W. Vetter, both of Champaign, Ill., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Sep. 14, 1979, Ser. No. 75,671
Term of patent 14 years
Int. Cl. D03—*02*
U.S. Cl. D7—77

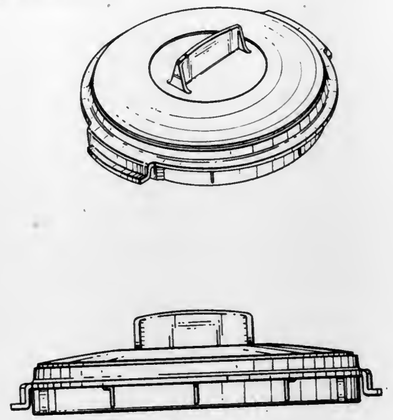


261,214
COMBINED BUTTER HOLDER DISH AND COVER
Alfred H. Oelzner, 1205 Leeds Ter., Baltimore, Md. 21227
Filed Jan. 2, 1979, Ser. No. 953,975
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84

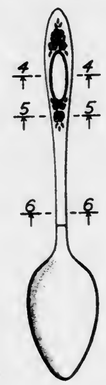




261,215
COFFEE URN LID
Leo A. Groh; Douglas D. Ludwig, both of West Bend, Wis.; David L. Painter, Glenview, Ill., and John H. Free, Kalispell, Mont., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 4, 1980, Ser. No. 118,121
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—131

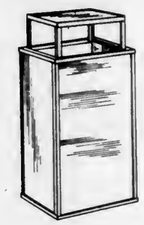


261,216
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Sep. 14, 1979, Ser. No. 75,639
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

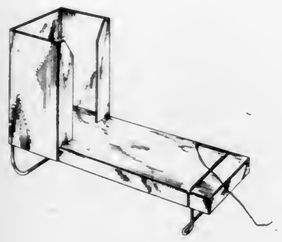



261,217
DISH OR POT SCRAPER
Clyde E. Mutch, 5238 Mt. Alifan, San Diego, Calif. 92111
Filed Aug. 23, 1979, Ser. No. 68,974
Term of patent 14 years
Int. Cl. D07—*05*
U.S. Cl. D32—49

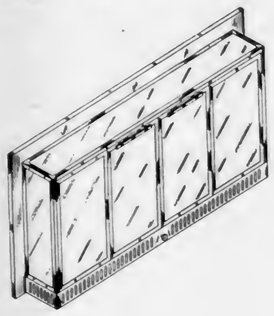
261,218
REFUSE CONTAINER
William A. Gilbert, Clayton, Mo., assignor to Clean City Squares, Inc., St. Louis, Mo.
Filed Mar. 6, 1978, Ser. No. 884,018
Term of patent 14 years
Int. Cl. D7—*07, 99*
U.S. Cl. D34—1



261,219
IRON HOLDER
Margaret D. Latimer, 1828 Ceres Way, Sacramento, Calif. 95825
Filed Jun. 20, 1979, Ser. No. 50,450
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D32—73

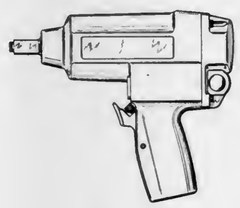


261,220
FIRE SCREEN
Ralph E. Matthews, Decatur, Ala., assignor to Matthews Machine Co., Inc., Decatur, Ala.
Filed Apr. 23, 1979, Ser. No. 32,718
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208

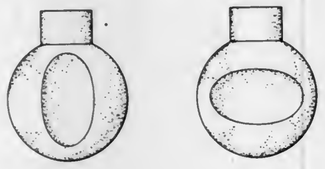


261,221
UNDERSIDE WICK HAND-HELD ROPE WICK APPLICATOR
Ricks H. Pluenneke, Rte. 7, Box 441E, Ft. Worth, Tex. 76119
Continuation-in-part of Ser. No. 156,086, Jun. 3, 1980. This application Oct. 31, 1980, Ser. No. 202,753
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—02

261,222
PNEUMATIC IMPACT WRENCH
Roderick F. Bunyea, Cockeysville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Aug. 8, 1979, Ser. No. 64,964
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68

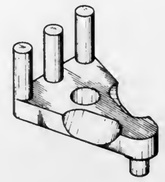


261,223
DOOR KNOB
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to HEWI, Heinrich Wilke GmbH, Fed. Rep. of Germany
Filed Aug. 7, 1979, Ser. No. 64,564
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, MR89
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—312

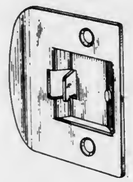




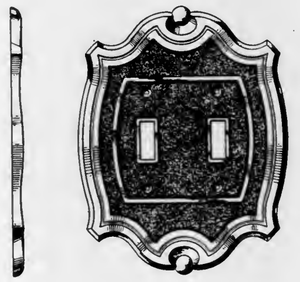
261,224
PIVOT PIN FOR MOVABLE LOUVERS OR THE LIKE
Paul H. Sanderson, Jr., Lewisville, Tex., assignor to Dowco Corporation, Dallas, Tex.
Filed Mar. 19, 1979, Ser. No. 21,616
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—323



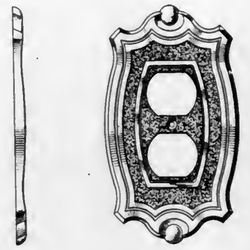
261,225
STRIKE PLATE
John G. Sterling, 888 Country Club Rd., Crystal Lake, Ill. 60014
Filed May 29, 1979, Ser. No. 42,860
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—344



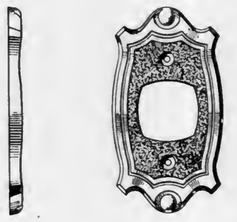
261,226
WALL PLATE FOR DOUBLE ELECTRIC SWITCH
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,359
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



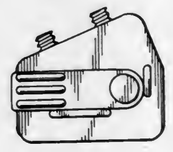
261,227
WALL PLATE FOR DOUBLE ELECTRIC SOCKET
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,360
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



261,228
WALL PLATE
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,363
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



261,229
QUICK RELEASE HONDA
Daniel A. Dvorsky, Rte. 2, Box 106-D, Conifer, Colo. 80433
Filed Jan. 29, 1979, Ser. No. 7,665
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396



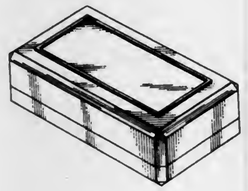
261,230
BOTTLE
John J. Bird, 1725 Glenoaks, San Fernando, Calif. 91340
Filed Jun. 25, 1979, Ser. No. 51,418
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—367

261,231
BOTTLE OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 21, 1979, Ser. No. 13,774
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

261,232
BOTTLE AND CAP OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 21, 1979, Ser. No. 13,775
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

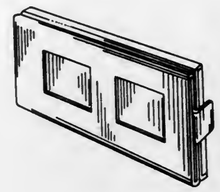
261,233
CONTAINER FOR LIQUIDS OR THE LIKE
Marianne C. Green, Midland, Mich., assignor to Koehring Company, Brookfield, Wis.
Division of Ser. No. 835,418, Sep. 21, 1977, Pat. No. Des. 254,234, which is a division of Ser. No. 552,702, Feb. 24, 1975, Pat. No. Des. 246,891. This application Jun. 29, 1979, Ser. No. 53,380
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398

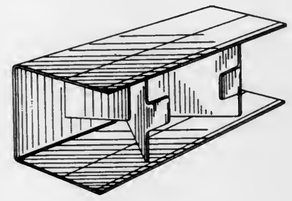
261,234
COMBINED BOX AND LID
Anthony S. Abraham, Stanmore, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Sep. 5, 1979, Ser. No. 72,855
Claims priority, application United Kingdom, Mar. 7, 1979, 988896/79
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432





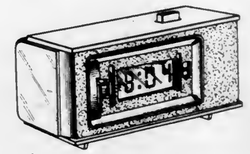
261,235
COLLAPSIBLE HANDLE
Robert G. McMullan, Oakville, Canada, assignor to SCM (Canada) Limited, Don Mills, Canada
Filed Feb. 8, 1979, Ser. No. 10,388
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434





261,236
CLOSURE ASSEMBLY FOR LIQUID CONTAINER
Robert P. Williams, Kingswood, Australia, assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jan. 29, 1979, Ser. No. 7,084
Claims priority, application Australia, Oct. 13, 1978, 76355
Term of patent 7 years
Int. Cl. D9—*07*
U.S. Cl. D9—435

261,237
DIGITAL CLOCK OR THE LIKE
David K. Haufe, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Division of Ser. No. 794,904, May 9, 1977, Pat. No. Des. 256,676. This application Sep. 28, 1979, Ser. No. 79,688
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

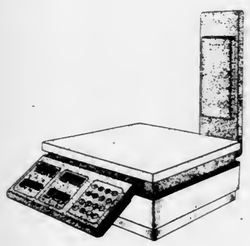


261,238
ADJUSTABLE BATTER BOARD
James K. Pitt, 1712 S. Walnut, Pittsburg, Kans. 66762
Filed May 3, 1979, Ser. No. 35,527
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—61

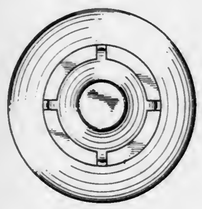
261,239
DUAL SIZE BRAKE SHOE APERTURE GAUGE
Thomas E. Morgan, 11061 Clinton River Dr., Sterling Heights, Mich. 48078
Filed Jan. 18, 1980, Ser. No. 113,408
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

261,240
BATTERY TESTER
Gary W. Vest, and James C. Loase, both of Cleveland, Ohio, assignors to New Era Products, Inc., Cleveland, Ohio
Filed Jun. 28, 1979, Ser. No. 53,047
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77

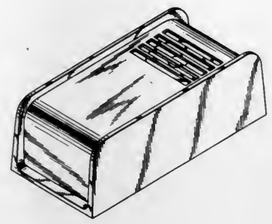
261,241
SCALE
Edward Lawing, Columbus, Ohio, assignor to Reliance Electric Co., Cleveland, Ohio
Filed Aug. 30, 1979, Ser. No. 71,313
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



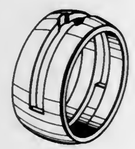
261,242
HOUSING FOR AN EMERGENCY ALARM FOR SWIMMING POOLS AND THE LIKE
Hendrik J. G. Lorist, 791 Cornell Dr., Santa Clara, Calif. 95050
Filed May 14, 1979, Ser. No. 38,632
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



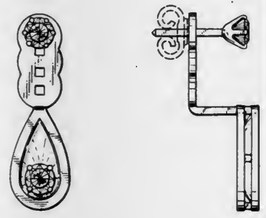
261,243
WATER SENSING ALARM
Richard P. Mintz, Oceanside; Ronald A. Buttner, Bellmore, and Alton K. Allen, Great Neck, all of N.Y., assignors to Datasonic, Inc., Mineola, N.Y.
Filed Dec. 3, 1979, Ser. No. 99,864
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



261,244
INTERLOCKING WEDDING BAND
Vito A. Scola, 139 Baker St., Providence, R.I. 02905
Filed Apr. 14, 1980, Ser. No. 139,977
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—27

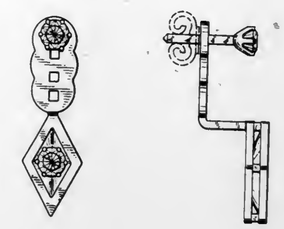


261,245
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,525
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

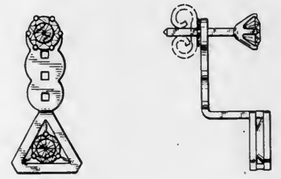




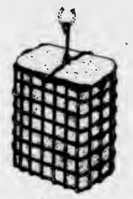
261,246
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,526
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



261,247
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,609
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



261,248
ORNAMENT PREFORM
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,533
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121



261,249
CREATURE ORNAMENT
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,534
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

261,250
CREATURE ORNAMENT
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,535
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

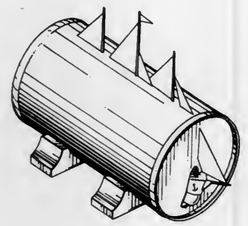
261,251
DESK ORNAMENT
Arthur E. Lange, 222 11th Ave. North, and Roger F. Bautch, 235 11th Ave. North, both of Waite Park, Minn. 56387
Filed Aug. 29, 1979, Ser. No. 70,917
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

261,252
FIGURINE OF A BULLDOG
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Mar. 9, 1979, Ser. No. 19,227
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

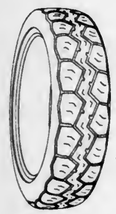
261,253
FIGURINE OF A LYNX
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 970,007
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,254
FIGURINE OF A POODLE
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 970,008
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,255
MODEL SHIP
William R. Ervin, 7011 Pinefield Dr., Orlando, Fla. 32809
Filed Mar. 25, 1980, Ser. No. 133,794
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—163

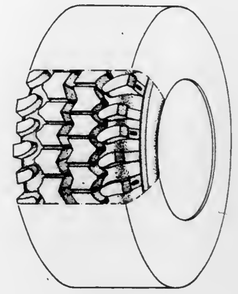


261,256
VEHICLE TIRE
Naoki Yamazaki, Kodaira; Hiroshi Kojima, Hino, and Hideaki Nishio, Kunitachi, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1978, Ser. No. 971,127
Claims priority, application Japan, Oct. 28, 1978, 53-45612
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



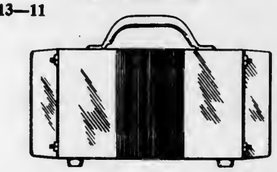


261,257
TIRE
Warren L. Guidry, Rayne, La., assignor to Interco Marketing, Incorporated, Rayne, La.
Filed Mar. 30, 1979, Ser. No. 25,576
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

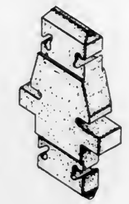


261,258
ADJUSTABLE VIEWING MIRROR
Patricia S. Lavanhar, 1776 Elmwood Dr., Highland Park, Ill. 60035
Filed Feb. 5, 1979, Ser. No. 9,509
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—189

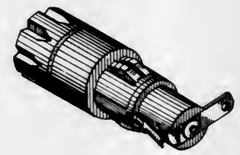
261,259
UNITIZED POWER CONVERTOR
Henry A. Swartz, 436 N. Rockwell, Oklahoma City, Okla. 73127
Filed Jul. 3, 1979, Ser. No. 54,504
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



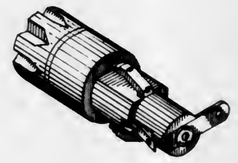
261,260
INSULATOR FOR AN OPEN-COIL ELECTRIC HEATING ELEMENT
Wayne R. Seeley, Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 22, 1979, Ser. No. 86,937
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18



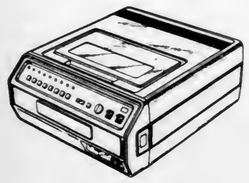
261,261
FUSE HOLDER
John C. Linton, Potomac, Md., assignor to FIC Corporation, Rockville, Md.
Filed May 24, 1979, Ser. No. 42,075
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



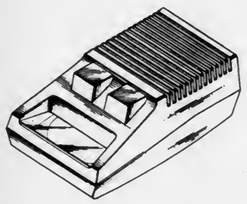
261,262
FUSE HOLDER
John C. Linton, Potomac, Md., assignor to FIC Corporation, Rockville, Md.
Filed May 24, 1979, Ser. No. 42,076
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



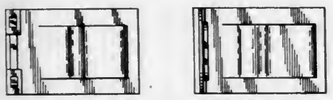
261,263
VIDEO TAPE RECORDER DECK
Koya Kurokawa; Noriyuki Arai; Hideo Takahashi, and Taisuke Saeki, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 7, 1979, Ser. No. 18,392
Claims priority, application Japan, Sep. 7, 1978, 53/38172
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2



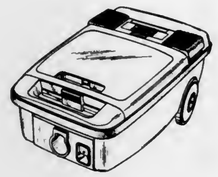
261,264
CASING FOR A MICROPHONOGRAPH
Bruce P. Carey, Saugus; Lloyd Y. Ishimaru, Agoura, and Moto Shimano, Los Angeles, all of Calif., assignors to Microsonics Corporation, Los Angeles, Calif.
Filed Aug. 10, 1977, Ser. No. 823,542
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14



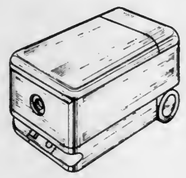
261,265
TELEPHONE NOTE HOLDER, OR THE LIKE
Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613
Filed Feb. 19, 1980, Ser. No. 122,250
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

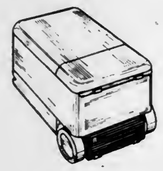


261,266
VACUUM CLEANER
Toshihiko Yoshida, Suita; Masakazu Tatsumi; Seiichi Sakakibara, both of Hirakata; Toshiki Kubo, Kobe; Tsugio Akita, Osaka, and Yoshiaki Ueda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 23, 1980, Ser. No. 114,528
Claims priority, application Japan, Oct. 8, 1979, 54-42524
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



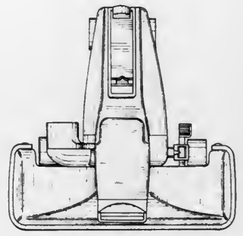
261,267
VACUUM CLEANER
Niklaus Hug, Romanshorn, Switzerland, assignor to Rommag P. Wörwag & Co., Romanshorn, Switzerland
Filed Dec. 29, 1978, Ser. No. 974,530
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 636
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



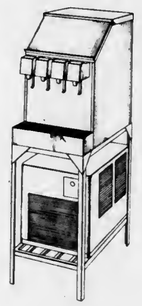




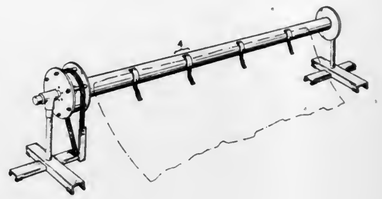
261,268
MOTOR HOUSING AND RUG NOZZLE FOR A VACUUM CLEANER
Sheldon Rutter, New York, N.Y., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Jan. 21, 1980, Ser. No. 114,067
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32



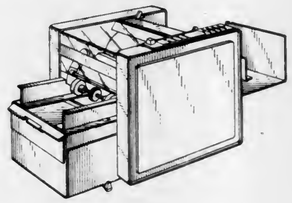
261,269
COMBINED DISPENSER CABINET AND STAND
Donald F. Cornett, Cartersville, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Mar. 4, 1980, Ser. No. 127,055
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116



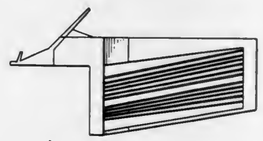
261,270
COMBINED SWIMMING POOL COVER-ROLLER AND BRAKE
Alfred D. Jeffrey, 9 Delaware St., Epping, New South Wales 2121, Australia
Filed Aug. 30, 1978, Ser. No. 938,123
Claims priority, application Australia, Mar. 1, 1978, 74142
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199



261,271
DUPLICATING APPARATUS
Casimir S. Samczyk, Itasca, Ill., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jul. 31, 1978, Ser. No. 929,386
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

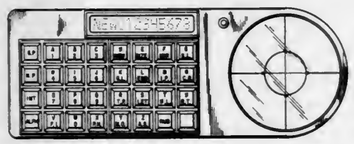


261,272
SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Calif.
Filed Sep. 24, 1979, Ser. No. 78,398
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



261,273
DESK TOP ELECTRONIC CALCULATOR
Masaaki Sakai, Tokyo, and Sakae Uematsu, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Jun. 28, 1979, Ser. No. 52,986
Claims priority, application Japan, Jan. 25, 1979, 54-2564
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

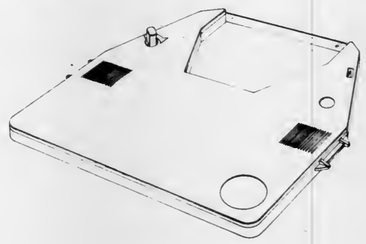
261,274
DIGITIZER CURSOR FOR COMPUTER DRAFTING
Gregg P. Gobeli, Plano, Tex., assignor to Camsco, Inc., Richardson, Tex.
Filed Aug. 24, 1979, Ser. No. 69,492
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



261,275
DISK FOR A MENSTRUAL CALENDAR
Kurt Christensen, Abildgaardsparken 29, 3460 Birkeroed, Denmark
Filed Jan. 24, 1979, Ser. No. 6,191
Claims priority, application Denmark, Jul. 24, 1978, 581
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—10

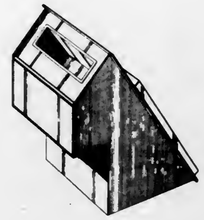
261,276
CASH REGISTER ATTACHMENT FOR SCREENING KEYS
William B. Denker, Fridley, and Jeanne C. Frank, Minneapolis, both of Minn., assignors to Red Owl Stores, Inc., Hopkins, Minn.
Filed Feb. 26, 1979, Ser. No. 15,457
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12

261,277
PRINTER RIBBON CASSETTE
Masanori Hashimoto, and Kolchi Soda, both of Tokyo, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan
Filed Jan. 2, 1980, Ser. No. 109,059
Claims priority, application Japan, Jul. 13, 1979, 54-29244
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12

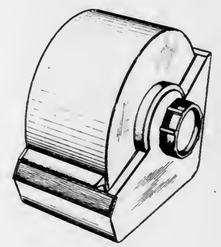


261,278
FONT OF VEGETABLE SCRIPT
Willi Rieser, Kloten, Switzerland, assignor to Pfanni-Werk Otto Eckart KG, Munich, Fed. Rep. of Germany
Filed Jan. 22, 1979, Ser. No. 5,481
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, MR 11421; Jul. 21, 1978, MR 11423
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—27

261,279
SOLAR DEMONSTRATION UNIT
Walter H. Barrett, Woonsocket, R.I., assignor to Columbia Chase Corporation, Braintree, Mass.
Filed Dec. 21, 1978, Ser. No. 971,947
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

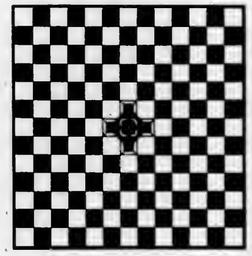


261,280
ROTARY CARD FILE
Albrecht Goertz, Nassau, The Bahamas, assignor to Rolodex Corporation, Secaucus, N.J.
Continuation-in-part of Ser. No. 757,514, Jan. 7, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,218
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

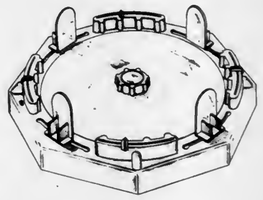


261,281
LAWN SIGN
Christopher L. McDonald, 28444 Joy Rd., Livonia, Mich. 48150
Filed Jan. 19, 1979, Ser. No. 4,723
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—38

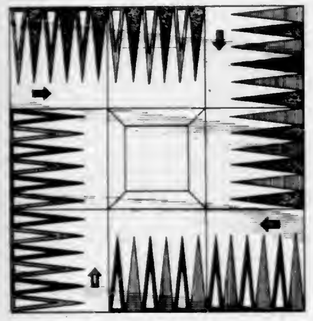
261,282
GAME BOARD
Enoch E. Hicks, 3727 Pittsburgh Ave., Dayton, Ohio 45406
Filed Aug. 13, 1979, Ser. No. 66,157
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24



261,283
GAME BOARD
James R. Becker, New York; David D. Austin, Rochester, both of N.Y., and Ronald A. Rudat, Attleboro, Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Aug. 27, 1979, Ser. No. 70,306
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—33



**261,284**
**BACKGAMMON GAMEBOARD (I)**
Robert M. Thomas, 2970 Mendon Rd.-15, Cumberland, R.I. 02864, and Robert E. Thomas, R.D.-3 Acorn St., Stanhope, N.J. 07874
Filed Aug. 6, 1979, Ser. No. 64,347
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—34



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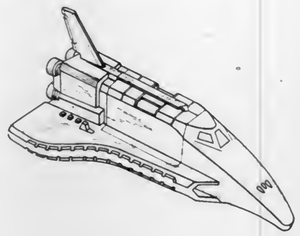
**261,285**
**GINGERBREAD MAN RATTLE**
Robin Clark, Kenley, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, England
Filed Sep. 5, 1979, Ser. No. 72,605
Claims priority, application United Kingdom, Mar. 16, 1979, 989079/79
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—65

**261,286**
**TOY SPACE SHUTTLE**
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 22, 1980, Ser. No. 114,277
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



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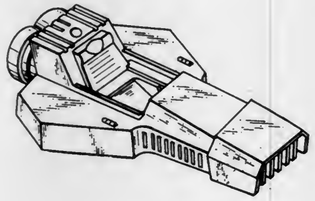
**261,287**
**TOY SPACE ROCKET**
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 22, 1980, Ser. No. 114,280
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



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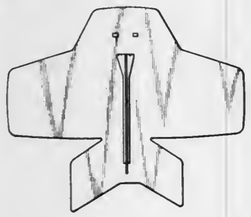
**261,288**
**TOY GLIDER**
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 10, 1979, Ser. No. 101,803
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89





**261,289**
**COMBINED CASH REGISTER AND BAR CODE READER TOY**
Palmer J. Schoenfield, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 12, 1980, Ser. No. 120,864
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—111

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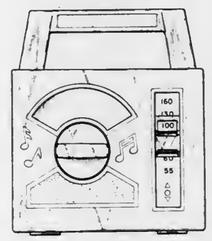
**261,290**
**TOY RADIO**
Paul D. Snyder, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1979, Ser. No. 85,692
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—113



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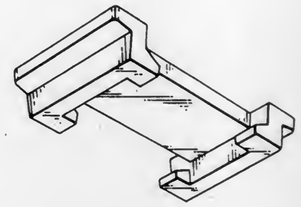
**261,291**
**SIMULATIVE TOY VEHICLE**
Donald C. Wilson, 18085 Birchcrest, Detroit, Mich. 48221
Continuation-in-part of Ser. No. 894,198, Apr. 5, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,556
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—128

**261,292**
**CLIP FOR TOY RAILWAY TRACK**
Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong
Filed Mar. 29, 1979, Ser. No. 25,130
Claims priority, application United Kingdom, Nov. 29, 1978, 987465/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143



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**261,293**
**JACK-IN-THE-BOX TOY**
Donald H. Samuels, Warwick, and Brian L. Newton, Woonsocket, both of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Feb. 15, 1979, Ser. No. 12,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—151

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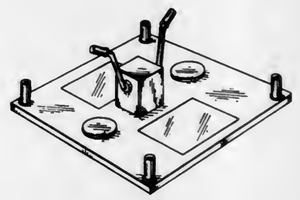
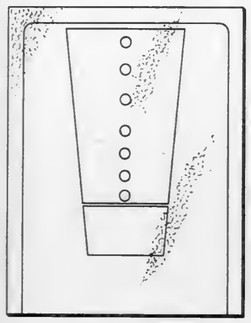
**261,294**
**ARM WRESTLING DEVICE**
Sterling A. Clink, 1930 Maxwell Ave., and Jack E. Barringer, 1313 Ontario Cir., both of Ames, Iowa 50010
Filed Sep. 8, 1978, Ser. No. 940,578
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



**261,295**
**INDOOR/OUTDOOR GOLF PRACTICE TARGET**
James Todd, 24 Casey La., East Northport, N.Y. 11731
Filed Nov. 5, 1979, Ser. No. 78,009
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



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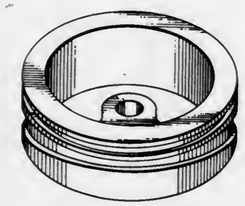
**261,296**
**PULLEY FOR COMPOUND ARCHERY BOWS**
Joseph M. Caldwell, 2259 W. Big Tujunga Canyon, Tujunga, Calif. 91042
Filed Jan. 28, 1980, Ser. No. 115,955
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—5



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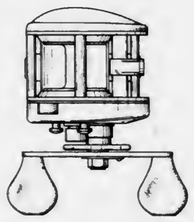
**261,297**
**FISHING REEL**
Masakazu Sakamoto, and Takeshi Shohoji, both of Fukuyama, Japan, assignors to Ryobi, Ltd., Fuchu, Japan
Filed Dec. 4, 1979, Ser. No. 100,151
Claims priority, application Japan, Jul. 24, 1979, 54-31206
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



**261,298**
**FISHING LURE**
Lester M. Davis, 10805 36 NW., Gig Harbor, Wash. 98335
Filed Apr. 23, 1979, Ser. No. 32,245
Term of patent 14 years
Int. Cl. D22—*27*
U.S. Cl. D22—27

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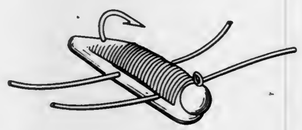
**261,299**
**FISHING LURE**
James E. Easterday, R.R. #1, Spencer, Ind. 47460
Filed Mar. 14, 1980, Ser. No. 130,457
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



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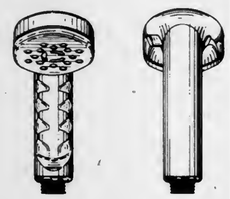
**261,300**
**HANDSHOWER**
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed May 23, 1979, Ser. No. 41,695
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, MR 6891
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35





**261,301**
**DENTAL HANDPIECE**
N. Dominic Marucci, Philadelphia, and David B. Wright, Wayne, both of Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Sep. 29, 1978, Ser. No. 947,123
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

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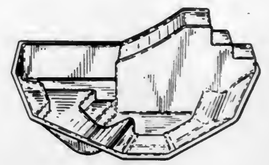
**261,302**
**SURGICAL CALIPER**
Michael R. Wheeler, 4448 Lennington Ct., Flint, Mich. 48503
Filed Mar. 5, 1979, Ser. No. 17,399
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

**261,303**
**HYDROTHERAPY POOL WITH SLIDE**
John L. Haller, 7249 Carrizo Dr., La Jolla, Calif. 92037
Filed Jul. 18, 1979, Ser. No. 58,746
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—38



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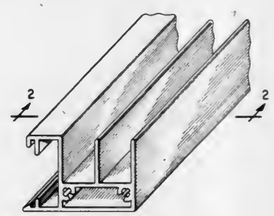
**261,304**
**FRAME MEMBER FOR WINDOWS OR THE LIKE**
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,561
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

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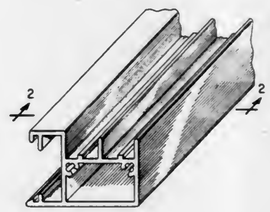
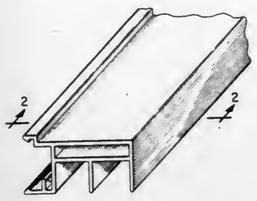
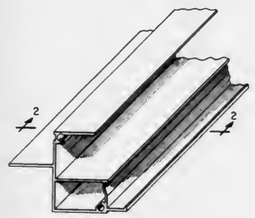
**261,305**
**FRAME MEMBER FOR WINDOWS OR THE LIKE**
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,562
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



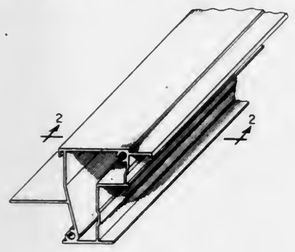
261,306
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,563
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



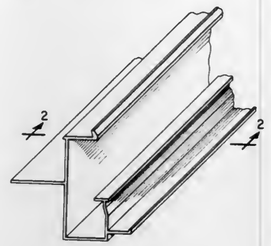
261,307
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,564
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



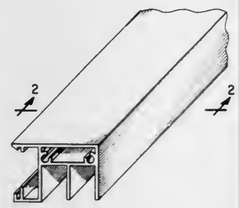
261,308
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,565
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



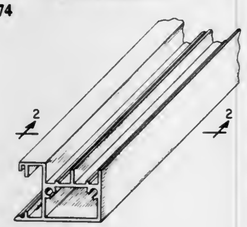
261,309
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,566
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,310
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,567
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

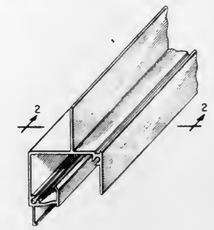


261,311
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,568
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74





261,312
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,641
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,313
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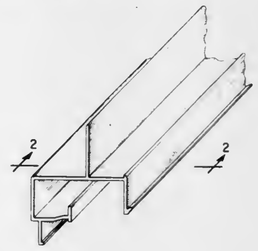
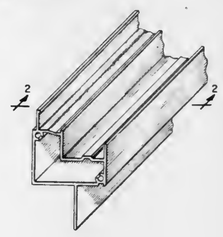
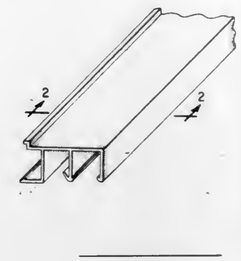
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,794
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—74



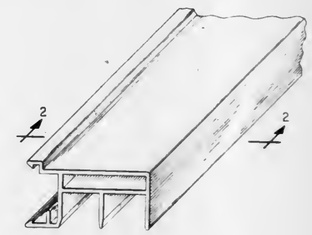
261,314
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,795
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



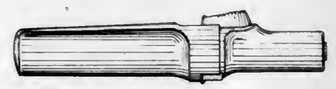
261,315
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 24, 1980, Ser. No. 115,085
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,316
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 24, 1980, Ser. No. 115,086
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,317
COMBINED CURLING IRON WITH COVER
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 19, 1980, Ser. No. 158,837
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



**261,318**
**CURLING IRON**
**Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany**

**Filed Jun. 19, 1980, Ser. No. 158,838**

**Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842**

**Term of patent 14 years**
**Int. Cl. D28—*03***

**U.S. Cl. D28—35**

**261,319**
**COVER FOR A CURLING IRON**
**Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany**

**Filed Jun. 19, 1980, Ser. No. 158,839**

**Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842**

**Term of patent 14 years**
**Int. Cl. D28—*03***

**U.S. Cl. D28—35**

# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 13TH DAY OF OCTOBER, 1981

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Acher, Jacques: *See—*
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Agfa-Gevaert Aktiengesellschaft: *See—*
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Ainsworth, Bobby J. Attachment for windshield wiper blades. 4,293,975, Cl. 15-250.410.

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Allen, Thomas C., 4,294,731, Cl. 260-17.4CL.

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Alberts, Alfred W.: *See—*
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Alford, Raymond N.: *See—*
Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.

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Altschuler, Bruce R.; Taboada, John; and Altschuler, Martin D. Topographic comparator. 4,294,544, Cl. 356-376.000.

Altschuler, Martin D.: *See—*
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Ammons, Staron E.; Paschall, Edwin L.; and Carter, Morris G. System and method for controlling the conditioning and delivery of air to a conditioned space. 4,294,403, Cl. 236-13.000.
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Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., to Electronic Systems Engineering, Inc. Beverage flow switch. 4,295,044, Cl. 250-229.000.
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Andresen, Donald D. Honeycomb overhead door. 4,294,055, Cl. 52-795.000.
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Assmann, Jurgen, to Grossag GmbH. Hot air grill. 4,295,034, Cl. 219-400.000.
Astegiano, Luciano; and van Veen, Wouter M. D., to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A. Line identifier for switchboards. 4,295,007, Cl. 179-7.00R.
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, to BASF Aktiengesellschaft. Process for the manufacture of 4,4'-diphenyl-methane diisocyanate and a mixture of diphenyl-methane diisocyanate isomers containing a small amount of uretdiones and hydrolyzable chlorine. 4,294,666, Cl. 203-72.000.
Atkins, Larry P., to General Motors Corporation. Battery vent cap for preventing electrolyte foam escape. 4,294,895, Cl. 429-84.000.
Atlantic Richfield Company: *See—*
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, 4,294,999, Cl. 568-910.000.
Pinaire, Ronald; and Everett, Gary L., 4,294,687, Cl. 208-58.000.
Aubusson, Russell C.; and Gledhill, Richard J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Interconnection arrangements for testing microelectronic circuit chips on a wafer. 4,295,182, Cl. 361-400.000.
Aulich, Hubert; and Graubmaier, Josef, to Siemens Aktiengesellschaft. Process for manufacturing Si useful for semiconductor components from quartz sand. 4,294,811, Cl. 423-350.000.
Ault, James R.: *See—*
Winzer, Frederick W.; and Ault, James R., 4,294,603, Cl. 65-346.000.
Ausserbauer, Valentin: *See—*
Pietralla, Norbert; Ausserbauer, Valentin; and Rosenthal, Christian, 4,294,771, Cl. 260-413.000.
Autelca AG: *See—*
Wuthrich, Werner, 4,294,553, Cl. 400-219.100.
Babcock & Wilcox Company, The: *See—*
Christiansen, David W., 4,294,660, Cl. 376-442.000.
Bach, Hartwig C.; and Hinderer, Helmuth E., to Monsanto Company. Acrylic fiber having improved basic dyeability and method for making the same. 4,294,884, Cl. 428-364.000.
Bagnall, Elizabeth A.; Guiliano, Basil A.; and Pfeffer, Henry A., III, to FMC Corporation. Continuous process for the manufacture of cyanuric acid. 4,294,962, Cl. 544-192.000.



Bahjat, Dhari S.: *See—*
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,295,096, Cl. 324-357.000.
Bahrmann, Heinrich: *See—*
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.
Bailey, William. Apparatus for assembling ladder-type frames. 4,293,991, Cl. 29-243.520.
Bair, Eugene C.; and Hopkins, Willard C., to General Electric Company. Automatic control for wire crimping machine. 4,294,006, Cl. 29-701.000.
Baird, Charles D. Cotton module compacter. 4,294,169, Cl. 100-48.000.
Bak, Johannes A.: *See—*
Nordstrom, Immo R.; and Bak, Johannes A., 4,294,185, Cl. 114-75.000.
Baker, Donal E.: *See—*
Stacey, Eric J.; and Baker, Donal E., 4,295,190, Cl. 363-162.000.
Baker, James A. Tool for removing casement window from building. 4,293,993, Cl. 29-278.000.
Baker, Joseph T.; Hoffler, George W.; and Hursta, William, to United States of America, National Aeronautics and Space Administration. Logic-controlled occlusive cuff system. 4,294,261, Cl. 128-691.000.
Baker Perkins Holdings Limited: *See—*
Naylor, Arthur V.; and Spencer, John K., 4,294,060, Cl. 53-506.000.
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., to International Business Machines Corporation. Composition containing alcohol and use thereof for epoxy removal. 4,294,729, Cl. 252-545.000.
Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Process for producing 2-bromo-3,5-disubstituted pyridines. 4,294,969, Cl. 546-286.000.
Baldwin, Stanley L.; Hampton, Vernon; and Embleton, Tony F. W., to Inco Limited. Mufflers for percussive pneumatic machines. 4,294,330, Cl. 181-230.000.
Balint nee Fodor, Katalin: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.
Balko, Edward N., to General Electric Company. High temperature and low feed acid concentration operation of HCl electrolyzer having unitary membrane electrode structure. 4,294,671, Cl. 204-128.000.
Ball Corporation: *See—*
Miller, Edward C.; and Straw, David A., 4,294,373, Cl. 220-70.000.
Ballester, Ricardo H.: *See—*
Thompson, Arthur H.; and Ballester, Ricardo H., 4,295,097, Cl. 324-429.000.
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., to International Business Machines Corporation. Master image chip organization technique or method. 4,295,149, Cl. 357-45.000.
Ban, Mikichi, to Canon Kabushiki Kaisha. Image forming optical system. 4,294,538, Cl. 355-51.000.
Bando Chemical Industries, Ltd.: *See—*
Ueno, Toshihiko; and Tomogane, Teruhisa, 4,294,712, Cl. 252-12.000.
Banford, Samuel E. Athletic footwear for non-contact or light contact sports. 4,294,023, Cl. 36-11.500.
Banke, Horst: *See—*
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.
Barach, Jeffrey T.; and Bluhm, Leslie, to Miles Laboratories, Inc. Process for improving the recovery of microbial cell biomass. 4,294,930, Cl. 435-261.000.
Baran, Walter J., to American Sterilizer Company. Pressure responsive conditioning control gas sterilization. 4,294,804, Cl. 422-112.000.
Barbarasch, Joseph: *See—*
Carollo, Jerome T.; and Barbarasch, Joseph, 4,295,159, Cl. 358-22.000.
Bard, Robert A. Upward vented trash receptacle for flexible collapsible trash liner. 4,294,379, Cl. 220-404.000.
Barker, John C.: *See—*
Turnbull, James O.; Barker, John C.; and Knight, Arthur J., 4,294,021, Cl. 34-224.000.
Barr, Rolla W. Security device for spare tires. 4,294,088, Cl. 70-56.000.
BASF Aktiengesellschaft: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.
Helfert, Herbert; Reinert, Friedrich; Richter, Paul; Vescia, Michele; and Wegerle, Dieter, 4,294,576, Cl. 8-137.500.
Kanter, Hartmut, 4,294,755, Cl. 260-154.000.
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,294,773, Cl. 260-453.00P.
Mensch, Siegfried; Epple, Gerhard; and Elser, Wolfgang, 4,294,581, Cl. 8-611.000.
Merger, Franz; and Towae, Friedrich, 4,294,971, Cl. 548-226.000.
Sappok, Reinhard; and Kranz, Joachim, 4,294,620, Cl. 106-288.00Q.
Schmidt, Wolfram; and Paust, Joachim, 4,294,766, Cl. 260-343.600.
BASF Wyandotte Corporation: *See—*
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,294,944, Cl. 525-423.000.
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, to Centro Ricerche Fiat S.p.A. Distributor-type injector pump, for multi-cylinder compression-ignition internal combustion engines. 4,294,210, Cl. 123-300.000.
Bassompierre-Sewrin, Christian C., to Martech International, Inc. Method for coating pipeline. 4,294,869, Cl. 427-177.000.
Bauer, Jerome: *See—*
Froehlig, Guy M., 4,294,782, Cl. 264-1.400.
Bauer, William A.: *See—*
Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., 4,294,438, Cl. 266-280.000.
Baumann, Dieter; and Bidegain, Pierre, to Bidegain S.A. Apparatus for determining the shoe size corresponding to a foot. 4,294,014, Cl. 33-3.00C.
Baumberger, Otto: *See—*
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Baxter Travenol Laboratories, Inc.: *See—*
Bayham, Edward L., 4,294,574, Cl. 493-213.000.
Bilstad, Arnold C.; and Foley, John T., 4,294,320, Cl. 177-1.000.
Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., 4,294,247, Cl. 128-214.00D.
Dennehey, T. Michael, 4,294,250, Cl. 128-247.000.
Bayer Aktiengesellschaft: *See—*
Beck, Ulrich; and Rohloff, Ekhard, 4,294,656, Cl. 162-192.000.
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,294,777, Cl. 260-544.00D.
Cramm, Gunther; and Blocher, Karl H., 4,294,985, Cl. 564-18.000.
Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, 4,294,934, Cl. 521-160.000.
Hendricks, Udo-Winifred; Hildebrand, Dietrich; and Kuth, Robert, 4,294,579, Cl. 8-549.000.
Henk, Hermann; Wunderlich, Klaus; and Wild, Peter, 4,294,580, Cl. 8-549.000.
Hoffmann, Hellmut, 4,294,762, Cl. 260-340.300.
Klein, Alfons; Kron, Rudolf; Wedemeyer, Karlfried; Knust, Ernst; and Havenith, Lothar, 4,294,715, Cl. 361-318.000.
Krock, Friedrich W.; and Neeff, Rutger, 4,294,578, Cl. 8-516.000.
Krock, Friedrich W.; Neeff, Rutger; and Scheiter, Heinz, 4,294,769, Cl. 260-378.000.
Kuhlthau, Hans-Peter, 4,294,756, Cl. 260-163.000.
Preiss, Michael; and Metzger, Karl G., 4,294,827, Cl. 424-226.000.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,294,967, Cl. 546-242.000.
Schmidt, Robert R.; and Thomas, Rudolf, 4,294,607, Cl. 71-92.000.
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,294,973, Cl. 548-320.000.
Voss, Eckart; Petersen, Uwe; and Stadler, Peter, 4,294,959, Cl. 536-17.00R.
Wagner, Kuno; Block, Hans-Dieter; and Schafer, Walter, 4,294,719, Cl. 252-182.000.
Wilms, Klaus G.; and Waldmann, Helmut, 4,294,703, Cl. 210-631.000.
Bayerische Motoren Werke Aktiengesellschaft: *See—*
Jochmann, Franz; and Jedeck, Helmar, 4,295,052, Cl. 307-10.00R.
Reh, Walter, 4,294,343, Cl. 192-113.00A.
Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Method of making seal for flexible container. 4,294,574, Cl. 493-213.000.
Bayham, Edward L.: *See—*
Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., 4,294,247, Cl. 128-214.00D.
BBC Brown, Boveri & Company Limited: *See—*
Kaspar, Ernst, 4,295,071, Cl. 310-213.000.
Beatty, William E., Jr.; and Ellsworth, James P., to Westinghouse Electric Corp. Circuit breaker with electromechanical trip means. 4,295,025, Cl. 200-288.000.
Beauvais, Max P.; and Camezon, Raymond E. Method of apparatus for canning food products. 4,294,167, Cl. 99-369.000.
Bechle, Philip D.; and Roth, Joseph A., to Eastman Kodak Company. Instant processing sleeve. 4,294,906, Cl. 430-207.000.
Beck, Ulrich; and Rohloff, Ekhard, to Bayer Aktiengesellschaft. Process for measuring the state of charge of suspensions and for controlling the addition of auxiliary agents to the suspensions. 4,294,656, Cl. 162-192.000.
Beckman Instruments, Inc.: *See—*
Stephens, Donald E.; and Taylor, John T., 4,294,799, Cl. 422-62.000.
Beckman, John T., to Owens-Corning Fiberglas Corporation. Controlled multipackage winding. 4,294,416, Cl. 242-18.00G.
Bedue, Abel J. H.: *See—*
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,294,311, Cl. 165-104.00S.
Beecham Group Limited: *See—*
Cassidy, Frederick; and Goudie, Alexander C., 4,294,972, Cl. 548-264.000.
Elliott, Thomas J.; and Ford, David, 4,294,823, Cl. 424-78.000.
Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, to Siemens Aktiengesellschaft. Device for coating objects. 4,294,194, Cl. 118-719.000.
Bell Telephone Laboratories, Incorporated: *See—*
Brunssen, James E., 4,295,188, Cl. 363-21.000.
Dombrowski, Leonard C., 4,295,226, Cl. 455-618.000.
Draper, Don R.; and Kusulas, Peter, Jr., 4,295,219, Cl. 371-51.000.
Wittwer, Norman C., 4,295,176, Cl. 361-91.000.
Bellas, Michael; and Cahill, Robert, to Eastman Kodak Company. Process for monoalkylation of dihydric phenols. 4,294,991, Cl. 568-650.000.

Bencene, Robert C.; and Granger, Charles A. Belt cleaning apparatus. 4,293,970, Cl. 15-21.00D.

Bendix Autolite Corporation: *See—*
Young, Ching T., 4,294,668, Cl. 204-1.00T.

Bendix Corporation, The: *See—*
Gage, Millard E.; and Landers, Derek J., 4,295,013, Cl. 200-11.00C.
O'Connor, James M.; and Goodrich, George W., 4,294,518, Cl. 350-357.000.

Bennett, Richard N., to National Instrument Company, Inc. Control system for filling machine. 4,294,294, Cl. 141-179.000.

Benson, Ernest J., to Better Agricultural Goals Corporation. Insulated container and process for shipping perishables. 4,294,079, Cl. 62-60.000.

Bentley Alemannia Limited: *See—*
Trautner, Johann G., 4,294,085, Cl. 66-75.100.

Bentley, John; and Thompson, Morice, to Imperial Chemical Industries Limited. Coating compositions. 4,294,735, Cl. 260-22.0CB.

Benzschawel, Steven J.: *See—*
Nauheimer, James F.; and Benzschawel, Steven J., 4,294,358, Cl. 206-419.000.

Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, to International Business Machines Corporation. Power supply system for monolithic cells. 4,295,210, Cl. 365-227.000.

Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L. Withdrawal roll unit for horizontal continuous billet casting machines. 4,294,306, Cl. 164-448.000.

Berentzen, Hardo: *See—*
Mayer, Harald; and Berentzen, Hardo, 4,294,086, Cl. 66-121.000.

Beresniewicz, Aleksander, to Du Pont de Nemours, E. I., and Company. Water-extendible oligomer solutions and coatings therefrom. 4,294,738, Cl. 260-29.4UA.

Bergdahl, Knut. Arrangement to counteract or prevent spreading of fire or smoke. 4,294,165, Cl. 98-1.000.

Berger, Mitchell H.; Gill, Peter J.; and Maresca, Louis M., to Union Carbide Corporation. Process for preparing polyarylates in the presence of a diphenyl ether. 4,294,956, Cl. 528-179.000.

Berger, Mitchell H.; Maresca, Louis M.; and Matzner, Markus, to Union Carbide Corporation. Process for preparing polyarylates. 4,294,957, Cl. 528-179.000.

Berglind, Eilert: *See—*
Henoch, Bengt; and Berglind, Eilert, 4,295,221, Cl. 375-23.000.

Bergthaller, Peter: *See—*
Helling, Gunter; Saleck, Wilhelm; and Bergthaller, Peter, 4,294,920, Cl. 430-569.000.

Berkel, Michael R., to Owens-Illinois, Inc. Reshipper carton for finished or unfinished TV bulbs. 4,294,359, Cl. 206-422.000.

Bernard, Claude, to Agence Nationale de Valorisation de la Recherche (Anvar). Measuring head enabling the production of physiological measurement signals designed to be positioned on or in corporeal parts. 4,294,258, Cl. 128-635.000.

Bernard, Leo N., to Pervel Industries, Inc. Dyed flocked fabric and method of making the same. 4,294,577, Cl. 8-488.000.

Beroff, Howard: *See—*
Jewusiak, Stephen J.; Beroff, Howard; and Schuler, Michael, 4,294,355, Cl. 206-339.000.

Berr, Charles E.; and Deyrup, Edward J., to Du Pont de Nemours, E. I., and Company. Thermal stabilization of polyalkylene terephthalate resin compositions. 4,294,938, Cl. 525-101.000.

Berthier, Daniel, to Hewlett-Packard Company. Detector arrangement for data-card readers. 4,295,040, Cl. 235-458.000.

Bertholdo, Gene: *See—*
Intrater, Josef; Bertholdo, Gene; and Intrater, Janet, 4,294,271, Cl. 134-113.000.

Bertin & Cie: *See—*
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.

Bertolacini, Ralph J.: *See—*
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,294,685, Cl. 208-10.000.

Bertotti, Elvio: *See—*
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,294,734, Cl. 260-22.0CB.
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,294,748, Cl. 260-22.0CB.

Best Lock Corporation: *See—*
Best, Walter E.; and Foshee, William R., 4,294,089, Cl. 70-150.000.
Best, Walter E.; Foshee, William R.; and Flack, Max L., 4,294,093, Cl. 70-369.000.

Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Latchbolt rim lock. 4,294,089, Cl. 70-150.000.

Best, Walter E.; Foshee, William R.; and Flack, Max L., to Best Lock Corporation. Pin tumbler lock with pull-resistant key plug. 4,294,093, Cl. 70-369.000.

Bettencourt, George S.: *See—*
Kovatch, George N.; Bettencourt, George S.; and Soles, Otto H., 4,295,054, Cl. 307-80.000.

Better Agricultural Goals Corporation: *See—*
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Betz Laboratories, Inc.: *See—*
Polizzotti, David M.; and Steelhammer, Joe C., 4,294,588, Cl. 55-5.000.

Bex, Peter T. J.; and Asselman, George A. A., to U.S. Philips Corporation. Drive for a machine comprising variable-stroke reciprocating pistons. 4,294,139, Cl. 74-839.000.

Bianchi, George. Harvester and method for harvesting green tomatoes. 4,294,063, Cl. 56-16.400.

Bidegain, Pierre: *See—*
Baumann, Dieter; and Bidegain, Pierre, 4,294,014, Cl. 33-3.00C.

Bidegain S.A.: *See—*
Baumann, Dieter; and Bidegain, Pierre, 4,294,014, Cl. 33-3.00C.

Bielz, Siegfried: *See—*
Lohrberg, Karl; Bielz, Siegfried; and Janisch, Paul, 4,294,815, Cl. 423-478.000.

Bigley, William J., Jr.; and Rizzo, Vincent J., to Lockheed Electronics Co., Inc. Load actuating servomechanism with resonance equalization. 4,295,081, Cl. 318-327.000.

Bilbrey, Donald L. Log cradle. 4,294,364, Cl. 211-60.00R.

Billenstein, Siegfried: *See—*
Kleber, Rolf; and Billenstein, Siegfried, 4,294,990, Cl. 568-601.000.

Billerud Uddeholm AB: *See—*
Kullander, Mats O., 4,294,872, Cl. 427-358.000.

Billot, Michel: *See—*
Godard, Pierre; and Billot, Michel, 4,294,309, Cl. 165-18.000.

Bills, David: *See—*
Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, 4,294,315, Cl. 166-322.000.

Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Method and apparatus for weighing material being collected. 4,294,320, Cl. 177-1.000.

Binder, Georg; and Wossner, Gunter, to Robert Bosch GmbH. Cooling apparatus for electrical machinery. 4,295,067, Cl. 310-52.000.

Binder, Klaus: *See—*
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, 4,294,209, Cl. 123-293.000.

Bindin, Peter J., to Chloride Silent Power Limited. Sealing of ceramic electrolyte tubes in electrochemical cells. 4,294,897, Cl. 429-104.000.

Bingham, John A. C., to Racal-Vadic, Inc. Switched-capacitor modulator. 4,295,105, Cl. 332-9.00R.

Bings, Hubert: *See—*
Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

Bio-Rad Laboratories, Inc.: *See—*
Curry, Robert E.; and Simonsen, Michael G., 4,295,199, Cl. 364-555.000.

Biondetti, Mario, to Escher Wyss Limited. Controlled deflection roll. 4,293,988, Cl. 29-116.0AD.

Bios Inc.: *See—*
Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.

Biospherics Incorporated: *See—*
Levin, Gilbert V.; and Straat, Patricia A., 4,294,931, Cl. 435-301.000.

Bissell, Eugene R.: *See—*
Smith, Robert E.; and Bissell, Eugene R., 4,294,923, Cl. 435-23.000.

Bjorklund, Anders; Persson, Erik; and Virsberg, Lars-Goran, to Asea Aktiebolag. Sheet-wound transformer or reactor. 4,295,113, Cl. 336-84.00M.

Black, John W., to Pemco-Kalamazoo, Inc. Metal disk wheel with resilient tread and bearing support. 4,294,491, Cl. 301-63.0DD.

Black, John W.: *See—*
Peters, Lester L.; and Black, John W., 4,294,109, Cl. 73-119.00A.

Blackburn, Martin J.; and Smith, Michael P., to United Technologies Corporation. Titanium alloys of the TiAl type. 4,294,615, Cl. 75-175.500.

Blair, Eskel B.; and Koleske, Joseph V., to Union Carbide Corporation. Stabilizers for cycloaliphatic epoxide containing compositions. 4,294,746, Cl. 260-37.0EP.

Blair, Matthew J.; and Wiktorowski, Thomas A., to Republic Steel Corporation. Method and apparatus for cooling BOF hood paneling. 4,294,432, Cl. 266-46.000.

Blake, William W., to Caterpillar Tractor Co. Pressure modulating valve. 4,294,278, Cl. 137-115.000.

Blanchard, Carroll H.; and Marcelonis, Robert P. Shield for typewriter keyboard and cylinder. 4,294,557, Cl. 400-714.000.

Blau KG Fabrik Fur Kraftfahrzeugteile: *See—*
Gerdes, Thedor, 4,294,375, Cl. 220-293.000.
Gerdes, Theodor, 4,294,281, Cl. 137-541.000.

Blauer, Aaron. Prefabricated load bearing structure. 4,294,052, Cl. 52-236.500.

Blocher, Karl H.: *See—*
Cramm, Gunther; and Blocher, Karl H., 4,294,985, Cl. 564-18.000.

Block, Hans-Dieter: *See—*
Wagner, Kuno; Block, Hans-Dieter; and Schafer, Walter, 4,294,719, Cl. 252-182.000.

Block, Thomas S., to Clarke-Gravely Corporation. Flour treating machine with squeegee. 4,293,971, Cl. 15-98.000.

Bloomfield Farms, Inc.: *See—*
Olin, C. Howard, 4,294,295, Cl. 144-3.00K.

Blueberry Equipment, Inc.: *See—*
Patzlaff, Albert W., 4,294,691, Cl. 209-3.100.

Bluhm, Leslie: *See—*
Barach, Jeffrey T.; and Bluhm, Leslie, 4,294,930, Cl. 435-261.000.

Blum, Arnold; Geng, Hellmuth R.; Schulze-Schoelling, Hermann; and Spaeth, Bernd, to International Business Machines Corporation. Clock check circuits using delayed signals. 4,295,220, Cl. 371-61.000.

Board of Reagents, University of Texas: *See—*
Serwer, Philip, 4,294,684, Cl. 204-299.00R.

Boaz, Premakaran T., to Ford Motor Company. Method for developing a pattern on a ceramic substrate. 4,294,867, Cl. 427-96.000.





Bock, Erich: *See—*
Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, 4,294,172, Cl. 102-473.000.

Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, to Bayer Aktiengesellschaft. Color-stabilized aromatic carboxylic acid chlorides and a process for their preparation. 4,294,777, Cl. 260-544.00D.

Bodenbender, Manfred; Reinhardt, Willy; and Ritzenhoff, Hermann, to Hermann Ritzenhoff, Firma. Metal sealing cap. 4,294,368, Cl. 215-256.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Giesenberg, Peter, 4,294,128, Cl. 74-5.440.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.
Tomoff, Toma, 4,294,127, Cl. 73-864.210.

Bodewein, Jakob, to Jagenberg Werke AG. Machine for the crosscutting of a web conveyed as a multi-ply web. 4,294,145, Cl. 83-302.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Non adjustable hydraulic cylinder. 4,294,163, Cl. 92-52.000.

Boeing Company, The: *See—*
Horne, William E., 4,294,602, Cl. 65-40.000.
Hyatt, Michael V.; and Quist, William E., 4,294,625, Cl. 148-2.000.
Klees, Garry W., 4,294,068, Cl. 60-204.000.

Boese, Harold L., to Cryogenics Unlimited. Cryogenic powered vehicle. 4,294,323, Cl. 180-54.00B.

Boettcher, John W.: *See—*
Adin, Anthony; Boettcher, John W.; and Fleming, James C., 4,294,912, Cl. 430-341.000.

Bofors America, Inc.: *See—*
Studlien, Vance D., 4,295,116, Cl. 338-4.000.

Bogner, Richard D. Disc-on-rod end-fire microwave antenna. 4,295,141, Cl. 343-753.000.

Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., to SCA Development Aktiebolag. Method and apparatus for controlling wood pulp grinding machines. 4,294,412, Cl. 241-30.000.

Bolesky, Richard C.: *See—*
Gold, Barry L.; and Bolesky, Richard C., 4,293,963, Cl. 3-1.910.

Boliden Aktiebolag: *See—*
Hellestam, Carl-Johan S., 4,294,705, Cl. 210-695.000.

Bollinger, Roger K.: *See—*
Nims, Philip A.; and Bollinger, Roger K., 4,294,291, Cl. 139-438.000.

Bonifer, Georg W.: *See—*
Killmann, Irolt; and Bonifer, Georg W., 4,294,546, Cl. 356-399.000.

Bonori, Maurizio; and Franconi, Cafiero, to AD.ELE. -Advanced Electronics- S.R.L. Low consumption pulses doppler effect intrusion sensor. 4,295,131, Cl. 340-554.000.

Boone, Gary A., to Carmet Company. Eight edge positive chip control insert. 4,294,566, Cl. 407-114.000.

Borg-Warner Corporation: *See—*
Simmons, John P., 4,294,338, Cl. 192-4.00A.

Borio, Richard W.; and Mehta, Arun K., to Combustion Engineering, Inc. Tangential firing system. 4,294,178, Cl. 110-347.000.

Boris, Robert W.: *See—*
Oram, W. Wayne; Oram, Nora L.; and Boris, Robert W., 4,294,239, Cl. 128-96.000.

Borja, Jesus; and Halvorsen, Jack R., to Illinois Tool Works Inc. Threaded screw mounting means. 4,295,003, Cl. 174-53.000.

Borowski, Edward: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Borrelli, Dominick. Electrical housing and switch box. 4,295,018, Cl. 200-51.090.

Borsig GmbH: *See—*
Kehrer, Wolfgang; and Lachmann, Helmut, 4,294,312, Cl. 165-134.00R.

Borzym, John J. Tube cutting apparatus. 4,294,147, Cl. 83-382.000.

Bosch-Siemens Hausgerate GmbH: *See—*
Reichl, Ernst; and Marloth, Herbert, 4,294,407, Cl. 239-102.000.

Bosso, Joseph F., to PPG Industries, Inc. Cationic polymers and their use in electrodeposition. 4,294,741, Cl. 260-29.6NR.

Boswell, William C. Shifting valve. 4,294,287, Cl. 137-625.690.

Bottcher, Winfried; and Germer, Kurt, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for applying thread staples to folded sheets. 4,294,182, Cl. 112-21.000.

Boutin, Jean; Guenot, Bernard; and Jamet, Bruno, to Rhone-Poulenc Industries. Aqueous monomer solutions adapted for direct photopolymerization. 4,294,676, Cl. 204-159.230.

Bouwman, Johannes E., to Nedschroef Octrooi Maatschappij N.V. Self-locking fastener. 4,294,300, Cl. 411-185.000.

Bouyoucos, John V.: *See—*
Nelson, David E.; and Bouyoucos, John V., 4,294,513, Cl. 350-96.290.

Bowerman, Leonard E., to Electrolux Corporation. Vacuum cleaner including automatic shutoff device. 4,294,595, Cl. 55-213.000.

Bowman, John A.: *See—*
Dulaney, Donald C.; and Bowman, John A., 4,294,619, Cl. 106-188.000.

Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., to Bertin & Cie. Solar collector. 4,294,232, Cl. 126-443.000.

Boyesen, Eyvind, to Performance Industries, Inc. Fuel porting for two cycle internal combustion engine. 4,294,202, Cl. 123-73.0PP.

Boys, John T., to University of Auckland, The. Apparatus and method for generating waveforms which are particularly suitable for a PWM-driven motor. 4,295,189, Cl. 363-41.000.

Bozon, Alfred; Koberstein, Edgar; Pletka, Hans-Dieter; Volker, Herbert; and Lakatos, Eduard, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Catalyst for the purification of exhaust gases of internal combustion engines. 4,294,726, Cl. 252-462.000.

Bozzuto, Carl R.: *See—*
Darling, Scott L.; and Bozzuto, Carl R., 4,294,199, Cl. 122-276.000.

Brandenstein, Manfred: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, 4,294,100, Cl. 72-340.000.

Brandtstaedter, Horst: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.

Bratt, Martin D.; and Oakley, John F., to Du Pont de Nemours, E. I., and Company. Apparatus for pre-conditioning film. 4,294,533, Cl. 354-318.000.

Braun, Charles H.: *See—*
Peffer, Robert M.; and Braun, Charles H., 4,294,104, Cl. 73-9.000.

Brede, Uwe;'and Kern, Heinz, to Dynamit Nobel Aktiengesellschaft. Method for increasing the resistance of igniter elements of given geometry. 4,294,648, Cl. 156-627.000.

Bremer, Noel J.; and Dria, Dennis E., to Standard Oil Company. Preparation of vanadium phosphorus catalysts. 4,294,722, Cl. 252-435.000.

Brems, John J.: *See—*
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J., 4,294,251, Cl. 128-276.000.

Brendle, Paul C.: *See—*
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy simulated rocket propelled aircraft system. 4,294,032, Cl. 46-1.00R.

Brennan, Michael P. J., to Chloride Silent Power Limited. Method of forming cathodic electrode structure for a sodium sulfur cell. 4,294,005, Cl. 29-623.500.

Brennan, Ray A. Air flotation ore enriching apparatus. 4,294,693, Cl. 209-466.000.

Bridgestone Tire Company Limited: *See—*
Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, 4,294,475, Cl. 285-165.000.
Ohyachi, Tomio; and Irako, Koichi, 4,294,732, Cl. 260-27.0BB.

Bristol-Myers Company: *See—*
Tencza, Thomas M., 4,294,819, Cl. 424-14.000.

British Cellophane Limited: *See—*
Andrews, William J.; Espley, David J. C.; and Philpott, William J. M., 4,294,882, Cl. 428-349.000.

British Gas Corporation: *See—*
Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., 4,295,095, Cl. 324-326.000.

Britton, Kenneth L., to Inspiration Consolidated Copper Company. Electrode seal. 4,295,001, Cl. 13-17.000.

Brockman, Milton H.: *See—*
United States of America, National Aeronautics and Space Administration; and Brockman, Milton H., 4,295,140, Cl. 343-100.0PE.

Bronnec, Jean A. L., to Etablissements Generaux de Mecanique de l'Ouest. Device for cleaning liquid surfaces. 4,294,698, Cl. 210-242.300.

Bronstein-Bonte, Irena Y.; Lindholm, Edward P.; and Taylor, Lloyd D., to Polaroid Corporation. Image-receiving elements. 4,294,907, Cl. 430-213.000.

Brooks, Albert C. Portable hoist frame. 4,294,176, Cl. 105-363.000.

Brooks, Philip A. Moving picture apparatus. 4,294,516, Cl. 350-335.000.

Broquet, Jean B., to Matra. Attitude control systems for space vehicles. 4,294,420, Cl. 244-165.000.

Brown, William F., to Weston Research Corporation. Dry wall joint and finishing compounds. 4,294,622, Cl. 106-314.000.

Bruhne, Friedrich: *See—*
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,294,777, Cl. 260-544.00D.

Brundage, Ruth P.: *See—*
Lesher, George Y.; and Brundage, Ruth P., 4,294,836, Cl. 424-263.000.

Bruns, Klaus: *See—*
Conrad, Jens; Upadek, Horst; and Bruns, Klaus, 4,294,727, Cl. 252-522.00R.

Brunssen, James E., to Bell Telephone Laboratories, Incorporated. Converter circuit providing isolation and load sensing. 4,295,188, Cl. 363-21.000.

Bryant, LeRoy J. Device for retaining a compound bow in a partially drawn condition. 4,294,221, Cl. 124-23.00R.

Buchmuller, Horst; and Michelbrink, Bernhard, to Deutsche Babcock Aktiengesellschaft. Apparatus for the hydraulic transport of precipitator dust. 4,294,592, Cl. 55-120.000.

Buckeye Cellulose Corporation, The: *See—*
Camden, James B.; and Vinson, Kenneth D., 4,294,876, Cl. 428-95.000.

Buckshaw, Thomas M., to Robertshaw Controls Company. Water level control device and method of making the same. 4,295,019, Cl. 200-61.200.

Bud Antle, Inc.: *See—*
Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,294,179, Cl. 111-3.000.

Bullis, Stephen J.: *See—*
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., 4,294,158, Cl. 89-12.000.

Bulten-Kanthal Aktiebolag: *See—*
Lindgren, Hakan O.; and Magnusson, Bengt, 4,295,033, Cl. 219-388.000.

Burgess, William H., III; and Heiberger, Philip, to Du Pont de Nemours, E. I., and Company. Accelerated process for making nonlinear polyesters. 4,294,736, Cl. 260-22.00M.

Burgett, Michael W.; and Harte, Richard A., to International Diagnostic Technology, Inc. Method of fluoro immunoassay. 4,294,817, Cl. 424-8.000.

Burney, Charles F.; and Laymon, Marvin D., to GTE Products Corporation. Capacitance intrusion detection system. 4,295,132, Cl. 340-562.000.

Burnham, Ralph L., to United States of America, Navy. Laser having simultaneous ultraviolet and visible wavelengths. 4,295,104, Cl. 331-94.50C.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,294,587, Cl. 44-74.000.

Burns, William S., Jr.; and Sankey, William M., to Western Electric Company, Incorporated. Safety guards and methods for manually feeding workpieces to assembly machines. 4,294,480, Cl. 294-131.000.

Buro Patent A.G.: *See—*
Todt, Gerhard H., 4,294,174, Cl. 104-250.000.

Burroughs Wellcome Co.: *See—*
Schaeffer, Howard J., 4,294,831, Cl. 424-253.000.
Weston, John B., 4,294,842, Cl. 424-272.000.
Weston, John B., 4,294,843, Cl. 424-272.000.

Burton, Edward D., to Great Lakes Carbon Corporation. Foundry coke. 4,294,610, Cl. 75-43.000.

Buser, Hansueli; and Jordi, Peter E., to Ciba-Geigy Corporation. Sample charger for a gas chromatograph. 4,294,117, Cl. 73-864.850.

Bussey, Joseph G., to Stimtech, Inc. Perioperative application of electronic pain control in combination with anesthetic agents. 4,294,245, Cl. 128-207.210.

BXL Plastics Limited: *See—*
Jack, James; and Gray, Derek C., 4,294,796, Cl. 264-559.000.

Byrnes, Bruce R.: *See—*
Byrnes, Robert J.; and Byrnes, Bruce R., 4,294,017, Cl. 33-265.000.

Byrnes, Robert J.; and Byrnes, Bruce R. Archery sighting device and methods of constructing and utilizing same. 4,294,017, Cl. 33-265.000.

Bystrov, Valentin P.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Cade, Phillip J., to Electronics Corporation of America. System condition indicator. 4,295,129, Cl. 340-520.000.

Cahill, Robert: *See—*
Bellas, Michael; and Cahill, Robert, 4,294,991, Cl. 568-650.000.

Cain, John D.; and Lovie, Gary C., to NCR Canada Ltd.-NCR Canada Ltee. Document sorting method. 4,295,206, Cl. 364-900.000.

Calmac Manufacturing Corporation: *See—*
MacCracken, Calvin D., 4,294,078, Cl. 62-59.000.

Camardella, Giuseppe, to Tekma Kinomat S.p.A. Static wire tensioner for coil winding machines. 4,294,417, Cl. 242-149.000.

Camden, James B.; and Vinson, Kenneth D., to Buckeye Cellulose Corporation, The. Tufted material having a laminated film primary tufting substrate. 4,294,876, Cl. 428-95.000.

Camezon, Raymond E.: *See—*
Beauvais, Max P.; and Camezon, Raymond E., 4,294,167, Cl. 99-369.000.

Camp, Vann T., to United Technologies Corporation. Exhaust nozzle control and core engine fuel control for turbofan engine. 4,294,069, Cl. 60-238.000.

Campbell, Charles S., to United Kingdom Atomic Energy Authority. Apparatus for use in a liquid alkali metal environment. 4,294,659, Cl. 165-133.000.

Campbell, Gerald A.: *See—*
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., 4,294,739, Cl. 260-29.6RW.

Cannings, John A. Rotary seal unit. 4,294,454, Cl. 277-65.000.

Canon Kabushiki Kaisha: *See—*
Ban, Mikichi, 4,294,538, Cl. 355-51.000.
Ito, Susumu; Sugawara, Noboru; and Amano, Sayoko, 4,294,890, Cl. 428-641.000.
Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, 4,294,530, Cl. 354-173.000.
Sato, Yasuhisa; Tsuji, Sadahiko; and Ishikawa, Kazuo, 4,294,529, Cl. 354-53.000.
Sugiura, Muneharu; and Sagara, Seiji, 4,295,186, Cl. 362-217.000.

Cantlin, John H., to Hudson Lock, Inc. Garage door lock. 4,295,016, Cl. 200-44.000.

Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., to Olin Corporation. Sodium amalgam monitor. 4,294,798, Cl. 422-62.000.

Carl Hahn, G.m.b.H.: *See—*
Friese, Axel, 4,294,253, Cl. 128-285.000.

Carlsen, W. John, to GTE Laboratories Incorporated. Reading one-dimensional line image holograms of a video from a disc with a guide track. 4,295,162, Cl. 358-128.600.

Carmet Company: *See—*
Boone, Gary A., 4,294,566, Cl. 407-114.000.

Carollo, Jerome T.; and Barbarasch, Joseph, to General Electric Company. Light projection system. 4,295,159, Cl. 358-22.000.

Carrier Corporation: *See—*
Geary, Carl H., Jr., 4,293,996, Cl. 29-446.000.

Carson, John R., to McNeilab, Inc. Preparation of 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivatives. 4,294,760, Cl. 260-326.470.

Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., to RCA Corporation. Circumferentially apertured cylindrical grid for electron tube. 4,295,077, Cl. 313-293.000.

Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Frangible, resealable closure for a flexible tube. 4,294,247, Cl. 128-214.00D.

Carter, Morris G.: *See—*
Ammons, Staron E.; Paschall, Edwin L.; and Carter, Morris G., 4,294,403, Cl. 236-13.000.

Casio Computer Co., Ltd.: *See—*
Fujisawa, Hidetaka, 4,294,154, Cl. 84-1.010.

Casper, Thomas J., to Envirex Inc. Submerged large diameter seal. 4,294,700, Cl. 210-403.000.

Cassand, Jean: *See—*
Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, 4,294,328, Cl. 181-120.000.

Cassidy, Frederick; and Goudie, Alexander C., to Beecham Group Limited. 1,2-Disubstituted oxo triazolidine. 4,294,972, Cl. 548-264.000.

Cassill, William G.: *See—*
Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., 4,294,111, Cl. 73-150.00R.

Castaneda, Fernando: *See—*
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis, 4,294,022, Cl. 36-4.000.

Castelli, Enrico: *See—*
Eschinasi, Emile H.; and Castelli, Enrico, 4,294,767, Cl. 260-347.800.

Caterpillar Tractor Co.: *See—*
Blake, William W., 4,294,278, Cl. 137-115.000.
Flesburg, Edward E., 4,294,303, Cl. 164-44.000.
King, Dennis M.; and Richardson, Ronald D., 4,294,218, Cl. 123-502.000.
Simmons, Gerald P., 4,294,465, Cl. 280-756.000.

Caux, Gerard: *See—*
Couderc, Pierre; Grardel, Jean-Luc; and Caux, Gerard, 4,294,717, Cl. 252-97.000.

Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., to Bud Antle, Inc. Dibble tube soil plug planter. 4,294,179, Cl. 111-3.000.

Cazier, Verl O.: *See—*
Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., 4,295,044, Cl. 250-229.000.

CBS Inc.: *See—*
Turner, James, 4,294,155, Cl. 84-1.010.

Cecchin, Giuliano; and Albizzati, Enrico, to Montedison S.p.A. Process for preparing components of catalysts for polymerizing alpha-olefins and mixtures thereof with ethylene. 4,294,721, Cl. 252-429.00B.

CEM - Compagnie Electro-Mecanique: *See—*
Delassus, Jean, 4,294,304, Cl. 164-504.000.

Centro Ricerche Fiat S.p.A.: *See—*
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,294,210, Cl. 123-300.000.
Iemmi, Giuliano; and Macerata, Diego, 4,294,893, Cl. 429-42.000.
Taricco, Stefano, 4,294,609, Cl. 75-34.000.

Cerroni, Manlio. Apparatus for the breaking of heterogeneous materials, as city solid wastes. 4,294,413, Cl. 241-36.000.

Chakrabarti, Paritosh M.: *See—*
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,294,848, Cl. 424-302.000.

Chamness, Dale L. Surgical apparatus. 4,294,254, Cl. 128-303.140.

Champion International Corporation: *See—*
Fogle, Ozzie, 4,294,187, Cl. 118-244.000.
Schlotter, Harold J.; and Young, Leroy, 4,294,452, Cl. 273-403.000.

Champseix, Alain A.; and Le Fur, Gerard R., to Pharmindustrie. Derivatives of 1-phenyl 3-(4-piperidyl) 1-propanone usable as drugs. 4,294,841, Cl. 424-267.000.

Chang, Chi S.: *See—*
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

Chang, Long F., to Owens-Illinois, Inc. Free-standing plastic bottle. 4,294,366, Cl. 215-1.00C.

Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., to Texas Instruments Incorporated. Module for an integrated circuit system. 4,295,181, Cl. 361-395.000.

Chapman, Arthur J.; and Hayes, Geoffrey M. G., to Pentabloc, Ltd. Jointing member for frame systems. 4,294,561, Cl. 403-219.000.

Chappell, Terry I., to International Business Machines Corporation. Semiconductor fiber optical detection. 4,294,510, Cl. 350-96.170.





Chappell, Terry I.; and Woodall, Jerry M., to International Business Machines Corporation. Heterojunction V-groove multijunction solar cell. 4,295,002, Cl. 136-244.000.

Charzinski, Hans-Peter: *See—*
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, 4,294,209, Cl. 123-293.000.

Cheetham, Jeffery J. Containers. 4,294,351, Cl. 206-222.000.

Chehovah, Felix, to Thomson-CSF. Series-parallel print mechanism for printer. 4,294,551, Cl. 400-119.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.

Chen, Evan N.; and Ferraro, Frank A., to Warner-Lambert Company. Rotatable safety razor and blade cartridge therefor. 4,294,010, Cl. 30-42.000.

Chen, Shin-I. Constant pressure cooker and fastener. 4,294,377, Cl. 220-321.000.

Cheng, Paul J., to Phillips Petroleum Company. Carbon black process and reactor. 4,294,814, Cl. 423-457.000.

Chesler, Ronald B.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,294,601, Cl. 65-3.120.

Chesworth, Graham: *See—*
Seed, Geoffrey; Chesworth, Graham; Hind, John R.; and Hodgson, Donald, 4,294,661, Cl. 376-363.000.

Chevalier, Philippe J. M. R.: *See—*
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.

Chevron Research Company: *See—*
Feffer, Philip C., 4,293,985, Cl. 28-254.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,294,714, Cl. 252-34.000.

Chiba, Toshiyuki: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.

Chidsey, Francis A., Jr., to Container Corporation of America. Partition for carrier carton. 4,294,398, Cl. 229-15.000.

Chimura, Kozo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; and Chimura, Kozo, 4,295,215, Cl. 368-196.000.

Chloride Silent Power Limited: *See—*
Bindin, Peter J., 4,294,897, Cl. 429-104.000.
Brennan, Michael P. J., 4,294,005, Cl. 29-623.500.

Chlorine Engineers Corp., Ltd.: *See—*
Kasuya, Kazuki, 4,294,628, Cl. 148-6.350.

Chlosta, Wolfgang: *See—*
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.

Chmela, Franz: *See—*
Urlaub, Alfred; and Chmela, Franz, 4,294,206, Cl. 123-276.000.

Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, to Institut Francais du Petrole. Device for emitting acoustic waves in a liquid medium by implosion. 4,294,328, Cl. 181-120.000.

Chr. Eisele Maschinenfabrik GmbH. & Co. KG: *See—*
Drixler, Karl, 4,294,148, Cl. 83-397.000.

Christiansen, David W., to Babcock & Wilcox Company, The. Spacer assembly retainer arrangement. 4,294,660, Cl. 376-442.000.

Chubb Integrated Systems Limited: *See—*
Rankin, Kenneth F., 4,294,380, Cl. 221-195.000.

Ciba-Geigy AG: *See—*
Postle, Stephen R.; and Psaila, Alexander, 4,294,916, Cl. 430-522.000.
Postle, Stephen R.; and Psaila, Alexander, 4,294,917, Cl. 430-522.000.

Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie, 4,294,768, Cl. 260-372.000.
Buser, Hansueli; and Jordi, Peter E., 4,294,117, Cl. 73-864.850.
Hubele, Adolf, 4,294,850, Cl. 424-309.000.
Karrer, Friedrich, 4,294,949, Cl. 526-262.000.
Kreibich, Ursula; and Schmid, Rolf, 4,294,227, Cl. 126-400.000.
Martin, Henry, 4,294,772, Cl. 260-429.700.
Rody, Jean, 4,294,963, Cl. 544-198.000.
Schmid, Rolf; and Lohse, Friedrich, 4,294,745, Cl. 260-37.0EP.
Tobler, Hans; Fory, Werner; and Schurter, Rolf, 4,294,606, Cl. 71-88.000.
Zergenyi, Janos, 4,294,966, Cl. 544-316.000.

Cilny, Eugene J. Mono-seat gate valve. 4,294,427, Cl. 251-86.000.

Clarion Co., Ltd.: *See—*
Ariga, Shoji, 4,294,354, Cl. 206-335.000.

Clark, Merlin W. Aerial amusement projectile and method of manufacture. 4,294,447, Cl. 273-58.00R.

Clarke-Gravely Corporation: *See—*
Block, Thomas S., 4,293,971, Cl. 15-98.000.

Clay, Robert B. Blasting composition. 4,294,633, Cl. 149-2.000.

Cleland, Marshall R.; and Malone, Howard F., Sr. Method and system for scanning a beam of charged particles to control irradiation dosage. 4,295,048, Cl. 250-398.000.

Clelford, Douglas H.: *See—*
Fowler, Donald W.; and Clelford, Douglas H., 4,294,162, Cl. 91-434.000.

Clemence, Francois: *See—*
Humbert, Daniel; Clemence, Francois; and Dagnaux, Michele, 4,294,845, Cl. 424-278.00Q.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,294,631, Cl. 148-133.000.

Closs, Joseph J. Single stage rankine and cycle power plant. 4,294,075, Cl. 60-671.000.

Cochran, Loretta. Hair treating fluid applicator. 4,294,270, Cl. 132-112.000.

Cogit Systems, Inc.: *See—*
Copeland, Robert K.; and Dimaggio, Richard J., 4,295,198, Cl. 364-515.000.

Cohen, Georges; and Rojey, Alexandre, to Institut Francais du Petrole. Desorption step in absorption heat pumps and refrigerators. 4,294,080, Cl. 62-101.000.

Colgate-Palmolive Company: *See—*
Kaeser, James A., 4,294,718, Cl. 252-135.000.

Colloff, Nicholas J., to Lucas Industries Limited. Method of joining a pair of metal parts. 4,294,392, Cl. 228-111.000.

Colosimo, Ernest: *See—*
Colosimo, Gabriel A.; and Colosimo, Ernest, 4,293,979, Cl. 17-32.000.

Colosimo, Gabriel A.; and Colosimo, Ernest. Forming press for sausage and the like. 4,293,979, Cl. 17-32.000.

Colt Industries Operating Corp: *See—*
McCabe, Ralph P.; and Marsh, Keith D., 4,294,282, Cl. 137-595.000.

Combs, Steven P.: *See—*
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J., 4,294,251, Cl. 128-276.000.

Combustion Engineering, Inc.: *See—*
Borio, Richard W.; and Mehta, Arun K., 4,294,178, Cl. 110-347.000.
Darling, Scott L.; and Bozzuto, Carl R., 4,294,199, Cl. 122-276.000.

Command Control & Communications Corporation: *See—*
Apple, Joseph; and Upton, Eric L., 4,294,543, Cl. 356-375.000.

Commeau, Alain: *See—*
Guignard, Paul; and Commeau, Alain, 4,294,662, Cl. 219-61.000.

Commissariat a l'Energie Atomique: *See—*
Marine, Jean; and Ravetto, Michel, 4,295,148, Cl. 357-17.000.

Compagnie Francaise d'Etudes et de Construction Technip: *See—*
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,294,311, Cl. 165-104.00S.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Gevaud, Roland; and Tallon, Jacques, 4,294,106, Cl. 73-40.700.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Ugon, Michel, 4,295,041, Cl. 234-487.000.

Congoleum Corporation: *See—*
Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., 4,294,786, Cl. 264-46.400.

Conoco, Inc.: *See—*
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,295,096, Cl. 324-357.000.

Conrad, Jens; Upadek, Horst; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Perfume composition containing 4,5-dioxa-5-alkyl-tricyclo[7.2.1.0 $^{2,8}$ ]dodec-10-enes and its use as an odorant. 4,294,727, Cl. 252-522.00R.

Consolidated Fiberglass Products Company: *See—*
Pfeffer, John R., 4,294,655, Cl. 162-107.000.

Constantine, Albert B.: *See—*
Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., 4,294,549, Cl. 366-164.000.

Container Corporation of America: *See—*
Chidsey, Francis A., Jr., 4,294,398, Cl. 229-15.000.
Kohler, Karl A., 4,294,397, Cl. 229-27.000.
Nauheimer, James F.; and Benzschawel, Steven J., 4,294,358, Cl. 206-419.000.

Cooperman, Michael, to GTE Laboratories Incorporated. Methods of and apparatus for generating reference voltages. 4,295,089, Cl. 323-351.000.

Copeland, Robert K.; and Dimaggio, Richard J., to Cogit Systems, Inc. Automatic printed circuit dimensioning, routing and inspecting apparatus. 4,295,198, Cl. 364-515.000.

Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Preparation of high purity 1,4-butanediol. 4,294,998, Cl. 568-868.000.

Cordes, Paul B.: *See—*
Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., 4,295,095, Cl. 324-326.000.

Cordes, Werner, to Aristo Graphic Systeme GmbH & Co. KG. Device for moving automatic drawing machine tools. 4,295,146, Cl. 346-140.00R.

Cordray, Daniel E., to General Electric Company. Pilot wire relay protection system for electrical distribution networks. 4,295,175, Cl. 361-69.000.

Cornetti, Giorgio: *See—*
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,294,210, Cl. 123-300.000.

Corning Glass Works: *See—*
Ohls, James W., 4,294,190, Cl. 118-620.000.

Coroncos, James H. Process for preparing beef for use on a vertical rotisserie. 4,294,865, Cl. 426-646.000.

Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno. Low viscosity unsaturated polyester resins. 4,294,734, Cl. 260-22.0CB.

Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno. Low viscosity unsaturated polyester resins. 4,294,748, Cl. 260-22.0CB.

Couchman, James C., to General Dynamics Corporation. Fastener incorporating ultrasonic transducer. 4,294,122, Cl. 73-761.000.

Couderc, Pierre; Grardel, Jean-Luc; and Caux, Gerard, to Societe Chimique des Charbonnages SA. Compositions containing an alkali metal mono- or polyalkylarylsulfonate and the corresponding hydro-

peroxide, process for their preparation and detergent compositions containing them. 4,294,717, Cl. 252-97.000.
Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,294,678, Cl. 204-192.00R.
Coulthard, John L. Anaerobic filter. 4,294,694, Cl. 210-150.000.
Coverstone, Don A., to Lyall Electric, Inc. Insulated radiant heating panel. 4,294,003, Cl. 29-611.000.
Cowan, Keith B.: *See—*
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., 4,295,143, Cl. 343-840.000.
Cowans, Kenneth W., to Kinergetics, Inc. Survival system. 4,294,242, Cl. 128-201.130.
Cox, Charles P., Jr. Gasoline and diesel fuel additive. 4,294,586, Cl. 44-56.000.
Cozzy, Thomas W.: *See—*
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., 4,294,158, Cl. 89-12.000.
Cramm, Gunther; and Blocher, Karl H., to Bayer Aktiengesellschaft. Production of thiocarbohydrazide on a commercial scale. 4,294,985, Cl. 564-18.000.
Creusot-Loire: *See—*
Pere, Gerard, 4,294,683, Cl. 204-258.000.
Crompton & Knowles Corporation: *See—*
Nims, Philip A.; and Bollinger, Roger K., 4,294,291, Cl. 139-438.000.
Crosbie, Scott C. Sighting device with means for reflecting and superimposing light flashes on a viewed object. 4,294,445, Cl. 272-8.00M.
Cross, Barrington: *See—*
Spatz, David M.; and Cross, Barrington, 4,294,986, Cl. 564-52.000.
Crotti, Bianca M. Safety door for buildings and rooms. 4,294,040, Cl. 49-254.000.
Crouzet: *See—*
Jouret, Edouard, 4,294,501, Cl. 339-66.00M.
Crowley, Albert T., to RCA Corporation. Digitally adjustable phase shifting circuit. 4,295,098, Cl. 328-24.000.
Cryogenics Unlimited: *See—*
Boese, Harold L., 4,294,323, Cl. 180-54.00B.
CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Astegiano, Luciano; and van Veen, Wouter M. D., 4,295,007, Cl. 179-7.00R.
CTS Corporation: *See—*
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.
Cummins Engine Company, Inc.: *See—*
Jones, Philip E., 4,294,203, Cl. 123-195.00R.
Neff, Joseph J., 4,294,073, Cl. 60-597.000.
Peters, Lester L.; and Black, John W., 4,294,109, Cl. 73-119.00A.
Cunningham, Richard N.; and Loeffler, Romain E., deceased (by Loeffler, Carolyn R., personal representative), to Johns-Manville Corporation. Process for rapid annealing of refractory fiber bodies and laminated body produced by process. 4,294,878, Cl. 428-212.000.
Cunnington, Harry: *See—*
Figg, Anthony V. J.; and Cunnington, Harry, 4,294,645, Cl. 156-384.000.
Curran, Dennis P.: *See—*
Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., 4,294,763, Cl. 260-340.5DP.
Curry, Robert E.; and Simonsen, Michael G., to Bio-Rad Laboratories, Inc. Automatic fluorometer and data processor for performing fluorescent immunoassays. 4,295,199, Cl. 364-555.000.
Cushing, David E.: *See—*
Joyce, Thomas J.; and Cushing, David E., 4,295,202, Cl. 364-748.000.
Cutler, John H.; Espelage, Paul M.; and Walker, Loren H., to General Electric Company. Method and apparatus for dynamic braking in a motor control system. 4,295,086, Cl. 318-759.000.
Cutter Laboratories, Inc.: *See—*
Sheehan, Neil J.; and Norman, Melvin H., 4,294,249, Cl. 128-214.00G.
Cybulska, Emilia: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.
Dabby, Franklin W.; and Chesler, Ronald B., to Times Fiber Communications, Inc. Apparatus and process for automatic control of the production of optical fiber. 4,294,601, Cl. 65-3.120.
Dagnaux, Michele: *See—*
Humbert, Daniel; Clemence, Francois; and Dagnaux, Michele, 4,294,845, Cl. 424-278.00Q.
Daido Giken Industries, Co., Ltd.: *See—*
Matsuno, Ryohei, 4,294,435, Cl. 266-234.000.
Daimler-Benz Aktiengesellschaft: *See—*
Dalheimer, Walter; and Kuus, Olaf, 4,294,039, Cl. 49-248.000.
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, 4,294,209, Cl. 123-293.000.
Dalbert, Johannes: *See—*
Pittasch, Willi; and Dalbert, Johannes, 4,293,976, Cl. 16-129.000.
Dalheimer, Walter; and Kuus, Olaf, to Daimler-Benz Aktiengesellschaft. Pivotal connection for hoods and covers in motor vehicles. 4,294,039, Cl. 49-248.000.
Dallas, M. J. Whitfield for First National Bank in, executor: *See—*
Schwegman, Harry E., deceased, 4,294,313, Cl. 166-117.500.
Dam, Naim G.: *See—*
Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.
Damiano, Luigi. Traveling tool carrier for severing railway spikes. 4,294,046, Cl. 51-170.00R.
Dancot, Georges: *See—*
Hardy, Nicolas; and Dancot, Georges, 4,294,776, Cl. 260-502.00R.
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, to Rhone-Poulenc Industries. Process for the manufacture of printing paper and board. 4,294,704, Cl. 210-651.000.
Daniel, Robert A. Combined carrying case, display device and lectern. 4,294,497, Cl. 312-231.000.
Darden, Boyd E.; and Hartley, Henry F., to Honeywell Information Systems Inc. Adapter unit for use in a data processing system for processing a variety of requests. 4,295,194, Cl. 364-200.000.
Darling, Scott L.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Steam generating magnetohydrodynamic diffuser. 4,294,199, Cl. 122-276.000.
Darrow, Russell E.: *See—*
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., 4,294,729, Cl. 252-545.000.
Data Packaging Corporation: *See—*
Pepicelli, Pasquale L.; Lyman, George F.; and Mavilia, Robert A., 4,294,924, Cl. 435-30.000.
Datafile Limited: *See—*
Anderson, Dale L., 4,294,644, Cl. 156-361.000.
Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., to Western Electric Company, Inc. Cable splice closure. 4,295,005, Cl. 174-92.000.
Dauser, William C., Jr., to Heneveld, Lloyd A., Trustee. Wire connector. 4,295,004, Cl. 174-87.000.
Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., to Johns-Manville Corporation. Apparatus and method for grinding a helical surface on a flat blade. 4,294,042, Cl. 51-54.000.
Davidson, Daniel F.: *See—*
Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, 4,294,658, Cl. 376-404.000.
Davidson, James D. Solar panel window unit. 4,294,038, Cl. 49-63.000.
Davis, Paul, to Sweetheart Plastics, Inc. Sundae dish. 4,294,371, Cl. 220-4.00E.
Dawless, Robert K.; and Graziano, Robert E., to Aluminum Company of America. Fractional crystallization process. 4,294,612, Cl. 75-68.00R.
Dayco Corporation: *See—*
Vitellaro, Frank A., 4,294,636, Cl. 156-143.000.
Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, to Sperry Corporation. Baler feeder mechanism. 4,294,346, Cl. 198-740.000.
Deczky, Andrew E., to Alcan Research and Development Limited. Data acquisition systems. 4,294,682, Cl. 204-244.000.
de Figueiredo, Nuno R. M. Device for automatically controlling the infusion liquid flow in an infusion apparatus. 4,294,248, Cl. 128-214.00E.
de Jager, Christiaan L. Supports. 4,294,430, Cl. 256-58.000.
Delassus, Jean, to CEM - Compagnie Electro-Mecanique. Electromagnetic centrifuging inductor for rotating a molten metal about its casting axis. 4,294,304, Cl. 164-504.000.
Delio, Ralph D.: *See—*
Diemer, Donald J.; and Delio, Ralph D., 4,294,101, Cl. 72-356.000.
Delle-Alsthom: *See—*
Thuries, Edmond; Vernat, Pierre; and Sauvat, Roger, 4,295,023, Cl. 200-148.00R.
Delta Systems, Inc.: *See—*
Howard, William A., 4,294,327, Cl. 180-273.000.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Evaporative dispenser. 4,294,778, Cl. 261-30.000.
Den-Mat, Inc.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,294,349, Cl. 206-63.500.
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, to Compagnie Francaise d'Etudes et de Construction Technip. Method of and arrangement for the seasonal storage and use of hot water produced in particular by electrical power-generating thermal and nuclear stations. 4,294,311, Cl. 165-104.00S.
Dennehey, T. Michael, to Baxter Travenol Laboratories, Inc. Luer lock connection device. 4,294,250, Cl. 128-247.000.
Denzinger, Walter: *See—*
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.
Desbrandes, Robert; and Grolet, Pierre, to Institut Francais du Petrole. Device for measuring the stresses applied in use to the downhole assembly of a drill pipe. 4,294,318, Cl. 175-321.000.
DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,294,737, Cl. 260-29.2EP.
Wood, Donald C.; and McLaughlin, Robert L., 4,294,855, Cl. 424-358.000.
Desplats, Andre, to Tractel S.A. Pulley assembly for improving the cooperation between a winch and a cable actuated thereby. 4,294,429, Cl. 254-272.000.
Detroit Bank & Trust Co., executor: *See—*
McIntosh, Lester A., deceased, 4,294,439, Cl. 267-54.00A.
Deutsche Babcock Aktiengesellschaft: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,294,592, Cl. 55-120.000.
Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Bozon, Alfred; Koberstein, Edgar; Pletka, Hans-Dieter; Volker, Herbert; and Lakatos, Eduard, 4,294,726, Cl. 252-462.000.
Dewar, Colin A.: *See—*
Hardy, Frederick E.; and Dewar, Colin A., 4,294,710, Cl. 252-8.800.



Dexon, Inc.: *See—*
Intrater, Josef; Bertholdo, Gene; and Intrater, Janet, 4,294,271, Cl. 134-113.000.
Deyrup, Edward J.: *See—*
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Dickason, Alan F.: *See—*
Rugen, Donald F.; and Dickason, Alan F., 4,294,742, Cl. 260-31.80H.
Diehl GmbH & Co.: *See—*
Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, 4,294,172, Cl. 102-473.000.
Diemer, Donald J.; and Delio, Ralph D. Method of making single or double flanged track tractor roller for off-highway equipment. 4,294,101, Cl. 72-356.000.
Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin. Draft control arrangement. 4,294,401, Cl. 236-1.00G.
Dimaggio, Richard J.: *See—*
Copeland, Robert K.; and Dimaggio, Richard J., 4,295,198, Cl. 364-515.000.
Dr. Ing. h.c. F. Porsche Aktiengesellschaft: *See—*
Striebich, Helmut, 4,294,074, Cl. 60-616.000.
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, to Chemische Werke Huls Aktiengesellschaft. Process for the production of powdery, thermoplastic copolymers from ethylene and butene-(1). 4,294,947, Cl. 526-119.000.
Doi, Yoshikazu; Sakai, Yutaka; and Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Rear stop type zoom lens. 4,294,521, Cl. 350-426.000.
Doll, Thomas; Schacht, Erich; Radunz, Hans-Eckart; and Schulze, Ernst, to Merck Patent Gesellschaft mit beschrankter Haftung. Benzothiazole derivatives and pharmaceutical formulations containing them. 4,294,839, Cl. 424-263.000.
Dombrowski, Leonard C., to Bell Telephone Laboratories, Incorporated. High speed driver for optoelectronic devices. 4,295,226, Cl. 455-618.000.
Doner, Claude E.: *See—*
Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.
Donley, William B., to General Motors Corporation. Programming an IGFET read-only-memory. 4,295,209, Cl. 365-178.000.
Dopkin, Joseph A.: *See—*
Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.
Dorsen, Mac; and Saltzman, Philip A., to Stupell Industries, Ltd. Handbag construction. 4,294,299, Cl. 150-28.00R.
Dow Chemical Company, The: *See—*
Henson, Thomas R.; and Timberlake, John F., 4,294,774, Cl. 260-453.00P.
Stone, Frederick C.; and Schupska, Gary G., 4,294,968, Cl. 546-251.000.
Tamony, Andree E.; and Youngson, Charles R., Jr., 4,294,928, Cl. 423-235.000.
Zachary, Richard E., 4,294,589, Cl. 55-36.000.
Dragerwerk Aktiengesellschaft: *See—*
Leichnitz, Kurt, 4,294,583, Cl. 23-232.00R.
Pasternack, Adalbert, 4,294,244, Cl. 128-202.260.
Draper, Don R.; and Kusulas, Peter, Jr., to Bell Telephone Laboratories, Incorporated. Memory write error detection circuit. 4,295,219, Cl. 371-51.000.
Drennan, Arthur P.: *See—*
Arons, Irving J.; Merrill, Richard E.; and Drennan, Arthur P., 4,294,792, Cl. 264-311.000.
Dresser Industries, Inc.: *See—*
Sprott, Kenneth J.; and Herterick, George M., 4,294,113, Cl. 73-199.000.
Dria, Dennis E.: *See—*
Bremer, Noel J.; and Dria, Dennis E., 4,294,722, Cl. 252-435.000.
Drixler, Karl, to Chr. Eisele Maschinenfabrik GmbH. & Co. KG. Guards for circular saw blades of circular sawing machines. 4,294,148, Cl. 83-397.000.
Drouin, Gilbert; and Sibille, Jacques, to Ecole Polytechnique. Extensometer. 4,294,015, Cl. 33-174.00D.
Drugmand, Lester D., to Electro-Therm, Inc. Double-grip mounting means for sheathed heating elements. 4,295,035, Cl. 219-536.000.
DuBois, Chester G.; and Hulsebus, Richard P., to Outboard Marine Corporation. Temperature compensator for a carburetor choke valve. 4,294,780, Cl. 261-39.00B.
DuBord, Edward W.: *See—*
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Ducharme, Gilles H., to Du Pont de Nemours, E. I., and Company. Explosives package for coupled cast primer compositions. 4,294,171, Cl. 102-317.000.
Dulaney, Donald C.; and Bowman, John A., to Rust-Oleum Corporation. Method of producing pigmented silicate coatings. 4,294,619, Cl. 106-188.000.
Dunlop Limited: *See—*
Kenney, Michael J., 4,294,730, Cl. 260-17.4BB.
Duo-Fast Corporation: *See—*
Obergfell, Allen R., 4,294,391, Cl. 227-130.000.
Du Pont de Nemours, E. I., and Company: *See—*
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,294,489, Cl. 297-452.000.
Beresniewicz, Aleksander, 4,294,738, Cl. 260-29.4UA.
Berr, Charles E.; and Deyrup, Edward J., 4,294,938, Cl. 525-101.000.
Bratt, Martin D.; and Oakley, John F., 4,294,533, Cl. 354-318.000.
Burgess, William H., III; and Heiberger, Philip, 4,294,736, Cl. 260-22.00M.
Copelin, Harry B., 4,294,998, Cl. 568-868.000.
Ducharme, Gilles H., 4,294,171, Cl. 102-317.000.
Graham, William F., 4,294,743, Cl. 260-32.8EP.
Graham, William F., 4,294,877, Cl. 428-209.000.
Harris, John F., Jr., 4,294,955, Cl. 528-176.000.
Lee, Ross A., 4,294,909, Cl. 430-291.000.
Lovell, Peter J.; and Saunders, Ian C. B., 4,294,794, Cl. 264-328.100.
Stock, Albert M.; and Verbsky, James D., 4,294,997, Cl. 568-855.000.
Urquhart, Thomas, 4,294,646, Cl. 156-500.000.
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions. 4,294,854, Cl. 424-326.000.
Durkee, Richard G. Heavy metal removal apparatus. 4,294,434, Cl. 266-170.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Brede, Uwe; and Kern, Heinz, 4,294,648, Cl. 156-627.000.
Dynatrol Consultants (U.K.) Limited: *See—*
Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., 4,294,549, Cl. 366-164.000.
Dyneer Corporation: *See—*
St. John, Richard C., 4,294,342, Cl. 192-105.0CD.
E M I Limited: *See—*
Hounsfield, Godfrey N., 4,295,195, Cl. 364-414.000.
E. R. Squibb & Sons, Inc.: *See—*
Vellucci, Enzo, 4,294,894, Cl. 424-49.000.
Eagle-Picher Industries, Inc.: *See—*
Hayes, Richard H., 4,294,144, Cl. 83-71.000.
Eastman Kodak Company: *See—*
Adin, Anthony; Boettcher, John W.; and Fleming, James C., 4,294,912, Cl. 430-341.000.
Bechle, Philip D.; and Roth, Joseph A., 4,294,906, Cl. 430-207.000.
Bellas, Michael; and Cahill, Robert, 4,294,991, Cl. 568-650.000.
Fyson, John R., 4,294,914, Cl. 430-418.000.
Guild, John R., 4,294,911, Cl. 430-326.000.
Hyatt, John A., 4,294,761, Cl. 260-338.000.
Paxton, Kenneth B., 4,294,536, Cl. 355-14.00C.
Peffer, Robert M.; and Braun, Charles H., 4,294,104, Cl. 73-9.000.
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., 4,294,739, Cl. 260-29.6RW.
Eaton Corporation: *See—*
Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., 4,295,058, Cl. 307-252.00A.
Pohl, Walter, 4,295,114, Cl. 337-3.000.
Ebara Corporation: *See—*
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.
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Luscher, Jacob, 4,295,056, Cl. 307-221.00C.
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Eberle, William J., to General Battery Corporation. Tumble dumper. 4,294,292, Cl. 141-1.000.
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Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,294,685, Cl. 208-10.000.
Randolph, Alan D., 4,294,807, Cl. 423-242.000.
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Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, to Toyoda Koki Kabushiki Kaisha. Grinding machine with a sizing device. 4,294,045, Cl. 51-165.710.
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Enser, Mats A.; Hallberg, Lars O.; and Stalberg, Nils G., to International Business Machines Corporation. Device for optical character reading. 4,295,121, Cl. 340-146.3MA.
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Erkfritz, Donald S., to General Electric Company. Indexable finishing insert for a milling cutter. 4,294,565, Cl. 407-113.000.
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Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., to United States of America, Air Force. Respirators. 4,294,243, Cl. 128-201.180.
Errichiello, Dominic R. Book binders and books made with said binders. 4,294,469, Cl. 281-29.000.
Errichiello, Dominic R. Weatherproof portfolios. 4,294,558, Cl. 402-75.000.
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Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, to Politechnika Gdanska. Water-soluble salts of trimethylammonium derivatives of polyene macrolide antibiotics and the preparation thereof. 4,294,958, Cl. 536-17.00R.
Farah, Alfred E., to Sterling Drug Inc. Ketazocine anesthetic method of use. 4,294,840, Cl. 424-267.000.
Farr, Glyn P. R., to Lucas Industries Limited. Master cylinder assemblies. 4,294,070, Cl. 60-534.000.
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Ferri, Giampiero. Ammunition for a toy weapon. 4,294,173, Cl. 102-281.000.
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Finsterwalder, Lorenz, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for the controllable removal of one or more phases from a liquid-liquid extractor. 4,294,702, Cl. 210-513.000.
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Fischer, Armin O., to American Standard Inc. Flow control device. 4,294,289, Cl. 138-44.000.
Fischli, Albert E.; and Szente, Andre, to Hoffmann-La Roche Inc. 7-Isocyanato-1,4-benzodiazepin-2-ones. 4,294,758, Cl. 260-239.30D.
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Fisher, Ian P.; Woods, H. John; and Souhrada, Frank, to Gulf Canada Limited. Process for upgrading heavy hydrocarbonaceous oils. 4,294,686, Cl. 208-56.000.
Fitzke, Rudolf. Catastrophic-exposure emergency kit. 4,294,352, Cl. 206-223.000.
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Edwards, Merle L., 4,294,027, Cl. 37-43.00R.
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Focke, Heinz H.; and Liedtke, Kurt, to Focke & Co. Side connected cigarette half-packs. 4,294,353, Cl. 206-273.000.
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Fouse, Jack A.; and McClaren, Sherwood W., III, to Vought Corporation. Airframe assembly and process. 4,294,419, Cl. 244-117.00R.
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Frantom, Richard L., to Allied Chemical Corporation. Seat belt comfort device. 4,294,467, Cl. 280-801.000.
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Funck, Willi; Verheyen, Roland; and Schedler, Heinz, to Schloemann-Siemag Aktiengesellschaft. Overload safety device in hydraulic forming presses, in particular sheet metal form drawing presses. 4,294,103, Cl. 72-453.140.
Furlette, James L.; and Stadler, Donald A. Automatic accumulating lift and carry transfer mechanism. 4,294,347, Cl. 198-751.000.
Furr, Danny L., to Phillips Petroleum Company. Fractional distillation column control. 4,295,196, Cl. 364-501.000.
Fuson, Robert L., to Zimmer USA, Inc. Bone plug inserting system. 4,293,962, Cl. 3-1.900.
Futaba Denshi Kogyo K.K.: *See—*
Moto, Masato; and Ito, Seigo, 4,295,082, Cl. 318-599.000.
Futatsumori, Koji: *See—*
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Fyson, John R., to Eastman Kodak Company. Photographic bleach compositions and methods of photographic processing. 4,294,914, Cl. 430-418.000.
G. D. Searle & Co.: *See—*
Wagner, Hans A., 4,294,830, Cl. 424-251.000.
G. L. Rexroth GmbH: *See—*
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Gado, Istvan: *See—*
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GAF Corporation: *See—*
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,294,848, Cl. 424-302.000.
Gaffney, Edward N., to Lucas Industries Limited. Terminal connector for an electric storage battery. 4,294,505, Cl. 339-231.000.
Gage, Millard E.; and Landers, Derek J., to Bendix Corporation, The. Ignition switch. 4,295,013, Cl. 200-11.00C.
Gaidis, James M.; and Rosenberg, Arnold M., to W. R. Grace & Co. Process for forming calcium nitrite. 4,294,813, Cl. 423-385.000.
Gajjar, Jagdishchandra T., to Integrated Energy Systems. Environmental control system. 4,294,404, Cl. 236-49.000.
Galaske, Folker; and Hack, Oswald, to International Standard Electric Corporation. Multi-row keyboard for typewriters or similar machines. 4,294,555, Cl. 400-488.000.
Gallic, John. Golf training aid and game. 4,294,450, Cl. 273-176.00F.
Gamble, Bruce B., to General Electric Company. Cantilevered field winding support for a superconducting AC machine. 4,295,068, Cl. 310-52.000.
Ganellin, Charon R.: *See—*
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Ganser, Volker: *See—*
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.
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Gardner, Hugh C., to Union Carbide Corporation. Polyester resin compositions. 4,294,751, Cl. 260-400.00R.
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Gavin, David F.: *See—*
Knollmueller, Karl O.; Fairbrother, Robert J.; and Gavin, David F., 4,294,713, Cl. 252-28.000.
Gazda, Hans O. E. Apparatus for the separation of gas mixtures, particularly the enrichment of a gas mixture in a component containing uranium 235. 4,294,598, Cl. 55-403.000.
Geary, Carl H., Jr., to Carrier Corporation. Method for securing a wheel to a rotatable shaft. 4,293,996, Cl. 29-446.000.
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Stutz, Hansruedi, 4,294,545, Cl. 356-386.000.
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Geiszler, Willard A., Jr.: *See—*
Kassman, Allen J.; and Geiszler, Willard A., Jr., 4,294,265, Cl. 131-366.000.
Gell, Peter L., to Tuscan Industries Pty. Limited. Tape cartridge. 4,294,418, Cl. 242-197.000.
Gendron, Wilfred H., to Westvaco Corporation. Non-gusseted expansible envelope. 4,294,400, Cl. 229-68.00R.
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General Battery Corporation: *See—*
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Anthony, Thomas R.; and Cline, Harvey E., 4,294,631, Cl. 148-133.000.
Bair, Eugene C.; and Hopkins, Willard C., 4,294,006, Cl. 29-701.000.
Balko, Edward N., 4,294,671, Cl. 204-128.000.
Carollo, Jerome T.; and Barbarasch, Joseph, 4,295,159, Cl. 358-22.000.
Cordray, Daniel E., 4,295,175, Cl. 361-69.000.
Cutler, John H.; Espelage, Paul M.; and Walker, Loren H., 4,295,086, Cl. 318-759.000.
Erkfritz, Donald S., 4,294,565, Cl. 407-113.000.
Faler, Gary R.; and Loucks, George R., 4,294,995, Cl. 568-728.000.
Frank, James P., 4,294,004, Cl. 29-622.000.
Gamble, Bruce B., 4,295,068, Cl. 310-52.000.
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Laskow, William; and Morelock, Charles R., 4,294,788, Cl. 264-101.000.
Li, Ming K., 4,294,993, Cl. 568-724.000.
Li, Ming K., 4,294,994, Cl. 568-724.000.
Oler, Robert A., 4,294,812, Cl. 423-357.000.
Orlando, Charles M.; and Loucks, George R., 4,294,954, Cl. 528-174.000.
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., 4,294,158, Cl. 89-12.000.
Quinn, Clayton B.; and Hilakos, William, 4,294,953, Cl. 528-128.000.
Sedlak, John M.; and Lawrance, Richard J., 4,294,608, Cl. 75-0.50A.
Steigerwald, Robert L., 4,295,059, Cl. 307-253.000.
General Motors Corporation: *See—*
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Donley, William B., 4,295,209, Cl. 365-178.000.
Givan, David E.; and Ashton, Charles R., 4,295,069, Cl. 310-67.00R.
Lake, Donald E.; and Hart, John M., Jr., 4,295,117, Cl. 338-4.000.
Wendler, Paul O.; and Welsh, Clarence E., 4,294,159, Cl. 91-375.00A.
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General Refractories Company: *See—*
Anthonis, Henry E., 4,294,618, Cl. 501-129.000.
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Heydweiller, James, 4,295,020, Cl. 200-61.45R.
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Blum, Arnold; Geng, Hellmuth R.; Schulze-Schoelling, Hermann; and Spaeth, Bernd, 4,295,220, Cl. 371-61.000.
Genovese, Frank C., to Xerox Corporation. Thermoremanent magnetic imaging member and system. 4,294,901, Cl. 430-39.000.
Georgia-Pacific Corporation: *See—*
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Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,294,047, Cl. 51-327.000.
Gerboth, Patrick L.; and Thompson, Charles W., to SGM Co., Inc. Hydraulic blower system for vehicles. 4,294,082, Cl. 62-244.000.
Gerdes, Thedor, to Blau KG Fabrik Fur Kraftfahrzeugteile. Vehicle fuel tank sealing cap. 4,294,375, Cl. 220-293.000.
Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeugteile. Relief valve. 4,294,281, Cl. 137-541.000.
Germer, Kurt: *See—*
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Geroc, Andre. Intraluminal anastomosis. 4,294,255, Cl. 128-334.00C.
Gerstenberg, Roy W., to Leesona Corporation. Feed roll device for sheet granulator. 4,294,414, Cl. 241-222.000.
Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
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Gevaud, Roland; and Tallon, Jacques, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Leak detector. 4,294,106, Cl. 73-40.700.
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Gibson, Stephen. Stereoscopic apparatus and method of using same. 4,295,153, Cl. 358-3.000.
Giesenberg, Peter, to Bodenseewerk Geratetechnik GmbH. Device for erecting and stabilizing a gyro vertical. 4,294,128, Cl. 74-5.440.
Giflo, Henrik. Acid resistant, high-strength steel suitable for polishing. 4,294,613, Cl. 75-124.000.



Gilbert Products: *See—*
Lieberman, Gilbert R., 4,294,503, Cl. 339-119.00L.
Gilcrest, Richard K.: *See—*
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Gill, Peter J.: *See—*
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Gioello, Debbie A. Stretch knit body suit with padded areas. 4,293,959, Cl. 2-243.00B.
Givan, David E.; and Ashton, Charles R., to General Motors Corporation. Armature shaft for a vehicle starter motor. 4,295,069, Cl. 310-67.00R.
GKN Group Services Limited: *See—*
Fry, Timothy S., 4,294,326, Cl. 180-255.000.
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Glace, William R.: *See—*
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Person, Abraham; Wetmore, Sherman B.; and McNary, James F., 4,294,564, Cl. 405-195.000.
Glockler, Otto, to Robert Bosch GmbH. Electrically controlled fuel injection apparatus. 4,294,217, Cl. 123-491.000.
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Glymph, Ronald C. Pocket pipe. 4,294,267, Cl. 131-330.000.
GM Research: *See—*
Murez, James D., 4,294,496, Cl. 312-208.000.
Godard, Pierre; and Billot, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Method of controlling the heating of a chamber and a controlled chamber-heating installation. 4,294,309, Cl. 165-18.000.
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Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.
Golay, Marcel J. E. Heat insulator. 4,294,231, Cl. 126-441.000.
Gold, Barry L.; and Bolesky, Richard C., to Zimmer USA, Inc. Unrestrained elbow prosthesis. 4,293,963, Cl. 3-1.910.
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Gombas, Laszlo A. Bottom roll-forming method and apparatus and resultant can end configuration. 4,294,097, Cl. 72-94.000.
Goodman, Ronald L.: *See—*
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Goodyear Aerospace Corporation: *See—*
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Gordon, Roy G. Apparatus for vapor coating a moving glass substrate. 4,294,193, Cl. 118-718.000.
Gorzegno, Walter P., to Foster Wheeler Energy Corporation. Variable pressure vapor generator utilizing crossover circuitry for the furnace boundary wall fluid flow tubes. 4,294,200, Cl. 122-406.00S.
Gottbreht, Tom L.; and Shepherd, Glen C., to Texas Instruments Incorporated. Method of fabricating capacitive touch switch panel. 4,293,987, Cl. 29-25.420.
Goudie, Alexander C.: *See—*
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Gould Inc.: *See—*
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Gowans, Neil A.; and Riester, William C., to Trico Products Corporation. Arm to blade connector. 4,293,974, Cl. 15-250.320.
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Graf, Fredy E.; Mahler, William M.; and Malan, Howard J., to General Atomic Company. Optical card reader. 4,295,051, Cl. 250-569.000.
Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., to Congoleum Corporation. Solar heat energy collecting systems and methods of making the same. 4,294,786, Cl. 264-46.400.
Graham, William F., to Du Pont de Nemours, E. I., and Company. Epoxy imide. 4,294,743, Cl. 260-32.8EP.
Graham, William F., to Du Pont de Nemours, E. I., and Company. Epoxy imide compositions. 4,294,877, Cl. 428-209.000.
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, to Atlantic Richfield Company. Preparing oxygen-containing fuel wherein tertiary butyl alcohol is the major product of the process. 4,294,999, Cl. 568-910.000.
Granger, Bruce A.; and Klis, David S., to Toro Company, The. Clutch assembly. 4,294,339, Cl. 192-12.0BA.
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Granzow, Daniel B.: *See—*
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Greatbatch, Wilson. Rate controlled digital pacemaker. 4,294,256, Cl. 128-419.0PT.
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Greppmair, Martin; and Grunwald, Wittloff, to Wacker Werke GmbH & Co. KG. Crank gear with adjustable crank radius for motor driven working implements. 4,294,136, Cl. 74-600.000.
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Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, to Bayer Aktiengesellschaft. Process for the production of elastic, optionally cellular, polyurethane ureas. 4,294,934, Cl. 521-160.000.
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Gruter, Karl; and Leineweber, Jurgen, to Leybold Heraeus GmbH. Mass spectrometer. 4,295,046, Cl. 250-287.000.
GTE Automatic Electric Laboratories, Inc.: *See—*
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GTE Laboratories Incorporated: *See—*
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Cooperman, Michael, 4,295,089, Cl. 323-351.000.
Haugsjaa, Paul O., 4,295,137, Cl. 340-781.000.
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Resnick, Martin L., 4,295,207, Cl. 364-900.000.
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Lincoln, Howard P.; and Reddinger, Donald M., 4,294,669, Cl. 204-15.000.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,680, Cl. 204-224.00R.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,681, Cl. 204-224.00R.
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Gueret, Jean-Louis, to L'Oreal. Closing device, with a tiltable nozzle, for a pressurized container. 4,294,410, Cl. 239-577.000.
Guergen, Karlheinz. Cutter head for rotary percussion drills. 4,294,319, Cl. 175-389.000.
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Linde, Gerhard; Haeussinger, Peter; and Schliebener, Claus, 4,294,590, Cl. 55-48.000.
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, to Kureha Kagaku Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Stabilized electrocast zirconia refractories. 4,294,795, Cl. 264-332.000.
Haggstrom, Ake T. L., to GKN-Stenman AB. Cylinder lock having spring-actuated pins. 4,294,092, Cl. 70-364.00A.
Hagyu, Toshimasa: *See—*
Obata, Toshiharu; Hagyu, Toshimasa; and Kojima, Hisao, 4,294,396, Cl. 228-245.000.
Haji, Katsumi: *See—*
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Hajime Industries Ltd.: *See—*
Yoshida, Hajime, 4,295,120, Cl. 340-146.3MA.
Hall, John B.: *See—*
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,294,266, Cl. 131-277.000.
Hall, John W.: *See—*
Moore, Ronald D.; and Hall, John W., 4,294,112, Cl. 73-162.000.
Hallberg, Lars O.: *See—*
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Halle, Joan: *See—*
Haase, Margaret J.; Hasse, Meredith; and Halle, Joan, 4,294,350, Cl. 206-216.000.
Hallett, Robert J.: *See—*
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Halvorsen, Jack R.: *See—*
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Hammer, Josef: *See—*
Sindlinger, Rainer; and Hammer, Josef, 4,294,493, Cl. 308-10.000.
Hammersand, Fred G.: *See—*
Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.
Hampton, Vernon: *See—*
Baldwin, Stanley L.; Hampton, Vernon; and Embleton, Tony F. W., 4,294,330, Cl. 181-230.000.
Hanamura, Syoji: *See—*
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.
Hannes Marker: *See—*
Sedlmayr, Gerhard, 4,294,458, Cl. 280-605.000.
Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, to Robert Bosch GmbH. Fuel injection system. 4,294,215, Cl. 123-470.000.
Hansen, John M., to Emerson Electric Co. Tracking mechanism for a belt type sander. 4,294,044, Cl. 51-135.0BT.
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Heat resistant catalyst for the production of sulfuric acid for using a gas containing sulfur dioxide in a high concentration. 4,294,723, Cl. 252-440.000.
Hara, Reinosuke: *See—*
Otsuka, Chikao; Hara, Reinosuke; and Shigenaka, Yoshito, 4,294,367, Cl. 215-246.000.
Hara, Yukio: *See—*
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.
Harada, Hideo: *See—*
Nishimura, Yoshinori; Umeda, Kaoru; and Harada, Hideo, 4,295,224, Cl. 455-156.000.
Harada, Kunihiro: *See—*
Harita, Yoshiyuki; Kamoshida, Yoichi; and Harada, Kunihiro, 4,294,908, Cl. 430-286.000.
Harada, Yoshiaki: *See—*
Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, 4,294,706, Cl. 210-762.000.
Hardy, Frederick E.; and Dewar, Colin A., to Procter & Gamble Company, The. Detergent softener with amine ingredient. 4,294,710, Cl. 252-8.800.
Hardy, Frederick E.; and Stoddart, Barry, to Procter & Gamble Company, The. Washing and softening compositions and methods for their manufacture. 4,294,711, Cl. 252-8.750.
Hardy, Nicolas; and Dancot, Georges, to Propylox (Societe Anonyme). Process for the purification of organic solutions of percarboxylic acids. 4,294,776, Cl. 260-502.00R.
Harigane, Kotaro: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.
Harita, Yoshiyuki; Kamoshida, Yoichi; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Photoresist composition containing modified cyclized diene polymers. 4,294,908, Cl. 430-286.000.
Harjar, Martin J.: *See—*
Hastings, Donald R.; and Harjar, Martin J., 4,294,411, Cl. 239-707.000.
Harkleroad, James F. Mortar/concrete hand-mixing tub. 4,294,547, Cl. 366-1.000.
Harm, Josephus J. D. Prefabricated chimney-shaft. 4,294,474, Cl. 285-133.00R.
Harper, Norman J.: *See—*
Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., 4,294,824, Cl. 424-101.000.
Harris Corporation: *See—*
Pan, Jing-Jong, 4,295,225, Cl. 455-601.000.
Harris, George S., to Syntex (U.S.A.) Inc. Use of 4,5-dihydro-2-lower alkoxycarbonylamino-4-phenyl imidazoles and substituted phenyl derivatives thereof as anti-hypertensive agents. 4,294,844, Cl. 424-273.00R.
Harris, John F., Jr., to Du Pont de Nemours, E. I., and Company. Polymers from phenylterephthalic acid. 4,294,955, Cl. 528-176.000.
Harrison, John M.: *See—*
Johnson, Avery R.; McGurk, Richard G.; and Harrison, John M., 4,295,008, Cl. 179-18.0BC.
Harrison, Loren C. Water sensitive probe valve for use with a gas leak detector. 4,294,276, Cl. 137-67.000.
Harsy, Gabor, to Sig Schweizerische Industrie-Gesellschaft. Swivel-truck spring system for railroad use. 4,294,175, Cl. 105-199.00R.
Hart, John M., Jr.: *See—*
Lake, Donald E.; and Hart, John M., Jr., 4,295,117, Cl. 338-4.000.



Harte, Richard A.: *See—*
Burgett, Michael W.; and Harte, Richard A., 4,294,817, Cl. 424-8.000.
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, to Godecke Aktiengesellschaft. Azocine analgesics and method for their preparation. 4,294,834, Cl. 424-260.000.
Hartley, Henry F.: *See—*
Darden, Boyd E.; and Hartley, Henry F., 4,295,194, Cl. 364-200.000.
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, to BASF Aktiengesellschaft. Manufacture of paper having a high dry strength and a low wet strength. 4,294,873, Cl. 427-391.000.
Hartmann, Willy: *See—*
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,294,973, Cl. 548-320.000.
Hartstein, Allan M., to International Business Machines Corporation. Solid state battery. 4,294,898, Cl. 429-104.000.
Hashemian, Hashem M.; Kerlin, Thomas W.; and Upadhyaya, Belle R., to University of Tennessee Research Corp. Apparatus for measuring the degradation of a sensor time constant. 4,295,128, Cl. 340-506.000.
Hashimoto, Akihiko; Nakajima, Yukio; Koiwai, Tamotsu; and Kimura, Toyohiko, to Olympus Optical Company, Ltd. Motor driven camera. 4,294,527, Cl. 354-25.000.
Hashimoto, Fukashi, to Mitsubishi Petrochemical Co., Ltd. Resin compositions and heat-sealable composite biaxially-stretched films. 4,294,889, Cl. 428-515.000.
Hashimoto, Sadakatsu, to Sharp Kabushiki Kaisha. Color density stabilizer for electrochromic display. 4,294,519, Cl. 350-357.000.
Hasse, Meredith: *See—*
Haase, Margaret J.; Hasse, Meredith; and Halle, Joan, 4,294,350, Cl. 206-216.000.
Hastings, Donald R.; and Harjar, Martin J., to Nordson Corporation. Electrostatic spray gun. 4,294,411, Cl. 239-707.000.
Hastings, Jeanne D. Carrying case for artist's materials. 4,294,348, Cl. 206-1.700.
Hata, Hidetoh; Haji, Katsumi; Sako, Kazushige; Shibata, Yoji; and Achiha, Masahiko, to Nippon Telegraph, Telephone Public Corp.; and Hitachi, Ltd. Digital video and audio file system. 4,295,154, Cl. 358-4.000.
Hatada, Minoru; Hiyama, Kunio; Ihara, Hirokazu; and Kuma, Hisao, to Hitachi, Ltd. Bus priority control method in loop bus network system. 4,295,122, Cl. 340-147.0LP.
Hathaway, Dana B., to Epicure Products Inc. Linear excursion-constant inductance loudspeaker. 4,295,011, Cl. 179-115.5VC.
Hattori, Nobuoto, to Olympus Optical Company Ltd. Optical scanner with anamorphic optical system. 4,294,506, Cl. 350-6.800.
Haugsjaa, Paul O., to GTE Laboratories Incorporated. Electroluminescent display driver system for thin-film electroluminescent devices requiring electric field reversal. 4,295,137, Cl. 340-781.000.
Hausdorfer, Michael; and Heitmann, Jurgen, to Robert Bosch GmbH. Method for producing color television signals. 4,295,156, Cl. 358-12.000.
Havenith, Lothar: *See—*
Klein, Alfons; Kron, Rudolf; Wedemeyer, Karlfried; Knust, Ernst; and Havenith, Lothar, 4,294,715, Cl. 361-318.000.
Hawkins, Roland L., to Hoechst Fibers Industries, Div. of American Hoechst Corporation. Staple fiber, finish therefor and process for use of same. 4,294,883, Cl. 428-361.000.
Hawkins, William R.: *See—*
Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., 4,295,181, Cl. 361-395.000.
Hayakawa, Hideharu: *See—*
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,294,795, Cl. 264-332.000.
Hayashi, Masaki; Iguchi, Sadahiko; Okada, Takanori; and Kawasaki, Akiyoshi, to Warner-Lambert Company. Prostaglandin analogues. 4,294,849, Cl. 424-305.000.
Hayashi, Masayuki: *See—*
Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, 4,294,861, Cl. 426-475.000.
Hayatsu, Kazuo: *See—*
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Hayes, Geoffrey M. G.: *See—*
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Hayes, Richard H., to Eagle-Picher Industries, Inc. Apparatus for cutting sheet molding compound. 4,294,144, Cl. 83-71.000.
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Heap, Robert B., to National Research Development Corporation. Method for monitoring pregnancy in milk-producing domestic animals. 4,294,922, Cl. 435-7.000.
Hedley, Victor H.; and Olson, Walter A. Sod cutting and stacking machine. 4,294,316, Cl. 172-20.000.
Heiberger, Philip: *See—*
Burgess, William H., III; and Heiberger, Philip, 4,294,736, Cl. 260-22.00M.
Heimann, Joseph B. Method and apparatus for making a secondary key for a lock mechanism. 4,294,096, Cl. 70-60.000.
Heine, Hans-Georg: *See—*
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,294,973, Cl. 548-320.000.
Heinrich, Bernd. Multi-hull steering system. 4,294,184, Cl. 114-61.000.
Heitmann, Jurgen: *See—*
Hausdorfer, Michael; and Heitmann, Jurgen, 4,295,156, Cl. 358-12.000.
Heldt, Wolfgang: *See—*
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Helfert, Herbert; Reinert, Friedrich; Richter, Paul; Vescia, Michele; and Wegerle, Dieter, to BASF Aktiengesellschaft. Removal of oligomer deposits from textile materials. 4,294,576, Cl. 8-137.500.
Hellestam, Carl-Johan S., to Boliden Aktiebolag. Method and an agent for chemical purification of water by means of chemical precipitation and magnetic sludge separation. 4,294,705, Cl. 210-695.000.
Helling, Gunter; Saleck, Wilhelm; and Bergthaller, Peter, to Agfa-Gevaert Aktiengesellschaft. Photographic silver halide emulsion. 4,294,920, Cl. 430-569.000.
Henderson, Ellsworth S. Combined dart rack and safety depository. 4,294,365, Cl. 211-60.00R.
Henderson, James N., to Goodyear Tire & Rubber Company, The. Rubbery copolymers of 2,3-dimethyl 1,3-butadiene. 4,294,942, Cl. 525-314.000.
Hendricks, Udo-Winifred; Hildebrand, Dietrich; and Kuth, Robert, to Bayer Aktiengesellschaft. Process for the one-bath, single-stage dyeing or printing of cellulose fibres with fibre-reactive disperse dyestuffs. 4,294,579, Cl. 8-549.000.
Hendrickson, Thomas E., to Honeywell Inc. Dual signal control system. 4,295,057, Cl. 307-231.000.
Heneveld, Lloyd A., Trustee: *See—*
Dauser, William C., Jr., 4,295,004, Cl. 174-87.000.
Henk, Hermann; Wunderlich, Klaus; and Wild, Peter, to Bayer Aktiengesellschaft. Reactive dyestuffs, their preparation and their use for dyeing materials containing OH or N. 4,294,580, Cl. 8-549.000.
Henkel Corporation: *See—*
Spitzner, Ernest, 4,294,961, Cl. 544-49.000.
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Henkel Kommanditgesellschaft auf Aktien: *See—*
Conrad, Jens; Upadek, Horst; and Bruns, Klaus, 4,294,727, Cl. 252-522.00R.
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Henoch, Bengt; and Berglind, Eilert, to Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm. Method and apparatus at one-way or two-way information link to effect interference suppression. 4,295,221, Cl. 375-23.000.
Henson, Thomas R.; and Timberlake, John F., to Dow Chemical Company, The. Preparation of organic isocyanates. 4,294,774, Cl. 260-453.00P.
Herd, David P., to Smith International, Inc. Fail-safe, non-pressure locking gate valve. 4,294,284, Cl. 137-613.000.
Hermann Ritzenhoff, Firma: *See—*
Bodenbender, Manfred; Reinhardt, Willy; and Ritzenhoff, Hermann, 4,294,368, Cl. 215-256.000.
Herr, John A.; and Rogan, Bruce R., to Singer Company, The. Latching relay using Hall effect device. 4,295,118, Cl. 338-32.00H.
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Herrmann, Willy. Apparatus for purifying a liquid by ion-exchange. 4,294,699, Cl. 210-287.000.
Herron, Clifford W.; and Wunderlich, Robert J. Wall mountable housing for programmable thermostat. 4,295,180, Cl. 361-383.000.
Herterick, George M.: *See—*
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Hession, Brent M.: *See—*
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Hession Industries, Inc.: *See—*
Hession, Rodney J.; and Hession, Brent M., 4,294,383, Cl. 222-611.000.
Hession, Rodney J.; and Hession, Brent M., to Hession Industries, Inc. Mortar applying device. 4,294,383, Cl. 222-611.000.
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Hettiger, James, to RCA Corporation. Keyed noise filter in a television receiver. 4,295,161, Cl. 358-34.000.
Hettiger, James, to RCA Corporation. Keying signal generator responsive to plural input signals. 4,295,163, Cl. 358-165.000.
Hettiger, James: *See—*
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Heydweiller, James, to General Signal Corporation. Electrical switch mechanism. 4,295,020, Cl. 200-61.45R.
Heyes, Peter J., to Metal Box Limited. Treatment of tinplate surfaces. 4,294,627, Cl. 148-6.14R.
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Heywang, Hermann: *See—*
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Hidaka, Hidemasa; Kohno, Toshiaki; and Eida, Toshiaki, to Meiji Seika Kaisha, Ltd. Method of producing high purity maltose. 4,294,623, Cl. 127-55.000.

Hieber, Konrad; and Stolz, Manfred, to Siemens Aktiengesellschaft. Method for depositing a layer on the inside of cavities of a work piece. 4,294,871, Cl. 427-237.000.

Hilakos, William: *See—*
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Hildebrand, Dietrich: *See—*
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Hill, Richard N., to W. R. Grace & Co. Aeration of phosphoric acid. 4,294,809, Cl. 423-321.00R.

Hind, John R.: *See—*
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Hinderer, Helmuth E.: *See—*
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Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, to Sumitomo Chemical Company, Limited. Resin composition for electrocoating. 4,294,940, Cl. 525-124.000.

Hirai, Toru: *See—*
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Hirano, Shigeo: *See—*
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Hirokawa, Toshio: *See—*
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Hirose, Yoshiharu: *See—*
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Hirose, Yoshiteru: *See—*
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Hirota, Akira; Kosaka, Yoshiteru; and Ashida, Kazutaka, to Victor Company of Japan, Ltd. System for controlling rotation of rotating structure. 4,295,171, Cl. 360-73.000.

Hitachi Chemical Company, Ltd.: *See—*
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Hitachi Denshi Kabushiki Kaisha: *See—*
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Toriumi, Takeshi; and Tominaga, Tamotsu, 4,294,390, Cl. 226-181.000.

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Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.
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Hizume, Akio: *See—*
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Hochman, Benjamin L., to Air Shields, Inc. System for detecting probe dislodgement. 4,294,263, Cl. 128-736.000.

Hodgson, Donald: *See—*
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Hodgson, Thomas D.; and Jordan, Tony W. J., to United Kingdom Atomic Energy Authority. Method of leaching the contents of a can. 4,294,805, Cl. 423-4.000.

Hoechst Aktiengesellschaft: *See—*
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Hoechst Fibers Industries, Div. of American Hoechst Corporation: *See—*
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Hoffmann, Hellmut, to Bayer Aktiengesellschaft. Preparation of α-cyano-benzyl esters. 4,294,762, Cl. 260-340.300.

Hoffmann-La Roche Inc.: *See—*
Fischli, Albert E.; and Szente, Andre, 4,294,758, Cl. 260-239.30D.
Liu, Chao-Min; and Westley, John, 4,294,925, Cl. 435-84.000.

Hofstein, Steven R., to World Medical Marketing Corporation. Foot exerciser. 4,294,236, Cl. 128-25.00B.

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Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, 4,294,205, Cl. 123-274.000.
Sasaki, Takeshi, 4,295,032, Cl. 219-137.00R.
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Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

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Evans, Thomas E., 4,295,099, Cl. 328-151.000.
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Joyce, Thomas F., 4,295,203, Cl. 364-748.000.
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Hubele, Adolf, to Ciba-Geigy Corporation. Fungicidal acylanilides. 4,294,850, Cl. 424-309.000.

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Nyul, Paul; and Hughes, Frederick R., 4,295,151, Cl. 357-68.000.

Hughes, Graham K., to Southland Corporation, The. Process for the production of alkyl aryl ethers. 4,294,992, Cl. 568-632.000.

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Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, to United Kingdom Atomic Energy Authority. Nuclear reactors. 4,294,658, Cl. 376-404.000.

Humphries, William T.: *See—*
Wildnauer, Richard H.; and Humphries, William T., 4,294,852, Cl. 424-317.000.

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Hyatt, Michael V.; and Quist, William E., to Boeing Company, The. Aluminum alloy products and methods. 4,294,625, Cl. 148-2.000.

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Miyagishima, Tosh; Puntar, Joseph; and Wieveg, Raymond, 4,294,314, Cl. 166-318.000.

Hydroacoustics Inc.: *See—*
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Hyman, Dennis C., to Presley, Molly. Weight redistribution apparatus. 4,294,466, Cl. 280-772.000.

Ibsen, Robert L.; and Glace, William R., to Den-Mat, Inc. Kit for repair of porcelain dental prostheses. 4,294,349, Cl. 206-63.500.

Idelson, Elbert M., to Polaroid Corporation. Silver halide developing agents. 4,294,915, Cl. 430-441.000.

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Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Prefectural Economic Federation of Agricultural Co-operatives. Method of separating and taking out pulp from citrus fruits. 4,294,861, Cl. 426-475.000.

Iguchi, Sadahiko: *See—*
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Ikeda, Takashi: *See—*
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Ikemura, Yuichi: *See—*
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Iki, Tetsuo: *See—*
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Ikura, Hiroshi: *See—*
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Illinois Tool Works Inc.: *See—*
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Keeler, Robert J.; and Filipiak, Stanley E., 4,295,012, Cl. 200-5.00B.

Imperial Chemical Industries, Inc.: *See—*
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Imperial Chemical Industries Limited: *See—*
Anderson, Norman; Peak, Richard; and Moyse, James A., 4,294,709, Cl. 252-8.800.
Bentley, John; and Thompson, Morice, 4,294,735, Cl. 260-22.0CB.
Nicks, Peter F., 4,294,887, Cl. 428-423.100.

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Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.

Ingram, Arlen E. Tennis ball holder. 4,294,386, Cl. 224-252.000.

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Inoue, Eiichi; Shimizu, Isamu; and Shizukuishi, Makoto, to Fuji Photo Film Co., Ltd. Electrochromic display device. 4,294,520, Cl. 350-357.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,294,121, Cl. 73-662.000.

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Inoue, Toshinori: *See—*
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Inouye, Hiroshi; and Sato, Eiichi, to Hitachi, Ltd. Mechanical seal. 4,294,453, Cl. 277-22.000.

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Cohen, Georges; and Rojey, Alexandre, 4,294,080, Cl. 62-101.000.
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Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.
Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, 4,295,210, Cl. 365-227.000.
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Enser, Mats A.; Hallberg, Lars O.; and Stalberg, Nils G., 4,295,121, Cl. 340-146.3MA.
Fennel, John W., Jr.; Hallett, Robert J.; Head, Stanley M.; and Melas, Constantine M., 4,295,217, Cl. 370-81.000.
Hartstein, Allan M., 4,294,898, Cl. 429-104.000.
Jambotkar, Chakrapani G.; and Wang, Paul P., 4,294,002, Cl. 29-571.000.
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Kircher, Charles J.; Huang, Hung-Chang W.; and Murakami, Masanori, 4,295,147, Cl. 357-5.000.
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Mako, John, 4,294,552, Cl. 400-219.100.

Miersch, Ekkehard F.; and Romankiw, Lubomyr T., 4,295,183, Cl. 361-403.000.
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International Flavors &-Fragrances Inc.: *See—*
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,294,863, Cl. 426-538.000.
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,294,266, Cl. 131-277.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,294,708, Cl. 252-8.600.

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International Standard Electric Corporation: *See—*
Galaske, Folker; and Hack, Oswald, 4,294,555, Cl. 400-488.000.

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Irako, Koichi: *See—*
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IRD Mechanalysis, Inc.: *See—*
Stoutenburg, Donn V., 4,295,136, Cl. 340-753.000.

Isberg, Gary J. Fluid proportioning device. 4,294,273, Cl. 137-1.000.

Ise, Yukihiko: *See—*
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Issei, Katsuta; and Tetsuo, Tanaka, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of acetonitrile from crude olefinically unsaturated nitrile. 4,294,665, Cl. 203-50.000.

Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, to UBE Industries, Ltd. Process for producing biphenyl compounds. 4,294,976, Cl. 560-76.000.

Ito Optical Industrial Co., Ltd.: *See—*
Kato, Hirohisa, 4,294,950, Cl. 528-14.000.

Ito, Seigo: *See—*
Moto, Masato; and Ito, Seigo, 4,295,082, Cl. 318-599.000.

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Iwaki, Yoshiyuki: *See—*
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Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Hydraulic torque converter control system. 4,294,140, Cl. 74-868.000.

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Izawa, Ryuichi: *See—*
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

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Jagenberg Werke AG: *See—*
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Jakubek, John, to Timex Corporation. Electrooptical device with encapsulated self-luminous backlight assembly. 4,294,517, Cl. 350-345.000.

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Jamet, Bruno: *See—*
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Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,294,878, Cl. 428-212.000.
Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., 4,294,042, Cl. 51-54.000.
McHenry, Patricia A., 4,294,879, Cl. 428-288.000.

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Wildnauer, Richard H.; and Humphries, William T., 4,294,852, Cl. 424-317.000.

Johnson, Leighton C., to Miles Laboratories, Inc. Method for producing monocellular layers of cell-containing biological fluid. 4,294,866, Cl. 427-2.000.

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Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., 4,295,005, Cl. 174-92.000.

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Buser, Hansueli; and Jordi, Peter E., 4,294,117, Cl. 73-864.850.

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Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, 4,294,999, Cl. 568-910.000.

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Rock, Erich; and Mages, Bernhard, 4,294,499, Cl. 312-334.000.

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Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.

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Saito, Tsutomu; and Shida, Masaaki, 4,294,657, Cl. 162-303.000.

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Takahashi, Nagashige, 4,294,233, Cl. 128-4.000.

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Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.

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Shinoda, Akibumi; and Nakane, Masao, 4,294,334, Cl. 188-18.00A.
Takahisa, Shuji; Suzuki, Osamu; and Shibano, Michio, 4,294,067, Cl. 57-274.000.

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Kahl, Melvin R., to Envirotech Corporation. Mounting for high-voltage electrode support frame in an electrostatic precipitator. 4,294,591, Cl. 55-120.000.

Kahn, Leonard. Method and means for introducing additional asymmetry into audio waves. 4,295,106, Cl. 332-37.00R.

Kaido, Chikara: *See—*
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Kainosho, Masatsune: *See—*
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.

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Iida, Yoshihiko; and Kajiwara, Toshiyuki, 4,294,394, Cl. 228-158.000.

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Kaldor, Antal: *See—*
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Kaltenbach & Voight GmbH & Co.: *See—*
Eibofner, Eugen, 4,294,797, Cl. 422-36.000.

Kalwaitis, George V., to Air Products and Chemicals, Inc. Apparatus for extraction of materials from operating pressurized vessels. 4,294,124, Cl. 73-863.850.

Kamada, Hiroshi: *See—*
Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Machata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

Kamoshida, Yoichi: *See—*
Harita, Yoshiyuki; Kamoshida, Yoichi; and Harada, Kunihiro, 4,294,908, Cl. 430-286.000.

Kamp, Eugene L., to A. B. Chance Company. Spring biased energy absorber for vacuum switch contact shafts. 4,295,024, Cl. 200-288.000.

Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, to Bridgestone Tire Company Limited. Flexible pipe connector. 4,294,475, Cl. 285-165.000.

Kanamori, Kyozo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Kanamuller, Franz X.: *See—*
Eibner, Jules A.; and Kanamuller, Franz X., 4,295,043, Cl. 250-227.000.

Kandel, Arnold. Truss-framed building structures. 4,294,050, Cl. 52-93.000.

Kaneko, Toyohiko: *See—*
Sawa, Toshio; Kubota, Masayoshi; Takahashi, Sankichi; and Kaneko, Toyohiko, 4,294,697, Cl. 210-221.100.

Kanno, Iwao: *See—*
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,295,047, Cl. 250-363.00S.

Kanno, Tadao: *See—*
Watanabe, Teruoki; Kanno, Tadao; Hidaka, Akio; and Kobayashi, Shunji, 4,294,630, Cl. 148-16.600.

Kanter, Hartmut, to BASF Aktiengesellschaft. Pigments containing pyrazolo quinazolone radicals. 4,294,755, Cl. 260-154.000.

Kanto Yakin Kogyo Kabushiki Kaisha: *See—*
Takahashi, Susumu, 4,294,436, Cl. 266-257.000.

Kanzaki, Toshihide: *See—*
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, 4,294,723, Cl. 252-440.000.

Kari, Csaba: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

Karlsson, Kent A. B.: *See—*
Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., 4,294,412, Cl. 241-30.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. Novel polymeric compounds. 4,294,949, Cl. 526-262.000.

Kasashima, Masao; and Kubo, Yoshizo, to Alps Electric Co., Ltd. Rotary variable resistor. 4,295,119, Cl. 338-162.000.

Kashima, Isoo; Mishina, Masami; Takase, Yosio; and Maruchi, Katsumi, to Matsushita Electric Works, Ltd. Limit switch. 4,295,017, Cl. 200-47.000.

Kashiwa, Norio: *See—*
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, 4,294,948, Cl. 526-125.000.

Kaspar, Ernst, to BBC Brown, Boveri & Company Limited. Lattice bar for electrical machinery. 4,295,071, Cl. 310-213.000.

Kassman, Allen J.; and Geiszler, Willard A., Jr., to Philip Morris Incorporated. Filter cigarette with inlet vent zones. 4,294,265, Cl. 131-366.000.

Kasuya, Kazuki, to Chlorine Engineers Corp., Ltd. Method for the production of cathode for use in electrolysis. 4,294,628, Cl. 148-6.350.

Katayama, Morimitsu: *See—*
Kisaka, Hiroyuki; Sagata, Makoto; Miyahara, Masayoshi; and Katayama, Morimitsu, 4,294,130, Cl. 74-15.400.

Katayama, Tsutomu: *See—*
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Kato, Akihiro: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Kato, Hirohisa, to Ito Optical Industrial Co., Ltd. Coating composition comprising hydrolyzates from silane compounds. 4,294,950, Cl. 528-14.000.

Kato, Jyoji: *See*—
Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, 4,294,832, Cl. 424-258.000.

Kato, Tadaaki: *See*—
Sakagami, Teruo; Kato, Tadaaki; Hirai, Toru; and Murayama, Naohiro, 4,294,677, Cl. 204-181.00F.

Kaufman, Arthur. Virtual image display apparatus. 4,294,515, Cl. 350-174.000.

Kaufman, Kurt D., to Thomas C. Elder, Inc. 5-Aminoalkyl-4,4,8-trialkylpsoralens. 4,294,822, Cl. 424-59.000.

Kaufman, Kurt D., to Thomas C. Elder, Inc. 8-Aminoalkyl-4-alkylisopsoralens. 4,294,847, Cl. 424-279.000.

Kaufman, Richard H.: *See*—
Margulies, Herman; and Kaufman, Richard H., 4,294,361, Cl. 206-532.000.

Kaufmann, John, Jr., to Kaufmann, John, Jr. Spring tension fastener. 4,293,984, Cl. 24-221.00R.

Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Automatic apparatus for inserting electric components. 4,293,998, Cl. 29-564.100.

Kawakami, Kanji: *See*—
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Kawamura, Keita: *See*—
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Kawano, Tsuyoshi; Usuda, Matsuo; and Hirokawa, Toshio, to Nippon Steel Corporation. Process for fabricating heavy wall to pipe. 4,294,095, Cl. 72-51.000.

Kawasaki, Akiyoshi: *See*—
Hayashi, Masaki; Iguchi, Sadahiko; Okada, Takanori; and Kawasaki, Akiyoshi, 4,294,849, Cl. 424-305.000.

Kawasaki Steel Corporation: *See*—
Oda, Kenichi, 4,294,305, Cl. 164-150.000.

Keeler, Robert J.; and Filipiak, Stanley E., to Illinois Tool Works Inc. Secretarial shift mechanism for an electric keyboard. 4,295,012, Cl. 200-5.00B.

Kehrer, Wolfgang; and Lachmann, Helmut, to Borsig GmbH. Tube-bundle heat exchanger for cooling a medium having a high inlet temperature. 4,294,312, Cl. 165-134.00R.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing phenylephrine. 4,294,820, Cl. 424-28.000.

Keller, Alois, to Gebrueder Buehler AG. Drum-type screening machine and method of operation. 4,294,692, Cl. 209-300.000.

Keller, Andre, to Roll & Go AG. Sole attachment for facilitating walking. 4,294,025, Cl. 36-132.000.

Keller, Douglas V., Jr.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,294,695, Cl. 210-173.000.

Keller, Russell D. Fuel tank cap. 4,294,376, Cl. 220-318.000.

Kelly, Arnold J., to Exxon Research & Engineering Co. Mass sensing element. 4,294,105, Cl. 73-28.000.

Kemme, Wendell J., to T/Drill, Inc. Tube cutter. 4,294,011, Cl. 30-106.000.

Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., to University of Rochester. Intermediates for the production of picropodophyllin and related compounds and processes for the preparation and use thereof. 4,294,763, Cl. 260-340.5DP.

Kennecott Corporation: *See*—
Stevens, John H.; and Reidel, Bruce A., 4,294,357, Cl. 206-409.000.

Kenney, Michael J., to Dunlop Limited. Gelled lubricant composition for run-flat tires comprising polybutene acrylic or polyolefin gelling agent and particulate solid puncture sealing material. 4,294,730, Cl. 260-17.4BB.

Kent Corporation, The: *See*—
Oztekin, Muammer A.; and Albano, Vincent J., 4,294,363, Cl. 211-49.00D.

Kerlin, Thomas W.: *See*—
Hashemian, Hashem M.; Kerlin, Thomas W.; and Upadhyaya, Belle R., 4,295,128, Cl. 340-506.000.

Kern, Heinz: *See*—
Brede, Uwe; and Kern, Heinz, 4,294,648, Cl. 156-627.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Labus, Herwig, 4,294,115, Cl. 73-342.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Sieverdt, Lothar, 4,294,504, Cl. 339-132.00R.

Kestner, Diane E.: *See*—
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., 4,294,739, Cl. 260-29.6RW.

Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,294,820, Cl. 424-28.000.

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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Khoe, Giok D.; Kock, Hendrikus G.; Meuleman, Lambertus J.; and Van Ruyven, Lodewijk J., to U.S. Philips Corporation. Optical coupler with a housing permitting adjustment of the distance between the light source and the lens. 4,295,152, Cl. 357-74.000.

Kieffer, Vincent C. Router guide apparatus and method. 4,294,297, Cl. 144-134.00D.

Kierdorf, Hans: *See*—
Schmitz, Gunther; and Kierdorf, Hans, 4,294,064, Cl. 57-3.000.

Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, to Mitsubishi Petrochemical Company Limited. Process for the production of an ion exchange membrane. 4,294,933, Cl. 521-27.000.

Kilburn, James S., to Occidental Oil Shale, Inc. Thermally insulated bulkhead for in situ oil shale retort. 4,294,563, Cl. 405-132.000.

Killmann, Irolt; and Bonifer, Georg W., to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for working aligned bores. 4,294,546, Cl. 356-399.000.

Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., to Electric Power Research Institute, Inc. Process for coal liquefaction and catalyst. 4,294,685, Cl. 208-10.000.

Kim, Han J.; Peters, Thomas E.; and Gustafson, John, to GTE Products Corporation. Electrical contacts. 4,294,616, Cl. 75-234.000.

Kimball, Charles A.; and Sullivan, Marc L., to Time Commercial Financing Corporation. Cab suspension and restraining device. 4,294,324, Cl. 180-89.140.

Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Method of mirror-finishing a cylindrical workpiece. 4,294,673, Cl. 204-129.460.

Kimura, Hitoshi: *See*—
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Kimura, Toyohiko: *See*—
Hashimoto, Akihiko; Nakajima, Yukio; Koiwai, Tamotsu; and Kimura, Toyohiko, 4,294,527, Cl. 354-25.000.

Kinaga, Eiichi; and Mori, Mamoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,294,468, Cl. 280-807.000.

Kinashi, Keizo: *See*—
Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, 4,294,832, Cl. 424-258.000.

Kinergetics, Inc.: *See*—
Cowans, Kenneth W., 4,294,242, Cl. 128-201.130.

King, Barton. Air conditioning system. 4,294,083, Cl. 62-434.000.

King, Dennis M.; and Richardson, Ronald D., to Caterpillar Tractor Co. Differential timing altering mechanism for fuel injectors. 4,294,218, Cl. 123-502.000.

King, Margaret L.: *See*—
Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., 4,294,763, Cl. 260-340.5DP.

Kings, Donald; and Quang, Pham K., to Rhone Poulenc Systemes. Process for electrostatically developing and pressure-fixing a reversed image including charge dissipation prior to fixing. 4,294,903, Cl. 430-98.000.

Kinumaki, Toyosuke; Watanabe, Takehiko; Sugii, Kisaburo; and Iseki, Shigeo, to Tokai Regional Fisheries Research Laboratory. Process for manufacture of artificial milk replacer for raising infant pigs and other infant animals. 4,294,856, Cl. 426-7.000.

Kircher, Charles J.; Huang, Hung-Chang W.; and Murakami, Masanori, to International Business Machines Corp. Josephson devices of improved thermal cyclability and method. 4,295,147, Cl. 357-5.000.

Kirisawa, Atsushi, to Japan Envirotic Industry Co., Ltd. Method for the treatment of surfaces and apparatus employed in said method. 4,294,626, Cl. 148-6.200.

Kirsch, Bernhard. Foot-plates for ski-bindings. 4,294,460, Cl. 280-607.000.

Kisaka, Hiroyuki; Sagata, Makoto; Miyahara, Masayoshi; and Katayama, Morimitsu, to Kubota Ltd. Transmission for tractor. 4,294,130, Cl. 74-15.400.

Kishi, Akira: *See*—
Minematsu, Hiroyuki; Matsumoto, Kojiro; Saeki, Tadashi; and Kishi, Akira, 4,294,946, Cl. 526-80.000.

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Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, 4,294,611, Cl. 75-49.000.

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Kitai, Kiyoshi; Ogihara, Masuo; and Chimura, Kozo, to Seiko Koki Kabushiki Kaisha. Second hand correction device for use in timepieces. 4,295,215, Cl. 368-196.000.

Kitrell, John V. Pedicure easel. 4,294,268, Cl. 132-73.000.

Kiuchi, Norihiro: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,294,708, Cl. 252-8.600.

Klaiber, William C. Apparatus for washing, rinsing and spin drying paint rollers. 4,294,272, Cl. 134-138.000.

Kleber, Rolf; and Billenstein, Siegfried, to Hoechst Aktiengesellschaft. Alkyl-polyglycol mixed formals as fiber preparation agents. 4,294,990, Cl. 568-601.000.





Klees, Garry W., to Boeing Company, The. Supersonic jet engine and method of operating the same. 4,294,068, Cl. 60-204.000.

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Klein, David I., to Eng, George, a part interest. Device with visual and audio output. 4,294,035, Cl. 46-227.000.

Klein, Robert R.; and Makowski, Henry S., deceased (by Makowski, Patricia, executrix), to Exxon Research & Engineering Co. Process for forming a powdered EPDM terpolymer (C-955). 4,294,744, Cl. 260-33.6AQ.

Kline, Ellis L.: *See*—
McMichael, John; Kline, Ellis L.; and Spaulding, James G., 4,294,818, Cl. 424-12.000.

Kling, Erich: *See*—
Sloane, Thomas E., Jr.; Melius, Clair; and Kling, Erich, 4,294,594, Cl. 55-186.000.

Klingaman, Richard M.; and Ehrenreich, Leo C., to Penn Virginia Corporation. Pyroplastoid particles, composition and method of production. 4,294,750, Cl. 260-40.00R.

Klis, David S.: *See*—
Granger, Bruce A.; and Klis, David S., 4,294,339, Cl. 192-12.0BA.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Jordan, Friedrich, 4,293,995, Cl. 29-421.00R.
Killmann, Irolt; and Bonifer, Georg W., 4,294,546, Cl. 356-399.000.

Knight, Arthur J.: *See*—
Turnbull, James O.; Barker, John C.; and Knight, Arthur J., 4,294,021, Cl. 34-224.000.

Knoll, Berta: *See*—
Knoll, Jozsef; Kalasz, Huba; Knoll, Berta; and Nagy, Janos, 4,294,825, Cl. 424-101.000.

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Knowles, William S.; and Sabacky, Milton J., to Monsanto Company. Methylcyclohexyl-O-anisylphosphine. 4,294,989, Cl. 568-13.000.

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Klein, Alfons; Kron, Rudolf; Wedemeyer, Karlfried; Knust, Ernst; and Havenith, Lothar, 4,294,715, Cl. 361-318.000.

Koa Oil Company, Limited: *See*—
Okamura, Okiyoshi, 4,295,092, Cl. 324-61.00R.

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Erickson, John W.; and Petrie, Harold L., 4,294,573, Cl. 417-83.000.

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Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.

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Khoe, Giok D.; Kock, Hendrikus G.; Meuleman, Lambertus J.; and Van Ruyven, Lodewijk J., 4,295,152, Cl. 357-74.000.

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Hidaka, Hidemasa; Kohno, Toshiaki; and Eida, Toshiaki, 4,294,623, Cl. 127-55.000.

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Okishi, Yoshio; Koike, Akinobu; and Miyano, Shizuo, 4,294,905, Cl. 430-175.000.

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Yoshioka, Masahiro; Koike, Toshifumi; and Izumi, Hideki, 4,294,494, Cl. 308-76.000.

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Hashimoto, Akihiko; Nakajima, Yukio; Koiwai, Tamotsu; and Kimura, Toyohiko, 4,294,527, Cl. 354-25.000.

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Obata, Toshiharu; Hagyu, Toshimasa; and Kojima, Hisao, 4,294,396, Cl. 228-245.000.

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Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

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Blair, Eskel B.; and Koleske, Joseph V., 4,294,746, Cl. 260-37.0EP.

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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

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Murthy, Rajam R., 4,294,288, Cl. 138-30.000.

Korpman, Ralf, to Permacel. Adhesive compositions. 4,294,936, Cl. 525-93.000.

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Hirota, Akira; Kosaka, Yoshiteru; and Ashida, Kazutaka, 4,295,171, Cl. 360-73.000.

Kostan, Charles C.: *See*—
Fox, David H.; and Kostan, Charles C., 4,295,014, Cl. 200-19.00R.

Kotani, Hirotaro. Collapsible luggage carrier. 4,294,463, Cl. 280-646.000.

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Hufnagl, Walter; and Kotaucaek, Peter, 4,294,870, Cl. 427-189.000.

Kotecki, Damian J., to Teledyne Industries, Inc. Austenitic iron-base cryogenic alloy and arc welding electrode for depositing the same. 4,294,614, Cl. 75-128.00A.

Kovatch, George N.; and Wallace, James B., to Westinghouse Electric Corp. Electric control system with mechanical interlock. 4,295,053, Cl. 307-64.000.

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Koyanagi, Katubumi: *See*—
Nakauchi, Hiroshi; Koyanagi, Katubumi; Inami, Yasuhiko; and Uede, Hisashi, 4,295,138, Cl. 340-785.000.

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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Kraemer & Grebe GmbH & Co. KG Maschinen- und Modellfabrik: *See*—
Wetter, Manfred; and Schmidt, Karl H., 4,294,415, Cl. 241-292.000.

Kraemer, Horst, to Siemens Aktiengesellschaft. Microphone amplifier, in particular for telephone systems. 4,295,100, Cl. 330-257.000.

Krainev, Vladislav P.: *See*—
Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L., 4,294,306, Cl. 164-448.000.

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Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.

Kramer, Petrus A.; and Verbrugge, Pieter A., to Shell Oil Company. Cis-lactone pyrethroid intermediates. 4,294,765, Cl. 260-343.30R.

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Sappok, Reinhard; and Kranz, Joachim, 4,294,620, Cl. 106-288.00Q.

Kreibich, Ursula; and Schmid, Rolf, to CIBA-GEIGY Corporation. Apparatus for heating water by solar heat. 4,294,227, Cl. 126-400.000.

Kreikenbohm, Robert: *See*—
Reusch, Heinz; and Kreikenbohm, Robert, 4,294,310, Cl. 165-104.130.

Kreinbrink, Paul H.; and Neiman, David C., to Libbey-Owens-Ford Company. Marking and counting probe assembly. 4,295,038, Cl. 235-92.0PK.

Kretzschmar, Robert O.: *See*—
Woloshuk, Edward A.; Walz, Gregory J.; and Kretzschmar, Robert O., 4,294,523, Cl. 352-86.000.

Krieg, Adrian H., to Widder Corporation. Portable hacksaw. 4,294,013, Cl. 30-392.000.

Krob, Erwin: *See—*
Svoboda, Josef; Krob, Erwin; and Weigl, Erwin, 4,294,459, Cl. 280-605.000.

Krock, Friedrich W.; and Neeff, Rutger, to Bayer Aktiengesellschaft. Colorants. 4,294,578, Cl. 8-516.000.

Krock, Friedrich W.; Neeff, Rutger; and Scheiter, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-diamino-2,3-dicyano-anthraquinones. 4,294,769, Cl. 260-378.000.

Kron, Rudolf: *See—*
Klein, Alfons; Kron, Rudolf; Wedemeyer, Karlfried; Knust, Ernst; and Havenith, Lothar, 4,294,715, Cl. 361-318.000.

Kronseder, Hermann: *See—*
Schneider, Egon, 4,293,989, Cl. 29-130.000.

Krueger, Arnold F., to M & K Industries, Inc. Roller skate construction. 4,294,455, Cl. 280-11.200.

Krueger, Siegfried: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.

Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, to Vereinigte aluminium-Werke Aktiengesellschaft. Process for producing hydrogen fluoride from fluorine containing materials by continuous pyrohydrolysis. 4,294,816, Cl. 423-484.000.

Kruger, Robert; and Miller, William J. Solar heating and subterranean cooling. 4,294,228, Cl. 126-430.000.

Kubo, Masaharu: *See—*
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

Kubo, Yoshizo: *See—*
Kasashima, Masao; and Kubo, Yoshizo, 4,295,119, Cl. 338-162.000.

Kubota Ltd.: *See—*
Kisaka, Hiroyuki; Sagata, Makoto; Miyahara, Masayoshi; and Katayama, Morimitsu, 4,294,130, Cl. 74-15.400.
Murayama, Yoshinobu, 4,294,131, Cl. 74-15.400.
Okada, Yoshitsugu; and Nakai, Osamu, 4,294,428, Cl. 251-214.000.

Kubota, Masayoshi: *See—*
Sawa, Toshio; Kubota, Masayoshi; Takahashi, Sankichi; and Kaneko, Toyohiko, 4,294,697, Cl. 210-221.100.

Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, to Nisshin Steel Co., Ltd. Method for overaging of hot dip metal coated steel material. 4,294,632, Cl. 148-142.000.

Kubota, Yuzuru: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,295,084, Cl. 318-719.000.

Kuehnel, Werner: *See—*
Ebersberger, Otto; and Kuehnel, Werner, 4,295,049, Cl. 250-409.000.

Kuehnle, Manfred R., to Coulter Systems Corporation. Apparatus and method for preventing contamination of sputtering targets. 4,294,678, Cl. 204-192.00R.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Cationic dyestuffs. 4,294,756, Cl. 260-163.000.

Kuhr, Albert F., to United States Gypsum Company. Soffit system for suspended ceiling. 4,294,054, Cl. 52-484.000.

Kullander, Mats O., to Billerud Uddeholm AB. Method and an apparatus for coating a web with a coating composition. 4,294,872, Cl. 427-358.000.

Kulp, Karel; and Hoover, William J., to American Institute of Baking, The. Preparation of high-ratio cakes using untreated wheat flour. 4,294,864, Cl. 426-549.000.

Kuma, Hisao: *See—*
Hatada, Minoru; Hiyama, Kunio; Ihara, Hirokazu; and Kuma, Hisao, 4,295,122, Cl. 340-147.0LP.

Kumazawa, Eitaro; Saiki, Yukihiro; and Ishioka, Yozo, to Snow Brand Milk Products Co., Ltd. Material feed pipe for use in belt-system continuous vacuum drier. 4,294,018, Cl. 34-56.000.

Kunaev, Askar M.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Kunstadt, George H. Solid state mass memory system compatible with rotating disc memory equipment. 4,295,205, Cl. 364-900.000.

Kunstlicher, Erich; and Thomasson, Harry V. Knife holder. 4,294,421, Cl. 248-37.600.

Kunze, Dieter, to Jean Walterscheid GmbH. Overload clutch. 4,294,340, Cl. 192-56.00R.

Kuo, Chang-Kiang, to Texas Instruments Incorporated. Method of making implant programmable metal gate MOS read only memory. 4,294,001, Cl. 29-571.000.

Kuraray Company, Limited: *See—*
Kodera, Yuji; Ikari, Kyoichiro; and Miyake, Shunji, 4,294,935, Cl. 525-60.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,294,795, Cl. 264-332.000.
Sakagami, Teruo; Kato, Tadaaki; Hirai, Toru; and Murayama, Naohiro, 4,294,677, Cl. 204-181.00F.

Takita, Hitoshi; Mukaida, Yutaka; and Enomoto, Satoru, 4,294,770, Cl. 260-413.000.

Kurimoto, Kyoichi: *See—*
Mori, Keiji; and Kurimoto, Kyoichi, 4,294,134, Cl. 74-547.000.

Kusulas, Peter, Jr.: *See—*
Draper, Don R.; and Kusulas, Peter, Jr., 4,295,219, Cl. 371-51.000.

Kuth, Robert: *See—*
Hendricks, Udo-Winifred; Hildebrand, Dietrich; and Kuth, Robert, 4,294,579, Cl. 8-549.000.

Kutzner, Luitpold: *See—*
Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin, 4,294,401, Cl. 236-1.00G.

Kuus, Albert: *See—*
Snel, Cornelis; and Kuus, Albert, 4,294,197, Cl. 119-60.000.

Kuus, Olaf: *See—*
Dalheimer, Walter; and Kuus, Olaf, 4,294,039, Cl. 49-248.000.

Kuzunuki, Tatsuo: *See—*
Watanabe, Shigeru; and Kuzunuki, Tatsuo, 4,295,042, Cl. 250-226.000.

Kyte, Albert D. Compact toothbrush kit. 4,294,269, Cl. 132-84.00B.

Labus, Herwig, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Measuring device for practically simultaneous ΔT and T measurement. 4,294,115, Cl. 73-342.000.

Lachmann, Helmut: *See—*
Kehrer, Wolfgang; and Lachmann, Helmut, 4,294,312, Cl. 165-134.00R.

Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., to Eaton Corporation. Radiant energy activated semiconductor switch. 4,295,058, Cl. 307-252.00A.

Lafuze, David L., to General Electric Company. Phase lock loop commutation position control and method. 4,295,085, Cl. 318-721.000.

Lagoni, William A., to RCA Corporation. Signal processing circuit having a non-linear transfer function. 4,295,160, Cl. 358-31.000.

Lakatos, Eduard: *See—*
Bozon, Alfred; Koberstein, Edgar; Pletka, Hans-Dieter; Volker, Herbert; and Lakatos, Eduard, 4,294,726, Cl. 252-462.000.

Lake, Donald E.; and Hart, John M., Jr., to General Motors Corporation. Pressure sensor assembly. 4,295,117, Cl. 338-4.000.

Lam, Calvin K.: *See—*
Sarcia, Domenico S.; and Lam, Calvin K., 4,294,600, Cl. 62-6.000.

Lampert, Lester M. Article of jewelry with reciprocally movable gem. 4,294,084, Cl. 63-15.000.

Land, Donald E. Film punch. 4,294,152, Cl. 83-588.000.

Landers, Derek J.: *See—*
Gage, Millard E.; and Landers, Derek J., 4,295,013, Cl. 200-11.00C.

Lane, John E., to Parks-Cramer Company. Method and apparatus for facilitating maintenance of spinning machine information system. 4,294,065, Cl. 57-265.000.

Lane, John E., to Parks-Cramer Company. Method and apparatus for displaying specific spinning machine operating conditions. 4,294,066, Cl. 57-265.000.

Lang, Tibor: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

Langdon, Glen G., Jr., to International Business Machines Corporation. Method and means for pipeline decoding of the high to low order pairwise combined digits of a decodable set of relatively shifted finite number of strings. 4,295,125, Cl. 340-347.0DD.

Lanz, Donald D. Chain saw anti-pinch guard arm. 4,294,012, Cl. 30-378.000.

Lanzel, Leo C.: *See—*
Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., 4,294,438, Cl. 266-280.000.

Larkin, Miles K. Locking means. 4,294,560, Cl. 403-104.000.

Larsen, Charles H. Shower head and valve assembly for camping shower. 4,294,409, Cl. 239-577.000.

Larsen, Owen M. Gate assembly. 4,294,196, Cl. 119-27.000.

Laska, Ronald C.; and Pone, Janis, to Pako Corporation. Photographic reprint system with information display. 4,294,537, Cl. 355-35.000.

Laskow, William; and Morelock, Charles R., to General Electric Company. Method of making a shaped silicon carbide-silicon matrix composite and articles made thereby. 4,294,788, Cl. 264-101.000.

Latta, Milton R., to International Business Machines Corporation. Acousto-optically modulated laser scanning arrangement for correcting for interference appearing therein. 4,295,145, Cl. 346-108.000.

Lauterbach, Heinz, to Robert Bosch GmbH. Apparatus for the measurement of the mass of a flowing medium. 4,294,114, Cl. 73-204.000.

Lawrance, Richard J.: *See—*
Sedlak, John M.; and Lawrance, Richard J., 4,294,608, Cl. 75-0.50A.

Laymon, Marvin D.: *See—*
Burney, Charles F.; and Laymon, Marvin D., 4,295,132, Cl. 340-562.000.

Le Material Telephonique: *See—*
Quintin, Renee; and Villemant, Claude M., 4,294,009, Cl. 29-832.000.

Leavitt, Clyde M.: *See—*
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,294,331, Cl. 182-10.000.

LeBoeuf, Albert R., to American Optical Corporation. Hydrophilic silicone compounds and contact lenses containing polymers thereof. 4,294,974, Cl. 556-440.000.

Lectret S.A.: *See—*
Murphy, Preston V., 4,295,010, Cl. 179-110.00A.





Lee, Bobby L. Artificial flowers and method for their manufacture, unistem. 4,293,997, Cl. 29-450.000.

Lee, Ross A., to Du Pont de Nemours, E. I., and Company. Photosensitive negative-working toning process. 4,294,909, Cl. 430-291.000.

Lee, Tsao-Piao. Pipette controller with graduate reading plunger and lever assembly for gravity drainage. 4,294,125, Cl. 73-864.150.

Leenhouts, Albert C., to Superior Electric Company, The. Pulsed energy stepping motor power control unit. 4,295,083, Cl. 318-696.000.

Leesona Corporation: *See—*
Gerstenberg, Roy W., 4,294,414, Cl. 241-222.000.

Le Fur, Gerard R.: *See—*
Champseix, Alain A.; and Le Fur, Gerard R., 4,294,841, Cl. 424-267.000.

Leichnitz, Kurt, to Dragerwerk Aktiengesellschaft. Highly sensitive gas measuring method for the analysis of breath alcohol concentrations, using test tubes. 4,294,583, Cl. 23-232.00R.

Leidich, Arthur J., to RCA Corporation. Class AB push-pull quasi-linear amplifiers. 4,295,101, Cl. 330-262.000.

Leineweber, Jurgen: *See—*
Gruter, Karl; and Leineweber, Jurgen, 4,295,046, Cl. 250-287.000.

Leitex Stockholms-Tvatt Aktiebolag: *See—*
Holmquist, Borje G. A., 4,294,781, Cl. 261-89.000.

Lekas, John P. Comestible packaging apparatus. 4,294,061, Cl. 53-536.000.

Lembke, Manfred: *See—*
Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, 4,294,215, Cl. 123-470.000.

Lemelson, Jerome H. Solar energy collection panel and method. 4,294,230, Cl. 126-438.000.

Lemus, Julian. Anti-kick back device. 4,294,151, Cl. 83-477.200.

LeRoy, Rodney L., to Noranda Mines Limited; and Electrolyser Corporation Ltd., The. Hydrogen injection into gas pipelines and other pressurized containers. 4,294,274, Cl. 137-7.000.

Les Entreprises Rotot Ltee: *See—*
Thiboutot, Robert, 4,294,457, Cl. 280-20.000.

Lesher, George Y.; and Brundage, Ruth P., to Sterling Drug Inc. 1,3-Dihydro-6-(pyridinyl)-2H-imidazo[4,5-b]pyridin-2-ones and -imidazo[4,5-b]-pyridine-2-thiones and their cardiotonic use. 4,294,836, Cl. 424-263.000.

Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. 1,3-Dihydro-6-(pyridinyl)-2H-imidazo[4,5-b]pyridin-2-ones and -imidazo[4,5-b]pyridine-2-thiones and their cardiotonic use. 4,294,837, Cl. 424-263.000.

LeVeen, Harry H. Sterile article container with sterile opening edge portions. 4,294,360, Cl. 206-438.000.

Levin, Gilbert V.; and Straat, Patricia A., to Biospherics Incorporated. Device for conducting microbiological radiorespirometric assays. 4,294,931, Cl. 435-301.000.

Levine, Elliott M. Interconnected water skis. 4,293,968, Cl. 9-310.00A.

Lewis, Alfred E.; and Salisbury, Robert E., to Preco Inc. Single column load dividing gate. 4,294,569, Cl. 410-133.000.

Lewis, Robert A.; and Honnen, Lewis R., to Chevron Research Company. Carboxylic acid salt containing deposit control additives and fuel and lube oil compositions containing them. 4,294,714, Cl. 252-34.000.

Leybold Heraeus GmbH: *See—*
Gruter, Karl; and Leineweber, Jurgen, 4,295,046, Cl. 250-287.000.

Li, Ming K., to General Electric Company. Purification of bisphenol-A. 4,294,993, Cl. 568-724.000.

Li, Ming K., to General Electric Company. Purification of bisphenol-A. 4,294,994, Cl. 568-724.000.

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Kreinbrink, Paul H.; and Neiman, David C., 4,295,038, Cl. 235-92.0PK.

Licentia Patent-Verwaltungs GmbH: *See—*
Rauser, Horst, 4,295,164, Cl. 358-166.000.

Lieberman, Abraham. Method and apparatus for cutting into segments a continuously moving web of rigid insulation. 4,294,143, Cl. 83-37.000.

Lieberman, Gilbert R., to Gilbert Products. Locking means for a lamp holder. 4,294,503, Cl. 339-119.00L.

Liedtke, Kurt: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,294,642, Cl. 156-250.000.
Focke, Heinz H.; and Liedtke, Kurt, 4,294,353, Cl. 206-273.000.

Lightburn & Co. Limited: *See—*
Watson, Arthur, 4,294,548, Cl. 366-60.000.

Lincoln, Howard P.; and Reddinger, Donald M., to GTE Products Corporation. Process for plating selected metal areas. 4,294,669, Cl. 204-15.000.

Lincoln, Howard P.; and Reddinger, Donald M., to GTE Products Corporation. Apparatus for selective metal plating. 4,294,680, Cl. 204-224.00R.

Lincoln, Howard P.; and Reddinger, Donald M., to GTE Products Corporation. Molded selective plating mask. 4,294,681, Cl. 204-224.00R.

Lincoln, Howard P.; and Reddinger, Donald M., to GTE Products Corporation. Plating mask fabricating process. 4,294,789, Cl. 264-102.000.

Lindahl, Jonas A. I.; and Rudstrom, Lars G., to Mo och Domsjo Aktiebolag. Process for manufacturing chemimechanical cellulose pulp in a high yield within the range from 65 to 95%. 4,294,653, Cl. 162-25.000.

Linde AG: *See—*
Lohmuller, Reiner; Schneider, Helmut; and Watson, Allan, 4,294,932, Cl. 518-706.000.

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Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,294,777, Cl. 260-544.00D.

Little, Barry S. Oil pan adaptor for internal combustion engines. 4,294,333, Cl. 184-106.000.

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Antonio, Christo; and Uhl, Wyman F., 4,294,888, Cl. 428-451.000.

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Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., to CTS Corporation. Electromagnetic actuator. 4,295,066, Cl. 310-30.000.

Lo, Kun-Nan. Method of producing reinforced composite racket frame. 4,294,787, Cl. 264-46.600.

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Bigley, William J., Jr.; and Rizzo, Vincent J., 4,295,081, Cl. 318-327.000.

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Loof, Ingemar. Spray booth. 4,294,191, Cl. 118-634.000.

Lopes, Rosario. Mobile home anchor. 4,294,053, Cl. 52-295.000.

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Gueret, Jean-Louis, 4,294,410, Cl. 239-577.000.

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Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

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Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,294,210, Cl. 123-300.000.

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Colloff, Nicholas J., 4,294,392, Cl. 228-111.000.
Farr, Glyn P. R., 4,294,070, Cl. 60-534.000.
Flynn, Derek J., 4,294,072, Cl. 60-585.000.
Gaffney, Edward N., 4,294,505, Cl. 339-231.000.
Woodhouse, Richard G.; and Salway, Peter H., 4,295,177, Cl. 361-154.000.

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Snyder, Irving F.; and Luebeck, Duane A., 4,294,408, Cl. 239-218.500.

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Luther, Walter C., Sr. Fireplace screen and shield assembly. 4,294,224, Cl. 126-135.000.

Lutz, Sepp, to Alligator Ventilfabrik GmbH. Valve construction for tubeless tire. 4,294,301, Cl. 152-427.000.

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Coverstone, Don A., 4,294,003, Cl. 29-611.000.

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Pepicelli, Pasquale L.; Lyman, George F.; and Mavilia, Robert A., 4,294,924, Cl. 435-30.000.

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Reed, Kenneth J.; and Lythgoe, Alan L., 4,294,641, Cl. 156-234.000.

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Iemmi, Giuliano; and Macerata, Diego, 4,294,893, Cl. 429-42.000.

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Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,294,179, Cl. 111-3.000.

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Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

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Wion, David W., 4,294,036, Cl. 46-242.000.

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Magria-Deulofeu, Jorge; and Magria-Deulofeu, Jose, 4,294,034, Cl. 46-161.000.

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Maida, Osamu, to Nippon Kogaku K.K. Camera having a digital exposure value display device. 4,294,525, Cl. 354-23.00D.

Mailund, Steinar J. Method of hauling granulates and similar material. 4,294,784, Cl. 264-14.000.

Makar, Frank B., Jr.: *See*—
Webb, Edward A.; McKenna, John F.; and Makar, Frank B., Jr., 4,295,075, Cl. 313-220.000.

Mako, John, to International Business Machines Corporation. Bidirectional ribbon drive control for printers. 4,294,552, Cl. 400-219.100.

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Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,294,311, Cl. 165-104.00S.

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Cleland, Marshall R.; and Malone, Howard F., Sr., 4,295,048, Cl. 250-398.000.

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Mammino, Joseph, to Xerox Corporation. Inductive development materials for a magnetic development process. 4,294,904, Cl. 430-122.000.

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Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L., 4,294,306, Cl. 164-448.000.

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Young, Dick K.; and Sumner, Kenneth E., 4,294,049, Cl. 52-20.000.

Marcelonis, Robert P.: *See*—
Blanchard, Carroll H.; and Marcelonis, Robert P., 4,294,557, Cl. 400-714.000.

Marconi Instruments Limited: *See*—
Middleton, John D., 4,295,093, Cl. 324-77.00B.

Maresca, Louis M.: *See*—
Berger, Mitchell H.; Gill, Peter J.; and Maresca, Louis M., 4,294,956, Cl. 528-179.000.
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Marine, Jean; and Ravetto, Michel, to Commissariat a l'Energie Atomique. Method of fabrication of electroluminescent and photodetecting diodes. 4,295,148, Cl. 357-17.000.

Mark, Edgar, to G. L. Rexroth GmbH. Electrode-position control in arc furnaces. 4,295,000, Cl. 13-13.000.

Marloth, Herbert: *See*—
Reichl, Ernst; and Marloth, Herbert, 4,294,407, Cl. 239-102.000.

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McCabe, Ralph P.; and Marsh, Keith D., 4,294,282, Cl. 137-595.000.

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Bassompierre-Sewrin, Christian C., 4,294,869, Cl. 427-177.000.

Martensson, Kjell H., to Tetra Pak International AB. Parallelepipedic packing container. 4,294,362, Cl. 206-622.000.

Martin, Henry, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,294,772, Cl. 260-429.700.

Martin, Jack, to Westinghouse Electric Corp. Filament mount assembly for miniature incandescent lamp, and method of manufacture. 4,295,185, Cl. 362-211.000.

Martin, Walter L., Jr., to PPG Industries, Inc. Bushing terminal and buss bar. 4,294,502, Cl. 339-112.00L.

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Kashima, Isoo; Mishina, Masami; Takase, Yosio; and Maruchi, Katsumi, 4,295,017, Cl. 200-47.000.

Marvin Glass & Associates: *See*—
Terzian, Rouben T., 4,294,033, Cl. 46-118.000.

Marx, Herr J., to Trutzschler GmbH & Co. KG. Tool for opening up fiber bales. 4,293,982, Cl. 19-80.00A.

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Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, 4,295,210, Cl. 365-227.000.

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Mashimo, Yukio: *See*—
Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, 4,294,530, Cl. 354-173.000.

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Aslanian, Jerry L.; and Numbers, Jody L., 4,294,246, Cl. 128-214.00E.

Matra: *See*—
Broquet, Jean B., 4,294,420, Cl. 244-165.000.

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Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, 4,294,835, Cl. 424-263.000.

Matsumoto, Ken, to Eli Lilly and Company. 2-Aryl-1H-perimidines. 4,294,964, Cl. 544-249.000.

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Minematsu, Hiroyuki; Matsumoto, Kojiro; Saeki, Tadashi; and Kishi, Akira, 4,294,946, Cl. 526-80.000.

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Matsumura, Koji: *See*—
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Matsuno, Ryohei, to Daido Giken Industries, Co., Ltd.; and Amino Aluminium Industries, Co., Ltd. Method for agitation of molten metal and furnace for agitation of molten metal. 4,294,435, Cl. 266-234.000.

Matsuo, Kazumasa, to Olympus Optical Co., Ltd. Endoscope. 4,294,234, Cl. 128-6.000.

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Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukada, Tetsuji; and Ise, Yukihiko, 4,295,172, Cl. 360-109.000.
Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, 4,293,998, Cl. 29-564.100.





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Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.

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Matta, Joseph J.; and Skalina, Andrej, to RCA Corporation. Feed system for a circularly polarized tetra-coil antenna. 4,295,144, Cl. 343-895.000.

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May, Michael G. Externally ignited, four-cycle, piston-type internal combustion engine. 4,294,207, Cl. 123-279.000.

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Fischell, David R.; and Mazique, Jeffrey C., 4,294,264, Cl. 128-778.000.

Mazzorana, Alfred B., to Societe de Paris et du Rhone. Control lever of electrical starter. 4,294,129, Cl. 74-7.00A.

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Fouse, Jack A.; and McClaren, Sherwood W., III, 4,294,419, Cl. 244-117.00R.

McDaniel, Max P., to Phillips Petroleum Company. Titanium impregnated silica-chromium catalysts. 4,294,724, Cl. 252-451.000.

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Boehringer, Wilfred E., 4,294,163, Cl. 92-52.000.

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Johnson, Avery R.; McGurk, Richard G.; and Harrison, John M., 4,295,008, Cl. 179-18.0BC.

McHenry, Patricia A., to Johns-Manville Corporation. Fibrous insulation mat with anti-punking binder system. 4,294,879, Cl. 428-288.000.

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McIntosh, Lester A., deceased, 4,294,439, Cl. 267-54.00A.

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Webb, Edward A.; McKenna, John F.; and Makar, Frank B., Jr., 4,295,075, Cl. 313-220.000.

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Carson, John R., 4,294,760, Cl. 260-326.470.

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Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., 4,294,111, Cl. 73-150.00R.

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Mehta, Arun K.: *See*—
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Meierovich, Veniamin B.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Hidaka, Hidemasa; Kohno, Toshiaki; and Eida, Toshiaki, 4,294,623, Cl. 127-55.000.

Meiners, Hans-Joachim: *See*—
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Thill, Gary A., 4,294,240, Cl. 128-156.000.

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Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.

Misawa, Yoshihiko: *See—*
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Misawa, Yutaka: *See—*
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Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

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Fujiwara, Ichiroh; Motoki, Yoshiaki; Inoue, Toshinori; and Fukuoka, Kazuma, 4,295,015, Cl. 200-38.00R.
Morishita, Mitsuharu; and Iwaki, Yoshiyuki, 4,295,087, Cl. 322-99.000.
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Yamada, Yoshito; Okumura, Hiroshi; and Murakami, Shoji, 4,295,112, Cl. 336-84.00M.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, 4,294,861, Cl. 426-475.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Hashimoto, Fukashi, 4,294,889, Cl. 428-515.000.
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

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Mitsui-Nisso Corporation: *See—*
Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, 4,294,951, Cl. 528-55.000.

Mitsui Petrochemical Industries Ltd.: *See—*
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, 4,294,948, Cl. 526-125.000.

Miura, Shuichi: *See—*
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,295,047, Cl. 250-363.00S.

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Kisaka, Hiroyuki; Sagata, Makoto; Miyahara, Masayoshi; and Katayama, Morimitsu, 4,294,130, Cl. 74-15.400.

Miyake, Shunji: *See—*
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Miyamoto, Tomohiko: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

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Moertel, George B., to Textron, Inc. Slidering method and apparatus. 4,293,994, Cl. 29-409.000.

Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, to Merck & Co., Inc. Hypocholesteremic fermentation products and process of preparation. 4,294,926, Cl. 435-125.000.

Monier, Jean-Claude: *See—*
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,294,828, Cl. 424-232.000.

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Bach, Hartwig C.; and Hinderer, Helmuth E., 4,294,884, Cl. 428-364.000.
Knowles, William S.; and Sabacky, Milton J., 4,294,989, Cl. 568-13.000.
Kowalski, Xavier, 4,294,575, Cl. 8-111.000.
Newman, Randolph E., 4,294,652, Cl. 159-2.00R.

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Montague, Albert. Bi-loop heat recovery system for an oil fired furnace. 4,294,223, Cl. 126-112.000.

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Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., 4,294,891, Cl. 429-2.000.

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Mookil, Byun. Method for manufacturing a solid statue. 4,294,634, Cl. 156-59.000.

Mooney, Donald B.: *See—*
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

Moore, Eugene L.: *See—*
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Morelock, Charles R.: *See—*
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Morgan, George W., to Suncor Inc. Cutter configuration for efficient ice disaggregation and clearing. 4,294,183, Cl. 114-42.000.

Morgan, Thomas R.: *See—*
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., 4,294,243, Cl. 128-201.180.

Mori, Kazuhiro: *See—*
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Whaley, Morris L., 4,294,495, Cl. 308-174.000.

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Motomuro, Hisanao: *See—*
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Motor Wheel Corporation: *See—*
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Woelfel, James A.; and Smith, Richard W., 4,294,639, Cl. 156-185.000.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
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Moule, Rex E. Self-surfaced meat product manufacturing method and apparatus. 4,294,858, Cl. 426-241.000.

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Muller, Rolf, to Robert Bosch GmbH. Method and system to optimize recording conditions in magnetic recording systems. 4,295,168, Cl. 360-66.000.

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Murai, Asao: *See—*
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Murakami, Masanori: *See—*
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Murakami, Takashi: *See—*
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Murao, Sawao: *See—*
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Murayama, Naohiro: *See—*
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Murez, James D., to GM Research. Portable computer enclosure. 4,294,496, Cl. 312-208.000.

Murphy, Preston V., to Lectret S.A. Plural piezoelectric polymer film acoustic transducer. 4,295,010, Cl. 179-110.00A.

Murthy, Rajam R., to Koomey, Inc. Accumulator with float orienting means. 4,294,288, Cl. 138-30.000.

Naaktgeboren, Adrianus: *See—*
Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, 4,294,346, Cl. 198-740.000.

Nab, Joseph J. Sole for logging boot. 4,294,024, Cl. 36-113.000.

Nagai, Tsuneji: *See—*
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Nagao, Tsukasa. Optical circulators. 4,294,509, Cl. 350-96.150.

Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, to Hitachi, Ltd. Control apparatus of synchronous motor having thyristor converter. 4,295,084, Cl. 318-719.000.

Nagibin, Vladimir D.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Naito, Kenji: *See—*
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Nakagawa, Hiroshi: *See—*
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Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Automatic focusing camera combined with manual focusing system. 4,294,526, Cl. 354-25.000.

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Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, to Nippon Kayaku Kabushiki Kaisha. 2-Hydroxy benzamide derivatives and use thereof as a fungicide. 4,294,835, Cl. 424-263.000.

Nakahara, Akihiko: *See—*
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Nakai, Masaaki: *See—*
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Nakai, Osamu: *See—*
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Nakai, Syunzi; and Nakao, Motokazu, to Sharp Kabushiki Kaisha. Liquid electrostatic image developing system employs mesh development electrode. 4,294,192, Cl. 118-650.000.

Nakajima, Yukio: *See—*
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Nakamura, Yoshiharu, to Nissan Motor Company, Limited. Car body. 4,294,487, Cl. 296-188.000.

Nakane, Masao: *See—*
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Nakao, Motokazu: *See—*
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Nakatsuji, Tadao: *See—*
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Nakauchi, Hiroshi; Koyanagi, Katubumi; Inami, Yasuhiko; and Uede, Hisashi, to Sharp Corporation. Combined constant potential and constant voltage driving technique for electrochromic displays. 4,295,138, Cl. 340-785.000.

Naoi, Takashi: *See—*
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Nash, Patrick L. Connecting device. 4,294,476, Cl. 285-189.000.

Naslund, Jan I. Method for processing a body liquid specimen. 4,294,582, Cl. 23-230.00B.

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Bennett, Richard N., 4,294,294, Cl. 141-179.000.

National Research Development Corporation: *See—*
Heap, Robert B., 4,294,922, Cl. 435-7.000.
Mosse, Barbara; and Thompson, John P., 4,294,037, Cl. 47-59.000.

National Semiconductor Corporation: *See—*
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Roybal, Philip M., 4,295,124, Cl. 340-347.0DD.

Nauheimer, James F.; and Benzschawel, Steven J., to Container Corporation of America. Package for video tubes. 4,294,358, Cl. 206-419.000.

Naya, Mikio: *See—*
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Nayar, Harbhajan S., to Airco, Inc. Brazing process. 4,294,395, Cl. 228-220.000.

Naylor, Arthur V.; and Spencer, John K., to Baker Perkins Holdings Limited. Sweet forming and wrapping machine. 4,294,060, Cl. 53-506.000.

NCR Canada Ltd.-NCR Canada Ltee: *See—*
Cain, John D.; and Lovie, Gary C., 4,295,206, Cl. 364-900.000.

Nedschroef Octrooi Maatschappij N.V.: *See—*
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Neeff, Rutger: *See—*
Krock, Friedrich W.; and Neeff, Rutger, 4,294,578, Cl. 8-516.000.
Krock, Friedrich W.; Neeff, Rutger; and Scheiter, Heinz, 4,294,769, Cl. 260-378.000.

Neff, Joseph J., to Cummins Engine Company, Inc. Integral turbine housing and exhaust collector section. 4,294,073, Cl. 60-597.000.

Neiman, David C.: *See—*
Kreinbrink, Paul H.; and Neiman, David C., 4,295,038, Cl. 235-92.0PK.

Nelson, David E.; and Bouyoucos, John V., to Hydroacoustics Inc. Optical sensor system. 4,294,513, Cl. 350-96.290.

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Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Odor absorbing compositions. 4,294,821, Cl. 424-45.000.

Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Flame retardant antistatic additives and antistatic fibers. 4,294,944, Cl. 525-423.000.

Newman, Randolph E., to Monsanto Company. Falling strand devolatilizer. 4,294,652, Cl. 159-2.00R.

NGK Insulators, Ltd.: *See—*
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,294,795, Cl. 264-332.000.

Nicholson, James A. Support bracket and open shelving assembly. 4,294,177, Cl. 108-42.000.

Nicks, Peter F., to Imperial Chemical Industries Limited. Production of coating films from autoxidizable materials and coating compositions capable of producing such films. 4,294,887, Cl. 428-423.100.

Nims, Philip A.; and Bollinger, Roger K., to Crompton & Knowles Corporation. Shuttle retaining apparatus. 4,294,291, Cl. 139-438.000.

Nippon Clean Engine Laboratory Co.: *See—*
Onishi, Shigeru, 4,294,372, Cl. 220-20.000.

Nippon Electric Co., Ltd.: *See—*
Tokoda, Saburo; Okumura, Koichiro; and Sugimoto, Eiji, 4,295,061, Cl. 307-279.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Mitsuhashi, Yasuhiro, 4,294,153, Cl. 84-1.010.

Nippon Kayaku Kabushiki Kaisha: *See—*
Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, 4,294,835, Cl. 424-263.000.

Nippon Kogaku K.K.: *See—*
Maida, Osamu, 4,294,525, Cl. 354-23.00D.

Nippon Kokan Kabushiki Kaisha: *See—*
Okado, Masaru; and Ariizumi, Takashi, 4,294,094, Cl. 72-16.000.
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Nippon Mining Co., Ltd.: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Nippon Paint Co., Ltd.: *See—*
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.
Yamamoto, Takashi; and Amako, Hiroshi, 4,294,667, Cl. 204-1.00T.

Nippon Rotary Nozzle Co., Ltd.: *See—*
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See—*
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, 4,294,723, Cl. 252-440.000.

Nippon Soken, Inc.: *See—*
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,294,801, Cl. 422-98.000.

Nippon Steel Corporation: *See—*
Kawano, Tsuyoshi; Usuda, Matsuo; and Hirokawa, Toshio, 4,294,095, Cl. 72-51.000.

Nippon Telegraph, Telephone Public Corp.: *See—*
Hata, Hidetoh; Haji, Katsumi; Sako, Kazushige; Shibata, Yoji; and Achiha, Masahiko, 4,295,154, Cl. 358-4.000.

Nishida, Masazo, to Toyo Rubber Industry Co., Ltd., The. Foamed polyurethane articles with skin and a method for producing the same. 4,294,880, Cl. 428-315.000.

Nishiguchi, Hisanori: *See—*
Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.

Nishihara, Motohisa: *See—*
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Nishimura, Yoshinori; Umeda, Kaoru; and Harada, Hideo, to Sony Corporation. Tuning indicator apparatus for a frequency synthesizer tuner. 4,295,224, Cl. 455-156.000.

Nishiyama, Yoshihisa, to Tokyo Electric Co., Ltd. Electronic weight measuring device. 4,294,322, Cl. 177-210.00R.

Niskovskikh, Vitaly M.: *See—*
Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L., 4,294,306, Cl. 164-448.000.

Nissan Motor Company, Limited: *See—*
Abo, Toshimi; and Hosaka, Akio, 4,294,216, Cl. 123-489.000.
Ideta, Yasufumi; Takeda, George; and Watanabe, Shoei, 4,294,160, Cl. 91-378.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,294,140, Cl. 74-868.000.
Nakamura, Yoshiharu, 4,294,487, Cl. 296-188.000.
Shimizu, Kazuaki, 4,294,336, Cl. 188-72.400.
Yasuhara, Seishi; and Ohnishi, Eiichi, 4,294,220, Cl. 123-568.000.

Nissen, Nico; Op Het Veld, Sebastianus J.; and Schneider, Henri W., to U.S. Philips Corporation. Digital frequency divider. 4,295,158, Cl. 358-17.000.

Nisshin Steel Co., Ltd.: *See—*
Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

Noda, Teruaki: *See—*
Watanabe, Yasuaki; and Noda, Teruaki, 4,295,165, Cl. 358-193.100.

Nomura, Yoshihiko, to Aisin Seiki Kabushiki Kaisha. Power assisted steering system for vehicles. 4,294,325, Cl. 180-148.000.

Noranda Mines Limited: *See—*
LeRoy, Rodney L., 4,294,274, Cl. 137-7.000.

Norbedo, Robert A.; and Resnick, Martin L., to GTE Laboratories Incorporated. Signalling system including apparatus for generating and testing data and command words within first and second message intervals. 4,295,208, Cl. 364-900.000.

Nordson Corporation: *See—*
Hastings, Donald R.; and Harjar, Martin J., 4,294,411, Cl. 239-707.000.

Nordstrom, Immo R.; and Bak, Johannes A. System for securing containers in a ship's hold. 4,294,185, Cl. 114-75.000.

Norman, Melvin H.: *See—*
Sheehan, Neil J.; and Norman, Melvin H., 4,294,249, Cl. 128-214.00G.

Norprint Limited: *See—*
Figg, Anthony V. J.; and Cunnington, Harry, 4,294,645, Cl. 156-384.000.

Norris, Jerry L.: *See—*
Schmidt, Gary D.; Norris, Jerry L.; and Weirauch, Donald F., 4,295,102, Cl. 331-65.000.

Northern Telecom Limited: *See—*
Read, Clifford D., 4,295,179, Cl. 361-331.000.

Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, to Teijin Limited. Process for producing thermoplastic resin film of markedly reduced thickness unevenness. 4,294,791, Cl. 264-210.200.

Nuclear Power Company Limited: *See—*
Seed, Geoffrey; Chesworth, Graham; Hind, John R.; and Hodgson, Donald, 4,294,661, Cl. 376-363.000.

Numbers, Jody L.: *See—*
Aslanian, Jerry L.; and Numbers, Jody L., 4,294,246, Cl. 128-214.00E.

Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., to Stackpole Corporation, The. Replaceable liner for a crucible. 4,294,438, Cl. 266-280.000.

Nyul, Paul; and Hughes, Frederick R., to RCA Corporation. Method of bonding two parts together and article produced thereby. 4,295,151, Cl. 357-68.000.

Oakley, John F.: *See—*
Bratt, Martin D.; and Oakley, John F., 4,294,533, Cl. 354-318.000.

O'Banion, Michael L.; and Veara, Jack R. Apparatus for supporting a work piece. 4,294,441, Cl. 269-97.000.

Obata, Toshiharu; Hagyu, Toshimasa; and Kojima, Hisao, to Fuji Electric Co., Ltd. Method for manufacturing brazed parts. 4,294,396, Cl. 228-245.000.

Obergfell, Allen R., to Duo-Fast Corporation. Fastener driving tool. 4,294,391, Cl. 227-130.000.

Occidental Oil Shale, Inc.: *See—*
Kilburn, James S., 4,294,563, Cl. 405-132.000.

Occidental Research Corporation: *See—*
Schep, Raymond A., 4,294,977, Cl. 562-407.000.

O'Connor, James M.; and Goodrich, George W., to Bendix Corporation, The. Dual mode light valve display. 4,294,518, Cl. 350-357.000.

Oda, Kazutaka: *See—*
Ohba, Hisao; Oda, Kazutaka; Yabuta, Yukio; and Ohashi, Azusa, 4,294,672, Cl. 204-129.400.

Oda, Kenichi, to Kawasaki Steel Corporation. Roll gap measuring device for continuous casting machine. 4,294,305, Cl. 164-150.000.

Odekirk, William H. Gutter hanger. 4,294,422, Cl. 248-48.200.

Oerlikon-Buhrle U.S.A. Inc.: *See—*
Sarcia, Domenico S., 4,294,077, Cl. 62-6.000.
Sarcia, Domenico S.; and Lam, Calvin K., 4,294,600, Cl. 62-6.000.

Oeser, Heinz-Guenter: *See—*
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,294,773, Cl. 260-453.00P.

Ogawa, Masasi: *See—*
Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, 4,294,921, Cl. 430-621.000.

Ogihara, Masuo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; and Chimura, Kozo, 4,295,215, Cl. 368-196.000.

Ogiuchi, Ituo: *See—*
Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, 4,294,791, Cl. 264-210.200.

Ognevsky, Viktor A.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.

Ogrinc, Joseph F.: *See—*
Van Deusen, George S.; and Ogrinc, Joseph F., 4,293,983, Cl. 19-127.000.

Ohashi, Azusa: *See—*
Ohba, Hisao; Oda, Kazutaka; Yabuta, Yukio; and Ohashi, Azusa, 4,294,672, Cl. 204-129.400.

Ohashi, Yasuo: *See—*
Yamamura, Keizo; and Ohashi, Yasuo, 4,294,116, Cl. 73-362.0AR.

Ohba, Hisao; Oda, Kazutaka; Yabuta, Yukio; and Ohashi, Azusa, to Fuji Photo Film Co., Ltd. Method for preparing a support for a lithographic printing plate. 4,294,672, Cl. 204-129.400.

Ohba, Shinya: *See—*
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

Ohlinger, Rainer: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.

Ohls, James W., to Corning Glass Works. Method of coating optical waveguide filaments and coating die. 4,294,190, Cl. 118-620.000.



Ohmori, Kaoru: *See—*
Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, 4,294,835, Cl. 424-263.000.

Ohmura, Sohshi, to Fujitsu Limited. Method of surface-treating semiconductor substrate. 4,294,651, Cl. 156-662.000.

Ohnishi, Eiichi: *See—*
Yasuhara, Seishi; and Ohnishi, Eiichi, 4,294,220, Cl. 123-568.000.

Ohno, Kazunori: *See—*
Doi, Yoshikazu; Sakai, Yutaka; and Ohno, Kazunori, 4,294,521, Cl. 350-426.000.

Ohta, Minoru: *See—*
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,294,801, Cl. 422-98.000.

Ohta, Yoshiharu; and Naya, Mikio, to Minolta Camera Kabushiki Kaisha. Automatically controlled electronic flash device. 4,294,528, Cl. 354-33.000.

Ohtake, Yukio, to Hitachi, Ltd. Oscillation type flying shear. 4,294,146, Cl. 83-316.000.

Ohtsuka, Kunio: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,294,140, Cl. 74-868.000.

Ohumi, Takeharu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Electromagnetically operable fluid flow control valve mechanism. 4,294,286, Cl. 137-625.480.

Ohyachi, Tomio; and Irako, Koichi, to Bridgestone Tire Company Limited. Rubber mounting compositions. 4,294,732, Cl. 260-27.0BB.

Oida, Yoshio: *See—*
Zushi, Sadao; and Oida, Yoshio, 4,295,027, Cl. 219-10.55B.

Oikawa, Teruo: *See—*
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,294,810, Cl. 423-331.000.

Okada, Takanori: *See—*
Hayashi, Masaki; Iguchi, Sadahiko; Okada, Takanori; and Kawasaki, Akiyoshi, 4,294,849, Cl. 424-305.000.

Okada, Yoshitsugu; and Nakai, Osamu, to Kubota, Ltd. Butterfly valve. 4,294,428, Cl. 251-214.000.

Okado, Masaru; and Ariizumi, Takashi, to Nippon Kokan Kabushiki Kaisha. Method for automatically controlling width of slab during hot rough-rolling thereof. 4,294,094, Cl. 72-16.000.

Okamura, Okiyoshi, to Koa Oil Company, Limited. Apparatus for and method of detecting and measuring corrosion damage in pipe. 4,295,092, Cl. 324-61.00R.

Okishi, Yoshio; Koike, Akinobu; and Miyano, Shizuo, to Fuji Photo Film Co., Ltd. Light-sensitive lithographic printing plate and compositions therefore with multiple resins. 4,294,905, Cl. 430-175.000.

Okubo, Shigeki: *See—*
Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, 4,294,475, Cl. 285-165.000.

Okumura, Hiroshi: *See—*
Yamada, Yoshito; Okumura, Hiroshi; and Murakami, Shoji, 4,295,112, Cl. 336-84.00M.

Okumura, Koichiro: *See—*
Tokoda, Saburo; Okumura, Koichiro; and Sugimoto, Eiji, 4,295,061, Cl. 307-279.000.

Okuyama, Toshiaki: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,295,084, Cl. 318-719.000.

Oler, Newell B. Game apparatus. 4,294,448, Cl. 273-94.000.

Oler, Robert A., to General Electric Company. Recovery of ammonia from aqueous streams. 4,294,812, Cl. 423-357.000.

Olin, C. Howard, to Bloomfield Farms, Inc. Apparatus for cutting and splitting firewood. 4,294,295, Cl. 144-3.00K.

Olin Corporation: *See—*
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,294,798, Cl. 422-62.000.
Evrard, Thomas O., 4,294,604, Cl. 71-27.000.
Knollmueller, Karl O.; Fairbrother, Robert J.; and Gavin, David F., 4,294,713, Cl. 252-28.000.

Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, to SKF Kugellagerfabriken GmbH. Method of manufacturing a seamless outer sleeve for a ball bearing. 4,294,100, Cl. 72-340.000.

Olson, Walter A.: *See—*
Hedley, Victor H.; and Olson, Walter A., 4,294,316, Cl. 172-20.000.

Olsson, Lars J., to Saab-Scania AB. Apparatus for measuring and orienting logs for sawing. 4,294,149, Cl. 83-435.100.

Olympia Radiological Associates: *See—*
Veatch, William M., 4,294,260, Cl. 128-654.000.

Olympia Werke AG: *See—*
Rix, Albert, 4,294,556, Cl. 400-643.000.

Olympus Optical Company, Ltd.: *See—*
Hashimoto, Akihiko; Nakajima, Yukio; Koiwai, Tamotsu; and Kimura, Toyohiko, 4,294,527, Cl. 354-25.000.
Hattori, Nobuoto, 4,294,506, Cl. 350-6.800.
Matsuo, Kazumasa, 4,294,234, Cl. 128-6.000.
Yamashita, Nobuo; and Maeda, Miwako, 4,294,511, Cl. 350-96.180.

Omet, Dominique: *See—*
Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, 4,295,210, Cl. 365-227.000.

Omron Tateisi Electronics Co.: *See—*
Yamamura, Keizo; and Ohashi, Yasuo, 4,294,116, Cl. 73-362.0AR.

Onda, Hirotsuga, to Onda Ironworks Company, Limited. Carpenter planer. 4,294,296, Cl. 144-120.000.

Onda Ironworks Company, Limited: *See—*
Onda, Hirotsuga, 4,294,296, Cl. 144-120.000.

One Design, Inc.: *See—*
Maloney, Timothy, 4,294,229, Cl. 126-434.000.

Onishi, Shigeru, to Nippon Clean Engine Laboratory Co. Small-sized container capable of mixing more than two components at a predetermined mixing ratio. 4,294,372, Cl. 220-20.000.

Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, to Tokuyama Soda Kabushiki Kaisha. Process for preparing fluorine-containing polymers having carboxyl groups. 4,294,943, Cl. 525-358.000.

Op Het Veld, Sebastianus J.: *See—*
Nissen, Nico; Op Het Veld, Sebastianus J.; and Schneider, Henri W., 4,295,158, Cl. 358-17.000.

Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,294,837, Cl. 424-263.000.

Oram, Nora L.: *See—*
Oram, W. Wayne; Oram, Nora L.; and Boris, Robert W., 4,294,239, Cl. 128-96.000.

Oram, W. Wayne; Oram, Nora L.; and Boris, Robert W. Steady support abdominal splint. 4,294,239, Cl. 128-96.000.

Ord, Thomas M. Pivotal deck ramp. 4,293,967, Cl. 9-1.600.

Orlando, Charles M.; and Loucks, George R., to General Electric Company. Polycarbonate copolymers. 4,294,954, Cl. 528-174.000.

Orlovsky, Anatoly G.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.

Orzalesi, Giovanni: *See—*
Innocenti, Franco; Orzalesi, Giovanni; and Volpato, Ivo, 4,294,833, Cl. 424-263.000.

Osaka Gas Company, Limited: *See—*
Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, 4,294,706, Cl. 210-762.000.

Oshima, Takao: *See—*
Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, 4,294,940, Cl. 525-124.000.

Ostrovsky, Grigory A.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.

Otis Engineering Corporation: *See—*
Schwegman, Harry E., deceased, 4,294,313, Cl. 166-117.500.
Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, 4,294,315, Cl. 166-322.000.

Otsuka, Chikao; Hara, Reinosuke; and Shigenaka, Yoshito, to Asahi Breweries Ltd. Container having rimmed shrink cap. 4,294,367, Cl. 215-246.000.

Otsuka, Kenichi; and Hosokawa, Yorio, to Tokyo Shibaura Denki Kabushiki Kaisha. Lamp circuit with disconnected lamp detecting device. 4,295,079, Cl. 315-130.000.

Otte, Otho M., Jr. Impact cutting tool. 4,294,298, Cl. 144-193.00C.

Outboard Marine Corporation: *See—*
DuBois, Chester G.; and Hulsebus, Richard P., 4,294,780, Cl. 261-39.00B.

Owen, Gwilym E., Jr., to Owens-Corning Fiberglas Corporation. Compatible low shrink resin systems. 4,294,941, Cl. 525-170.000.

Owens-Corning Fiberglas Corporation: *See—*
Beckman, John T., 4,294,416, Cl. 242-18.00G.
Owen, Gwilym E., Jr., 4,294,941, Cl. 525-170.000.

Owens-Illinois, Inc.: *See—*
Ames, Geoffrey C., 4,294,374, Cl. 220-71.000.
Berkel, Michael R., 4,294,359, Cl. 206-422.000.
Chang, Long F., 4,294,366, Cl. 215-1.00C.

Oztekin, Muammer A.; and Albano, Vincent J., to Kent Corporation, The. Merchandise shelving display. 4,294,363, Cl. 211-49.00D.

Pachonik, Horst: *See—*
Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,294,194, Cl. 118-719.000.

Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,294,837, Cl. 424-263.000.

Pakhomov, Evgeny P.: *See—*
Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

Pako Corporation: *See—*
Laska, Ronald C.; and Pone, Janis, 4,294,537, Cl. 355-35.000.

Palmaer, Tore G. Headgear. 4,293,960, Cl. 2-416.000.

Palmer, Leonard F. W.: *See—*
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., 4,294,243, Cl. 128-201.180.

Palmieri, John A.: *See—*
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

Pan, Hsi-Lung: *See—*
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,294,996, Cl. 568-776.000.

Pan, Jing-Jong, to Harris Corporation. Fiber optic repeater. 4,295,225, Cl. 455-601.000.

Panter, Herbert: *See—*
Wasel-Nielen, Horst-Dieter; Adrian, Renate; Panter, Herbert; Heymer, Gero; Maurer, Alexander; and von Schenck, Raban, 4,294,808, Cl. 423-305.000.

Papenfuhs, Theodor; and Teige, Wolfgang, to Hoechst Aktiengesellschaft. Process for the coloration of thermoplastic polymers and polycondensates in the mass with water-insoluble disazo-methine compounds. 4,294,749, Cl. 260-40.00P.

Parks-Cramer Company: *See—*
Lane, John E., 4,294,065, Cl. 57-265.000.
Lane, John E., 4,294,066, Cl. 57-265.000.

Paschall, Edwin L.: *See—*
Ammons, Staron E.; Paschall, Edwin L.; and Carter, Morris G., 4,294,403, Cl. 236-13.000.

Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Respirator with a cooling device. 4,294,244, Cl. 128-202.260.

Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., to General Electric Company. Gun bolt control mechanism. 4,294,158, Cl. 89-12.000.

Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H.: *See—*
Eckhardt, Fritz; and Schonherr, Walter, 4,295,076, Cl. 313-223.000.

Pattison, Jack E. Internal fluid communication system for power cylinders. 4,294,572, Cl. 414-641.000.

Patton, Tad L., to Exxon Research & Engineering Co. Process of casting polyparabanic acid films from stabilized organic amide solvents. 4,294,785, Cl. 264-41.000.

Patzlaff, Albert W., to Blueberry Equipment, Inc. Hydrodynamic blueberry sorting. 4,294,691, Cl. 209-3.100.

Paulsen, Ralf; Sontheim, Max; and Ullmann, Christoph. Vacuum packaging machine. 4,294,056, Cl. 53-86.000.

Paust, Joachim: *See—*
Schmidt, Wolfram; and Paust, Joachim, 4,294,766, Cl. 260-343.600.

Paxton, Kenneth B., to Eastman Kodak Company. Automatic control of copier copy contrast and density for production runs. 4,294,536, Cl. 355-14.00C.

PDA Engineering: *See—*
Schutzler, Jerome C., 4,294,559, Cl. 403-28.000.

Peak, Richard: *See—*
Anderson, Norman; Peak, Richard; and Moyse, James A., 4,294,709, Cl. 252-8.800.

Pearl, David R., to Gerber Garment Technology, Inc. Method of sharpening lateral edges and end edges of a blade during reciprocation thereof. 4,294,047, Cl. 51-327.000.

Pearl, Douglas B., to Uniweld Products, Incorporated. Gas cylinder carrier. 4,294,481, Cl. 294-146.000.

Peffer, Robert M.; and Braun, Charles H., to Eastman Kodak Company. Friction drive force measurement fixture. 4,294,104, Cl. 73-9.000.

Pegler, Stewart M.: *See—*
Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., 4,295,095, Cl. 324-326.000.

Pelsue, Henry F. Piston type crossbow. 4,294,222, Cl. 124-25.000.

Pemco-Kalamazoo, Inc.: *See—*
Black, John W., 4,294,491, Cl. 301-63.0DD.

Penn Virginia Corporation: *See—*
Klingaman, Richard M.; and Ehrenreich, Leo C., 4,294,750, Cl. 260-40.00R.

Pentabloc, Ltd.: *See—*
Chapman, Arthur J.; and Hayes, Geoffrey M. G., 4,294,561, Cl. 403-219.000.

Pepicelli, Pasquale L.; Lyman, George F.; and Mavilia, Robert A., to Data Packaging Corporation. Method and container for growth of anaerobic microorganisms. 4,294,924, Cl. 435-30.000.

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Bernard, Leo N., 4,294,577, Cl. 8-488.000.

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Peters, Thomas E.: *See—*
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Peterson, Glenn S.: *See—*
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Erickson, John W.; and Petrie, Harold L., 4,294,573, Cl. 417-83.000.

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Bagnall, Elizabeth A.; Guiliano, Basil A.; and Pfeffer, Henry A., III, 4,294,962, Cl. 544-192.000.

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Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.

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Champseix, Alain A.; and Le Fur, Gerard R., 4,294,841, Cl. 424-267.000.

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Cheng, Paul J., 4,294,814, Cl. 423-457.000.
Furr, Danny L., 4,295,196, Cl. 364-501.000.
McDaniel, Max P., 4,294,724, Cl. 252-451.000.

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Luckert, Lothar; Pohl, Christoph; Proll, Carl-Erich; and Steffes, Paul, 4,294,102, Cl. 72-413.000.

Pohl, Walter, to Eaton Corporation. Thermo-switch. 4,295,114, Cl. 337-3.000.

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Bronstein-Bonte, Irena Y.; Lindholm, Edward P.; and Taylor, Lloyd D., 4,294,907, Cl. 430-213.000.
Idelson, Elbert M., 4,294,915, Cl. 430-441.000.
Shenk, Edwin K., 4,294,531, Cl. 354-195.000.

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Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

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Weiderrich, LeRoy J., 4,293,966, Cl. 6-12.00R.

Pollock, Stephen F., to Hudson Pulp & Paper Corp. Method of making embossing roll for producing paper towels. 4,293,990, Cl. 29-148.40D.

Pomares, Francis. Handle attaching means for brooms and the like. 4,293,972, Cl. 15-145.000.

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Ponkala, Jorma, to Vaisala Oy. Electronic selector switch particularly for use in radioscondes. 4,295,090, Cl. 324-60.0CD.

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Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin, 4,294,401, Cl. 236-1.00G.

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Howe, Mark J., 4,294,874, Cl. 427-393.000.
Martin, Walter L., Jr., 4,294,502, Cl. 339-112.00L.
Rinehart, Jay K., 4,294,764, Cl. 260-340.90R.

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Lewis, Alfred E.; and Salisbury, Robert E., 4,294,569, Cl. 410-133.000.

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Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, 4,294,861, Cl. 426-475.000.

Preiss, Michael; and Metzger, Karl G., to Bayer Aktiengesellschaft. Antibacterial and growth promoting β-lactam antibiotics carrying an -ylidene-2-pyrrolidinon-1-yl radical. 4,294,827, Cl. 424-226.000.

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Hyman, Dennis C., 4,294,466, Cl. 280-772.000.

Price, John J., Jr., to Motorola Inc. Fast settling digital to analog converter bit switch. 4,295,063, Cl. 307-362.000.

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Hardy, Frederick E.; and Dewar, Colin A., 4,294,710, Cl. 252-8.800.
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Proll, Carl-Erich: *See—*
Luckert, Lothar; Pohl, Christoph; Proll, Carl-Erich; and Steffes, Paul, 4,294,102, Cl. 72-413.000.

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Hardy, Nicolas; and Dancot, Georges, 4,294,776, Cl. 260-502.00R.

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Puntar, Joseph: *See—*
Miyagishima, Tosh; Puntar, Joseph; and Wieveg, Raymond, 4,294,314, Cl. 166-318.000.

Pust, Waldo H. Grain drill with device for preventing undesired backfilling of front furrow by rear furrow openers. 4,294,180, Cl. 111-52.000.

Quaker Oats Company, The: *See—*
Breneman, Jack L., 4,294,032, Cl. 46-1.00R.

Quang, Pham K.: *See—*
Kings, Donald; and Quang, Pham K., 4,294,903, Cl. 430-98.000.

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Quist, William E.: *See—*
Hyatt, Michael V.; and Quist, William E., 4,294,625, Cl. 148-2.000.

Rabinovich, Evsey, to Emco Wheaton Inc. Safety hatch cover apparatus. 4,294,378, Cl. 220-323.000.

Racal-Vadic, Inc.: *See—*
Bingham, John A. C., 4,295,105, Cl. 332-9.00R.

Racine, Pierre. Liquid dispensing receptacle. 4,294,369, Cl. 215-311.000.

Radunz, Hans-Eckart: *See—*
Doll, Thomas; Schacht, Erich; Radunz, Hans-Eckart; and Schulze, Ernst, 4,294,839, Cl. 424-263.000.

Ragland, Frank R., Jr., to RCA Corporation. Mercury arc lamp having communicating mercury reservoir. 4,295,074, Cl. 313-174.000.

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Fuller, Mary L., 4,294,857, Cl. 426-99.000.

Ramazanov, Nariman A.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Narinian A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Rankin, Kenneth F., to Chubb Integrated Systems Limited. Teller machines and methods of operation thereof. 4,294,380, Cl. 221-195.000.

Ranks Hovis McDougall Limited: *See—*
Solomons, Gerald L.; and Scammell, Gerald W., 4,294,929, Cl. 435-254.000.

Rasmussen, Ole-Bendt. Circular extrusion method providing for rotation around the extrusion opening. 4,294,638, Cl. 156-176.000.

Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, to Diehl GmbH & Co. Projectile with recoverable detonator. 4,294,172, Cl. 102-473.000.

Rauser, Horst, to Licentia Patent-Verwaltungs GmbH. Circuit for improving picture quality in a television receiver. 4,295,164, Cl. 358-166.000.

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Marine, Jean; and Ravetto, Michel, 4,295,148, Cl. 357-17.000.

Raymond, Louis W. Precision electroplating of metal objects. 4,294,670, Cl. 204-26.000.

RCA Corporation: *See—*
Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.
Crowley, Albert T., 4,295,098, Cl. 328-24.000.
Hettiger, James, 4,295,161, Cl. 358-34.000.
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Hsieh, Peter K.; and Vaccarella, Richard M., 4,295,065, Cl. 307-475.000.
Lagoni, William A., 4,295,160, Cl. 358-31.000.
Leidich, Arthur J., 4,295,101, Cl. 330-262.000.
Malchow, Max E., 4,295,088, Cl. 323-313.000.
Matta, Joseph J.; and Skalina, Andrej, 4,295,144, Cl. 343-895.000.
Nyul, Paul; and Hughes, Frederick R., 4,295,151, Cl. 357-68.000.
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Ragland, Frank R., Jr., 4,295,074, Cl. 313-174.000.
Shanley, Robert L., II; and Hettiger, James, 4,295,166, Cl. 358-243.000.
Truesdell, Raymond L.; and Ross, Michael D., 4,295,216, Cl. 369-55.000.
Wilmarth, Paul C., 4,295,078, Cl. 315-8.000.
Wittlinger, Harold A.; and Salerno, Carmine P., 4,294,321, Cl. 177-210.0FP.

Read, Clifford D., to Northern Telecom Limited. Electric test equipment housing. 4,295,179, Cl. 361-331.000.

Ready, Delbert L. Scaffold with gear drive. 4,294,332, Cl. 182-141.000.

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Redhead, Walden K. Insertable article for altering the cure rate and chemical composition of an object. 4,294,168, Cl. 99-494.000.

Reed Irrigation Systems Pty Ltd.: *See—*
Tucker, Alfred D., 4,294,470, Cl. 285-5.000.

Reed, Kenneth J.; and Lythgoe, Alan L. Heat transfer sheets. 4,294,641, Cl. 156-234.000.

Regie Nationale Des Usines Renault: *See—*
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Reh, Walter, to Bayerische Motoren Werke Aktiengesellschaft. Friction clutch for motor vehicles. 4,294,343, Cl. 192-113.00A.

Rehm, William A. Drilling mud degasser apparatus and system. 4,294,593, Cl. 55-166.000.

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Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,294,996, Cl. 568-776.000.

Reichl, Ernst; and Marloth, Herbert, to Bosch-Siemens Hausgerate GmbH. Atomizer for fluids, preferably an inhalation device. 4,294,407, Cl. 239-102.000.

Reid, Samuel C. M. Analog-to-digital converter. 4,295,123, Cl. 340-347.0AD.

Reidel, Bruce A.: *See—*
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Reinert, Friedrich: *See—*
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Reinhardt, Willy: *See—*
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Remond, Jean R. A., to Etablissements F. Nicollet & Cie Societe Anonyme. Suspension-type file folder. 4,294,028, Cl. 40-359.000.

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Rensner, Jurgen G., to Pepsico, Inc. Container package and its manufacture. 4,294,058, Cl. 53-413.000.

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Resnick, Martin L., to GTE Laboratories Incorporated. Data processing apparatus for receiving and decoding words in which data is encoded by phase reversals or non-phase reversals of a signal of a predetermined frequency. 4,295,207, Cl. 364-900.000.
Resnick, Martin L.: *See—*
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Reusch, Heinz; and Kreikenbohm, Robert, to Stiebel Eltron GmbH & Co. KG. Method for charging and discharging a latent-heat storage medium and heat storage. 4,294,310, Cl. 165-104.130.
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Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,294,331, Cl. 182-10.000.
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Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,294,704, Cl. 210-651.000.
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Richardson, Ronald D.: *See—*
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Ricoh Company, Ltd.: *See—*
Ariyama, Kenzo; Miyawaki, Syozo; and Murakami, Takashi, 4,294,535, Cl. 355-14.0SH.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, to Bayer Aktiengesellschaft. N-Acyl-piperidone compounds. 4,294,967, Cl. 546-242.000.
Riedel, Rudolph T. Design for flush tank control using non-buoyant flapper valve. 4,293,964, Cl. 4-378.000.
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Riel, Frank J.: *See—*
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Riessberger, Klaus: *See—*
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Rinehart, Jay K., to PPG Industries, Inc. N-(Optionally substituted 1,3-dioxolan- or dioxan-2-ylmethyl)-N-alkyl, alkenyl, or alkynyl-2,2-dichloroacetamides. 4,294,764, Cl. 260-340.90R.
Ritzenhoff, Hermann: *See—*
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Stumpp, Gerhard; and Wessel, Wolf, 4,294,211, Cl. 123-379.000.
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Robertshaw Controls Company: *See—*
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Robertson, Robert H., to Ronbil Industries, Inc. Vehicle camper. 4,294,484, Cl. 296-156.000.
Robins, Charles T., to Gould Inc. Trifurcated arc runner. 4,295,022, Cl. 200-147.00R.
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Thompson, Robert B., 4,295,214, Cl. 367-140.000.
Wagner, William R., 4,294,208, Cl. 123-285.000.
Rodenberg, Joseph H.; and Gilcrest, Richard K. Hog farrowing module. 4,294,195, Cl. 119-20.000.
Rody, Jean, to Ciba-Geigy Corporation. Polyalkylpiperidine derivatives of s-triazine. 4,294,963, Cl. 544-198.000.
Roen, Richard A., to Research Council of Alberta, The. Arc welding apparatus with oscillating electrode. 4,295,031, Cl. 219-125.120.
Rogan, Bruce R.: *See—*
Herr, John A.; and Rogan, Bruce R., 4,295,118, Cl. 338-32.00H.
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Rohm GmbH: *See—*
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Rohr Industries, Inc.: *See—*
Rose, Philip M.; and Riel, Frank J., 4,294,329, Cl. 181-222.000.
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Roll & Go AG: *See—*
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Romankiw, Lubomyr T.; and Thompson, David A., to International Business Machines Corporation. Thin film inductive transducer. 4,295,173, Cl. 360-125.000.
Romankiw, Lubomyr T.: *See—*
Miersch, Ekkehard F.; and Romankiw, Lubomyr T., 4,295,183, Cl. 361-403.000.
Romenets, Vladimir A.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
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Robertson, Robert H., 4,294,484, Cl. 296-156.000.
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Gaidis, James M.; and Rosenberg, Arnold M., 4,294,813, Cl. 423-385.000.
Rosenthal, Christian: *See—*
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Ross, Lawrence M. Traction bag. 4,294,405, Cl. 238-14.000.
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Roth, Eldon N. Refrigerating meat paste. 4,294,860, Cl. 426-417.000.
Roth, Joseph A.: *See—*
Bechle, Philip D.; and Roth, Joseph A., 4,294,906, Cl. 430-207.000.
Roullet, Robert: *See—*
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,294,704, Cl. 210-651.000.
Rowe, Bryant T. Fuel heating system for an engine. 4,294,219, Cl. 123-557.000.
Rowe, Lacy A. Sealing means for gutter hanger fastening means. 4,294,423, Cl. 248-48.200.
Roybal, Philip M., to National Semiconductor Corporation. Communication method and system. 4,295,124, Cl. 340-347.0DD.
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Lindahl, Jonas A. I.; and Rudstrom, Lars G., 4,294,653, Cl. 162-25.000.
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Rump, Bjorn S., to Rump, Bjorn Sigurd. Process for manufacture of a wide patterned band such as a transfer-carrying sheet and for printing on a substrate therewith. 4,294,637, Cl. 156-157.000.
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Runge, Thomas M. Pulsatile flow cardiopulmonary bypass pump. 4,293,961, Cl. 3-1.700.
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Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, 4,294,934, Cl. 521-160.000.
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Rust-Oleum Corporation: *See—*
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Ruti Machinery Works Ltd.: *See—*
Freisler, Erhard, 4,294,290, Cl. 139-26.000.
Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., to Mead Corporation, The. Portable fluid ink tack tester. 4,294,111, Cl. 73-150.00R.
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Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.
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Olsson, Lars J., 4,294,149, Cl. 83-435.100.
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Knowles, William S.; and Sabacky, Milton J., 4,294,989, Cl. 568-13.000.
Saccavino, Joseph F.; and Vanek, Edward A. Halocarbon and azeotrope refrigerant compositions containing offensive warning component. 4,294,716, Cl. 252-68.000.
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Sagara, Seiji: *See—*
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Sagata, Makoto: *See—*
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Saiki, Yukihiro: *See—*
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St. John, Richard C., to Dyneer Corporation. Centrifugal clutch construction. 4,294,342, Cl. 192-105.0CD.
Saito, Tsutomu; and Shida, Masaaki, to Kabushiki Kaisha Fuji Seisakusho. Apparatus for making fiberboard. 4,294,657, Cl. 162-303.000.
Sakagami, Teruo; Kato, Tadaaki; Hirai, Toru; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for electrodepositing a protein onto an ion-exchange membrane. 4,294,677, Cl. 204-181.00F.
Sakaguchi, Hiroaki: *See—*
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Sakai Chemical Industry Co., Ltd.: *See—*
Abe, Kazunobu; Tamura, Shoichi; and Nakatsuji, Tadao, 4,294,806, Cl. 423-239.000.
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Sakata, Touichi: *See—*
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Sakcriska, Glenn. Ice skate sharpener. 4,294,043, Cl. 51-100.00R.
Sakitani, Yoshio: *See—*
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Sako, Kazushige: *See—*
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Saleck, Wilhelm: *See—*
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Salerno, Carmine P.: *See—*
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Salisbury, Robert E.: *See—*
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Saltzman, Philip A.: *See—*
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Salway, Peter H.: *See—*
Woodhouse, Richard G.; and Salway, Peter H., 4,295,177, Cl. 361-154.000.
Sanka, Tsugio: *See—*
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Sankey, William M.: *See—*
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Sanner Contracting Co.: *See—*
Welch, James A., 4,294,026, Cl. 37-8.000.
Sanyo Electric Co., Ltd.: *See—*
Iwata, Mitsuo; Wada, Hajime; Iwasa, Tomoyuki; and Tsuchino, Kunio, 4,295,169, Cl. 360-71.000.
Yoshii, Kazuhiro, 4,294,076, Cl. 62-235.100.
Sappok, Reinhard; and Kranz, Joachim, to BASF Aktiengesellschaft. Phthalocyanine formulations. 4,294,620, Cl. 106-288.00Q.
Sarcia, Domenico S., to Oerlikon-Buhrle U.S.A. Inc. Cryogenic refrigerator with dual control valves. 4,294,077, Cl. 62-6.000.
Sarcia, Domenico S.; and Lam, Calvin K., to Oerlikon-Buhrle U.S.A. Inc. Valves for cryogenic refrigerators. 4,294,600, Cl. 62-6.000.
Sarka, Albert J. Method of making die plates. 4,294,649, Cl. 156-645.000.
Sasaki, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Process for balancing a crankshaft. 4,295,032, Cl. 219-137.00R.
Sassler, Marvin L.: *See—*
Jarger, Harold F.; and Sassler, Marvin L., 4,295,155, Cl. 358-12.000.
Sata, Toshikatsu: *See—*
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,294,943, Cl. 525-358.000.
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Sato, Yasuhisa; Tsuji, Sadahiko; and Ishikawa, Kazuo, to Canon Kabushiki Kaisha. Camera. 4,294,529, Cl. 354-53.000.
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Satzinger, Gerhard: *See—*
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.
Stoss, Peter; Satzinger, Gerhard; Herrmann, Manfred; and Heldt, Wolfgang, 4,294,838, Cl. 424-263.000.
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Sauerschell, Wolfgang; and Werkmann, Karl-Heinz, to VDO Adolf Schindling AG. Device for measuring the fuel consumption of a vehicle. 4,294,108, Cl. 73-119.00A.
Saunders, Ian C. B.: *See—*
Lovell, Peter J.; and Saunders, Ian C. B., 4,294,794, Cl. 264-328.100.
Sautter, Helmut; Hurst, Kurt; and Schink, Rainer, to Robert Bosch GmbH. Information display device. 4,295,127, Cl. 340-373.000.
Sauvat, Roger: *See—*
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Savin, Ivan V.: *See—*
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Sawa, Toshio; Kubota, Masayoshi; Takahashi, Sankichi; and Kaneko, Toyohiko, to Hitachi, Ltd. Apparatus for treatment of sewage. 4,294,697, Cl. 210-221.100.
Sawada, Hajimu; and Inubushi, Hisao, to Nippon Kokan Kabushiki Kaisha; Nippon Rotary Nozzle Co., Ltd.; Kokan Kikai Kogyo Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Slide closure for the pouring nozzle of a molten metal vessel. 4,294,437, Cl. 266-272.000.
Sax Zzyzx, Ltd.: *See—*
Anthony, Myron L., 4,294,664, Cl. 203-19.000.
SCA Development Aktiebolag: *See—*
Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., 4,294,412, Cl. 241-30.000.
Scammell, Gerald W.: *See—*
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Schadlich, Renate: *See—*
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Schaeffer, Howard J., to Burroughs Wellcome Co. Purine derivatives. 4,294,831, Cl. 424-253.000.

Schafer, Walter: *See—*
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Schar, Ernst. Floor cleaning device. 4,293,973, Cl. 15-230.170.
Scharres, Harry J. Wedge sealed damper. 4,294,283, Cl. 137-601.000.
Schedler, Heinz: *See—*
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Scheffel, Herbert; von Gericke, Rowlen E.; and Viviers, Joseph A., to South African Inventions Development Corporation. Railway wheel tread profile. 4,294,482, Cl. 295-34.000.
Scheier, Donald J.: *See—*
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Scheiter, Heinz: *See—*
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Schep, Raymond A., to Occidental Research Corporation. Process for producing aromatic carboxylic acids. 4,294,977, Cl. 562-407.000.
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Scheurecker, Werner: *See—*
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Schink, Rainer: *See—*
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Schlicklin, Philippe; Mertzweiller nee Maillard, Anne-Marie; and Ploussard, Jacques, to Air Industrie. Compositions and methods for the denaturation of water-base paints. 4,294,617, Cl. 106-14.370.
Schliebener, Claus: *See—*.
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Schloemann-Siemag Aktiengesellschaft: *See—*
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Spaude, Alfons, 4,294,099, Cl. 72-234.000.
Schlotter, Harold J.; and Young, Leroy, to Champion International Corporation. Target backstop. 4,294,452, Cl. 273-403.000.
Schmid, Rolf; and Lohse, Friedrich, to Ciba-Geigy Corporation. Curable mixture for producing reinforced elastomeric plastics based on epoxide resin. 4,294,745, Cl. 260-37.0EP.
Schmid, Rolf: *See—*
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Schmidt, Gary D.; Norris, Jerry L.; and Weirauch, Donald F., to Texas Instruments Incorporated. Surface acoustic wave sensor sensing circuits. 4,295,102, Cl. 331-65.000.
Schmidt, Karl H.: *See—*
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Schmidt, Robert R.; and Thomas, Rudolf, to Bayer Aktiengesellschaft. Herbicidal compositions. 4,294,607, Cl. 71-92.000.
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Schmidt, Wolfram; and Paust, Joachim, to BASF Aktiengesellschaft. Preparation of pure potassium ribonate and ribonolactone. 4,294,766, Cl. 260-343.600.
Schmidtpott, Friedrich: *See—*
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Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,294,863, Cl. 426-538.000.
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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,294,708, Cl. 252-8.600.
Schmitz, Gunther; and Kierdorf, Hans, to Felten & Guilleaume Carlswerk. Method of and a device for balancing a changing load of a strip roll orbiting about an axis in a strip winding machine. 4,294,064, Cl. 57-3.000.
Schneider, Egon, to Kronseder, Hermann. Glue roller for labelling machine. 4,293,989, Cl. 29-130.000.
Schneider, Hartmut, to Siemens Aktiengesellschaft. Light-wave guides and method of producing same. 4,294,514, Cl. 350-96.310.
Schneider, Helmut: *See—*
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Schneider, Henri W.: *See—*
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Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, to Bayer Aktiengesellschaft. Process for the preparation of diacylated 4-imidazolin-2-ones. 4,294,973, Cl. 548-320.000.
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Schuegraf, Eberhard, to Siemens Aktiengesellschaft. Rectangular wave guide elbow bent across the narrow side with capacitive loading. 4,295,109, Cl. 333-249.000.
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Schutzler, Jerome C., to PDA Engineering. Pre-stressed structural joint. 4,294,559, Cl. 403-28.000.
Schwegman, Harry E., deceased (by Dallas, M. J. Whitfield for First National Bank in, executor), to Otis Engineering Corporation. Kick-over tool. 4,294,313, Cl. 166-117.500.
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Sedlak, John M.; and Lawrance, Richard J., to General Electric Company. Catalytic alloys. 4,294,608, Cl. 75-0.50A.
Sedlmayr, Gerhard, to Hannes Marker. Ski stop. 4,294,458, Cl. 280-605.000.
Seed, Geoffrey; Chesworth, Graham; Hind, John R.; and Hodgson, Donald, to Nuclear Power Company Limited. Liquid metal cooled fast breeder nuclear reactor constructions. 4,294,661, Cl. 376-363.000.
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, to Nippon Soken, Inc. Gas component detector. 4,294,801, Cl. 422-98.000.
Seiko Koki Kabushiki Kaisha: *See—*
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Nakagawa, Tadashi, 4,294,526, Cl. 354-25.000.
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Seitmann, Vernon H. Grain drying apparatus. 4,294,019, Cl. 34-65.000.
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Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Water soluble epoxy ester copolymers for interior can use. 4,294,737, Cl. 260-29.2EP.
Sequeira, Avilino, Jr.; Smith, Benjamin F., Jr.; and Mead, Theodore C., to Texaco, Inc. Solvent refining process. 4,294,689, Cl. 208-326.000.
Sera, Hidefumi: *See—*
Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, 4,294,921, Cl. 430-621.000.
Serwer, Philip, to Board of Reagents, University of Texas. Template for forming multiple gel tracks within a single electrophoretic gel frame. 4,294,684, Cl. 204-299.00R.
Severt, Wilhelm. Holding device. 4,294,440, Cl. 269-71.000.
Seymour, Shaun A., to Sperry Corporation. Sensing bar. 4,294,062, Cl. 56-102.000.
SGM Co., Inc.: *See—*
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Shah, Nirad N.: *See—*
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Shah, Raj: *See—*
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Shanley, Robert L., II; and Hettiger, James, to RCA Corporation. Failure compensated automatic kinescope beam current limiter. 4,295,166, Cl. 358-243.000.
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Tanabe, Takeshi, 4,295,028, Cl. 219-10.55B.
Shaw, James K. Amusement device. 4,294,449, Cl. 273-126.00R.
Sheehan, Neil J.; and Norman, Melvin H., to Cutter Laboratories, Inc. Swage-molded injection site. 4,294,249, Cl. 128-214.00G.
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Verschuur, Eke, 4,294,584, Cl. 44-23.000.
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Sheppard, Peter H. Power steering gear with oil filled capillary balancing slots. 4,294,161, Cl. 91-422.000.
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Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,295,047, Cl. 250-363.00S.
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Shinkai, Ichiro: *See—*
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Shinoda, Akibumi; and Nakane, Masao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Axle housing sub-assembly. 4,294,334, Cl. 188-18.00A.
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Sig Schweizerische Industrie-Gesellschaft: *See—*
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Sih, John C., to Upjohn Company, The. 13,14-Didehydro-19-oxo-$PGF_2$ compounds. 4,294,978, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-19-oxo-$PGE_2$ compounds. 4,294,979, Cl. 562-503.000.
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Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-19-oxo-$PGE_1$ compounds. 4,294,982, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-19-oxo-$PGF_1$ compounds. 4,294,983, Cl. 562-503.000.
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Silberberg, Joseph, to Stauffer Chemical Company. Filled vinyl chloride polymer composition. 4,294,752, Cl. 260-42.140.
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Sindlinger, Rainer; and Hammer, Josef, to Teldix GmbH. Magnetic bearing assembly. 4,294,493, Cl. 308-10.000.
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Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, 4,294,100, Cl. 72-340.000.
Sloane, Thomas E., Jr.; Melius, Clair; and Kling, Erich, to United States Surgical Corporation. Self-contained filter assembly for removing air, particles and bacteria from a solution. 4,294,594, Cl. 55-186.000.
Small World Exchange, Inc.: *See—*
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Smith, Charles M. Crab butchering machine. 4,293,981, Cl. 17-71.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Multi-phase separation methods and apparatus. 4,294,695, Cl. 210-173.000.
Smith, Franklin. Subsoil agricultural implement with rotatable disc. 4,294,181, Cl. 111-87.000.
Smith, Herman W., to Upjohn Company, The. Structural analogues of 5,6,-dihydro $PG_1$. 4,294,759, Cl. 260-326.270.
Smith International, Inc.: *See—*
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Smith, Robert A.: *See—*
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Smith, Robert E.; and Bissell, Eugene R. Substrates and method for determining enzymes. 4,294,923, Cl. 435-23.000.
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Snel, Cornelis; and Kuus, Albert. Haybox. 4,294,197, Cl. 119-60.000.
Snelling, Christopher, to Xerox Corporation. Multiple function reproduction apparatus. 4,294,534, Cl. 355-3.00R.
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Societa Italo-Britannica: *See*—
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Societe Anonyme dite: L'Oreal: *See*—
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Spanier, Joseph; and Spanier, Florence. Method and assembly for camouflaging at least one building. 4,294,308, Cl. 165-1.000.
Spatz, David M.; and Cross, Barrington, to American Cyanamid Co. Novel para-phenylalkoxy phenylurea and thiourea compounds and herbicidal use thereof. 4,294,986, Cl. 564-52.000.
Spaude, Alfons, to Schloemann-Siemag Aktiengesellschaft. Rolling mill train. 4,294,099, Cl. 72-234.000.
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Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, 4,294,346, Cl. 198-740.000.
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Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Benzodioxanones and organoleptic uses thereof. 4,294,266, Cl. 131-277.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of perfumed article using alkyl cycloalkenyl carbinol. 4,294,708, Cl. 252-8.600.
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Stacey, Eric J.; and Baker, Donal E., to Westinghouse Electric Corp. Bank selection in naturally commutated thyristor controlled static power converters. 4,295,190, Cl. 363-162.000.
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Margulies, Herman; and Kaufman, Richard H., 4,294,361, Cl. 206-532.000.
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., to Conoco, Inc. Electrode prospecting method providing calculable electromagnetic coupling for the indirect detection of hydrocarbon reservoirs. 4,295,096, Cl. 324-357.000.
Stevens, John H.; and Reidel, Bruce A., to Kennecott Corporation. Pop up abrasive disc dispenser. 4,294,357, Cl. 206-409.000.
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Stock, Albert M.; and Verbsky, James D., to Du Pont de Nemours, E. I., and Company. Process for the control of pH in the ethynylation of formaldehyde. 4,294,997, Cl. 568-855.000.
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Stolecki, William E., to Electric Power Research Institute. Pipe coupling assembly especially suitable for use in the nuclear reactor. 4,294,472, Cl. 285-27.000.
Stoll, Kurt. Piston for use in pneumatically operated piston-cylinder apparatus. 4,294,164, Cl. 92-243.000.
Stolov, Michael. Image or picture projecting system using electronically controlled slides. 4,294,524, Cl. 353-84.000.
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Stone, Frederick C.; and Schupska, Gary G., to Dow Chemical Company, The. Method for preparing α-picoline from 5-oxohexanenitrile. 4,294,968, Cl. 546-251.000.
Storz, Karl. Laryngoscope. 4,294,235, Cl. 128-11.000.
Stoss, Peter; Satzinger, Gerhard; Herrmann, Manfred; and Heldt, Wolfgang. Certain heterocyclic sulfoximide derivatives. 4,294,838, Cl. 424-263.000.
Stoutenburg, Donn V., to IRD Mechanalysis, Inc. Indicating apparatus, particularly for vibration analyzing equipment. 4,295,136, Cl. 340-753.000.
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Strickler, Melvin D. Wood finger jointing apparatus. 4,294,647, Cl. 156-558.000.
Striebich, Helmut, to Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Drive assembly, especially for motor vehicles. 4,294,074, Cl. 60-616.000.
Stritzl, Karl: *See*—
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,294,462, Cl. 280-634.000.
Stuckert, Paul E., to International Business Machines Corporation. Method and apparatus for achieving secure password verification. 4,295,039, Cl. 235-380.000.
Studlien, Vance D., to Bofors America, Inc. Pressure transducer. 4,295,116, Cl. 338-4.000.
Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for correcting the fuel quantity in an internal combustion engine. 4,294,211, Cl. 123-379.000.
Stupell Industries, Ltd.: *See*—
Dorsen, Mac; and Saltzman, Philip A., 4,294,299, Cl. 150-28.00R.
Stutz, Hansruedi, to Gebruder Loepfe AG. Device for continuously measuring a transverse dimension of a thread-like structure. 4,294,545, Cl. 356-386.000.
Su, Tien-Kuei, to Milliken Research Corporation. Shapeable thermoplastic resin composition containing cyclic acetal. 4,294,747, Cl. 260-37.00R.
Subh, Naif T.: *See*—
Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., 4,295,005, Cl. 174-92.000.
Sugahara, Hiroshi: *See*—
Uesaka, Tatsuo; Sugahara, Hiroshi; and Fujimura, Takeo, 4,295,110, Cl. 335-212.000.
Sugahara, Syunji; and Morimoto, Takao, to Matsushita Electric Industrial Company, Limited. Automatic screwdriver. 4,294,142, Cl. 81-57.370.
Sugano, Kazuhiko: *See*—
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,294,140, Cl. 74-868.000.
Sugawara, Noboru: *See*—
Ito, Susumu; Sugawara, Noboru; and Amano, Sayoko, 4,294,890, Cl. 428-641.000.
Sugii, Kisaburo: *See*—
Kinumaki, Toyosuke; Watanabe, Takehiko; Sugii, Kisaburo; and Iseki, Shigeo, 4,294,856, Cl. 426-7.000.
Sugimoto, Eiji: *See*—
Tokoda, Saburo; Okumura, Koichiro; and Sugimoto, Eiji, 4,295,061, Cl. 307-279.000.
Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, to Mitsui-Nisso Corporation. Rapid curing polyurethane elastomer prepared from a diphenylmethanediisocyanate based liquid prepolymer and a curing agent containing a polytetramethylene ether glycol, a diol and an organometallic catalyst. 4,294,951, Cl. 528-55.000.
Sugiura, Muneharu; and Sagara, Seiji, to Canon Kabushiki Kaisha. Slit illuminating device. 4,295,186, Cl. 362-217.000.
Sukonick, Josef. Alignable electronic background grid generation system. 4,295,135, Cl. 340-734.000.
Sullivan, Marc L.: *See*—
Kimball, Charles A.; and Sullivan, Marc L., 4,294,324, Cl. 180-89.140.
Sumitomo Chemical Company, Limited: *See*—
Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, 4,294,940, Cl. 525-124.000.
Sumitomo Electric Industries, Ltd.: *See*—
Ashida, Hiroshi; and Takahashi, Fumitake, 4,294,189, Cl. 118-603.000.
Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
Shiraiwa, Toshio; Yamaguchi, Hisao; and Matsumoto, Shigeaki, 4,294,118, Cl. 73-620.000.
Sumitomo Naugatuck Co., Ltd.: *See*—
Minematsu, Hiroyuki; Matsumoto, Kojiro; Saeki, Tadashi; and Kishi, Akira, 4,294,946, Cl. 526-80.000.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, to Aisan Industry Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supplying device for use in fuel injection type internal combustion engine. 4,294,213, Cl. 123-454.000.
Summerhays, Brent: *See*—
Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., 4,295,044, Cl. 250-229.000.
Summers, Kenneth L.; and Rieke, Mahlon E., to Riche Corporation. Container closure device. 4,294,382, Cl. 222-529.000.
Sumner, Kenneth E.: *See*—
Young, Dick K.; and Sumner, Kenneth E., 4,294,049, Cl. 52-20.000.
Sun Oil Company of Pennsylvania: *See*—
Rugen, Donald F.; and Dickason, Alan F., 4,294,742, Cl. 260-31.80H.
Sun Yao, Huei Y.: *See*—
Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., 4,294,891, Cl. 429-2.000.
Suncor Inc.: *See*—
Morgan, George W., 4,294,183, Cl. 114-42.000.
Sunden, Olof, to EKA AB. Surface-modified pigment of natural kaolin material and a process of producing same. 4,294,885, Cl. 428-404.000.
Sung, Rodney L., to Texaco Inc. Novel fuel composition for internal combustion engine. 4,294,585, Cl. 44-53.000.
Sunstein, Drew E. Programmable correlator. 4,295,204, Cl. 364-824.000.
Superior Electric Company, The: *See*—
Leenhouts, Albert C., 4,295,083, Cl. 318-696.000.
Suppa, Vito; and Viallet, Daniel, to Thomson-CSF. Inertially released jettisonable airborne buoy. 4,295,211, Cl. 367-4.000.
Sutter, David L., to Hussey Manufacturing Co., Inc. Apparatus for supporting pivotally mounted seats. 4,294,048, Cl. 52-9.000.
Suzuki, Hidetsugu: *See*—
Tanaka, Mitsuaki; and Suzuki, Hidetsugu, 4,295,006, Cl. 179-1.00E.
Suzuki, Katsunori: *See*—
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,295,084, Cl. 318-719.000.
Suzuki, Osamu: *See*—
Takahisa, Shuji; Suzuki, Osamu; and Shibano, Michio, 4,294,067, Cl. 57-274.000.
Suzuki, Seiko: *See*—
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.
Suzuki, Tsuyoshi: *See*—
Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, 4,294,951, Cl. 528-55.000.
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, to Teijin Limited. Powdery pharmaceutical composition and powdery preparation for application to the nasal mucosa, and method for administration thereof. 4,294,829, Cl. 424-241.000.
Svenska Kassaregister AB: *See*—
Mattsson, Mats E., 4,294,554, Cl. 400-320.000.
Svoboda, Josef; Krob, Erwin; and Weigl, Erwin, to TMC Corporation. Ski brake. 4,294,459, Cl. 280-605.000.
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, to TMC Corporation. Spring locking device. 4,294,462, Cl. 280-634.000.
Swart, Petrus H. Gear ratio selection apparatus. 4,294,341, Cl. 192-0.073.
Swartz, Robert V. Internal combustion engines. 4,294,201, Cl. 123-73.00R.
Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 4,294,371, Cl. 220-4.00E.
Swenson, Richard C., to United States of America, Navy. Linear acoustic array. 4,295,212, Cl. 367-20.000.
Syntex (U.S.A.) Inc.: *See*—
Harris, George S., 4,294,844, Cl. 424-273.00R.
Szeliga, Philip C., to Foam Controls, Inc. Flow control apparatus. 4,294,277, Cl. 137-101.190.
Szente, Andre: *See*—
Fischli, Albert E.; and Szente, Andre, 4,294,758, Cl. 260-239.30D.
Szvoboda, Gyorgy: *See*—
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.
Szyszkowski, Adam; Moreau, Marc; and Priester, Pierre, to Trefimetaux. Drawn rods made of lead brass and a process for the thermal treatment thereof. 4,294,629, Cl. 148-11.50C.
T/Drill, Inc.: *See*—
Kemme, Wendell J., 4,294,011, Cl. 30-106.000.
Tabata, Yoneho: *See*—
Matsuda, Osamu; Watanabe, Terutaka; Tabata, Yoneho; and Machi, Sueo, 4,294,675, Cl. 204-159.140.

Taboada, John: *See—*
Altschuler, Bruce R.; Taboada, John; and Altschuler, Martin D., 4,294,544, Cl. 356-376.000.

Tachikara Kabushiki Kaisha: *See—*
Takazawa, Kazuyasu, 4,294,793, Cl. 264-311.000.

Tadewald, Thomas D., to UOP Inc. Heater assembly and method of forming same. 4,294,643, Cl. 156-293.000.

Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, to Tokuyama Soda Kabushiki Kaisha. Alkali calcium silicates and process for preparation thereof. 4,294,810, Cl. 423-331.000.

Taguchi, Yoshinobu: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Tai-Her, Yang. Audio-visual disaster alert system. 4,295,130, Cl. 340-524.000.

Takagi, Kazuhiro: *See—*
Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, to Shin-Etsu Chemical Co. Ltd. Hydroalkenyloxysilanes. 4,294,975, Cl. 556-482.000.

Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, to Ajinomoto Company, Incorporated. Ring peptide antibiotics, Permetin A and a process for producing the same. 4,294,754, Cl. 260-112.50R.

Takahashi, Fumitake: *See—*
Ashida, Hiroshi; and Takahashi, Fumitake, 4,294,189, Cl. 118-603.000.

Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, to Hitachi, Ltd. Semiconductor absolute pressure transducer assembly and method. 4,295,115, Cl. 338-4.000.

Takahashi, Nagashige, to Kabushiki Kaisha Medos Kenkyusho. Slack absorbing device for an endoscope. 4,294,233, Cl. 128-4.000.

Takahashi, Sankichi: *See—*
Sawa, Toshio; Kubota, Masayoshi; Takahashi, Sankichi; and Kaneko, Toyohiko, 4,294,697, Cl. 210-221.100.

Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Furnace with protective atmosphere for heating metals. 4,294,436, Cl. 266-257.000.

Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, to Tokyo Denki Kogaku Kogyo Kabushiki Kaisha. Machine for inserting electronic components. 4,294,000, Cl. 29-564.600.

Takahashi, Yuu, to Aida Engineering, Ltd. Roll feed device for feeding material to a press. 4,294,170, Cl. 100-216.000.

Takahisa, Shuji; Suzuki, Osamu; and Shibano, Michio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for doffing and donning bobbins in a spinning machine. 4,294,067, Cl. 57-274.000.

Takasaki, Toshio: *See—*
Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, 4,294,475, Cl. 285-165.000.

Takase, Yosio: *See—*
Kashima, Isoo; Mishina, Masami; Takase, Yosio; and Maruchi, Katsumi, 4,295,017, Cl. 200-47.000.

Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, to Matsushita Electric Industrial Co., Ltd. Image formation method having translucent particles containing a coloring agent and a colorless dye former. 4,294,902, Cl. 430-45.000.

Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.

Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. 7-[2-(2-Aminothiazol-4-yl)-2-cyclopentyloxyiminoacetamido]-3-cephem-4-carboxylic acid (synisomer). 4,294,960, Cl. 544-22.000.

Takazawa, Kazuyasu, to Tachikara Kabushiki Kaisha. Method and apparatus for manufacturing a spherical hollow body. 4,294,793, Cl. 264-311.000.

Takeda Chemical Industries, Ltd: *See—*
Asai, Mitsuko, 4,294,757, Cl. 260-239.30P.

Takeda, George: *See—*
Ideta, Yasufumi; Takeda, George; and Watanabe, Shoei, 4,294,160, Cl. 91-378.000.

Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Circuit for generating scanning pulses. 4,295,055, Cl. 307-221.00C.

Takeuchi, Shigeo. Apparatus for mixing and baking of bread. 4,294,166, Cl. 99-348.000.

Takeuchi, Yoko: *See—*
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.

Takeuchi, Yoshiyuki: *See—*
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.

Takeuchi, Yuzo: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.

Takezhanov, Sauk T.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Takita, Hitoshi; Mukaida, Yutaka; and Enomoto, Satoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing a normal long chain alkanoic acid. 4,294,770, Cl. 260-413.000.

Tallon, Jacques: *See—*
Gevaud, Roland; and Tallon, Jacques, 4,294,106, Cl. 73-40.700.

Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, to Vasipari Kutato Intezet. Process and apparatus for reducing the inclusion content of steels and for refining their structure. 4,294,611, Cl. 75-49.000.

Tamas, Lajos: *See—*
Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, 4,294,611, Cl. 75-49.000.

Tameo, Robert P., to United States of America, Navy. Turbomachine balance correction system. 4,294,135, Cl. 74-573.00R.

Tamiya, Katsunori: *See—*
Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

Tamm, Rolf: *See—*
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.

Tamony, Andree E.; and Youngson, Charles R., Jr., to Dow Chemical Company, The. Denitrification of a gas stream. 4,294,928, Cl. 423-235.000.

Tamura, Shoichi: *See—*
Abe, Kazunobu; Tamura, Shoichi; and Nakatsuji, Tadao, 4,294,806, Cl. 423-239.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, 4,294,832, Cl. 424-258.000.

Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Combination of gas sensor controlled cooking utensil and gas leak alarm. 4,295,028, Cl. 219-10.55B.

Tanaka, Mitsuaki; and Suzuki, Hidetsugu, to Victor Company of Japan, Limited. Speaker system. 4,295,006, Cl. 179-1.00E.

Tanaka, Shigeho: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Tanaka, Shuhei: *See—*
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

Tanigami, Takahiko: *See—*
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, to Toray Industries, Inc. Coating composition. 4,294,939, Cl. 525-118.000.

Tanihara, Yoshiaki: *See—*
Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, 4,294,791, Cl. 264-210.200.

Tanner, Robert M., to University of California, Regents of the. Error-correcting coding system. 4,295,218, Cl. 371-40.000.

Taricco, Stefano, to Centro Ricerche Fiat S.p.A. Process for the reduction of iron oxide. 4,294,609, Cl. 75-34.000.

Taverez, Dan. Air-filter apparatus in combination with a turbine engine. 4,294,596, Cl. 55-242.000.

Tavlarides, Lawrence L.; Freeman, Robert W.; and Hsia, Alexander M. Liquid jet recycle reactor. 4,294,800, Cl. 422-68.000.

Taylor, John T.: *See—*
Stephens, Donald E.; and Taylor, John T., 4,294,799, Cl. 422-62.000.

Taylor, Lloyd D.: *See—*
Bronstein-Bonte, Irena Y.; Lindholm, Edward P.; and Taylor, Lloyd D., 4,294,907, Cl. 430-213.000.

TBA Industrial Products Limited: *See—*
Thornley, Harry, 4,294,790, Cl. 264-171.000.

Teige, Wolfgang: *See—*
Papenfuhs, Theodor; and Teige, Wolfgang, 4,294,749, Cl. 260-40.00P.

Teijin Limited: *See—*
Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, 4,294,791, Cl. 264-210.200.
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,294,829, Cl. 424-241.000.

Teissier, Jacques. Suction gripping device. 4,294,424, Cl. 248-362.000.

Tekma Kinomat S.p.A.: *See—*
Camardella, Giuseppe, 4,294,417, Cl. 242-149.000.

Teldix GmbH: *See—*
Sindlinger, Rainer; and Hammer, Josef, 4,294,493, Cl. 308-10.000.

Telecommunications Radioelectriques et Telephoniques: *See—*
Van Uffelen, Jean-Pierre H., 4,295,222, Cl. 375-106.000.

Teledyne Industries, Inc.: *See—*
Kotecki, Damian J., 4,294,614, Cl. 75-128.00A.

Telemetry Controls, Inc.: *See—*
Wilson, Worley C., 4,295,191, Cl. 364-104.000.





Tencza, Thomas M., to Bristol-Myers Company. Alkaline analgesic capsule. 4,294,819, Cl. 424-14.000.

Tennigkeit, Jurgen: *See—*
Lorenz, Heribert; and Tennigkeit, Jurgen, 4,294,293, Cl. 141-100.000.

Tennyson, Richard P., to Munters Corporation. Method for operating a coke quench tower scrubber system. 4,294,663, Cl. 201-39.000.

Terada, Soichiro: *See—*
Ikeda, Tatsuhiko; and Terada, Soichiro, 4,294,707, Cl. 210-782.000.

Terumo Corporation: *See—*
Ikeda, Tatsuhiko; and Terada, Soichiro, 4,294,707, Cl. 210-782.000.

Terzian, Rouben T., to Marvin Glass & Associates. Animated talking doll. 4,294,033, Cl. 46-118.000.

Teshima, Hiroshi: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Tetra Pak International AB: *See—*
Martensson, Kjell H., 4,294,362, Cl. 206-622.000.

Tetsuo, Tanaka: *See—*
Issei, Katsuta; and Tetsuo, Tanaka, 4,294,665, Cl. 203-50.000.

Tevopharm-Schiedam B.V.: *See—*
van Maanen, Johannes D., 4,294,344, Cl. 198-461.000.

Texaco, Inc.: *See—*
Sequeira, Avilino, Jr.; Smith, Benjamin F., Jr.; and Mead, Theodore C., 4,294,689, Cl. 208-326.000.
Sung, Rodney L., 4,294,585, Cl. 44-53.000.

Texas Instruments Incorporated: *See—*
Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., 4,295,181, Cl. 361-395.000.
Gottbreht, Tom L.; and Shepherd, Glen C., 4,293,987, Cl. 29-25.420.
Kuo, Chang-Kiang, 4,294,001, Cl. 29-571.000.
Schmidt, Gary D.; Norris, Jerry L.; and Weirauch, Donald F., 4,295,102, Cl. 331-65.000.

Textron, Inc.: *See—*
Moertel, George B., 4,293,994, Cl. 29-409.000.

Thatcher, Gordon: *See—*
Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, 4,294,658, Cl. 376-404.000.

Thayer, Paul M., to Water Pollution Control Corporation. Swing diffuser. 4,294,696, Cl. 210-220.000.

Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft: *See—*
Mayer, Harald; and Berentzen, Hardo, 4,294,086, Cl. 66-121.000.

Thettu, Raghulinga R., to Xerox Corporation. Document belt vacuum manifold. 4,294,540, Cl. 355-76.000.

Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machines for removing surface irregularities from rail heads. 4,294,041, Cl. 51-5.00C.

Thiboutot, Robert, to Les Entreprises Rotot Ltee. Collapsible support device for a folding sled. 4,294,457, Cl. 280-20.000.

Thiere, Helmuth; and Vallentin, Werner, to Siemens Aktiengesellschaft. Corrugated horn radiator. 4,295,142, Cl. 343-781.0CA.

Thill, Gary A., to Minnesota Mining and Manufacturing Company. Perforated closed cell padding material. 4,294,240, Cl. 128-156.000.

Thir, Basil: *See—*
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,294,944, Cl. 525-423.000.

Thomas & Betts Corporation: *See—*
Logan, Maurus C., 4,294,512, Cl. 350-96.200.

Thomas C. Elder, Inc.: *See—*
Kaufman, Kurt D., 4,294,822, Cl. 424-59.000.
Kaufman, Kurt D., 4,294,847, Cl. 424-279.000.

Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., to British Gas Corporation. Apparatus and method for detecting the location of metallic objects having alternating current passing therethrough. 4,295,095, Cl. 324-326.000.

Thomas, Rudolf: *See—*
Schmidt, Robert R.; and Thomas, Rudolf, 4,294,607, Cl. 71-92.000.

Thomasson, Harry V.: *See—*
Kunstlicher, Erich; and Thomasson, Harry V., 4,294,421, Cl. 248-37.600.

Thome, Roland: *See—*
Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, to Societe d'Etudes Scientifiques et Industrielles de l'Ile de-France. New derivatives of 4-amino-5-alkyl sulphonyl orthoanisamides, methods of preparing them and their application as psychotropic agents. 4,294,828, Cl. 424-232.000.

Thompson, Arthur H.; and Ballester, Ricardo H., to Thompson, Arthur H. Battery capacity measuring method and apparatus. 4,295,097, Cl. 324-429.000.

Thompson, Charles W.: *See—*
Gerboth, Patrick L.; and Thompson, Charles W., 4,294,082, Cl. 62-244.000.

Thompson, David A.: *See—*
Romankiw, Lubomyr T.; and Thompson, David A., 4,295,173, Cl. 360-125.000.

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Suppa, Vito; and Viallet, Daniel, 4,295,211, Cl. 367-4.000.

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Henson, Thomas R.; and Timberlake, John F., 4,294,774, Cl. 260-453.00P.

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Kimball, Charles A.; and Sullivan, Marc L., 4,294,324, Cl. 180-89.140.

Times Fiber Communications, Inc.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,294,601, Cl. 65-3.120.

Timex Corporation: *See—*
Jakubek, John, 4,294,517, Cl. 350-345.000.

TMC Corporation: *See—*
Svoboda, Josef; Krob, Erwin; and Weigl, Erwin, 4,294,459, Cl. 280-605.000.
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Toben, Bernhard: *See—*
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.

Tobler, Hans; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Novel N-phenyl-substituted N-heterocyclic compounds, their preparation and use in agents for regulating plant growth. 4,294,606, Cl. 71-88.000.

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Toeppen, Thurston H. Threaded closure and container. 4,294,370, Cl. 215-329.000.

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Tokico Ltd.: *See—*
Amemori, Hiroyuki; and Yamada, Masao, 4,294,123, Cl. 73-861.920.

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Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,294,943, Cl. 525-358.000.
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,294,810, Cl. 423-331.000.

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Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Tokyo Electric Co., Ltd.: *See—*
Nishiyama, Yoshihisa, 4,294,322, Cl. 177-210.00R.

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Mitani, Akio; Sakamoto, Moriyoshi; and Murasaki, Hiroaki, 4,294,081, Cl. 62-140.000.
Otsuka, Kenichi; and Hosokawa, Yorio, 4,295,079, Cl. 315-130.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Zushi, Sadao; and Oida, Yoshio, 4,295,027, Cl. 219-10.55B.

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Tom, Milton D. Apparatus for producing and dispensing detergent solutions. 4,294,280, Cl. 137-268.000.

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Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sample feeding device. 4,294,126, Cl. 73-864.210.

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Tomuro, Jinichi: *See—*
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Toray Industries, Inc.: *See—*
Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, 4,294,939, Cl. 525-118.000.
Tordella, Joseph R. Van platform with lockable ramp. 4,294,571, Cl. 414-537.000.
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Granger, Bruce A.; and Klis, David S., 4,294,339, Cl. 192-12.0BA.
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Tottori Sanyo Electric Co., Ltd.: *See—*
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Towae, Friedrich: *See—*
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Toyo Rubber Industry Co., Ltd., The: *See—*
Nishida, Masazo, 4,294,880, Cl. 428-315.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for preparing olefin polymers or copolymers, and catalyst for use in said process. 4,294,948, Cl. 526-125.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Aoki, Kenji, 4,294,212, Cl. 123-440.000.
Kinaga, Eiichi; and Mori, Mamoru, 4,294,468, Cl. 280-807.000.
Mori, Keiji; and Kurimoto, Kyoichi, 4,294,134, Cl. 74-547.000.
Ohumi, Takeharu, 4,294,286, Cl. 137-625.480.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.
Ueda, Masahiro, 4,294,896, Cl. 429-86.000.
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Desplats, Andre, 4,294,429, Cl. 254-272.000.
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., to GAF Corporation. Thiocyano-containing polyoxyalkylenes. 4,294,848, Cl. 424-302.000.
Trautner, Johann G., to Bentley Alemannia Limited. Flat bed knitting machines. 4,294,085, Cl. 66-75.100.
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Gowans, Neil A.; and Riester, William C., 4,293,974, Cl. 15-250.320.
Trofimov, Oleg F.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.
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Trutzschler GmbH & Co. KG: *See—*
Marx, Herr J., 4,293,982, Cl. 19-80.00A.
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Tsui, Kwok W., to Arco Industries Ltd. Toy cash register. 4,295,036, Cl. 235-1.00E.
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Tsujino, Nobuyuki; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Direct positive silver halide light-sensitive material. 4,294,919, Cl. 430-559.000.
Tucker, Alfred D., to Reed Irrigation Systems Pty Ltd. In-line tube junctions. 4,294,470, Cl. 285-5.000.
Tuell Industries, Inc.: *See—*
Tuell, James L.; and Wahnschaff, Paul, 4,294,456, Cl. 280-11.280.
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Tull, Roger J.; Weinstock, Leonard M.; and Shinkai, Ichiro, to Merck & Co., Inc. Method of preparing 2,4-difluoroaniline. 4,294,988, Cl. 564-417.000.
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Turnbull, James O.; Barker, John C.; and Knight, Arthur J., to J. J. Barker Company Limited. Method and apparatus for curing of articles. 4,294,021, Cl. 34-224.000.
Turner, James, to CBS Inc. Electronic musical instrument. 4,294,155, Cl. 84-1.010.
Turner, Rex H., to International Paper Company. Delignification and bleaching of lignocellulosic pulp via photo-oxygenation. 4,294,654, Cl. 162-50.000.
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Gell, Peter L., 4,294,418, Cl. 242-197.000.
Uba, Toshio, to Gates Rubber Company, The. Battery strap connection welding method. 4,295,029, Cl. 219-75.000.
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Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.
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Ugon, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Device for the protection of access to a permanent memory of a portable data carrier. 4,295,041, Cl. 234-487.000.
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Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., 4,294,824, Cl. 424-101.000.
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Brockman, Milton H. Faraday rotation measurement method and apparatus. 4,295,140, Cl. 343-100.0PE.
Wang, William S. Low temperature latching solenoid. 4,295,111, Cl. 335-256.000.
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Johnson, Richard F., 4,295,200, Cl. 364-555.000.
Moore, Ronald D.; and Hall, John W., 4,294,112, Cl. 73-162.000.
Swenson, Richard C., 4,295,212, Cl. 367-20.000.
Tameo, Robert P., 4,294,135, Cl. 74-573.00R.
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Universal Optical Company, Inc.: *See—*
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Tanner, Robert M., 4,295,218, Cl. 371-40.000.
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University of Tennessee Research Corp.: *See—*
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Pearl, Douglas B., 4,294,481, Cl. 294-146.000.
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Tadewald, Thomas D., 4,294,643, Cl. 156-293.000.
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Smith, Herman W., 4,294,759, Cl. 260-326.270.
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., to Eastman Kodak Company. Antistatic compositions comprising crosslinkable latex binders. 4,294,739, Cl. 260-29.6RW.
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Urlaub, Alfred; and Chmela, Franz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Combustion method and device for practicing same. 4,294,206, Cl. 123-276.000.
Urquhart, Thomas, to Du Pont de Nemours, E. I., and Company. Apparatus for manufacturing flat plastic net. 4,294,646, Cl. 156-500.000.
Useldinger, Ronald E.: *See—*
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Martinelli, Lawrence G.; and Garrison, Mark R., 4,294,640, Cl. 156-213.000.
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van Bilderbeek, Bernard H., 4,294,471, Cl. 285-24.000.
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Vierstraete, Jean. Sawing or cutting machine. 4,294,150, Cl. 83-453.000.
Viessmann, Hans. Heating boiler for liquid or gaseous fuels. 4,294,198, Cl. 122-136.00R.
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Virnig, Michael J., to Henkel Corporation. Benzene sulfonamido pyrimidine derivatives. 4,294,965, Cl. 544-297.000.
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Visser, Pieter; and van de Water, Johan P., to Shell Oil Company. Process for the preparation of gas mixtures. 4,294,720, Cl. 252-373.000.
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Wiesinger, Horst; and Scheurecker, Werner, 4,294,307, Cl. 164-448.000.
Volk, Anthony J.; and Volk, Henry J. Poultry trussing device. 4,293,977, Cl. 17-11.000.
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Wagner, Hans A., to G. D. Searle & Co. {[[4-Azido-5-(ethoxyethyl)-6-phenyl-2-pyrimidinyl]amino]carbonyl}glycine and esters thereof. 4,294,830, Cl. 424-251.000.
Wagner, Kuno; Block, Hans-Dieter; and Schafer, Walter, to Bayer Aktiengesellschaft. Polyisocyanates which contain carbodiimide groups and which are stable in storage. 4,294,719, Cl. 252-182.000.
Wagner, William R., to Rockwell International Corporation. Atomizing shock wave precombustor. 4,294,208, Cl. 123-285.000.
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Watanabe, Shigeru; and Kuzunuki, Tatsuo, to Fuji Photo Film Co. Ltd. Method of and device for measuring chlorophyll of living leaves. 4,295,042, Cl. 250-226.000.
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Webb, Edward A.; McKenna, John F.; and Makar, Frank B., Jr., to GTE Products Corporation. Arc discharge lamp having ceramic arc tube. 4,295,075, Cl. 313-220.000.
Webb, James E. Diesel fuel injector tool. 4,293,992, Cl. 29-267.000.
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Weiderrich, LeRoy J., to Pollination Technics, Inc. Leafcutter bee larvae extracting method and device. 4,293,966, Cl. 6-12.00R.
Weidler, Charles H., to AMP Incorporated. Piezoelectric audio transducer mounting and electrical connector. 4,295,009, Cl. 179-110.00A.
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Wendler, Paul O.; and Welsh, Clarence E., to General Motors Corporation. Thread delasher in vehicle steering gear. 4,294,159, Cl. 91-375.00A.
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Weston, John B., to Burroughs Wellcome Co. Anti-protozoal oxadiazole derivatives. 4,294,843, Cl. 424-272.000.
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Whelan, James P., to Ad-Tec Products, Inc. Paint strainer. 4,294,701, Cl. 210-497.200.
Whitehead, Richard O., to Shell Oil Company. Impact polymers. 4,294,937, Cl. 525-99.000.
Whitehouse, Hugh L., to Stanley Works, The. Torque measuring system for an air tool. 4,294,110, Cl. 73-862.230.
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Wilfer, Oskar, to H. F. & Ph. F. Reemtsma. Folding box. 4,294,399, Cl. 229-44.0CB.
Wilke, Gerhard. Process for the production of pastry and flaky pastry-like products. 4,294,862, Cl. 426-502.000.
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Williams, John W.; Smith, Robert A.; and Arbir, Francis W., to Abbott Laboratories. Biocidal additive for cutting fluids. 4,294,853, Cl. 424-319.000.
Wilmarth, Paul C., to RCA Corporation. Color television receiver degaussing circuit. 4,295,078, Cl. 315-8.000.
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Wilreker, Victor F.; and Smith, William H., to Westinghouse Electric Corp. High voltage high frequency analog signal measuring system. 4,295,094, Cl. 324-96.000.
Wilson, Jack A. Rotary electrical junction assembly. 4,294,500, Cl. 339-5.00M.
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Winiasz, Michael E.; and Long, James M., to A-T-O, Inc. Case packer apparatus including velocity compensator assembly. 4,294,057, Cl. 53-244.000.

Winzer, Frederick W.; and Ault, James R., to Emhart Industries, Inc. Glass forehearth construction. 4,294,603, Cl. 65-346.000.

Wion, David W., to Magmate Australia Proprietary Limited. Figure for arrangement on magnetically attractive surface. 4,294,036, Cl. 46-242.000.

Witherspoon, Romeo R., to General Motors Corporation. PTFE-Bound talc separators for secondary zinc alkaline batteries. 4,294,899, Cl. 429-206.000.

Wittlinger, Harold A.; and Salerno, Carmine P., to RCA Corporation. Position sensing and display means. 4,294,321, Cl. 177-210.0FP.

Wittwer, Norman C., to Bell Telephone Laboratories, Incorporated. Semiconductor integrated circuit protection arrangement. 4,295,176, Cl. 361-91.000.

Wnek, Kenneth A. Convertible ski carrying apparatus. 4,294,387, Cl. 224-315.000.

Woelfel, James A., to Motor Wheel Corporation. Fiber-reinforced composite wheel construction. 4,294,490, Cl. 301-63.0PW.

Woelfel, James A.; and Smith, Richard W., to Motor Wheel Corporation. Fiber-reinforced composite wheel construction. 4,294,639, Cl. 156-185.000.

Wolfson, Sidney K., Jr.: *See—*
Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., 4,294,891, Cl. 429-2.000.

Wollner, Robert A. Slot machine card game. 4,294,451, Cl. 273-308.000.

Woloshuk, Edward A.; Walz, Gregory J.; and Kretzschmar, Robert O., to Zyntrax Corporation, The. Three-dimensional display apparatus. 4,294,523, Cl. 352-86.000.

Wong, Thomas S. W.: *See—*
Mihalich, Stephen K.; and Wong, Thomas S. W., 4,295,062, Cl. 307-279.000.

Wood, Donald C.; and McLaughlin, Robert L., to DeSoto, Inc. Emollient and/or dyed prilled urea bath bead composition. 4,294,855, Cl. 424-358.000.

Wood, Lindley S.: *See—*
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,294,848, Cl. 424-302.000.

Woodall, Jerry M.: *See—*
Chappell, Terry I.; and Woodall, Jerry M., 4,295,002, Cl. 136-244.000.

Woodford, Thomas J., to Stephen C. Small, a part interest. Lower limb muscle aid device. 4,294,238, Cl. 128-80.00G.

Woodhouse, Richard G.; and Salway, Peter H., to Lucas Industries Limited. Control circuits for solenoids. 4,295,177, Cl. 361-154.000.

Woodman, Daniel W., Jr., to USM Corporation. Radial lead inserting machine. 4,293,999, Cl. 29-564.600.

Woods, H. John: *See—*
Fisher, Ian P.; Woods, H. John; and Souhrada, Frank, 4,294,686, Cl. 208-56.000.

World Medical Marketing Corporation: *See—*
Hofstein, Steven R., 4,294,236, Cl. 128-25.00B.

World Wide Oil Tools, Inc.: *See—*
Horton, Herbert D., 4,294,444, Cl. 269-156.000.

Worrell, G. Richard: *See—*
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, 4,294,999, Cl. 568-910.000.

Wossner, Gunter: *See—*
Binder, Georg; and Wossner, Gunter, 4,295,067, Cl. 310-52.000.

Wuerthner, Herbert: *See—*
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,294,462, Cl. 280-634.000.

Wunderlich, Klaus: *See—*
Henk, Hermann; Wunderlich, Klaus; and Wild, Peter, 4,294,580, Cl. 8-549.000.

Wunderlich, Robert J.: *See—*
Herron, Clifford W.; and Wunderlich, Robert J., 4,295,180, Cl. 361-383.000.

Wunstel, Franz. Car top carrier support. 4,294,388, Cl. 224-315.000.

Wuthrich, Werner, to Autelca AG. Ribbon feed mechanism. 4,294,553, Cl. 400-219.100.

Wyeth, Harold W. G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Fuel tanks. 4,294,279, Cl. 137-264.000.

Xerox Corporation: *See—*
Genovese, Frank C., 4,294,901, Cl. 430-39.000.
Mammino, Joseph, 4,294,904, Cl. 430-122.000.
Snelling, Christopher, 4,294,534, Cl. 355-3.00R.
Spehrley, Charles W., Jr., 4,294,539, Cl. 355-76.000.
Thettu, Raghulinga R., 4,294,540, Cl. 355-76.000.
Wiggins, Douglas G., 4,295,167, Cl. 358-285.000.

Yabuta, Yukio: *See—*
Ohba, Hisao; Oda, Kazutaka; Yabuta, Yukio; and Ohashi, Azusa, 4,294,672, Cl. 204-129.400.

Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive material. 4,294,918, Cl. 430-553.000.

Yamada, Masao: *See—*
Amemori, Hiroyuki; and Yamada, Masao, 4,294,123, Cl. 73-861.920.

Yamada, Yoshito; Okumura, Hiroshi; and Murakami, Shoji, to Mitsubishi Denki Kabushiki Kaisha. Residual current transformer. 4,295,112, Cl. 336-84.00M.

Yamagata, Takeo: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Yamaguchi, Hisao: *See—*
Shiraiwa, Toshio; Yamaguchi, Hisao; and Matsumoto, Shigeaki, 4,294,118, Cl. 73-620.000.

Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, to Fuji Photo Film Co., Ltd. Method of hardening gelatin. 4,294,921, Cl. 430-621.000.

Yamamoto, Michio: *See—*
Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, 4,294,940, Cl. 525-124.000.

Yamamoto, Takashi; and Amako, Hiroshi, to Nippon Paint Co., Ltd. Corrosion evaluation testing method of coated metallic material and apparatus employed therefor. 4,294,667, Cl. 204-1.00T.

Yamamoto, Takashi: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Yamamoto, Tatsuo: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Yamamura, Keizo; and Ohashi, Yasuo, to Omron Tateisi Electronics Co. Temperature detecting circuit. 4,294,116, Cl. 73-362.0AR.

Yamashita, Gentaro: *See—*
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,294,829, Cl. 424-241.000.

Yamashita, Nobuo; and Maeda, Miwako, to Olympus Optical Co., Ltd. Connecting optical system for light guides. 4,294,511, Cl. 350-96.180.

Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., to Montefiore Hospital Association of Western Pennsylvania, The. Intermittently refuelable implantable bio-oxidant fuel cell. 4,294,891, Cl. 429-2.000.

Yartsev, Ivan M.: *See—*
Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

Yasuda, Eturo: *See—*
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,294,801, Cl. 422-98.000.

Yasuhara, Seishi; and Ohnishi, Eiichi, to Nissan Motor Co., Ltd. Intake port means for extracting engine exhaust gas for recirculation. 4,294,220, Cl. 123-568.000.

Yasui, Seimei: *See—*
Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, 4,294,940, Cl. 525-124.000.

Yasukawa, Eiki: *See—*
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Yokota, Akiyoshi: *See—*
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yokota, Yukio: *See—*
Yagihara, Morio; and Yokota, Yukio, 4,294,918, Cl. 430-553.000.

Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, to Tanabe Seiyaku Co., Ltd. Tetrahydroisoquinoline compounds and a pharmaceutical composition thereof. 4,294,832, Cl. 424-258.000.

Yoneda, Takoao: *See—*
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.

Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, to Otis Engineering Corporation. Landing nipple. 4,294,315, Cl. 166-322.000.

Yoshibayashi, Shigeru: *See—*
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Yoshida, Hajime, to Hajime Industries Ltd. Pattern data processing method and apparatus to practice such method. 4,295,120, Cl. 340-146.3MA.

Yoshida, Hiroshi: *See—*
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Yoshii, Kazuhiro, to Sanyo Electric Co. Ltd.; and Tokyo Sanyo Electric. Absorption refrigerating system. 4,294,076, Cl. 62-235.100.

Yoshikiyo, Motozoh: *See—*
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yoshimoto, Hataaki: *See—*
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yoshino, Kimiaki: *See—*
Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.





Yoshioka, Masahiro; Koike, Toshifumi; and Izumi, Hideki, to Hitachi, Ltd. Sliding-type bearing. 4,294,494, Cl. 308-76.000.

Yoshioka, Susumu: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Yoshioka, Tamotu: *See—*
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.

Yoshitugu, Ken: *See—*
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, 4,294,948, Cl. 526-125.000.

Young, Ching T., to Bendix Autolite Corporation. Method of measuring oxygen and process for pretreating a solid electrolyte oxygen gas sensing element. 4,294,668, Cl. 204-1.00T.

Young, Dick K.; and Sumner, Kenneth E., to Marathon Oil Company. Quick opening internal manway for towers. 4,294,049, Cl. 52-20.000.

Young, Leroy: *See—*
Schlotter, Harold J.; and Young, Leroy, 4,294,452, Cl. 273-403.000.

Youngson, Charles R., Jr.: *See—*
Tamony, Andree E.; and Youngson, Charles R., Jr., 4,294,928, Cl. 423-235.000.

Zachary, Richard E., to Dow Chemical Company, The. Method for removing trapped gas under pond liners. 4,294,589, Cl. 55-36.000.

Zaitsev, Vladimir Y.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Zalewski, Z. Leo: *See—*
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.

Zauner, Christian W. Head gear. 4,293,958, Cl. 2-12.000.

Zeigarnik, Vladimir A.: *See—*
Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

Zergenyi, Janos, to Ciba-Geigy Corporation. Process for inverting the configuration in optically active compounds. 4,294,966, Cl. 544-316.000.

Ziberov, Valentin E.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Zielinski, Jan: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Zimmer USA, Inc.: *See—*
Fuson, Robert L., 4,293,962, Cl. 3-1.900.
Gold, Barry L.; and Bolesky, Richard C., 4,293,963, Cl. 3-1.910.

Zushi, Sadao; and Oida, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Microwave ovens with programmable control. 4,295,027, Cl. 219-10.55B.

Zyntrax Corporation, The: *See—*
Woloshuk, Edward A.; Walz, Gregory J.; and Kretzschmar, Robert O., 4,294,523, Cl. 352-86.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aladdin Industries, Incorporated: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bentz, Erwin J. H., to Caterpillar Tractor Co. Modular heat exchanger with pivotal cores. Re. 30,766, Cl. 165-41.000.

Bramming, Carl, deceased; by Bramming, Clara B., heir; by Bramming, Kenneth R., heir; and by Wheeler, Beverley B., heir, to Aladdin Industries, Incorporated. Vacuum insulated bottle. Re. 30,768, Cl. 215-13.00R.

Bramming, Clara B., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bramming, Kenneth R., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bussjager, Rudy C., to Carrier Corporation. Heat pump system. Re. 30,765, Cl. 62-115.000.

Carrier Corporation: *See—*
Bussjager, Rudy C., Re. 30,765, Cl. 62-115.000.

Caterpillar Tractor Co.: *See—*
Bentz, Erwin J. H., Re. 30,766, Cl. 165-41.000.
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., to Caterpillar Tractor Co. Mounting arrangement for impact rock-breaker. Re. 30,769, Cl. 299-67.000.

Dauben, Dwight L.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Dowbenko, Rostyslaw: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., to Standard Oil Company (Indiana). Method using lignosulfonates for high-temperature plugging. Re. 30,767, Cl. 166-261.000.

Fidler, Jerry D.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Fish, Elson B.: *See—*
Shobert, Samuel M.; and Fish, Elson B., Re. 30,770, Cl. 156-180.000.

Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Amide-modified urethane acrylate radiation curable compounds and coating compositions and methods of making same. Re. 30,772, Cl. 525-421.000.

Glaser, Paul F.; and Orford, Richard J., to Transaction Technology, Inc. Transaction terminal. Re. 30,773, Cl. 235-379.000.

Gruber, Gerald W.: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Gutman, Nathan: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Livesay, Richard E.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Marrs, Richard E.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Orford, Richard J.: *See—*
Glaser, Paul F.; and Orford, Richard J., Re. 30,773, Cl. 235-379.000.

Plas/Steel Products, Inc.: *See—*
Shobert, Samuel M.; and Fish, Elson B., Re. 30,770, Cl. 156-180.000.

PPG Industries, Inc.: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Shobert, Samuel M.; and Fish, Elson B., to Plas/Steel Products, Inc. Method for fabricating improved fiber reinforced plastic rods having a smooth surface. Re. 30,770, Cl. 156-180.000.

Simmons, Gerald P.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Standard Oil Company (Indiana): *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Stemler, Orrin A.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Transaction Technology, Inc.: *See—*
Glaser, Paul F.; and Orford, Richard J., Re. 30,773, Cl. 235-379.000.

Wheeler, Beverley B., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Zondek, Klaus. Method of protecting the hulls of marine vessels from fouling. Re. 30,771, Cl. 156-196.000.

# LIST OF DESIGN PATENTEES

Abraham, Anthony S., to Lever Brothers Company. Combined box and lid. 261,234, 10-13-81, Cl. D9-432.000.

Akita, Tsugio: *See—*
Yoshida, Toshihiko; Tatsumi, Masakazu; Sakakibara, Seiichi; Kubo, Toshiki; Akita, Tsugio; and Ueda, Yoshiaki, 261,266, Cl. D32-21.000.

Allen, Alton K.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Altadonna, James. Container for carrying first aid data and equipment. 261,198, 10-13-81, Cl. D2-400.000.

American Cyanamid Company: *See—*
Grip, John A., 261,231, Cl. D9-370.000.
Grip, John A., 261,232, Cl. D9-370.000.

Arai, Noriyuki: *See—*
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 261,263, Cl. D14-2.000.

Austin, David D.: *See—*
Becker, James R.; Austin, David D.; and Rudat, Ronald A., 261,283, Cl. D21-33.000.

Barrett, Walter H., to Columbia Chase Corporation. Solar demonstration unit. 261,279, 10-13-81, Cl. D19-62.000.

Barringer, Jack E.: *See—*
Clink, Sterling A.; and Barringer, Jack E., 261,294, Cl. D21-195.000.

Bautch, Roger F.: *See—*
Lange, Arthur E.; and Bautch, Roger F., 261,251, Cl. D11-157.000.

Baxter Travenol Laboratories, Inc.: *See—*
Williams, Robert P., 261,236, Cl. D9-435.000.

Becker, James R.; Austin, David D.; and Rudat, Ronald A., to Hasbro Industries, Inc. Game board. 261,283, 10-13-81, Cl. D21-33.000.

Bird, John J. Bottle. 261,230, 10-13-81, Cl. D9-367.000.

Birmingham, Joan T. Ornament preform. 261,248, 10-13-81, Cl. D11-121.000.

Birmingham, Joan T. Creature ornament. 261,249, 10-13-81, Cl. D11-128.000.

Birmingham, Joan T. Creature ornament. 261,250, 10-13-81, Cl. D11-128.000.

Black & Decker Inc.: *See—*
Bunyea, Roderick F., 261,222, Cl. D8-68.000.

Blake, Jack E. Stand. 261,201, 10-13-81, Cl. D6-85.000.





Braun Aktiengesellschaft: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,317, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,318, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,319, Cl. D28-35.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy space shuttle. 261,286, 10-13-81, Cl. D21-87.000.

Bridgestone Tire Co., Ltd.: *See—*
Yamazaki, Naoki; Kojima, Hiroshi; and Nishio, Hideaki, 261,256, Cl. D12-148.000.

Bunyea, Roderick F., to Black & Decker Inc. Pneumatic impact wrench. 261,222, 10-13-81, Cl. D8-68.000.

Buttner, Ronald A.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Caldwell, Joseph M. Pulley for compound archery bows. 261,296, 10-13-81, Cl. D22-5.000.

Camsco, Inc.: *See—*
Gobeli, Gregg P., 261,274, Cl. D18-7.000.

Canon Kabushiki Kaisha: *See—*
Sakai, Masaaki; and Uematsu, Sakae, 261,273, Cl. D18-7.000.

Capanear, Patricia. Tablecloth. 261,210, 10-13-81, Cl. D6-286.000.

Capitol Products Corporation: *See—*
Schmidt, Dietrich F., 261,304, Cl. D25-74.000.
Schmidt, Dietrich F., 261,305, Cl. D25-74.000.
Schmidt, Dietrich F., 261,306, Cl. D25-74.000.
Schmidt, Dietrich F., 261,307, Cl. D25-74.000.
Schmidt, Dietrich F., 261,308, Cl. D25-74.000.
Schmidt, Dietrich F., 261,309, Cl. D25-74.000.
Schmidt, Dietrich F., 261,310, Cl. D25-74.000.
Schmidt, Dietrich F., 261,311, Cl. D25-74.000.
Schmidt, Dietrich F., 261,312, Cl. D25-74.000.
Schmidt, Dietrich F., 261,313, Cl. D25-74.000.
Schmidt, Dietrich F., 261,314, Cl. D25-74.000.
Schmidt, Dietrich F., 261,315, Cl. D25-74.000.
Schmidt, Dietrich F., 261,316, Cl. D25-74.000.

Carbajales Santa-Eulalia, Javier B.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,252, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,253, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,254, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a bulldog. 261,252, 10-13-81, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a lynx. 261,253, 10-13-81, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a poodle. 261,254, 10-13-81, Cl. D11-158.000.

Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, to Microsonics Corporation. Casing for a microphonograph. 261,264, 10-13-81, Cl. D14-14.000.

Christensen, Kurt. Disk for a menstrual calendar. 261,275, 10-13-81, Cl. D18-10.000.

Clark, Robin, to Hilary Page "Sensible" Toys Limited. Gingerbread man rattle. 261,285, 10-13-81, Cl. D21-65.000.

Clean City Squares, Inc.: *See—*
Gilbert, William A., 261,218, Cl. D34-1.000.

Clink, Sterling A.; and Barringer, Jack E. Arm wrestling device. 261,294, 10-13-81, Cl. D21-195.000.

Coca-Cola Company, The: *See—*
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Columbia Chase Corporation: *See—*
Barrett, Walter H., 261,279, Cl. D19-62.000.

Cornett, Donald F., to Coca-Cola Company, The. Combined dispenser cabinet and stand. 261,269, 10-13-81, Cl. D15-116.000.

Dart Industries Inc.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,215, Cl. D7-131.000.

Datasonic, Inc.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Davis, Lester M. Fishing lure. 261,298, 10-13-81, Cl. D22-27.000.

Denker, William B.; and Frank, Jeanne C., to Red Owl Stores, Inc. Cash register attachment for screening keys. 261,276, 10-13-81, Cl. D18-12.000.

Dockery, Allen W. Cane. 261,199, 10-13-81, Cl. D3-7.000.

Dowco Corporation: *See—*
Sanderson, Paul H., Jr., 261,224, Cl. D8-323.000.

Durand, Jean-Jacques. Goblet or similar article. 261,211, 10-13-81, Cl. D7-13.000.

Dvorsky, Daniel A. Quick release honda. 261,229, 10-13-81, Cl. D8-396.000.

Easterday, James E. Fishing lure. 261,299, 10-13-81, Cl. D22-27.000.

Emerson Electric Co.: *See—*
Seeley, Wayne R., 261,260, Cl. D13-18.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,245, 10-13-81, Cl. D11-75.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,246, 10-13-81, Cl. D11-75.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,247, 10-13-81, Cl. D11-75.000.

Ervin, William R. Model ship. 261,255, 10-13-81, Cl. D11-163.000.

FIC Corporation: *See—*
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Linton, John C., 261,262, Cl. D13-35.000.

First Champaign Corporation: *See—*
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Free, John H.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,215, Cl. D7-131.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
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General Mills, Inc.: *See—*
Richmond, Colin B., II, 261,216, Cl. D7-137.000.

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Glen Shoe Company: *See—*
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Gobeli, Gregg P., to Camsco, Inc. Digitizer cursor for computer drafting. 261,274, 10-13-81, Cl. D18-7.000.

Goertz, Albrecht, to Rolodex Corporation. Rotary card file. 261,280, 10-13-81, Cl. D19-76.000.

Gradco/Dendoki, Inc.: *See—*
Lawrence, Frederick J., 261,272, Cl. D16-32.000.

Green, Marianne C., to Koehring Company. Container for liquids or the like. 261,233, 10-13-81, Cl. D9-398.000.

Greubel, Jurgen: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,317, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,318, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,319, Cl. D28-35.000.

Griffin, Robert P. Sportsman's belt. 261,196, 10-13-81, Cl. D2-383.000.

Grip, John A., to American Cyanamid Company. Bottle or similar article. 261,231, 10-13-81, Cl. D9-370.000.

Grip, John A., to American Cyanamid Company. Bottle and cap or similar article. 261,232, 10-13-81, Cl. D9-370.000.

Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., to Dart Industries Inc. Coffee urn lid. 261,215, 10-13-81, Cl. D7-131.000.

Guidry, Warren L., to Interco Marketing, Incorporated. Tire. 261,257, 10-13-81, Cl. D12-146.000.

Haller, John L. Hydrotherapy pool with slide. 261,303, 10-13-81, Cl. D24-38.000.

Hasbro Industries, Inc.: *See—*
Becker, James R.; Austin, David D.; and Rudat, Ronald A., 261,283, Cl. D21-33.000.
Samuels, Donald H.; and Newton, Brian L., 261,293, Cl. D21-151.000.

Hashimoto, Masanori; and Soda, Koichi, to Ricoh Company Ltd. Printer ribbon cassette. 261,277, 10-13-81, Cl. D18-12.000.

Haufe, David K., to Sunbeam Corporation. Digital clock or the like. 261,237, 10-13-81, Cl. D10-15.000.

HEWI, Heinrich Wilke GmbH: *See—*
Scholl, Winfried, 261,223, Cl. D8-312.000.

Hicks, Enoch E. Game board. 261,282, 10-13-81, Cl. D21-24.000.

Hilary Page "Sensible" Toys Limited: *See—*
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Hilko, Steven E., to Quaker Oats Company, The. Toy space rocket. 261,287, 10-13-81, Cl. D21-87.000.

Hilko, Steven E., to Quaker Oats Company, The. Toy glider. 261,288, 10-13-81, Cl. D21-89.000.

Hug, Niklaus, to Rommag P. Worwag & Co. Vacuum cleaner. 261,267, 10-13-81, Cl. D32-21.000.

Interco Marketing, Incorporated: *See—*
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Ishimaru, Lloyd Y.: *See—*
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 261,264, Cl. D14-14.000.

Jeffrey, Alfred D. Combined swimming pool cover-roller and brake. 261,270, 10-13-81, Cl. D15-199.000.

John J. Madison Company, Inc.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,252, Cl. D11-158.000.
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Kaspar & Esh, Inc.: *See—*
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Epstein, Elias, 261,246, Cl. D11-75.000.
Epstein, Elias, 261,247, Cl. D11-75.000.

Klose, Odo, to Friedrich Grohe Armaturenfabrik GmbH & Co. Handshower. 261,300, 10-13-81, Cl. D23-35.000.

Koehring Company: *See—*
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Kojima, Hiroshi: *See—*
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Kubo, Toshiki: *See—*
Yoshida, Toshihiko; Tatsumi, Masakazu; Sakakibara, Seiichi; Kubo, Toshiki; Akita, Tsugio; and Ueda, Yoshiaki, 261,266, Cl. D32-21.000.
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, to Matsushita Electric Industrial Co., Ltd. Video tape recorder deck. 261,263, 10-13-81, Cl. D14-2.000.
Lange, Arthur E.; and Bautch, Roger F. Desk ornament. 261,251, 10-13-81, Cl. D11-157.000.
Latimer, Margaret D. Iron holder. 261,219, 10-13-81, Cl. D32-73.000.
Lavanhar, Patricia S. Adjustable viewing mirror. 261,258, 10-13-81, Cl. D12-189.000.
Lawing, Edward, to Reliance Electric Co. Scale. 261,241, 10-13-81, Cl. D10-91.000.
Lawrence, Frederick J., to Gradco/Dendoki, Inc. Sorting apparatus. 261,272, 10-13-81, Cl. D16-32.000.
Le Compte, Marcia L.: *See—*
Perethian, Charles M.; Le Compte, Marcia L.; and Vetter, Bruce W., 261,213, Cl. D7-77.000.
Lee, David L.; and O'Connor, Harry J. Panel for a chair back. 261,209, 10-13-81, Cl. D6-197.000.
Leopoldi, Norbert. Telephone note holder, or the like. 261,265, 10-13-81, Cl. D14-59.000.
Lever Brothers Company: *See—*
Abraham, Anthony S., 261,234, Cl. D9-432.000.
Linton, John C., to FIC Corporation. Fuse holder. 261,261, 10-13-81, Cl. D13-35.000.
Linton, John C., to FIC Corporation. Fuse holder. 261,262, 10-13-81, Cl. D13-35.000.
Lloyd, Kenneth A., Jr. Check-out station accessory frame. 261,206, 10-13-81, Cl. D6-143.000.
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Lorist, Hendrik J. G. Housing for an emergency alarm for swimming pools and the like. 261,242, 10-13-81, Cl. D10-106.000.
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Marucci, N. Dominic; and Wright, David B., to Syntex (U.S.A.) Inc. Dental handpiece. 261,301, 10-13-81, Cl. D24-12.000.
Marvin Glass & Associates: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matthews, Ralph E., to Matthews Machine Co., Inc. Fire screen. 261,220, 10-13-81, Cl. D7-208.000.
McDonald, Christopher L. Lawn sign. 261,281, 10-13-81, Cl. D20-38.000.
McMullan, Robert G., to SCM (Canada) Limited. Collapsible handle. 261,235, 10-13-81, Cl. D9-434.000.
Microsonics Corporation: *See—*
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Mills, Frederick G. W., to U.G. Closures & Plastics Ltd. Combined funnel and pouring spout. 261,212, 10-13-81, Cl. D7-68.000.
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., to Datasonic, Inc. Water sensing alarm. 261,243, 10-13-81, Cl. D10-121.000.
Morgan, Thomas E. Dual size brake shoe aperture gauge. 261,239, 10-13-81, Cl. D10-64.000.
Mutch, Clyde E. Dish or pot scraper. 261,217, 10-13-81, Cl. D32-49.000.
New Era Products, Inc.: *See—*
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Newton, Brian L.: *See—*
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Nishio, Hideaki: *See—*
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Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, to Braun Aktiengesellschaft. Combined curling iron with cover. 261,317, 10-13-81, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, to Braun Aktiengesellschaft. Curling iron. 261,318, 10-13-81, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, to Braun Aktiengesellschaft. Cover for a curling iron. 261,319, 10-13-81, Cl. D28-35.000.
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Perethian, Charles M.; Le Compte, Marcia L.; and Vetter, Bruce W., to First Champaign Corporation. Insulated carrier for food or the like. 261,213, 10-13-81, Cl. D7-77.000.
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Pitt, James K. Adjustable batter board. 261,238, 10-13-81, Cl. D10-61.000.
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Tong, Duncan, 261,292, Cl. D21-143.000.
Pluenneke, Ricks H. Underside wick hand-held rope wick applicator. 261,221, 10-13-81, Cl. D8-02.000.
Quaker Oats Company, The: *See—*
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Robins, Robert R. Roll top wet bar. 261,207, 10-13-81, Cl. D6-144.000.
Rolodex Corporation: *See—*
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Rommag P. Worwag & Co.: *See—*
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Rowswell, Donald. Belt attachable hammer holder or the like. 261,197, 10-13-81, Cl. D2-400.000.
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Sakamoto, Masakazu; and Shohoji, Takeshi, to Ryobi, Ltd. Fishing reel. 261,297, 10-13-81, Cl. D22-25.000.
Samczyk, Casimir S., to White Consolidated Industries, Inc. Duplicating apparatus. 261,271, 10-13-81, Cl. D16-31.000.
Samuels, Donald H.; and Newton, Brian L., to Hasbro Industries, Inc. Jack-in-the-box toy. 261,293, 10-13-81, Cl. D21-151.000.
Sanderson, Paul H., Jr., to Dowco Corporation. Pivot pin for movable louvers or the like. 261,224, 10-13-81, Cl. D8-323.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,304, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,305, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,306, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,307, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,308, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,309, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,310, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,311, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,312, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,313, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,314, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,315, 10-13-81, Cl. D25-74.000.
Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows or the like. 261,316, 10-13-81, Cl. D25-74.000.
Schoenfield, Palmer J., to Marvin Glass & Associates. Combined cash register and bar code reader toy. 261,289, 10-13-81, Cl. D21-111.000.
Scholl, Winfried, to HEWI, Heinrich Wilke GmbH. Door knob. 261,223, 10-13-81, Cl. D8-312.000.
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Shames, Sidney J.; and Shames, Harold. Soap dish for attachment to a frame. 261,202, 10-13-81, Cl. D6-89.000.
Shames, Sidney J.; and Shames, Harold. Wall mounted soap dish. 261,203, 10-13-81, Cl. D6-90.000.
Shames, Sidney J.; and Shames, Harold. Towel bar support post. 261,204, 10-13-81, Cl. D6-103.000.
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Shames, Sidney J.; and Shames, Harold. Wall plate for double electric switch. 261,226, 10-13-81, Cl. D8-350.000.
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Shames, Sidney J.; and Shames, Harold. Wall plate. 261,228, 10-13-81, Cl. D8-350.000.
Shaw, Jerry; and Solitt, Samuel G. Display unit and light fixtures therefor. 261,200, 10-13-81, Cl. D6-85.000.
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Sterling, John G. Strike plate. 261,225, 10-13-81, Cl. D8-344.000.
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Todd, James. Indoor/outdoor golf practice target. 261,295, 10-13-81, Cl. D21-234.000.
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Wright, David B.: *See—*
Marucci, N. Dominic; and Wright, David B., 261,301, Cl. D24-12.000.
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# CLASSIFICATION OF PATENTS

## ISSUED OCTOBER 13, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

2.1 R 4,293,957
12 4,293,958
243 B 4,293,959
416 4,293,960

**CLASS 3**

1.7 4,293,961
1.9 4,293,962
1.91 4,293,963

**CLASS 4**

378 4,293,964

**CLASS 5**

465 4,293,965

**CLASS 6**

12 R 4,293,966

**CLASS 8**

111 4,294,575
137.5 4,294,576
488 4,294,577
516 4,294,578
549 4,294,579
4,294,580
611 4,294,581

**CLASS 9**

1.6 4,293,967
310 A 4,293,968

**CLASS 13**

13 4,295,000
17 4,295,001

**CLASS 14**

71.1 4,293,969

**CLASS 15**

21 D 4,293,970
98 4,293,971
145 4,293,972
230.17 4,293,973
250.32 4,293,974
250.41 4,293,975

**CLASS 16**

129 4,293,976

**CLASS 17**

11 4,293,977
12 4,293,978
32 4,293,979
51 4,293,980
71 4,293,981

**CLASS 19**

80 A 4,293,982
127 4,293,983

**CLASS 23**

230 B 4,294,582
232 R 4,294,583

**CLASS 24**

221 R 4,293,984

**CLASS 28**

254 4,293,985

**CLASS 29**

25.35 4,293,986
25.42 4,293,987
116 AD 4,293,988
130 4,293,989
148.4 D 4,293,990
243.52 4,293,991
267 4,293,992
278 4,293,993
409 4,293,994
421 R 4,293,995
446 4,293,996
450 4,293,997
564.1 4,293,998
564.6 4,293,999
4,294,000
571 4,294,001
4,294,002
611 4,294,003
622 4,294,004
623.5 4,294,005
701 4,294,006
830 4,294,007
831 4,294,008
832 4,294,009

**CLASS 30**

42 4,294,010
106 4,294,011
378 4,294,012
392 4,294,013

**CLASS 33**

3 C 4,294,014
174 D 4,294,015
180 AT 4,294,016
265 4,294,017

**CLASS 34**

56 4,294,018
65 4,294,019
168 4,294,020
224 4,294,021

**CLASS 36**

4 4,294,022
11.5 4,294,023
113 4,294,024
132 4,294,025

**CLASS 37**

8 4,294,026
43 R 4,294,027

**CLASS 40**

359 4,294,028
388 4,294,029

**CLASS 43**

4 4,294,030
43.16 4,294,031

**CLASS 44**

23 4,294,584
53 4,294,585
56 4,294,586
74 4,294,587

**CLASS 46**

1 R 4,294,032
118 4,294,033
161 4,294,034
227 4,294,035
242 4,294,036

**CLASS 47**

59 4,294,037

**CLASS 49**

63 4,294,038
248 4,294,039
254 4,294,040

**CLASS 51**

5 C 4,294,041
54 4,294,042
100 R 4,294,043
135 BT 4,294,044
165.71 4,294,045
170 R 4,294,046
327 4,294,047

**CLASS 52**

9 4,294,048
20 4,294,049
93 4,294,050
98 4,294,051
236.5 4,294,052
295 4,294,053
484 4,294,054
795 4,294,055

**CLASS 53**

86 4,294,056
244 4,294,057
413 4,294,058
448 4,294,059
506 4,294,060
536 4,294,061

**CLASS 55**

5 4,294,588
36 4,294,589
48 4,294,590
120 4,294,591
4,294,592
4,294,593
166 4,294,594
186 4,294,595
213 4,294,596
242 4,294,597
283 4,294,598
403 4,294,599
485

**CLASS 56**

16.4 4,294,063
102 4,294,062

**CLASS 57**

3 4,294,064
265 4,294,065
4,294,066
274 4,294,067

**CLASS 60**

204 4,294,068
238 4,294,069
534 4,294,070
547 A 4,294,071
585 4,294,072
597 4,294,073
616 4,294,074
671 4,294,075

**CLASS 62**

6 4,294,077
4,294,600
59 4,294,078
60 4,294,079
101 4,294,080
115 Re.30,765
140 4,294,081
235.1 4,294,076
244 4,294,082
434 4,294,083

**CLASS 63**

15 4,294,084

**CLASS 65**

3.12 4,294,601
40 4,294,602
346 4,294,603

**CLASS 66**

75.1 4,294,085
121 4,294,086

**CLASS 69**

21 4,294,087

**CLASS 70**

56 4,294,088
150 4,294,089
226 4,294,090
276 4,294,091
364 A 4,294,092
369 4,294,093

**CLASS 71**

27 4,294,604
73 4,294,605
88 4,294,606
92 4,294,607

**CLASS 72**

16 4,294,094
51 4,294,095
60 4,294,096
94 4,294,097
128 4,294,098
234 4,294,099
340 4,294,100
356 4,294,101
413 4,294,102
453.14 4,294,103

**CLASS 73**

9 4,294,104
28 4,294,105
40.7 4,294,106
49.2 4,294,107
119 A 4,294,108
4,294,109
150 R 4,294,111
162 4,294,112
199 4,294,113
204 4,294,114
342 4,294,115
362 AR 4,294,116
620 4,294,118
625 4,294,119
650 4,294,120
662 4,294,121
761 4,294,122
861.92 4,294,123
862.23 4,294,110
863.85 4,294,124
864.15 4,294,125
864.21 4,294,126
4,294,127
864.85 4,294,117

**CLASS 74**

5.44 4,294,128
7 A 4,294,129
15.4 4,294,130
4,294,131
462 4,294,132
501 P 4,294,133
547 4,294,134
573 R 4,294,135
600 4,294,136
665 G 4,294,137
750 B 4,294,138
839 4,294,139
868 4,294,140

**CLASS 75**

0.5 A 4,294,608
34 4,294,609
43 4,294,610
49 4,294,611
68 R 4,294,612
124 4,294,613
128 A 4,294,614
175.5 4,294,615
234 4,294,616

**CLASS 81**

3 R 4,294,141
57.37 4,294,142

**CLASS 83**

37 4,294,143
71 4,294,144
302 4,294,145
316 4,294,146
382 4,294,147
397 4,294,148
435.1 4,294,149
453 4,294,150
477.2 4,294,151
588 4,294,152

**CLASS 84**

1.01 4,294,153
4,294,154
4,294,155

**CLASS 89**

1 G 4,294,157
12 4,294,158

**CLASS 91**

375 A 4,294,159
378 4,294,160
422 4,294,161
434 4,294,162

**CLASS 92**

52 4,294,163
243 4,294,164

**CLASS 98**

1 4,294,165

**CLASS 99**

348 4,294,166
369 4,294,167
494 4,294,168

**CLASS 100**

48 4,294,169
216 4,294,170

**CLASS 102**

281 4,294,173
317 4,294,171
473 4,294,172

**CLASS 104**

250 4,294,174

**CLASS 105**

199 R 4,294,175
363 4,294,176

**CLASS 106**

14.37 4,294,617
188 4,294,619
288 Q 4,294,620
306 4,294,621
314 4,294,622

**CLASS 108**

42 4,294,177

**CLASS 110**

347 4,294,178

**CLASS 111**

3 4,294,179
52 4,294,180
87 4,294,181

**CLASS 112**

21 4,294,182

**CLASS 114**

42 4,294,183
61 4,294,184
75 4,294,185
151 4,294,186

**CLASS 118**

244 4,294,187
305 4,294,188
603 4,294,189
620 4,294,190
634 4,294,191
650 4,294,192
718 4,294,193
719 4,294,194

**CLASS 119**

20 4,294,195
27 4,294,196
60 4,294,197

**CLASS 122**

136 R 4,294,198
276 4,294,199
406 S 4,294,200

**CLASS 123**

73 PP 4,294,202
73 R 4,294,201
195 R 4,294,203
198 DB 4,294,204
274 4,294,205
276 4,294,206
279 4,294,207
285 4,294,208
293 4,294,209
300 4,294,210
379 4,294,211
440 4,294,212
454 4,294,213
458 4,294,214
470 4,294,215
489 4,294,216
491 4,294,217
502 4,294,218
557 4,294,219
568 4,294,220

**CLASS 124**

23 R 4,294,221
25 4,294,222

**CLASS 126**

112 4,294,223
135 4,294,224
204 4,294,225
286 4,294,226
400 4,294,227
430 4,294,228
434 4,294,229
438 4,294,230
441 4,294,231
443 4,294,232

**CLASS 127**

55 4,294,623
62 4,294,624

**CLASS 128**

4 4,294,233
6 4,294,234
11 4,294,235
25 B 4,294,236
77 4,294,237
80 G 4,294,238
96 4,294,239
156 4,294,240
4,294,241
201.13 4,294,242
201.18 4,294,243
202.26 4,294,244
207.21 4,294,245
214 D 4,294,247
214 E 4,294,246
4,294,248
214 G 4,294,249
247 4,294,250
276 4,294,251
283 4,294,252
285 4,294,253
303.14 4,294,254
334 C 4,294,255
419 PT 4,294,256
495 4,294,257
635 4,294,258
653 4,294,259
654 4,294,260
691 4,294,261
726 4,294,262
736 4,294,263
778 4,294,264

**CLASS 131**

277 4,294,266
330 4,294,267
366 4,294,265

**CLASS 132**

73 4,294,268
84 B 4,294,269
112 4,294,270

**CLASS 134**

113 4,294,271
138 4,294,272

**CLASS 136**

244 4,295,002

**CLASS 137**

1 4,294,273
7 4,294,274
15 4,294,275
67 4,294,276
101.19 4,294,277
115 4,294,278
264 4,294,279
268 4,294,280
541 4,294,281
595 4,294,282
601 4,294,283
613 4,294,284
625.11 4,294,285
625.48 4,294,286
625.69 4,294,287

**CLASS 138**

30 4,294,288
44 4,294,289

**CLASS 139**

26 4,294,290
438 4,294,291

**CLASS 141**

1 4,294,292
100 4,294,293
179 4,294,294

**CLASS 144**

3 K 4,294,295
120 4,294,296
134 D 4,294,297
193 C 4,294,298

**CLASS 148**

2 4,294,625
6.14 R 4,294,627
6.2 4,294,626
6.35 4,294,628
11.5 C 4,294,629
16.6 4,294,630
133 4,294,631
142 4,294,632

**CLASS 149**

2 4,294,633

**CLASS 150**

28 R 4,294,299

**CLASS 152**

427 4,294,301

**CLASS 156**

59 4,294,634
89 4,294,635
143 4,294,636
157 4,294,637
176 4,294,638
180 Re.30,770
185 4,294,639
196 Re.30,771
213 4,294,640
234 4,294,641
250 4,294,642
293 4,294,643
361 4,294,644
384 4,294,645
500 4,294,646
558 4,294,647
627 4,294,648
645 4,294,649
660 4,294,650
662 4,294,651

**CLASS 159**

2 R 4,294,652

**CLASS 160**

133 4,294,302

**CLASS 162**

25 4,294,653
50 4,294,654
107 4,294,655
192 4,294,656
303 4,294,657

**CLASS 164**

44 4,294,303
150 4,294,305
448 4,294,306
4,294,307
504 4,294,304

**CLASS 165**

1 4,294,308
18 4,294,309
41 Re.30,766
104 S 4,294,311
104.13 4,294,310
133 4,294,659
134 R 4,294,312

**CLASS 166**

117.5 4,294,313
261 Re.30,767
318 4,294,314
322 4,294,315

**CLASS 172**

20 4,294,316

**CLASS 173**

57 4,294,317

**CLASS 174**

53 4,295,003
87 4,295,004
92 4,295,005

**CLASS 175**

321 4,294,318
389 4,294,319

**CLASS 177**

1 4,294,320
210 FP 4,294,321
210 R 4,294,322

**CLASS 179**

1 E 4,295,006
7 R 4,295,007
18 BC 4,295,008
110 A 4,295,009
4,295,010
115.5 VC 4,295,011

**CLASS 180**

54 B 4,294,323
89.14 4,294,324
148 4,294,325
255 4,294,326
273 4,294,327

**CLASS 181**

120 4,294,328
222 4,294,329
230 4,294,330

**CLASS 182**

10 4,294,331
141 4,294,332

**CLASS 184**

106 4,294,333

**CLASS 188**

18 A 4,294,334
71.9 4,294,335
72.4 4,294,336
171 4,294,337

**CLASS 192**

0.073 4,294,341
4 A 4,294,338
12 BA 4,294,339
56 R 4,294,340
105 CD 4,294,342
113 A 4,294,343

**CLASS 198**

461 4,294,344
683 4,294,345
740 4,294,346
751 4,294,347

**CLASS 200**

5 B 4,295,012
11 C 4,295,013
19 R 4,295,014
38 R 4,295,015
44 4,295,016
47 4,295,017
51.09 4,295,018
61.2 4,295,019
61.45 R 4,295,020
147 R 4,295,021
4,295,022
148 R 4,295,023
288 4,295,024
4,295,025
331 4,295,026

**CLASS 201**

39 4,294,663

**CLASS 203**

19 4,294,664
50 4,294,665
72 4,294,666

**CLASS 204**

1 T 4,294,667
4,294,668
15 4,294,669
26 4,294,670
128 4,294,671
129.4 4,294,672
129.46 4,294,673
157.1 H 4,294,674
159.14 4,294,675
159.23 4,294,676
181 F 4,294,677
192 R 4,294,678
195 S 4,294,679
224 R 4,294,680
4,294,681
244 4,294,682
258 4,294,683
299 R 4,294,684

**CLASS 206**

1.7 4,294,348
63.5 4,294,349
216 4,294,350
222 4,294,351
223 4,294,352
273 4,294,353
335 4,294,354
339 4,294,355
368 4,294,356
409 4,294,357
419 4,294,358
422 4,294,359
438 4,294,360
532 4,294,361
622 4,294,362

**CLASS 208**

10 4,294,685
56 4,294,686
58 4,294,687
164 4,294,688
326 4,294,689

**CLASS 209**

3 4,294,690
3.1 4,294,691
300 4,294,692
466 4,294,693

**CLASS 210**

150 4,294,694
173 4,294,695
220 4,294,696
221.1 4,294,697
242.3 4,294,698
287 4,294,699
403 4,294,700
497.2 4,294,701
513 4,294,702
631 4,294,703
651 4,294,704
695 4,294,705
762 4,294,706
782 4,294,707

**CLASS 211**

49 D 4,294,363
60 R 4,294,364
4,294,365

**CLASS 215**

1 C 4,294,366
13 R Re.30,768
246 4,294,367
256 4,294,368
311 4,294,369
329 4,294,370

**CLASS 219**

10.55 B 4,295,027
4,295,028
61 4,294,662
75 4,295,029
121 PH 4,295,030
125.12 4,295,031
137 R 4,295,032
388 4,295,033
400 4,295,034
536 4,295,035

**CLASS 220**

4 E 4,294,371
20 4,294,372
70 4,294,373
71 4,294,374
293 4,294,375
318 4,294,376
321 4,294,377
323 4,294,378
404 4,294,379

**CLASS 221**

195 4,294,380

**CLASS 222**

1 4,294,381
529 4,294,382
611 4,294,383

**CLASS 224**

42.42 4,294,384
240 4,294,385
252 4,294,386
315 4,294,387
4,294,388

**CLASS 225**

34 4,294,389

**CLASS 226**

181 4,294,390

**CLASS 227**

130 4,294,391

**CLASS 228**

111 4,294,392
134 4,294,393
158 4,294,394
220 4,294,395
245 4,294,396

**CLASS 229**

15 4,294,398
27 4,294,397
44 CB 4,294,399
68 R 4,294,400

**CLASS 234**

487 4,295,041

**CLASS 235**

1 E 4,295,036
92 PD 4,295,037
92 PK 4,295,038
379 Re.30,773
380 4,295,039
458 4,295,040

**CLASS 236**

1 G 4,294,401
12 R 4,294,402
13 4,294,403
49 4,294,404

**CLASS 238**

14 4,294,405

**CLASS 239**

20 4,294,406
102 4,294,407
218.5 4,294,408
577 4,294,409
4,294,410
707 4,294,411

**CLASS 241**

30 4,294,412
36 4,294,413
222 4,294,414
292 4,294,415

**CLASS 242**

18 G 4,294,416
149 4,294,417
197 4,294,418

**CLASS 244**

117 R 4,294,419
165 4,294,420

**CLASS 248**

37.6 4,294,421
48.2 4,294,422
4,294,423
362 4,294,424
445 4,294,425
561 4,294,426

**CLASS 250**

226 4,295,042
227 4,295,043
229 4,295,044
255 4,295,045
287 4,295,046
363 S 4,295,047
398 4,295,048
409 4,295,049
479 4,295,050
569 4,295,051

**CLASS 251**

86 4,294,427
214 4,294,428

**CLASS 252**

8.6 4,294,708
8.75 4,294,711
8.8 4,294,709
4,294,710
12 4,294,712
28 4,294,713
34 4,294,714
68 4,294,716
97 4,294,717
135 4,294,718
182 4,294,719
373 4,294,720
429 B 4,294,721
435 4,294,722
440 4,294,723
451 4,294,724
455 Z 4,294,725
462 4,294,726
522 R 4,294,727
542 4,294,728
545 4,294,729

**CLASS 254**

272 4,294,429

**CLASS 256**

58 4,294,430

**CLASS 260**

17.4 BB 4,294,730
17.4 CL 4,294,731
22 CB 4,294,734
4,294,735
4,294,748
22 M 4,294,736
27 BB 4,294,732
28.5 B 4,294,733
29.2 EP 4,294,737
29.4 UA 4,294,738
29.6 NR 4,294,741
29.6 RB 4,294,740
29.6 RW 4,294,739
31.8 H 4,294,742
32.8 EP 4,294,743
33.6 AQ 4,294,744
37 EP 4,294,745
4,294,746
37 R 4,294,747
40 P 4,294,749
40 R 4,294,750
42.14 4,294,752
112 R 4,294,753
112.5 R 4,294,754
154 4,294,755
163 4,294,756
239.3 D 4,294,758
239.3 P 4,294,757
326.27 4,294,759
326.47 4,294,760
338 4,294,761
340.3 4,294,762
340.5 DP 4,294,763
340.9 R 4,294,764
343.3 R 4,294,765
343.6 4,294,766
347.8 4,294,767
372 4,294,768
378 4,294,769
400 R 4,294,751
413 4,294,770
4,294,771
429.7 4,294,772
453 P 4,294,773
4,294,774
455 R 4,294,775
502 R 4,294,776
544 D 4,294,777

**CLASS 261**

30 4,294,778
35 4,294,779
39 B 4,294,780
89 4,294,781

**CLASS 264**

1.4 4,294,782
8 4,294,783
14 4,294,784
41 4,294,785
46.4 4,294,786
46.6 4,294,787
101 4,294,788
102 4,294,789
171 4,294,790
210.2 4,294,791
311 4,294,792
4,294,793
328.1 4,294,794
332 4,294,795
559 4,294,796

**CLASS 266**

44 4,294,431
46 4,294,432
161 4,294,433
170 4,294,434
234 4,294,435
257 4,294,436
272 4,294,437
280 4,294,438

**CLASS 267**

54 A 4,294,439

**CLASS 269**

71 4,294,440
97 4,294,441
101 4,294,442
108 4,294,443
156 4,294,444

**CLASS 272**

8 M 4,294,445
133 4,294,446

**CLASS 273**

58 R 4,294,447
94 4,294,448
126 R 4,294,449
176 F 4,294,450
308 4,294,451
403 4,294,452

**CLASS 277**

22 4,294,453
65 4,294,454

**CLASS 280**

11.2 4,294,455
11.28 4,294,456
20 4,294,457
605 4,294,458
4,294,459
607 4,294,460
618 4,294,461
634 4,294,462
646 4,294,463
649 4,294,464
756 4,294,465
772 4,294,466
801 4,294,467
807 4,294,468

**CLASS 281**

29 4,294,469

**CLASS 285**

5 4,294,470
24 4,294,471
27 4,294,472
50 4,294,473
133 R 4,294,474
165 4,294,475
189 4,294,476
336 4,294,477

**CLASS 293**

128 4,294,478

**CLASS 294**

82 R 4,294,479
131 4,294,480
146 4,294,481

**CLASS 295**

34 4,294,482

**CLASS 296**

136 4,294,483
156 4,294,484
166 4,294,485
167 4,294,486
188 4,294,487

**CLASS 297**

367 4,294,488
452 4,294,489

**CLASS 299**

67 Re.30,769

**CLASS 301**

63 DD 4,294,491
63 PW 4,294,490

**CLASS 307**

10 R 4,295,052
64 4,295,053
80 4,295,054
221 C 4,295,055
4,295,056
231 4,295,057
252 A 4,295,058
253 4,295,059
273 4,295,060
279 4,295,061
4,295,062
362 4,295,063
468 4,295,064
475 4,295,065

**CLASS 308**

8.2 4,294,492
10 4,294,493
76 4,294,494
174 4,294,495

**CLASS 310**

30 4,295,066
52 4,295,067
4,295,068
67 R 4,295,069
70 R 4,295,070
213 4,295,071

**CLASS 312**

208 4,294,496
231 4,294,497
245 4,294,498
334 4,294,499

**CLASS 313**

7 4,295,072
105 CM 4,295,073
174 4,295,074
220 4,295,075
223 4,295,076
293 4,295,077

**CLASS 315**

8 4,295,078
130 4,295,079

**CLASS 318**

257 4,295,080
327 4,295,081
599 4,295,082
696 4,295,083
719 4,295,084
721 4,295,085
759 4,295,086

**CLASS 322**

99 4,295,087

**CLASS 323**

313 4,295,088
351 4,295,089

**CLASS 324**

60 CD 4,295,090
4,295,091
61 R 4,295,092
77 B 4,295,093
96 4,295,094
326 4,295,095
357 4,295,096
429 4,295,097

**CLASS 328**

24 4,295,098
151 4,295,099

**CLASS 330**

257 4,295,100
262 4,295,101

**CLASS 331**

65 4,295,102
94.5 C 4,295,104
94.5 PE 4,295,103

**CLASS 332**

9 R 4,295,105
37 R 4,295,106



**CLASS 333**

25 4,295,107
193 4,295,108
249 4,295,113

**CLASS 335**

212 4,295,110
256 4,295,111

**CLASS 336**

84 M 4,295,112
4,295,113

**CLASS 337**

3 4,295,114

**CLASS 338**

4 4,295,115
4,295,116
4,295,117
32 H 4,295,118
162 4,295,119

**CLASS 339**

5 M 4,294,500
66 M 4,294,501
112 L 4,294,502
119 L 4,294,503
132 R 4,294,504
231 4,294,505

**CLASS 340**

146.3 MA 4,295,120
4,295,121
147 LP 4,295,122
347 AD 4,295,123
347 DD 4,295,124
4,295,125
4,295,126
373 4,295,127
506 4,295,128
520 4,295,129
524 4,295,130
554 4,295,131
562 4,295,132
573 4,295,133
610 4,295,134
734 4,295,135
753 4,295,136
781 4,295,137
785 4,295,138
870.01 4,295,139

**CLASS 343**

100 PE 4,295,140
753 4,295,141
781 CA 4,295,142
840 4,295,143
895 4,295,144

**CLASS 346**

108 4,295,145
140 R 4,295,146

**CLASS 350**

6.8 4,294,506
96.13 4,294,507
96.15 4,294,508
4,294,509
96.17 4,294,510
96.18 4,294,511
96.20 4,294,512
96.29 4,294,513
96.31 4,294,514
174 4,294,515
335 4,294,516
345 4,294,517
357 4,294,518
4,294,519
4,294,520
426 4,294,521

**CLASS 351**

2 4,294,522

**CLASS 352**

86 4,294,523

**CLASS 353**

84 4,294,524

**CLASS 354**

23 D 4,294,525
25 4,294,526
4,294,527
33 4,294,528
53 4,294,529
173 4,294,530
195 4,294,531
246 4,294,532
318 4,294,533

**CLASS 355**

3 R 4,294,534
14 C 4,294,536
14 SH 4,294,535
35 4,294,537
51 4,294,538
76 4,294,539
4,294,540

**CLASS 356**

145 4,294,541
339 4,294,542
375 4,294,543
376 4,294,544
386 4,294,545
399 4,294,546

**CLASS 357**

5 4,295,147
17 4,295,148
45 4,295,149
54 4,295,150
68 4,295,151
74 4,295,152

**CLASS 358**

3 4,295,153
4 4,295,154
12 4,295,155
4,295,156
17 4,295,157
4,295,158
22 4,295,159
31 4,295,160
34 4,295,161
128.6 4,295,162
165 4,295,163
166 4,295,164
193.1 4,295,165
243 4,295,166
285 4,295,167

**CLASS 360**

66 4,295,168
71 4,295,169
73 4,295,170
4,295,171
109 4,295,172
125 4,295,173

**CLASS 361**

16 4,295,174
69 4,295,175
91 4,295,176
154 4,295,177
220 4,295,178
318 4,294,715
331 4,295,179
383 4,295,180
395 4,295,181
400 4,295,182
403 4,295,183
406 4,295,184

**CLASS 362**

211 4,295,185
217 4,295,186
352 4,295,187

**CLASS 363**

21 4,295,188
41 4,295,189
162 4,295,190

**CLASS 364**

104 4,295,191
200 4,295,192
4,295,193
4,295,194
414 4,295,195
501 4,295,196
510 4,295,197
515 4,295,198
555 4,295,199
4,295,200
561 4,295,201
748 4,295,202
4,295,203
824 4,295,204
900 4,295,205
4,295,206
4,295,207
4,295,208

**CLASS 365**

178 4,295,209
227 4,295,210

**CLASS 366**

1 4,294,547
60 4,294,548
164 4,294,549

**CLASS 367**

4 4,295,211
20 4,295,212
41 4,295,213
140 4,295,214

**CLASS 368**

196 4,295,215

**CLASS 369**

55 4,295,216

**CLASS 370**

81 4,295,217

**CLASS 371**

40 4,295,218
51 4,295,219
61 4,295,220

**CLASS 375**

23 4,295,221
106 4,295,222

**CLASS 376**

363 4,294,661
404 4,294,658
442 4,294,660

**CLASS 400**

110 4,294,550
119 4,294,551
219.1 4,294,552
4,294,553
320 4,294,554
488 4,294,555
643 4,294,556
714 4,294,557

**CLASS 402**

75 4,294,558

**CLASS 403**

28 4,294,559
104 4,294,560
219 4,294,561
383 4,294,562

**CLASS 405**

132 4,294,563
195 4,294,564

**CLASS 407**

113 4,294,565
114 4,294,566

**CLASS 408**

72 R 4,294,567

**CLASS 409**

244 4,294,568

**CLASS 410**

133 4,294,569
646 4,294,865

**CLASS 411**

103 4,294,570
185 4,294,300
345 4,294,156

**CLASS 414**

537 4,294,571
641 4,294,572

**CLASS 417**

83 4,294,573

**CLASS 422**

36 4,294,797
62 4,294,798
4,294,799
68 4,294,800
98 4,294,801
103 4,294,802
111 4,294,803
112 4,294,804

**CLASS 423**

4 4,294,805
235 4,294,928
239 4,294,806
242 4,294,807
305 4,294,808
321 R 4,294,809
331 4,294,810
350 4,294,811
357 4,294,812
385 4,294,813
457 4,294,814
478 4,294,815
484 4,294,816

**CLASS 424**

8 4,294,817
12 4,294,818
14 4,294,819
28 4,294,820
45 4,294,821
49 4,294,894
59 4,294,822
78 4,294,823
101 4,294,824
4,294,825
4,294,826
226 4,294,827
232 4,294,828
241 4,294,829
251 4,294,830
253 4,294,831
258 4,294,832
260 4,294,834
263 4,294,833
4,294,835
4,294,836
4,294,837
4,294,838
559 4,294,839
267 4,294,840
4,294,841
272 4,294,842
4,294,843
273 R 4,294,844
278 Q 4,294,845
279 4,294,846
4,294,847
302 4,294,848
305 4,294,849
309 4,294,850
311 4,294,851
317 4,294,852
319 4,294,853
326 4,294,854
358 4,294,855

**CLASS 426**

7 4,294,856
99 4,294,857
241 4,294,858
410 4,294,859
417 4,294,860
475 4,294,861
502 4,294,862
538 4,294,863
549 4,294,864

**CLASS 427**

2 4,294,866
96 4,294,867
109 4,294,868
177 4,294,869
189 4,294,870
237 4,294,871
358 4,294,872
391 4,294,873
393 4,294,874

**CLASS 428**

72 4,294,875
95 4,294,876
209 4,294,877
212 4,294,878
288 4,294,879
315 4,294,880
334 4,294,881
349 4,294,882
361 4,294,883
364 4,294,884
404 4,294,885
412 4,294,886
423.1 4,294,887
451 4,294,888
515 4,294,889
641 4,294,890

**CLASS 429**

2 4,294,891
13 4,294,892
42 4,294,893
84 4,294,895
86 4,294,896
104 4,294,897
4,294,898
206 4,294,899

**CLASS 430**

7 4,294,900
39 4,294,901
45 4,294,902
98 4,294,903
122 4,294,904
175 4,294,905
207 4,294,906
213 4,294,907
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326 4,294,911
341 4,294,912
396 4,294,913
418 4,294,914
441 4,294,915
522 4,294,916
4,294,917
553 4,294,918
559 4,294,919
569 4,294,920
621 4,294,921

**CLASS 435**

7 4,294,922
23 4,294,923
30 4,294,924
84 4,294,925
125 4,294,926
172 4,294,927
254 4,294,929
261 4,294,930
301 4,294,931

**CLASS 455**

72 4,295,223
156 4,295,224
601 4,295,225
618 4,295,226

**CLASS 493**

213 4,294,574

**CLASS 501**

129 4,294,618

**CLASS 518**

706 4,294,932

**CLASS 521**

27 4,294,933
160 4,294,934

**CLASS 525**

60 4,294,935
93 4,294,936
99 4,294,937
101 4,294,938
118 4,294,939
124 4,294,940
170 4,294,941
314 4,294,942
358 4,294,943
421 Re.30,772
423 4,294,944

**CLASS 526**

74 4,294,945
80 4,294,946
119 4,294,947
125 4,294,948
262 4,294,949

**CLASS 528**

14 4,294,950
55 4,294,951
67 4,294,952
128 4,294,953
174 4,294,954
176 4,294,955
179 4,294,956
4,294,957

**CLASS 536**

17 R 4,294,958
4,294,959

**CLASS 544**

22 4,294,960
49 4,294,961
192 4,294,962
198 4,294,963
249 4,294,964
297 4,294,965
316 4,294,966

**CLASS 546**

242 4,294,967
251 4,294,968
286 4,294,969
294 4,294,970

**CLASS 548**

226 4,294,971
264 4,294,972
320 4,294,973

**CLASS 556**

440 4,294,974
482 4,294,975

**CLASS 560**

76 4,294,976

**CLASS 562**

407 4,294,977
503 4,294,978
4,294,979
4,294,980
4,294,981
4,294,982
4,294,983
4,294,984

**CLASS 564**

18 4,294,985
52 4,294,986
331 4,294,987
417 4,294,988

**CLASS 568**

13 4,294,989
601 4,294,990
632 4,294,992
650 4,294,991
724 4,294,993
4,294,994
728 4,294,995
776 4,294,996
855 4,294,997
868 4,294,998
910 4,294,999

| | | | | | | | | | | | | | | | | | |
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| D2— | 279 | 261,195 | | 137 | 261,216 | | 77 | 261,240 | | 35 | 261,261 | | 65 | 261,285 | | | 261,306 |
| | 383 | 261,196 | | 208 | 261,220 | | 91 | 261,241 | | | 261,262 | | 87 | 261,286 | | | 261,307 |
| | 400 | 261,197 | D8— | 02 | 261,221 | | 106 | 261,242 | D14— | 2 | 261,263 | | | 261,287 | | | 261,308 |
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| | | 261,201 | | 344 | 261,225 | | | 261,246 | | 199 | 261,270 | | 128 | 261,291 | | | 261,312 |
| | 89 | 261,202 | | 350 | 261,226 | | | 261,247 | D16— | 31 | 261,271 | | 143 | 261,292 | | | 261,313 |
| | 90 | 261,203 | | | 261,227 | | 121 | 261,248 | | 32 | 261,272 | | 151 | 261,293 | | | 261,314 |
| | 103 | 261,204 | | | 261,228 | | 128 | 261,249 | D18— | 7 | 261,273 | | 195 | 261,294 | | | 261,315 |
| | 122 | 261,205 | | 396 | 261,229 | | | 261,250 | | | 261,274 | | 234 | 261,295 | | | 261,316 |
| | 143 | 261,206 | D9— | 367 | 261,230 | | 157 | 261,251 | | 10 | 261,275 | D22— | 5 | 261,296 | D28— | 35 | 261,317 |
| | 144 | 261,207 | | 370 | 261,231 | | 158 | 261,252 | | 12 | 261,276 | | 25 | 261,297 | | | 261,318 |
| | 197 | 261,209 | | | 261,232 | | | 261,253 | | | 261,277 | | 27 | 261,298 | | | 261,319 |
| | 234 | 261,208 | | 398 | 261,233 | | | 261,254 | | 27 | 261,278 | | | 261,299 | D32— | 21 | 261,266 |
| | 286 | 261,210 | | 432 | 261,234 | | 163 | 261,255 | D19— | 62 | 261,279 | D23— | 35 | 261,300 | | | 261,267 |
| D7— | 13 | 261,211 | | 434 | 261,235 | D12— | 146 | 261,257 | | 76 | 261,280 | D24— | 12 | 261,301 | | | |
| | 68 | 261,212 | | 435 | 261,236 | | 148 | 261,256 | D20— | 38 | 261,281 | | 26 | 261,302 | | 32 | 261,268 |
| | 77 | 261,213 | D10— | 15 | 261,237 | | 189 | 261,258 | D21— | 24 | 261,282 | | 38 | 261,303 | | 49 | 261,217 |
| | 84 | 261,214 | | 61 | 261,238 | D13— | 11 | 261,259 | | 33 | 261,283 | D25— | 74 | 261,304 | | 73 | 261,219 |
| | 131 | 261,215 | | 64 | 261,239 | | 18 | 261,260 | | 34 | 261,284 | | | 261,305 | D34— | 1 | 261,218 |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 68 | 4,775 | | 69 | 4,776 | | | 4,777 | | | | | | | | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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## PATENTS

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| 9 : | 4,294,029 | | 4,294,569 | | 4,294,515 | 16 : | 4,294,181 | | 4,294,203 | | 4,294,077 |
| 01 : | 4,294,363 | | 4,294,573 | | 4,294,517 | 17 : | Re.30,766 | | 4,294,254 | | 4,294,113 |
| | 4,294,654 | | 4,294,596 | | 4,294,577 | | Re.30,769 | | 4,294,338 | | 4,294,135 |
| | 4,295,197 | | 4,294,635 | | 4,294,594 | | 4,294,004 | | 4,294,381 | | 4,294,193 |
| 04 : | 4,294,026 | | 4,294,640 | | 4,294,595 | | 4,294,008 | | 4,294,382 | | 4,294,371 |
| | 4,294,061 | | 4,294,655 | | 4,294,601 | | 4,294,033 | | 4,294,476 | | 4,294,400 |
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| | 4,294,807 | | 4,294,753 | | 4,294,615 | | 4,294,084 | | 4,294,930 | | 4,294,472 |
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| 05 : | 4,293,981 | | 4,294,860 | | 4,294,970 | | 4,294,278 | | 4,295,117 | | 4,294,599 |
| | 4,294,604 | | 4,294,923 | | 4,295,083 | | 4,294,283 | | 4,295,160 | | 4,294,600 |
| 06 : | Re.30,773 | | 4,294,928 | | 4,295,187 | | 4,294,302 | | 4,295,161 | | 4,294,608 |
| | 4,293,977 | | 4,294,977 | 10 : | 4,294,489 | | 4,294,303 | | 4,295,163 | | 4,294,652 |
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| | 4,294,179 | | 4,295,125 | | 4,294,955 | | 4,294,469 | | 4,294,500 | | 4,294,945 |
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| | 4,294,242 | | 4,295,192 | | 4,294,083 | | 4,294,685 | | 4,294,480 | | 4,295,116 |
| | 4,294,249 | | 4,295,199 | | 4,294,107 | | 4,294,687 | | 4,294,589 | | 4,295,129 |
| | 4,294,267 | | 4,295,205 | | 4,294,124 | | 4,294,737 | | 4,294,688 | | 4,295,137 |
| | 4,294,270 | | 4,295,214 | | 4,294,151 | | 4,294,780 | | 4,294,774 | | 4,295,162 |
| | 4,294,276 | | 4,295,218 | | 4,294,186 | | 4,294,800 | | 4,294,775 | | 4,295,202 |
| | 4,294,308 | 08 : | 4,294,042 | | 4,294,224 | | 4,294,826 | 23 : | 4,294,048 | | 4,295,203 |
| | 4,294,314 | | 4,294,049 | | 4,294,269 | | 4,294,830 | 24 : | 4,293,985 | | 4,295,207 |
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| | 4,294,333 | | 4,294,373 | | 4,294,385 | | 4,294,859 | | 4,294,035 | 26 : | 4,293,971 |
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| | 4,294,365 | | 4,294,664 | | 4,294,481 | | 4,295,012 | | 4,294,176 | | 4,294,017 |
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| | 4,294,492 | | 4,294,013 | | 4,295,191 | | 4,293,963 | | 4,294,931 | | 4,294,147 |
| | 4,294,495 | | 4,294,047 | | 4,295,194 | | 4,294,003 | | 4,295,035 | | 4,294,159 |
| | 4,294,496 | | 4,294,155 | | 4,295,200 | | 4,294,073 | | 4,295,104 | | 4,294,226 |
| | 4,294,522 | | 4,294,162 | | 4,295,225 | | 4,294,089 | | 4,295,217 | | 4,294,238 |
| | 4,294,543 | | 4,294,178 | 13 : | 4,294,245 | | 4,294,093 | 25 : | 4,293,999 | | 4,294,252 |
| | 4,294,559 | | 4,294,199 | | 4,294,456 | | 4,294,109 | | 4,294,065 | | 4,294,282 |
| | 4,294,564 | | 4,294,441 | | 4,295,005 | | 4,294,195 | | 4,294,066 | | 4,294,298 |

| | | | | | |
|---|---|---|---|---|---|
| 4,294,347 | 4,294,678 | 4,293,959 | 4,295,106 | 4,293,996 | 4,294,169 |
| 4,294,364 | 4,295,008 | 4,293,965 | 4,295,141 | 4,294,023 | 4,294,261 |
| 4,294,386 | 4,295,184 | 4,293,972 | 4,295,147 | 4,294,031 | 4,294,284 |
| 4,294,439 | 4,295,204 | 4,293,974 | 4,295,149 | 4,294,058 | 4,294,288 |
| 4,294,443 | 34 : 4,294,016 | 4,294,002 | 4,295,167 | 4,294,062 | 4,294,313 |
| 4,294,467 | 4,294,078 | 4,294,032 | 4,295,173 | 4,294,096 | 4,294,315 |
| 4,294,488 | 4,294,079 | 4,294,104 | 4,295,193 | 4,294,161 | 4,294,323 |
| 4,294,490 | 4,294,105 | 4,294,141 | 37 : 4,293,983 | 4,294,202 | 4,294,332 |
| 4,294,491 | 4,294,185 | 4,294,156 | 4,294,219 | 4,294,263 | 4,294,403 |
| 4,294,518 | 4,294,200 | 4,294,190 | 4,294,239 | 4,294,292 | 4,294,419 |
| 4,294,565 | 4,294,214 | 4,294,256 | 4,294,272 | 4,294,378 | 4,294,427 |
| 4,294,566 | 4,294,223 | 4,294,259 | 4,294,291 | 4,294,387 | 4,294,448 |
| 4,294,572 | 4,294,228 | 4,294,264 | 4,294,502 | 4,294,398 | 4,294,484 |
| 4,294,639 | 4,294,230 | 4,294,277 | 4,294,709 | 4,294,438 | 4,294,544 |
| 4,294,668 | 4,294,236 | 4,294,285 | 4,294,731 | 4,294,483 | 4,294,593 |
| 4,294,691 | 4,294,266 | 4,294,299 | 4,294,812 | 4,294,588 | 4,294,597 |
| 4,294,759 | 4,294,271 | 4,294,348 | 4,294,831 | 4,294,591 | 4,294,684 |
| 4,294,822 | 4,294,321 | 4,294,350 | 38 : 4,293,957 | 4,294,612 | 4,294,689 |
| 4,294,847 | 4,294,355 | 4,294,356 | 39 : 4,294,057 | 4,294,614 | 4,294,785 |
| 4,294,866 | 4,294,361 | 4,294,370 | 4,294,082 | 4,294,616 | 4,294,937 |
| 4,294,867 | 4,294,379 | 4,294,404 | 4,294,101 | 4,294,669 | 4,294,987 |
| 4,294,881 | 4,294,395 | 4,294,455 | 4,294,110 | 4,294,680 | 4,294,997 |
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| 4,294,978 | 4,294,512 | 4,294,513 | 4,294,251 | 4,294,750 | 4,295,181 |
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| 4,294,981 | 4,294,571 | 4,294,536 | 4,294,327 | 4,294,789 | 4,294,324 |
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| 4,294,983 | 4,294,708 | 4,294,552 | 4,294,359 | 4,294,818 | 4,294,633 |
| 4,294,984 | 4,294,718 | 4,294,557 | 4,294,366 | 4,294,874 | 50 : 4,294,158 |
| 4,295,004 | 4,294,744 | 4,294,585 | 4,294,374 | 4,294,891 | 51 : 4,294,050 |
| 4,295,014 | 4,294,751 | 4,294,631 | 4,294,411 | 4,294,962 | 4,294,157 |
| 4,295,037 | 4,294,779 | 4,294,695 | 4,294,416 | 4,294,969 | 4,294,229 |
| 4,295,038 | 4,294,786 | 4,294,716 | 4,294,432 | 4,294,999 | 4,294,265 |
| 27 : 4,294,030 | 4,294,819 | 4,294,729 | 4,294,498 | 4,295,009 | 4,294,423 |
| 4,294,204 | 4,294,846 | 4,294,739 | 4,294,649 | 4,295,019 | 4,294,449 |
| 4,294,240 | 4,294,848 | 4,294,752 | 4,294,722 | 4,295,022 | 4,294,660 |
| 4,294,339 | 4,294,852 | 4,294,763 | 4,294,764 | 4,295,025 | 4,295,073 |
| 4,294,384 | 4,294,863 | 4,294,782 | 4,294,941 | 4,295,043 | 4,295,086 |
| 4,294,408 | 4,294,925 | 4,294,836 | 4,294,942 | 4,295,053 | 4,295,123 |
| 4,294,445 | 4,294,926 | 4,294,837 | 4,295,136 | 4,295,054 | 52 : 4,295,058 |
| 4,294,485 | 4,294,936 | 4,294,840 | 4,295,139 | 4,295,074 | 53 : 4,293,967 |
| 4,294,537 | 4,294,956 | 4,294,898 | 40 : Re.30,767 | 4,295,077 | 4,294,068 |
| 4,294,644 | 4,294,957 | 4,294,901 | 4,293,975 | 4,295,094 | 4,294,168 |
| 4,294,961 | 4,294,988 | 4,294,904 | 4,294,287 | 4,295,151 | 4,294,260 |
| 4,294,965 | 4,294,992 | 4,294,906 | 4,294,478 | 4,295,175 | 4,294,422 |
| 4,295,057 | 4,295,065 | 4,294,909 | 4,294,516 | 4,295,190 | 4,294,466 |
| 28 : 4,295,212 | 4,295,081 | 4,294,911 | 4,294,587 | 4,295,223 | 4,294,542 |
| 29 : 4,294,088 | 4,295,088 | 4,294,912 | 4,294,724 | 44 : 4,294,046 | 4,294,602 |
| 4,294,152 | 4,295,097 | 4,294,954 | 4,294,814 | 45 : 4,294,187 | 4,294,625 |
| 4,294,393 | 4,295,098 | 4,294,993 | 4,295,096 | 4,294,360 | 4,294,996 |
| 4,294,452 | 4,295,101 | 4,294,994 | 4,295,133 | 4,294,747 | 54 : 4,294,746 |
| 4,294,575 | 4,295,107 | 4,294,995 | 4,295,170 | 4,294,883 | 55 : 4,294,027 |
| 4,294,610 | 4,295,118 | 4,295,002 | 4,295,196 | 47 : Re.30,768 | 4,294,044 |
| 4,294,857 | 4,295,144 | 4,295,013 | 41 : 4,294,012 | 4,293,970 | 4,294,405 |
| 4,294,989 | 4,295,155 | 4,295,018 | 4,294,024 | 4,294,357 | 4,294,406 |
| 4,295,024 | 4,295,176 | 4,295,020 | 4,294,221 | 4,294,761 | 4,294,622 |
| 30 : 4,293,966 | 4,295,185 | 4,295,039 | 4,294,295 | 4,295,128 | 4,294,643 |
| 4,294,180 | 4,295,188 | 4,295,048 | 4,294,376 | 48 : 4,293,961 | 4,294,693 |
| 4,294,647 | 4,295,198 | 4,295,059 | 4,294,944 | 4,293,987 | 4,294,696 |
| 31 : 4,294,268 | 4,295,216 | 4,295,064 | 42 : Re.30,772 | 4,293,992 | 4,294,700 |
| 4,294,297 | 35 : 4,294,007 | 4,295,068 | 4,293,984 | 4,294,001 | 4,294,821 |
| 33 : 4,294,225 | 4,294,444 | 4,295,085 | 4,293,994 | 4,294,122 | 56 : 4,294,409 |
| 4,294,539 | 36 : Re.30,765 | | | | |

## DESIGN PATENTS

| | | | | | |
|---|---|---|---|---|---|
| 6 : 261,296 | 17 : 261,208 | 261,262 | 261,204 | 261,295 | 261,313 |
| 01 : 261,220 | 261,225 | 26 : 261,233 | 261,205 | 39 : 261,200 | 261,314 |
| 06 : 261,209 | 261,237 | 261,239 | 261,216 | 261,240 | 261,315 |
| 261,213 | 261,258 | 261,281 | 261,226 | 261,241 | 261,316 |
| 261,217 | 261,265 | 261,291 | 261,227 | 261,282 | 44 : 261,244 |
| 261,219 | 261,271 | 261,302 | 261,228 | 40 : 261,259 | 261,279 |
| 261,230 | 261,289 | 27 : 261,251 | 261,243 | 42 : 261,301 | 261,284 |
| 261,242 | 18 : 261,206 | 261,276 | 261,245 | 261,304 | 261,293 |
| 261,248 | 261,299 | 29 : 261,218 | 261,246 | 261,305 | 48 : 261,199 |
| 261,249 | 19 : 261,196 | 34 : 261,210 | 261,247 | 261,306 | 261,201 |
| 261,250 | 261,294 | 261,231 | 261,268 | 261,307 | 261,221 |
| 261,264 | 20 : 261,207 | 261,232 | 261,283 | 261,308 | 261,224 |
| 261,272 | 261,238 | 36 : 261,195 | 261,286 | 261,309 | 261,274 |
| 261,303 | 22 : 261,257 | 261,198 | 261,287 | 261,310 | 51 : 261,260 |
| 08 : 261,229 | 24 : 261,214 | 261,202 | 261,288 | 261,311 | 53 : 261,298 |
| 12 : 261,255 | 261,222 | 261,203 | 261,290 | 261,312 | 55 : 261,215 |
| 13 : 261,269 | 261,261 | | | | |

## PLANT PATENTS

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| 06 : 4,775 | | | | | |

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October 20, 1981

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# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,729,680,** Re. S.N. 273,371, Filed June 15, 1981, Cl. 455/36, RADIO PAGER WITH VOICE MESSAGE AND SUBSTITUTE PAGING NUMBERS, Ramsey H. McDonald, Owner of Record: *Inventor,* Attorney or Agent: Harold R. Woodard, et al., Ex. Gp.: 233

**4,153,174,** Re. S.N. 261,623, Filed May 7, 1981, Cl. 215/252, TAMPER-PROOF CLOSURE, Frederick D. Keeler, Owner of Record: *The KLM Co., Stratford, Conn.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 241

**4,157,724,** Re. S.N. 273,040, Filed June 12, 1981, Cl. 141/1, METHOD AND AN APPARATUS FOR DISTRIBUTING A DISINTEGRATED MATERIAL ONTO A LAYER FORMING SURFACE, Torsten B. Persson, Owner of Record: *Inventor,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 243

**4,188,103,** Re. S.N. 268,781, Filed June 1, 1981, Cl. 354/27, RANGE SYNCHRONIZED FLASH PHOTOGRAPHIC APPARATUS AND METHOD FOR ACHIEVING OPTIMUM FLASH EXPOSURE, Conrad H. Biber, et al., Owner of Record: *Polaroid Corp., Cambridge, Mass.,* Attorney or Agent: David R. Thornton, Ex. Gp.: 211

**4,195,953,** Re. S.N. 270,721, Filed June 5, 1981, Cl. 405/300, ADVANCE MECHANISM FOR A MINE ROOF SUPPORT ASSEMBLY, Kunibert Becker, et al., Owner of Record: *Gewerkschaft Eisenhutte Westfalia, Lunen, Germany,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 354

**4,207,206,** Re. S.N. 271,564, Filed June 8, 1981, Cl. 252/429B, CATALYST SYSTEM, Nikolaous K. Balint, Owner of Record: *Standard Oil Co., Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 117

**4,221,751,** Re. S.N. 273,266, Filed June 12, 1981, Cl. 264/119, ARTICLES MOLDED FROM PAPERMILL SLUDGE, Bruce A. Haataja, et al., Owner of Record: *Board of Control of Michigan Technological University, Houghton, Mich.,* Attorney or Agent: Gerrit D. Foster, et al., Ex. Gp.: 147

**4,249,044,** Re. S.N. 271,771, Filed June 8, 1981, Cl. 200/5A, MEMBRANE SWITCH WITH MEANS FOR PREVENTING CONTAMINATION OF THE INTERIOR THEREOF, Willis A. Larson, Owner of Record: *Oak Industries, Inc., Crystal Lake, Ill.,* Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 217

**4,257,204,** Re. S.N. 263,442, Re. S.N. June 2, 1981, Cl. 52/395, PREFABRICATED INSULATED PANEL AND WALL STRUCTURE PRODUCED THEREFROM, Martin C. Rieger, Owner of Record: *Childers Products Co., Inc., Cleveland, Ohio,* Attorney or Agent: David A. Burge, et al., Ex. Gp.: 354

**4,262,138,** Re. S.N. 272,519, Filed June 11, 1981, Cl. 560/233, PREPARATION OF CARBOXYLIC ACID ESTERS WITH $BF_3$ COMPLEX CATALYST, Abraham P. Gelbein, Owner of Record: *Chem Systems, Inc., New York, N.Y.,* Attorney or Agent: Bert J. Lewen, Ex. Gp.: 126

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**3,828,610,** Reexam. No. 90/000,073, Requested: Sept. 18, 1981, Cl. 73/862.49, THRUST MEASUREMENT, Judson S. Swearingen, Owner of Record: *Rotoflow Corp., Los Angeles, Calif.,* Attorney or Agent: Browning & Bushman, Ex. Gp.: 244, Requester: Alfred B. Levine, Washington, D.C.

**4,031,289,** Reexam. No. 90/000,070, Requested: Sept. 18, 1981, Cl. 428/451, STAIN RESISTANT POLYESTER-COATED BLOCK, John A. Sergovic, Owner of Record: *The Burns & Russell Co., Baltimore Md.,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 160, Requester: Trenwyth Ind., Inc., Emigsville, Pa.

**4,246,240,** Reexam. No. 90/000,071, Requested: Sept. 17, 1981, Cl. 423/139, PROCESS FOR SEPARATING COBALT AND NICKEL FROM A SOLUTION CONTAINING COBALT AND NICKEL, Takashi Ogata, et al., Owner of Record: *Nippon Mining Co. Ltd., Tokyo, Japan,* Attorney or Agent: Wegner & Bretschneider, Ex. Gp.: 110, Requester: John W. Schneller, Washington, D.C.



# PATENT NOTICES

### Certificates of Correction for the Week of Oct 20, 1981

| | | | |
|---|---|---|---|
| Re. 30,520 | 4,256,014 | 4,270,183 | 4,278,590 |
| Re. 30,568 | 4,257,731 | 4,270,424 | 4,278,826 |
| Re. 30,585 | 4,258,479 | 4,270,824 | 4,278,866 |
| D. 257,600 | 4,258,864 | 4,270,858 | 4,279,523 |
| 4,089,491 | 4,260,373 | 4,271,153 | 4,279,593 |
| 4,135,808 | 4,260,851 | 4,271,197 | 4,280,477 |
| 4,157,357 | 4,261,860 | 4,271,328 | 4,280,541 |
| 4,159,331 | 4,262,236 | 4,271,546 | 4,280,753 |
| 4,166,465 | 4,262,497 | 4,271,705 | 4,280,826 |
| 4,167,567 | 4,263,027 | 4,271,847 | 4,280,835 |
| 4,186,119 | 4,263,218 | 4,272,457 | 4,281,094 |
| 4,204,702 | 4,263,273 | 4,272,530 | 4,281,154 |
| 4,204,717 | 4,263,274 | 4,272,604 | 4,281,163 |
| 4,205,178 | 4,263,287 | 4,272,711 | 4,281,205 |
| 4,208,328 | 4,263,290 | 4,272,994 | 4,281,597 |
| 4,212,076 | 4,263,601 | 4,274,118 | 4,281,617 |
| 4,215,480 | 4,263,777 | 4,274,146 | 4,281,664 |
| 4,216,541 | 4,263,997 | 4,274,232 | 4,281,871 |
| 4,220,925 | 4,264,075 | 4,274,427 | 4,282,016 |
| 4,221,328 | 4,264,435 | 4,274,494 | 4,282,405 |
| 4,224,434 | 4,264,466 | 4,274,686 | 4,282,517 |
| 4,236,218 | 4,264,932 | 4,275,051 | 4,282,540 |
| 4,238,325 | 4,265,022 | 4,275,664 | 4,283,070 |
| 4,239,656 | 4,265,197 | 4,275,793 | 4,283,301 |
| 4,240,633 | 4,265,524 | 4,276,089 | 4,283,343 |
| 4,241,078 | 4,265,922 | 4,276,205 | 4,283,611 |
| 4,241,815 | 4,266,054 | 4,276,266 | 4,283,796 |
| 4,242,009 | 4,266,523 | 4,276,619 | 4,283,823 |
| 4,242,098 | 4,267,186 | 4,276,771 | 4,283,895 |
| 4,243,543 | 4,267,532 | 4,276,812 | 4,284,208 |
| 4,245,804 | 4,267,915 | 4,277,293 | 4,284,249 |
| 4,246,844 | 4,268,267 | 4,277,322 | 4,284,571 |
| 4,248,729 | 4,268,578 | 4,277,485 | 4,284,596 |
| 4,249,104 | 4,268,782 | 4,277,583 | 4,284,734 |
| 4,250,526 | 4,268,871 | 4,278,031 | 4,284,833 |
| 4,252,707 | 4,269,053 | 4,278,126 | 4,284,839 |
| 4,252,973 | 4,269,410 | 4,278,206 | 4,284,879 |
| 4,253,037 | 4,270,096 | 4,278,255 | |
| 4,255,346 | 4,270,131 | 4,278,479 | |

### Disclaimers

4,023,105.—*Kenneth Rau Woolling, Jr.,* Indianapolis, Ind. COUNTER TYPE REMOTE CONTROL RECEIVER PRODUCING BINARY OUTPUTS CORRELATED WITH NUMERICAL COMMANDS OF A COMPANION REMOTE CONTROL TRANSMITTER. Patent dated May 10, 1977. Disclaimer filed Aug. 17, 1981, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,074,896.—*Larry G. Eftefield,* Joliet, Ill. CUSHION COMPRESSION STRUTS FOR BULLDOZER BLADES. Patent dated Feb. 21, 1978. Disclaimer filed Aug. 17, 1981, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,183,921.—*W. David Weir,* Levittown and *Edward E. Kilbourn,* Chalfont, Pa. PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS. Patent dated Jan. 15, 1980. Disclaimer filed Mar. 31, 1981, by the assignee, *Beecham, Inc.*

Hereby enters this diclaimer to all claims of said patent.

4,203,652.—*Hiroshi Hanada,* Yokohama, Japan BEAM SHAPING OPTICAL SYSTEM. Patent dated May 20, 1980. Disclaimer filed Aug. 28, 1981, by the assignee, *Canon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2, 17 and 18 of said patent.

4,235,158.—*A. David Johnson, Jr.,* Radnor, Pa. METHOD OF MAKING HIGH STRENGTH SHIPPING CARTON. Patent dated Nov. 25, 1980. Disclaimer filed Aug. 27, 1981, by the aissignee, *Wayne Automation Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,239,861.—*Hans-Eberhard Braese; Winfried Fischer; Dietrich Hardt,* Cologne, *Richard Prinz,* Leverkusen; and *Volker Serini,* Krefeld, Germany. POLYVINYL CHLORIDE-POLYCARBONATE ALLOYS. Patent dated Dec. 16, 1980. Disclaimer filed Aug. 28, 1981, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enters this disclaimer to claims 1–9, all claims of said patent.

4,264,429.—*Joel W. Rosenthal,* El Cerrito; *Arthur J. Dahlberg,* Pinole; and *Christopher W. Kuehler,* Larkspur, Calif. TWO-STAGE COAL LIQUEFACTION PROCESS WITH PROCESS-DERIVED SOLVENT. Patent dated Apr. 28, 1981. Disclaimer filed July 27, 1981, by the assignee, *Chevron Research Co.*

The term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

4,278,756.—*Eric W. Bouldin,* Woodside, and *Jerome Drexler,* Los Altos Hills, Calif. REFLECTIVE DATA STORAGE MEDIUM MADE BY SILVER DIFFUSION TRANSFER. Patent dated July 14, 1981. Disclaimer filed Aug. 17, 1981, by the assignee, *Drexler Technology Corp.*

Hereby enters this disclaimer to claims 2, 4, 5, 7, 8 and 9 of said patent.

### Dedication

3,414,928.—*Jerome H. Lemelson,* Metuchen, N.J. COMBINATION SPONGE AND SCANNER. Patent dated Dec. 10, 1968. Dedication filed June 11, 1981, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby dedicates the remaining term of said patent to the Public.

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**CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-12-80 |
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| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 7-09-80 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 1-12-80 |
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| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-20-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 2-08-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 1-09-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 6-12-79 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 1-30-80 |
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| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-19-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

**Patent and Trademark Office**

Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on November 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after November 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of November 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after November 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

Date: Oct. 15, 1981.

# REISSUES

OCTOBER 20, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 30,774**

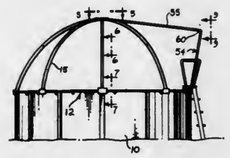
## LIGHTWEIGHT REMOVABLE COVER FOR A POOL, GREENHOUSE OR THE LIKE

**Edwin L. Dahlbeck, and Verna H. Dahlbeck, both of 739 N. 198th, Seattle, Wash. 98133**

**Original No. 4,136,408, dated Jan. 30, 1979, Ser. No. 744,729, Nov. 24, 1976. Application for reissue Feb. 26, 1980, Ser. No. 124,121**

**Int. Cl.³ E04H** *3/16, 3/18*

**U.S. Cl. 4—498** **22 Claims**



*12. Apparatus for supporting a flexible cover over an enclosure such as a swimming pool, greenhouse or the like, comprising:*

*a peripheral lower frame,*

*a plurality of curved, interconnected tubular supports coupled to the lower frame overlying the enclosure and spaced along the lower frame,*

*rigid elongated stabilizer members located above the peripheral lower frame and interconnecting said tubular supports, said stabilizer members being attached to the tubular supports on a side remote from the flexible cover so as not to contact the cover,*

*a flexible cover overlying said supports and stabilizer members for covering the space above the enclosure, and*

*means for securing the cover to the lower frame.*

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**Re. 30,775**

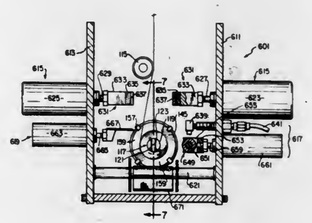
## AUTOMATIC CAPACITOR WINDING MACHINE AND METHOD

**Fredric S. Miller; Armando A. De Mauro, both of Wayne, N.J., and Robert J. Delvy, Bridgeport, Conn., assignors to Universal Manufacturing Corporation, Paterson, N.J.**

**Original No. 4,003,112, dated Jan. 18, 1977, Ser. No. 562,012, Mar. 25, 1975. Application for reissue Jan. 17, 1979, Ser. No. 4,018**

**Int. Cl.³ H01G** *4/16*

**U.S. Cl. 29—25.42** **30 Claims**



1. A method for winding capacitors including:

moving a bifurcated arbor having a slot to a retracted position;

clamping portions of dielectric layers into a substantially planar configuration above said arbor; [retracting said arbor;]

rotating said arbor so that its slot is substantially in alignment with the plane of said dielectric layers;

carrying the planar portion of said dielectric layers into alignment with the axis of said arbor;

maintaining said alignment while extending said arbor axially to an advanced position to grasp said dielectric layers;

rotating said arbor to wind the capacitor;

feeding electrodes from continuous supplies to said rotating arbor;

supplying a relatively thick structural insert while said capacitor is being wound to reinforce the capacitor;

moving said arbor to a retracted position while stripping said capacitor off said arbor.

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**Re. 30,776**

## BREAK-OUT APPARATUS FOR FAULT PREVENTION IN THE PRODUCTION OF MULTI-STRAND YARNS

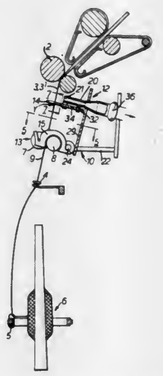
**Dieter E. A. Plate, Torquay, and John D. Feehan, Belmont, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia**

**Original No. 4,110,963, dated Sep. 5, 1978, Ser. No. 796,790, May 13, 1977. Application for reissue May 6, 1980, Ser. No. 147,016**

**Claims priority, application Australia, May 13, 1976, 5921/76**

**Int. Cl.³ D01H** *13/16*

**U.S. Cl. 57—86** **10 Claims**



*20. Apparatus for spinning a two-ply yarn in a single operation from two separate running strands, said apparatus having a drafting unit for drawing said strands in spaced relation to one another from separate rovings and having a rotatable spindle for twisting the drawn strands together and for winding thereon the two-ply yarn so formed, the twisting action being such as to form a distinctive convergence point between the two component strands, wherein twist blocking means are provided in the vicinity of the said convergence point so that, when one strand breaks the other is allowed to adopt a modified line of travel in which it is acted upon by said twist blocking means to substantially block the travel of twist to that portion of said other strand between said means and the drafting unit so as to thereby cause said other strand to also break.*

**Re. 30,777**

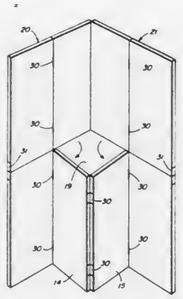
## PORTABLE DISPLAY SYSTEM

**Willy Ytter, Stockholm, Sweden, assignor to Extraversion, Inc., Dover, Del.**

**Original No. 4,147,198, dated Apr. 3, 1979, Ser. No. 838,667, Oct. 3, 1977. Application for reissue Oct. 25, 1979, Ser. No. 87,992**

**Int. Cl.³ A47G** *5/00*

**U.S. Cl. 160—135** **30 Claims**



1. A portable display system comprising:

a plurality of panels each having a detachable front wallboard and detachable rear wallboard;

a first and second peripheral support means to support and position said detachable front and rear wallboard in a substantially parallel and confronting relationship so as to form a panel assembly; said first peripheral support means removably positioned along at least one outer edge of said detachable front and rear wallboard, said second peripheral support means positioned along the remaining edges of said detachable front and rear wallboard so that said detachable front and rear wallboard is removable from said first and second peripheral support means in a direction perpendicular to the edge along which said first peripheral support means is positioned,

hinging means for connecting a plurality of said panel assemblies to each other so that said panel assemblies are divided into a first and second group;

said hinging means comprising a plurality of corner hinges greater than two and a plurality of double hinges greater than two so that said corner hinges are connected to a plurality of said panel assemblies movable in a vertical direction and said double hinges connected to a plurality of said panel assemblies movable in a horizontal direction,

said first and second group comprising a number of connected panel assemblies such that said number of connected panel assemblies are hinged in the said two directions so that in the extended position the number of panel assemblies extending in the vertical direction equals the number of panel assemblies extending in the horizontal direction,

said first group being extended to said position independent of said second group.

**Re. 30,778**

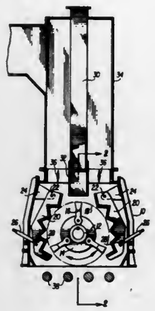
## CRUSHER-DRYER AND METHOD OF CRUSHING

**William F. Hahn, Devon; Joseph P. Nigro, Villanova, and Frank Wallitsch, Jr., Center Valley, all of Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.**

**Original No. 4,085,897, dated Apr. 25, 1978, Ser. No. 816,828, Jul. 18, 1977. Continuation of Ser. No. 746,379, Dec. 1, 1976, abandoned. Application for reissue Apr. 23, 1980, Ser. No. 142,957**

**Int. Cl.³ B02C** *23/24*

**U.S. Cl. 241—18** **48 Claims**



1. An improved apparatus for crushing and drying materials, such as moist coal, comprising:

a housing having an inlet opening located [;] in the upper portion thereof and an outlet opening located in the lower portion thereof;

a rotor mounted for rotation in said housing, said rotor having impact members thereon for striking and crushing material falling through said inlet opening and passing through the impact circle defined by the outer extremities of said impact members;

a first inlet duct means entering said inlet opening and terminating a short distance above said [hammer] *impact* circle, for causing said material to drop through said inlet opening above said impact circle to be struck by said impact members;

a second inlet duct means entering said inlet opening for conveying hot air into said housing without substantially [interfereing] *interfering* with said material until just prior to entry of said material into said impact circle;

at least one breaker plate mounted within said housing in position to be impacted by material thrown off by said impact members; and

means located within said second inlet duct for selectively directing the flow of hot air through said second inlet duct to pass between said breaker plate and said rotor; behind said breaker plate; or both.

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**Re. 30,779**

## FILTER ASSEMBLY WITH REPLACEABLE FILTER ELEMENT

**Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.**

**Original No. 4,133,763, dated Jan. 9, 1979, Ser. No. 856,959, Dec. 5, 1977. Application for reissue Apr. 24, 1980, Ser. No. 143,227**

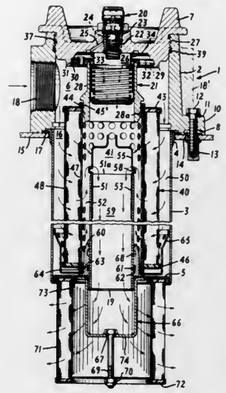
**Int. Cl.³ B01D** *27/04*

**U.S. Cl. 210—232** **28 Claims**

1. A filter assembly having a filter chamber and a filter element therein that is replaceable without contamination of filtered fluid with unfiltered fluid in the filter chamber even though the filter chamber is not emptied of unfiltered fluid when a filter element is removed and installed, comprising, in combination, a filter housing; a filter chamber in the housing;



an inlet for unfiltered fluid and an outlet for filtered fluid in the housing; a filter element removably disposed in the filter chamber across the line of fluid flow from the inlet to the outlet so that fluid flow from the inlet to the outlet normally proceeds through the filter; a weir spaced from and downstream of the filter element, compelling filtered fluid from the filter flowing towards the outlet to proceed upwardly through the space between the weir and the filter and then by overflow across the weir; and a weir follower operatively associated with the base of the filter element [and] *removably attached to one end of the*



*filter element and mounted on the weir in a manner to be retained thereon while a used filter element is being removed, and while a clean filter element is being installed, and slidably* movable along the weir in fluid-tight relation to the base and the weir, to carry filtered fluid in the space between the weir and the filter element on the downstream side of the filter element to the top of the weir while a used filter element is being removed, and to displace unfiltered fluid in the filter chamber from contact with the downstream side of a clean filter element while the clean filter element is being installed.

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**Re. 30,780**

## HEAT TREATMENT OF HEAT-SENSITIVE PRODUCTS

**Lennart A. Stenstrom, Huddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden**

**Original No. 3,814,889, dated Jun. 4, 1974, Ser. No. 176,966, Sep. 1, 1971. Application for reissue Jul. 31, 1978, Ser. No. 929,668**

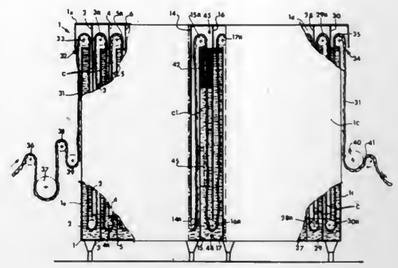
**Claims priority, application Sweden, Sep. 8, 1970, 12153/70**

**The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.**

**Int. Cl.³ H05B** *6/78*

**U.S. Cl. 219—10.55 M** **11 Claims**

1. In the processing of a heat-sensitive product by subjecting it to a sterilizing or pasteurizing treatment temperature, the method which comprises pre-treating units of the product by heating at least the main part of each said unit to a pre-heating temperature of at least 50° C. *interrupting said pretreatment heating*, and subjecting each unit to the influence of a cooling medium to prevent the surface layer of said unit from acquiring a substantially higher pre-heating temperature than the inner



parts of said unit, and then heating each product unit to substantially said treatment temperature by subjecting the unit to electromagnetic energy of at least microwave frequency.

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**Re. 30,781**

## LOGARITHMIC AMPLIFIER

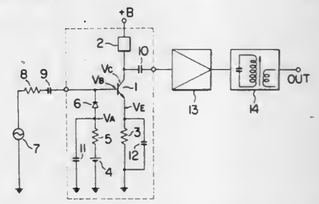
**Yukihiko Miyamoto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan**

**Original No. 4,209,714, dated Jun. 24, 1980, Ser. No. 806,098, Jun. 13, 1977. Application for reissue Aug. 15, 1980, Ser. No. 178,457**

**Claims priority, application Japan, Jun. 14, 1976, 51-69605**

**Int. Cl.³ H03K** *5/08;* **G06G** *7/12*

**U.S. Cl. 307—490** **5 Claims**



1. A logarithmic amplifier circuit comprising at least one transistor connected in a common-emitter amplifier arrangement, said transistor having base, collector and emitter electrodes, said emitter electrode being connected to ground through a resistor, said collector electrode being connected to a power source through a load and providing an output signal, said base electrode being connected to a bias voltage source through a diode and to an input signal source, said diode and the base-emitter junction of the transistor cooperating to rectify the input signal from said signal source and comprising means to impart a logarithmic input-amplitude-level-to-output-amplitude-level transfer characteristic to the amplifier circuit for a predetermined amplitude range of input signals.

# PLANT PATENTS

## GRANTED OCTOBER 20, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,778**

### GERANIUM PLANT

**Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Aug. 5, 1980, Ser. No. 175,751**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

**1.** A new and distinct geranium plant, a hybrid of the genus Pelargonium, L'Her., to be known by the cultivar name Songster, as described and illustrated, and particularly characterized by the combination of characteristics of orange-red flower color; medium plant height; medium internode length; semi-double flower form; semi-spreading branching pattern; mid-season spring-pot flowering response; prolific outdoor summer flowering traits; good foliage durability; good flower durability; and dark green foliage color with pronounced dark zonation.

**4,779**

### IMPATIENS PLANT NAMED CHINOOK

**John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538**

**Filed May 16, 1980, Ser. No. 150,699**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

**1.** A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Chinook.

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**4,780**

### DWARF PEACH W-114

**Fedor Wassiliew, deceased, late of Orange, Calif.; by Nicolaus Wassiliew, heir, Costa Mesa, Calif.; by Alexander Wassiliew, heir; by Marsha W. Hartman, heir, both of Orange, Calif., and by Valentina Wassiliew, heir, Costa Mesa, Calif., assignors to Jackson & Perkins Co., Medford, Oreg.**

**Filed May 1, 1980, Ser. No. 145,510**
**Int. Cl.³ A01H** *5/00*
**U.S. Cl. Plt.—43** **1 Claim**

**1.** A new and distinct variety of peach tree of the genetically dwarf type, substantially as herein shown and described, characterized particularly as to novelty by its unique combination of vigorous, dwarf plant, semi-double pink flowers, late July ripening date, nearly spherical, red flushed yellow fruit skin, and sweet yellow flesh.

# PATENTS

## GRANTED OCT. 20, 1981

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 474–083 | 4,295,383 |
| 501–090 | 4,295,890 |
| 501–099 | 4,295,891 |
| 501–120 | 4,295,892 |
| 376–203 | 4,295,934 |
| 376–285 | 4,295,935 |
| 073–864 | 4,296,071 |

# PATENTS

GRANTED OCTOBER 20, 1981

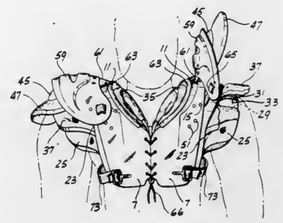
## GENERAL AND MECHANICAL

**4,295,227**

### SHOULDER PAD

**Hal D. Mitchell, Rolla, Mo., assignor to A-T-O Inc., Willoughby, Ohio**

**Filed Apr. 25, 1980, Ser. No. 143,899**
**Int. Cl.³ A41D *13/00***
**U.S. Cl. 2—2** **7 Claims**



1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being a relatively rigid member of generally inverted U-shape as viewed from the side and having a chestplate portion, a backplate portion and an arch integrally connecting said plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie adjacent and relatively close to the neck, each of said members having padding on the inside thereof with the padding at the top of the arch comprising an inner portion generally beneath the arch adapted to overlie the inner part of a respective shoulder and an outer portion extending laterally outwardly beyond the arch adapted to overlie the outer part of said shoulder, said outer portion comprising a front section adjacent the chestplate portion and a back section adjacent the backplate portion, said front and back sections being separate toward their outer ends for allowing the sections to spread apart upon upward movement of the arm at the shoulder, each member further comprising a cover pad extending laterally outwardly from said inner portion of the arch padding over the separate outer ends of said front and back sections of the arch padding at the top of the shoulder, said cover pad being hinged to the inner portion of the arch padding for permitting the cover pad to swing upwardly on upward movement of the arm at the shoulder, and a cap with padding on the inside thereof overlying said cover pad and adapted to fit over the outer part of the shoulder.

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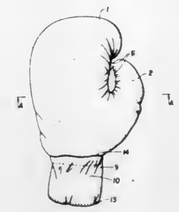
**4,295,228**

### BOXING GLOVES WITHOUT A SEAM ON THE FRONTAL STRIKE PORTION THEREOF

**Stojicic Dragomir, Jurija Gagarina 211/9, 11070 Novi Beograd, Yugoslavia**

**Filed Dec. 28, 1979, Ser. No. 107,973**
**Claims priority, application Yugoslavia, Jan. 17, 1979, 18/79**
**Int. Cl.³ A41D *13/10***
**U.S. Cl. 2—18** **3 Claims**

1. A boxing glove comprising a frontal strike portion, a palm portion and a thumb portion, wherein said frontal strike portion and thumb portion represent a unitary piece and are slanted inwardly in a convex manner towards said palm portion and wherein said frontal portion and said thumb portion are mutually joined in said palm portion by fabric seams inwardly tucked at the point where (1) the interior of said thumb section interconnects with said palm portion; (2) said frontal strike portion at the opposite extreme from said thumb side interconnects with said palm portion and (3) said convexly situated frontal strike portion interconnects with the top portion of said palm portion, said interconnections comprising the



attachment of at least two separate ply fabrics and wherein said attachment provides an open interconnection of stuffing between the interiors of said frontal strike portion and said thumb portion.

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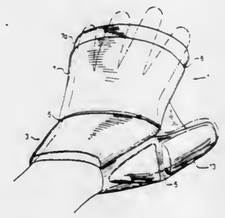
**4,295,229**

### FOOTBALL GLOVES

**Eugene A. Clark, 27 Blen Cathia Hill, R.R. 2, Gormley, Ontario, Canada (L04 1G0), and Morris Zubkewych, 2184 D Bloor St. W., Toronto, Ontario, Canada**

**Filed Feb. 19, 1980, Ser. No. 122,418**
**Int. Cl.³ A41D *13/08***
**U.S. Cl. 2—20** **8 Claims**



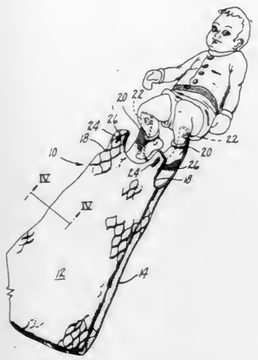
1. A football glove including an upper pad arrangement comprising a wrist protecting portion and a hand protecting portion integrated with one another with said hand protecting portion being partially open from beneath for palm, finger and thumb exposure below said pad arrangement, said hand protecting portion being provided with finger and thumb pads of a length such that there is at least first phalange finger and thumb coverage from above by said finger and thumb pads, inelastic web means connecting the thumb pad to the finger pads to limit movement of said thumb pad away from said finger pads, individual finger and thumb receptacles beneath said finger and thumb pads, said receptacles being adapted for limited stretching thereof to enable ready finger and thumb manipulation and being provided with restraining means for restraining excessive stretching of said receptacles to reduce finger and thumb injuries, said pad arrangement being provided with a plurality of transverse flexible joints along its length to permit flexing of the glove in said hand protecting portion and between said hand protecting portion and said wrist protecting portion and separate securing means at both said hand protecting portion and said wrist protecting portion to secure said glove in position from beneath said pad arrangement.

**4,295,230**

## CHILDREN'S SLEEPING GARMENTS

**Camille C. Blodgett, P.O. Box 202, West Stockbridge, Mass. 01266**

**Filed Apr. 14, 1980, Ser. No. 139,871**
**Int. Cl.³ A41D** *11/00*
**U.S. Cl. 2—69.5** **2 Claims**



1. A sleeping garment comprising front and rear unitary panels connected by a single seam extending around bottom and side edges of the panels, each panel terminating at its upper end in a pair of unitary shoulder straps, one shoulder strap from each panel being detachably connectible to the strap from the other panel, the upper ends of the panels being contoured together to form a pair of arm holes closed only by the shoulder straps and adapted to leave the upper body of the occupant free of restraint said pair of straps from one of the panels being connected to the pair of straps from the other panel by button and buttonhole connections, the margins of the panels being turned outwardly and the seam being inserted through two thicknesses of each panel.

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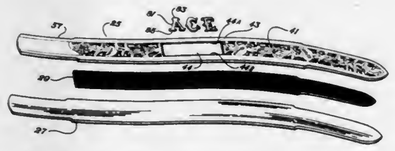
**4,295,231**

## FILIGREED BELT WITH SOLID CENTER PORTION

**Earl R. Wright, Comanche, Tex., assignor to Wright Leather Goods Manufacturing Co., Comanche, Tex.**

**Filed Apr. 14, 1980, Ser. No. 140,314**
**Int. Cl.³ A41F** *9/00*
**U.S. Cl. 2—338** **8 Claims**



1. A belt to be worn by a person comprising:
an outer layer attached to second layer means,
said outer layer facing outward when the belt is worn by a person,
design openings formed through said outer layer forming part of a design,
said design openings being spaced inward from the opposite edges of said outer layer whereby said opposite edges comprise strips extending along the length of said belt free from said design openings,
said design openings being spaced outward on opposite sides of a central portion of said outer layer extending along at least a part of the length of said belt whereby said central portion is free from said design openings,
the remainder of said design being formed on said central portion by lines or markings,
said belt having a buckle at one end,
said design openings and said central portion extending at least to said one end of said belt and to an end opposite said one end, and
spaced apertures formed through said belt and hence through said central portion of said outer layer at said end opposite said one end of said belt for receiving the tongue of the buckle when the belt is worn by a person.

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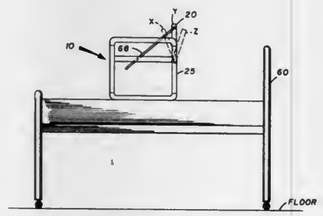
**4,295,232**

## DEVICE FOR HUMAN BODY WASTE ELIMINATION DURING INCAPACITATION

**Jeweral E. Marshall, Box 57, Oldtown, Md. 21555**

**Filed Jun. 9, 1980, Ser. No. 157,328**
**Int. Cl.³ A47K** *11/06*
**U.S. Cl. 4—480** **4 Claims**




1. A device for human body waste elimination, during incapacitation, comprising:
a chair-like structure;
a back rest structure, said back rest structure consisting of a pair of support members, said support members being movably affixed to said chair-like structure, said support members having a plurality of slots therein;
a leg support member for a user, said leg support member having a pair of crescent-like depressed areas therein, each said depressed area providing a holding means for one of the legs of a user, said leg support member being removably and adjustably affixed to said pair of support members in a matching pair of said plurality of slots in said pair of support members;
a pair of pivot means, said pivot means movably affixing said pair of support members to said chair-like structure;
a pair of locking means, said locking means being affixed to said pair of support members and removably affixed to said chair-like structure, said locking means being capable of locking said pair of support member means with said leg support member in a plurality of adjustable positions;
a pair of latching means, said latching means being movably affixed to said chair-like structure to latch said back rest structure into a back-rest position for said chair-like structure;
a bed pan holding means, chair-like structure having a plurality of slots therein, said plurality of slots providing a means for said bed pan holding means being adjustably and removably located within said chair-like structure;
a toilet seat, said toilet seat being affixed to said bed pan holding means; and
a bed pan, said bed pan being used in association with said chair-like structure.

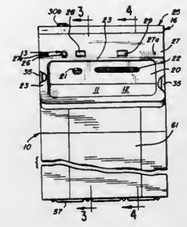


**4,295,233**

## AUTOMATIC HAND WASHER AND DRIER

**Lester H. Hinkel, Benton Harbor, and Lawrence E. Wolske, St. Joseph, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Continuation of Ser. No. 866,175, Dec. 30, 1977, abandoned.**
**This application Nov. 13, 1979, Ser. No. 93,906**
**Int. Cl.³ A47K** *1/04, 5/06, 10/48;* **E03C** *1/14*
**U.S. Cl. 4—619** **15 Claims**



1. A hand washing and drying device comprising:
a bowl defining an upwardly and forwardly opening hand washing and drying space, said bowl including a rear wall having a downwardly facing portion and having an upper substantially planar narrow rim extending at a substantial angle to the horizontal for deterring persons from sitting on said rim, said bowl further having a bottom drain underlying said rear wall portion;
water supply means including a water heating tank mounted closely adjacent said rear wall of the bowl and having an outlet opening substantially vertically downwardly generally toward said drain through said rear wall portion inwardly adjacent said rim for supplying wash water into said space in a first direction away from said rim, said outlet being spaced above the lowermost level of the rim; and
air moving means including a blower mounted closely adjacent said rear wall of the bowl and having a horizontally elongaged outlet opening across said space through said rear wall portion adjacent said rim and at the level of said water supply means outlet for supplying hand drying air across said space in a second direction generally parallel to said rim.

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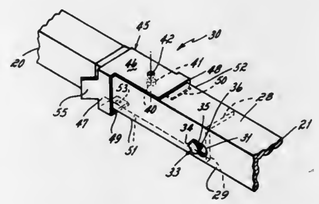
**4,295,234**

## BED FRAME

**Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.**

**Filed Jan. 28, 1980, Ser. No. 116,220**
**Int. Cl.³ A47C** *19/04*
**U.S. Cl. 5—184** **6 Claims**



1. A bed frame including a pair of side rails interconnected by a pair of adjustable elongated cross rail assemblies, said cross rail assemblies being fastened transversely between said pair of side rails so as to hold said side rails in spaced parallel relationship, each of said adjustable cross rail assemblies comprising,
a pair of cross rails connected at one end to one of said side rails, each of said cross rails being L-shaped in cross section and having mutually perpendicular flat legs,
one of said cross rails having a first shouldered protrusion extending from one leg thereof, the other of said cross rails having a plurality of longitudinally spaced slots adapted to receive said shouldered protrusion when said cross rails are located in any one of a plurality of overlapping face abutting positions of adjustment, said slots being configured so as to permit relative longitudinal movement of said first protrusion within said slots,
one of said cross rails having a second protrusion extending from a leg thereof, the other of said cross rails having a plurality of longitudinally spaced apertures adapted to receive said second protrusion when said cross rails are located in any one of the plurality of overlapping positions of adjustment, said apertures being sized and configured so as to prevent relative longitudinal movement of said rails when said second protrusion is located within one of said apertures,
said first and second protrusions extending from mutually perpendicular legs of said cross rails, and
clamping means for locking said cross rails in one of said plurality of positions of adjustment.

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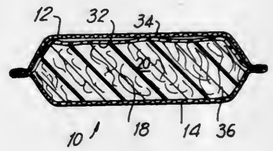
**4,295,235**

## WATERPROOF CUSHION FOR OUTDOOR USE AND METHOD FOR MANUFACTURING THE SAME

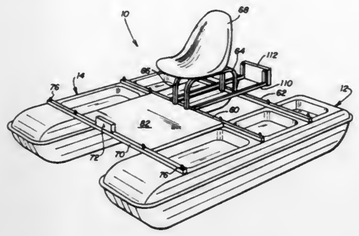
**Bernard Deitz, West Orange, N.J., assignor to Deltz Plastic Formers, Prospect Park, N.J.**

**Filed Jan. 28, 1980, Ser. No. 115,871**
**Int. Cl.³ A47C** *27/14;* **A47G** *9/00*
**U.S. Cl. 5—473** **7 Claims**



1. In a furniture cushion for outdoor use of the type including a pair of opposed side layers, each formed of woven fabric material, and attached to each other along their respective peripherally extending regions to define an interior space therebetween and a filler material located substantially throughout said interior space, the improvement comprising: said fabric material is formed of filaments at least the outer surfaces of which comprise thermoplastic material, a thin interlayer formed of water impervious plastic material having a peripherally extending edge region interposed between peripherally extending edge regions of said pair of opposed side layers, said peripherally extending edge regions of said side layers and interlayer being heat sealed to each other to form a continuous seal band extending around the entire periphery of the cushion, said interlayer extending entirely through said interior space to divide the latter into a pair of adjacent isolated chambers separated by said interlayer and wherein said filler material is located entirely in one of said chambers such that said interlayer is contiguous with the inner surface of one of said side layers and spaced from the inner surface of the other of said side layers by said filler material.

**4,295,236**
**PONTOON BOAT**
**Lonnie W. Upchurch, Irving, Tex., assignor to Advanced Marine Concepts, Inc., Arlington, Tex.**
**Filed Jan. 12, 1979, Ser. No. 2,878**
**Int. Cl.³ B63B *7/04***
**U.S. Cl. 9—2 S** **9 Claims**



1. A relatively small watercraft for one or more persons, comprising:
(a) a pair of spaced and generally parallel pontoons, each of which consists of an elongated body of closed-cell foamed plastic, with the body having a longitudinal axis and a length of at least 2 meters and having a generally square cross-section as viewed in a transverse direction;
(b) a load-distribution truss provided on top of each of the foamed cell bodies for transferring vertical loads, and said trusses having a length and width so as to distribute loads across the top of the foamed cell bodies in an approximately uniform manner;
(c) a personnel station adapted to carry at least one person above and generally between the two spaced pontoons, and said station having a width which is sufficiently narrow so as to restrict the center of gravity of personnel on said station to a space which lies internally of the longitudinal axes of the pair of pontoons;
(d) a structural frame for transferring loads from the personnel station to the load-distribution trusses, with at least some of said loads being transferred through a plurality of bolts; and
(e) a waterproof and generally puncture-resistant skin for each of the pair of pontoons, with a given skin being installed between the structural frame and the load-distribution truss of a respective pontoon in such a way that the structural frame is external and the load-disribution truss is internal of said given skin.

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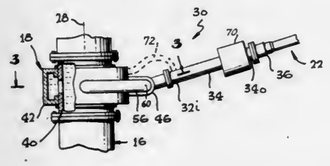
**4,295,237**
**HOSE ARM COUPLING FOR UNDERWATER FLUID SWIVEL**
**George M. Pomonik, Van Nuys, Calif., assignor to Amtel, Inc., Providence, R.I.**
**Filed Nov. 20, 1978, Ser. No. 961,991**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 9—8 P** **4 Claims**



1. In a mooring and cargo transfer installation which includes a product distribution unit having a stationary portion coupled to the sea floor and a rotatable portion rotatable without limit about a vertical axis for coupling through a hose to a vessel that may drift thereabout, the improvement comprising:
a pair of horizontally-spaced flanges fixed to the outside of said rotatable portion of the product distribution unit;
a fluid joint having a member pivotally coupled to said flanges to pivot about a substantially horizontal axis extending through said flanges and lying outside said rotatable portion of said product distribution unit; and
an elongated rigid structure which includes a fluid conduit extending along its length, said structure having an inner end connected to said fluid joint member and an outer end coupled to said hose.

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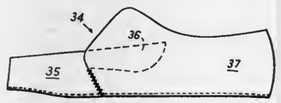
**4,295,238**
**FOOTWEAR**
**Lancelot P. Clark, Street, England, assignor to Clarks Limited, Street, England**
**Filed Nov. 16, 1979, Ser. No. 94,921**
**Claims priority, application United Kingdom, Nov. 17, 1978, 45098/78**
**Int. Cl.³ A43D *9/00*; A43C *13/08*; A43B *23/00***
**U.S. Cl. 12—142 RS** **3 Claims**



1. A method of making an article of footwear comprising pre-forming from flexible sheet material a component which provides a sock for underlying the foot and one part of an upper, which part comprises two side panels to extend respectively along opposite sides of the foot, the sock and side panels being formed either integrally with each other or in separate pieces which are connected together to form said component, placing said component on a last which defines the internal shape of the finished article, then enclosing the last and said component in a cavity mould having within it sealing knife edges which serve to nip said part of the upper to the last at locations adjacent but spaced from the edges of said part of the upper and to close the cavity of the mould, said cavity mould being shaped in relation to the last and said component to define therewith a sole unit and, integrally with the sole unit, the remaining part or parts of the upper, and injecting into the mould cavity a plastics material in a settable liquid form thereby in a single moulding operation to form the sole unit of the article and the remaining part or parts of the upper, the plastics material also overlying edge portions of said one part of the upper on the outer face thereof.

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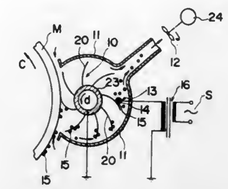
**4,295,239**
**APPARATUS FOR REMOVING RESIDUAL TONER**
**Hisashi Myochin, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Mar. 27, 1980, Ser. No. 134,578**
**Claims priority, application Japan, Mar. 30, 1979, 54-38662**
**Int. Cl.³ G03G *21/00***
**U.S. Cl. 15—1.5 R** **5 Claims**

1. In an apparatus for removing residual toner from a surface to be cleaned which comprises a rotatable cleaning brush in frictional engagement with the surface for removing residual toner therefrom, a dusting bar disposed in abutting relation to brush bristles of said cleaning brush for dusting toner off said brush bristles, both said dusting bar and said brush bristles



being made of electrically conductive material with at least one covered with an insulating material, and means for forming



an alternating electric field between said brush bristles and said dusting bar.

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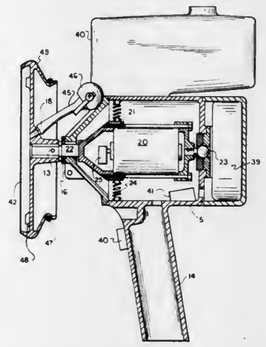
**4,295,240**
**CLEANING DEVICE**
**Franz Lex, Annenstrasse 6, A 8020 Graz, Austria**
**Filed Aug. 27, 1979, Ser. No. 70,317**
**Claims priority, application Austria, Apr. 9, 1978, 6365/78**
**Int. Cl.³ A46B *13/04***
**U.S. Cl. 15—22 R** **5 Claims**



1. A cleaning device comprising a housing having an axis and guide means at one end of the housing, a cleaning body to be pressed against an object to be cleaned in a working direction, a drive part glidingly arranged in the guide means, the cleaning body being mounted on the drive part and being driven thereby, and a driving system for driving the drive part and the cleaning body mounted thereon in an oscillatory manner, the driving system including a drive motor having an axis and two ends, a shaft axially extending from one one of the motor ends, a flywheel mass mounted on the motor shaft for generating an oscillatory motion, means for transmitting the oscillatory motion to the drive part, means mounting the drive motor in the housing for oscillation, the mounting means being arranged at one of the motor ends adjacent the drive part, and means for pivotally mounting the other end of the motor in the housing.

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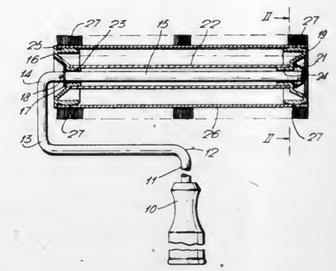
**4,295,241**
**PAINT ROLLER**
**Kenneth W. Woolcock, Rouse Hill, Australia, assignor to Rota Cota Pty. Ltd., New South Wales, Australia**
**Filed Apr. 15, 1980, Ser. No. 140,491**
**Int. Cl.³ B05C *17/02***
**U.S. Cl. 15—230.11** **4 Claims**

1. A paint roller comprising a handle, an axle attached to said handle extending at right angles to the axis of the handle and approximately symmetrically on either side thereof, rotatable plastic end caps mounted on the axle ends having outer cylindrical sections to receive and support the base tube of a paint roller cover in the inner surface thereof, a plurality of circumferentially spaced external longitudinal ribs on said cylindrical sections, said ribs functioning when a base tube is pushed over said end caps to distort said outer cylindrical sections of said end caps so that said ribs are deflected inwardly and the mid areas of said cylindrical sections between each pair of ribs are deflected outwardly to contact the inner surface of said base tube, thereby increasing the rigidity of said ribs already in



contact with the said inner surface and enabling a base tube having manufacturing tolerance variations of its inner diameter to have a frictional fit on a major part of each outer cylindrical section of said end caps while being held firmly and ensuring that the base tube and end caps rotate together and at the same time permitting easy installation and removal of the base tube, and means at each end of the axle to retain said end caps on said axle, said end caps constituting the only connection between the base tube and the axle.

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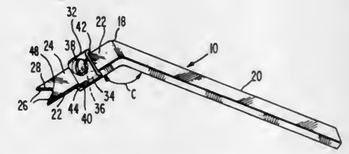
**4,295,242**
**CORNER BEADING CLEANER**
**William Dixon, Rte. #2, Box 2009, Circle Dr., Browns Mills, N.J. 08015**
**Filed May 5, 1980, Ser. No. 146,712**
**Int. Cl.³ B05C *17/10***
**U.S. Cl. 15—235.7** **10 Claims**



10. A corner beading cleaner, being particularly adapted to shape hardened joint compound adjacent convex corner beadings, said corner beading cleaner comprising:
(a) a body section further including:
(1) a handle means adapted to be grasped by the user; and
(2) a lip means extending outwardly from said handle means and being integral therewith, said lip means extending outwardly from said handle at an angle of approximately 135 degrees with respect thereto; and
(b) a tool means detachably secured to said lip means of said body section, said tool means including two first blade edges extending outwardly therefrom at an angle of 80 to 90 degrees with respect to one another to form a cutting surface of 80 to 90 degrees, said tool means further including two second blade edges extending outwardly therefrom at an angle of 80 to 90 degrees with respect to one another to form a cutting surface of 80 to 90 degrees, said tool means defining a first arcuate concave edge at the intersection between said first blade edges and a second arcuate concave edge at the intersection between said second blade edges; and

(c) a securement means adapted to detachably secure said tool means with respect to said lip means of said body section, said securement means further including;

(1) a clamping plate extending laterally across said lip means of said body section and adapted to receive said tool means between said clamping plate and said lip means to fixedly hold said tool means in place with respect to said body section when said clamping plate is secured to said lip means, said clamping means further including a first ear means and a second ear means extending downwardly from the opposite lateral sides of said clamping plate to prevent lateral dislodgement of said tool means from between said clamping plate and said lip means; and

(2) a threaded member extending through said clamping plate to detachably secure said clamping plate and said tool means to said lip means, said lip means defining a threaded aperture mated to said threaded member and adapted to receive said threaded member therein to fixedly secure said clamping plate, said tool means and said lip means with respect to one another.

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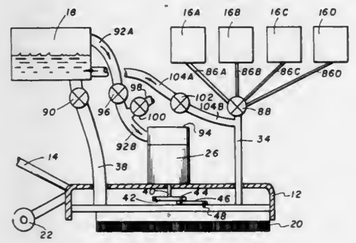
**4,295,243**

## FLOOR TREATING APPARATUS

**Virginia B. King, P.O. Box 5274, 7528 Popen Dr., Knoxville, Tenn. 37918**

**Filed Oct. 15, 1979, Ser. No. 84,888**
**Int. Cl.³ A47L** *7/00, 11/205*
**U.S. Cl. 15—320** **6 Claims**




1. Apparatus for cleaning and treating the surface of a floor comprising:

a carriage means having a handle for guiding and maneuvering said apparatus;

a plurality of dispensing chambers attached to said carriage means for holding a selection of floor cleaning and treating fluids;

reciprocating scrubbing means moveably attached to said carriage means and suitable for use with said selection of fluids for cleaning and treating said floor surfaces;

first transporting means connected to said dispensing chambers and a front portion of said scrubbing means for transporting a selected fluid from said dispensing chambers to said scrubbing means, said first transporting means including a first cut off valve cooperating with said transporting means for selectively interrupting the flow of said selected fluid to said scrubbing means;

a receiving chamber attached to said carriage means suitable for receiving any excess of said selected fluids used for treating said floor surfaces;

vacuum means for creating a vacuum at said receiving chamber;

second transporting means connected between a rear portion of said scrubbing means and said receiving chamber such that said vacuum at said receiving chamber is applied to said second transporting means for transporting excess cleaning or treating fluid from said rear portion of said scrubbing means to said receiving chamber;

a third transporting means having a first end and a further end and a second cut off valve between said first end and said further end, said third transporting means connected to said receiving chamber at said first end and to said first transporting means at said further end such that said first cut off valve may be closed to interrupt the flow of a selected fluid from said dispensing chambers and said second cut off valve opened to create a vacuum at said first transporting means such that excess cleaning or treating fluid may be transported from said front part of said scrubbing means to said receiving chamber; and

power means for driving said vacuum means and for imparting said reciprocating motion to said scrubbing means.

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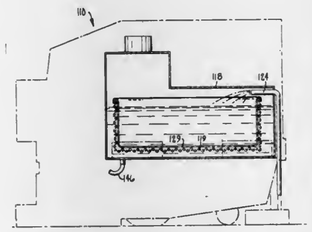
**4,295,244**

## SCRUBBING MACHINE WITH WATER REGENERATION

**Ferdinand J. Herpers, Minnetonka; Harley E. Kroll, Chaska; Alfred D. Carlson, Minneapolis, and Paul D. Dodge, Apple Valley, all of Minn., assignors to Tennant Company, Minneapolis, Minn.**

**Division of Ser. No. 916,929, Jun. 19, 1978, Pat. No. 4,194,263.**
**This application Nov. 19, 1979, Ser. No. 95,343**
**Int. Cl.³ A47L** *11/20*
**U.S. Cl. 15—320** **8 Claims**




1. A scrubbing device including a body portion suitable for movement along a surface to be scrubbed;

a tank including a pair of tank chambers and separator means providing communication between said chambers, said separator means comprising a basket-like filter member, said separator means being capable of separating a dirty scrubbing solution int , a clean solution portion and a solid matter portion, said clean portion being fed into one of said tank chambers, said basket-like filter member comprising a mesh basket and a box-like filter member being spaced from the bottom of said tank, thereby providing a first tank chamber outside said basket-like filter member and a second tank chamber within said basket-like filter, said tank including means cooperating with said basket-like filter member to prevent downward movement of said basket-like filter member, and to concurrently preclude any resistance against upward movement of said basket-like filter member to thereby allow said basket-like filter member to be readily removable at all times for dumping the used box-like filter.

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**4,295,245**

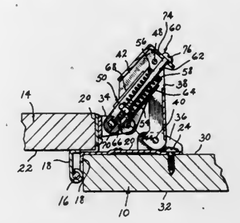
## COMBINATION HINGE AND OVERCENTER CLOSURE FOR A DOOR

**George E. Malcom, 55356 County Rd. 15 South, Elkhart, Ind. 46514**

**Continuation of Ser. No. 929,857, Jul. 31, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,985**
**Int. Cl.³ G05F** *1/12, 1/14*
**U.S. Cl. 16—80** **2 Claims**

1. In a combination hinge and overcenter retainer connecting a door having front and rear faces separated by a side edge to a frame having a front face and an adjoining side face wherein said hinge includes first and second legs mutually connected for pivotal movement and first and second connector plates, said first connector plate joined to said first leg, said second connector plate joined to said second leg, said first connector plate secured to the rear face of said door with said first leg extending along said door edge, said second connector plate secured to the side face of said frame with said second leg extending forwardly of said frame front face whereby said door is pivotal about said legs pivot connection for movement between open and closed positions, said overcenter retainer including a flange connected to each hinge connector plate, a first said flange projecting outwardly from said first connector plate at said frame side face, a second said flange projecting outwardly from said second connector plate at said door rear face, a first link pivotally connected at one end to said first flange and a second link pivotally connected at one end to said second flange, said links pivotally connected together at their respective opposite ends, expansion means pivotally connected between one of said flanges spaced from the pivot connection of the link thereto and such link next to its pivot connection to the other link, said expansion means for applying a yieldable






biasing pull between said one flange and its connected link to urge said door into its closed and open positions upon manual movement of the door between said positions, the improvement wherein said expansion means includes a retainer and an adjustment member having a shank and a head, one end of said retainer pivotally connected to said one flange at a location spaced from the pivot connection of its connected link, the opposite end of said retainer receiving in sliding cooperation the shank of said adjustment member with the adjustment member head located exteriorly of the retainer, spring means extending between said retainer and said adjustment member shank in compression for causing said adjustment member head to be yieldably drawn toward said retainer, said adjustment member secured at its head to said one flange connected link adjacent its pivot connection to said other link, said adjustment member shank including means associated with said spring means for varying the compression of the spring means upon rotation of said adjustment member shank whereby the force exerted by said expansion means upon said door in its open and closed positions can be varied.

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**4,295,246**

## KNOB

**Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.**

**Filed Apr. 18, 1980, Ser. No. 141,575**
**Int. Cl.³ F16D** *1/06*
**U.S. Cl. 16—121** **2 Claims**

1. A molded knob of the type which frictionally engages and slips over the end of a shaft of generally circular cross section and having at least one longitudinally extending flat surface,

a hub formed as part of said knob,

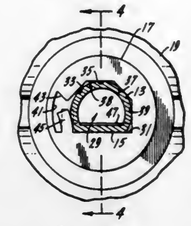
a shaft receiving walled socket formed in said hub,

said socket having a flat wall adapted to engage a flat surface on said shaft, and

a resilient finger formed as part of said hub and extending into the socket from said flat wall,

said resilient finger being positioned to engage an arcuate side of said shaft at a location adjacent said flat wall when said shaft is inserted into said socket to slightly deform said resilient finger and thereby apply force to said shaft, and

the wall of the socket located opposite the flat wall is a rigid part of a semi-hexagonal walled socket, the circular portion of said shaft engages said semi-hexagonal rigid wall part and said resilient finger extends towards but terminates short of said semi-hexagonal rigid wall part and constitutes a flexible part of said walled socket.

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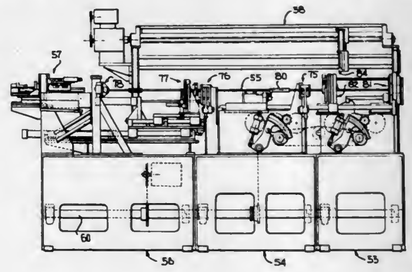
**4,295,247**

## GRIPPER-SEPARATOR DEVICE FOR CONTINUOUSLY SHIRRED CASINGS

**Roy L. Trimble, Theodosia, Mo.; Alfred D. Story, and Harold H. Martinek, both of Danville,, Ill., assignors to Teepak, Inc., Chicago, Ill.**

**Filed May 8, 1980, Ser. No. 147,768**
**Int. Cl.³ A22C** *13/02*
**U.S. Cl. 17—1 R** **24 Claims**




1. In a machine for continuously shirring casings of the type having a fixed mandrel along which the shirred casing is continuously advanced, a segregator for segregating a continuously shirred casing into separate strands, said segregator comprising a gripper unit and a separator unit, means mounting said gripper unit and said separator unit for selected individual movement longitudinally along said mandrel, each of said units including gripper means for engaging an intermediate portion of a shirred casing, control means for separately actuating said gripper means of said units, and drive means for separately moving said units longitudinally along said mandrel with said separator unit being movable away from said gripper unit while said gripper means of said units are engaged with an intermediate portion of a shirred casing to separate a leading portion of said shirred casing from the remainder thereof.

**4,295,248**

## CARDING WIRE BRUSH ARRANGEMENT

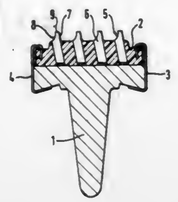
**Wolfgang Beneke, and Paul Teichmann, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany**

**Filed Jun. 8, 1979, Ser. No. 46,789**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825506**

**Int. Cl.³ D01G *15/24***

**U.S. Cl. 19—113** **10 Claims**



1. A carding wire brush, particularly for revolving flats, comprising: a carrying layer, hooklike brush elements inserted into said carrying layer and protruding from said carrying layer to form carding teeth, said carding teeth having tooth faces forming an angle larger than 90° with said carrying layer, said carding teeth having tooth flanks chamfered and curved concavely in relation to said carrying layer; said carding teeth having tip regions substantially parallel to said carrying layer.

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**4,295,249**

## COMBING MACHINE

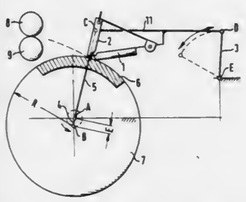
**Bernhard Siemon, Hanover, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany**

**Filed Oct. 16, 1979, Ser. No. 85,415**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845245**

**Int. Cl.³ D01G *19/16***

**U.S. Cl. 19—225** **4 Claims**



1. A combing machine having stationary detaching rollers (8, 9), a rotating circular comb (6) and reciprocating gripper, said gripper having a lower gripper plate (11) with a gripper opening provided adjacent thereto, said rotating circular comb combing a fiber beard held by said gripper, comprising:

a driven gripper oscillation shaft (E);

crank means mounted on said gripper oscillation shaft pivotally connected to said lower gripper plate (11);

a second driven crank means (4), and

a guide link (5) pivotally connecting said second driven crank means (4) to said lower gripper plate (11) adjacent said gripper opening whereby effective combing is produced between said gripper and said circular comb.

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**4,295,250**

## CABLE DEAD ENDING

**James A. Dupuy, 135 McAuley Dr., Vicksburg, Miss. 39180**

**Filed Sep. 28, 1979, Ser. No. 79,702**

**Int. Cl.³ F16G *11/02, 11/04***

**U.S. Cl. 24—122.6** **5 Claims**

1. A cable dead end of steel multistrand cable including a core strand, comprising:

a ferrule having an elliptical interior cross section;

an insert disposed around the cable core strand with the other cable strands disposed around the insert in a birdcage configuration, and with the insert substantially centered in the ferrule interior, said ferrule being generally elliptical in cross section and having barbs on the exterior surface thereof; and

steel wool packing the ferrule interior between it, the strands, and said insert.

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**4,295,251**

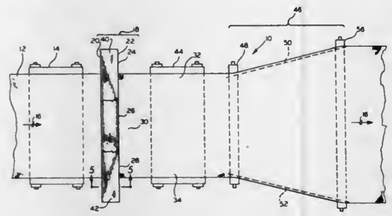
## METHOD FOR CONTROLLING EDGE UNIFORMITY IN NONWOVEN FABRICS

**Jack R. Tatham, Fair Play, and Jerry L. Shelor, Walhalla, both of S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 14, 1980, Ser. No. 130,631**

**Int. Cl.³ D04H *1/46***

**U.S. Cl. 28—112** **12 Claims**



1. A method of producing a nonwoven fabric comprising:

passing a nonwoven fabric web through a needle punching zone, said fabric web being produced from staple fibers and having two edge portions and a medial portion intermediate the edge portions, wherein the weight per unit area of the edge portions is greater than the weight per unit area of the medial portion;

needle punching the medial portion and the edge portions in the needle punching zone in such a manner that the needle punching density per unit area of said fabric web is less in the two edge portions than the needle punching density per unit area of said fabric web in the medial portion so as to reduce the bonding among the staple fibers of the edge portions relative to the bonding among the staple fibers of the medial portion;

passing the thus needle punched fabric web to a tentering zone; and



tentering the thus needle punched fabric web so as to stretch said fabric web transversely relative to its direction of movement and thereby reduce the weight of said fabric web per unit area in the edge portions approximately to the weight of said fabric web per unit area in the medial portion so that a nonwoven fabric web of substantially uniform thickness is produced.

8. A method of producing a nonwoven fabric comprising:

moving a nonwoven fabric web along a direction of movement through a needle punching zone, said fabric web comprising nonwoven fibers and having two edge portions and a medial portion intermediate the edge portions, wherein the weight per unit area of the edge portions is greater than the weight per unit area of the medial portion;

needle punching the medial portion and edge portions of said nonwoven fabric web to produce bonding among said nonwoven fibers in the needle punching zone in such a manner that the needle punching density per unit area of said nonwoven fabric web is less in the two edge portions than the needle punching density per unit area of said nonwoven fabric web in the medial portion so as to reduce the bonding among said nonwoven fibers of the edge portions relative to the bonding among said nonwoven fibers of the medial portion;

moving said thus needle punched nonwoven fabric web from said needle punching zone along its direction of movement; and

stretching said thus needled nonwoven fabric web transversely relative to its direction of movement so as to thereby reduce the weight of said nonwoven fabric web per unit area in the edge portions approximately to the weight of said nonwoven fabric web per unit area in the medial portion so that a nonwoven fabric web of substantially uniform weight per unit area is produced.

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**4,295,252**

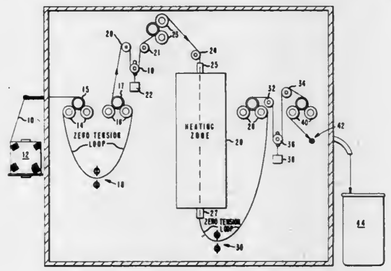
## METHOD FOR MEASURING YARN SHRINKAGE AND CRIMP DEVELOPMENT

**Bruce A. Robinson, Gananoque, and John R. Thompson, Yarker, both of Canada, assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.**

**Continuation-in-part of Ser. No. 56,947, Jul. 12, 1979, abandoned. This application Jun. 11, 1980, Ser. No. 158,609**

**Int. Cl.³ D02G *1/20;* D02J *1/12***

**U.S. Cl. 28—248** **1 Claim**




1. In a method for measuring continuously shrinkage and crimp development in yarns which develop crimp upon heating under low tension and wherein the yarn is advanced by driven rolls from a yarn source to a first tension zone, through a heating zone to a second tension zone and then through an elongation zone, whereby shrinkage and crimp development are determined in a measuring system from ratios of driven roll speeds; the improvement comprising: advancing said yarn downwardly in a free-hanging loop as it passes from said source to said first tension zone while maintaining zero tension in the yarn of said loop by noncontacting means sensing the length of the free-hanging loop and in turn controlling the speed of the driven rolls near the yarn source whereby tension differences in the yarn due to removing the yarn from the source are isolated from the measuring system, passing the yarn downward through said heating zone into a second free-hanging loop while maintaining zero tension in the yarn in said second loop by a second noncontacting means sensing the length of the second free-hanging loop and in turn controlling the speed of driven rolls in the second tension zone whereby the yarn is able to retract completely prior to entering the elongation zone, and cooling the yarn while passing upward to the second tension zone.

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**4,295,253**

## PROCESS AND APPARATUS FOR TEXTURIZING FILAMENT BUNDLES

**Hans Knopp, Ludwigshafen; Dieter Herion, Frankenthal; Gerhard Conzelmann, Otterstadt, and Heinz Gehrig, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Sep. 27, 1979, Ser. No. 79,327**

**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844391**

**Int. Cl.³ D02G *1/12, 1/16***

**U.S. Cl. 28—255** **7 Claims**

1. A process for texturizing bundles of filaments of synthetic high molecular weight materials, comprising

passing the filament bundle through a feed nozzle and then a filament guide tube which is coaxial to said nozzle and is spaced therefrom by a gap,

passing a hot fluid medium from a fluid medum inlet through a space surrounding said filament guide tube, in the direction opposite to the passage of the filaments through said guide tube, toward said gap so as to heat said filaments countercurrent-wise,

imparting to said fluid medium incident to its passage through said space at a location in the immediate vicinity of said gap and over a lengthwise extent short compared with the overall length of said space between the fluid medium inlet and said gap, a vortical motion at a vortex angle of 10° to 70°, said space having an unobstructed cross section between said fluid medium inlet and said vortex imparting location so that the countercurrent-wise fluid flow completely surrounds said tube in transit to said location,

causing the direction of flow of said medium to be reversed at said gap so as to entrain said filaments in their passage through said guide tube, and

feeding the filaments subsequent to their passage through said guide tube, to an expansion stage to produce the crimp.

5. An apparatus for texturizing bundles of filaments of synthetic high molecular weight materials, comprising:

a jacket and, in this order,

a feed nozzle for the filament bundle,

a filament guide tube and

an expansion stage,

said feed nozzle and said filament guide tube being disposed, axially spaced from each other by a gap, coaxially within said jacket,

an inlet for a hot fluid medium provided in said jacket downstream from said gap as viewed in the direction of travel of said filaments through said guide tube, for causing said fluid to flow in the space between said jacket and said guide tube, towards said gap to meet said filaments,

said space being closed past said gap so that said fluid medium reverses its direction of flow at said gap, thereby to entrain said filaments in their travel through said guide tube, and

means provided in said space at a point between said fluid medium inlet and said gap and inclined relatively to the axis of said space, for imparting a vortical motion to said fluid medium at a vortex angle of from 10° to 70°,

said vortex imparting means being located in the immediate vicinity of said gap and having a length short compared with the overall length of said space between the fluid medium inlet and said gap, and

said space having an unobstructed cross section between said fluid medium inlet and said vortex imparting means so that the countercurrent-wise fluid flow completely surrounds said guide tube in transit to said vortex imparting means.

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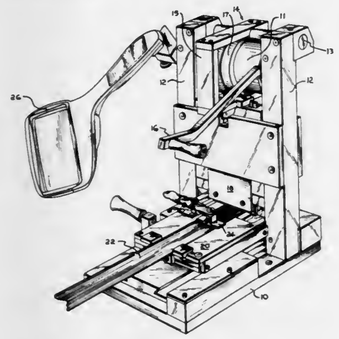
**4,295,254**

## TRANSMISSION LINE CABLE APPLICATOR MACHINE

**John E. Adams, Mechanicsburg; Robert F. Evans, New Cumberland, and John H. Gavin, Lancaster, all of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 8, 1978, Ser. No. 940,620**
**Int. Cl.³ H01R *43/00***
**U.S. Cl. 29—33 M** **3 Claims**



1. In a machine for terminating to a connector a stripped multi-conductor flat transmission line cable having signal and ground wires, said machine having a base for supporting said connector, a slide movably attached to said base and punch guides supported by said base, the improvement comprising a punch assembly including a signal wire stuffer and buss bar hold down, said punch assembly movable on said punch guides, means for moving said punch assembly toward and away from said connector, said slide having a wire locator for separating exposed signal and ground wires, said punch assembly having plural relatively movable plates for terminating the signal and ground wires respectively in successive strokes toward said connector.

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**4,295,255**

## EXPANDED COOLING JACKET ASSEMBLY

**Charles M. Weber, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed May 7, 1979, Ser. No. 36,720**
**Int. Cl.³ B23P *15/26*; B21D *26/02*; B23K *15/00***
**U.S. Cl. 29—157.3 V** **4 Claims**

1. A method of manufacturing a cooling jacket comprising the steps of:

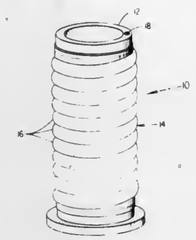
providing a cylindrical inner casing having a fluid inlet and a fluid outlet formed at opposite ends therein extending through a cylindrical portion of said inner casing a;

force-fitting a cylindrical outer sleeve over said cylindrical inner casing to longitudinally align said outer sleeve over said inner casing to cover said inlet and outlet holes extending through said cylindrical portion of said inner casing;

rotating the assembly formed by fitting said outer sleeve over said inner casing at a predetermined rotational speed;

providing an electron-beam welder having a movable welding head;

maintaining the welding head of the electron-beam welder stationary at one end of said outer sleeve to form a sealing weld at the end thereof longitudinally beyond the first hole of said fluid inlet extending through said cylindrical portion of said inner casing;



traversing the welding head of the electron-beam welder along the length of said outer sleeve to form a series of parallel weld lines on said outer sleeve;

maintaining the weld head of the electron-beam welder stationary at the other end of said outer sleeve to thereby form a sealing weld thereat longitudinally beyond the second hole of said fluid outlet extending through said cylindrical portion of said inner casing; and

pressurizing said inner casing by applying a pressure in excess of the normal operating pressure of said cooling jacket to either the inlet or the outlet formed therein while sealing the other to thereby expand said outer sleeve between said parallel weld lines to thereby form a fluid passageway between said inner casing and said outer sleeve.

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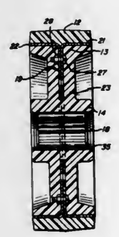
**4,295,256**

## MOLDED HEAVY DUTY WHEEL

**Robert A. Pascal, 1350 Forest, Highland Park, Ill. 60035**

**Division of Ser. No. 845,074, Oct. 25, 1977, Pat. No. 4,217,944.**
**This application Oct. 5, 1979, Ser. No. 82,232**
**Int. Cl.³ B21K *1/32***
**U.S. Cl. 29—159.01** **10 Claims**



1. The method of forming a wheel comprising the steps of:

forming a metallic core having a central open portion and a circumferential flange,

positioning and securing said metallic core inside an injection mold,

injecting a moldable material to cover essentially the entire inner portion of said metallic core and interior to said circumferential flange while forming an aperture at the center portion,

removing the same from the mold,

coating the exterior of said circumferential flange with a bonding agent,

and applying a tread to said bonding agent on said exterior of said circumferential flange, whereby a substantially totally molded wheel is formed utilizing an interfacial metallic member for purposes of bonding two plastic or rubber materials or combination thereof which otherwise will not bond to each other.



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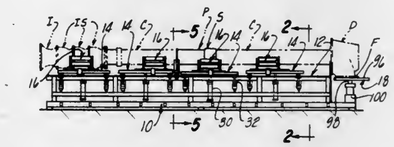
**4,295,257**

## WORK STAND FOR VERTICAL TURBINE PUMPS

**Robert F. Strohs, 8736 Buffalo Dr., Union Lake, Mich. 48085**

**Filed Feb. 20, 1980, Ser. No. 122,990**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—240** **8 Claims**



1. A workstand for supporting and aligning components of a vertical turbine pump during assembly or disassembly comprising an elongate horizontally extending bed frame, a plurality of support cradles mounted at longitudinally spaced positions on said bed frame, each of said cradles comprising a cradle frame and at least a pair of support rollers mounted for free rotation on said cradle frame about spaced parallel horizontal axes extending longitudinally of said bed frame and symetrically disposed on opposite sides of a common vertical plane extending longitudnally of said bed frame, said rollers being operable to supportingly engage cylindrical positions of components of a vertical turbine pump to maintain said components in alignment with each other with the axis of said components lying in said vertical plane, means for independently vertically positioning each of said cradle frames relative to said bed frame, means for independently longitudinally positioning each of said cradle frames relative to said bed frame, and a shaft support assembly for supporting a shaft projecting coaxially from a pump component supported on at least one of said cradles, said shaft support assembly comprising lower frame means adapted to be seated upon the support rollers of one of said cradles, and upper frame means having a longitudinally extending shaft receiving notch of V shaped transverse cross section.

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**4,295,258**

## PIN PULLER AND INSERTER

**Eric J. Penn, San Jose, and Derylle L. Teegarden, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Feb. 21, 1980, Ser. No. 123,195**
**Int. Cl.³ B25B *27/00***
**U.S. Cl. 29—283** **5 Claims**

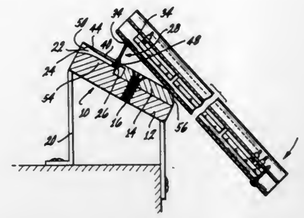
1. A pin puller and inserter for pulling pins from an integrated circuit package shipping rail and inserting pins thereinto, comprising:

a elongated body member having a top and a bottom;

an elongated channel formed in said body member said channel having an outwardly flared opening at one end of said body member and being dimensioned to admit the head of a pin from an integrated circuit package shipping rail through said opening;

a tapered ramp in said channel which progressively narrows the depth of the channel from a dimension which is larger than the depth of the head of a pin to a dimension that will snugly hold the pinhead in place;

a slot in said body member extending from said channel opening along said channel and communicating into said channel, said slot being dimensioned to admit the shank of said pin when the head thereof is admitted into said channel;



a rounded fulcrum surface on said body member on the end thereof opposing said channel opening, said rounded surface serving as a fulcrum for engagement by a package, for pulling a pin whose head is in said channel; and

mounting means on the bottom of said body member for mounting said body member in a fixed position at a convenient height and angle for use in removing pins from a package.

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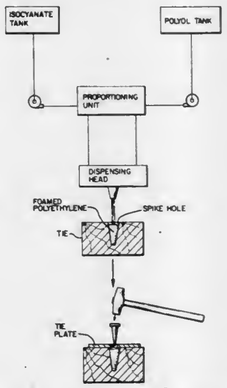
**4,295,259**

## METHOD OF FILLING SPIKE HOLES IN RAILWAY TIES

**Curtis A. Rhodes; Tim A. Jur, and Donald A. Keating, all of Columbia, S.C., assignors to Canron Corp., Columbia, S.C.**

**Filed Oct. 13, 1978, Ser. No. 951,132**
**Int. Cl.³ B23P *7/00***
**U.S. Cl. 29—402.18** **8 Claims**




1. An in situ method of plugging spike holes in a succession of wooden railroad ties and then securing a rail to the ties, comprising: mixing components of a polyurethane foam which is foamable and curable at an outdoor ambient temperature and ambient pressure and which when foamed and cured has a sufficiently high rigidity and density to retain a spike when subsequently driven into foamed polyurethane and the polyurethane is cured, and then immediately injecting the mixed components into the spike holes to a depth sufficient for causing the polyurethane when it is foamed to at least partially fill the holes; causing the holes and the ties to remain at ambient conditions of outdoor temperature and pressure while the foaming and curing of the polyurethane is completed; and

before the polyurethane has cured, placing rail-holding tie plates on the ties over the thus filled spike holes and driving spikes through the tie plates and into thus plugged holes aligned therewith before the polyurethane has cured, for securing a rail to the ties.

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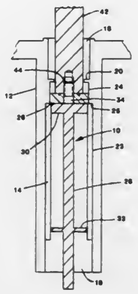
**4,295,260**

## TOOL FOR REMOVING SLEEVES FROM CYLINDERS

**Robert M. Divers, 9119 Clydesdale Dr., St. Louis, Mo. 63126**

**Filed Oct. 15, 1979, Ser. No. 84,617**
**Int. Cl.³ B23P** *19/00*
**U.S. Cl. 29—426.5** **13 Claims**



7. A method for removing a sleeve from a cylinder having a restricted opening at one end and an unrestricted opening at the other end which comprises inserting a tool provided with guide means into said sleeve from said unrestricted opening of the cylinder, inserting a plurality of radial collar segments from said restricted opening of the cylinder and forming a disc-shaped circular collar fitting over a shoulder of the sleeve, inserting a pusher rod means through said restricted opening, connecting the pusher rod means to said guide means and clamping the collar segments thereto, forcefully moving the pusher rod means toward said unrestricted opening of the cylinder with the clamped collar segments bearing against the sleeve to force it out of the cylinder housing.

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**4,295,261**

## METHOD OF MOUNTING A THERMAL INSULATING DOOR GASKET

**Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.**

**Division of Ser. No. 869,765, Jan. 16, 1978, Pat. No. 4,214,571. This application Dec. 26, 1979, Ser. No. 107,090**
**Int. Cl.³ B23P** *11/02*
**U.S. Cl. 29—451** **1 Claim**

1. A method of mounting a thermal insulating door gasket adjacent an oven liner comprising:

aligning the gasket with a panel opening in an oven panel having an opening perimeter slightly smaller than a perimeter of the gasket;

forcing the gasket into the panel opening to frictionally mount the gasket on the oven panel;

aligning the panel opening with an open end of an oven liner mounted within an oven body;

forcing the panel opening over the liner open end pressing the oven gasket between the liner and the oven panel and exposing a portion of the gasket for engaging an oven door; and

securing the oven panel to the oven body to secure the gasket on the open end of the liner.

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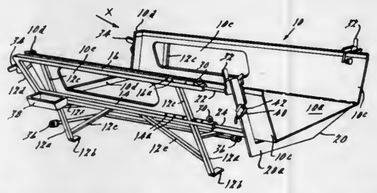
**4,295,262**

## METHOD OF MAKING TRUCK BED COVER ASSEMBLY

**Daniel Grote, Mt. Clemens; Duane Raymond, Warren, and Joseph C. Mosher, Rochester, all of Mich., assignors to Thermoplastics, Inc., Prairie View, Tex.**

**Filed Mar. 21, 1980, Ser. No. 132,509**
**Int. Cl.³ B23P** *19/00, 25/00*
**U.S. Cl. 29—462** **3 Claims**



1. A method of making a cover for a truck bed, comprising forming a shell having the general configuration of a truck bed cover and having a top wall, and sidewalls joined to the longitudinal margins of the top wall, said shell being of a length which is greater than the length of the cover to be made therefrom; positioning the shell in an inverted condition on a support member having adjustable guide means; positioning the guide means at a predetermined distance inwardly of the leading edge of the shell; trimming the shell along the guide means to provide a body portion for the truck bed cover having the length desired; and completing the assembly of the cover by securing a front panel and rear door thereto while the body portion is maintained in a fixed position on the support member.

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**4,295,263**

## CIRCULAR INSULATION SAW SYSTEM

**Harry C. Davis, 8993 Airline Hwy., Baton Rouge, La. 70815**

**Filed Aug. 6, 1979, Ser. No. 63,743**
**Int. Cl.³ B23D** *57/00, 3/02*
**U.S. Cl. 29—561** **13 Claims**

1. A circular insulation saw apparatus for cutting blocks of insulation material into pipe insulation members comprising:

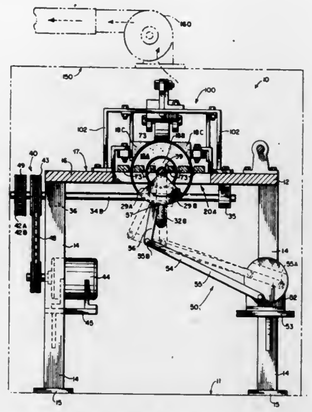
a. a frame with a material feed surface having first and second end portions and being supported by the frame, there being further provided a saw mount opening in said feed surface;

b. a powered circular cutting blade movably mounted with respect to said feed surface at the said opening;

c. a shaft spanning said opening and attaching at the end portions thereof to said material feed surface of said frame;

d. at least one strut member attaching said blade to said shaft, said shaft occupying a position at the center of said circular cutting blade;





e. router means on said feed surface between said first end portion and said cutting blade for pre-cutting a generally semi-circular groove in a block of insulation material to be cut responsive to movement of the block of insulation material from said first to said second end portion with the semi-circular groove cut by said router means thereafter registering with said shaft during the subsequent cutting of the insulation block by said blade.

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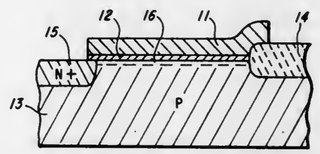
**4,295,264**

## METHOD OF MAKING INTEGRATED CIRCUIT MOS CAPACITOR USING IMPLANTED REGION TO CHANGE THRESHOLD

**Gerald D. Rogers, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 645,171, Dec. 29, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,815**
**Int. Cl.³ H01L** *7/44;* **B01J** *17/00*
**U.S. Cl. 29—571** **4 Claims**



1. A method of making an MOS integrated circuit device having a capacitor comprising the steps of:

a. providing a body of silicon having an area on a major face thereof for a capacitor device;

b. implanting a shallow surface-adjacent part of said area with conductivity-determining impurity to create a capacitor region in the surface of the silicon to function as the lower plate of the capacitor, the capacitor region being implanted to an impurity concentration selected to exhibit a threshold of the capacitor substantially different from that of the silicon not implanted whereby such region has a threshold less than zero volts;

c. providing a coating of silicon oxide on said area as the capacitor dielectric;

d. applying a layer of polycrystalline silicon over said coating of silicon oxide to provide the upper plate of the capacitor;

e. and diffusing impurity material into the major face near and on one side of said area to a depth much greater than that of said shallow surface-adjacent implanted part to provide electrical connections to the capacitor region, using said coating of silicon oxide as a mask.

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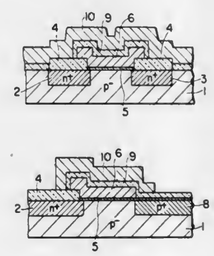
**4,295,265**

## METHOD FOR PRODUCING A NONVOLATILE SEMICONDUCTOR MEMORY

**Masatada Horiuchi, Koganei, and Hisao Katto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 18, 1979, Ser. No. 58,501**
**Claims priority, application Japan, Jul. 31, 1978, 53-92634**
**Int. Cl.³ H01L** *21/28*
**U.S. Cl. 29—571** **11 Claims**



1. Method for producing a nonvolatile semiconductor memory comprising;

a step of forming a source region and a drain region in a surface portion of a semiconductor substrate having a first conductivity type, said source region and said drain region having a second conductivity type which is opposite to said first conductivity type;

a step of forming a thin insulating film on a channel region between said source region and said drain region;

a step of depositing a silicon layer on at least a portion of said thin insulating film;

a step of doping said silicon layer and at the same time at least one surface portion of said substrate, which is adjacent to said channel region, with impurity having the same conductivity type as that of said substrate for forming a floating gate and at least one high impurity concentration region, doping of said at least one high impurity concentration region being effected by self-alignment with said floating gate using said floating gate as part of a mask;

a step of forming a second insulating film on the surface of said floating gate; and

a step of forming a control gate electrode on said second insulating film.

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**4,295,266**

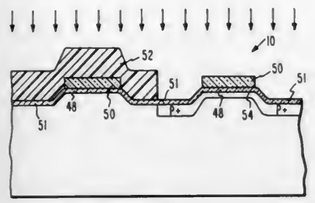
## METHOD OF MANUFACTURING BULK CMOS INTEGRATED CIRCUITS

**Sheng T. Hsu, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jun. 30, 1980, Ser. No. 164,681**
**Int. Cl.³ H01L** *21/26*
**U.S. Cl. 29—571** **7 Claims**

1. An improved method for manufacturing a complementary symmetry metal oxide semiconductor integrated circuit comprising the steps of:

(a) forming an oxide layer on the surface of a semiconductor substrate of a first conductivity type;
(b) forming a silicon nitride layer on the surface of said oxide layer;
(c) defining said silicon nitride layer to cover areas where transistors will be formed in said substrate; and
(d) applying a photoresist layer over said defined silicon nitride layer; wherein the improvement comprises the steps of:
(a) defining openings in said photoresist layer over areas where well regions of opposite conductivity type to said substrate will be formed;




(b) implanting ions through said defined silicon nitride layer, through the underlying portions of said oxide layer and into said substrate;
(c) removing said photoresist layer;
(d) simultaneously driving said implanted ions into said substrate while growing a thermal oxide by heating said substrate in a dry oxygen ambient;
(e) removing the silicon nitride layer and any underlying silicon dioxide portions; and
(f) growing a gate oxide layer.

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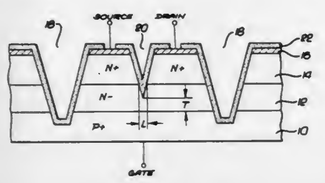
**4,295,267**

## TWO-MASK VJ-FET TRANSISTOR STRUCTURE

**Alan L. Harrington, Glendale; Vladimir Rodov, Hollywood, and Richard Allison, Los Angeles, all of Calif., assignors to TRW Inc., Los Angeles, Calif.**

**Filed Jul. 18, 1980, Ser. No. 170,144**
**Int. Cl.³ H01L *21/20***
**U.S. Cl. 29—571** **5 Claims**




1. A method of making field effect transistor devices comprising:
(a) forming a wafer consisting of an epitaxial layer of semiconductor material of a first conductivity type on a substrate of semiconductor material of a second conductivity type;
(b) forming an ohmic layer of semiconductor material of a third conductivity type in the epitaxial layer;
(c) forming an ohmic refractory metal layer on the surface of the ohmic layer;
(d) creating a central and two outer openings in the metal layer, wherein the outer openings are wider than the central opening;
(e) forming, through the central opening, a device definition V-groove by anistropically etching the semiconductor wafer, said device definition V-groove extending through the ohmic layer, dividing it into separate regions, and into the epitaxial layer, thereby defining a conduction channel between the separate regions around the device definition V-groove;
(f) forming, through the outer openings, isolation V-grooves by anistropically etching the semiconductor wafer, said isolation V-grooves extending through the ohmic layer and the epitaxial layer into the substrate, thereby defining the outer edges of the separate regions;
(g) forming a passivating layer on the front surface of the wafer;
(h) creating openings in the passivating layer over the separate regions;
(i) forming metal contacts to the separate regions, thereby defining source and drain electrodes; and
(j) forming an ohmic contact to the back surface of the wafer beneath the device definition V-groove, thereby defining the gate electrode.

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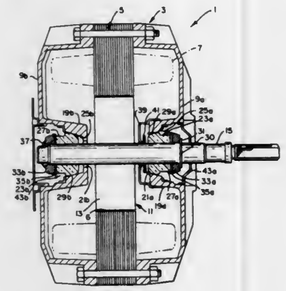
**4,295,268**

## METHOD OF ASSEMBLING AN ELECTRIC MOTOR

**William D. Punshon, Bridgeton, and C. Theodore Peachee, Maryland Heights, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.**

**Division of Ser. No. 27,728, Apr. 6, 1979, Pat. No. 4,245,870.**
**This application Aug. 28, 1980, Ser. No. 182,084**
**Int. Cl.³ H02K *15/02***
**U.S. Cl. 29—596** **1 Claim**



1. The method of assembling an electric motor having a stator assembly including a core having a bore therethrough, a rotor, a shaft extending axially from said rotor in opposite directions, and a pair of bearing support members secured to said core for journalling said shaft for rotation about its axis with the rotor being rotatable within said bore, said method comprising the steps of:
inserting said rotor in said bore with said shaft extending outwardly therefrom;
installing a pair of said bearing support members on said core, each of said bearing support members having an opening therethrough for reception of a respective portion of said shaft and having an outwardly opening tapered race surrounding said shaft;
fixing a first ball member in axial position on said shaft, said first ball member having a surface thereon adapted to be journalled in its respective race for the transfer of both radially loads and axial thrust loads in one axial direction from said shaft to said stator assembly;
installing a second ball member on said shaft, said second ball member having a surface thereon adapted to be journalled in its respective race for the transfer of both radial loads and axial thrust loads in the opposite direction from said first ball member;
seating said first ball member in its race;
seating said second ball member in its race; and
axially securing said second ball member relative to said shaft thereby to substantially prevent axial movement of said shaft and said rotor relative to said stator assembly.

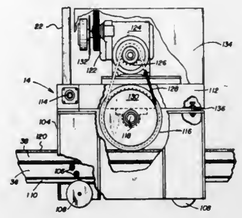


**4,295,269**

## TRUSS ASSEMBLY APPARATUS

**Ronald F. Wright, 6901 Glen Hills Rd., Fort Worth, Tex. 76118**

**Filed May 31, 1979, Ser. No. 44,060**
**Int. Cl.³ B23P *19/00***
**U.S. Cl. 29—798** **12 Claims**



1. Apparatus for assembling trusses from precut truss members and fastener plates, said apparatus comprising:
an elongate table having a work surface thereon;
a rigid support means supporting the table from a support surface such as the floor with the work surface in an elevated position above the support surface;
a pair of elongate side members secured to said table, said side members positioned to protrude above the work surface on the table and to extend in a spaced apart relationship, each side member having a support surface thereon which is positioned above the work surface, said side members and work surface defining a recess of sufficient size to receive therein said precut truss members and fastener plates for assembly into trusses by said apparatus;
carriage means supported above the work surface of said table and mounted for movement therealong;
press roller means mounted for pressing said fasterner plates into said truss members and for rolling movement along said side members, said press roller means spanning the recess between said side members and engaging said support surface on each of said side members, said roller means being supported in a position spaced above said work surface,
means rotatably connecting said press roller means to said carriage for effecting both carriage movement and said rolling movement of said press roller means along the support surfaces on said side members for contacting and pressing said fastener plates into truss members located in said recess; and
means for selectively effecting movement of said carriage and press roller means along said table.

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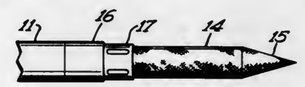
**4,295,270**

## ELECTRODE POSITIONING SYSTEM

**Jacob J. Cammarata, Crystal, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Filed Oct. 15, 1979, Ser. No. 84,802**
**Int. Cl.³ H01B *13/20***
**U.S. Cl. 29—828** **6 Claims**




1. A method of positioning a ring electrode at a desired location on, and in electrical communication with, the outer braided conductor of a coaxial electrical lead comprising the steps of:
stripping the outer insulation from the desired electrode location to one end of said lead to expose said braided conductor;
pushing the exposed braided conductor back from said one lead to expose said one lead end;
severing at least a portion of said exposed lead end;
extending said braided conductor past said exposed lead end;
forming the extending braided conductor into a twist; and
threading said twist and exposed braided conductor through a ring electrode having an inside diameter generally identical to the outside diameter of said braided conductor until said ring electrode overlies said desired location.

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**4,295,271**

## METHOD OF SOLDERING A LEAD TO A SINTERED LEAD PAD

**Donald Neuhoff; Arthur H. Mones, and Man K. Lam, all of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Division of Ser. No. 942,728, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 861,226, Dec. 16, 1977, abandoned. This application Apr. 3, 1980, Ser. No. 137,043**
**Int. Cl.³ H05K *3/34***
**U.S. Cl. 29—840** **3 Claims**

1. The method of soldering a lead to a lead pad on a substrate comprising the steps of:
printing a conductor pattern including at least one lead pad on the substrate using a gold composition, said gold composition being composed of finely divided gold particles and finely divided inorganic binder particles dispersed in an inert liquid vehicle, by weight 98 to 99 percent gold particles and complementally 2.0 to 1.0 percent inorganic binder particles, the binder consisting essentially by total weight of gold and binder of:
0.6 to 0.2 percent copper
0.2 percent lead
0.2 percent cadmium and the balance glass;
firing the substrate to sinter the inorganic materials of the gold composition;
presoldering the lead pad with a lead indium solder using a noncorrosive solder flux;
presoldering a lead with a lead indium solder using a noncorrosive solder flux; and
soldering the presoldered lead to the presoldered lead pad using a noncorrosive solder.

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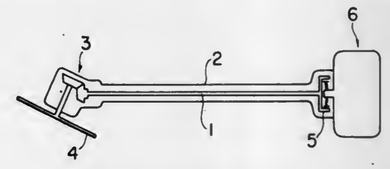
**4,295,272**

## VIBRATION CONTROL FOR MOWING MACHINE

**Toshifumi Kubota, Katsuta, Japan, assignor to Hitachi Koki Company, Limited, Tokyo, Japan**

**Filed Apr. 25, 1980, Ser. No. 143,862**
**Claims priority, application Japan, Apr. 28, 1979, 54-52844**
**Int. Cl.³ A01D *35/00***
**U.S. Cl. 30—276** **10 Claims**




1. A mowing machine having a prime mover, a centrifugal clutch connected to said prime mover at one end thereof, a shaft connected to the other end of said centrifugal clutch at one end thereof, a gear means connected to the other end of said shaft, a rotary blade connected via said gear means to said shaft, and a pipe for covering said shaft, said centrifugal clutch starting transmission of the rotational torque of said prime mover to said shaft when the rotational frequency of said prime mover exceeds a predetermined value, rotary portions of said prime mover, centrifugal clutch, shaft, gear means and

rotary blade constituting a rotational system, wherein the improvement comprises:

the outer diameter of said shaft is selected such that the torsional natural vibration frequency of said rotational system is below one third of said predetermined value.

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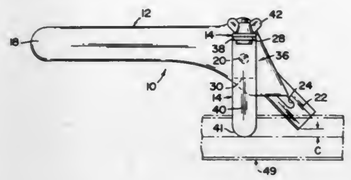
**4,295,273**

## COMBINATION CARPET RAZOR KNIFE AND GUIDE

**James Matthews, 11373 121st Ter. N., Largo, Fla. 33540**

**Filed Jan. 17, 1980, Ser. No. 113,070**
**Int. Cl.³ B26B** *29/00*
**U.S. Cl. 30—293** **1 Claim**




1. A device for cutting carpets, comprising, in combination,

a blade having a cutting edge and an elongated longitudinally extending central slot formed in said blade, said slot formed in parallelism with said cutting edge,

an elongate handle member,

a blade-retaining member,

said blade-retaining member integrally formed with said elongate handle member,

said elongate handle member and said blade-retaining member disposed in co-planar relation to one another,

said blade-retaining member disposed in angular relation to said elongate handle member,

an internally threaded bore formed in said blade-retaining member,

said bore orthogonally disposed relative to the plane of said elongate handle member and said blade-retaining member,

said blade-retaining member adapted to slidingly receive said blade member so that said blade member is disposed in sandwiched relation to said blade-retaining member and so that the slot formed in said blade member is aligned with said bore throughout a plurality of functional positions of adjustment of said blade member,

a first L-shaped member having a truncate leg portion and an elongate leg portion,

said truncate leg portion having an aperture means formed therein,

said truncate leg portion disposed so that said aperture means formed therein is in aligned relation with said internally threaded bore formed in said blade-retaining member,

a first bolt member aligned with and extending through said truncate leg portion aperture means, said internally threaded bore and said slot formed in said blade member so that said first bolt member, when in secure screw-threaded engagement with said internally threaded bore, secures the truncate leg portion of said first L-shaped member to said blade-retaining member, in abutting relation thereto, and maintain the sandwiched relation between said blade member and said blade-retaining member,

said elongate leg portion disposed at right angles to the plane of said blade-retaining member when said truncate leg portion is secured to said blade-retaining member,

said elongate leg portion being substantially flat and being generally disposed in a horizontal plane,

said elongate leg portion having a longitudinally extending central slot,

a second L-shaped member having a truncate leg portion and an elongate leg portion substantially orthogonally disposed relative to said truncate portion,

an aperture formed substantially centrally of said truncate leg portion,

said truncate leg portion being flat and disposed in abutting relation to the underside of said elongate leg portion of said first L-shaped member so that the aperture formed in said truncate leg portion of said second L-shaped member is in registration with the longitudinally extending slot formed in the elongate leg portion of said first L-shaped member throughout a plurality of functional positions of adjustment of said second L-shaped member relative to said first L-shaped member,

a bolt member aligned with and extending through said aperture means in said truncate leg portion of said second L-shaped member and said slot formed in the elongate leg portion of said first L-shaped member,

said elongate leg portion of said second L-shaped member disposed in spaced apart, substantially parallel relation to the common plane of said handle member and said blade-retaining member when the truncate leg portion of said second L-shaped member is disposed in abutting relation to the elongate leg portion of said first L-shaped member,

said elongate leg portion of said second L-shaped member having a distal end portion that extends beyond the distal end of said blade member so that at least a portion of said distal end of such elongate leg portion slidedly engages a carpet edge when said blade member is disposed in cutting relation to a carpet,

said distal end portion of said elongate leg portion thereby serving as a cam follower means that effectively communicates the contour of a carpet edge to said blade member,

a wing head engaged in screw threaded relation to said second bolt so that the apertured truncate leg portion of said second L-shaped member and the slotted elongate leg portion of said first L-shaped member are releasably secured to one another, said truncate leg portions of said second L-shaped member and hence said elongate leg portion of said second L-shaped member being positionable in a plurality of functional positions of adjustment attendant loosening and tightening of said wing head, so that the spaced apart relation of said elongate leg portion of said second L-shaped member and said blade member is variable,

whereby a substantially perfect seam between two abutting carpets is at least in part provided by loosening said wing head, positioning said blade member and the elongate leg portion of said second L-shaped member in a preselected spaced apart relation such that said elongate leg portion of second L-shaped member is substantially parallel to said blade member, tightening said wing head to fix the spaced apart relation of said blade member and said elongate leg portion of said second L-shaped member, positioning the abutting edges of said abutting carpets so that one edge overlies the other, cutting both of said carpets with a conventional top cutter tool so that the cut made in the backing of the overlying carpet is in substantial vertical alignment with the cut made in the backing of the underlying carpet through the length of said cut, cutting a first salvage edge from the overlying carpet by placing the overturned edge of said carpet in sliding abutting relation to the elongate leg portion of said second L-shaped member and cutting the backing of said carpet with said blade while maintaining the sliding abutting relation of said carpet edge and said elongate leg portion of said second L-shaped member so that the cut so made in said backing is substantially parallel to the cut made in said backing by said top cutter tool, said distal end portion of such elongate leg portion of said second L-shaped member thereby serving as a cam follower means that effectively communicates the contour of a carpet edge to said blade member, and cutting a salvage edge from said underlying carpet in a like manner,

whereby the respective cuts made in the backing of said abutting carpets by said blade follow the contour of the respective cuts made in the backings of said carpets by said conventional top cutter means, which cuts made in said overlying and underlying carpets by said conventional top cutter means define a mating profile, so that the backings of the carpets will mate when said carpets are placed in upturned, side-by-side relation to one another, such that a substantially perfect seam is formed between said abutting carpets.



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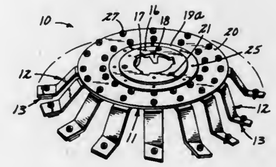
**4,295,274**

## SCARIFYING MACHINE

**Charles W. Bricher, St. Paul, and Ferdinand J. Herpers, Minnetonka, both of Minn., assignors to Tennant Company, Minneapolis, Minn.**

**Filed Jul. 27, 1978, Ser. No. 928,685**
**Int. Cl.³ B26B** *27/00, 25/00*
**U.S. Cl. 30—347** **23 Claims**




1. A tool suitable for removing built-up layers of soilage or coatings from surfaces, said tool comprising:

first support means adapted for attachment to a rotary power machine;

second support means mounted on said first support means, said second support means comprising a multiplicity of radially-extending elongated resilient spring members; and

removable cutter means mounted on said second support means;

said first support means, second support means and cutter means in combination serving to at least partially support said rotary power machine on said surface, said cutter means being resiliently supported with respect to said first support means by said second support means.

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**4,295,275**

## METHOD AND APPARATUS FOR MAKING RAISED AND FLAT LETTER SIGNS

**Larry Cugini, Sr., and John J. Cugini, both of 23 Holley St. Extension, Danbury, Conn. 06810**

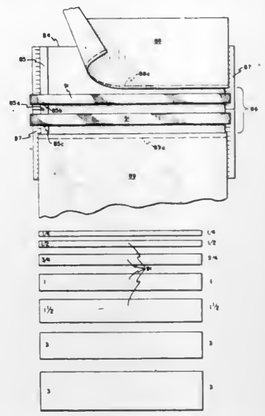
**Division of Ser. No. 23,599, Mar. 26, 1979, Pat. No. 4,230,513.**
**This application May 8, 1980, Ser. No. 147,919**
**Int. Cl.³ B43L** *5/00;* **G01B** *3/14;* **G09F** *7/04*
**U.S. Cl. 33—1 G** **1 Claim**

1. A layout table for making signmakers' line level indicating layout master guide strips comprising a paramagnetic layout panel having height and width at least equal to those of a signblank to be laid out,

a blank layout master strip of sheet material positionable along one side of the layout panel, an upper curtain sheet having a magnetized strip along its lower edge positionable across the upper portion of the layout panel to denote the upper edge of a signblank,

a lower curtain sheet having a magnetized strip along its upper edge positionable across the lower portion of the layout panel to denote the lower edge of a signblank, leaving a central transverse portion of the blank layout master strip and the layout panel exposed between the curtains representing the signblank,

and a selectable plurality of magnetized layout strips of different widths corresponding to heights of letters to be employed by the signmaker, each individually positionable extending across the exposed panel portion and the blank layout master and independently manually adjustable to positions representing individual lines of sign letters



whereby the signmaker may shift and readjust the magnetized layout strips on the paramagnetic panel to produce a visually pleasing line layout, and then inscribe the blank layout master with line level indicia, thereby completing the layout master for juxtaposition with a signblank for indicating the level of lines of letters to be mounted thereon.

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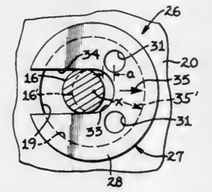
**4,295,276**

## TEMPLATE FOR ALIGNING A SHAFT

**Rayburn P. Ellington, III, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Nov. 3, 1978, Ser. No. 957,507**
**Int. Cl.³ G01B** *7/31*
**U.S. Cl. 33—181 R** **5 Claims**



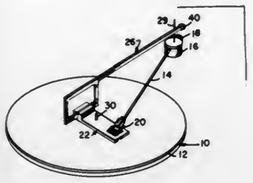

1. A shaft alignment template (**26**) comprising:

a disc (**27**) having a diameter larger than the thickness thereof,

a piloting slot means (**32**) formed through said disc (**27**) for engaging a shaft member therein, said piloting slot means (**32**) including a semi-circular opening (**33**) disposed centrally of said disc and a slot portion (**34**) extending radially outwardly from said opening (**33**) in tangential relationship therewith and terminating in open relationship at the periphery of said disc (**27**), and

an annular flange (**28**) having an annular hub means (**29**) secured on only one side thereof for engaging another member, said hub means (**29**) having an outside diameter which is less than the outside diameter of said flange (**28**).

**4,295,277**
## STYLUS POSITIONER
**Francis G. Dennesen, Beverly; Richard S. Wilson, Swampscott; Roy D. Toulan, Jr., Beverly, and Peter Madnick, Andover, all of Mass., assignors to Dennesen Electronics Inc., Beverly, Mass.**
**Filed Sep. 26, 1979, Ser. No. 79,041**
**Int. Cl.³ G11B *3/10***
**U.S. Cl. 33—181 R** **29 Claims**




1. A stylus positioner for a turntable assembly, which assembly has a turntable mounted to rotate about a spindle and a stylus arm pivotably mounted proximate said turntable, which stylus arm moves on a pivot axis relative to said turntable, which positioner comprises; a locater plate having an aperture which fits over said spindle and pivots thereon; said plate having a stylus positioning indicator therein at a distance from said spindle; a pivot arm fixably connectable to said locater plate; means for rotating said pivot arm and thus said locater plate around said spindle toward the pivot axis of said stylus arm to locate said indicator on said turntable so that the stylus can be positioned on said stylus arm in registration with said indicator.

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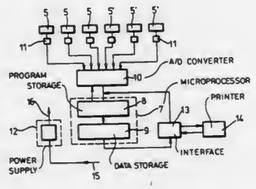
**4,295,278**
## METHOD AND APPARATUS FOR MEASURING OUT A STRAND GUIDE ARRANGEMENT
**Hans Gloor, Umiken, Switzerland, assignor to Concast AG, Zürich, Switzerland**
**Filed Jan. 14, 1980, Ser. No. 111,768**
**Claims priority, application Switzerland, Jan. 30, 1979, 883/79**
**Int. Cl.³ G01B *5/14***
**U.S. Cl. 33—182** **4 Claims**




1. An apparatus for measuring out a strand guide arrangement of a continuous casting installation, comprising:
means providing a strand guide arrangement defining guide tracks arranged at a mutual spacing from one another;
a measuring device provided with measuring feeler means capable of moving along the guide tracks of the strand guide arrangement; and
said measuring device comprising:
analogue-digital converter means operatively connected with said measuring feeler means;
microprocessor means containing program means and data storage means connected with said analogue-digital converter means, said storage means being displaced with the measuring means through the guide arrangements; and
interface means operatively connected with said microprocessor means.

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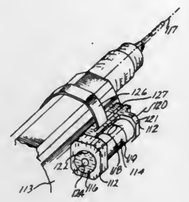
**4,295,279**
## HAND TOOL LEVELING APPARATUS
**Walter F. Sienknecht, 3839 Temple City Blvd., Rosemead, Calif. 91770**
**Filed Mar. 10, 1980, Ser. No. 128,723**
**Int. Cl.³ G01C *9/28***
**U.S. Cl. 33—334** **9 Claims**




1. Apparatus for leveling a tool having a working axis comprising:
a receptacle of a predetermined configuration attached to the tool;
an elongated, sealed, transparent cylindrical tube containing a liquid and a bubble formed by the liquid, said tube being mounted in the receptacle with its horizontal axis parallel to the working axis of the tool to level the tool in a horizontal plane, the receptacle being configured so as to enable viewing the bubble in the cylindrical level from at least the top and both sides thereof.
a circular bubble level mounted in the receptacle having an axis passing perpendicular through the center of the circular level, said axis being disposed parallel to the working axis of the tool for leveling the tool in a vertical plane, said circular level containing a transparent liquid and a bubble formed by the liquid, said circular level being biconvex in cross-section and positioned in the receptacle whereby the bubble can be properly positioned in the level to level the tool in either the vertical upward or vertical downward positions and the circular level retains the cylindrical level in the receptacle; and
resilient means for removably locking the circular bubble level within the receptacle.

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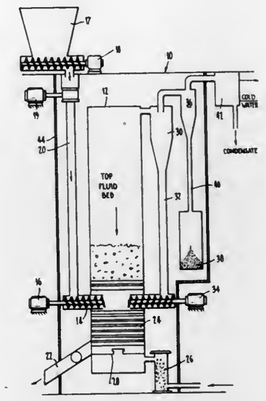
**4,295,280**
## METHOD OF OBTAINING A LYOPHILIZED PRODUCT
**John Krupey, Montreal, Canada, assignor to American Home Products Corporation, New York, N.Y.**
**Filed Mar. 17, 1980, Ser. No. 130,927**
**Int. Cl.³ F26B *5/06***
**U.S. Cl. 34—5** **6 Claims**

1. A process for obtaining a package containing a mass of dry material comprising at least two immunologic reagent materials incompatible with each other in the presence of moisture comprising the steps of:
(a) preparing separate aqueous liquid compositions of each of the materials;
(b) cooling each of the liquid compositions to a temperature slightly above its freezing point;
(c) mixing the cooled liquid compositions to obtain a mixture thereof;
(d) charging the mixture of liquid compositions at a temperature slightly above the freezing point of the mixture into a container maintained at a temperature substantially below the freezing point of the mixture so that the mixture freezes in the container; and
(e) lyophilizing the frozen mixture.



**4,295,281**
## DRYING SOLID MATERIALS
**Owen E. Potter, Camberwell, Australia, assignor to Monash University, Victoria, Australia**
**Filed Dec. 29, 1978, Ser. No. 974,245**
**Claims priority, application Australia, Feb. 10, 1978, PD3341**
**Int. Cl.³ F26B *3/08, 3/10, 3/00, 5/00***
**U.S. Cl. 34—10** **13 Claims**




3. In a method of drying a solid material containing less than 95% by weight of a vapourisable material which comprises establishing a fluidized bed containing the solid material, introducing fluidizing medium, heating the fluidized bed indirectly, feeding the material to be dried to the fluidized bed, removing dried solid material therefrom, and removing vapour product from the fluidized bed; the improvement wherein the fluidizing medium is the vapourizable material in vapour form, wherein dried solid material is removed from the bottom of the fluidized bed, and wherein vapour product comprising the vapourisable material substantially uncontaminated by other gases is removed from the fluidized bed for further use.

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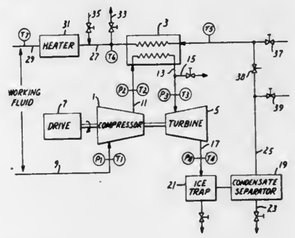
**4,295,282**
## HEAT AND LIQUID RECOVERY USING OPEN CYCLE HEAT PUMP SYSTEM
**Bryce J. Fox, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Nov. 15, 1978, Ser. No. 960,774**
**Int. Cl.³ F26B *21/08***
**U.S. Cl. 34—27** **29 Claims**




1. A drying oven system for removing vaporizable liquid from materials laden with said liquid, said system comprising a circulating gas drying oven having in combination therewith liquid removal apparatus for removing condensable vapor from said circulating gas, said apparatus comprising, in sequence means for compressing said gas, means for cooling said compressed gas and means for expanding said compressed gas to effect further cooling of said gas, said cooling causing condensation of at least a portion of the vapor contained therein, said apparatus further including means for separating the condensed liquid from said circulating gas.

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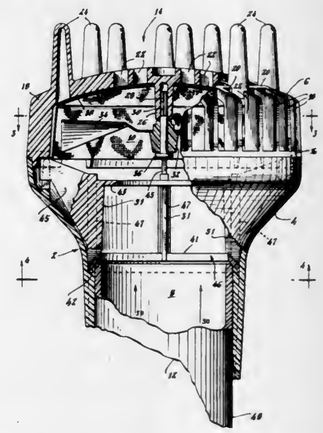
**4,295,283**
## AIR DIFFUSER FOR A HAIR DRYER
**Patrick M. Tomaro, deceased, late of Maplewood, N.J. (by Rita Tomaro, executrix), assignor to Conair Corporation, Edison, N.J.**
**Continuation of Ser. No. 40,886, May 21, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 161,073**
**Int. Cl.³ A45D *20/12***
**U.S. Cl. 34—97** **5 Claims**



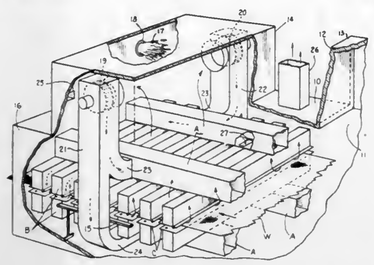

1. A diffuser attachment for a hand-held hair dryer for dissipating and reducing the force of an air stream of a hair dryer, said diffuser including:
a housing having an air inlet opening at a first end and an air outlet opening at a second end in alignment with said air inlet opening such that air introduced into said air inlet opening flows through said housing and is discharged therefrom through said air outlet opening,
said air outlet opening being larger than said air inlet opening,
said first end of said housing being adapted to be removably interconnectable with an air discharge outlet of a hair dryer,
a freely rotatable fan rotatably mounted within said housing between said air inlet opening and said air outlet opening having a plurality of fan blades arranged symmetrically about a central hub,
said fan blades extending substantially throughout the entire cross sectional area of said housing,
said blades of said fan being so positioned such that substantially all the air discharged from said hair dryer into said air inlet opening strikes said fan and causes it to rotate,
whereby said rotatable fan disperses and deflects substantially all air discharged from said hair dryer into a plurality of diversely directed, less powerful eddy air currents, which are discharged from said housing through said air outlet opening.

**4,295,284**

## DRYER RANGE

**Philip M. Witkin, Greenville, S.C., assignor to Marshall and Williams Company, Greenville, S.C.**

**Filed Jul. 5, 1979, Ser. No. 54,861**
**Int. Cl.³ F26B *13/02*; D06C *3/02***
**U.S. Cl. 34—155** **2 Claims**



1. A dryer range having spaced means supplying heated air to upper and lower longitudinal manifold means for treating a web moving longitudinally through the range comprising:
- spaced transverse plenums carried above said lower manifold means receiving heated air therefrom;
- spaced transverse plenum carried below said upper manifold means receiving heated air therefrom;
- said plenums each having a closure member opposite said web carrying a plurality of spaced nozzles therealong directing heated air against said web, and opposed sides extending marginally of said closure member;
- said spaced transverse plenums being carried both above and below said cloth communicating with respective upper and lower manifold means;
- air flow retaining baffle means carried by each of said plenums extending laterally outwardly adjacent said closure member defining an air passage adjacent an edge thereof;
- said air retaining baffle means providing a wide face confronting opposing sides of said fabric for holding heated air against said fabric while allowing sufficient spacing relative to the width of said air passage between said opposed sides of adjacent plenums to facilitate a smooth uniform flow and removal of spent air such that moisture is evenly removed from said web, and
- the area of entrance of said air passage being greater than the area of said nozzles.

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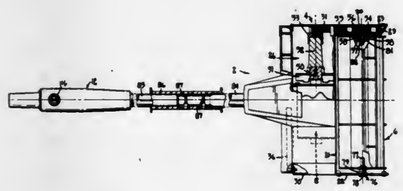
**4,295,285**

## SNOWTHROWER

**Eric Stevens, El Cajon, Calif., assignor to The Toro Company, Minneapolis, Minn.**

**Filed Dec. 17, 1979, Ser. No. 104,264**
**Int. Cl.³ E01H *5/00***
**U.S. Cl. 37—43 D** **8 Claims**



1. An improved snowthrower of the type having a snow throwing impeller mounted in an impeller housing, wherein the impeller housing has end walls and an outlet through which the snow is thrown by the impeller, wherein the impeller is mounted between the end walls of the impeller housing for rotation about a substantially horizontal axis, wherein the impeller includes a plurality of impeller blades which are spaced apart from one another to establish an open volume therebetween, and wherein the improvement relates to the impeller and comprises:

an impeller having spaced apart side walls between which the blades extend, wherein the blades are sufficiently rigid to transmit a drive torque from one side wall to the other side wall, and wherein the open volume is radially inwardly of the blades and is completely open in that no mounting shaft extends through the impeller in a direction substantially parallel to the blades, whereby the blades themselves, rather than a mounting shaft, transmit a drive torque applied to one of the side walls through the impeller, wherein one of the end walls of the housing includes a stub shaft and the other end wall of the housing includes a means for driving the impeller, wherein the impeller driving means includes a drive member, and wherein the impeller includes a bore on one side wall for being loosely received on the stub shaft and a drive aperture on the other side wall which is configured to receive the drive member in a driving engagement, and wherein the stub shaft is removably contained in the end wall and the impeller has a length less than the distance between the drive member and the end wall which holds the stub shaft such that the impeller can be slid laterally off the drive member when the stub shaft is removed to allow removal of the impeller without disassembly of the impeller or the end walls of the housing.

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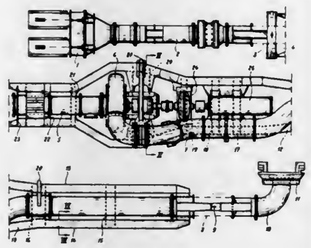
**4,295,286**

## SUPPORT FRAME FOR MOTOR, PUMP AND SUCTION TUBE OF A SUCTION DREDGER

**Willem Brandwijk, Nieuw-Lekkerland, and Herman Dam, Alblasserdam, both of Netherlands, assignors to IHC Holland N.V., Papendrecht, Netherlands**

**Filed Apr. 8, 1980, Ser. No. 138,402**
**Int. Cl.³ E02F *3/88***
**U.S. Cl. 37—58** **9 Claims**



1. A suction dredger having a dredging tube with suction head, said dredging tube being pivotably connected to the side wall of the hull about a horizontal axis extending transversely to the side wall, said dredging tube between its connection to the hull and its suction head having a pump unit with a motor which in operation with the suction head at the bottom of the water operates below water level, said dredging tube between the pump and its connection to the hull having a pivot frame with one pivot axis in a vertical plane, through which frame extends a hose interconnecting the pressure conduit parts of the dredging tube while between said pump and its suction head a cardan joint frame has been provided through which extends a further hose interconnecting the suction tube parts of the dredging conduit, said cardan joint frame and said vertical pivot frame forming integral parts of a support frame, carrying the motor and the pump as well as the adjacent part of the suction tube and the part of the pressure conduit tube between cardan joint and vertical pivot frame respectively, said support frame at the side turned towards the hull having one or more fenders extending outside the longitudinal profile of the support frame and the motor and the pump and the tube parts supported by it.

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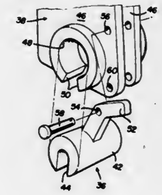
**4,295,287**

## BACKHOE BUCKET QUICK COUPLER

**Ronald C. Natzke, Burlington, and Thomas R. Brown, Yarmouth, both of Iowa, assignors to J. I. Case Company, Racine, Wis.**

**Filed Apr. 10, 1980, Ser. No. 139,037**
**Int. Cl.³ E02F *3/70***
**U.S. Cl. 37—103** **2 Claims**



1. A quick attachment and release mechanism for attaching a bucket to a loader scoop arm, said mechanism comprising:
- a quick coupler pivotally mounted to an end of said scoop arm for receiving various types and sizes of buckets, said quick coupler having a three-leg configuration including a pair of bucket mounting legs pivotally mounted to opposite sides of said scoop arm end, each bucket mounting leg including a hook portion engaging a lateral projection of a mounting pin on said bucket;
- a releasable latch mechanism rotatably mounted on a third leg of said quick coupler for engagement with a latch pin mounted on said bucket, said latch mechanism including a main body having a slot along its longitudinal extent, said main body rotatably mounted between spaced apart side members which form said third leg of said quick coupler;
- each side member including a bearing for rotatably holding one end of said main body, each bearing including a slot, said bearing slots forming an opening through said side members which is substantially the same size as the opening formed by the slot in said main body;
- a latch arm mounted to said main body, said latch arm being movable in the space between said side members for rotating said main body, said latch arm having an opening therein;
- and said side members having spaced apart first and second latching openings, said opening in said latch arm being aligned with and secured to said first opening through said side members by pin means thereby axially aligning said slot in said main body with said bearing slots so that said main body slot may be seated on said bucket latch pin, and said opening in said latch arm being aligned with and secured to said second opening through said side members by said pin means thereby providing a mounting for said bucket latch pin in said main body for coupling said bucket to said quick coupler.

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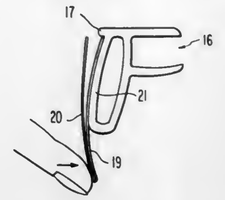
**4,295,288**

## HOLDER FOR INFORMATION CARRIERS IN STRIP FORM

**Ake G. Westberg, Sundsvall, Sweden, assignor to H. L. Plast H. Lundvall AB, Sundsvall, Sweden**

**Continuation-in-part of Ser. No. 841,764, Oct. 13, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 962,849**
**Claims priority, application Sweden, Oct. 15, 1976, 7611481**
**Int. Cl.³ G09F *3/18***
**U.S. Cl. 40—16.4** **10 Claims**



1. A holder for information strips, such as price strips for supermarket shelves, goods containers and the like, comprising:
- (a) an attachment portion for removably mounting the holder to a shelf, container edge or the like,
- (b) a display portion for receiving an information strip, said display portion defining a pocket having an upwardly directed opening and a portion extending below said attachment portion, said pocket having a prestressed transparent front wall forming a front-facing surface of said holder, said display portion flexible to deflect said front wall under a force applied to said pocket portion extending below said attachment portion thereby opening said upwardly directed opening and
- (c) means connecting a rear wall of said display portion to said attachment portion at a point spaced from the bottom of said pocket.

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**4,295,289**

## LASER AIMING DEVICE WITH LATERAL SHOCK ABSORBER

**Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77077**

**Continuation-in-part of Ser. No. 949,997, Oct. 10, 1978, Pat. No. 4,168,588, which is a continuation-in-part of Ser. No. 846,691, Oct. 31, 1977, Pat. No. 4,161,076. This application Feb. 12, 1979, Ser. No. 11,085**
**Int. Cl.³ F41G *1/34***
**U.S. Cl. 42—1 A** **18 Claims**

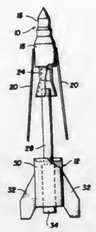
1. An aiming device for attachment to a barrelled weapon comprising:
- a light source for projecting a coherent beam of light onto a target;
- a member securable to the weapon for carrying said light source such that the beam is directed along the barrel of the weapon, said member defining an internal surface;
- a longitudinal buffer supported by said member and interposed between said light source and said internal surface for cushioning said light source from shock upon recoil of said weapon; and
- shock absorbing materials disposed laterally of said light source for preventing damage to said light source due to lateral impact.

**4,295,290**

## TOY PROJECTILE

George T. Boswell, Springfield, Va., assignor to Frontier Industries, Inc., Springfield, Va.

Filed Jul. 1, 1980, Ser. No. 164,909
Int. Cl.³ A63H 27/00
U.S. Cl. 46—74 C 10 Claims



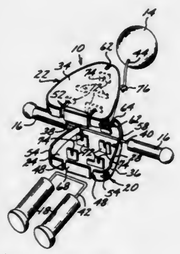
1. A toy projectile having an upper stage and a lower stage,
said upper stage comprising a plurality of vanes movably mounted thereon for movement between a closed, substantially longitudinally extending position and an open, substantially radially outwardly extending position, means for biasing said vanes to said open position, and an adaptor portion disposed on the lower end of said upper stage and comprising a downwardly opening tubular section; and
said lower stage comprising a first tubular portion having an upper end adapted to be received within said tubular section of said adaptor portion to removably secure said lower stage to said upper stage, means mounted on said first tubular portion for engaging the lower portions of said vanes to retain them in said closed position when said upper and lower stages are removably connected, and means mounted in the lower end of said first tubular portion for propelling said projectile and for separating said upper and lower stages to enable the lower portions of said vanes to move away from said retaining means, whereby said biasing means moves said vanes to said open position.

**4,295,291**

## TOY FIGURE HAVING REPOSITIONABLE HEAD AND LIMBS

Osamu Fukui, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1979, Ser. No. 90,414
Claims priority, application Japan, May 1, 1979, 54-58486[U]
Int. Cl.³ A63H 3/20
U.S. Cl. 46—161 4 Claims



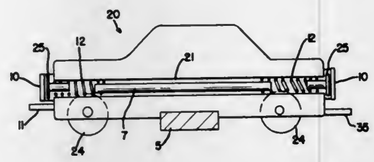
1. A toy doll figure comprising:
a plurality of limb members configured to simulate limb members such as arms and legs of a humanoid;
a head member configured to simulate a humanoid head;
an approximately triangularly-shaped hollow body member having a front portion and a rear portion, each portion having a substantially flat panel respectively corresponding to the front and the back of the toy doll figure and a peripheral rim disposed substantially at a right angle to the flat panels, the body member being assembled from the front and rear portions so that the rims are in contact with one another, the rims having apertures approximately aligned with the respective positions of the limb members and head members and one or more of the front portions and rear portions having an aligned aperture with a rim aperture extending across its flat panel to form a continous slot that extends across the right angled interface of the flat panels and the rim, each limb member having a substantially flat mating surface with a substantially circular periphery to permit a juxtapositional mounting of the respective limb members flush against the body member; the rim aperture for the arm limb members positioned to enable the arms to extend vertically upward relative to a horizontal support surface;
resilient connectors are fixedly attached to each limb member and head member and are attached within the hollow body member to permit limited relative movement between the body member and each limb member and the head member;
at least a pair of rib members are mounted respectively on the front portion and the rear portion within the hollow body member to secure at least one resilient connector, the respective rib members extend upward from the interior of the flat panel members respectively and are spaced apart from the peripheral rim, one of the respective rib members is configured with a groove to receive a portion of the resilient connector while the other rib member is configured with a flat surface to hold the resilient connector within the groove whereby the head member and the limb member may be selectively placed in at least two positions at the option of a player.

**4,295,292**

## DEMOLITION DERBY TOY

Stella Fitzgerald, Las Vegas, Nev., and Bryan Beaver, 3660 Boulder Hwy. - Space 129, Las Vegas, Nev. 89121, assignors to Bryan Beaver, Las Vegas, Nev.

Filed Dec. 11, 1979, Ser. No. 102,436
Int. Cl.³ A63H 11/10
U.S. Cl. 46—201 8 Claims



1. A demolition derby toy which comprises, in combination,
(a) a vehicle,
(b) shaft means slidably positioned in said vehicle along a vehicle axis and greater in length than said vehicle axis in said vehicle along which it lies,
(c) removable vehicle component means spanning a vehicle axis and removable from said vehicle in response to movement of said shaft means against said removable vehicle component, and
(d) ram means on said vehicle extending outwardly from said vehicle beyond a removable component means, wherein each said shaft means includes a shaft, a spring on each end of said shaft and a disc on each said spring, the distance between said discs being greater than the length of the vehicle along the shaft axis, said movable component means spanning said discs, said vehicle having grooves on opposite sides of said discs, said removable component means being removably positioned in said grooves and capable of both inward and outward movement in said grooves.

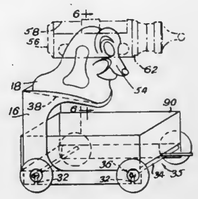


**4,295,293**

## NURSING BOTTLE HOLDER

Paul S. Baclit, 2167 College View Dr., Monterey Park, Calif. 91754

Filed Apr. 4, 1980, Ser. No. 137,289
Int. Cl.³ A63H 17/26; A47D 15/00
U.S. Cl. 46—202 2 Claims



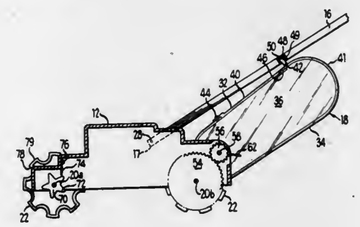
1. A nursing bottle holder in conjunction with a pull toy, forming a combination toy, wherein,
the bottle holder includes a main support member adapted to be placed in an active position over an infant in lying position, and having its longitudinal dimension in the head-to-body direction of the infant, and having a top wall element and depending side elements with bottom surfaces engageable with the surface the infant is lying on, said bottom surfaces being shaped to contact said surface and support said main member stably thereon,
a bottle support demountably supported on the main support member, and a bottle carriage supported in the bottle support for positioning a bottle carried thereby for feeding by the infant,
the depending side elements having vertical slots opening from said bottom surfaces in longitudinally spaced positions therealong, and
the pull toy having axles and wheels supporting a body, and
the main support member being fitted over the body of the pull toy, with the slots receiving the axles, and the pull toy supporting the nursing bottle holder, thereby constituting the combination toy.

**4,295,294**

## TOY LAWN MOWER

Donald A. Rosenwinkel, Tinley Park; Burton C. Meyer, Downers Grove, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 11, 1980, Ser. No. 139,467
Int. Cl.³ A63H 11/10
U.S. Cl. 46—205 12 Claims



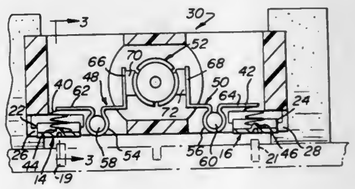
1. A toy power tool comprising:
a housing in the shape of a power tool;
wheel means mounted on said housing for rotation when said housing is pushed over a surface; and,
enclosure means extending away from said housing for holding particulate matter, said enclosure means including a bed of particulate matter and agitating means mounted within said enclosure means for creating a cloud-like particulate suspension of said matter in air, said agitating means including a rotatable brush mounted adjacent one end of said enclosure means, a lower end of said enclosure means conforming to the path of movement of said agitating means so that said particulate matter is contacted by said agitating means and dispersed within the interior of said enclosure means when said toy is pushed over a surface, said agitating means being operably connected to said wheel means and said enclosure means including a transparent region to make said cloud-like suspension visible from outside said enclosure means.

**4,295,295**

## PICK-UP SHOE AND MOTOR CONTACT ASSEMBLY FOR TOY VEHICLE

Derek A. Brand, Camarillo, and Derek R. Brand, Carpenteria, both of Calif., assignors to Tyco Industries, Inc., Moorestown, N.J.

Filed Mar. 17, 1980, Ser. No. 130,757
Int. Cl.³ A63H 18/12; F42B 13/34; H02K 21/26
U.S. Cl. 46—259 26 Claims



1. A pick-up shoe and motor contact assembly for a toy vehicle having a chassis and a motor for powering the vehicle, the motor having commutator segments, comprising:
a least one conductive brush arm for contacting the commutator segments of the motor,
said brush arm being moveable with respect to the motor commutator segments,
at least one conductive pick-up shoe depending from the vehicle chassis,
resilient means disposed in contact relation with said pick-up shoe and said brush arm for resiliently urging said pick-up shoe downwardly while resiliently urging said brush arm against the motor commutator segments,
said resilient means being adapted to conduct electrical current between said pick-up shoe and brush arm.

**4,295,296**

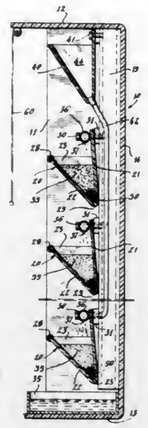
## VERTICAL GARDEN

Michael H. Kinghorn, 178 Bible St., Cos Cob, Conn. 06807

Filed Jan. 14, 1980, Ser. No. 111,863
Int. Cl.³ A01G 25/00
U.S. Cl. 47—82 14 Claims

1. An upright garden assembly for culture of vertical garden displays comprising a plurality of elongated open top growing troughs, said troughs having front and rear sides and drain apertures, support frame means for separately removably supporting said troughs horizontally one above the other to form a substantially vertically extending row of trays with the drain apertures of each trough positioned and directed toward said rear side to cause drainage to be directed to the rear of the rear sides of the troughs thereunder, a water container mounted above said row, a separate horizontal distribution conduit mounted above each trough and having irrigation aperture means for directing water to the respective trough, and plural

separate tubes extending substantially directly downwardly from the lower portion of said water container, each tube being



releasably terminated in a respective distribution conduit in a removable connection.

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**4,295,297**

## REVOLVING SECURITY DOOR

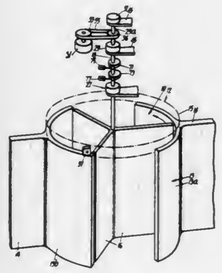
**Noel Carroll, Poet's La., Sherbrooke, Victoria, and William F. Carroll, 5 Garden Ct., Wheelers Hill, Victoria, both of Australia**

**Filed Sep. 24, 1979, Ser. No. 78,491**

**Claims priority, application Australia, Oct. 6, 1978, PD6263; Aug. 2, 1979, PD9865**

**Int. Cl.³ E05D** *15/02*

**U.S. Cl. 49—42** **3 Claims**



1. The security door comprising:

(a) a revolving door assembly having an upright shaft and a plurality of outwardly extending upright door panels secured thereto, said door assembly being arranged for rotation about the axis of said shaft,

(b) an enclosure extending around said revolving door assembly and presenting two opposed portions one to either lateral side of the revolving door assembly and each extending from an entrance to the security door to an exit thereof, the said opposed portions being so arranged that, as the said revolving door assembly revolves about said axis, there are always at least two said panels in position adjacent the upright inner surface of each respective said opposed portion to define a separate closed space between each respective opposed portion and the two adjacent said panels, whereby a person passing through the security door must move around said axis between an adjacent pair of said panels under rotation of the revolving door assembly, and through a said substantially closed space,

(c) an electric motor,

(d) a reduction gear drive coupled to said motor and to said shaft for driving of said shaft by operation of said motor through said reduction gear drive,

(e) rotation controlling means permitting revolving of said revolving door assembly about said axis in one direction but precluding operation in the other direction,

(f) a control circuit controlling operation of said motor for effecting revolving of the revolving door assembly in said one direction, said control circuit having a detector for detecting the presence of a person at said entrance and operating, pursuant to said detecting, to then cause said operation of said motor to revolve said revolving door assembly in said one direction and to brake the motor at the end of one revolution to stop revolving of the revolving door assembly,

(g) an electric clutch mechanism coupled to said shaft,

(h) a mat switch positioned in said enclosure adjacent to one of said opposed portions, being that of said opposed portion which must be passed by a person attempting passing through the security door from said exit to said entrance when said revolving door assembly revolves in said one direction, said mat switch being located such that it must be stepped on by such person attempting passing; said clutch mechanism and said mat switch being interconnected with said control circuit whereby said clutch mechanism is energized under control of the control circuit to lock said shaft against rotation thereof when a person steps on said mat switch whereby in use a person so stepping on the mat switch is trapped in the said substantially closed space then defined adjacent to the said one opposed portion.

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**4,295,298**

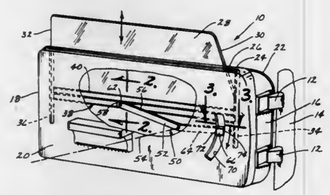
## WINDOW REGULATOR

**Richard A. Pundt, 4118 Hickory Hill La. SE., Cedar Rapids, Iowa 52403**

**Filed Aug. 27, 1979, Ser. No. 70,178**

**Int. Cl.³ E05F** *11/14*

**U.S. Cl. 49—353** **3 Claims**



1. A window regulator for vehicles comprising,

a vehicle door having a window opening, an interior side and exterior side,

a window pane recessed in said door, adapted to move through said window opening, and including two substantially vertically disposed edges,

a guide bar on said window pane within said door,

a single eccentric arm pivotally mounted away from its ends within said door with one end thereof being movably secured to said guide bar, and said pivot point being offset below a line extending between the opposite ends of said arm whereby the opposite ends of said arm move in substantially opposite directions,

an arcuate slot in said door being substantially vertically disposed and positioned forward from and concentrically about said pivot point,

a handle on the other end of said eccentric arm and being recessed within said arcuate slot and extending interiorally through said slot no further than the interior of said door, and

means connected to said door between the sides thereof and adapted to slidably receive the edges of said window pane.



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**4,295,299**

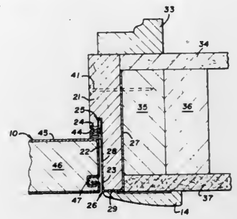
## STEEL CLAD WOOD DOOR FRAME

**David M. Nelson, Kewanee, Ill., assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Oct. 9, 1979, Ser. No. 83,133**

**Int. Cl.³ E06B** *1/04*

**U.S. Cl. 49—504** **6 Claims**



1. A door frame comprising wood frame members including a strike jamb, a hinge jamb, and a header, said frame members each being recessed longitudinally to provide a rabbet having a major surface and a minor surface perpendicular to said major surface, a slot substantially coplanar with a major surface of said rabbet extending into a non-recessed portion of said member and along substantially the entire length of said member, and a substantially J-shaped metal frame reinforcing member extending along substantially the entire length of said member and having a major flange, a minor flange substantially parallel to said major flange, and a connecting web substantially perpendicular to said major and minor flanges, said minor flange engaging the major surface of said rabbet and extending into said slot, and the major flange of said reinforcing member extending in engagement with the outer surface of said member.

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**4,295,300**

## FLAP ARRANGED ON DISCHARGE AND SEPARATING DEVICES OF VIBRATORY ABRASIVE CONTAINERS

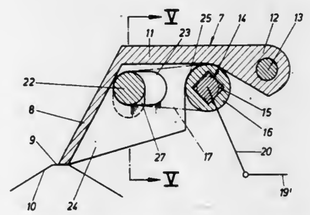
**Carl K. Walther, Wuppertal-Vohwinkel, and Karl Temme, Wuppertal-Elberfeld, both of Fed. Rep. of Germany, assignors to Carl Kurt Walther GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany**

**Filed May 27, 1980, Ser. No. 153,807**

**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923414**

**Int. Cl.³ B24B** *31/00*

**U.S. Cl. 51—163.2** **13 Claims**



1. In discharge and separating devices of vibratory abrasive containers forming a trough and having a flap for the placing into operation a separating path which is coordinated behind the flap, the flap being swingable around an axis of the flap shaft which is transverse to the container trough and being able to be moved upwardly by means of an actuating device into a maximum upper position, the improvement comprising

a control lever operatively connected to the actuating device being pivotally mounted under a portion of flap parallel to the flap shaft,

the control lever having a free end formed with a pin,

the flap being formed with an elongated slot having an end region,

the pin engaging into the slot in the flap and constituting means for limiting the upward movement of the flap by abutting against the end region of the slot.

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**4,295,301**

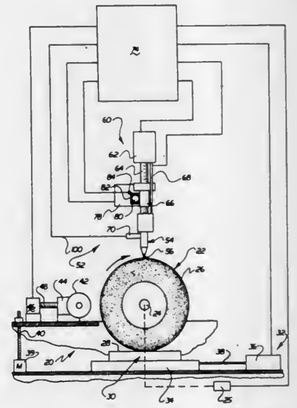
## DRESSING APPARATUS WITH MEANS FOR DETECTING GRINDING WHEEL WEAR

**Charles F. Barth, Parma; Thomas S. Stelson, Richmond Heights, and David E. Blake, Cleveland Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio**

**Filed Nov. 8, 1979, Ser. No. 92,623**

**Int. Cl.³ B24B** *53/00*

**U.S. Cl. 51—165.88** **8 Claims**



1. An apparatus comprising a grinding wheel having a circular side surface for use in grinding a workpiece, a member, motor means for moving said member toward the circular side surface of said grinding wheel from a retracted position in which said member is spaced from the circular side surface of said grinding wheel, drive means for rotating said grinding wheel as said member moves toward the circular side surface of said grinding wheel, detector means for detecting when said member initially engages the circular side surface of said grinding wheel, and control means for effecting operation of said motor means to move said member toward the side surface of said grinding wheel in incremental steps and for interrupting movement of said member between steps for a time period sufficient to enable said drive means to rotate said grinding wheel through at least one complete revolution.

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**4,295,302**

## INFLATABLE TENT

**Morris Liu, 5, Alley 21, Lane 172, Sec. 1 Keelung Rd., Taipei, Taiwan**

**Filed Oct. 9, 1979, Ser. No. 82,941**

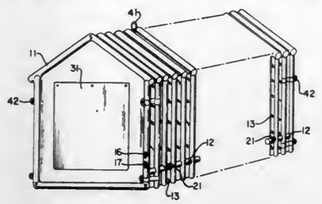
**Claims priority, application Taiwan, Aug. 21, 1979, 6823010**

**Int. Cl.³ E04B** *1/345*

**U.S. Cl. 52—2** **4 Claims**

1. An inflatable tent substantially comprising a plurality of inflatable frames for supporting the tent; an air passage tube for

interconnecting the frames and permitting air to flow therein; a plurality of blockage studs installed on the air passage tube for partitioning the air system inside the tent into several isolated parts; a waterproof layer of plastic film integrally formed with the frames and the air passage tube for filling the gaps between the frames and between the frames and the air passage



tube; the frames, the air passage tube, and the plastic film are multi-layer structured and all comprise an inner layer of soft plastic film and an outer layer of reinforcing netted plastic material; and inlet and an outlet for receiving or releasing air respectively; and a plurality of handles for easy set up of the tent.

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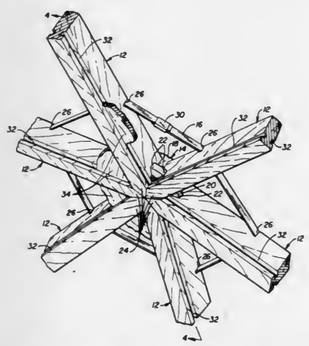
**4,295,303**

## GEODETIC DOME

**Wilmer A. Klebe, 35 Park Ave., Petaluma, Calif. 94952**

**Filed Oct. 1, 1979, Ser. No. 80,743**
**Int. Cl.³ E04B** *1/32;*
**U.S. Cl. 52—81** **25 Claims**



1. A joint for a geodetic dome structure comprising:
a spool having an outer surface including a radially projecting circumferential spline;
a plurality of beams having ends abutting the outer surface of the spool and engaging the spline to prevent movement of the beams axially with respect to the spool, each said beam having engaging means spaced from the end of the beam in abutment with the spool; and
a tension member passing through the engaging means in the beams and coplanar with the spool to retain the beams against the spool and prevent movement of the beams radially with respect to the spool.

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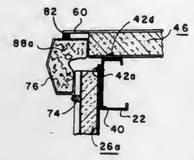
**4,295,304**

## PREFABRICATED PANEL CONSTRUCTION SYSTEM

**Kwon S. Kim, Oklahoma City, Okla., assignor to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.**

**Filed Apr. 4, 1978, Ser. No. 893,435**
**Int. Cl.³ E04B** *7/02;* **E04C** *1/10*
**U.S. Cl. 52—90** **10 Claims**

1. A prefabricated building system having an arrangement of support members disposed on a foundation for supporting the walls and roof of a building, comprising:
a plurality of panels of generally rectangular shape adapted to be joined edge to edge to form walls and a roof;
each panel having a foamed insulating core disposed between the interior and exterior metal sheets, the metal sheets having strengthening corrugations running generally parallel to side edges and transversely to end edges of the panels;
trim disposed at the juncture of the walls and the roof to form a weather-tight enclosure,



first closure strips disposed along the upper ends of the walls, the first closure strips having flat outer surfaces for attaching the trim and inner surfaces conforming to the corrugated exterior of the wall panels;
second closure strips disposed on an upper surface of the trim along a side of the building running transversely to the corrugations in the roof panels adjacent thereto, the second closure strips having flat lower surfaces for mounting on the trim and upper surfaces conforming to corrugated exterior of the roof panels;
the roof panels having an end flap portion of the exterior metal sheet extending beyond the foamed core to overlie and make a seal with the second closure strips.

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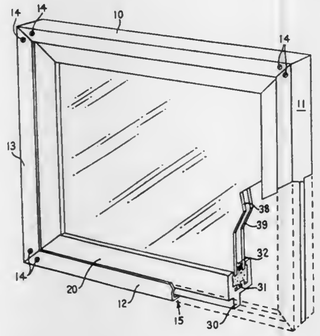
**4,295,305**

## THERMAL GLASS STRUCTURE AND METHOD FOR FORMING SAME

**Lyle N. Shelver, 5020 Ambrose Dr., Reno, Nev. 89502**

**Continuation-in-part of Ser. No. 585,299, Jun. 9, 1975, Pat. No. 4,033,087, which is a divisIon of Ser. No. 460,277, Apr. 12, 1974, Pat. No. 3,889,434. This application Dec. 23, 1976, Ser. No. 754,033**
**Int. Cl.³ E06B** *7/12*
**U.S. Cl. 52—172** **2 Claims**



1. The method of forming a couble-walled thermally insulated window including: (1) Placing two rectangular panes of glass of the same size and shape upon a spacer containing desiccant material adjacent the edges of said panes of glass; (2) providing a coating of waterproof mastic about the edges of the panes of glass and the desiccant and spacing material so as



to form one unit; (3) cutting a length of pliable material to the length which equals the length of all four edges of the rectangular unit as formed, and cutting three slits into said pliable material at those positions which will allow three corners of the said glass unit to protrude through said slits and wherein the slits are cut at such a distance that the fourth corner extends through the pliable material where the two cut ends of the pliable material are brought together, and placing said pliable material about the edges of said unit as formed; (4) placing adaptive elements of rigid material about said pliable material on each side of the unit; and (5) fastening the corners of the adaptive elements together.

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**4,295,306**

## WINDOW CLIP RETAINER

**Ronald H. Garman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00365, § 371 Date May 29, 1979, § 102(e) Date May 29, 1979, PCT Pub. No. WO80/02676, PCT Pub. Date Dec. 11, 1980**
**PCT Filed May 29, 1979, Ser. No. 89,118**
**Int. Cl.³ B60J** *1/02, 1/08*
**U.S. Cl. 52—208** **24 Claims**

1. In a window assembly (10,110,210, 310,410,510) having a pane (15,115,215,315,415,515) provided with a peripheral frame (16,116,216,316,416,516), and resilient mounting means (20,120,220,320,420,520) extending about the periphery of the frame for resiliently sealingly mounting the frame to a wall portion (14,114,214,314,414,514) defining an opening (13,113,213,313,413,513) for receiving the window assembly, said resilient mounting means providing the normal sole mounting of the frame to said wall portion, the improvement comprising a motion limiting means comprising:
a substantially rigid retainer (21,121,221,321,421,521) having a mounting portion (22,122,222,322,422,522), and a retaining portion (25,125,225,325,425,525); and
securing means (23,123,223,323,423,523) for fixedly securing said mounting portion to one of said wall portion and said frame, said retaining portion being disposed adjacent the other of said wall portion and frame with a preselected spacing therebetween in the normal position of the frame as supported by said resilient mounting means to prevent dislodging of the window assembly from the wall portion in the event of relative movement between the wall portion and frame permitted by said resilient mounting means reaching a preselected maximum movement as determined by said spacing of said retaining portion.

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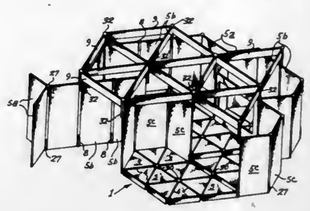
**4,295,307**

## MODULAR BUILDING STRUCTURE

**David C. Jensen, 2357 Riverside Dr., North Vancouver, British Columbia, Canada (V6B 1C8)**

**Continuation of Ser. No. 796,974, May 16, 1977, Pat. No. 4,186,533. This application Aug. 6, 1979, Ser. No. 63,761**
**Int. Cl.³ E04B** *1/343, 2/28*
**U.S. Cl. 52—236.1** **22 Claims**

1. A freestanding, post-free modular building structure comprising an array of upright modular panels; panel-connecting means connecting adjacent edges of adjacent panels in said array; three overhead beam members, said beam members being horizontal and assembled in coplanar triangular relationship; and beam-and-panel connecting means connecting each end of said beam members with one adjacent beam member end with said beam members in such triangular relationship



and interconnecting said interconnected beam member ends and said modular panels for supporting said interconnected beam members entirely above the upper edges of said array of panels with at least one of said beam members being parallel to at least one of said panels.

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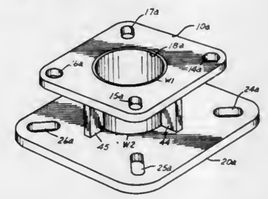
**4,295,308**

## POLE BASE ASSEMBLY, BOLT CIRCLE ADAPTOR

**Carl Korfanta, Denver, Colo., assignor to K S L Corporation, Denver, Colo.**

**Filed Oct. 26, 1979, Ser. No. 88,530**
**Int. Cl.³ E04H** *12/00*
**U.S. Cl. 52—296** **4 Claims**



1. An adapter for pole bases having a bolt hole configuration different than the bolts formed in a concrete foundation, comprising:
(a) a generally square bottom plate having elongated bolt holes set on radials from the center of said plate for mating over the bolts in a concrete foundation, and having a large central circular bore;
(b) a generally square top plate having elongate bolt holes set on radials from the center of said plate for mating with bolt holes on a pole base which are of a different configuration than the bolts on the concrete foundation, and having a central circular bore;
(c) a short length of pipe welded into the bores of said bottom and top plates to rigidly hold said plates parallel and provide space for manipulating attaching nuts and bolts, and
(d) at least four spacers welded to the top and bottom plates securing the plates rigidly and strongly together and spaced a predetermined distance apart, said spacers being spaced uniformly around said short length of pipe.

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**4,295,309**

## LOAD SUPPORT STRUCTURE

**Clarence J. Hornbeck, Allentown, Pa., assignor to Follett Corporation, Easton, Pa.**

**Filed Oct. 1, 1979, Ser. No. 80,885**
**Int. Cl.³ E04C** *1/26*
**U.S. Cl. 52—309.7** **20 Claims**

1. Apparatus comprising a housing having at least one wall

for resisting forces within the housing, said wall comprising a tension member on an outer surface thereof and at least one arched compression member inwardly thereof, said compression member being juxtaposed to the tension member and spaced therefrom except for the end portions thereof, said members having curved end portions adjacent each free end thereof, the curved end portions of said members being welded together, each free end of said compression member being spaced from the adjacent free end of said tension member, a low modulous filler between said members and bonded to the

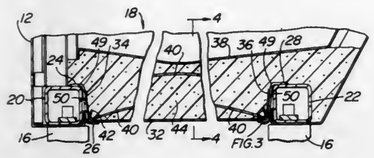

FIG. 3

juxtaposed surface of each of said members so that force supplied to one of said members will be resisted in part by the shear and tension strength of the filler, and means for supporting said members on said housing at or adjacent the focal points for minimizing residual bending moments including at least one hanger on opposite sides of the end portions of said tension member, each hanger having one end fixedly anchored to a support on said housing and which is stationary with respect to said wall, each hanger having its other end fixedly secured to the tension member at a location spaced from the ends of the tension member.

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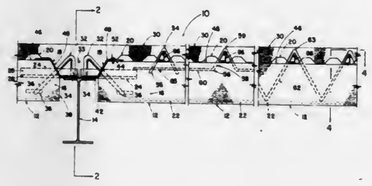
**4,295,310**

## PRECAST CONCRETE JOIST COMPOSITE SYSTEM

**Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940**

**Filed Aug. 22, 1979, Ser. No. 68,830**
**Int. Cl.³ E04B *1/16***
**U.S. Cl. 52—334** **41 Claims**



1. A precast concrete joist composite system, comprising:
(a) support means;
(b) at least first and second space apart precast concrete joist members supported at their respective ends by said support means, each of said joist members having a concrete portion, said concrete portions comprising respective end faces, said joist members comprising at their said end portions respective projecting structures that have first parts anchored in said concrete portions of their respective joist members and second parts extending from said concrete portions, said joist members including end faces, said end faces having respective portions thereof that slope downward and away from said concrete portions, said concrete portions comprising respective top surfaces; said projecting structure second part being at least partly disposed on said support means;
(c) at least a first pan element that is disposed at said end face, a first part of said pan element being disposed over said top surfaces of said concrete portions and a second part thereof disposed over said sloping portions of said end faces;
(d) a decking element disposed over the respective said top surface of said first and second joist members and spanning the space between said joist members and part of said first pan element.

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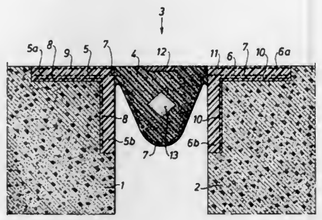
**4,295,311**

## EXPANSION JOINT ELEMENT

**Anders Dahlberg, Täby, Sweden, assignor to Tätis Plasttätningar AB, Täby, Sweden**

**Filed Nov. 28, 1979, Ser. No. 98,047**
**Claims priority, application Sweden, Dec. 1, 1978, 7812402**
**Int. Cl.³ E01C *11/04*; E04B *1/68***
**U.S. Cl. 52—396** **6 Claims**



1. A pre-fabricated expansion joint element for forming an elongated surface joint between two concrete construction parts, comprising an intermediate resilient member, substantially consisting of an elastic material, and side elements adjoining at each side thereto, and respectively adapted to be secured to one of the concrete construction parts, said side elements being constituted by profile elements of an epoxy plastic having reinforcing means, said profile elements being securable by adhesion directly onto the edge portions of the concrete construction parts, the intermediate resilient member having a thickened central portiion, at least one of said reinforcing means being integrally cast into both of the profile elements as well as into the intermediate resilient member, and the external surface of the intermediate resilient member being connected to and substantially in alignment with the external surfaces of the profile elements.

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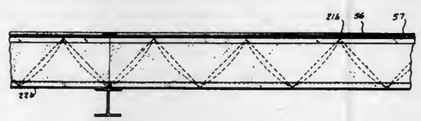
**4,295,312**

## BUILDING CONSTRUCTION

**Henry F. Campbell, Belleville, Mich., assignor to Campbell Research Corporation, Detroit, Mich.**

**Filed Jan. 22, 1979, Ser. No. 5,473**
**Int. Cl.³ E04B *1/40, 7/00***
**U.S. Cl. 52—408** **7 Claims**



1. A building construction comprising a panel comprising spaced sheets and a plurality of spaced longitudinally extending prefabricated truss members,
each said truss member comprising a pair of channels and an undulating member comprising alternating first and second apices connected by legs, the apices being bonded to said channels,
at least one of said sheets having a plurality of transversely spaced longitudinally extending grooves receiving the truss members,
said grooves having a cross sectional configuration conforming to the cross sectional configuration of the channel of said truss member,
and means for fastening said last-mentioned channel to said sheet,
said sheet having said grooves therein including a partially extending groove along each longitudinal edge in which a truss member is positioned, the corresponding channel of the truss member including a base wall and side walls, the free edge of the sheet terminating along the base wall of the channel, adjacent panels being positioned such that they extend parallel with one another in side-by-side relation,
a plurality of said panels, means defining a joint between adjacent panels comprising a member which has a generally T-shaped section including a web extending between the flanges of adjacent truss members of panels and engaging the free edges of said flanges of the adjacent channels of said truss members and arms extending laterally outwardly and including portions extending inwardly against the sides of the partial groove in the sheet member.



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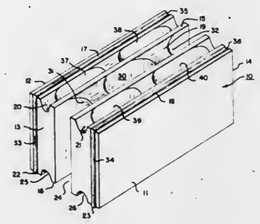
**4,295,313**

## BUILDING BLOCKS, WALL STRUCTURES MADE THEREFROM AND METHODS OF MAKING THE SAME

**John N. Rassias, c/o Intralock Systems International Corporation, 565 Park Ave., New York, N.Y. 10021**

**Filed Dec. 10, 1979, Ser. No. 102,251**
**Int. Cl.³ E04B *2/68***
**U.S. Cl. 52—438** **10 Claims**



1. A substantially rectangular masonry building block having a pair of spaced opposite generally parallel side walls, spaced top and bottom faces and a pair of spaced end faces, a pair of spaced apart ribs on said top face, one adjacent and spaced from each side wall, a pair of mating recesses on said bottom face, an intermediate generally centrally extending horizontal groove in each of the top and bottom faces, a pair of narrower grooves, one on either side of said centrally extending groove on each of said top and bottom faces and spaced from said ribs and mating recesses and from said intermediate groove, a pair of spaced ribs on one end face, a pair of mating grooves on the other end face, said ribs and grooves being aligned with the ribs and recesses on the top and bottom faces, an intermediate vertical passage in said block corresponding in width to the widest portion of the central grooves on said top and bottom faces, a pair of vertical passages on each side of said intermediate vertical passage connecting the pair of top and bottom narrower grooves, and a vertical recess in each end face intermediate the side walls and having a cross section substantially equal to one half of said intermediate vertical passage.

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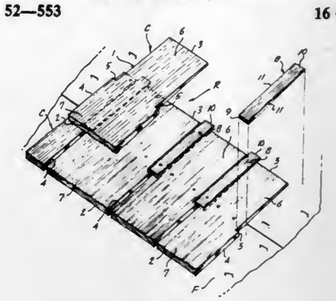
**4,295,314**

## SHOULDERED SHAKE AND FILLER ROOF STRUCTURE

**Stewart Ferguson, P.O. Box 12, Aloha, Wash. 98525**

**Filed Jul. 23, 1979, Ser. No. 59,998**
**Int. Cl.³ E04D *1/00***
**U.S. Cl. 52—553** **16 Claims**



1. In a roof including generally rectangular individual covering elements having respective butt and tip ends and applied in generally coplanar, side adjacent relationship in each of several overlapping courses, the improvement comprising the adjacent sides of adjacent covering elements in a course having respective shoulders extending transversely of such sides, each shoulder dividing its covering element into respective tip and butt portions of unequal width, and a filler fitted between such adjacent sides and abutting said shoulders.

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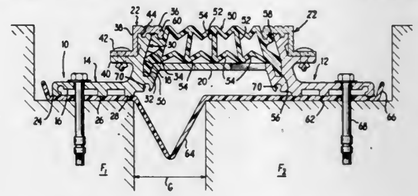
**4,295,315**

## EXPANSION JOINT COVER

**David M. Lynn-Jones, Muncy, Pa., and R. Gordon Stewart, Georgetown, Canada, assignors to Construction Specialties, Inc., Cranford, N.J.**

**Filed Oct. 23, 1978, Ser. No. 953,775**
**Int. Cl.³ E04B *1/68***
**U.S. Cl. 52—573** **3 Claims**



1. An expansion joint cover for bridging the space between adjacent sections of a building on opposite sides of an expansion gap comprising a pair of elongated extruded rigid frame members adapted to be anchored to the respective sections, each of the frame members including a generally vertical wall portion and a multiplicity of longitudinally spaced apart, substantially horizontal plate-like tongues integral with and supported in cantilevered relation by the vertical wall portion at locations spaced from the upper edge of the wall portion and in longitudinal alignment, each tongue being a vestigial segment of a longitudinally continuous flange from which pieces corresponding to the spaces have been removed, the longitudinal spacings between adjacent tongues of each frame member being not less than the widths of the tongues of the other frame member such that in the cover as installed in the expansion gap the tongues of each frame member project into the spaces between the tongues of the other frame member and a generally longitudinally continuous bridge is formed by an interven-

ing of end portions of the tongues of each of the frame members between end portions of the tongues of the other along the expansion gap, and wherein each frame member includes a longitudinally continuous flange extending generally inwardly from the vertical wall portion toward the expansion gap and spaced apart from and located above the tongues, the flange defining with the tongues a longitudinal inwardly open cavity, and a resiliently compressible sealing element composed of interconnected walls defining hollow longitudinally elongated cells engaging the vertical wall portions of the respective frame members and supported by the tongues, wherein portions along the edges of the sealing element are received and retained in the respective cavities of the frame members, wherein said sealing element includes a multiplicity of longitudinally continuous side by side, generally rectilinear hollow cells defined in cross section by transversally spaced apart generally vertical walls and vertically spaced apart generally transverse walls interconnecting the respective top and bottom edges of adjacent vertical walls, at least one of the transverse walls of each cell having angularly related segments adapted to fold into the space within the cell upon movement of the building sections toward each other tending to close the gap, said transverse walls having angularly related segments being the top walls on every other cell along the width of the element and the bottom walls of the remaining cells, the number of side by side cells of the sealing element being an uneven number not less than five, and the top wall of the center cell having angularly related segments, and wherein the vertical walls defining the center cell extend higher above the tongues than the vertical walls of the remaining cells, the top of the walls of the center cell being generally flush with the upper surface of the flanges of the frame members.

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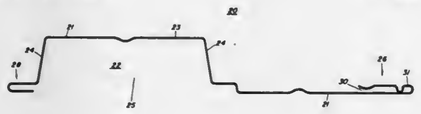
**4,295,316**
**NESTABLE BUILDING WALL PANEL**
**Lawrence E. Carlson, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**
**Filed May 2, 1977, Ser. No. 792,782**
**Int. Cl.³ E04C** *1/10*
**U.S. Cl. 52—588** **1 Claim**



1. A contoured building panel adapted to be secured to a building structure by concealed fasteners, said panel having faces for exposed and concealed disposition on a building structure and having improved nestability with other like panels in a vertical stack for storage and shipment with a relatively short stack height, comprising:

(a) a body portion including at least one longitudinally extending channel therein having opposed sidewalls substantially continuously diverging from the bottom of the channel to the mouth of the channel to permit nesting of the channels of stacked panels, each of said diverging sidewalls defining an angle of 5° to 80° measured between said sidewall and a plane passing through the sidewall near the mouth of the channel and normal to the general plane of said panel;

(b) lateral edge structures along opposite sides of said body portion for engagement with an opposite edge structure of an adjacent panel;

each of said edge structures projecting outwardly substantially laterally from the mouth of the channel in said body portion, having leg portions substantially lying in a plane parallel to the general plane of said panel with no portion of each of said edge structures projecting inwardly beyond the periphery of its respective side of said body portion, and having a maximum extent measured perpendicular to the general plane of said panel no more than 25% of the extent of the channel measured in the same direction, the perpendicular extent being determinative of the nesting height of stacked panels;

at least one of said edge structures having a reverse bend therein forming a groove open laterally inward of said panel for receiving at least a portion of the opposite edge structure of an adjacent panel for engaging said panels in a tension joint;

(c) a fastening edge portion on the edge structure which has said reverse bend therein and disposed laterally outwardly of the open mouth of said groove and adapted to receive fastening means to secure said panel to a building structure with the fastening means underlying said body portion of the adjacent panel for concealing the fastening means; and

(d) the angle of the diverging sidewalls of the channel being a function of the maximum perpendicular extent of said edge structures so that said like panels when vertically stacked contact adjacent panels along the leg portions of said edge structures and along said diverging sidewalls of said channel for increasing support surfaces of nested panels.

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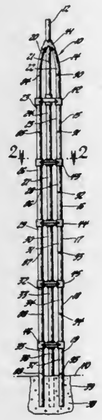
**4,295,317**
**MODULAR TOWER AND METHOD OF CONSTRUCTING SAME**
**Willem R. VanTielen, Rte. No. 3, Box 17, East Jordan, Mich. 49727**
**Filed Jun. 14, 1979, Ser. No. 48,482**
**Int. Cl.³ E04H** *12/00*
**U.S. Cl. 52—637** **6 Claims**



1. A modular tower comprising, in combination, substantially identical first and second tower sections, each tower section including at least two substantially identical parallel vertical columns, each of said columns having a hollow first end defined by an inside and outside diameter and a second end defined both by an outside diameter that is slightly smaller than said first end inside diameter and also by a shoulder, said second column ends in said first section being inserted in said first column ends in said second section until each of said first column ends abuts said shoulder on one of said second column ends; a brace assembly for connecting said sections, said brace assembly including a plurality of tubes and a plurality of support members rigidly connecting said tubes, each of said tubes being defined by a vertical axis and an inside diameter slightly larger than the outside diameter of said first column end, said brace assembly being positioned so that each of said tubes substantially surrounds one of said first column ends in said first section at a point where one of said second column ends is inserted in said one first column end; and connecting means for rigidly securing said brace assembly to each of said first and second column ends at a point where said first and second column ends are surrounded by tubes in said brace assembly so as to fasten each of said tubes to first and second column ends in said tubes whereby one of said sections is supported on the other of said sections.



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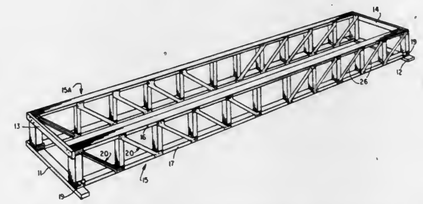
**4,295,318**
**CONNECTOR FOR WOODEN TRUSS**
**Milton Perlman, Miami Beach, Fla., assignor to Monex Corporation, North Miami Beach, Fla.**
**Filed Jul. 26, 1979, Ser. No. 60,912**
**Int. Cl.³ E04C** *3/02*
**U.S. Cl. 52—693** **2 Claims**



1. A unitary metal connector for interconnecting spaced-apart chord members of a wooden truss structure, wherein said truss structure includes a plurality of wooden studs extending between the parallel spaced-apart chord members, said connector comprising an elongated generally rectangular support member having a central stiffening rib extending longitudinally thereof and side flanges formed thereon and extending therefrom substantially normal thereto along the side edges of said rectangular support member, said connector further including two end plates respectively integrally formed with said support member at the opposite ends thereof, each of said end plates being generally rectangular in shape and coplanar with said support member and being oriented with respect to said support member so that the longitudinal axis of said support member extends generally diagonally of said end plates; each of said end plates having fastening means integrally formed therewith consisting of a plurality of rows of aligned barbs struck from the associated end plate and extending therefrom substantially normal thereto and in the same direction, said barbs being configurated and arranged such that said fastening members are adapted to be respectively embedded in the two associated spaced-apart wooden truss members and into opposite ends of spaced wooden studs extending therebetween, for attachment thereto and to provide a strengthening interconnection therebetween.

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**4,295,319**
**FLOOR PANEL**
**Kary A. Griffin, Dallas, Tex., assignor to G. H. Products, Inc., Dallas, Tex.**
**Filed Oct. 31, 1979, Ser. No. 90,018**
**Int. Cl.³ E04B** *2/28*
**U.S. Cl. 52—785** **4 Claims**

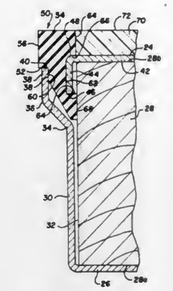
1. A floor panel for use in elevated floor assemblies, the panel comprising:

a noncompressible solid core having a side;

a bottom metal sheet having an upwardly deflected edge formed about a periphery of the bottom, the edge forming a first shoulder;

a top metal sheet having a downwardly deflected edge, said edge spaced from the side of said core and inwardly of said first shoulder, said edge further forming a second shoulder, and said top metal sheet and bottom metal sheet being positioned on opposed sides of said core; and

a flexible edge member having an outer shoulder engaging said first shoulder on said bottom metal sheet and an inner channel formed in said flexible edge member having an upper inner shoulder engaging the upper surface of said top metal sheet and a lower inner shoulder engaging said second shoulder of said top metal sheet, the channel receiving said deflected edge of said top metal sheet to prevent rotation of the flexible edge member, said flexible



edge member being wedged between the upward deflected edge of the bottom metal sheet and the downward deflected edge of the top metal sheet, and said flexible edge member further having an abuttment surface formed adjacent said channel and lower inner shoulder, the abuttment surface having a substantially flat, wide surface preventing inward rotation of the edge member to engage a side of said core.

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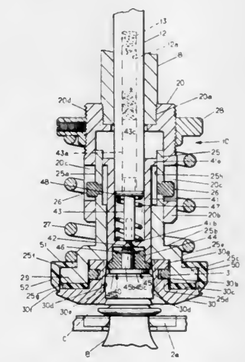
**4,295,320**
**CLOSURE CONVERSION APPARATUS FOR EXISTING CLOSURE APPLICATING MACHINES**
**Wendell D. Willingham, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**
**Filed Jan. 9, 1980, Ser. No. 94,514**
**Int. Cl.³ B67B** *3/20;* **B65B** *7/28*
**U.S. Cl. 53—201** **5 Claims**



1. In a capping machine of the type having a rotating turret arranged to successively move the plurality of bottles around its perimeter and including means for loosely positioning a threaded cap on the threaded neck of each bottle, a continuously rotating cap applicator shaft located above each bottle and movable therewith around the turret, and means for moving each applicator shaft downwardly towards the respective bottle for a portion of the peripheral path of the bottle around the turret, the improvement comprising a capping head carried by each applicator shaft including the following elements:

(1) an annular housing assembly adapted to be rigidly secured to the lower end portions of the cap applicator shaft;
(2) an annular cap actuator assembly mounted for rotation relative to said annular housing assembly, said annular cap actuator assembly having means on its inner wall for engaging a cap positioned on a bottle in the turret to rotate the cap;
(3) a pair of annular radial surfaces respectively provided on said housing and said cap actuator assembly and disposed in axially spaced alignment;
(4) a washer of frictional material mounted between said radial surfaces;
(5) resilient means urging said radial surfaces towards each other, thereby controlling the amount of friction exerted on said friction washer, and
(6) means for shielding said friction washer from ambient air, thereby maintaining the friction characteristics of said washer substantially independent of ambient humidity conditions.

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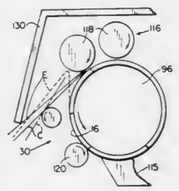
**4,295,321**
**ENVELOPE PROCESSING MACHINE**
**John R. DeHart, Coral Gables, and Robert A. Majewski, Homestead, both of Fla., assignors to Docutronix, Inc., Homestead, Fla.**
**Filed Jul. 9, 1979, Ser. No. 56,275**
**Int. Cl.³ B65B *43/30***
**U.S. Cl. 53—381 R** **17 Claims**



1. In a machine for advancing a pre-opened envelope and separating the envelope from its contents, the envelope having two panels defining an opening therebetween along a leading edge of the envelope and connected together along the remaining edges of the envelope, the machine having feeding means for receiving and advancing an envelope along a generally predetermined path, severing means disposed along the path for engaging the advancing envelope and cutting it inwardly of its opposite side edges to sever connections between the panels along opposite side edges thereof leaving one panel connected to the other panel along a trailing edge opposite the one edge and the contents in juxtaposition between the two panels, and separating means disposed to receive the severed envelope and its contents from the severing means and including a cylindrical vacuum drum having vacuum ports opening through its peripheral surface for engaging and holding the one panel in engagement with an associated portion of the peripheral surface of the drum, drive means for rotating the drum about its axis to advance the severed envelope and move it in a direction away from its contents, and a follower roller journalled for rotation about an axis parallel to the axis of said drum, said follower roller and said drum defining a nip therebetween through which said advancing severed envelope and its contents are constrained to pass, the improvement wherein said separating means includes an extraction roller journalled for rotation about an axis parallel to said drum axis and angularly spaced about said drum axis from said follower roller axis and in the direction of drum rotation for engaging the contents as the contents advances through said nip and along a path generally tangent to the peripheral surface of said drum, means for rotating the extraction roller about its axis, and abutment means in the path of the leading edge of the other panel for engaging the other panel as it advances through said nip and along a path generally tangent to the peripheral surface of said drum and biasing the other panel toward the contents and the extraction roller to urge the contents toward engagement with the extraction roller.

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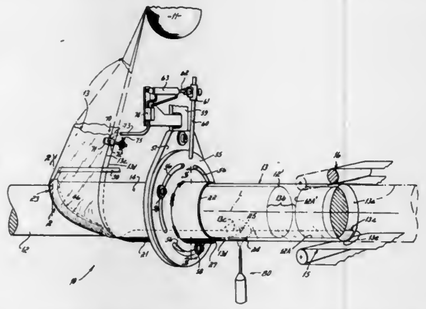
**4,295,322**
**TUBE FORMING SHOE AND METHODS OF FORMING A FLEXIBLE WEB INTO A TUBE**
**Peter Kuipers, Taylors, S.C., assignor to Nordson Corporation, Amherst, Ohio**
**Filed Oct. 15, 1979, Ser. No. 85,044**
**Int. Cl.³ B65B *9/00***
**U.S. Cl. 53—450** **36 Claims**

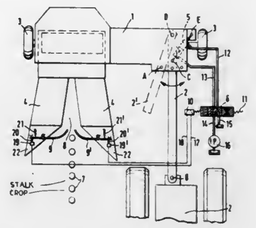


1. Apparatus for forming a flexible web into a tube, said apparatus including a tube forming shoe comprising:
a tubular shoe having an entry end and an exit end,
said entry end being defined by a web brake edge,
said brake edge including a plurality of fluid ports directed outwardly for blowing fluid onto said web near said brake edge and for holding said web away from said brake edge where said web bends around said brake edge and when it is pulled through said shoe, and
said brake edge having a forward curved portion which, when developed in a flat plane, has a radius approximately equal to the interior diameter of said shoe, and said brake edge further including straight portions extending from each side of said curved portion.

29. A method of forming a flat flexible film web into a tube-shaped film having a longitudinal seam, said method including the steps of:
introducing said web to one end of a tube forming shoe at an angle with respect to a longitudinal axis of said shoe,
bending said film around a curved brake edge of said shoe, said brake edge having a formed curved portion which, when developed in a flat plane, has a radius approximately equal to the interior diameter of said shoe, and said brake edge further including straight portions extending from each side of said curved portion,
drawing said film across said brake edge of said shoe and guiding said film into a tubular shape while pulling said film through said shoe,
blowing fluid from said edge against said film to hold said film away from said brake edge as said film is bent around said brake edge and pulled through said shoe, and
including the further step of sensing changes of position of an edge of said film prior to said bending and rotating said shoe in response to the change of position of said edge to adjust film position in said shoe.

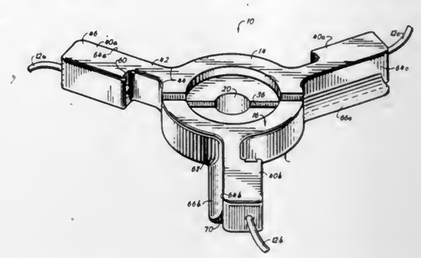


**4,295,323**
**TOWED CROP HARVESTER**
**Martin Maier; Josef Pürrer, both of Gottmadingen, and Ronald Clemens, Allensbach, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG (Zweigniederlassung Fahr), Gottmadingen, Fed. Rep. of Germany**
**Filed Mar. 28, 1980, Ser. No. 135,080**
**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912715**
**Int. Cl.³ A01D *75/28***
**U.S. Cl. 56—10.2** **3 Claims**




1. A harvesting machine comprising:
a chassis adapted to be drawn along the ground;
a harvesting mechanism on said chassis having a crop engaging mouth and adapted to harvest stalk crop guided into said mouth upon the movement of the chassis along the ground along a row of crop to be harvested;
a tow bar pivotally connected to said chassis and adapted to be attached to a tractor to enable the chassis to be towed thereby;
a hydraulic cylinder pivotally connected to said chassis and to said tow bar at respective locations spaced from the pivot between said tow bar and said chassis whereby hydraulic pressurization of said cylinder varies the angular orientation of said tow bar and said chassis about said pivot;
two lateral guide feelers swingable on said chassis on opposite sides of said mouth responsive to the said position of said row; and
control means connected between said feeler and said cylinder for pressurizing said cylinder in response to said feeler to align said mouth with said row, said control means including
a hydraulic pump,
a multiposition valve connected between said pump and said cylinder and having a valve-actuating solenoid,
respective double-pole switches operatively connected with said feelers and actuated thereby each of said switches including a normally closed fixed contact opened by the pivoting of the respective feeler upon engagement with a stalk of said crop and a normally open fixed contact closed by said pivoting of the respective feeler and respective movable contacts assigned to said fixed contacts and connected to the respective feeler,
first circuit means electrically connecting the normally closed fixed contact of one of said switches to the normally open fixed contact of the other switch and the normally open fixed contact of said one of said switches to the normally closed fixed contact of said other switch,
second circuit means connecting the movable contacts associated with said normally closed switches together and to an electric current source, and
third circuit means connecting the movable contacts associated with said normally open switches to terminals of said solenoid.

**4,295,324**
**BALANCED MOWER HEAD FOR CARRYING A PLURALITY OF MONOFILAMENT LINES**
**Alfred A. Frantello, Satellite Beach, Fla., and Lester R. Kefauver, Knoxville, Tenn., assignors to Corinco, Inc., Knoxville, Tenn.**
**Filed Jun. 30, 1980, Ser. No. 164,093**
**Int. Cl.³ A01D *55/18***
**U.S. Cl. 56—12.7** **10 Claims**



1. A head for carrying a plurality of monofilament lines suitable for being mounted on the shaft which secures the blade of a conventional rotary mower said head comprising:
a head body defining an upper surface and a lower surface, and a centrally positioned bore extending through said head body, one end portion of said bore opening on said upper surface and the further end portion of said bore opening on said lower surface, said bore being proportioned for receiving said shaft,
a plurality of line holders extending outwardly from said body, each of said line holders including a first end portion joined with said body at annularly spaced locations, and an outboard end portion, said outboard end portion defining an opening therethrough having an axis substantially perpendicular to the axis of said bore in said body, each of said line holders defining a leading surface, and
a grass lifting blade carried by the leading surface of each line holder, said blade serving to generate air currents in a vertical direction during operation of said mower to stand the vegetation up during the cutting operation.

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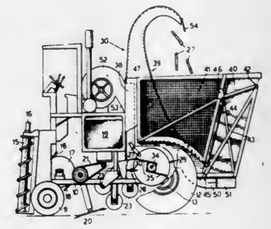
**4,295,325**
**SUGAR CANE HARVESTER**
**Christopher J. Cannavan, Iona Rd., Home Hill, Queensland, Australia (4806)**
**Filed Sep. 10, 1979, Ser. No. 74,051**
**Claims priority, application Australia, Sep. 15, 1978, PD5981**
**Int. Cl.³ A01D *45/10***
**U.S. Cl. 56—13.9** **5 Claims**



1. A sugar cane harvester of the type having a mobile frame, a base cutter on the frame for cutting cane stalks at or near to ground level as the harvester advances, a chopping cutter on the frame, means for feeding cut cane stalks to the chopping cutter which cuts them into billets, and means for elevating and

discharging the billets, wherein the chopping cutter and elevating means include:

a rotary cutter having a knife blade on a rotatable shaft,

a vaned thrower, rotatable about an axis parallel to that of the rotary cutter shaft,

means for counter-rotating the rotary cutter and the rotary thrower,

the rotary cutter knife blade coacting with a vane of the thrower to sever cane fed thereto into billets,

the thrower thereafter throwing the severed billets upwardly, and

a cane guard chute extending essentially upright from the thrower and receiving such severed billets, the upper part of said chute curving downwardly to an outlet for the billets,

the speed of rotation of said thrower being such that said thrower propels the severed billets upwardly into and through said cane guard chute, without separate assistance, into a collecting bin.

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**4,295,326**

## SELF-PROPELLED FLAIL BLADE LAWN MOWER

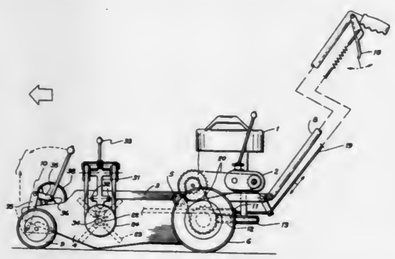
**Douglas F. Green, Brisbane, Australia, assignor to Royer Mowers (Aust.) Pty. Ltd., Brisbane, Australia**

**Filed Mar. 10, 1980, Ser. No. 129,092**

**Claims priority, application Australia, Nov. 4, 1977, PD2313**

**Int. Cl.³ A01D** *50/02*

**U.S. Cl. 56—11.3** **6 Claims**



1. A self-propelled flail blade lawn mower comprising a support frame having forward and rearward ends, a handle assembly extending upwardly and rearwardly from said rearward end and a cutter housing extending forwardly of said forward end, said support frame and said cutter housing being affixed to a common cross member extending transversely across the support frame whereby the cross member supports the forward end of the support frame and the rearward end of the cutter housing, a rear axle and wheel assembly rotatably supported substantially in the vicinity of the rearward end of said support frame and a pair of front wheels rotatably mounted substantially in the vicinity of the forward end of said cutter housing, a cutter shaft bearing a plurality of pivotally mounted flail blades horizontally and rotatably supported within said cutter housing, said flail blades being adapted for rotation in a vertical plane, a motor and a transmission box mounted on said support frame, said motor having a downwardly extending output shaft and said transmission box having input and output shafts, first drive means operatively connected between said transmission box output shaft and said rear axle and wheel assembly, second drive means connectable between said motor output shaft and said transmission box input shaft in response to the movement of a first lever mounted on said handle assembly, third drive means connectable between said motor output shaft and said cutter shaft in response to the movement in one direction of a second lever mounted on said cutter housing, and brake means operable to prevent rotation of said cutter shaft in response to the movement of said second lever in a direction opposite to said one direction.

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**4,295,327**

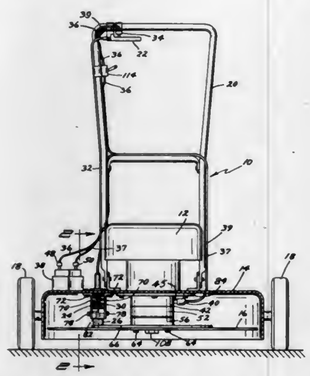
## MAGNETIC SAFETY CLUTCH FOR ROTARY LAWNMOWER

**Everest J. Bortolussi, 3148 Louisiana Ave. N., Minneapolis, Minn. 55427**

**Filed Jun. 5, 1980, Ser. No. 156,692**

**Int. Cl.³ A01D** *75/20*

**U.S. Cl. 56—11.3** **4 Claims**



1. A magnetic safety clutch apparatus for use with a rotary lawnmower having a main frame, a prime mover mounted on said frame, a prime mover drive shaft extending downwardly of said main frame, a rotary lawnmower blade adaped to be rotated by said drive shaft on a vertical axis, and a lawnmower operating handle mounted to a said main frame, said apparatus including:

A. a source of electromotive force on said frame;

B. a magnetic flux-producing coil fixedly mounted to said main frame in concentric, surrounding relation to said drive shaft;

C. a housing of electromagnetic material encompassing said coil;

D. a first magnetic clutch plate fixed to said drive shaft to rotate therewith and situated in close relationship to said coil housing to provide a low reluctance path between said first clutch plate and said housing;

E. a second magnetic clutch plate mounted to rotate with said blade and freely rotatably mounted with respect to said drive shaft and movable axially of said drive shaft between an engaged, drive transmitting, position and an unengaged position with respect to said first clutch plate;

F. means to limit axial movement of said second clutch plate to retain it within the effective magnetic field of said coil when energized;

G. a lever action hand switch mounted to said operating handle to be readily accessible to an operator of said lawnmower, said hand switch being biased to be normally situated in an inoperative condition and being manually movable to and maintainable in an operative condition; and

H. circuit means including said hand switch, said circuit means being operative to electrically connect said magnetic coil to said source of electromotive force when said hand switch is in its operative condition and to disconnect said coil from said source when said hand switch is in its inoperative condition.



**4,295,328**

## HOLDING MEANS FOR GRAIN LIFTERS, SUPPORT SKIDS AND THE LIKE

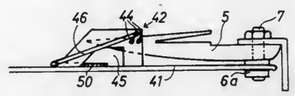
**Gustav Schumacher, II, Gartenstrasse 8, and Günter Schumacher, Raiffeisenstrasse 10, both of 5231 Eichelhardt, Fed. Rep. of Germany**

**Filed Aug. 3, 1979, Ser. No. 63,478**

**Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835505; Jul. 17, 1979, 2928871**

**Int. Cl.³ A01D** *55/10*

**U.S. Cl. 56—313** **19 Claims**



1. Holding apparatus for coupling a resilient, substantially flat support leg of a grain lifter, support skid or the like, to a cutter finger of the cutter mechanism of a harvester, comprising:

clamping means for clamping one end of said support leg with respect to said cutter finger;

a retention bracket fixed to said support leg at a location spaced from said clamping means, said retention bracket including a pair of upstanding legs, each of which extends from said support leg on a respective side of said cutter finger upwardly beyond the same; and

locking means located vertically above said cutter finger and extending between said upstanding legs of said retention bracket so that said cutter finger is received in the space defined between said support leg, said locking means and said pair of upstanding legs of said retention bracket;

whereby said support leg can be resiliently biased in a manner such that said locking means engage said cutter finger and said pair of upstanding legs of said retention bracket prevent the latter from unhooking from said cutter finger during up-and-down movement of said resilient support leg when engaging ground irregularities.

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**4,295,329**

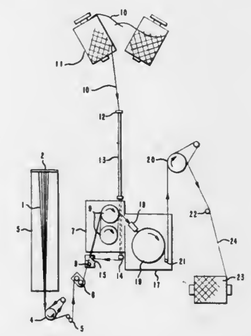
## COBULKED CONTINUOUS FILAMENT HEATHER YARN METHOD AND PRODUCT

**William T. Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jun. 10, 1980, Ser. No. 158,120**

**Int. Cl.³ D02G** *1/16, 1/18, 3/24*

**U.S. Cl. 57—245** **23 Claims**



1. An improved composite cobulked continuous filament yarn containing a first oriented continuous multifilament yarn which has been bulked in a hot fluid jet process simultaneously with a second oriented continuous multifilament yarn, the filaments of both yarns being randomly intermingled throughout the length of the composite yarn and having random three-dimensional curvilinear filament crimp with frequently alternating regions of S and Z filament twist, the filaments of said second yarn being from about 4% to about 20% longer in said composite yarn than the filaments of said first yarn, wherein the improvement comprises: the filaments of said first and second yarns being of polymers containing the same type of chemical dye site with the filaments of said second yarn having a substantially greater concentration of said dye site in equivalents per unit weight of polymer than the filaments of said first yarn, thus providing differential dyeability, and the filaments of said first yarn and of said second yarn each comprise from about 25% to about 75% of the total denier of said composite yarn.

13. In a method of producing a composite cobulked continuous filament yarn containing filaments of a first oriented continuous filament yarn and of a second oriented continuous filament yarn in which the filaments of said second yarn are longer than the filaments of said first yarn said method including the steps of (1) feeding said first yarn in an undrawn state at a controlled speed to a pair of heated draw rolls, (2) wrapping said first yarn around said draw rolls a sufficient number of times to avoid slippage thereon and said rolls being driven at surface speed at least twice the feeding speed of said first yarn thereby applying tension to and drawing to molecularly orient said first yarn, (3) also feeding to said pair of draw rolls from a yarn package at a tension of less than 1.0 grams per denier said second yarn having a lower shrinkage potential in a hot gas bulking jet than said first yarn, (4) wrapping said second yarn around said draw rolls to prevent slippage thereon, (5) bringing said first and second yarns together and forwarding the combined yarns in a high velocity stream of hot turbulent fluid in a confined space which randomly crimps and entangles the filaments thereof and thereby forms a composite cobulked yarn in which the filaments of said second yarn are from about 4% to about 20% longer than the filaments of said first yarn, (6) removing the cobulked yarn from the stream of hot fluid and cooling it at low tension while the filaments are in a crimped condition to set crimp in the filaments and (7) winding the cobulked yarn into a package under tension, the improvement for making a heather dyeable yarn comprising: feeding to said draw rolls as said second yarn a heat-relaxed yarn containing crimped filaments which filaments are differentially dyeable with respect to the filaments of said first yarn and which filaments constitute from about 25% to about 75% of the total denier of the cobulked yarn.

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**4,295,330**

## RE-ATTACHMENT DEVICE FOR AN OPEN-END TYPE SPINNING FRAME

**Hermann Pfeifer, Geneva, Switzerland, assignor to Officine Savio, S.p.A., Pordenone, Italy**

**Filed Jun. 24, 1980, Ser. No. 162,502**

**Claims priority, application Switzerland, Jun. 26, 1979, 5936/79**

**Int. Cl.³ D01H** *15/02;* **B65H** *54/26, 67/08*

**U.S. Cl. 57—263** **10 Claims**

1. Re-attachment device for an open-end type spinning frame, comprising:

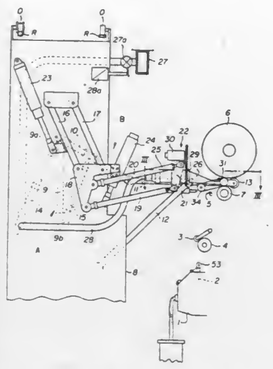
means to lift a cop from its drive shaft, means to drive the movement of said cop in the direction in which it is unwound, a suction conduit having an inlet to remove and aspirate the end of the yarn from the periphery of said cop, a first perforated roller next to said conduit installed coaxially with an axis crosswise to the inlet end of said conduit, an outlet pipe for the yarn coming from a spinning unit, means to transfer the yarn between said cop and said outlet pipe, an organ to shear the yarn, a drive organ, said first perforated roller and a second roller connected to said drive organ, said drive organ having a reversible direction so as to introduce the yarn into a rotor through

said outlet pipe for the yarn and then to pull it back again as soon as it is re-attached;

a third roller fitted so as to rotate near to the outlet of the aforesaid pipe;

said second roller cooperating with said first roller positioned next to said suction conduit and associated with said drive organ;

a portion of said suction conduit next to said first roller being installed so as to rotate around the lengthwise axis of said conduit;



a positioning organ connected to said portion of the suction conduit serving to position it between two angular positions located 180° from each other;

said organ to shear the yarn being installed within said suction conduit; and

a part of the suction conduit next to its rotating portion solidly fixed to said transfer means enabling movement of said first perforated roller from a first position next to the cop in one angular position of said rotating portion to a second position next to said third roller installed near the outlet of the outlet pipe of the yarn in the other angular position of said rotating portion.

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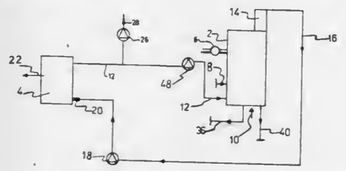
**4,295,331**

**PROCESS FOR THE PRODUCTION OF ENERGY FROM SOLID HYDROCARBON FUELS**

**Uriel Rekant, Kovlosky St. 22/5, Kiryat Herzog, Bnei Brak, Israel**

**Filed Jan. 31, 1979, Ser. No. 8,199**
**Claims priority, application Israel, Mar. 7, 1978, 54214**
**Int. Cl.³ F02B *43/08***
**U.S. Cl. 60—39.02** **6 Claims**



1. A process for the production of energy from solid hydrocarbon fuels selected from the group consisting of ground coal, shale, and peat comprising:

(a) conveying solid hydrocarbon fuel by means of a continuous conveyor through a reactor substantially filled with $CO_2$ and raising the temperature within said reactor to at least about 400° C. whereby in the substantial absence of air said solid hydrocarbon fuel reacts endothermically with said $CO_2$ to form CO;

(b) conveying the relatively light CO and other accompanying gases from the top of said reactor to a combustion chamber for exothermic reaction of the CO gas with $O_2$ to form $CO_2$ and to generate both heat and gas pressure energy;

(c) recycling at least a portion of the gases exiting from said combustion chamber to a reactor for reaction with solid hydrocarbon fuel; and

(d) collecting for further industrial processing and use the waste product of said hydrocarbon fuel reaction with $CO_2$ by discharging the waste product from said continuous conveyor.

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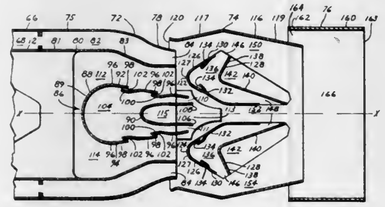
**4,295,332**

**INFRARED SUPPRESSOR SYSTEM**

**William Steyer, Ipswich, and Robert J. Duffy, Boxford, both of Mass., assignors to General Electric Company, Lynn, Mass.**

**Filed Nov. 13, 1978, Ser. No. 960,351**
**Int. Cl.³ F02K *3/00, 7/00***
**U.S. Cl. 60—264** **15 Claims**



1. In an apparatus for suppressing infrared radiation emitted from hot metal parts at the aft end of a gas turbine engine and from the stream of hot exhaust gases flowing therefrom during operation of the engine, the invention comprising:

duct means for receiving the stream of hot exhaust gases from said engine, said duct means adapted to generally confine said exhaust gases to flow through said duct;

first splitter means disposed within said duct means for splitting said gas stream into first and second flowing gas streams; and

second splitter means disposed within said duct means downstream of said first splitter means for splitting each of said first and second gas streams, said first and second splitter means cooperating to obstruct the line of sight viewing of said hot metal parts when said engine is viewed from the aft direction.

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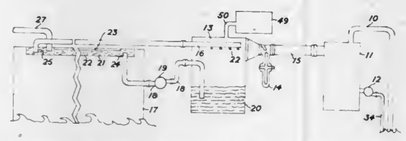
**4,295,333**

**MELTING ICEBERGS TO PRODUCE FRESH WATER AND MECHANICAL ENERGY**

**Wayne M. Camirand, Albany; John M. Randall, El Cerrito, and Earl Hautala, Martinez, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Jul. 11, 1979, Ser. No. 56,652**
**Int. Cl.³ F03G *7/04***
**U.S. Cl. 60—641.6** **24 Claims**



1. A method of melting an iceberg to produce fresh water in an amount greater than that available from the melting of the iceberg and mechanical energy, which comprises—

(a) evaporating warm surface seawater to produce water vapor,

(b) generating mechanical energy from said vapor,

(c) condensing said vapor by contacting it directly and intimately with cold melt water from the iceberg to produce a mixture of condensed vapor and melt water from the iceberg, said mixture having a temperature and a volume greater than the cold melt water alone,

(d) contacting the so-produced mixture with the body of the iceberg to melt the iceberg and produce cold melt water, said contact being made in such a manner as to produce turbulent flow of the cold melt water,

(e) separating a portion of the so-produced mixture and cold melt water as fresh water produce, and

(f) cycling the remainder of the so-produced mixture and cold melt water for direct and intimate contact with said vapor,

the amount of said fresh water produced being greater than the amount of cold water obtained from melting of the iceberg.



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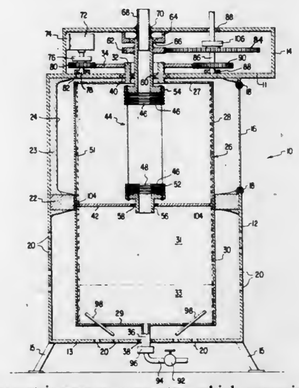
**4,295,334**

**PARAMETRIC ENERGY CONVERTER**

**Richard N. Johnson, 14411 Quince Orchard Rd., Gaithersburg, Md. 20760**

**Filed Dec. 3, 1979, Ser. No. 99,368**
**Int. Cl.³ F01K *11/02***
**U.S. Cl. 60—669** **10 Claims**



1. A parametric energy converter, which comprises:

a housing comprising a rotary boiler having a substantially cylindrical inner and outer wall, a top wall and a bottom wall which substantially enclose the ends of said boiler, and an intermediate wall which defines and separates an upper portion and a lower portion of said boiler;

a fluid mass positioned within said housing;

means for rotating said housing about a center of rotation thereby compressing said fluid mass against said substantially cylindrical inner wall of said boiler;

means for heating said fluid mass for causing said fluid mass to move toward said center of rotation; and

means positioned at said center of rotation for extracting the resultant kinetic energy of said fluid mass.

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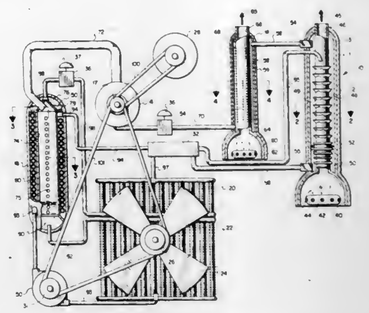
**4,295,335**

**REGENATIVE ABSORPTION ENGINE APPARATUS AND METHOD**

**VerDon C. Brinkerhoff, 917 Park Row, Salt Lake City, Utah 84105**

**Continuation-in-part of Ser. No. 868,117, Jan. 9, 1978, abandoned. This application May 14, 1979, Ser. No. 39,035**
**Int. Cl.³ F01K *25/06***
**U.S. Cl. 60—673** **11 Claims**



1. A regenative absorption engine comprising:

a closed cycle system comprising a first fluid having a first, lower boiling point and a second fluid having a second, higher boiling point, said second fluid having a relatively high degree of absorptivity for the first fluid;

distillation means for separating the first fluid from the second fluid by selectively vaporizing the first fluid, the distillation means comprising a first column having a coaxial first flue in spaced relationship inside the first column and a plurality of perforated, inverted, frustoconical distributor rings mounted to the first flue, the distributor rings directing incoming third fluid into thermal contact with the first flue for more efficient heat transfer into the third fluid, the third fluid including the first fluid and the second fluid, the trays being spaced from the internal wall of the first column for the upward passage of vaporized first fluid inside the first column, the first flue directing heated combustion products upwardly through the first column;

superheater means for superheating the vaporized first fluid;

mechanical expansion engine means downstream of the superheater means, the mechanical expansion engine means converting thermal energy of the first fluid into mechanical energy; and

absorption means downstream of the mechanical expansion engine means, the absorption means providing absorption of the first fluid from the mechanical expansion engine means with the second fluid while reducing backpressure in the first fluid, the absorbed first fluid in the second fluid comprising a third fluid.

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**4,295,336**

**MASTER CYLINDER ASSEMBLY WITH DETACHABLE RESERVOIR**

**Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.**

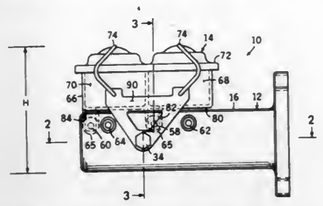
**Filed Feb. 5, 1980, Ser. No. 118,781**
**Int. Cl.³ B60T *11/20***
**U.S. Cl. 60—562** **2 Claims**

1. A master cylinder assembly comprising:

(a) a body having a bore therein and having first and second sides;

(b) primary and secondary pistons movably disposed in said bore defining primary and secondary fluid chambers, respectively, in said bore;

(c) a fluid reservoir having depending reservoir portions on one side and a depending bracket on the other side;
(d) first and second means detachably attaching said fluid reservoir to the first and second sides, respectively, of said body so that said depending reservoir portions and said depending bracket straddle said body;



(e) said first means comprising bosses on said depending reservoir portions, holes in said body first side, said bosses engaged in said holes; and
(f) said second means comprising a threaded member connecting said fluid reservoir depending bracket to said body second side, said threaded member extending into said bore and acting as a stop for rearward movement of said secondary piston.

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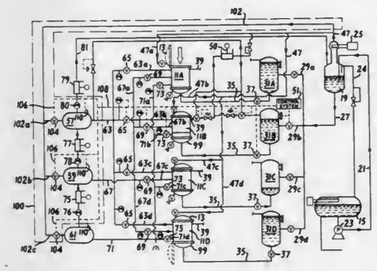
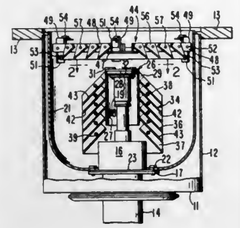
**4,295,337**
**COOLING APPARATUS AND METHOD IN A LIQUID CRYOGEN TREATMENT PROCESS**
**Harry D. Johnson, Glen Allen; Christopher J. Campbell, Richmond, both of Va.; Thomas O. Turner, Midland; Carl W. Poole, Concord, both of N.C.; James E. Gilmore, and James R. Thomas, both of Mauldin, S.C., assignors to Philip Morris Incorporated, New York, N.Y.**
**Filed Dec. 26, 1979, Ser. No. 106,671**
**Int. Cl.³ F17C *13/00***
**U.S. Cl. 62—54** **11 Claims**



1. In an apparatus for processing a product by treatment with a liquid cryogen, said apparatus including a processing chamber having means for introducing and withdrawing product, a source for supplying cryogen vapor to said chamber at superatmospheric pressure, means for supplying liquid cryogen to said chamber and removing liquid cryogen therefrom and compressing means interconnected to said processing chamber for effecting withdrawal of cryogen vapor therefrom upon removal of liquid cryogen from said processing chamber and compression of such vapor, the improvement comprising:
selectively operable means interconnected between said vapor source and said compressing means for supplying vapor to said compressing means; and
means responsive to a predetermined pressure at said compressing means for acutating said selectively operable vapor supply means, said predetermined pressure being lower than the pressure at said vapor source.

**4,295,338**
**CRYOGENIC PUMPING APPARATUS WITH REPLACEABLE PUMPING SURFACE ELEMENTS**
**Kimo M. Welch, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**
**Filed Oct. 18, 1979, Ser. No. 86,107**
**Int. Cl.³ B01D *8/00***
**U.S. Cl. 62—55.5** **11 Claims**



1. In a cryogenic pumping apparatus having pumping surfaces maintained at a predetermined temperature for condensation and adsorption of gaseous species: a frame having an axially extending core portion and a plurality of fins extending radially from the core portion, a group of axially spaced generally parallel plate members extending outwardly from the core portion between adjacent ones of the fins and inclined at a predetermined angle to the axis of the core portion, a coating of cryosorbent material on one surface of each of the plate members, and removable fasteners securing the plate members to the fins.

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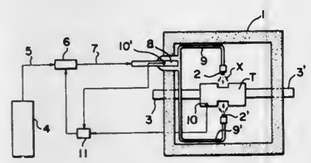
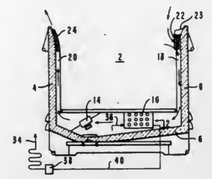
**4,295,339**
**CRYOSTAT SYSTEM UTILIZING A LIQUEFIED GAS**
**Yasuo Kuraoka, and Yasuhiro Tsuchida, both of Sapporo, Japan, assignors to Hoxan Co. Ltd., Sapporo, Japan**
**Filed Mar. 11, 1980, Ser. No. 129,485**
**Claims priority, application Japan, Mar. 14, 1979, 54-29515; May 21, 1979, 54-68174[U]; Nov. 26, 1979, 54-152604**
**Int. Cl.³ F25D *17/02***
**U.S. Cl. 62—64** **1 Claim**



1. A cryostat process using a liquified gas, in which a coolant is fed from a liquified gas source through a heat exanger to be sprayed out from at least one spray nozzle provided in a thermostatic zone onto a material therein, comprising the steps of:
(a) spraying said coolant in the liquid phase as a first cooling step directly onto said material so as to localize the cooling treatment of said material to a limited space, and cooling said material towards an intended cryogenic temperature;
(b) detecting the temperature of said material as it reaches the proximity of said temperature; and,
(c) causing a temperature controller to respond to said detected temperature so as to gasify said coolant for thermostatically controlling the temperature of said material to said intended temperature.



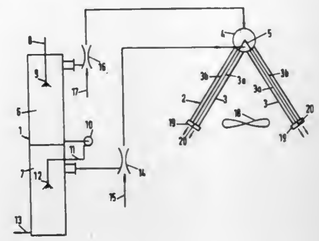
**4,295,340**
**REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST**
**Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.**
**Continuation-in-part of Ser. No. 11,804, Feb. 14, 1979. This application Jul. 25, 1979, Ser. No. 60,459**
**Int. Cl.³ A47F *3/04*; F25D *21/12***
**U.S. Cl. 62—82** **22 Claims**



1. An open top refrigerated display case being selectively operative in a refrigeration cycle and a defrost cycle, said case comprising: a bottom wall and four side walls; a single air conduit extending along a first of said side walls, along said bottom wall and a second of said side walls, said first and second side walls being opposing side walls, said air conduit having first and second openings at its opposite ends and each of said openings being located near the top portion of the respective said side wall; means for refrigerating air moving through said conduit during a refrigeration cycle, said means for refrigerating being arranged within said air conduit, air circulating means arranged within said air conduit, said air circulating means circulating within said air conduit in a forward direction during a refrigeration cycle and circulating air in a reverse direction during a defrost cycle, and said air circulating means drawing in ambient air from outside of said display case through said first opening when said air circulating means circulates air within said air conduit in the reverse direction; means for switching operation of said display case between a refrigeration cycle and a defrost cycle and correspondingly causing said air circulating means to change the direction of circulation of air within said air conduit; and means for directing air leaving said air conduit upwardly and over the outside of the adjacent said side wall so as to flow away from said case when such air is flowing in said reverse direction so that such air is prevented from reentering said air conduit.

14. A method for selectively operating an open top refrigerated display case in a refrigeration cycle and a defrost cycle, where the case includes: a bottom wall and side walls, an air conduit extending along a first of the side walls, along the bottom wall and a second of the side walls, the air conduit having first and second openings at its opposite ends and each of the openings being located near the top portion of the respective side wall; the method comprising the steps of: refrigerated air moving through the air conduit during a refrigeration cycle; circulating air within the air conduit in a forward direction during a refrigeration cycle; circulating air in a reverse direction during a defrost cycle; drawing in ambient air from outside of said display case through the first opening when air is circulated within the air conduit in the reverse direction; switching the operation of the display case between a refrigeration cycle and a defrost cycle; and directing air leaving the air conduit upwardly and over the outside of the adjacent side wall so as to flow away from the case when such air is flowing in the reverse direction.

**4,295,341**
**WATER CHILLING PLANT**
**John A. Gale, Pulborough, England, assignor to A.P.V. Spiro-Gills Limited, West Sussex, England**
**Filed Sep. 4, 1979, Ser. No. 71,840**
**Claims priority, application United Kingdom, Sep. 5, 1978, 35666/78**
**Int. Cl.³ F25B *19/00***
**U.S. Cl. 62—100** **9 Claims**



1. In a method of chilling water in a vacuum chilling plant having at least two chilling states wherein the vapour from each chilling state is condensed in a multi stage air-cooled heat exchanger, having an air inlet and an air outlet the improvement comprising:
feeding the vapour to the heat exchanger in at least two separate flows at different states of compression and temperature whereby the cooler air near the air inlet condenses vapour at a lower temperature and the warmer air nearer the air outlet condenses vapour at a higher temperature.

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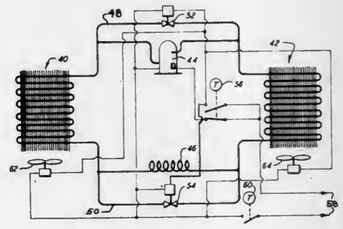
**4,295,342**
**HEAT EXCHANGE METHOD USING NATURAL FLOW OF HEAT EXCHANGE MEDIUM**
**James Parro, R.D. 2, Sadler Rd., Skaneateles, N.Y. 13152**
**Continuation-in-part of Ser. No. 845,896, Oct. 27, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,419**
**Int. Cl.³ F25D *15/00*; F28D *15/00***
**U.S. Cl. 62—119** **9 Claims**



1. A method of reducing energy losses in heating and cooling an enclosed room while ventilating said room with outside air at a temperature below that of said room during heating cycles and above that of said room during cooling cycles by reversible heat exchange between room air and outside air, comprising:
(a) providing a pair of continuous heat exchange coils each having an upper and a lower end and a plurality of substantially horizontal portions therebetween;
(b) placing the upper ends of said coils at a vertical level substantially higher than the lower ends of each coil;
(c) connecting said upper ends for direct communication

therebetween and connecting said lower ends for direct communication therebetween;

(d) charging said coils with a heat exchange liquid to a level substantially above the lower ends and below the upper ends of both of said coils; and

(e) contacting one of said coils with room air and the other with outside air, whereby refrigerant is evaporated from said one coil when room air is warmer than outside air, and vice versa, thereby increasing the pressure in the coil from which refrigerant is evaporated and causing refrigerant to flow to the other coil giving up heat to the air at the lowest temperature.

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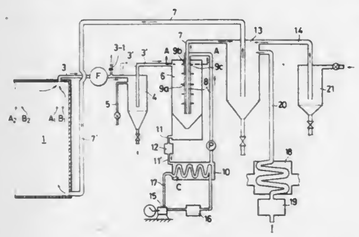
**4,295,343**

## MICROBE-REMOVING AND AIR-CONDITIONING APPARATUS

**Masahiko Izumi, 8,26-ban, 5-chome, Hiikawa, Nishi-ku, Fukuoka-shi, Fukuoka-ken, Japan**

**Filed Jul. 20, 1979, Ser. No. 59,184**
**Int. Cl.³ F25D** *17/04*
**U.S. Cl. 62—309** **2 Claims**



1. A microbe-removing and air-conditioning apparatus comprising

a room;

a water-spraying cyclone, in which a return pipe is surrounded with a water pipe which has a plurality of spraying nozzles, said water-spraying cyclone comprising means through which the air in said room is circulated and in which water is sprayed and odor, fine dust and microbes are caused to adhere to the wall of the cyclone and removed, and the air is caused to become saturated with moisture;

a temperature-regulating cyclone in which a temperature-regulating medium conduit is spirally arranged within said cyclone, said temperature-regulating cyclone comprising means to remove water droplets from the humid air pressing from said water-spraying cyclone and means to regulate the temperature of the air; and

a circulation pipe for feeding the air leaving the room to the water-spraying cyclone and from the water-spraying cyclone to the temperature-regulating cyclone and then back to the room therefrom; wherein upstream the water-spraying cyclone there is provided a sterilization cyclone where a high temperature vapour is introduced and mixed with the air coming from the room to effect sterilization.

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**4,295,344**

## REFRIGERATION UNIT WITH WATER

**William J. Hannett, Jamesville; Thomas E. Brendel, and David S. Wilson, both of Fayetteville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

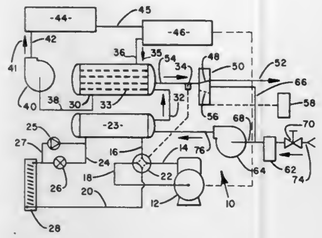
**Filed Nov. 8, 1979, Ser. No. 92,297**
**Int. Cl.³ F25B** *13/00, 27/02*
**U.S. Cl. 62—324.5** **4 Claims**

1. An engine-driven refrigeration unit including a first heat exchanger functioning as a condenser in a first operating mode and as an evaporator in a second operating mode of said refrigeration unit comprising:

means for delivering water from a source thereof to said first heat exchanger for condensing refrigerant vapor delivered thereto when said heat exchanger is functioning as a condenser, and for vaporizing refrigerant when the heat exchanger is functioning as an evaporator;

a second heat exchanger connected to a source of relatively warm fluid;

a conduit connected to said first heat exchanger for delivering said water to said second heat exchanger to pass in heat transfer relation with said relatively warm fluid to increase the temperature of said water;



discharge means connected to said second heat exchanger including valve means having a first position for directing the water from said second heat exchanger to the source thereof and a second position for directing the water to the inlet of said first heat exchanger; and

means for placing said valve means in said second position when said first heat exchanger is functioning as a refrigerant evaporator.

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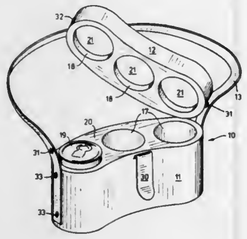
**4,295,345**

## COOLING CONTAINER FOR CANNED BEVERAGES

**Lyle H. Atkinson, 3828 Pavant Dr., Salt Lake City, Utah 84120**

**Filed Apr. 21, 1980, Ser. No. 142,384**
**Int. Cl.³ F25D** *3/08*
**U.S. Cl. 62—371** **7 Claims**



1. A portable cooling container for transporting and cooling canned beverages, comprising in combination:

a curved bottom housing having a plurality of vertically oriented compartments for holding canned beverages, said housing having walls of insulating material which entirely surround each of said compartments;

a correspondingly curved top housing having walls of insulating material and having a plurality of recessed cavities therein corresponding to said vertically oriented compartments in said bottom housing;

a slow-thawing cooling gel disposed in the upper ends of each respective recessed cavity;

sealing means for sealing the interface between said top housing and said bottom housing; and



means for attaching said bottom housing to said top housing.

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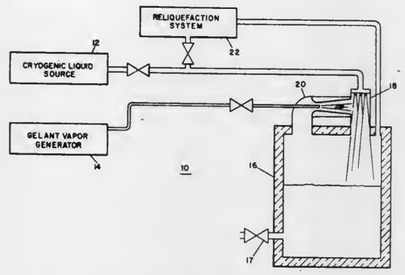
**4,295,346**

## RECIRCULATING VAPOR SYSTEM FOR GELLING CRYOGENIC LIQUIDS

**Lawrence C. Hoffman, Fair Oaks, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.**

**Filed Sep. 8, 1980, Ser. No. 185,349**
**Int. Cl.³ F25B** *1/06*
**U.S. Cl. 62—500** **3 Claims**




1. A system for gelling cryogenic liquid comprising:

means for providing a spray of cryogenic liquid droplets;

a vessel for receiving said cryogenic spray;

a jet pump for introducing a gelant into said cryogenic spray disposed to also educt cryogenic vapor from said vessel; and,

means for providing a flow of gelant fluid to said jet pump to thereby drive said pump.

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**4,295,347**

## SIMULATED GEM

**James Visconti, 55 W. 28th St., New York, N.Y. 10001**

**Filed May 25, 1978, Ser. No. 909,347**
**Int. Cl.³ A44C** *17/00*
**U.S. Cl. 63—32** **3 Claims**

1. A simulated gem of lacquer and plastic comprising a plastic core and a lacquer coating, said lacquer covering at least the entire outer surface of said core, said lacquer coating including a plurality of hues, said lacquer of said coating when in liquid state having a solvent adapted to superficially interfuse with the surface of said plastic core, said plastic core having a least the periphery of its underside on a single plane and substantially no upper surface concavities, and in the shape of a cobochon said lacquer coating marbled and interfused with the surface of said plastic core when in solid state, whereby the illusion of a solid unitary gem is created.

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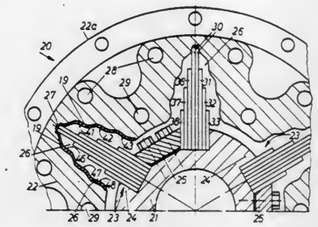
**4,295,348**

## PROGRESSIVE TORQUE TRANSMISSION IN LEAF-SPRING COUPLING

**Friedrich Helfer, Königsbronn-Zang; Ernst Elsner, Herbrechtingen, and Wolfgang Zaiser, Steinheim, all of Fed. Rep. of Germany, assignors to Voith Getriebe KG., Fed. Rep. of Germany**

**Filed Aug. 24, 1979, Ser. No. 69,373**
**Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2901933**
**Int. Cl.³ F16D** *3/56*
**U.S. Cl. 64—27 L** **29 Claims**



1. A leaf-spring coupling comprising:

a first coupling part and a second coupling part spaced from said first coupling part;

a plurality of leaf-spring assemblies extending between and coupling said first and said second coupling parts in an elastic manner; each said leaf-spring assembly comprising a plurality of leaf-springs oriented to extend between said first and said second coupling parts, and said leaf-springs of each said assembly being of different lengths, including a longer principal spring and a plurality of flank springs arrayed next to at least one side of said principal spring, wherein the lengths of said flank springs decrease stepwise from spring to spring away from said one side of said principal spring;

said leaf-spring assemblies being clamped to said first clamping part;

said second coupling part including respective stop means for each said assembly which are spaced from said flank springs of that said assembly and are so located with respect to said flank springs that upon relative motion of said first and said second coupling parts in a direction laterally of said leaf-springs, said principal spring engaging said second coupling part and being stressed and flexed by such engagement in a direction away from said flank springs at said one side of said principal springs and said stop means also engaging at least a part of at least some of said flank springs also at said one side, thereby increasing the number of said leaf-springs in a said assembly which are stressed.

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**4,295,349**

## DOOR LOCK

**Georg Wasserfaller, Gratschach, A 9523 Post Landskron, Austria**

**Filed Jan. 15, 1979, Ser. No. 3,465**
**Int. Cl.³ E05B** *59/00*
**U.S. Cl. 70—111** **3 Claims**

1. A door lock comprising

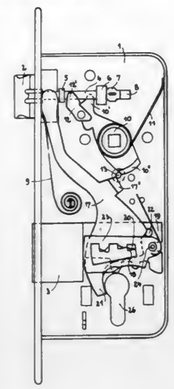
(a) a latch reciprocal between an open and a locking position, the latch being biased into the locking position,

(b) a pivotal element having at least one arm engageable with the latch to withdraw it to the open position,

(c) a locking bolt depressable to move into a blocking position to prevent swivelling of the pivotal element to withdraw said latch,

(d) a key-operable unlocking lever for moving the locking

bolt out of the blocking position to permit swivelling of said pivotal element, the unlocking lever having a catch operable by the key, and



(e) a key-bolt key-operable for reciprocation between an open and locked position, the unlocking lever being pivotally mounted on the key-bolt.

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**4,295,350**

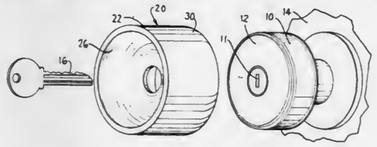
**KEYHOLE SIGHTER**

**Kim D. Grinage, 636 Eire St., South Haven, Mich. 49090**

**Filed Jan. 18, 1980, Ser. No. 113,013**

**Int. Cl.³ E05B *15/08***

**U.S. Cl. 70—454** **8 Claims**



1. A keyhole sighting device for mounting on a key receiving member at a keyhole in said member, comprising:

a shell having a rearwardly facing base surface for opposing the front surface of said key receiving member, said shell projecting forwardly from said base surface, said shell having a substantially funnel-like interior cavity, said cavity being wide open at the front of said shell and converging rearwardly to a key receiving opening of substantially less diameter through said base surface, said shell having a night visible material along the surface of said funnel-like cavity;

an annular skirt of elastomeric material extending rearward from said base surface for snug telescoping over the key receiving member, said annular skirt having a generally radially inwardly offset annular edge portion at the rear end thereof and circumferentially stretchable to fit over and grip the rear portion of the key receiving member for holding the device on the key receiving member with said key receiving member snugly closed within said skirt, the entire device being an annular one-piece member of said elastomeric material defining said shell and skirt, said member having a substantially cylindrical peripheral surface continuing from the front end of said shell substantially to the rear end of said skirt.

**4,295,351**

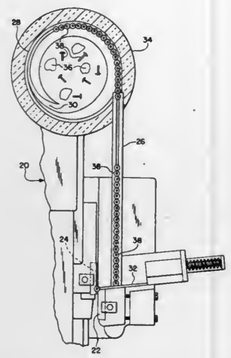
**SELF-TAPPING STAINLESS STEEL SCREW AND METHOD FOR PRODUCING SAME**

**Lowell L. Bjorklund, Elgin, Ill.; Ramon A. Berg, Hales Corners, Wis., and Henry A. Sygnator, Arlington Heights, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Jan. 8, 1979, Ser. No. 1,975**

**Int. Cl.³ B21H *3/06*; B21K *1/56***

**U.S. Cl. 72—38** **5 Claims**



1. A process for producing a threaded, self-tapping screw with a thread hardness in the range of RC 45–50 while its core retains a hardness in the area of RC 30, said screw being made from an austenitic 300 series nickel-chromium stainless steel material said method including the steps of forming a headed blank with a shank portion from said 300 series material, chilling at least the shank portion of the thus formed austenitic blank to a temperature substantially below 0° F., rolling the blank between thread-rolling dies forming threads on said shank portion while the blanks are in the chilled condition, said thread-rolling step causing sufficient localized transformation of the material in the region of the threads to martensite to produce the RC 45–50 hardness without substantial effect on a central core portion of said threaded shank.

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**4,295,352**

**DIE FOR THE FORMATION OF SEMI-CLOSED CHANNELS OR OTHER COMPLEX CONFIGURATIONS**

**Richard P. Stokes, and William Stokes, both of Carteret, N.J., assignors to Unlimited Steel Fabricators, Inc., Middlesex, N.J.**

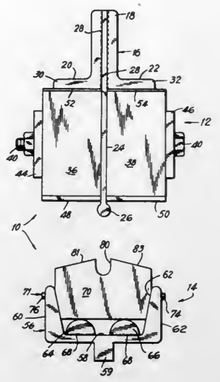
**Filed Oct. 12, 1979, Ser. No. 84,179**

**Int. Cl.³ B21D *22/10***

**U.S. Cl. 72—57** **8 Claims**

1. In a die for the formation of semi-closed channels or other complex configurations in workpieces which includes relatively movable male and female die members and wherein said male die member includes a mandrel, the improvements comprising, an elastically deformable matrix included in said female die member, said matrix having a surface comprising a generally open forming groove formed therein and configured to receive said mandrel whereby, a workpiece may be disposed between said male and female die members and the same relatively moved to drive said mandrel and the relevant portion of said workpiece into said forming groove to deform said matrix and substantially close said forming groove around said mandrel to essential wrap said workpiece portion around said mandrel and form said configuration therein, whereupon said male and female die members may be relatively moved to remove said mandrel from said forming groove with attendant return of the matrix to its undeformed condition and re-opening of said forming groove to enable removal of said workpiece portion therefrom, said matrix being generally wedge-shaped, and said forming groove being formed in the wider





surface of the matrix which tapers away to either side of said forming groove.

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**4,295,353**

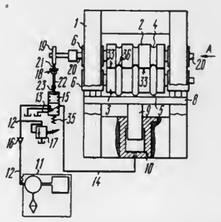
**MILL STAND FOR FORMING DISCONTINUOUS LONGITUDINAL DEFORMATIONS IN SHEET METAL**

**Vyacheslav I. Anisimov, ulitsa Metallurgov, 11, kv. 16, Magnitogorsk; Evgeny G. Bulgakov, ulitsa Vrachebnaya, 23, kv. 37; Vasily N. Gurin, ulitsa Lyapidevskogo, 16, both of Kramatorsk; Leonid V. Radjukevich, ulitsa 23 Avgusta, 47, kv. 42; Igor S. Trishevsky, ulitsa Dzerzhinskogo, 34, kv. 7, both of Kharkov; Oleg I. Trishevsky, ulitsa Lunacharskogo 8, kv. 20, Kramatorsk; Grigory R. Kheifets, ulitsa Bairona, 154a, kv. 114, Kharkov, and Anatoly B. Jurchenko, ulitsa Tukhachevskogo, 22, korpus 2, kv. 253, Moscow, all of U.S.S.R.**

**Filed Sep. 24, 1979, Ser. No. 78,238**

**Int. Cl.³ B21D *13/04***

**U.S. Cl. 72—180** **5 Claims**



1. A mill stand for forming discontinuous longitudinal deformations on continuous sheet metal uninterruptedly fed to said mill stand, comprising:

a frame member;

forming rolls, having congruent circumferential forming elements, mounted on said frame member in such a way that one of the forming rolls is adapted for movement toward and away from said other forming rolls;

a power cylinder being connected with said forming roll adapted for movement;

a system for feeding a working medium to said power cylinder including means for controlling said power cylinder; and

a master device operatively connected with one of said forming rolls and interacting with said means for controlling said power cylinder for periodically bringing together said forming rolls, thereby discontinuously forming longitudinal deformations on said sheet metal of generally any length without the need to change said forming rolls.

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**4,295,354**

**METHOD FOR PRODUCING BEAM BLANK FOR LARGE SIZE H-BEAM FROM FLAT SLAB**

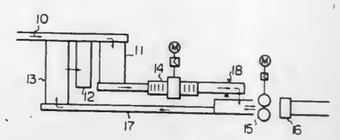
**Koichi Itoh, Ichikawa; Osamu Koshida, and Katsuichi Nakayama, both of Ibaraki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan**

**Filed Aug. 29, 1979, Ser. No. 70,831**

**Claims priority, application Japan, May 8, 1979, 54/56073**

**Int. Cl.³ B21B *1/12***

**U.S. Cl. 72—225** **3 Claims**



1. A method for producing a beam blank for a large size H-beam from a flat slab, comprising the steps of:

positioning a large size flat slab with the width dimension vertical and rolling the vertically spaced edges a plurality of times in a two-high rolling mill to form a preformed beam blank, the shaping rolls of the two-high rolling mill having a roll profile with a groove-shaped recess therein having a depth b a width c at the bottom thereof and width d at the opening thereof, with dimensions of:

$$t \leqq c \leqq 1.2t$$

$$d = M + M'$$

$$b = f + f'$$

t is the thickness of the flat slab

M is the width of the flange of the beam blank to be formed

M' is a dimension of from 15 to 35 mm

f is the thickness of the flange of the beam blank to be formed; and

f' is a dimension from 20 to 40 mm; and

positioning said preformed beam blank with the width dimension thereof horizontal and further rolling the preformed blank by plurality of passes through a universal roughing mill into a beam blank of the desired shape, the rolling in the earlier passes through the universal roughing mill being with the rolls of the roughing mill position for making the reduction of the preformed beam blank by the horizontal rolls greater than the reduction by the vertical rolls thereof and the rolling in the later passes being with the rolls of said roughing mill positioned for making the reduction of the preformed beam blank by the horizontal rolls less than the reduction by the vertical rolls thereof.

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**4,295,355**

**BEAM-BACKED STRIP MILL WITH ATTACHED INSERTS**

**Tadeusz Sendzimir, P.O. Box 1350, Waterbury, Conn. 06720**

**Filed Aug. 13, 1979, Ser. No. 66,019**

**Int. Cl.³ B21B *13/14***

**U.S. Cl. 72—242** **13 Claims**

1. In a multi-roll mill for rolling wide strips, a one-piece mill housing having a rigid beam facing each side of the strip, each beam having on its pressure side an arcuate section machined around the roll bite as an axis, an insert snugly seated in each of said arcuate sections, each of said inserts having arcuate channels machined on its inner surface parallel to said axis, roll-backing elements seated in said channels, each of said inserts being interchangeable in order to change the roll configuration

of the mill, each of said inserts being axially divided into segments, each segment having at least one of said channels

therein, each segment being individually fastened to its respective one of said arcuate beam sections by means operable from the front side of said mill for withdrawal and replacement.

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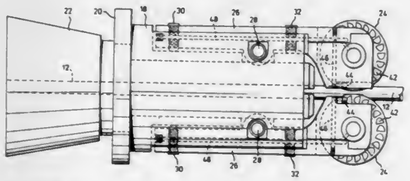
**4,295,356**

## ROLLER ENTRY GUIDES FOR ROD MILLS

**Mario Fabris, 8 Roberts Rd., Grimsby, Ontario, Canada (L3M 3X2)**

**Filed Oct. 1, 1979, Ser. No. 80,820**
**Int. Cl.³ B21B** *39/16*
**U.S. Cl. 72—250** **4 Claims**



1. A roller entry guide for a rod mill comprising:

a body providing a rod passage therein through which the rod passes;

a pair of longitudinally extending rocker arm members mounted by the body on opposite sides of the rod passage for pivoting rocking movement about respective parallel pivot axes;

a pair of guide roller members each mounted by the respective rocker arm member for rotation about a respective rotation axis, the pivoting rocking movement of the arm members permitting movement of the guide roller members toward and away from one another;

each guide roller member having, in a peripheral portion, a ring of fluid reaction members coaxial with its axis of rotation;

nozzle means carried by each arm member external thereto and communicating with the passage means and disposed to direct a stream of fluid at the said ring of fluid reaction members substantially tangentially thereto to rotate the respective guide roller member about its axis of rotation; and

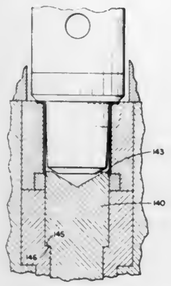
means for feeding fluid to the said nozzle means through said passage means whereby the guide roller members can be rotated at about their operative speeds prior to engagement by a rod passing through the device.

**4,295,357**

## APPARATUS FOR MAKING METAL OUTERS AND INNERS

**Ralph E. Roper, Indianapolis, Ind., assignor to General Tire & Rubber Co.**

**Continuation of Ser. No. 937,278, Aug. 28, 1978, Pat. No. 4,238,949, and a continuation-in-part of Ser. No. 691,720, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,269, Oct. 14, 1975. This application May 19, 1980, Ser. No. 150,776**
**Int. Cl.³ B21D** *45/00*
**U.S. Cl. 72—344** **13 Claims**



1. Apparatus for forming an annular sheet metal blank into an annular member of precise tolerances which comprises:

(a) an external die having a continuous die surface of the configuration desired for the external surface of said annular member, at least one portion of said continuous die surface being of smaller diameter than said annular metal blank so as to be capable of shrinking said blank to said smaller diameter when said blank is forced through said die, and said die having an annular ridge surrounding the inside of the die for seating one end of said annular metal blank,

(b) a first punch mounted with relation to said external die for the reciprocal travel through a path into and out of an endmost position within said external die, said first punch having a reduced diameter portion shaped and proportioned to fit inside said annular metal blank and having an enlarged diameter portion that engages said blank so as to force said blank through said external die when said punch travels toward said endmost position, said reduced diameter portion being spaced away from the portion of said annular metal blank that is reduced to a smaller diameter by the continuous die surface of said external die so as to allow the free inward movement of the internal surface of said annular metal blank when said external die reduces the diameter of the blank, said reduced diameter portion also having means for holding said blank on said punch when said reduced diameter portion and blank are located outside of said external die, and

(c) means for reciprocating said first punch axially through said path into and out of said endmost position in said external die.

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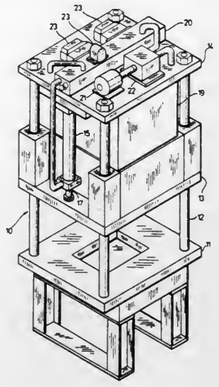
**4,295,358**

## HYDRAULIC PRESS

**J. Stewart Bulmer, 755 Fernhill Blvd., Oshawa, Ontario, Canada (L1J 5K2)**

**Filed Oct. 16, 1979, Ser. No. 85,241**
**Int. Cl.³ B21J** *9/12*
**U.S. Cl. 72—453.06** **7 Claims**

1. A hydraulic trim press comprising a horizontal rectangular bed; four tie rods extending vertically upwardly from each corner of said bed; a movable rectangular platen parallel to said bed and slidably mounted on said tie rods to move towards and away from said bed; a stationary rectangular platen parallel to said bed and connected to the end of said tie rods distal from said bed; two spaced apart hydraulic cylinders secured to said stationary platen and extending vertically downward, said cylinders located between the end tie rods with piston rods



extending outwardly from each of said cylinders and connected to said movable platen, a hydraulic tank for storage of hydraulic fluid attached to the underside of said stationary platen, a means for driving said cylinders, a manifold secured on top of said stationary platen to direct hydraulic fluid to the control valves and cylinders.

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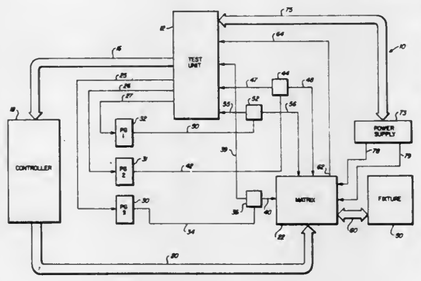
**4,295,359**

## CALIBRATION APPARATUS FOR CML CIRCUIT TEST UNIT

**Dennis C. Hilker, Cave Creek, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Mar. 17, 1980, Ser. No. 131,294**
**Int. Cl.³ G04F** *7/00;* **G01R** *31/02*
**U.S. Cl. 73—5** **8 Claims**




1. Apparatus for calibrating CML integrated circuit test unit comprising:

a. fixture capable of receiving a CML integrated circuit therein and including a plurality of pins, each pin capable of contact with one pad of said circuit when said circuit is mounted on said fixture;

b. a pulse generator producing a shaped pulse upon actuation;

c. a power splitter connected to receive said shaped pulse for transferring said shaped pulse to outputs thereof;

d. a matrix of electrically actuated relays connected to one output of said power splitter and to each pin of said fixture, said matrix adapted to connect said shaped pulse to a preselected pin; said matrix adapted to connect a predetermined pin to a waveform output of said matrix;

e. a controller connected to said relays for providing a switching signal to each relay of said matrix, said test unit connected to another output of said power splitter and waveforms from said waveform output; and

f. a shorting device selectively connectable between said predetermined pin and said preselected pin.

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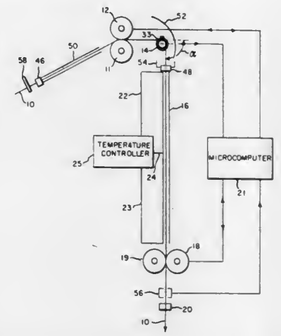
**4,295,360**

## TENSION MEASURING APPARATUS

**Frank S. Fountain, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jan. 14, 1980, Ser. No. 111,665**
**Int. Cl.³ G01N** *25/00, 33/36*
**U.S. Cl. 73—15.6** **2 Claims**




1. In an apparatus for measuring yarn tension while the yarn is being drawn that includes means for feeding the yarn from a source through a heater to a drawing means, a yarn direction-changing tension-measuring device located between the feed means and the heater comprising: a shaft having a plug attached to one end and a direction-changing guide mounted at its other end around which yarn passes, said shaft being of rectangular cross section with wide flat surfaces several times greater than its narrower surfaces to allow for flexure in response to forces generated during change of yarn direction about said guide, a strain transducer connected to opposite wide flat surfaces of said shaft and means for mounting said plug for limited rotation to detect only forces perpendicular to said wide flat surfaces.

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**4,295,361**

## DRILL PIPE TESTER WITH AUTOMATIC FILL-UP

**Michael E. McMahan, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

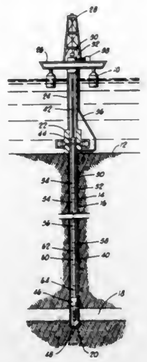
**Filed Apr. 3, 1980, Ser. No. 136,830**
**Int. Cl.³ G01M** *3/08*
**U.S. Cl. 73—40.5 R** **19 Claims**

1. A pipe tester valve, comprising:

spherical closure valve means having a valve bore therethrough and being rotatable between an open and a closed position for opening and closing an interior of a string of pipe; and

automatic means for automatically closing said spherical closure valve means when said string of pipe is statically positioned within a well so that said string of pipe may be pressure tested, and for automatically opening said spherical closure valve means and allowing well fluid within said well to fill said string of pipe above said closure valve

means as said string of pipe and closure valve means are lowered into said well, said spherical closure valve means



being rotatable to its said open position when said string of pipe is finally positioned within said well.

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**4,295,362**

## PENTAERYTHRITOL IN DRY DEVELOPERS

**Michael L. White, Lake in the Hills, Ill., assignor to Magnaflux Corporation, Chicago, Ill.**

**Filed Feb. 22, 1980, Ser. No. 123,683**
**Int. Cl.³ C09K *3/00*; G01N *19/08, 33/00***
**U.S. Cl. 73—104** **14 Claims**

1. In the method of non-destructive testing for surface flaws in which a liquid penetrant is applied to the test surface, excess penetrant is removed while leaving penetrant entrapped in surface flaws and a dry developer powder is applied over the test surface to aid in drawing the entrapped penetrant to the surface and thereby render the location of said flaws visible, the improvement which comprises:

employing as said developer powder a dry composition including at least 35% by weight pentaerythritol powder at least 90% of said powder being less than 20 microns in diameter.

9. A dry developer composition for use in the penetrant inspection method for locating surface flaws in a workpiece, said developer consisting essentially of a mixture of at least 35% by weight pentaerythritol having a particle size such that at least 90% of the particles are less than 20 microns in dimension and a finely divided inert powder with a bulk density lower than pentaerythritol.

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**4,295,363**

## APPARATUS FOR DIAGNOSING FAULTS IN INDIVIDUAL CYLINDERS IN AN INTERNAL COMBUSTION ENGINE

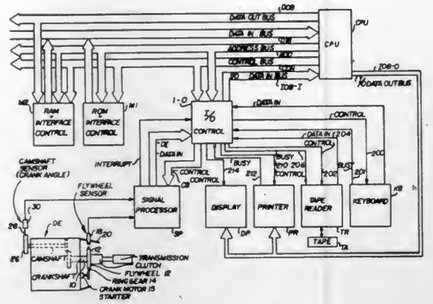
**Gordon K. Buck, Greenlawn, and Cynthia H. Kozin, Huntington, both of N.Y., assignors to Harris Corporation, Cleveland, Ohio**

**Filed Mar. 25, 1977, Ser. No. 781,313**
**Int. Cl.³ G01M *15/00***
**U.S. Cl. 73—117.3** **19 Claims**

1. Apparatus for determining malfunctions of individual cylinders of an internal combustion engine, comprising:

means for measuring the values of the time intervals between successive crankshaft positions as the crankshaft of a said engine rotates through at least one engine cycle, wherein one engine cycle includes a number of power periods corresponding with the number of cylinders of the engine being tested and wherein each power period includes a plurality of said crankshaft positions;

first means for comparing for each power period the values of selected said time intervals associated with selected said crankshaft positions in the associated power period and providing for each cylinder a first indication having a value in accordance therewith; and,



second means for comparing each said first indication with said other first indications and providing for each cylinder a second indication having a value in accordance with the ratio of the value of said first indication for that cylinder to the average value of at least two of said first indications.

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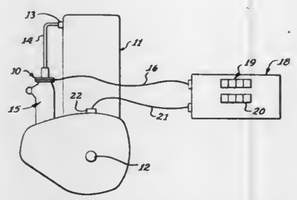
**4,295,364**

## TRANSDUCER DEVICE FOR MONITORING OF FUEL INJECTION

**Joseph L. Dooley, Chicago, and Daniel J. Dooley, Burr Ridge, both of Ill., assignors to Creative Tool Company, Burr Ridge, Ill.**

**Filed Sep. 7, 1979, Ser. No. 73,251**
**Int. Cl.³ G01M *19/00***
**U.S. Cl. 73—119 A** **7 Claims**



7. A method for monitoring the injection of fuel into a fuel line of a fuel injection system from an injection pump assembly including a delivery valve assembly of the type wherein the fuel is forced past a spring-valve element into a delivery chamber which has a cross-sectional area substantially larger than that of an outlet passage therefrom, said delivery valve assembly including a thick-walled section having a polygonal shape with a plurality of flat surfaces for facilitating installation of said delivery valve assembly, said method comprising: providing a transducer including a piezoelectric plate element and clamping said plate element against one of said flat surfaces to produce a short-duration electrical output pulse in response to each injection operation of said pump assembly, and monitoring electrical output pulses developed by said transducer means.



**4,295,365**

## NMR ANALYSIS OF SUBTERRANEAN RESERVOIR SAMPLES IMMERSED IN LIQUID HALOCARBONS

**Indurani D. Meshri, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Feb. 26, 1979, Ser. No. 15,267**
**Int. Cl.³ E21B *49/02***
**U.S. Cl. 73—153** **5 Claims**

1. In a method of analyzing a sample of a subterranean reservoir with a nuclear magnetic resonance means, wherein said sample is saturated with an aqueous liquid and thereafter analyzed with said nuclear magnetic resonance means, wherein the improvement comprises:

immediately after saturating said sample, immersing it in a liquid halocarbon having no hydrogen atoms bound thereto and analyzing said sample immersed in said liquid halocarbon.

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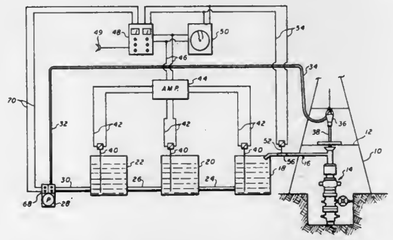
**4,295,366**

## DRILLING FLUID CIRCULATING AND MONITORING SYSTEM AND METHOD

**Joseph T. Gibson, and Gerald L. Duhon, both of New Iberia, La., assignors to A. C. Company, New Iberia, La.**

**Filed May 29, 1979, Ser. No. 42,969**
**Int. Cl.³ E21B *47/04***
**U.S. Cl. 73—155** **15 Claims**



1. A drilling fluid circulating system, comprising:

tank means for storing a quantity of drilling fluid used in a well;

means mounted in fluid communication with said tank means for pumping the stored drilling fluid into the well;

a drilling fluid return line mounted in fluid communication with the well for transporting drilling fluid from said well to said tank means, said drilling fluid return line including a section thereof having an interior of parallelogram cross-section;

flow sensing means mounted with said drilling fluid return line for providing an electrical output proportionate to the level of the drilling fluid flowing through the parallelogram cross-section; and

means mounted with said flow sensing means for receiving the electrical output therefrom to indicate the volume of drilling fluid flowing into said tank.

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**4,295,367**

## SPEED INDICATING DEVICE

**Wayne B. Leslie, 12347 E. Bates Cir., Aurora, Colo. 80014**

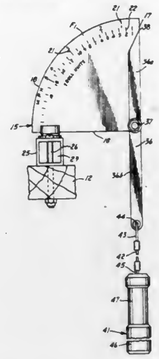
**Filed Jan. 21, 1980, Ser. No. 113,622**
**Int. Cl.³ G01C *21/10***
**U.S. Cl. 73—184** **20 Claims**

1. A speed indicating device for a boat and like craft moving in a body of water comprising:

a plate with speed indicia for indicating the speed of the boat and having a first pivot joint portion at the front of said plate;

a mounting arm that extends laterally out from a side of the boat having a second pivot joint portion operatively associated with said first pivot joint portion for supporting said plate for pivotal movement about a generally vertical pivot to permit the plate to aline with the course of travel of the boat; and

a combination pointing arm, flexible line, and weight supported at a rear bottom portion of said plate, said pointing arm being pivotally mounted intermediate its ends to pivot relative to said plate about a generally horizontal pivot at the rear of the plate with a pointing end moving along said speed indicia to indicate speed,



said line being connected to the lower end of said pointing arm and said weight being connected to the lower end of said line, said weight being adapted to move through a body of water while suspended from said pointing arm whereby to pivot said pointing arm about said generally horizontal pivot in relation to the speed of the boat, said plate also being moved about said generally vertical pivot to seek out a direction to aline the plate with the course of travel of the boat as said weight is dragged via the body of water.

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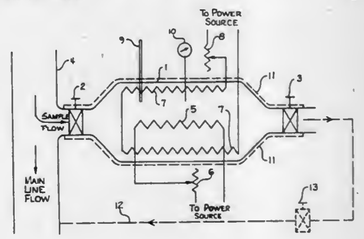
**4,295,368**

## METHOD FOR MEASURING THE FULL RANGE IN QUALITY OF A VAPOR

**Joseph Jannone, 133-48 84th St., Ozone Park, New York, N.Y. 11417**

**Filed Aug. 22, 1979, Ser. No. 68,686**
**Int. Cl.³ G01K *17/00***
**U.S. Cl. 73—192** **1 Claim**




1. A method for determining the quality of a fluid vapor comprising the steps of (1) providing a source of fluid vapor, (2) directing a portion of said fluid vapor through an open insulated sampling chamber at substantially the same pressure and temperature as the fluid vapor in said source, (3) sealing said chamber to seal a representative portion of fluid vapor therein, (4) applying heat to said representative portion of fluid vapor to change the state of said representative portion of fluid

vapor to a superheated or liquid condition, (5) cooling said representative portion of fluid vapor to establish a cooling mode for said superheated vapor or liquid wherein the temperatures and pressures during said cooling mode are recorded, (6) utilizing the temperature and pressure readings during said cooling mode while in the superheated state to determine the specific volume of the fluid vapor source; and (7) thereafter determining the quality of said fluid vapor source by the following equation:

$$V_a = V_b = V_f + X(V_g - V_f)$$

wherein

$V_a$ and $V_b$ individually is the specific volume of the representative portion;

$V_g$ is the dry saturated specific volume of the fluid vapor source;

$V_f$ is the wet saturated specific volume of the fluid vapor source; and

X is the quality of the fluid vapor source.

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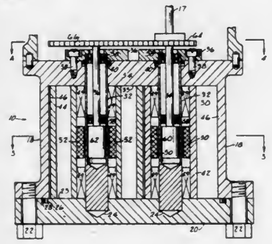
**4,295,369**

## DUAL MAGNETIC DRIVE FOR GEAR METERS

**Fred E. Wendelboe, Erie, Pa., assignor to Geosource Inc., Houston, Tex.**

**Filed Apr. 10, 1980, Ser. No. 138,985**
**Int. Cl.³ G01F 3/08**
**U.S. Cl. 73—261** **23 Claims**



1. A gear meter, comprising:

a casing having a chamber, the casing having a fluid inlet and a fluid outlet communicating with the chamber;

a pair of fixed hollow shafts extending through the chamber;

a measuring gear rotatably mounted on each of the fixed shafts within the chamber so as to continuously engage one another and so as each measuring gear is in continuous dynamic sealing arrangement with the chamber walls;

a driver magnet arranged in each measuring gear; and

a drive transmission for operably connecting the measuring gears to a meter accessory wherein the drive transmission comprises:

rotatable shafts arranged inside the fixed, hollow shafts and extending beyond the measuring chamber;

driven magnets fixed to the rotatable shafts such that the rotation of the measuring gears and driver magnets urges the rotation of the driven magnets and rotatable shafts; and

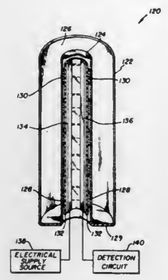
a coupling gear mounted to each of the rotatable shafts outside the measuring chamber, said coupling gears being adapted for connection to a meter accessory.

**4,295,370**

## CAPACITIVE SCHEME FOR MEASURING THE LEVEL OF A LIQUID

**Robert G. Bristol, Everett, Mass., assignor to Emhart Industries, Inc., Indianapolis, Ind.**

**Continuation of Ser. No. 19,653, Mar. 12, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,819**
**Int. Cl.³ G01F 23/26**
**U.S. Cl. 73—304 C** **1 Claim**




1. Apparatus for measuring the level of a liquid comprising:

a generally cylindrical receptacle for receiving said liquid, said receptacle having a generally concentric cylindrical portion extending substantially therethrough and being made of dielectric material;

a plurality of electrodes located within said cylindrical portion and against said dielectric material, each of said electrodes being situated at a different vertical level for said liquid in said receptacle;

a drive electrode means located within said cylindrical portion for capacitively coupling an electrical signal to said plurality of electrodes;

a layer of insulation mounted between said drive electrode means and each of said electrodes of said plurality of electrodes for forming signal transmitting capacitance therebetween;

an electrical supply means connected to said drive electrode means for supplying said electrical signal thereto;

means for capacitively shunting said electrical signal through said dielectric portion of said receptacle and any liquid in said receptacle and away from said plurality of electrodes, the amount of signal shunted being dependent upon the amount of said liquid in said receptacle;

detection electrode means mounted adjacent said plurality of electrodes and separated therefrom by said layer of insulation for capacitively receiving said electrical signal from said plurality of electrodes; and

a single measuring circuit means connected to said detection electrode means for measuring the amount of signal transmitted to said circuit means from all of said plurality of electrodes, said amount of signal transmitted to said circuit means being responsive to said amount of signal shunted by said means for capacitively shunting and thereby being responsive to the amount of said liquid in said receptacle, said measuring circuit means thereby being adapted for measuring the amount of said liquid in said receptacle.

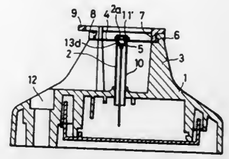


**4,295,371**

## TEMPERATURE DETECTING DEVICE

**Hiroshi Sawa, Yokohama, Japan, assignor to Hochiki Corporation, Tokyo, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,524**
**Claims priority, application Japan, Jun. 22, 1979, 54-85583[U]**
**Int. Cl.³ G01K 7/00**
**U.S. Cl. 73—359 A** **9 Claims**



1. A temperature detecting device comprising: casing means, said casing means being provided with a plurality of rib portions each having a receiving shoulder formed on an inside portion thereof; a protective tube formed of a material having a high thermal conductivity and being mounted upon said casing means centrally of said rib portions; heat detecting means disposed within said protective tube and in thermal contact with an end portion thereof; heat collecting means being received in said shoulder portions of said rib portions; and a protective member having portions thereof adapted to engage with said rib portions, said heat collecting means being fixedly supported on said casing means by engagement of said rib portions and said protective member.

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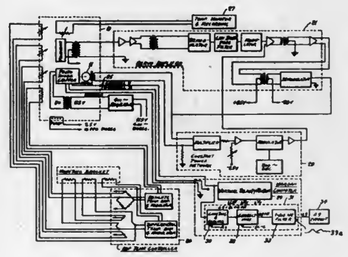
**4,295,372**

## GRAVITY MEASUREMENT APPARATUS FOR SHIPS

**John De Matteo, Whitestone, and Frank Villani, Brooklyn, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Dec. 5, 1968, Ser. No. 781,488**
**Int. Cl.² G01M 1/12**
**U.S. Cl. 73—382 G** **4 Claims**



1. An apparatus for continually measuring the free-air gravity anomaly from a moving vehicle which comprises:

vertical acceleration measuring means carried by said vehicle and having a digital rate pulse output proportional to the instantaneous total vertical acceleration sensed by said measuring means,

a scaler/counter having an input and output terminal and providing an output which is scaled to a selected factor and which output is a count of the input pulses,

first electrical means connecting the output of said measuring means to the said input terminal of said scaler/counter means,

a correction circuit having a pair of inputs and an output, one of its inputs connected to receive the output of said scaler/counter means, the output of said correction being the sum of the input signals,

a Mardan navigational computer including a vertical velocity routine for providing an output which is the negative of the theoretical gravity and the Coriolis error,

second electrical means connecting the output of said computer to said other input of said correction circuit, a time averaging means having negligible weighting at the beginning and end of the period relative to the center time,

said averaging means connected to receive the output of said correction means, and

readout means connected to the output of said averaging means, thereby providing an indication of the free-air gravity anomaly.

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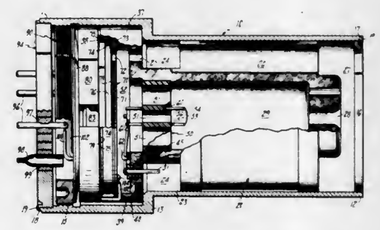
**4,295,373**

## FLUIDIC ANGULAR RATE SENSOR WITH INTEGRATED IMPULSE JET PUMP ASSEMBLY

**E. Marston Moffatt, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Apr. 3, 1980, Ser. No. 137,109**
**Int. Cl.³ G01P 3/26**
**U.S. Cl. 73—505** **7 Claims**



1. An angular rate sensor, having:

a sealed, fluid filled casing for housing a nozzle block assembly having a jet chamber disposed therein, and for housing a jet pump assembly in registration with said jet chamber and connected for response to an external source of AC signals, said jet chamber including a nozzle and sensing elements disposed at opposite ends thereof, said sensing elements being cooled differentially in dependence on the angular rotation of the sensor, by a fluid jet formed by fluid forced under pressure through said nozzle by said pump assembly at a constant rate of flow provided by the improvement, comprising:

a unitary jet pump structure having a hollow cylindrical supporting flexure element cohesively joined with a metallurgical bond at one end to the periphery of a deformable piezoelectric diaphragm and cohesively joined with a metallurgical bond at the other end to a major surface of an anvil support means, said anvil means major surface providing the end wall of a pump chamber defined otherwise by the internal diameter of the cylindrical flexure and the diaphragm bonded to the other end thereof, said anvil support means being adapted to rigidly engage the casing internally for supporting said pump unitary structure in registration with said jet chamber within said casing.

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**4,295,374**

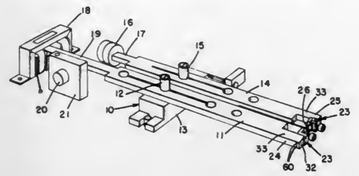
## SPECIMEN GRIPS FOR DYNAMIC MECHANICAL ANALYZER

**Robert P. Kusy, Chapel Hill, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Sep. 10, 1979, Ser. No. 74,092**
**Int. Cl.³ G01N 3/32**
**U.S. Cl. 73—579** **4 Claims**

1. In a dynamic mechanical analyzer to support a specimen for testing, said analyzer having a pair of spaced sample arms

displaceable relative to each other and having terminal freely extending spaced-apart ends, one of said sample arms being driven and the other counterbalanced, said driven arm having an electromechanical transducer, and means to determine the frequency and amplitude of oscillation of said driven arm, the improvement comprising; a pair of clamps for releasably supporting a specimen to be tested and said clamps and specimen being retained by said sample arms adjacent to the terminal spaced-apart ends thereof, each clamp having a body member, said body member having a base section, said base section having a pair of laterally spaced-apart projecting and cooperating guide lugs, said guide lugs having a specimen stop means for prepositioning a specimen to be tested, said specimen stop means being removable and positionable at selected spaced increments to accommodate a specimen to be centralized relative to said guide lugs and specimen positioning means for testing, means on said base section for mounting said body member to an arm terminal end, a specimen means cooperatively and slidably retained by said guide lugs, means on one of said guide lugs for displacing said specimen positioning means laterally between said guide lugs to releasably clamp a specimen to be tested.



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**4,295,375**

**ULTRASONIC METHOD OF TESTING WELDED JOINTS**

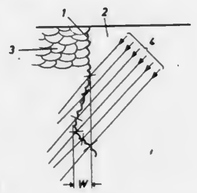
**Otto Ganglbauer; Felix Wallner, both of Linz; Helmut Scheidl, Ried; Hermann Reindl, Linz, all of Austria, and Rainer Frielinghaus, Bornheim-Merten, Fed. Rep. of Germany, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria and Krautkraemer GmbH, Cologne, Fed. Rep. of Germany**

**Filed Dec. 26, 1979, Ser. No. 106,865**

**Claims priority, application Austria, Jan. 8, 1979, 115/79**

**Int. Cl.³ G01N** *29/04*

**U.S. Cl. 73—582** **6 Claims**



1. A method of testing a welded joint comprising base metal and a weld bonded to said base metal at an interface, said method comprising the steps of causing an ultrasonic sound beam to be incident on said interface at an oblique angle to said joint, receiving echoes generated by reflectors in said joint in response to said beam, and deriving information regarding the size and nature of such reflectors from the amplitude of said echoes,

the improvement residing in that the frequency of said sound beam is below an upper frequency limit at which sound has in said base material a wavelength which equals the largest peak-to-valley distance of said interface in any area thereof on which said sound beam is incident at a time.

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**4,295,376**

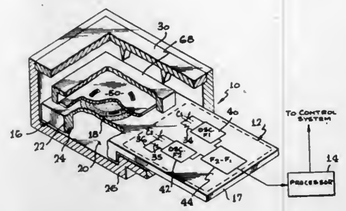
**FORCE RESPONSIVE TRANSDUCER**

**Robert L. Bell, Chatsworth, Calif., assignor to Besco Industries, Inc., Chatsworth, Calif.**

**Filed Dec. 1, 1978, Ser. No. 965,604**

**Int. Cl.³ G01L** *9/12*

**U.S. Cl. 73—724** **42 Claims**



1. A force responsive capacitive transducer comprising:

a flexible diaphragm having a face region deflectable in response to a deflecting force acting thereon and including first electrode means comprising electrically separate electrodes in at least two different regions on the deflectable face region thereof that are deflected differently in response to a deflecting force;

and movable plate means coupled to the deflectable face region of said diaphragm between the separate electrodes of said first electrode means and including second electrode means facing the first electrode means.

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**4,295,377**

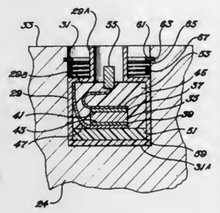
**FASTENER INCORPORATING REMOVABLE ULTRASONIC TRANSDUCER**

**James C. Couchman, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.**

**Filed Jul. 12, 1979, Ser. No. 57,057**

**Int. Cl.³ F16B** *31/02;* **G01N** *29/00*

**U.S. Cl. 73—761** **21 Claims**



1. A fastener, comprising:

a shank having a head at one end and threads formed at the other end,

an acoustic transducer located in a container means and affixed therein such that said transducer and said container means are an integral unit, and

attaching means for removably attaching said container means to one end of said fastener with said acoustic transducer being acoustically coupled to said fastener to allow pulse-echo measurements to be obtained while said fastener is torqued in place with a wrench means,

said attaching means being separate from the wrench means whereby when the wrench means is removed from said fastener, said container means remains attached to said fastener,

the entire portion of said fastener between said container means and the end of said fastener opposite said container means being of solid metal throughout.



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**4,295,378**

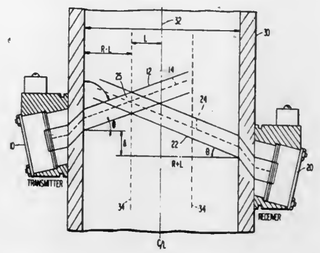
**METHOD AND APPARATUS FOR FLOW MEASUREMENT USING DOPPLER FREQUENCY SHIFT**

**Tom L. Erb, and Wendell D. Miller, both of Austin, Tex., assignors to Ramsey Engineering Company, St. Paul, Minn.**

**Filed Feb. 11, 1980, Ser. No. 120,189**

**Int. Cl.³ G01F** *1/66*

**U.S. Cl. 73—861.25** **12 Claims**



1. The method of measurement of the average velocity of media flowing in a conduit by the use of Doppler frequency shift comprising the steps of:

(a) determining the locus of points within said conduit where the incremental media flow rate is equal to the average flow rate of the media in said conduit;

(b) directing a transmitting transducer beam central axis to an intersecting point on said locus of points;

(c) directing a receiving transducer beam central axis at said intersecting point on said locus of points;

(d) measuring the incremental rate of flow at said intersecting point on said locus by the use of Doppler frequency shift flow measurement.

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**4,295,379**

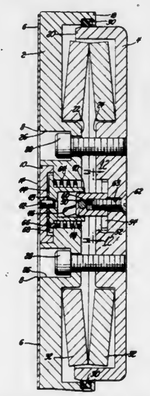
**GAGE TO MEASURE TRACK TENSION**

**Boris Zura, Sterling Heights, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Feb. 4, 1980, Ser. No. 118,136**

**Int. Cl.³ G01L** *1/04*

**U.S. Cl. 73—862.62** **8 Claims**



1. A gage to measure the tension in the track of a track laying vehicle comprising:

a. a compressible spring,

b. a housing for said spring having telescoping inside and outside housing covers and a central axis,

c. the covers having aligned cavities along said axis,

d. means, including cam and cam follower elements, in the cavities to convert relative translatory movement of one element along said axis into angular movement of the remaining element about said axis,

e. a radially disposed indicator arm secured to the angularly movable element,

f. means to secure the two covers against relative angular movement while permitting relative telescoping of the covers along said axis, and

g. additional spring means to oppose said angular movement.

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**4,295,380**

**GEARING FOR A MOTOR DRIVEN TIMING RELAY**

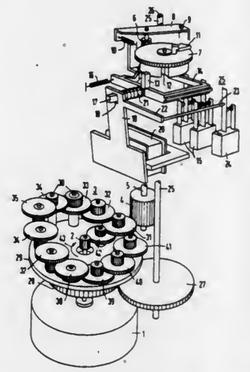
**Alois Mühling, Pleinfeld; Frank Reissner, and Helmut Schmidt, both of Nuremberg all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 25, 1978, Ser. No. 936,946**

**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740743**

**Int. Cl.² F16H** *5/74, 3/34*

**U.S. Cl. 74—3.5** **5 Claims**



5. Gearing for a motor driven, multiple range timing relay including:

a turntable having a motor driven shaft mounted coaxially therewith,

a coupling pinion adjacent to the turntable;

a chain of cascaded gear pairs having a first gear pair and at least one more driven gear pair rotatably carried on posts which are fastened by one end to the turntable, being parallel to the motor driven shaft, only every second gear pair positioned on the turntable for engagement with the coupling pinion,

a pinion on the drive shaft engaging the first of the gear pairs, and

a drive for indexing the turntable so as to engage any one of the driven second gear pairs with the coupling pinion, whereby the timing range of the relay is set.

**4,295,381**

## CRANKLESS RECIPROCATING ENGINE AND GYROSCOPIC POWER TRANSMISSION SYSTEM

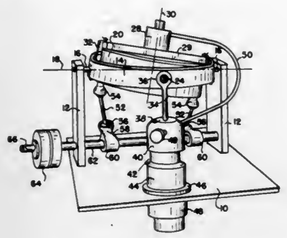
**Virgil A. Hinds, 1950 Miller Ave., Ann Arbor, Mich. 48103**

**Continuation-in-part of Ser. No. 785,943, Apr. 8, 1977, Pat. No. 4,161,889. This application Feb. 16, 1979, Ser. No. 12,841**

**The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.**

**Int. Cl.**[3] **F16H** *29/02, 33/10;* **G01C** *19/00*

**U.S. Cl. 74—5 R** **7 Claims**



1. A crankless reciprocating engine and power transmission system comprising means for supporting and substantially linearly guiding an oscillating member of said engine, a mass rotating about a first axis, said rotating mass being in a frame pivotably supported by a gimbal about a second axis at right angle to said first axis, pivot means pivotably supporting said gimbal about a third axis at right angle to said second axis and at variable angle relative to said first axis, means coupling said engine oscillating member to a point of said gimbal for oscillating said gimbal and said rotating mass frame about said third axis, power output means reciprocable by said rotating mass frame when precessionally oscillating about said second axis and biasing means urging said first axis to a position wherein said first axis is orthogonal to said third axis.

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**4,295,382**

## IRREGULAR-MOTION MECHANISM

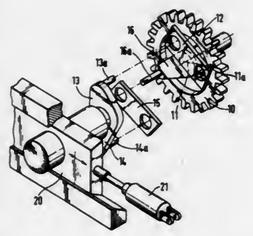
**Bernd Lollert, and Heinrich Risse, both of Düsseldorf, Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Düsseldorf, Fed. Rep. of Germany**

**Filed Aug. 23, 1979, Ser. No. 69,150**

**Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836451**

**Int. Cl.**[3] **F16H** *21/48, 21/18*

**U.S. Cl. 74—68** **1 Claim**



1. In an irregular-motion mechanism comprising two series-connected double cranks each comprising a driving link and a driven link connected thereto by a connecting rod, the driving link of the first double crank and the driven link of the second double crank being mounted for independent rotation about a common axis, the driven link of the first double crank being rigidly joined to the driving link of the second double crank, the improvement wherein the driven link of the first double crank forms an obtuse angle of between 120° and 160° with the driving link of the second double crank and the ratio of their lengths is about 2:3, the length-ratio range for the driving link of the first double crank to the driven link of the second double crank is about 3:2 to 5:4, and the length ratio for the connecting rods of the first and second double cranks is about 1:1.

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**4,295,383**

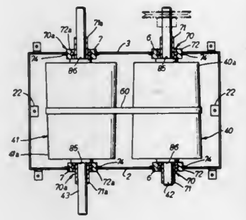
## VARIABLE SPEED DRIVE

**John W. Frost, De Pere, Wis., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Nov. 11, 1977, Ser. No. 850,607**

**Int. Cl.**[3] **F16H** *7/08;* **F16G** *5/16*

**U.S. Cl. 474—83** **5 Claims**



1. A variable speed transmission having a pair of tapered rollers arranged in parallelism and each having a smaller end, the smaller end of said roller as being oppositely disposed from one another, said rollers having a central shaft extending from either end thereof, anti-friction bearing assemblies mounted on each of said shafts and adjacent the rollers thereon, a casing for enclosing said rollers and including a lower half having a pair of generally vertical side walls, one on either end of said rollers, said side walls having semi-circular openings therein for the reception of the said bearing assemblies mounted on said shaft, an endless belt trained around said rollers for providing driving connection therebetween, the spacing of the semi-circular openings in each side wall being such that when the bearing assemblies are mounted in said openings, said belt is tensioned to a predetermined magnitude, said belt including a chrome leather driving face which is bonded to a combination nylon and polyester plastic.

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**4,295,384**

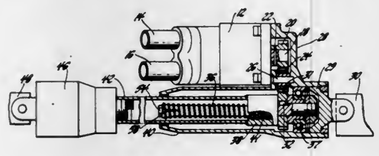
## BALL NUT AND SCREW ASSEMBLY WITH TRAVEL LIMIT STOP

**Howard C. Brandt, Saginaw, and Leonard R. Grabowski, Bay City, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 13, 1979, Ser. No. 74,960**

**Int. Cl.**[3] **F16H** *1/08, 27/02, 29/20*

**U.S. Cl. 74—424.8 NA** **6 Claims**



1. In a ball screw assembly, the combination of an elongated screw having helical ball groove means therein, a ball nut member operatively mounted for movement relative to said screw having helical ball groove means therein which matches the groove means of said screw and cooperates therewith to form a helical ball track, a train of balls operatively mounted in said track to drivingly interconnect said nut member and said screw, ball return means supported by said ball nut member for circulating said balls between opposite end turns of said track, and fixed radially extending stop means disposed in a predetermined position on said screw to provide outwardly inclined ramp means for acting on said balls of said train to progressively force said balls outwardly and radially against the inner surface of said ball nut member forming a portion of said ball groove means therein as said ball nut member progressively moves onto said ramp means to thereby place said ball nut member in hoop stress to prevent said ball nut from traveling past said stop means and thereby provide a limit stop for said assembly.



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**4,295,385**

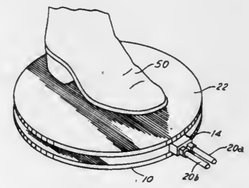
## PIVOTED LEVER ACTUATOR

**George H. Huttenhow, 4630 Fillmore St., Denver, Colo. 80216**

**Filed Jan. 21, 1980, Ser. No. 114,056**

**Int. Cl.**[3] **G05G** *9/02, 1/14;* **F16C** *1/12*

**U.S. Cl. 74—478** **5 Claims**



1. Pivotable control means for a cable actuator comprising:

(a) circular base plate means for resting on a surface without attachment;

(b) circular rotatable top plate means with a planar top surface mounted for free rotation on and in close proximity said base plate means;

(c) circular cable support ring means depending from and rotatable with said top plate means positioned between said bottom and top plate means, and said ring means being slightly smaller than said top plate means including a cable support groove;

(d) cable guide means mounted on said base plate means for passing a cable onto and from said cable support ring means, providing two free cable ends beyond said unit; and

(e) guide roller means mounted adjacent said cable guide means for simultaneously guiding two stretches of a cable through said cable guide means and onto said support ring means.

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**4,295,386**

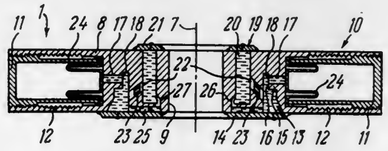
## APPARATUS FOR BALANCING BODIES OF REVOLUTION

**Jury G. Zhivotov, ulitsa Svobody, 4, kv. 148, Dnepropetrovsk, U.S.S.R.**

**Filed Mar. 12, 1979, Ser. No. 19,935**

**Int. Cl.**[3] **F16F** *15/22*

**U.S. Cl. 74—573 F** **2 Claims**



1. An apparatus for balancing a body of revolution with a vertical axis of rotation, comprising: a plurality of balancing tanks located peripherally within said body of revolution;

a distributing chamber, having an annular shoulder, mounted coaxially with said body of revolution, and hydraulically connected with said balancing tanks; conduits of said distributing chamber, made in the annular shoulder of said distributing chamber and hydraulically connecting said distributing chamber with said balancing tanks; one of the ends of said conduits being located inside said distributing chamber and equidistant from said axis of rotation of said body of revolution; and the other of said ends of said conduits being located inside said balancing tanks;

resilient diaphragms fixed on walls of said balancing tanks at the other ends or outlets of said conduits;

a balancing liquid supply source hydraulically associated with said distributing chamber; a chamber of said liquid supply source, having a diameter smaller than the diameter of said distributing chamber and located centrally within said body of revolution; and

said chamber of the liquid supply source, the distributing chamber and part of said balancing tanks defined by said resilient diaphragm, and forming a fluid tight cavity.

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**4,295,387**

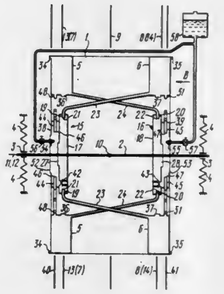
## APPARATUS FOR BALANCING BODIES OF REVOLUTION

**Jury G. Zhivotov, ulitsa Svobody, 4, kv. 148; Igor I. Kupchinsky, ulitsa Kuibysheva, 4, kv. 3; Vyacheslav D. Plokhuta, ulitsa Dzerzhinskogo, 33-a, kv. 7; Alexandr M. Bezverkhny, ulitsa Titova, 30, kv. 76, all of Dnepropetrovsk, U.S.S.R.; Samoil I. Nabutovsky, deceased, late of Dnepropetrovsk, U.S.S.R., and by Elena D. Eroshevskaya, administrator, ulitsa Lenina, 1a, kv. 51, Dnepropetrovsk, U.S.S.R.**

**Filed Jul. 12, 1979, Ser. No. 56,925**

**Int. Cl.**[3] **F16F** *15/22*

**U.S. Cl. 74—573 F** **3 Claims**



1. An apparatus for balancing bodies of revolution secured on a shaft, said bodies of revolution having an axis of rotation, a geometric axis and a center of mass, comprising:

a liquid supply source;

distributing units mounted coaxially with the body of revolution in measurement planes on both sides of a plane passing through said center of mass of said body of revolution perpendicular to the geometric axis of said body of revolution, a first chamber of each of the distributing units being installed in a first measurement plane and being hydraulically connected with said liquid supply source, conduits of said first chamber of each of the distributing units being provided in a side surface of said first chamber, and ends of said conduits being located inside said first chamber and equidistant from the geometric axis of said body of revolution;

balancing tanks mounted peripherally within said body of revolution in correction planes on both sides of the plane

passing through said center of mass of said body of revolution perpendicular to said geometric axis of said body of revolution, and hydraulically associated with said distributing units,

each conduit of said first chamber of each of said distributing units being hydraulically associated with respective balancing tanks which are located in the correction plane to the other side of the respective measurement plane containing said distributing unit relative to the plane passing through said center of mass of said body of revolution perpendicular to said geometric axis of said body of revolution,

each of said balancing tanks and said conduit, hydraulically associated therewith, of each of said distributing units being arranged in planes passing through said geometric axis of said body of revolution to form an angle within the range of 0° to 90°, defined by the plane containing said conduit hydraulically associated with said balancing tank, and said angle coinciding in direction with the sense of rotation of said body of revolution; and

pipelines connecting said liquid supply source with said conduits of the first chamber of said distributing units, and connecting said first chambers of said distributing units with said balancing tanks.

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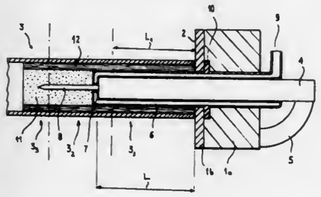
**4,295,388**

## CONTROL ROD AND A PROCESS FOR FITTING A CONNECTING MEMBER AT ONE END OF A CONTROL ROD

**Jacques Mialon, Vitrolles, and Bernard Lamarche, Velaux, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France**

**Filed Nov. 26, 1979, Ser. No. 97,338**
**Claims priority, application France, Dec. 4, 1978, 78 34111**
**Int. Cl.³ G05G *1/00***
**U.S. Cl. 74—579 R** **7 Claims**



1. A process for fitting a connecting member at a tubular deformable end of a light weight metal shaft, comprising the steps of:

inserting into said tubular end a sleeve formed of resistant fibers impregnated with polymerizable resin, the outer surface of said sleeve being in substantial contact with the inner wall of said end;

flattening a portion of said end sufficiently to bring opposite inner walls of said sleeve into substantial contact with each other; and

polymerizing said resin to seal the interior of said rod against entry of air or other gas.

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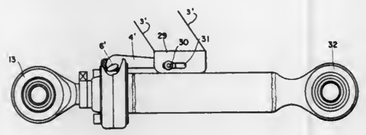
**4,295,389**

## ADJUSTABLE LENGTH UPPER GUIDE MEMBER

**Hubert Geisthoff, Lohmar, and Wilhelm von Allwörden, Erbach, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 779,615, Mar. 21, 1977, Pat. No. 4,126,057. This application Nov. 20, 1978, Ser. No. 962,476**
**Int. Cl.³ B60D *7/00***
**U.S. Cl. 74—586** **4 Claims**

1. An adjustable length upper guide member for a hitch attachment of a tractor comprising an outer tubular guide element and an inner relatively displaceable guide element telescopingly positioned therein, said inner guide element having annular grooves on its outer surface, a housing on said outer guide element, a pair of jaws pivotally mounted within said housing to define first and second arms on each jaw, the first arms of said jaw being engageable with the annular grooves on said inner guide element, said second arms defining actuating cams facing each other, and a first lever having a longer end extending outwardly of said housing and one end extending into said housing and an eccentric portion of said one end with two sides within said housing, one of said sides engageable against the inner surface of said housing and the other of said sides engageable with the actuating cams of said jaws such that when the longer end of the first lever is pivoted



said one side of said eccentric portion will apply a force urging the other of said sides against said actuating cams of the jaws to disengage the jaws from the annular grooves on said inner guide element, and a support lever pivotably mounted on said first lever and pivotable with respect to said outer tubular member into a first position wherein a portion of said support lever is engageable with said outer tubular guide member for supporting said first lever in a position in which said jaws are disengaged from said inner guide element grooves and into a second position in which said jaws are engaged with said inner guide element, and means connected to said support lever for pivoting said support lever between said first and second positions.

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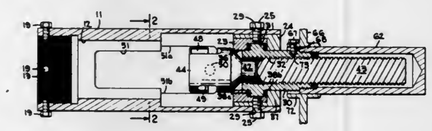
**4,295,390**

## MANUAL OVERRIDE CONTROL FOR DOUBLE-ACTING ACTUATOR

**Ervin A. Buchta, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.**

**Filed Oct. 19, 1979, Ser. No. 86,966**
**Int. Cl.³ F16H *1/18*; F16K *31/00***
**U.S. Cl. 74—625** **8 Claims**



5. A manual override control for selectively operating a double-acting actuator, said actuator having an actuator housing and an actuator rod with a distal end projecting from said actuator housing comprising:

laterally directed connector means on said rod distal end;

a control housing having an internal passage and a laterally directed aperture;

means for detachably connecting said control housing to said actuator housing to dispose said passage in axially aligned and surrounding relation to said rod distal end;

a threaded member having a socket portion at one end thereof for receiving said rod distal end therewithin;

means for mounting said threaded member to said control housing for axial movement in said passage;

said socket portion having means for releasably engaging said rod distal end connector means;

operating means for said engaging means including a handle member carried by said socket portion and extending laterally through said control housing aperture;

means for mounting said threaded member and said socket portion in said control housing to facilitate removing said override control from said actuator as a single unit, said actuator being operable with said override control removed; and,

means for moving said threaded member in said passage to selectively move said actuator rod relative to said actuator housing when said socket portion has said rod distal end received therein and engaged therewith upon operation of said laterally directed handle member.



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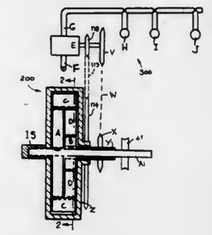
**4,295,391**

## TRANSMISSION ASSEMBLY

**Arthur Philpott, Little Eaton, and Reginald S. Fuher, Alvaston, both of England, assignors to Ready Pen Limited, Derby, England**

**Filed May 29, 1979, Ser. No. 43,234**
**Claims priority, application United Kingdom, May 30, 1978, 24160/78**
**Int. Cl.³ F16H *3/00, 57/10***
**U.S. Cl. 74—782** **11 Claims**



1. A transmission assembly comprising an input shaft, an output shaft in co-axial alignment with the input shaft, a drive sprocket wheel carrying member secured to the input shaft and extending generally radially therefrom, a first sprocket wheel co-axially mounted on the output shaft, a second sprocket wheel rotatably mounted on the output shaft, at least one drive sprocket wheel assembly rotatably mounted on the sprocket wheel carrying member, each drive sprocket where assembly including at least a primary and secondary sprocket wheel, and for each drive sprocket wheel assembly, a chain extending about the primary sprocket wheel and the first sprocket wheel and a further chain extending about the secondary sprocket wheel and the second sprocket wheel, and control means for controlling the speed of the rotation of the second sprocket wheel to control the speed of rotation of the output shaft, and reversal drive means providing a step up driving connection between the input shaft and said second sprocket wheel via a clutch, so that when said clutch is activated the second sprocket wheel is rotated faster than the input shaft to effect reversal of the output shaft.

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**4,295,392**

## CORKED BOTTLE OPENER

**Wallace C. Peck, 227 Grove St., Norwell, Mass. 02061**

**Filed Jun. 22, 1979, Ser. No. 50,991**
**Int. Cl.³ B67B *7/04, 7/36***
**U.S. Cl. 81—3.32** **4 Claims**

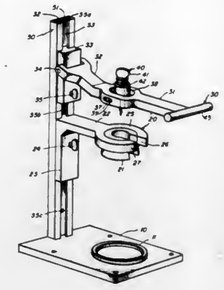
1. A corked bottle opener (according to claim 1 wherein said cork removing means comprises) comprising

a base section,

a bracket support means, said bracket support means being in a substantially 90° relationship with said base section,

retaining means contiguous with said bracket support means and positioned above said base section so that a bottle is positioned and retained onto said base section,

a first bracket portion having a key portion configured to engage said bracket support means, said first bracket portion having means to pivotally engage a second and a third bracket portion, said second bracket portion is integral with said third bracket portion and are in an angular relationship to one another, said third bracket portion confronts said retaining means and further comprises a corkscrew mechanism means pivotally and longitudinally movably mounted to the third bracket portion at a position confronting a slotted cylindrical opening in said retaining means and adapted to engage said cork in the bottle whereby upward movement of said second and third bracket portions pivotally about said first bracket causes the corkscrew mechanism means inserted in said cork to lift the cork out of the bottle.



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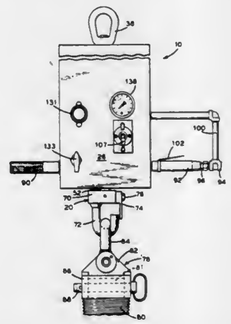
**4,295,393**

## STUD HANDLING TOOL

**Marty E. Adcock, Logan, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Jan. 25, 1980, Ser. No. 115,519**
**Int. Cl.³ B25B *29/00***
**U.S. Cl. 81—57.4** **9 Claims**



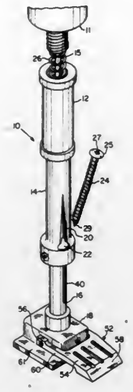
1. An apparatus for threadingly engaging a first threaded member with a second threaded receiving member and disengaging it therefrom, comprising a frame, means extending from said frame for suspending said first threaded member above said second threaded receiving member, a rotary air motor attached to said frame, engagement means attached to the output of said rotary air motor for engaging said first threaded member for rotation by said rotary air motor, and means attached to said frame operable to apply a lifting force to said first threaded member while said first threaded member is rotated by said air motor and in threaded engagement with said second threaded receiving member, said lifting force applying means comprising a linear air motor operably attached to said frame, and said means extending from said frame being defined by an extensible output member of said linear air motor.

**4,295,394**

## INSTALLATION TOOL BARREL ASSEMBLY

**Charles J. DeCaro, Pittsburgh, Pa., assignor to Textron Inc., Providence, R.I.**

**Filed Feb. 25, 1980, Ser. No. 124,524**
**Int. Cl.³ B25B *23/02***
**U.S. Cl. 81—57.37** **8 Claims**



1. A barrel assembly suitable for connection to a fastener driver tool having a tool body and a driver comprising:

A. an outer sleeve adapted for attachment at one end to the tool body;

B. an inner sleeve mounted to the outer sleeve so as to be retractable therein, said inner sleeve including an annular wall, a bore and an elongated slot in the wall, said slot increasing in depth from a starting point and terminating in an enlarged clear through opening in registry with the bore to accommodate a fastener head;

C. a barrel retractably connected at a first end to the inner sleeve and including a clear through notch in alignment with said slot to receive the fastener in a bore of the barrel; and

D. biasing means associated with the inner sleeve and barrel to urge them into an extended position, the driver being positioned at the tool body end of the clear through notch in said extended position so that the barrel assembly can receive said fastener.

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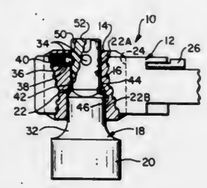
**4,295,395**

## TOOL ATTACHMENT HAVING SPRING EJECT RELEASE

**Vincent A. Stifano, Jr., Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.**

**Filed May 7, 1979, Ser. No. 36,797**
**Int. Cl.³ B25B *13/06***
**U.S. Cl. 81—121 R** **10 Claims**



1. A tool comprising a body having a drive member with a non-circular opening therein, and a releasable tool attachment having a fastener driving element and connected shank, the shank being dimensioned and configured to be inserted into the opening into an operating position in driving engagement with the drive member, one of the drive and shank members having a camming surface, the other of the drive and shank members having resiliently biased ejection means engageable with the camming surface upon discrete movement of the shank from its operating position relative to the drive member in a tool attachment release direction, the ejection means and the camming surface cooperating upon engagement to apply an axial driving force to the attachment for positively ejecting the attachment from the tool body.

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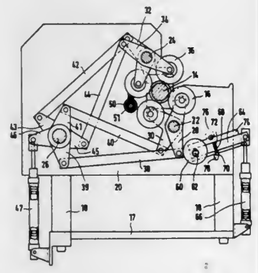
**4,295,396**

## BAR FEEDING MECHANISM FOR MACHINES FOR WORKING ROTATING BAR STOCK

**Heinz Hasslauer, Uhingen, Fed. Rep. of Germany, assignor to Hermann Traub GmbH & Co., Fed. Rep. of Germany**

**Continuation of Ser. No. 933,954, Aug. 15, 1978, abandoned. This application Apr. 22, 1980, Ser. No. 142,669**
**Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737957**
**Int. Cl.³ B23B *3/00, 13/00, 25/00***
**U.S. Cl. 82—1 C** **7 Claims**



1. A method of guiding a rotating bar stock in a machine for working said bar stock, said bar stock having a middle portion and a tail portion, comprising the steps of:

(a) contacting said rotating bar stock with pressure engagement by rollers in a plurality of roller assemblies, said roller assemblies being adapted to support and center said bar stock for feeding to said machine;

(b) feeding said rotating bar stock for working by said machine;

(c) limiting the contact of said rollers of at least one roller assembly engaging said middle portion of said rotating bar stock to allow sufficient play for a radial antinode of rotation; and

(d) readjusting the contact of said rollers of at least one roller assembly after the middle portion has passed to allow pressure engagement of said tail portion of said rotating bar stock.

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**4,295,397**

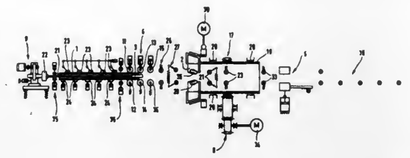
## APPARATUS FOR PEELING PIPES

**Wilhelm Schweer, Leichlingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany**

**Filed Feb. 7, 1979, Ser. No. 10,177**
**Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805947**
**Int. Cl.³ B23B *5/12***
**U.S. Cl. 82—20** **7 Claims**

1. Apparatus for peeling pipes comprising: internal and external independent rotatably driven cutter heads for peeling a pipe, said cutter heads being positioned sufficiently close together for simultaneous peeling of a pipe over at least a portion of the pipe length, feed means for non-rotatably longitudinally feeding a pipe past said cutter heads, and said internal cutter head being in the form of a drill head secured to one end of an elongated drill rod which extends through the pipe and along which the pipe is fed by said feed means including independent variable speed drive means for each said cutter head for independently driving each said cutter head at a desired speed.





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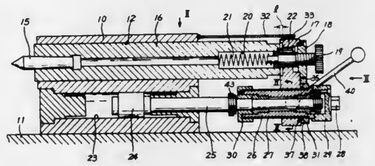
**4,295,398**

## WORKPIECE SUPPORTING DEVICE

**Yoshiaki Sugata, and Kiyoshi Miyagawa, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Mar. 21, 1980, Ser. No. 132,426**
**Claims priority, application Japan, Mar. 22, 1979, 54-37377**
**Int. Cl.³ B23B *23/00***
**U.S. Cl. 82—31** **5 Claims**



1. A workpiece supporting device comprising:

a housing;

a holding shaft slidably received in said housing;

a center member carried on one end of said holding shaft and adapted to support one end of said workpiece;

a hydraulic cylinder formed in said housing and including a piston slidably received in said housing and a piston rod integrally formed with said piston and extending from said housing in parallel relationship with the axis of said holding shaft;

a sleeve member rotatably but non-slidably mounted on said piston rod and formed with a threaded portion at the periphery thereof;

means for rotating said sleeve member;

a connecting member threadedly engaged with said threaded portion of said sleeve member;

an adjusting member threadedly engaged with said connecting member in coaxial relationship with said holding shaft;

spring means interposed between said holding shaft and said adjusting member for applying a holding force to said workpiece being supported on said center member; and

means arranged between said holding shaft and said connecting member for limiting relative axial movement therebetween within a predetermined distance.

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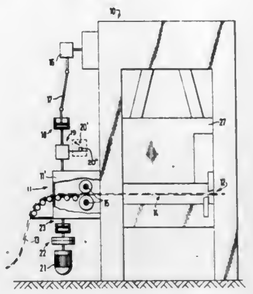
**4,295,399**

## APPARATUS FOR INTERMITTENT FEEDING OF WEB-TYPE OR STRIP-TYPE MATERIAL

**Kurt Finsterwalder; Karl-Heinz Philipp, both of Göppingen; Günter Riedisser, Eislingen, and Wilfried Voss, Göppingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany**

**Filed Oct. 6, 1978, Ser. No. 949,232**
**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744960**
**Int. Cl.³ B26D *5/22***
**U.S. Cl. 83—251** **6 Claims**



1. An apparatus for intermittently feeding a web-type or strip-type material to an operating chamber of a press having a main press drive means and a scrap cutter means driven in correspondence with an operating cycle of the press, the apparatus including feed roller means, feed gear means operatively connected with the feed roller means, and means for connecting the feed gear means with the main press drive means so that the feed roller means may be driven by said main press drive means, characterized in that means are provided for selectively interrupting the driving of said feed roller means by said main press drive, an auxiliary drive means is operatively connected with the feed gear means so as to drive the same when the drive is interrupted by said interrupting means, and in that a further drive means is operatively connected with the scrap cutter for driving the scrap cutter independently of the main press drive in correspondence with a cycle of the feed gear means.

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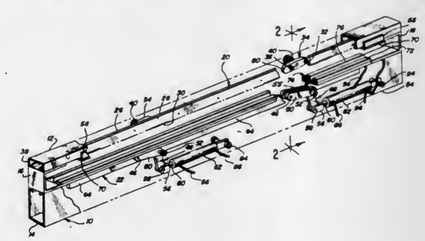
**4,295,400**

## WEB SEVERING DEVICE

**Clifford L. Larson, Marco Island, Fla., assignor to Baldwin-Korthe Web Controls, Inc., Addison, Ill.**

**Filed Mar. 31, 1980, Ser. No. 135,772**
**Int. Cl.³ B26D *7/22***
**U.S. Cl. 83—545** **11 Claims**



1. A web severing device for a printing press or the like comprising, in combination, a pair of generally parallel spaced-apart elongated carriages positioned transverse to the direction of travel of the web and straddling the path of the web so that

the web passes between said pair of carriages, a severing blade attached to a first carriage of said pair of carriages, a first means for moving the second carriage of said pair of carriages in a direction toward said first carriage to narrow the spaced-apart distance between said carriages, a second means responsive to further movement of said second carriage toward said first carriage for moving said first carriage in the opposite direction toward said second carriage to bring said blade into severing contact with said web, and means for preventing effective activation of said responsive means during any period of time in which a relatively non-flexible, rigid object is disposed between said carriages.

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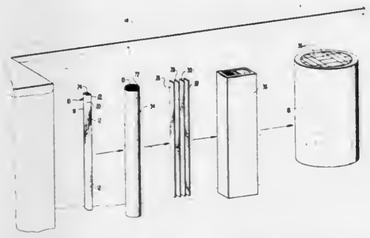
**4,295,401**

## APPARATUS FOR DISPOSING OF RADIOACTIVE FUEL CHANNELS

**William L. Mullett, Dunedin, Fla., assignor to NUS Corporation, Rockville, Md.**

**Filed Jul. 29, 1976, Ser. No. 709,745**
**Int. Cl.³ G21C *19/32*; B26D *11/00***
**U.S. Cl. 83—864** **5 Claims**



1. Apparatus for disposing of a radioactive rectangular tubular fuel channel comprising elongated housing means for containing therein the tubular channel, and cutter means, mounted on said housing means, for cutting the channel along each longitudinal corner thereof until the channel is severed into four side plates; wherein said cutter means comprises four roller cutter blades respectively engaging the four longitudinal corners of the tubular channel, and motive means on said housing for simultaneously longitudinally moving said cutter blades in a reciprocating motion along the four longitudinal corners of the tubular channel, whereby severance is achieved by material displacement, as opposed to material removal, so that no material chips are produced; said apparatus further comprising guide roller means associated with each cutter blade to maintain alignment of the cutter blade on the corresponding longitudinal corner during the cutting operation, and to maintain the rectangular configuration of the channel after one or more plates are severed.

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**4,295,402**

## AUTOMATIC CHORD ACCOMPANIMENT FOR A GUITAR

**Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan**

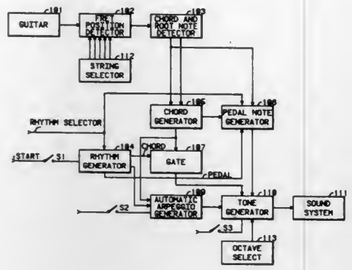
**Filed Oct. 29, 1979, Ser. No. 88,978**
**Int. Cl.³ G10F *1/00***
**U.S. Cl. 84—1.03** **22 Claims**

1. In combination with a fretted musical instrument having a plurality of electrically conducting strings, apparatus for providing automatic accompaniment comprising;

a means for generating fret signals corresponding to members of said plurality of electrically conducting strings pressed into contact with frets on said fretted musical instrument,

a string selection means for selecting said fret signals corresponding to a preselected subset of said plurality of electrically conducting strings,

a chord detect means responsive to said selected fret signals comprising a matched filter processor wherein a musical chord type is selected from a preselected set of musical chord types irrespectively of whether or not said fret signals comprise a musical chord type,




a root note detect means responsive to said selected fret signals for selecting a chord root note corresponding to said selected musical chord type,

a note data generator means responsive to said selected musical chord type and said selected chord root note wherein input note data is generated, and

a tone generator for creating musical tones at pitches responsive to said input note data.

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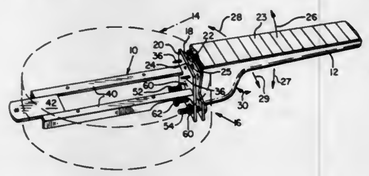
**4,295,403**

## ADJUSTABLE NECK ATTACHMENT FOR STRINGED INSTRUMENTS

**Jeff B. Harris, 10275 SW. Century Oak Dr., Tigard, Oreg. 97223**

**Filed Dec. 24, 1980, Ser. No. 220,080**
**Int. Cl.³ G10D *3/00***
**U.S. Cl. 84—293** **9 Claims**



1. In a stringed musical instrument having a body, an elongate neck extending therefrom, and at least one string extending along said body and said neck, an adjustable neck attachment device for connecting said neck to said body, comprising:

(a) a neck adapter plate and means for attaching said neck adapter plate to said neck;

(b) a body adapter plate and means for attaching said body adapter plate to said body;

(c) single point pivot means associated with said neck adapter plate and said body adapter plate for permitting angular adjustment of the position of said neck adapter plate with respect to said body adapter plate about said single point pivot means;

(d) angle adjustment means extending between said body adapter plate and said neck adapter plate for adjusting the angular position of said neck with respect to said body by rotating said body and neck adapter plates with respect to one another about an axis extending through said pivot means and generally perpendicular to the length of said neck; and

(e) rotational adjustment means associated with said angle



adjustment means, for adjustably holding said neck in a selected position of rotation with respect to said body, about an axis extending generally along the length of said neck and through said pivot means.

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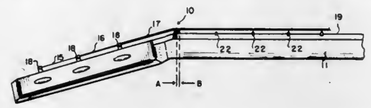
**4,295,404**

## COMPENSATED NUT FOR A LUTE-TYPE INSTRUMENT

**Paul R. Smith, Annapolis, Md., assignor to DiMarzio Musical Instrument Pickups, Inc., N.Y.**

**Filed Mar. 14, 1980, Ser. No. 130,574**
**Int. Cl.³ G10D *3/04***
**U.S. Cl. 84—314 N** **7 Claims**



1. A nut for a lute-type instrument said nut comprising an elongated body, said body normally having a length to straddle the neck of said instrument, said body normally adapted to abut the fingerboard of said instrument, and said body including an extending portion, said extending portion adapted to extend over said fingerboard, said extended portion regularly graduated in extent increasing from the treble side to the bass side of said neck, said extent of a selected distance adapted to compensate for sharpness of notes played near said neck.

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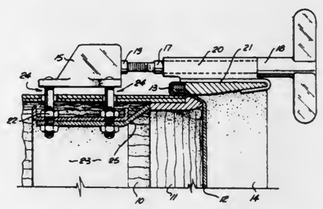
**4,295,405**

## MUSICIAN'S DRUM

**Donald E. Sleishman, 56A Bignell St., Illawong, New South Wales, 2234, Australia**

**Filed Oct. 9, 1979, Ser. No. 82,462**
**Claims priority, application Australia, Oct. 18, 1978, PD6446**
**Int. Cl.³ G10D *13/02***
**U.S. Cl. 84—413** **8 Claims**



1. A musician's drum of the kind comprising a cylindrical shell, a diaphragm, and loading means to stretch the diaphragm across one end of the shell, wherein said loading means comprise: engaging means gripping the periphery of the diaphragm; a stabilizer ring co-axial with the shell intermediate the ends of the shell and spaced from the shell; at least three abutment means spaced apart around, secured to and extending from said ring into abutment with said shell to prevent movement of said ring towards at least said one end of the shell; and a plurality of tensioning means extending from said engaging means to said ring.

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**4,295,406**

## NOTE TRANSLATION DEVICE

**Larry C. Smith, 22916 Juniper Ave., Torrance, Calif. 90505**

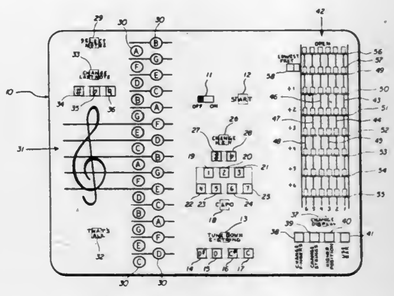
**Filed Aug. 20, 1979, Ser. No. 68,063**
**Int. Cl.³ G09B *15/02***
**U.S. Cl. 84—470 R** **25 Claims**

1. A note translation device for translating selected note symbols shown in printed music to string and fingerboard location information to use for playing the notes on a stringed fingerboard instrument, comprising:

a support structure;

a keyboard switch array supported by said support structure and including a plurality of musical note switch means corresponding to a plurality of printed music note symbols and selectively operable to enable the operator to input selected note symbols shown in the printed music;

electronic processing circuitry means responsive to said musical note switch means for storing said selected note symbols that correspond to note symbols shown in the printed music,



said electronic processing circuit means further adapted for choosing string and fingerboard location information for playing said selected note symbols thereby translating the note symbols shown in the printed music into string and fingerboard locations to use for playing the notes of a stringed fingerboard instrument, and

means for communicating to the operator said string and fingerboard location information selected by said electronic processing circuit means whereby the string number and fingerboard location is identified for playing each selected note symbol on said stringed fingerboard instrument.

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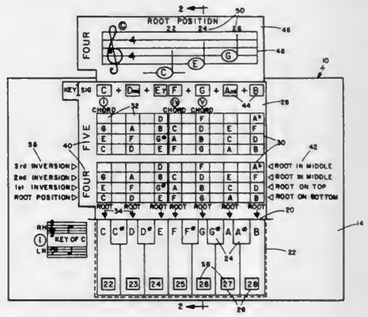
**4,295,407**

## KEYBOARD SIMULATION WITH VERTICAL INVERSION INDEXES

**Verna M. Leonard, 3848 E. Swift, Fresno, Calif. 93726**

**Filed Apr. 18, 1980, Ser. No. 141,577**
**Int. Cl.³ G10G *1/02***
**U.S. Cl. 84—471 R** **6 Claims**




1. A musical teaching aid comprising:

(a) a base member having a backing panel and a front panel, side panels being seamed together across the top and bottom and said front panel defining a horizontal slit;

(b) a simulated keyboard displayed on said front panel beneath said slit;

(c) an insert card for insertion in said slit and having a plural-

ity of vertical rows of tone-naming indicia indexed above the keys in said keyboard;

(d) the tones in said tone-naming indicia beginning at the bottom tone thereof with the tone of the underlying key and progressing upwardly naming sequential tones in a particular chord; and

(e) indicia displayed on the front of said front panel naming the inversions of said particular chord and indexing with the tones on said insert card initiating the respective inversion.

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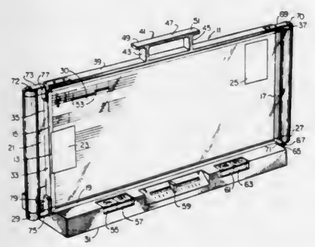
**4,295,408**

## MUSIC TEACHING APPARATUS AND METHOD

**John W. Pasker, 472 Tonawanda St., Buffalo, N.Y. 14207, assignor to John W. Pasker, Buffalo, N.Y.**

**Filed Apr. 20, 1978, Ser. No. 898,071**
**Int. Cl.[3] G04F** *5/02;* **G09B** *15/04*
**U.S. Cl. 84—484** **17 Claims**



1. A music teaching apparatus comprising means to hold music in position for viewing by a player of a musical instrument, a continuous transparent web having a plurality of indicia thereon for indicating notes of the music to be played when the web is in position with respect to the music and the player, said indicia being so positioned as to permit continuous reading and playing of the music by the player ahead of one thereof when the web and the indicia are moving with respect to the music, means for continuously moving the web with respect to the music, and J-shaped or U-shaped spring members, one each at the top and bottom respectively of the apparatus at an end thereof and at a side of the continuous web, for applying a spring force to the web to hold it in tension, which spring members each have horizontal extensions directed away from the main portion of the apparatus and longitudinally with respect thereto and have mounted on such extensions a non-driving cylinder which applies tension to the web.

2. A music teaching apparatus comprising means to hold music in stationary position for viewing by a player of a musical instrument, a continuous transparent web having a plurality of readily removable and repositionable opaque covers thereon for covering parts of the music when the web is in position with a face thereof between the music and the player, which opaque covers are each of size and shape so as each to cover the height of a staff of the music and which are so positioned as to permit continuous reading and playing of the music by the player ahead of such covers when the web is being moved with respect to the stationary music, and means for continuously moving the web with respect to said music.

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**4,295,409**

## SHOT AND POWDER DISPENSER ATTACHMENT

**Frank H. Simpson, Rte. 2 Box 276, Cornelius, Oreg. 97113**

**Filed Apr. 20, 1979, Ser. No. 31,764**
**Int. Cl.[3] F42B** *33/02*
**U.S. Cl. 86—31** **2 Claims**

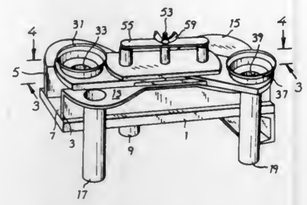
1. A shot and powder dispenser in combination with a cartridge reloading machine comprising:

a body defining a channel;

metering means movable within the channel;

lip means on the body, the lip means including a hollow chute;

a powder carrier on the body, the carrier optionally pivotable;



from a first position above the metering means to either a second position on the lip means, so that the flow of powder to the metering means is blocked, or to a third position on the lip means above the chute;

and a dispensing tube on the body operatively connected to the metering means and to the reloading machine.

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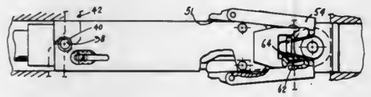
**4,295,410**

## GUN BOLT LOCKING SYSTEM

**Raymond A. Patenaude, Burlington; Steven R. Duke, Williston, and Edward A. Proulx, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.**

**Filed Nov. 28, 1979, Ser. No. 97,993**
**Int. Cl.[3] F41D** *7/04*
**U.S. Cl. 89—12** **12 Claims**



1. A gun including:

a receiver **[18]**;

a gun bolt assembly journaled for reciprocation along a longitudinal axis in said receiver;

a first transverse cam track **[36]**;

a second transverse cam track **[42]**;

means for providing relative transverse motion between said gun bolt assembly and said first and second cam tracks;

a locking lug **[22]** pivotally mounted to said receiver **[18]** and having a first cam following surface **[51]** and a second cam following surface **[68]**;

said gun bolt assembly including:

a gun bolt body **[10]** having

a cam surface **[50]**;

a face **[56]** for transmitting force along a longitudinal component;

a first cam follower **[34]** engaged with said first cam track **[36]**, having a mode of operation such that relative transverse motion between said first cam track and said first cam follower provides reciprocation of said gun bolt body **[10]** relative to said receiver **[18]**;

a slide **[12]** carried by and journaled for relative longitudinal reciprocation with respect to said gun bolt body **[10]** and having:

a cam surface **[66]**;

a second cam follower **[40]** engaged with said second cam track **1 [42]**, having a mode of operation such that relative motion between said second cam track and said second cam follower provides reciprocation of said slide **[12]** relative to said gun bolt body **[10]**;



an actuator lug **[44]** pivotally mounted to said slide **[12]**, having a mode of operation such that reciprocation of said slide progressively in a first direction [aft] relative to said body causes said actuator lug to be cammed progressively outwardly by such cam surface **[50]** of said gun bolt body and to engage said first cam following surface **[51]** of said locking lug **[22]** to pivot said locking lug progressively in a first direction to engage said gun bolt body to lock said gun bolt body against reciprocation in a first direction [aft], and that reciprocation of said slide in a second direction [forward] relative to said body causes said cam surface **[66]** of said slider to engage said second cam following surface **[68]** of said locking lug **[22]** to pivot said locking lug progressively in a second direction to disengage from said gun bolt body to unlock said gun bolt body to permit reciprocation in said first direction.

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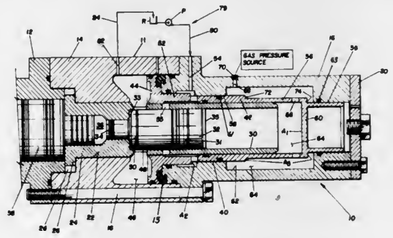
**4,295,411**

## IMPACTOR

**Innes Grantmyre, and Brent Miedema, both of Cambridge, Canada, assignors to Joy Manufacturing Company, Pittsburgh, Pa.**

**Filed Oct. 3, 1979, Ser. No. 81,519**
**Int. Cl.[3] F01L** *17/00, 25/04;* **F01B** *7/18*
**U.S. Cl. 91—165** **14 Claims**



1. In an impactor assembly in which a hammer piston is reciprocably movable through alternate work strokes and return strokes within an elongated bore with the work strokes being effected by a closed drive system which continuously urges said hammer piston in one axial direction toward a rest position thereof by applying to said hammer piston a variable driving impetus of a magnitude dependent upon the displacement of said hammer piston from said rest position and the return strokes being effected by the selective supplying of hydraulic fluid flow from a fluid flow supply means into said bore to apply to said hammer piston a return impetus which displaces said hammer piston from said rest position by overcoming said variable driving impetus, and wherein a valve means includes a valve member which is selectively movable to a supply position to permit the supplying of hydraulic fluid flow into said bore to effect such a return stroke and subsequently is movable to an exhaust position to permit expulsion of hydraulic fluid from said bore thereby permitting said drive system to effect such a work stroke, the improvement comprising:

actuator means integral with said valve means and including surface means upon which said drive system and said hydraulic fluid flow from said fluid flow supply means continuously exert a bias to cycle said valve member between said supply and exhaust positions by providing variable valve actuating impetus to act on said valve member wherein said valve actuating impetus includes a first component resulting from the bias of said drive system on said surface means to urge said valve member toward said supply position, a second component resulting from the bias of said hydraulic fluid flow on said surface means to urge said valve member toward said supply position and a third component resulting from the bias of said drive system on said surface means to urge said valve member toward said exhaust position.

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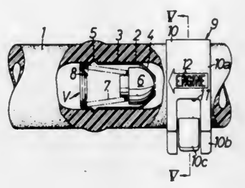
**4,295,412**

## HOSE WITH A ONE-WAY VALVE FOR A VACUUM OPERATED SERVOMOTOR

**Nobuaki Hachiro, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan**

**Filed Dec. 12, 1979, Ser. No. 103,512**
**Claims priority, application Japan, Dec. 19, 1978, 53-158996**
**Int. Cl.[3] F15B** *13/04;* **F16K** *15/00*
**U.S. Cl. 91—468** **1 Claim**



1. In a connection device for use with a vacuum operated servomotor comprising a flexible hose connected between a booster shell of said servomotor and an intake manifold of an internal combustion engine; a housing having a valve seat, a cylindrical guide portion, and an annular seal projection of a diameter larger than that of said cylindrical guide portion all disposed in an axial direction; a valve member disposed in said housing; and a valve spring in said housing for urging said valve member into seating engagement with said valve seat, said housing being urged into said hose and said cylindrical guide portion being closely fitted in the inner surface of said hose while said seal projection acts to expand said hose radially outwardly to form a tight seal therebetween; the improvement comprises said seal projection having a caulked portion formed at one end of said housing for holding therein an outer peripheral portion of a retainer for supporting a fixed end of said valve spring.

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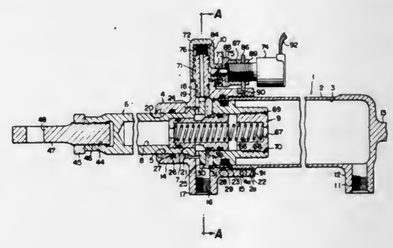
**4,295,413**

## HYDRAULIC ACTUATOR

**Toshio Kamimura, Gifu, Japan, assignor to Teijin Seiki Company, Limited, Osaka, Japan**

**Continuation of Ser. No. 4,534, Jan. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 807,233, Jun. 16, 1977, abandoned. This application Jun. 2, 1980, Ser. No. 155,743**
**Claims priority, application Japan, Jun. 18, 1976, 51-71966**
**Int. Cl.[3] F01B** *25/26*
**U.S. Cl. 92—5 L** **2 Claims**



1. A hydraulic actuator for aircrafts, comprising:

a cylinder;

a main piston axially slidably received in said cylinder and having a hollow bore axially extending therein;
a liquid source system for supplying a liquid to said cylinder to relatively slidably move said cylinder and piston;
at least one locking member radially movably retained in said main piston;
a ram axially slidably received in said hollow bore of said main piston and having a lower engaging portion slidably engageable with the radially inner face of said locking member, an upper engaging portion axially spaced apart from said lower engaging portion with a circumferential length longer than that of said lower engaging portion and slidably engageable with the radially inner face of said locking member, a stepped portion positioned between said lower and upper engaging portions with a circumferential length longer than that of said lower engaging portion but shorter than that of said upper engaging portion and slidably engageable with the radially inner face of said locking member, a first inclined portion connected at one end with said lower engaging portion and at the other end connected with one end of said stepped portion to be slidably engageable with the radially inner face of said locking member for radial movement thereof, and a second inclined portion connected at one end with the other end of said stepped portion and at the other end connected with said upper engaging portion to be slidably engageable with the radially inner face of said locking member for radial movement thereof;
a compression coil spring accommodated in said bore of said main piston to urge said ram toward said lower engaging portion from said upper engaging portion;
a switch piston radially slidably mounted on said cylinder to have a radially inner face engageable with the radially outer face of said locking member;
an indicator for indicating lock and unlock engagement conditions of said cylinder and said main piston; and
a detecting electric switch for detecting the radially moved position of said locking member through said switch piston to detect said main piston which is locked and unlocked and for transmitting lock and unlock signals to said indicator, whereby the radially inner face of said locking member is in engagement with said lower engaging portion of said ram to assume an unlock engagement position wherein said main piston is in unlocked relation with said cylinder, the radially inner face of said locking member is in engagement with said stepped portion of said ram to assume a first lock engagement position wherein said indicator indicates said unlock signal even though said cylinder and said main piston are in said first lock engagement condition, and the radially inner face of said locking member is in engagement with said upper engaging portion of said ram to assume a second lock engagement position wherein said indicator remains indicating said lock signal.

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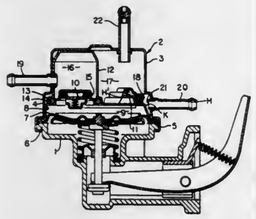
**4,295,414**
**DIAPHRAGM-TYPE FUEL PUMP**
**Hiroshi Mochizuki, and Tokio Seki, both of Sowamachi, Japan, assignors to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Aug. 9, 1979, Ser. No. 85,037**
**Int. Cl.³ F15B *21/04*; F04B *45/10***
**U.S. Cl. 92—98** **2 Claims**

1. In a diaphragm-type fuel pump, including a body having an opening therein, a pumping diaphragm extending across and closing said opening, a cup-shaped outer casing positioned over said diaphragm and connected to said body, said outer casing having an end wall spaced a substantial distance from said diaphragm, said outer casing having three axially-spaced sections with a first said section being disposed directly adjacent said end wall and a second said section being cylindrical and disposed axially between said first section and a third said section, said third section being cylindrical and defined at the mouth of said outer casing and connected to said body, said third section having a diameter greater than said second section, said second section having a cross-sectional area greater than said first section, a separator positioned within and extending diametrically across said outer casing, said separator being positioned axially between said end wall and said diaphragm and being spaced from said diaphragm to define a pumping chamber therebetween, said separator and said diaphragm having the peripheral edges thereof fixedly interposed between said body and said outer casing within said third cylindrical section, said separator having cylindrically projecting inlet and outlet valve holding sections formed thereon and projecting axially of said separator toward said end wall, inlet and outlet valve means respectively mounted within said inlet and outlet valve holding sections, and divider means disposed within the compartment defined within said outer casing between said end wall and said separator for dividing said compartment into inlet and outlet chambers which respectively communicate with the inlet and outlet valve means, a fuel inlet pipe projecting through the outer casing for communication



with the inlet chamber, and a fuel outlet pipe connected to the outer casing for communication with the outlet chamber, comprising the improvement wherein the fuel outlet pipe is connected to the second section of said outer casing and has an inlet opening associated with the end thereof which is disposed in direct communication with said outlet chamber, said inlet opening in its entirety being disposed at an elevation below the elevation of said outlet valve means so that the inlet opening is continuously immersed in its entirety within a reservoir of fuel which collects within said outlet chamber below the elevation of said outlet valve means, and a return pipe connected to said casing for direct communication with said outlet chamber for removing vapors from the upper portion of said outlet chamber, said return pipe having an inlet opening formed at the end thereof in direct communication with said outlet chamber at an elevation which is substantially higher than the elevation of said outlet valve means so that said last-mentioned inlet opening is not immersed in the fuel reservoir to permit continuous removal of vapors from said outlet chamber.

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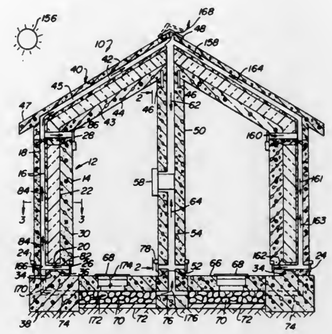
**4,295,415**
**ENVIRONMENTALLY HEATED AND COOLED PRE-FABRICATED INSULATED CONCRETE BUILDING**
**Peter J. Schneider, Jr., R.D. #4, Boyertown, Pa. 19512**
**Filed Aug. 16, 1979, Ser. No. 67,090**
**Int. Cl.³ F24F *7/00***
**U.S. Cl. 98—31** **14 Claims**

1. A building wall construction comprising exterior wall units constructed of an inner and an outer wall forming a space therebetween with said inner and outer walls being joined by a connecting member along their lower ends, said inner and outer walls being composed of reinforced concrete, said inner and outer walls being provided with an interlocking shape along their lateral edges for interlocking with an adjacent wall unit; said wall unit being assemblable to form a wall having a continuous and substantially uniform space between said inner and outer walls for receiving and forming a continuous and substantially uniform layer of insulation; said outer walls being provided with air ducts therein providing an air passage path between a lower point and a higher point of said outer wall,



said air ducts being provided with a pair of controlled openings at its lower end for selectively communicating with the environment and the inside of the building formed by the building wall, control means for selectively placing the upper portion of



said ducts in communication with the environment and the inside of the building, said controlled openings and said control means being selectively openable to provide heating or cooling of the building.

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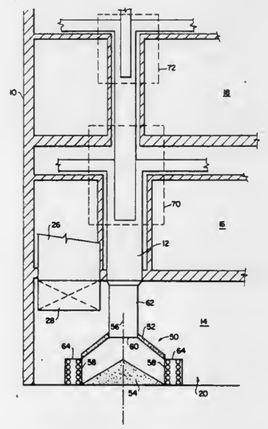
**4,295,416**
**AIR DISTRIBUTION SYSTEM**
**Dimiter Gorchev, Boston, Mass.; Karl U. Ingard, Kittery Point, Me., and Herbert L. Willke, Jr., Cambridge, Mass., assignors to Mitco Corporation, Somerville, Mass.**
**Filed Sep. 20, 1978, Ser. No. 944,134**
**Int. Cl.³ F24F *13/00***
**U.S. Cl. 98—33 R** **19 Claims**



1. An air distribution system comprising, in combination:
A. a mixing plenum including means for receiving outside and return air,
B. input flow concentrator and integral silencer disposed within said plenum, said concentrator and silencer including a concentrator input port coupled to said plenum and sidewalls establishing an airflow path from said concentrator input port to an output port, said airflow path being substantially symmetrical about an output axis, said sidewalls including inner and outer path defining surfaces lined with acoustically absorbent material, said inner and outer path defining surfaces defining a substantially radial airflow path adjacent to said plenum and a substantially axial airflow path at said output port, said inner path defining surface being substantially symmetrical about said output axis and extending along said output axis substantially across said concentrator input port, wherein said concentrator and silencer include inner and outer sections coaxial with said airflow axis, said outer section being hollow and having an inner surface and said inner section having an outer surface, said inner section having an outer surface, said inner and outer surface being mutually separated to form said path defining surfaces.
C. a fan having a fan input port coupled to said output port.

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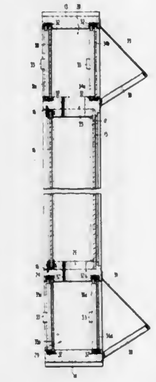
**4,295,417**
**WINDOW UNIT**
**Raymond H. Isley, Decatur, Ga., assignor to Isley Window Manufacturing Co., Inc., Decatur, Ga.**
**Filed Apr. 30, 1980, Ser. No. 133,916**
**Int. Cl.³ E06B *7/02***
**U.S. Cl. 98—88 R** **3 Claims**

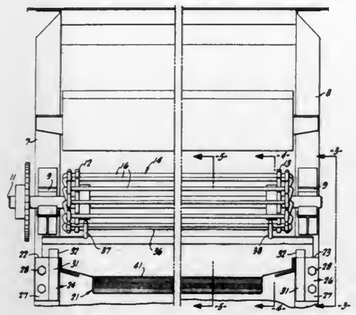


1. A window unit for a building comprising a peripheral frame, said window unit having a first facade in communication with exterior ambient air and a second facade in communication with interior ambient air, means within said frame defining multiple compartments stacked vertically one above the other, said multiple compartments comprising an upper compartment, a middle compartment and a lower compartment, said middle compartment comprising an exterior window pane and an interior window pane, said panes being spaced apart defining an air space therebetween, the upper and lower compartments being in communication with one another through the middle compartment, the upper and lower compartments having means for communication with the interior and exterior ambient air comprising a closure means in communication with the interior ambient air and a closure means in communication with the exterior ambient air, each of said closure means comprises a pair of horizontally sliding panels positioned for movement in track means and each panel being independently movable, means for preventing inclement weather from entering said upper and lower compartments comprising an awning structure mounted on the exterior facade above each of said upper and lower compartments, the interior window pane of the middle compartment being selectively removable from said frame.

## 4,295,418
## CHAIN BROILER DOCTOR BLADE

Nils Lang-Ree, Los Altos, Calif., assignor to NPI Corporation, Burlingame, Calif.

Filed May 19, 1980, Ser. No. 151,325
Int. Cl.³ A47J 37/06
U.S. Cl. 99—355 2 Claims

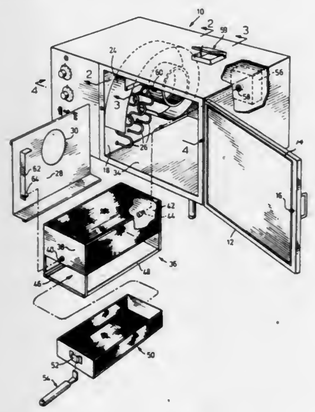


1. A chain broiler doctor blade construction comprising a frame, a chain conveyor mounted on said frame to extend in a path having upper and lower portions connected by a semi-circular arcuate rear portion, means engaging said frame and defining supporting sockets on said frame at opposite sides of said chain conveyof, a doctor blade extending transversely of said chain conveyor near said arcuate rear portion thereof, means forming shoulders on said doctor blade near the central side portions of said blade and tiltably disposed in said sockets, and rods extending from said doctor blade and adapted to abut said arcuate rear portion of said chain conveyor.

## 4,295,419
## CONFINED AIR FOOD HEATING APPARATUS

Jerome Langhammer, Rexdale, Canada, assignor to Larry Poulson, Mission, Canada

Filed May 12, 1980, Ser. No. 148,966
Int. Cl.³ A47J 43/18
U.S. Cl. 99—427 6 Claims



1. Means for cooking foodstuffs comprising:

a walled housing defining forward and rearward walls, and an opening in said forward wall;

means on said rearward wall for rotatably and removably mounting the rearward end of a food container;

means projecting into said opening adjacent the forward side of said housing for rotatably supporting the forward end of such container;

a container for foodstuffs designed to be removably rotatably mounted on said inward and outward mounting means;

means for rotating said container when so mounted;

said means for mounting the forward end of said container being designed: to be removable to allow said container from said housing through said opening and to expose at least a portion of said container below said forward mounting means;

said container when so mounted, and said forward and rearward mounting means being within said housing a door designed to substantially close said opening when said container is so mounted,

said container being provided with side openings to allow passage of air through foodstuffs therein,

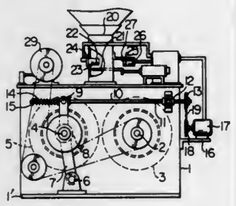
said container being provided with means allowing removal of foodstuffs therefrom and the supply of foodstuffs thereto;

means for heating and circulating air in said housing.

## 4,295,420
## AUTOMATIC CONTROL SYSTEM FOR HULLING MACHINE

Toshihiko Satake; Akira Kono; Takashi Horie, and Yasuharu Mitoma, all of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1980, Ser. No. 109,634
Claims priority, application Japan, Feb. 23, 1979, 54-6820; Mar. 13, 1979, 54-28298
Int. Cl.³ B02B 3/04
U.S. Cl. 99—486 14 Claims



1. In a hulling machine comprising a hulling roll supported on a fixed main rotary shaft, another hulling roll supported on a movable auxiliary rotary shaft disposed parallel to said fixed main rotary shaft, a main electric motor for driving said two hulling rolls, means for supplying unhulled rice to the gap between said two hulling rolls and means for controlling the movement of the movable auxiliary rotary shaft, an automatic control system comprising:

(a) load detecting means for detecting the load applied to said main electric motor; and

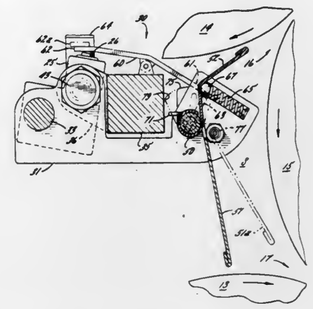
(b) control means for connecting said load detecting means to said means for controlling the movement of the auxiliary rotary shaft.



## 4,295,421
## SAFETY DEVICE FOR GUARDING NIPS IN A SHEET-FED ROTARY PRINTING PRESS

Paul Abendroth, Offenbach am Main, and Dietrich Dettinger, Dietzenbach, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,915
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914152
Int. Cl.³ B41F 5/00
U.S. Cl. 101—216 14 Claims



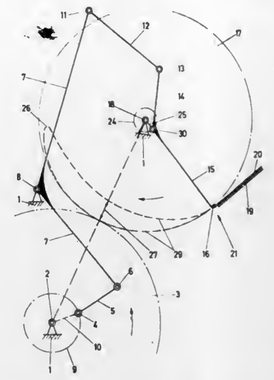
1. In a sheet-fed rotary printing press the combination comprising a pair of side frames, lower and upper blanket cylinders in running engagement with an impression cylinder, the cylinders being so arranged as to define between them lower and upper nips having a horizontally accessible access space, driving means for the cylinders including an inching circuit and a drive enabling circuit, an interlock switch stationarily mounted adjacent the access space and connected in the drive enabling circuit, a safety subassembly mounted in the access space between the side frames, the subassembly having a horizontal shaft, a guard plate thereon, the guard plate being swingable between (a) a downwardly extending normal position in which the plate closes off the access space and serves as a sheet guide and (b) a horizontally extending alternate position in which it opens up the access space for manual cleaning, and a linkage coupling the guard plate to the interlock switch so arranged that when the guard plate is in its normal closing position the enabling circuit is enabled for normal driving of the press and so that when the guard plate departs from its normal position such circuit is disabled with operation of the press being thereby limiting to inching movement, the subassembly being bodily removable from the access space.

## 4,295,422
## CAMLESS DRIVE OF A SWINGING PRE-GRIPPER FEEDER

Norbert Thünker, Grossachsen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,257
Claims priority, application European Pat. Off., Jun. 26, 1978, 78/00234.0
Int. Cl.³ B41F 21/05; B65H 5/10, 5/14
U.S. Cl. 101—232 3 Claims

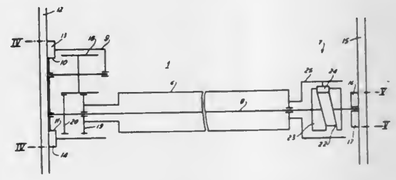
1. Camless drive of an oscillating pregripper feeder for a sheet-fed rotary printing machine having a fixed frame and a feed table, an impression cylinder rotatably mounted on said fixed frame and an oscillating pregripper feeder disposed between the feed table and the impression cylinder, the camless drive comprising a milti-bar linkage transmission system having bars mutually connected serially to one another and having pivot joints located at each of the mutual connections of said bars, two cranks articulatingly connected, on the one hand to the fixed frame and, on the other hand, to said transmission system and revolvable at the same angular velocity for driving said transmission system, one of said bars forming at least part of a pregripper of said oscillating pregripper feeder, said one bar being disposed directly behind and articulatingly connected to one of said cranks, said one bar being rigidly connected to a second bar, in turn, articulatingly connected by a coupler to a swing lever articulatingly connected to the fixed frame, said swing lever being drivingly swingable by a crank lever mechanism including the other of said two cranks, said oscillating pregripper feeder having means for gripping a sheet to be printed which lies on the feed table, and said multi-bar linkage transmission system being actuatable by said cranks for transporting the gripped sheet along a given path directly to the impression cylinder.



## 4,295,423
## LIQUID DISTRIBUTING ROLLER ASSEMBLY FOR PRINTING MACHINES

Hans Johne, Radebeul; Wolfgang Muller; Arndt Jentzsch, both of Coswig, and Günter Schumann, Radebeul, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 87,296, Oct. 22, 1979, abandoned. This application Nov. 16, 1979, Ser. No. 95,089
Claims priority, application German Democratic Rep., Oct. 28, 1978, 208737
Int. Cl.³ B41F 31/14, 27/16
U.S. Cl. 101—349 6 Claims



1. A distributing roller assembly for distributing printing ink or a dampening liquid on a driven roller of a printing machine, said assembly comprising two stationary guiding tracks arranged opposite each other; a transmission gear unit formed of a housing supported for sliding movement on one of said tracks, a main shaft having one end thereof journalled in said housing and the other end thereof being supported for sliding movement and for rotation on the other track, a drive output gear rigidly connected to one end portion of said main shaft, a transmission gear journalled in said housing and being in mesh

with said drive output gear, and a drive input gear supported for rotation and for axial movement on said one end portion of the main shaft and being in mesh with said transmission gear; a distributing roller supported for rotation and for axial movement on an intermediate portion of said main shaft, one end face of said distributing roller being connected to said input gear to impart rotary movement thereto when said driven roller of the machine is being operated; and an axial cam mechanism arranged between the other end portion of said main shaft and the other end face of said distributing roller to impart thereto via said transmission gear unit a reciprocating axial movement.

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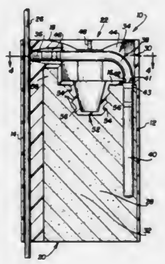
**4,295,424**

## EXPLOSIVE CONTAINER FOR CAST PRIMER

**Don H. Smith, Dallas, Tex.; Arthur F. Bowman, Tamaqua, and Norman M. Junk, New Ringgold, both of Pa., assignors to Atlas Powder Company, Dallas, Tex.**

**Filed Apr. 24, 1979, Ser. No. 32,777**
**Int. Cl.³ C06C** *11/00*
**U.S. Cl. 102—322** **16 Claims**



1. An explosive container for use with a detonator delay unit of the type having an initiating means and a delay detonator means and for containing a cast explosive charge comprising:

a hollow body having closed sides and two open ends with a tubular conduit disposed longitudinally on the exterior of said body, said tubular conduit being dimensioned to receive a detonating cord;

partition means contained within and attached to said hollow body, said partition means extending over a cross-section of said hollow body and dividing the interior of said hollow body into an open-ended first volume and an open-ended second volume, said first volume for containing the cast explosive charge, said partition means having an aperture therein to allow the detonator delay unit to be positioned wherein the delay detonator means is positionable adjacent the explosive charge and the initiating means is located in said second volume;

means located in said second volume for aligning the initiating means adjacent said tubular conduit;

means for retaining the cast explosive charge within said open-ended first volume.

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**4,295,425**

## ROCKET ASSISTED PROJECTILE AND CARTRIDGE ARRANGEMENT WITH PRESSURE RELIEF SKIRT

**William O. Davis, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.**

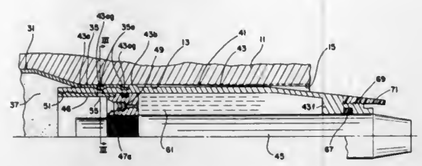
**Filed Dec. 6, 1977, Ser. No. 857,957**
**Int. Cl.³ F42B** *5/02, 11/14, 5/10*
**U.S. Cl. 102—326** **12 Claims**

1. In a cartridge arrangement having a cartridge case containing ignitable propellant for propelling a rocket-assisted projectile and having an open forward mouth end for receiving and holding a projectile,

the improvement comprising:

a rocket-assisted projectile having a casing containing a rocket propellant grain and a nozzle block rearward of said rocket grain and having a discharge nozzle therein,

said projectile casing having an external rifling-engaging rotating band about a portion of the zone of said nozzle block, and an annular securing skirt extending rearwardly of said rifling band and said nozzle block and grippingly secured within and by said open forward mouth end of said cartridge case,



said projectile securing skirt being of smaller diameter than said rotating band and having at least one vent hole formed therein rearward of and closely adjacent said nozzle block for pressure equalization between the interior and exterior of said skirt during exit of said projectile from said cartridge case by the ignition of said propellant mix, to thereby minimize likelihood of hoop tension cracking of said securing skirt.

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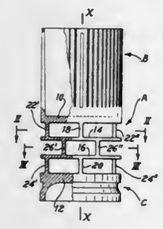
**4,295,426**

## PLASTIC WADS AND WAD ASSEMBLIES FOR SHOT CARTRIDGES

**Vito Genco, Rome, and Vincenzo L. Turco, Colleferro, both of Italy, assignors to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy**

**Filed Mar. 20, 1979, Ser. No. 22,361**
**Claims priority, application Italy, Mar. 22, 1978, 21258/78[U]**
**Int. Cl.³ F42B** *7/08*
**U.S. Cl. 102—451** **4 Claims**



1. A deformable plastic wad assembly for shot cartridges for hunting and shooting, said wad assembly comprising:

a first substantially rigid disc-like member extending perpendicular to a longitudinal axis of the wad assembly and forming a bottom of a shot container;

a second substantially rigid disc-like member extending perpendicular to said axis and forming a top of a seal adapted to be adjacent a powder charge; and

a reticular cushioning structure symmetric with respect to said axis and positioned between said first and second disc-like members, said cushioning structure comprising:

at least first and second discs axially spaced from each other and extending perpendicular to said axis, said discs being capable of bending in two opposite directions;

first and second ribs extending parallel to each other and to said axis on opposite lateral sides of said axis, said first and second ribs extending between and being connected to said first and second discs;

a first set of ribs extending between and being connected to said first disc-like member and said first disc, said first set of ribs comprising a first diametral rib extending in a plane containing said axis and first and second lateral ribs located symmetrically on opposite sides of said first diametral rib and extending parallel to each other and to said first diametral rib, said first and second lateral ribs being disposed along and forming chords of the periphery of said first disc, which chords have lengths, in directions parallel to the plane of said first disc, which are less than the radius of said first dics;

a second set of ribs extending between and being connected to said second disc-like member and said second disc, said second set of ribs comprising a second diametral rib extending in a plane containing said axis and third and fourth lateral ribs located symmetrically on opposite sides of said second diametral rib and extending parallel to each other and to said second diametral rib, said third and fourth lateral ribs being disposed along and forming chords of the periphery of said second disc, which chords have lengths, in directions parallel to the plane of said second disc, which are less than the radius of said second disc;

all of said ribs being of a construction to resist axial loading; and

said first and second ribs being spaced from each other by a distance approximately equal to the distances spacing said first diametral rib from said first and second lateral ribs and to the distances spacing said second diametral rib from said third and fourth lateral ribs.



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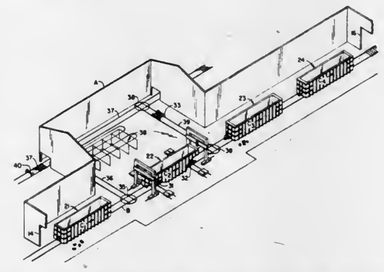
**4,295,427**

## CAR REPAIR APPARATUS

**Fred W. Waterman, Daly City; Jerry E. McCleery, San Francisco, both of Calif., and Robert T. McKie, Boise, Id., assignors to Morrison-Knudsen Co., Inc., Boise, Id. and Railcar Maint. Co., San Francisco, Calif.**

**Continuation of Ser. No. 895,685, Apr. 12, 1978, abandoned.**
**This application Jan. 9, 1980, Ser. No. 110,568**
**Int. Cl.³ B61K** *5/00*
**U.S. Cl. 104—32 R** **3 Claims**



1. A railroad car repair station to lift and rotate a railroad car located at said car repair station comprising in combination: a track passing longitudinally of said car repair station; first and second gantries located at each end of said car repair station, at least one of said gantries including means for mounting said gantry for ground supported rolling movement substantially parallel to said track from a position removed from the ends of said car to a position confronted to the ends of said car; each gantry further including a substantially horizontal beam member attached at least one end to said gantry, said beam having an upward and downward movement on said gantries, said upward movement defining an unobstructed interval between said track and said beam member sufficient to permit the unobstructed passage of said car under said beam on said track, each said horizontal beam including means for grasping said car at an end of a car and means for rotating said car when said car is lifted between said grasping means and beam; whereby when said car is fastened to said beam and lifted by said beam, said car can be rotated, said means for grasping a car for rotating includes a bell crank mounted for rotation to said horizontal beam and having a male eccentric member for being received by the female coupler concavity of said car.

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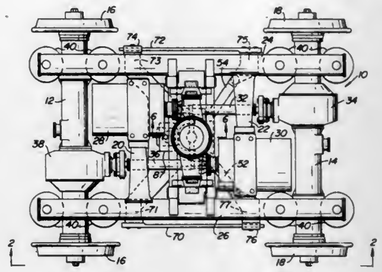
**4,295,428**

## STEERABLE TRUCK FOR A RAILWAY VEHICLE

**William W. Dickhart, III, Ft. Washington, and Richard H. Marvin, Philadelphia, both of Pa., assignors to The Budd Company, Troy, Mich.**

**Filed Apr. 13, 1979, Ser. No. 29,720**
**Int. Cl.³ B61F** *3/08, 5/20, 5/30*
**U.S. Cl. 105—168** **9 Claims**



1. In a railway vehicle having a car body for use on rectilinear and curvilinear pairs of tracks, the combination comprising:

a. a truck for supporting said car body,

b. said truck including a pair of axles each having a pair of wheels mounted thereto,

c. a forced steering mechanism attached to said truck connected to steer at least one of said axles and a pair of wheels, said forced steering mechanism comprises a steering frame including at least two pivotable arms attached thereto to steer one of said pair of axles and two additional arms attached to steer the other of said pair of axles when forced steering becomes effective on curved tracks exceeding predetermined curvatures, and

d. means for loosely connecting said car body to said truck and said forced steering mechanism to permit limited relative lateral movement and self steering between said car body and said truck with said forced steering mechanism being maintained ineffective to cause forced steering when said vehicle is moving over rectilinear tracks, and to restrict said lateral movement and self steering and render said steering mechanism effective to cause forced steering when said vehicle is moving over curvilinear tracks exceeding predetermined curvatures.

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**4,295,429**

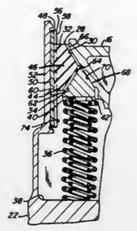
## RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY

**Donald Wiebe, Sewickley, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.**

**Filed Mar. 24, 1980, Ser. No. 133,268**
**Int. Cl.³ B60F** *3/00*
**U.S. Cl. 105—197 DB** **10 Claims**

1. A railway truck bolster friction assembly adapted to be captively retained within a pocket of an elongated truck bolster member which extends between spaced elongated side frame members of a railway truck vehicle comprising: elastomeric friction means adapted to have a first portion thereof in communication with adjacent surfaces of such a pocket and a second portion thereof in frictional engagement with adjacent portions of wearing surface means of a column guide of a respective one of said side frames, said second portion being spaced longitudinally outwardly, with respect to the longitudinal axis of such a bolster member, from such a pocket and said first portion being spaced longitudinally inwardly from said second portion; said elastomeric friction means being operative

to deform and maintain said frictional engagement, without slipping between adjacent engaging surfaces, during at least initial vertical and transverse movements of such a bolster member with respect to such a respective one of said side frame members; during a subsequent transverse movement of such a bolster member with respect to such a side frame member, at least a section of said section portion slips transversely



with respect to the adjacent portion of said wearing surface means; and during such transverse slipping, said adjacent portion of said wearing surface means cooperates with such a pocket to continuously increase the friction between said section of said second portion and said adjacent portion of said wearing surface means in direct proportion to the amount of said subsequent transverse movement.

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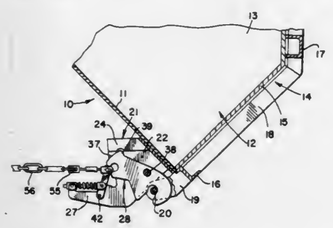
**4,295,430**

## RAILWAY HOPPER CAR LATCH MECHANISM

**Willis H. Knippel, Palos Park, and Ray Ferris, Thornton, both of Ill., assignors to Pullman Incorporated, Chicago, Ill.**

**Filed Feb. 25, 1980, Ser. No. 124,506**
**Int. Cl.³ B61D** *7/18, 7/22, 7/26*
**U.S. Cl. 105—308 E** **10 Claims**



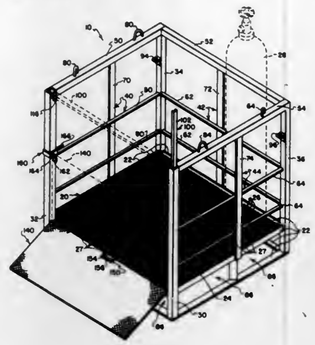
1. A closure locking mechanism for a railway hopper car including a discharge opening, closure means mounted for movement adjacent said opening and selectively closing the same and having a keeper rod disposed thereon, latching means positioned adjacent said closure means and adapted to engage and lock the same in its closed position, said latching means including bracket means attached to a hopper, a self-supporting latch member pivotally mounted by a pivot pin on said bracket means and having a keeper gathering opening adapted to move to one position to be aligned with said keeper rod to receive and hold the keeper rod and further to move to another position to latch the keeper rod, said latch member including a cam portion, and having a recessed abutment means, lever means pivotally mounted on said bracket means, and means biasing said lever means into engagement with said abutment means and said cam portion respectively whereby the latch member is positioned to initially engage the keeper rod and maintain it in said closed position.

**4,295,431**

## PALLET FOR PRESSURIZED GAS CYLINDERS

**Lars G. Stavlo, Sigtuna, Sweden, assignor to AGA AB, Sweden**

**Filed Nov. 23, 1979, Ser. No. 96,689**
**Int. Cl.³ B65D** *19/00*
**U.S. Cl. 108—55.1** **13 Claims**



1. A pallet, comprising:

(a) first structure defining a floor having an elevated top surface;

(b) second structure defining a substantially continuous side wall extending upwardly above the top surface of the floor structure and having opposite end formations leaving an open side wall portion therebetween, one of the end formations including a hollow upstanding post structure;

(c) first and second gate means, each being connected to at least one of the first and second structures and each being movable between a retaining position and a loading position providing substantially no obstruction to loading and unloading of the pallet through the open side wall portion;

(d) the first gate means including a bar-like member being non-removably connected to the hollow upstanding post structure, being operable when in its retaining position to bridge the open side wall portion so as to provide a continuation of upper portions of the continuous side wall, and being nested within the hollow upstanding post structure when in its loading position; and,

(e) the second gate means being operable when in its retaining position to bridge the open side wall portion so as to provide a continuation of lower portions of the continuous side wall, and being operable when in its loading position to facilitate loading and unloading onto and off of the elevated top surface of the floor structure.

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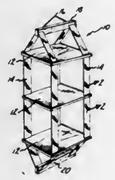
**4,295,432**

## HANGING SHELVES

**Donald B. Hulke, 14254 Ash Cir. Northeast, Prior Lake, Minn. 55372**

**Filed Dec. 20, 1979, Ser. No. 105,512**
**Int. Cl.³ A47B** *47/06*
**U.S. Cl. 108—149** **13 Claims**



1. A hanging shelf apparatus comprising:



webbing means;

a shelf having a pair of opposing sides and an upper and a lower surface, each side having a recess proximate both ends with a depth equal to at least the width of the webbing means and a slot with a length approximately equal to the width of the webbing means communicating with and along each recess and communicating with the upper and the lower surface of the shelf, the slot and the recess being positioned to receive and hold the webbing means such that the webbing means extends through the upper and lower surfaces; and

recess engaging plug means having a width sufficient for frictionally engaging the webbing means against a surface of the recess to connect the webbing means and the shelf.

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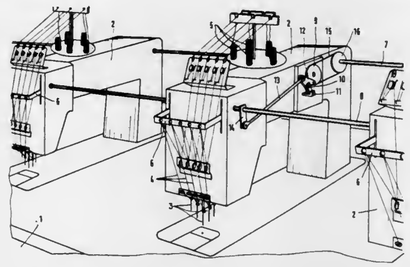
**4,295,433**

## TAKE-UP DRIVE FOR A MULTI-HEAD EMBROIDERY MACHINE

**Alfred Desprez, Wachtendonk; Heinz Sauerland, Neukirchen-Vluyn, and Wolfgang Teetz, Kerken, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany**

**Filed Aug. 6, 1979, Ser. No. 64,273**
**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835185**
**Int. Cl.³ D05C** *11/00, 7/00*
**U.S. Cl. 112—241** **7 Claims**



1. In an apparatus for the drive of the thread take-up on a multi-head embroidery machine having a machine frame, with a plurality of embroidery heads arranged in a row, with at least one embroidery needle in each head, the oscillating thread take-up comprising a thread take-up lever for each embroidery head respectively, which thread take-up lever is mounted on the respective embroidery head pivotable back and forth about a horizontal axis and is operatively driveable by a machine main shaft, the improvement comprising

one common thread take-up shaft extending to and passing through all of the embroidery heads,

said thread take-up levers of all of the embroidery heads are secured on said common thread take-up shaft,

means comprising a single crankdrive mechanism for driving said common thread take-up shaft by the machine main shaft.

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**4,295,434**

## FEED MECHANISM FOR SEWING MACHINES

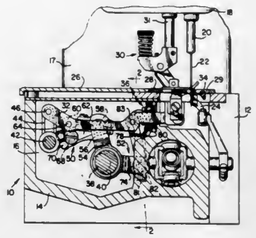
**James C. Hsiao, Morton Grove, Ill., assignor to Union Special Corporation, Chicago, Ill.**

**Filed Oct. 24, 1979, Ser. No. 87,906**
**Int. Cl.³ D05B** *27/02*
**U.S. Cl. 112—314** **20 Claims**

1. A sewing machine having a frame, work support means, revoluble shaft means arranged in said frame beneath said work support means, eccentric means carried by said shaft means and a feed mechanism comprising:

feed bar means;

feed dog means carried thereby; drive mechanism means including a series of connected link means operatively associated with said eccentric means for imparting motion to said feed bar means in mutually perpendicular directions, one direction being transversely across said frame to provide work advancing and return movements, the other direction being toward or away from said work support means so as to lift said feed dog means to a position above



said work support means during the work advancing movement and to lower said feed dog means below said work support means during the return movement; and

means associated with said drive mechanism means for allowing rising and falling movements to be translated from said eccentric means to said feed bar means including means for modulating the amplitude of lift being imparted to said feed dog means.

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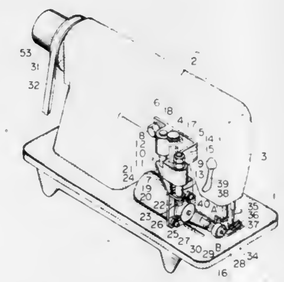
**4,295,435**

## CLOTH FEED APPARATUS

**Tamio Uemura, Kawasaki; Yoshimasa Ito, and Takahiro Itakura, both of Yokohama, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,289**
**Claims priority, application Japan, Sep. 12, 1978, 53-11876**
**Int. Cl.³ D05B** *27/14*
**U.S. Cl. 112—322** **12 Claims**



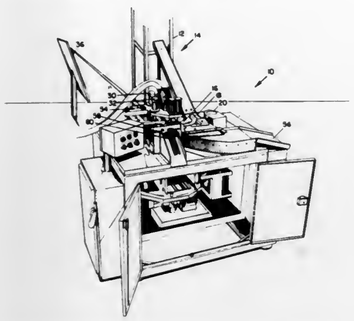
1. A cloth feed apparatus for a sewing machine comprising a needle and a feed dog which is coupled to a main driving shaft, rotor means coupled to said main shaft for rotation in synchronism therewith, detector means for detecting the rotation of said rotor means to generate directly a plurality of pulses in cooperation with said rotor means, stepping motor means actuated in accordance with the pulses generated by said detecting means, and rotary mechanism means driven by said stepping motor means and feeding the cloth fed by the feed dog.

**4,295,436**

## CAP LINING MACHINE

**Dominic V. Zangari, 6 Drew La., Hightstown, N.J. 08529, and Douglas R. Cranston, East Brunswick, N.J., assignors to Dominic V. Zangari, Hightstown, N.J.**

**Filed May 15, 1979, Ser. No. 39,220**
**Int. Cl.³ B21D *51/46***
**U.S. Cl. 113—80 D** **11 Claims**



1. A cap lining apparatus for cutting a cap liner from a web of lining material and placing said cap liner in a cap, said apparatus comprising:

a hollow anvil means;

a hollow score cutting means for cutting said web, said anvil means and said score cutting means being lined up coaxially so that the hollow portions of said anvil means and said score cutting means form a cavity;

web feed means for transporting said web between said anvil means and said score cutting means;

anvil drive means for driving said anvil means against said score cutting means;

pusher means for pushing said cap liner into said cap, said pusher means being located in the cavity formed by said anvil means and said score cutting means, said cavity being large enough to allow said pusher means to reciprocate therein;

a rotatable means for holding said caps, said rotatable means including a plurality of cap receiving pockets therein;

indexing means for indexing said rotatable means; and,

feed means for presenting at least two caps to a first and second receiving pocket respectively between successive indexing rotations of said rotatable means, said feed means further including a first feed means for gravity feeding a first cap to a first receiving pocket and a second feed means for positively and directly feeding a second cap to a second receiving pocket.

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**4,295,437**

## AUTOMATIC FLARE SIGNAL APPARATUS

**George W. Mock, Jr., 5315 Carinleigh, Houston, Tex. 77084, and George W. Mock, Sr., 13206 Boca Raton, Houston, Tex. 77069**

**Continuation-in-part of Ser. No. 937,473, Aug. 28, 1978, Pat. No. 4,205,619. This application Sep. 26, 1979, Ser. No. 78,914**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 116—202** **4 Claims**

1. An apparatus for signalling separation between a first structure and a second structure, comprising:

attachment means for connecting the first structure and the second structure, said attachment means including an elongated member of a predetermined length;

signalling means responsive to the disconnection of said attachment means for indicating said disconnection, said signalling means including a lanyard cable running parallel to said attachment means, said lanyard cable being substantially the same length as said elongated member, said length of said lanyard cable being such that said lanyard cable is subjected to tension stresses after said disconnection of said attachment means;

an alarm box attached to the second structure, including alarm means for alerting operators of said disconnection of said attachment means substantially immediately upon the happening of said disconnection; and

triggering means comprising a trigger bar, said lanyard cable being removably attached to said trigger bar;

said trigger bar extends into the interior of said alarm box thereupon depressing and opening a pneumatic safety valve when said tirgger bar is pulled out of said alarm box by said lanyard cable; and

said triggering means includes a compressed air tank supplying pressure to a regulator valve and said pneumatic safety valve, both controlling a pneumatic piston which drives a firing pin into a signal flare when said safety valve is opened to compressed air flow from said air tank.

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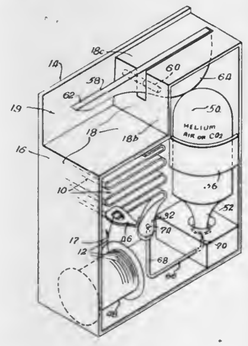
**4,295,438**

## RESCUE LOCATOR SIGNAL PACKAGE

**Howard L. Porter, Rte. 5, Box 83, Lake Placid, Fla. 33852**

**Filed Feb. 25, 1980, Ser. No. 124,097**
**Int. Cl.³ G09F *9/00***
**U.S. Cl. 116—210** **5 Claims**




1. A rescue locator package comprising,

a casing,

a deflated and collapsed balloon in the casing, and having a fillable end with a self-closing valve therein,

a cartridge of compressed gas in the casing and movable between an inactive position and an active position, means normally holding the cartridge in its inactive position and so holding it in normal handling of the package,

a needle tube fixedly mounted in the casing having one end extending through the self-closing valve in the balloon and communicating with the interior of the balloon and the other end having a puncturing point positioned and operable for puncturing the cartridge when the cartridge is moved to active position, and the needle tube, in response to so puncturing the cartridge, extending into the cartridge and thereby establishing communication between the cartridge and the balloon, filing the balloon with the gas,

the fillable end of the balloon being friction-held on the needle tube, and the remainder and body portion of the balloon being loosely contained in the casing and expellable therefrom in response to being filled, and pursuant to being so expelled being normally friction-held on the needle tube and the latter holding the balloon until it is manually released therefrom,

a tether line interconnecting the fillable end of the balloon and the casing, and

manually manipulable means for moving the cartridge to active position and thereby puncturing it,

the manually manipulable means having at least a portion extending into the interior of the casing, and all of the remaining elements being entirely contained in the casing.



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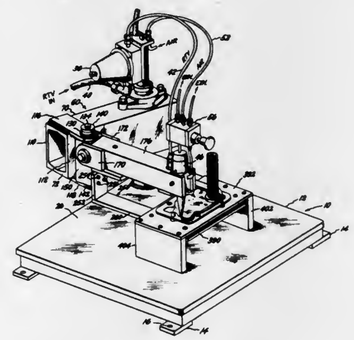
**4,295,439**

## HAND OPERATED APPARATUS FOR APPLYING A GASKETING COMPOSITION

**Edward G. Kruszona, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.**

**Filed Sep. 25, 1979, Ser. No. 78,754**
**Int. Cl.³ B05B *13/04***
**U.S. Cl. 118—317** **12 Claims**



1. A hand operated machine for applying a gasketing coposition on a part comprising,

a frame;

a base on said frame in which is placed said part on which said gasketing composition is applied;

template means corresponding to a said part and having track means therewith corresponding to said template;

a vertical support mounted on said frame;

a horizontally movable arm connected at one end to said support and a horizontally movable joint means pivotally mounted at the other end;

first forearm means extending from said joint means and pivotally mounted thereon for movement in a vertical plane;

second forearm means extending from said joint means and supporting roller means operatively associated with said track;

means for dispensing said composition mounted on said first forearm such that it travels in fixed relationship to said roller means;

trigger means for activating said dispensing means; and

means for imparting motion to said assemblage of arms and joint means whereby movement of said roller means about said track is associated with movement of the dispenser in a path to effect application of the gasketing composition to said part.

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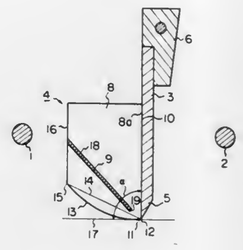
**4,295,440**

## APPARATUS FOR CONTINUOUSLY COATING A SHEET MATERIAL CONCURRENTLY WITH A PLURALITY OF STRIPES

**Shinzo Nakai, Tokyo, and Chitomi Shimizu, Matsudo, both of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,948**
**Claims priority, application Japan, Feb. 28, 1979, 54-23101**
**Int. Cl.³ B05C *3/18***
**U.S. Cl. 118—412** **11 Claims**



1. An apparatus for continuously coating a sheet material concurrently with a plurality of coating liquids in the pattern of a plurality of stripes, which apparatus comprises:

(1) means for feeding a sheet material and means for delivering said sheet material;

(2) a substantially vertical coating doctor knife having a blade formed in the lower end portion thereof and arranged between the sheet material-feeding means and the sheet material-delivering means, and;

(3) a coating liquid-feeding device attached to a front surface of said doctor knife, which front surface faces said sheet material-feeding means, and having a plurality of compartments, each of which compartments is defined by:

(A) a pair of substantially vertical partitioning plates which are parallel to each other, spaced from each other and connected to the front surface of said doctor knife in such a manner that a side edge surface of each partitioning plate is in close contact with the front surface of the doctor knife, and a lowermost end of the side edge surface is at substantially the same level as that of a lowermost end of the blade of said doctor knife, and each of which partitioning plates has a bottom edge thereof having a profile in the shape of an arc bulged downwardly from an imaginary straight line drawn between the lowermost end of the side edge of said partitioning plate adjacent the doctor knife, and a lowermost end of another side edge of said partitioning plate, and;

(B) an inclined guide plate interposed between said pair of partitioning plates and having an inclined upper surface thereof obliquely, downwardly approaching the blade of said doctor knife, and a lower end thereof located close to the blade of said doctor knife, said guide plate also having a lower surface located inside the bottom edges of said pair of partitioning plates.

**4,295,441**

## APPARATUS FOR APPLYING SOLDER TO THE CONNECTIONS OF INTEGRATED CIRCUIT COMPONENTS

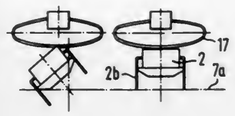
**Anton Forstner, and Kurt Schatzmann, both of Dietikon, Switzerland, assignors to Siemens-Albis Aktiengesellschaft, Zürich, Switzerland**

**Filed Nov. 24, 1980, Ser. No. 209,665**

**Claims priority, application Switzerland, Jan. 30, 1980, 738/80**

**Int. Cl.³ B05C** *3/09*

**U.S. Cl. 118—425** **6 Claims**




1. An apparatus for applying to the connections of integrated components arranged in dual-in-line housings solder located in a solder bath, comprising:

at least one support for carrying at least one of the components;

means for displacing said support relative to the solder bath such that the component is placed in a position in which its connections are located at a predetermined distance above the surface of the solder bath;

means for tilting the support in such position about an axis extending essentially parallel to the connections of the component carried by the support and into a position which is inclined with respect to the surface of the solder bath; and

the connections of a connection row of the component, following tilting of the support to one or the other side, simultaneously immersing into the solder bath.

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**4,295,442**

## MAGNETIC TONER APPARATUS

**James B. Thaxter, Townsend, Mass., assignor to Sperry Corporation, New York, N.Y.**

**Filed Aug. 4, 1978, Ser. No. 931,214**

**Int. Cl.³ G03G** *15/09*

**U.S. Cl. 118—657** **8 Claims**

1. An improved electrophoretic printer of the type having a recipient sheet, a printhead, a supply of toner, and a transfer surface having first and second sides, for conveying the toner to the printhead for transferring the toner to the recipient sheet to form an image thereon, wherein the improvement comprises:

a magnetic roller disposed in magnetic relationship to the supply of toner and opposite the first side of the transfer surface, having an inner magnetic surface and outer cylindrical shell, for generating magnetic field gradients and magnetically attracting the toner to the outer cylindrical shell; and

a high permeability backing plate disposed opposite the second side of the transfer surface and aligned with the magnetic roller cooperating therewith for modifying the magnetic field gradients by magnetization induced in the high permeability backing plate having a selectively profiled surface to produce selectively profiled gradients and for transferring the toner from the roller to the transfer surface in a controlled, uniform thickness.

**4,295,443**

## DEVELOPING APPARATUS FOR ELECTROSTATIC COPYING MACHINE

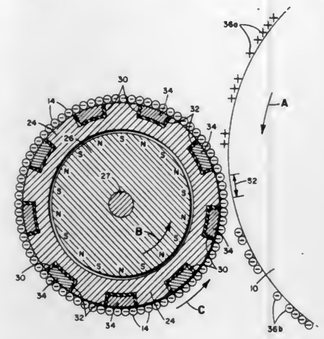
**Mitsuaki Kohyama, Higashikurume, Japan, assignor to Toshiba Corporation, Kawasaki, Japan**

**Filed Mar. 25, 1980, Ser. No. 133,664**

**Claims priority, application Japan, Apr. 18, 1979, 54-47524**

**Int. Cl.³ G03G** *15/09*

**U.S. Cl. 118—657** **9 Claims**




1. A developer apparatus for developing an electrostatic image on an electrostatic image bearing member, comprising:

a single component developer;

a stationary developing roller adjacent said electrostatic image bearing member, said developing roller comprising an electrically conductive sleeve having a plurality of spaced apart channels on the surface of said conductive sleeve, an electrically conductive segment in each of said channels and an insulator in each of said channels between said conductive sleeve and said electrically conductive segment;

voltage means connected to said conductive sleeve and said conductive segments for applying voltage between said conductive sleeve and said conductive segments to charge the developer; and

developer moving means for moving the developer across said developing roller to said electrostatic image bearing member.

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**4,295,444**

## AUTOMATIC COATING SYSTEM FOR LOST WAX PROCESS

**Masami Hatta, Matsue; Katsumi Iwata, Saihakugun, and Masao Sasaki, Fujisawa, all of Japan, assignors to Hitachi Metals Precision, Ltd., Tokyo, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,854**

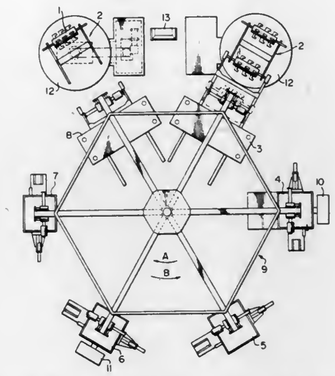
**Claims priority, application Japan, Dec. 22, 1978, 53-157613; Dec. 22, 1978, 53-174971[U]; Dec. 22, 1978, 53-174972[U]**

**Int. Cl.³ B05C** *3/02, 3/09*

**U.S. Cl. 118—668** **18 Claims**

1. An automatic coating system for making a set-up by coating a wax pattern with a refractory material in lost wax process, comprising a set-up pickup device adapted for picking set-ups one by one from a set-up storage section, whereby said set-ups enter said system; a slurry dipping device adapted for receiving said set-ups and for dipping said set-ups in a slurry of a coating refractory material; a sanding device adapted for receiving said set-ups and for depositing sand on the surface of said set-ups; and a set-up taking-out device for removing said set-ups out of said system; said devices being disposed on a common circle; said automatic coating system further comprising a set-up transportation device, wherein said set-up transportation device is disposed at the center of said circle and includes a vertical column, cylinder means attached to said vertical column, a guide member attached to said vertical column, a main shaft movable up and down by the operation of said cylinder means along said guide member attached to said vertical column, a rotational driving means attached to said vertical column and adapted to cause a rotation of said main shaft around its own axis, a plurality of beams attached to the upper end of said main shaft and extending radially outwardly in a plane perpendicular to the axis of said main shaft, each beam having attached to an end thereof farthest from said main shaft an arm, a cylinder mounted on each beam, slide shafts






mounted on each beam, each arm being movable along said slide shafts attached to said beam in the longitudinal direction of said beam by the operation of said cylinder mounted on said beam, each arm having means for holding, rotating and centering said set-ups, whereby said set-up transportation device is adapted to vertically move the set-ups and move said set-ups rotationally from one device to the next respective device around said common circle, for transporting said set-ups from predetermined positions in respective devices to predetermined positions in respective next devices.

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**4,295,445**

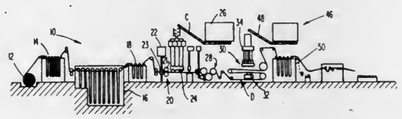
## APPARATUS FOR MANUFACTURING ROOFING SHINGLES HAVING MULTIPLE PLY-APPEARANCE

**Robert Kopenhaver, Berwyn, Pa., assignor to Certain-teed Corporation, Valley Forge, Pa.**

**Filed Jun. 20, 1977, Ser. No. 808,171**

**Int. Cl.³ B05C** *1/08, 1/16, 19/00*

**U.S. Cl. 118—695** **16 Claims**




1. An improved apparatus for manufacturing roofing shingles from dry roofing material comprising, means for continuously feeding dry roofing material into said apparatus, an asphalt saturation tank for receiving, saturating and coating said dry material with asphalt, means for applying a first continuous coating of granules to said saturated and coated material, means for cutting said material into roofing shingles of a given length and a given width, wherein the improvement comprises, means disposed between said means for applying a first coating of granules and said cutting means for automatically applying a repeated series of spaced apart bands of granules to said first continuous coating of granules, said series of bands having various widths and periodically applied along said first continuous coating at a predetermined periodicity, such that said series of bands are applied to said first coating of granules over a length different than said given length of shingle, whereby varying portions of said series of bands will be present on each of said given length of shingle.

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**4,295,446**

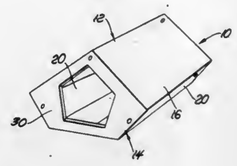
## COLLAPSIBLE SHELTER

**Clifford C. Voss, 406 Donald Ave., Clawson, Mich. 48017**

**Filed Feb. 13, 1980, Ser. No. 121,265**

**Int. Cl.³ A01K** *1/03*

**U.S. Cl. 119—19** **5 Claims**




1. A collapsible shelter, comprising;

a wrap-around roof and side wall forming part having the relatively opposite wrap-around ends thereof adapted to form and provide a floor area therefor,

said wrap-around part being formed and dimensioned to have a roof area equivalent to that of the side walls and floor area together for allowing said roof, side wall and floor areas to be collapsed and folded flatly together,

and end wall parts formed to fit and close the open ends of said first mentioned part, as erected, and to otherwise lie flatly thereon and therewith,

said end wall parts being interconnected together and relatively spaced to be folded and fitted into the open ends of said first mentioned part, as erected, and to be folded flatly together, one over the other.

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**4,295,447**

## HEATING BOILER AND TEMPERATURE CONTROL THEREFOR

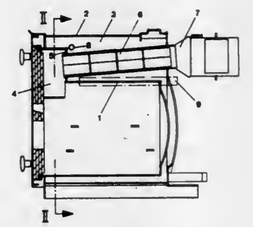
**Adolf Heeb, Vaduz, Liechtenstein, assignor to Interliz Anstalt, Vaduz-Neugut, Liechtenstein**

**Filed Sep. 5, 1979, Ser. No. 72,755**

**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841476**

**Int. Cl.³ F22B** *7/00*

**U.S. Cl. 122—136 R** **2 Claims**




1. In a heating boiler having a substantially horizontally extending combustion chamber for combustion of liquid or gaseous fuel, said combustion chamber having a cylindrical cross sectional configuration and having a front end and a closed rear end, said combustion chamber having at said front end thereof a flue exhaust outlet, a boiler water chamber surrounding said combustion chamber, said boiler water chamber being defined by a boiler body of oval-shaped cross sectional configuration, said combustion chamber being disposed within

the lower region of said boiler body, a thermostat probe having a sensor section extending into said boiler water chamber, an auxiliary heating channel positioned above said combustion chamber within the boiler water chamber to extend longitudinally of the combustion chamber, said auxiliary heating channel comprising a box-shaped hollow body disposed within the upper region of said boiler body, a return pipe extending into the boiler water chamber for fthe discharge of return water thereinto, an outflow chamber surmounting said flue exhaust outlet, said outflow chamber comprising a separator wall which separates said outflow chamber from said boiler water chamber, said outflow chamber being in communication with said flue exhaust outlet, said auxiliary heating channel having an inlet joined to said separator wall such that said inlet of said auxiliary heating channel communicates through said separator wall with said outflow chamber and via the outflow chamber with said flue exhaust outlet at the front end of said combustion chamber, said box-shaped hollow body having an upper horizontal side and at least one vertical side, said thermostat probe extending through said boiler body and transversely of said auxiliary heating channel into said boiler water chamber to terminate in said sensor section above said upper horizontal side of said auxiliary heating channel and adjacent to said separator wall, said return pipe extending within said boiler water chamber from the rear end of said boiler body and along side said vertical side wall of said auxiliary heating channel, the discharge end of said return pipe being disposed below said thermostat probe, said sensor section of the thermostat probe being disposed above said inlet of said auxiliary heating channel and adjacent to said separator wall, the discharge end of the return pipe being located within said boiler water chamber in the vicinity of said sensor section such that said sensor section of the thermostat probe is directly washed by the discharged return water.

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**4,295,448**

## GAS GENERATOR FOR FINE-GRAINED COAL FUELS

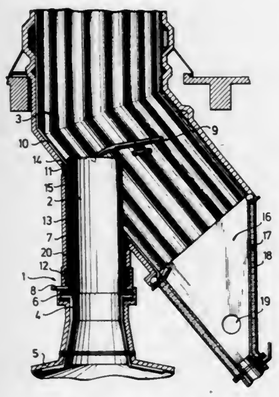
**Reinhard Waldhofer, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany**

**Filed May 1, 1980, Ser. No. 145,791**

**Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920372**

**Int. Cl.³ F22B *7/18*; C10J *3/48***

**U.S. Cl. 122—164** **7 Claims**



1. A gas generator for operation on a fuel of fine grained coal, the said generator comprising
   a steam boiler,
   a combustion chamber,
   a stack leading from the combustion chamber to the steam boiler,
   a slanting bottom portion forming the lower part of the steam boiler for the discharge of flue ash and slag,
   a gas outlet pipe attached to the combustion chamber and forming the lower part of said stack,
   a gas inlet pipe leading to the boiler and forming the upper part of said stack,
   connecting means attaching the gas inlet pipe to the said gas outlet pipe, the said gas inlet pipe having a double wall of which the inner wall with its top extends freely into said slanting bottom portion of the boiler and thus is adapted for axial movement due to heat expansion, and the outer wall being provided with a heat expansion compensator and being connected with its top end to the said slanting bottom portion of the boiler and being attached with its bottom end to the said connecting means between said gas inlet and gas outlet pipes.

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**4,295,449**

## ROTARY FUEL INJECTION WITH SEQUENCING

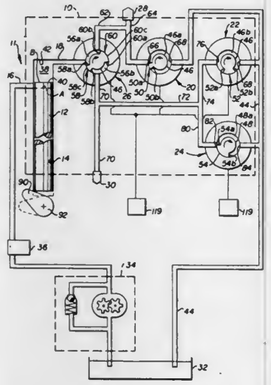
**Richard A. Cemenska, Edelstein, and George B. Grim, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00762, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO81/00884, PCT Pub. Date Apr. 2, 1981**

**PCT Filed Sep. 24, 1979, Ser. No. 99,137**

**Int. Cl.³ F02M *41/06***

**U.S. Cl. 123—300** **22 Claims**



1. A fuel injection apparatus comprising:
a plunger (**12**) reciprocably mounted in a plunger bore (**14**) to define a pumping cavity (**38**) therein;
means (**20,22,24**) for starting and stopping pilot injection and main injection of said fuel by alternately permitting pressurization and venting of said pumping cavity (**38**), said means for starting and stopping including a plurality of continuously rotating valves (**46,48**), said valves being fluidly connected to the pumping cavity (**38**) defined in said plunger bore (**14**);
a first nozzle (**28**);
a second nozzle (**30**); and
(means (**26**) for sequentially directing said fuel from the pumping cavity (**38**) of said plunger bore to said first and second nozzles (**28,30**) for controlling said pilot injection through said first nozzle (**28**) and main injection through said second nozzle (**30**).



**4,295,450**

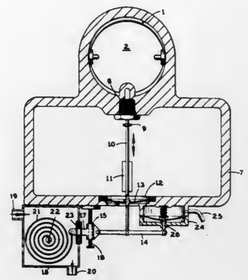
## THERMAL AND VACUUM TRACKING CARBURETOR JET

**Ralph Muscatell, 200 N.E. 20th Ave., Fort Lauderdale, Fla. 33305**

**Filed Dec. 19, 1978, Ser. No. 970,994**

**Int. Cl.³ F02M *7/00, 1/04***

**U.S. Cl. 123—435** **2 Claims**



1. In a carburetor system for an internal combustion engine, said system having:
   means defining a fuel chamber;
   a fuel mixing conduit having an air inlet at one end and a fuel/air outlet at the opposite end, a venturi throat between said inlet and said outlet, and a throttle valve between said throat and said outlet;
   a fuel nozzle operatively arranged to discharge fuel into said throat;
   means defining a metering orifice operatively connected between said fuel chamber and said nozzle to supply fuel to said nozzle;
   a valve member adjustably positioned at said metering orifice to control the flow of fuel therethrough;
   and means responsive to the engine vacuum to adjust said valve member in a direction to increase the flow of fuel to said nozzle when the engine vacuum diminishes and in the opposite direction to decrease the flow of fuel to said nozzle when the engine vacuum increases;
the improvement which comprises:
   a temperature sensor operatively arranged to sense the temperature of the engine exhaust;
   and means acting between said temperature sensor and said valve member to adjust the latter in a direction to increase the flow of fuel to said nozzle in response to an increased temperature of the engine exhaust and in the opposite direction to decrease the flow of fuel to said nozzle in response to a decreased temperature of the engine exhaust, whereby the richness of the fuel/air mixture is controlled jointly by the engine vacuum and the engine exhaust temperature.

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**4,295,451**

## CLOSED LOOP FUEL CONTROL FOR INTERNAL COMBUSTION ENGINE

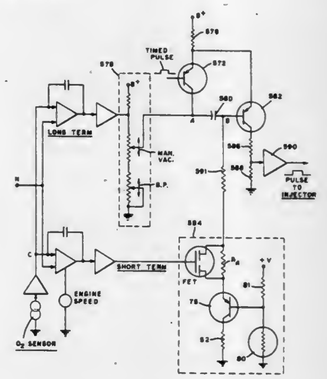
**E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Continuation of Ser. No. 929,156, Jul. 31, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,820**

**Int. Cl.³ F02M *7/00***

**U.S. Cl. 123—438** **4 Claims**

1. A closed loop fuel injection system for proportioning a mixture of air and fuel delivered to an internal combustion engine comprising:
   (a) sensor means for producing an electrical signal having a magnitude that varies in proportion to the concentration of exhaust gas from said engine;
   (b) first electrical circuit mean responsive to said electrical signal to compensate for small amplitude, short term disturbances in said electrical signal, said first circuit means having high gain, low stability and restrictive modification capability over said electrical signal, for providing a first circuit signal with an amplitude limited to a small value;
   (c) second electrical circuit means responsive to said electrical signal to compensate for large amplitude, long term disturbances in said electrical signal, said second circuit means having low gain, high stability, and large modification capability over said electrical signal for providing a second circuit signal with a large amplitude;
   (d) said first circuit means having a response time that varies directly with and is substantially the same as the time between formation and detection of said air fuel mixture, and being adapted to correct any part of said large amplitude disturbances that is not corrected by said second circuit means;



   (e) said second circuit means having a response time longer than the response time of said first circuit means, and being adapted to at least partially correct said large amplitude disturbances;
   (f) means for combining the first and second circuit signals to produce a composite pulse of variable width to fix the proportion of air-fuel in said mixture;
   (g) means for applying said composite pulse to an injector of said internal combustion engine;
   (h) wherein said means for combining includes a timing means connected to receive said circuit signals, means for enabling said timing means, said timing means being enabled in response to said enabling means and producing a timing signal having a time period responsive to said first and second circuit signals, said composite pulse of variable width produced by said means for combining, having a variable width responsive to said time period.

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**4,295,452**

## FUEL INJECTION SYSTEM

**Manfred Lembke, Gerlingen, and Heinrich Knapp, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 6, 1979, Ser. No. 45,894**

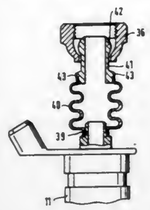
**Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829057**

**Int. Cl.³ F02M *53/04***

**U.S. Cl. 123—470** **6 Claims**

1. A fuel injection system for internal combustion engines comprising a metallic fuel distributor tube which is in communication with a pressure regulator and a fuel supply pump, at least one fuel injection valve, at least one fuel branch line made of bendable metal connected at one end to said metallic fuel

distributor tube and at its opposite end to at least one fuel injection valve, a threaded assembly for connecting said bend-



able metal branch line to said fuel injection valve and a thin-walled bellows interposed between said threaded assembly and said fuel injection valve.

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**4,295,453**

## FUEL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

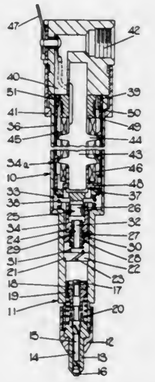
**Alec H. Seilly, North Wembley; Dorian F. Mowbray, Burnham; John E. Mardell, Uxbridge, and Michael J. Davison, London, all of England, assignors to Lucas Industries Limited, Birmingham, England**

**Filed Nov. 16, 1979, Ser. No. 94,719**

**Claims priority, application United Kingdom, Feb. 9, 1979, 4724/79; Mar. 3, 1979, 7556/79**

**Int. Cl.³ F02M *37/04***

**U.S. Cl. 123—499** **7 Claims**



**1**. A fuel system for an internal combustion engine of the type in which fuel is injected into a combustion space of the engine, the system being of the kind comprising an injection nozzle positioned on the engine so that fuel delivered to the nozzle will be injected into the combustion space and an injection pump for delivering fuel to the nozzle in timed relationship with the engine, the pump comprising a piston movable in a bore to vary the size of a pumping chamber, resilient means biasing the piston in a direction to increase the size of the pumping chamber, electromagnetic means operable to move the piston against the action of the resilient means to displace fuel from the pumping chamber through the associated nozzle, a valve controlled fuel inlet to said pumping chamber and through which fuel can flow into the bore from a source of fuel when the piston is moved by the action of the resilient means, the system including first electronic means for supplying power to the electromagnetic means for a period of time during which the piston is moved to deliver fuel from the pump, the electromagnetic means at the end of said period of time being de-energised to allow return movement of the piston under the action of the resilient means and second electronic means operable to supply a holding current to said electromagnetic means to halt the return movement of said piston after the required amount of fuel has been drawn into the pumping chamber.

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**4,295,454**

## HEATED FUEL INTAKE SYSTEM IN AUTOMOBILE ENGINE

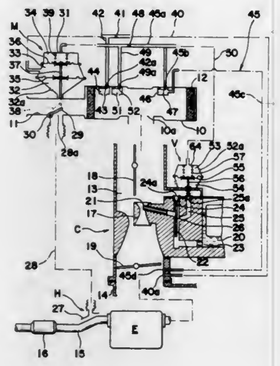
**Yoshihiko Iida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan**

**Filed Feb. 25, 1980, Ser. No. 124,239**

**Claims priority, application Japan, Feb. 24, 1979, 54/21175**

**Int. Cl.³ F02M *31/00***

**U.S. Cl. 123—556** **13 Claims**



**1**. In an automobile internal combustion engine comprising an air cleaner, an intake passage leading from the air cleaner to the engine for the passage of air therethrough to the engine from the atmosphere by way of the air cleaner, a fuel supplying means for introducing a controlled amount of fuel into the intake passage, a heated fuel intake system which comprises:

a heating means for heating the air to a predetermined temperature when the temperature of the atmosphere is lower than the predetermined temperature, and heating the air to another predetermined temperature when the temperature of the atmosphere is higher than the predetermined temperature and lower than the another predetermined temperature; and

means for compensating for the increased richness of the air-fuel mixture to be fed to the engine when the temperature of the atmosphere is higher than the predetermined temperature.

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**4,295,455**

## EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR A COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINE

**Seishi Yasuhara; Jun Teranuma, both of Yokosuka; Motohiro Shinzawa, Zushi, and Hiroshi Fujii, Yokohama, all of Japan, assignors to Nissan Motor Co. Ltd, Yokohama, Japan**

**Filed Oct. 2, 1979, Ser. No. 81,144**

**Claims priority, application Japan, Oct. 9, 1978, 53-124421**

**Int. Cl.³ F02M *25/06***

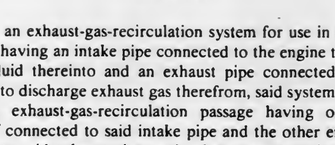
**U.S. Cl. 123—569** **9 Claims**

**1**. An exhaust gas recirculation control system for a compression-ignition internal combustion engine having an intake throttle valve in an intake passage and an exhaust gas recirculation passage opening located downstream of the intake throttle valve, comprising

(a) a shutoff valve in the exhaust gas recirculation passage;

(b) control means of a fuel injection pump, said control means interconnected with the shutoff valve, said shutoff valve being closed in proximity to a full load region of the engine; and

(c) a link mechanism interconnecting the intake throttle valve and control means, said link mechanism including




delay means for initiating opening of the intake throttle valve at a time following commencement of operation of the control means of the fuel injection pump and means for completely opening said intake throttle valve before said control means reaches a full operating position.

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**4,295,456**

## EXHAUST-GAS-RECIRCULATION SYSTEM FOR USE IN DIESEL ENGINES

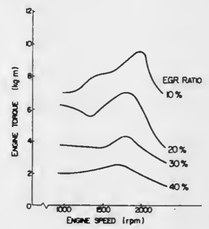
**Etsuji Nomura, Okazaki; Kazuma Matsui, Toyohashi; Toshikuni Miyazaki, Okazaki; Hiroshi Sami, Numazu, and Tatehito Ueda, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Nov. 8, 1979, Ser. No. 92,516**

**Claims priority, application Japan, Nov. 13, 1978, 53-140184**

**Int. Cl.³ F02M *25/06***

**U.S. Cl. 123—569** **4 Claims**




**1**. In an exhaust-gas-recirculation system for use in a diesel engine having an intake pipe connected to the engine to introduce fluid thereinto and an exhaust pipe connected to the engine to discharge exhaust gas therefrom, said system including an exhaust-gas-recirculation passage having one end thereof connected to said intake pipe and the other end connected to said exhaust pipe, and valve means associated with said exhaust-gas-recirculation passage to control the flow rate of the exhaust gas to be recirculated from said exhaust pipe to said intake pipe through said exhaust-gas-recirculation passage, the improvement which comprises:

a shaft rotatable in synchronization with the engine;

a fly-weight mounted on said shaft to produce a centrifugal force upon the rotation of said shaft;

a governor member movable in response to a thrust acting thereon due to the centrifugal force produced by said fly-weight;

at least one control spring acting against the thrust on said governor menber and having a spring load variable in response to the change in amount of depression of an accelerator pedal; and

actuating means operative in response to the movement of said governor member to actuate said valve means.



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**4,295,457**

## CRANKCASE VENTILATING DEVICE FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

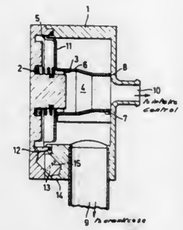
**Herbert Schleiermacher, Brühl, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Continuation of Ser. No. 845,350, Oct. 25, 1977, abandoned. This application Sep. 11, 1979, Ser. No. 74,413**

**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648112**

**Int. Cl.³ F02B *25/06***

**U.S. Cl. 123—574** **1 Claim**



**1**. A device for ventilating a crankcase of a reciprocating piston, internal combustion engine by connecting the crankcase to the air intake of the engine, the device comprising:

a housing having a first opening in one wall thereof connected to the crankcase, a downwardly extending second opening communicating with ambient air, and a third opening in a first end wall of the housing connected to the air intake and disposed substantially normal to the first opening;

a piston mounted in the housing, the piston having a cavity therein which faces and surrounds the third opening and which extends normally with respect to the first opening; whereby when the piston reciprocates in a direction normal to the first opening, the third opening is uncovered allowing vapor to flow from the first opening through the housing and out of the third opening;

a projection mounted on a second end wall of the housing opposite the third opening and extending into the cavity of the piston, the projection having a diameter substantially less than the inner diameter of the cavity;

a coil spring surrounding the projection and abutting the piston at one end and the second end wall at the other end for urging the piston to close the third opening;

a first diaphragm disposed between the piston and said one wall of the housing at a location between the first and second openings to seal the first opening from the second opening;

a second diaphragm disposed between the surface of the cavity in the piston and the projection to effect a seal between the second opening and third opening, wherein the first and second diaphragms cooperate with the second end wall to form an ambient air chamber isolated from the first and third openings, the ambient air chamber communicating with the atmosphere via the second opening, whereby when pressure in the housing between the first and third openings exceeds ambient air pressure the piston compresses the coil spring and opens communication between the first and second openings;

a relatively narrow inlet communicating directly with the ambient air chamber and the second opening for throttling ambient air entering the ambient air chamber, and

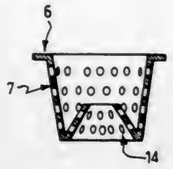
a separating chamber communicating with the narrow inlet and being relatively wide with respect to the narrow inlet, said separating chamber including a downwardly facing screen extending thereacross for filtering out dirt in the ambient air and a downwardly facing outlet through which the ambient air enters and the filtered dirt drops.

**4,295,458**

## DEVICE FOR INCREASING THE UNIFORMITY OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

**Albert Pellerin, 35 rue Lambrechts, 92400 Courbevoie, France**

**Division of Ser. No. 851,971, Nov. 16, 1977, Pat. No. 4,177,780.**
**This application Jun. 14, 1979, Ser. No. 48,372**
**Claims priority, application France, Nov. 16, 1976, 76 34414**
**Int. Cl.³ F02M *29/00***
**U.S. Cl. 123—590** **4 Claims**




1. In a device for internal combustion engines for increasing the uniformity of the air-fuel mixture, comprising a frusto-conical element formed by a perforated lateral wall having a collar at its major opening, the collar being adapted to fit between the carburetor flange and the manifold flange of an internal combustion engine whereas the apex of the truncated cone extends into the manifold inlet of said engine; the improvement comprising a perforated truncated cone disposed inside said element and having its large base secured to the small base of said element and its small base extending in the direction of the large base of said element but terminating a substantial distance short of said large base of said element, both ends of said truncated cone being open.

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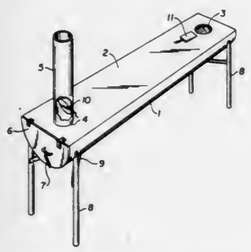
**4,295,459**

## STOVE

**Charles B. Reedy, Morelia, Mexico, assignor to Benedictine Monks Inc., Benet Lake, Wis.**

**Filed May 23, 1979, Ser. No. 41,739**
**Int. Cl.³ F24C *1/00***
**U.S. Cl. 126—60** **2 Claims**




1. A stove consisting essentially of:
1. an elongated shallow, open trough-shaped fuel chamber adapted to be filled from its bottom almost to its top with fuel,
2. a door closing one end of said chamber, said door being openable to permit introduction of fuel,
3. a flat generally rectangular surface member closing the top of the trough-shaped fuel chamber,
4. said flat surface member having a first opening at the door end of the fuel chamber and a second opening at the opposite end of the chamber, said second opening serving as the sole air inlet to the fuel chamber when the stove is in operation,
5. a chimney communicating with said first opening,
6. an adjustable closure member for said second opening to regulate admission of air into said fuel chamber,
7. said stove during operation being completely closed except for the two openings in said flat surface member.

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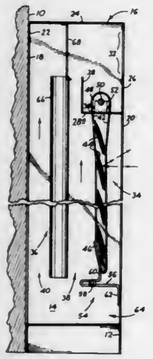
**4,295,460**

## COMBINATION HEAT TRANSFER PANEL AND WALL SHIELD FOR USE WITH STOVES AND OTHER RADIANT HEATERS

**Thomas T. Wilson, San Carlos, Calif., assignor to Epoxon Products, Inc., San Carlos, Calif.**

**Filed Feb. 2, 1979, Ser. No. 9,222**
**Int. Cl.³ F24B *7/00***
**U.S. Cl. 126—121** **3 Claims**



1. A combination heat transfer panel and wall shield for use between a stove type radiant heater and a combustible wall surface, comprising:
(a) a hollow case having a top wall and laterally spaced side walls, the case being arranged for support independently of and spaced from a radiant heater,
(b) a front curtain comprising a plurality of spaced louvers mounted in the case adjacent the open front thereof and spanning the space between the lateral sides thereof, the front louver curtain terminating at its upper end below the top wall of the case and at its lower end above the bottom side of the case,
(c) a rear curtain mounted in the case spaced rearwardly of the front louver curtain and forwardly of the rear side of the case and terminating at its upper end below the top wall of the case and at its lower end above the bottom side of the case,
(d) the space between the front louver curtain and rear curtain defining a first vertical convection chamber and the space between the rear curtain and the rear side of the case defining a second vertical convection chamber,
(e) the space between the bottom side of the case and the lower ends of the first and second curtains defining a cold air inlet communicating the bottom portion of the open front of the case with the bottom ends of the first and second vertical convection chambers,
(f) the space between the top wall of the case and the upper ends of the first and second curtains defining a hot air outlet communicating the top portion of the open front of the case with the top ends of the first and second vertical convection chambers.

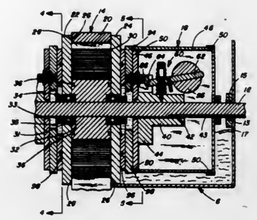


**4,295,461**

## FRICTION HEAT GENERATOR APPARATUS

**J. Francis Cummings, 35155 Chardon Rd., Willoughby Hills, Ohio 44094, and Alfred O. Werner, 194 Hawthorn Dr., Painesville, Ohio 44077**

**Filed Dec. 19, 1979, Ser. No. 105,131**
**Int. Cl.³ F24C *9/00***
**U.S. Cl. 126—247** **10 Claims**



1. A friction heat generator apparatus comprising,
a. an outer housing having a fluid inlet and outlet means,
b. a drive shaft journaled for rotative movement within said housing,
c. a heat exchange means mounted on said drive shaft,
d. said heat exchange means including a heat exchange chamber containing a heat transfer medium communicating with said inlet and outlet means,
e. a non-rotatable conductor plate member attached to said heat exchange means,
f. fly-force-friction drive means mounted for rotation with said drive shaft,
g. said friction drive means including a drive hub member connected to said drive shaft,
h. a friction drive shoe assembly operably mounted for axial movement relative to said drive hub member,
i. a fly-weight mechanism mounted for resilient pivotal movement on said drive hub member, and
j. said fly-weight mechanism including cam means operably connected to said friction drive shoe assembly for frictionally engaging said conductor plate member upon rotation of said drive shaft.

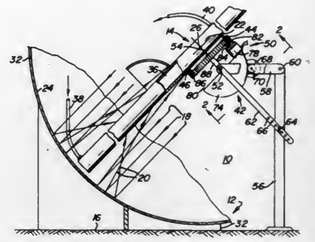
10. A friction heat generator apparatus comprising,
a. an outer hollow housing having fluid inlet and outlet means,
b. a drive shaft journaled for rotative movement within said housing,
c. a heat exchange means mounted on said drive shaft interiorly of said housing,
d. said heat exchange means including a heat exchange chamber containing a heat transfer medium communicating with said inlet and outlet means,
e. a conductor plate member attached to said heat exchange means and said housing for non-rotation relative to said drive shaft,
f. fly-force-friction drive means mounted for rotation with said drive shaft,
g. said friction drive means including a drive hub member connected to said drive shaft,
h. a friction drive shoe member operably mounted for axial movement on said drive hub member,
i. a fly-weight unit mounted for resilient pivotal movement on said drive hub member, and
j. said fly-weight member including cam means operably connected to said friction drive shoe member for frictionally engaging said conductor plate member upon rotation of said drive shaft in response to centrifugal force imparted to said fly-weight unit.

**4,295,462**

## ENERGY CONCENTRATOR SYSTEM

**Jesse C. Bunch, 816 Easley St., Silver Spring, Md. 20910**

**Continuation of Ser. No. 805,867, Jun. 13, 1977, Pat. No. 4,137,902. This application Feb. 5, 1979, Ser. No. 9,358**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—424** **11 Claims**



1. A radiant energy concentrator system, comprising:
(a) reflector means fixedly secured to a base surface, said reflector means for reflecting incident radiation impinging thereon from an energy source, said reflector means having a geodesic dome type configuration including a plurality of reflective elements of predetermined perimetrical contour, said reflector means having a primary focus;
(b) receiver means having an extended length in a predetermined direction, said extended length being maintained in a direction substantially parallel with said incident radiation; and,
(c) receiver displacement means secured to said receiver means for maintaining said extended length of said receiver means in said parallel direction responsive to directional variations of said incident radiation, said receiver displacement means including means for rotating said receiver means about a pair of substantially mutually perpendicular axes, said mutually perpendicular axes intersecting each other within said extended length of said receiver means, said receiver means extending from at least said axes intersection to said primary focus of said reflector means.

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**4,295,463**

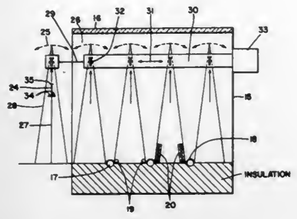
## FLEXIBLE V-SHAPED SOLAR TRACKING CONCENTRATING SOLAR ENERGY COLLECTOR

**Jeffrey M. Citron, 6111 E. 15th St., Tucson, Ariz. 85711**

**Continuation-in-part of Ser. No. 680,389, Apr. 26, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 960,121**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—425** **3 Claims**

1. A tracking solar energy concentrator comprising: a plurality of parallel adjacent solar tracking ridges of inverted V-shape in cross-section, said ridges being spaced to form V-shaped troughs, each of said ridges having an apex axis edge and two base axis edges joined by two sides, support means for supporting each of said ridges at said apex and base axis edges, said sides formed of material having a highly light-reflective

surface facing said troughs, said reflective material being of a flexibe nature to provide for slippage around said support means during tracking orientation, said support means also providing for slippage and pivoting of said reflective material around said support means during tracking orientation, means to provide tension upon said reflective material whereby the shape of said ridges is maintained throughout thermal fluctuations and tracking orientation, driving and guiding means for the simultaneous relative lateral and vertical displacement of each of said apex axis support means with respect to said base axes support means, said driving means and said pivotally mounting means such that the operative axis of the control means shifts with and remains substantially in parallel with the operative axis of the V-shaped troughs throughout tracking orientation.

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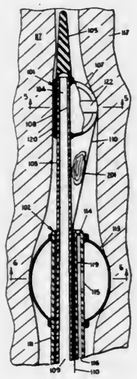
**4,295,464**

**URETERIC STONE EXTRACTOR WITH TWO BALLOONED CATHETERS**

**Alfred A. Shihata, 3584 Fairlanes Ave., SW., Grandville, Mich. 49418**

**Filed Mar. 21, 1980, Ser. No. 131,937**
**Int. Cl.³ A61B** *19/00, 17/00;* **A61M** *25/00, 29/02*
**U.S. Cl. 128—1 R** **17 Claims**



**1.** A stone extractor for extracting a ureteral stone arrested within any of various sections of a ureter of a patient wherein said various sections include ureteral sections above the lower third sectional area of said ureter; said stone extractor comprising:

first inflatable means for gradually applying an increasing outward radial force to inner walls of said ureter wherein said inner walls are distended in response to said radial force in a manner such that a stress relaxation state is induced therein;

first catheter means connected to said first inflatable means and adapted to position said first inflatable means below the position of arrestment of said ureteral stone;

second inflatable means for applying a downward force to said ureteral stone to achieve dislodgment of said stone from said inner walls of said ureter;

second catheter means connected to said second inflatable means for positioning said second inflatable means above the position of arrestment of said ureteral stone; and

said second catheter means is adapted to adjust the position of said second inflatable means relative to said first inflatable means and is manually manipulable to move said ureteral stone into a spacial area of said ureter distended by said first inflatable means.

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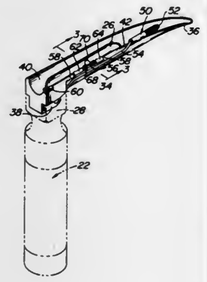
**4,295,465**

**LARYNGOSCOPE BLADE**

**Gabor Racz, Lubbock, Tex., and Forrest Allen, Fayetteville, N.Y., assignors to N.A.D., Inc., Telford, Pa.**

**Filed Apr. 3, 1980, Ser. No. 137,057**
**Int. Cl.³ A61B** *1/06*
**U.S. Cl. 128—11** **10 Claims**



**1.** A blade for a laryngoscope having a handle, said blade comprising a base member and a projecting flange member, and bias means, said base member being an elongated member having a rear portion, a midportion and a tip portion, said blade being secured to said handle at said rear portion said midportion being generally linear, said flange projecting upward from said base member along said rear and midportion and being pivotly mounted on said base member, said bias means providing a bias force to said blade, whereupon when said blade is inserted into a patient's mouth with flange in contact with the patient's teeth, said flange is enabled to pivot with respect to said blade against the force provided by said bias means to prevent the application of excess pressure to the teeth.

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**4,295,466**

**LIMB ENGAGING BAND FOR ORTHOTIC DEVICE**

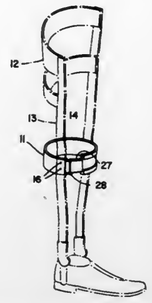
**Wesley C. Prout, Los Gastos, Calif., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.**

**Filed May 16, 1980, Ser. No. 150,646**
**Int. Cl.³ A61F** *3/00*
**U.S. Cl. 128—80 R** **8 Claims**

**1.** A strap assembly for an orthotic device, comprising a form retaining first member including an arcuate configuration to encircle a portion of a limb; a second, flexible, resilient member having a longitudinally extending channel portion, said channel portion engaging and securing said first member;



said first and second members being longitudinally offset to define a free end of each, and strap and buckle means secured to said free ends to join said free ends together in confronting relationship.



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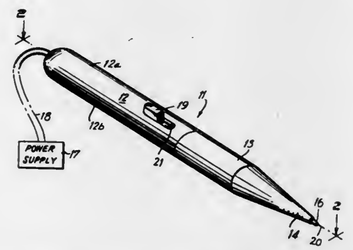
**4,295,467**

**ELECTROLYSIS APPARATUS WITH RETRACTABLE PROBE**

**Samuel J. Mann, Englewood, and Michael Hrehovcik, Little Falls, both of N.J., assignors to Inverness International Corp., River Edge, N.J.**

**Filed May 24, 1979, Ser. No. 42,277**
**Int. Cl.³ A61B** *17/38*
**U.S. Cl. 128—303.18** **9 Claims**




**1.** An electrolysis apparatus comprising a housing including a probe end, said housing including a conductor means supported on said exterior thereof for defining a current path, an electrically conductive probe adapted to be coordinately displaced between an operative position wherein said probe extends from said probe end of said housing and an inoperative position wherein said probe is retracted into the probe end of said housing, positioning means associated with said housing and said probe for selectively displacing said probe between said operative position and said inoperative position, said positioning means including spring biasing means for biasing said probe against the papilla with a force normally sufficient for entry into a pore but normally insufficient to cause penetration of the skin when said probe is displaced in an operative position, first conductive means electrically connected with said conductor means and second conductive means electrically connected with said probe, said first and second conductive means being electrically connectable with a voltage source.

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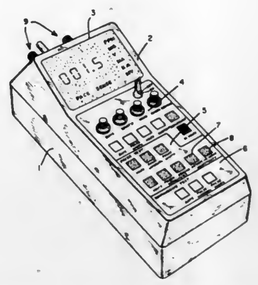
**4,295,468**

**CARDIAC PACER TESTING SYSTEM**

**James T. Bartelt, Shoreview, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Oct. 24, 1979, Ser. No. 87,867**
**Int. Cl.³ A61N** *1/36*
**U.S. Cl. 128—419 PT** **6 Claims**



**1.** Apparatus for measuring the R-wave sensitivity of a demand cardiac pacer comprising:

(a) means for receiving pacer pulses from said cardiac pacer;

(b) means responsive to successive ones of received pacer pulses for producing pseudo R-waves of incrementally increasing amplitude;

(c) means for applying said pseudo R-wave signals to the R-wave sensing circuit of said cardiac pacer; and

(d) means for displaying the voltage amplitude of the pseudo R-wave just sufficient to cause resetting of the pulse generator of said demand cardiac pacer.

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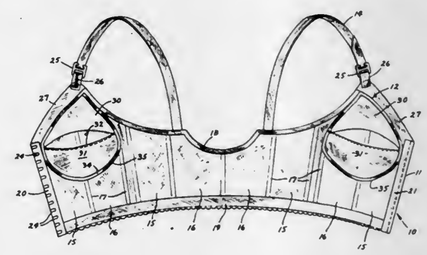
**4,295,469**

**BRASSIERE CONSTRUCTION**

**Hazelle C. Lindgren, Rte. 4, Box 283A, Buffalo, Minn. 55313**

**Filed Oct. 20, 1978, Ser. No. 953,273**
**Int. Cl.³ A41C** *3/10, 3/00*
**U.S. Cl. 128—480** **3 Claims**



**1.** A brassiere construction for a brassiere having a latchable, elongated vest member encircling the wearer's body, a pair of breast covering cups with upper and lower edge portions and a pair of shoulder straps, said brassiere construction comprising:

a pair of fabric material elements having upper and lower edges, each said fabric material element being flexibly secured at its lower edge to said brassiere near the lower edge portion of a cup, said material extending upwardly at least to a location for contacting the lower junction of the breast and the lower rib cage,

whereby said fabric material element may pivot about the lower edge inwardly away from the cup to form a pouch within which a breast may be contained, said material

thereby laying between the underside of a breast and the wearer's lower rib cage.

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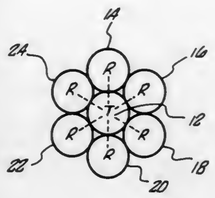
**4,295,470**
**OPTICAL CATHETERS AND METHOD FOR MAKING SAME**

**Robert F. Shaw, Portola Valley, and John Sperinde, San Jose, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.**

**Continuation of Ser. No. 733,279, Oct. 18, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,612**
**Int. Cl.³ A61B 5/02**
**U.S. Cl. 128—634** **18 Claims**




1. A catheter for photometric analysis of a fluid, said catheter comprising a plurality of transmitting and a plurality of receiving optical fibers; each said optical fiber for conducting radiant energy therethrough from an aperture at one end thereof to an aperture at the other end thereof; each aperture of each transmitting and each receiving optical fiber at the distal end thereof having a centroid of area; the centroid of the aperture of the distal end of each and every transmitting optical fiber being equidistant from the centroid of the aperture of the distal end of each and every receiving optical fiber.

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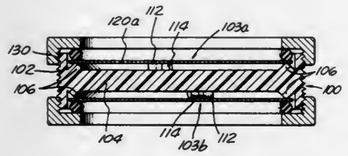
**4,295,471**
**NON-INVASIVE VASCULAR WAVEFORM TRANSDUCER AND APPARATUS**

**William J. Kaspari, 342 Willowbrood Dr., Portola Valley, Calif. 94025**

**Filed May 25, 1979, Ser. No. 42,415**
**Int. Cl.³ A61B 5/02**
**U.S. Cl. 128—675** **11 Claims**




1. A transducer for noninvasively monitoring a vascular waveform comprising
- a housing forming two independent cavities therein,
- a pair of support members, one disposed in each of said cavities,
- a pair of sensing elements, one resting on each of said first support members in said cavities,
- a pair of retaining members, one disposed on top of each said sensing element in said cavities,
- a pair of retaining caps, each cap having an orifice therethrough, said retaining caps being affixed to said housing to cause each of said sensing elements to be positioned between said support member and said retaining members,
- pressure-transmitting means within each of said orifices for causing pressure waves impinging thereupon to be transmitted to the associated sensing element, each sensing element being responsive only to pressure waves entering its associated orifice.

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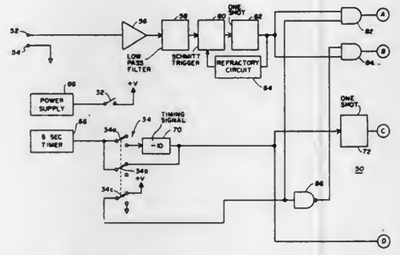
**4,295,472**
**HEART RATE MONITOR**

**John M. Adams, Mesa, Ariz., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 851,030, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 714,873, Aug. 16, 1976, abandoned. This application Oct. 1, 1979, Ser. No. 80,597**
**Int. Cl.³ A61N 5/04**
**U.S. Cl. 128—690** **4 Claims**




1. A cardiac signal detector comprising:

a housing containing circuitry for detecting and counting individual heartbeats of a person as said heartbeats are manifested by a pair of electric signals, each one of which signals manifests the electrocardiac potential at a different limb of said person, said circuitry including means for selecting the time during which said detected beats are counted to be six or sixty seconds;

a band member of an electrically conductive material selected to be capable of detecting electric signals on the skin of such person, said band being affixed to said housing and said housing and band combination being capable of firmly contacting one of said limbs, said band and housing combination further being in electric communication with said circuitry to provide the signal at said one limb as one of said pair of signals;

receiving means electrically isolated from said housing and band combination, said receiving means being adapted for physical contact with said other limb and being in electrical communication with said circuitry to provide the other one of said pair of signals;

display means for providing a signal representative of the heart rate of said person;

timing means responsive to the state of said means for selecting for providing timing signals to cause said detecting beats to be counted for said selected time;

means responsive to said timing signals and the counted beats for providing signals representative of the heart rate of said person to said display means;

means responsive to said means for selecting whereby in the event a sixty second timing signal is selected, said display means displays the number of detected and counted heartbeats;

and

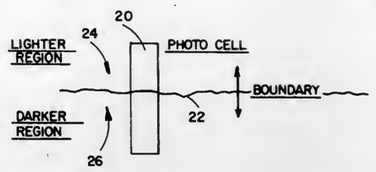
decade means responsive to said means for selecting whereby in the event a six second timing signal is selected, said display means displays ten times the number of detected and counted heartbeats.



**4,295,473**
**APPARATUS AND METHOD FOR ANALYSIS OF MOTION OF A DYNAMIC STRUCTURE**

**George Diamond, 2408 Wild Oak Dr., Los Angeles, Calif. 90068; James Forrester, 3226 Serra Rd., Malibu, Calif. 90265; Michael Hirsch, 756 Amalfi Dr., Pacific Palisades, Calif. 91272, and Ran Vas, 17130 Clemons Dr., Encino, Calif. 91436**

**Filed May 24, 1979, Ser. No. 42,247**
**Int. Cl.³ D61N 5/00**
**U.S. Cl. 178—695** **58 Claims**




1. A system for detecting and measuring the linear motion in at least one dimension of a portion of either a dynamically movable structure or visual image representations of that structure and providing an analog signal representative of the movement, said system comprising:

(a) sensing means for detecting amd measuring the light change pursuant to a moving boundary on the structure or a series of sequential image representations of that structure moving between dark and light regions on said dynamically movable structure or on said series of sequential visual image representations of said dynamically movable structure, and which sequential visual image representations are displayed in sequence at a rate to represent the movable structure during movement thereof, said sensing means generating a current signal representative of the boundary movement,

(b) conversion means for receiving the current signal from said sensing means for generating an analog voltage signal as a fairly exact analog of the current signal and being representative of and directly related to the amount of movement of said boundary on the dynamically movable structure or on the series of sequential visual image representations,

(c) selection means operatively connected to said conversion means for selecting a sample of predetermined instantaneous amplitude and at least temporarily holding such sample,

(d) detection means operatively connected to said selection means for aiding in and determining a sample of predetermined instantaneous amplitude to thereby determine a maximum limit of movement of the boundary at least in one region, and

(e) means operatively connected to at least said selection means for providing a representation of the amount of movement of said boundary.

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**4,295,474**
**RECORDER WITH PATIENT ALARM AND SERVICE REQUEST SYSTEMS SUITABLE FOR USE WITH AUTOMATIC IMPLANTABLE DEFIBRILLATOR**

**Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.**

**Filed Oct. 2, 1979, Ser. No. 81,167**
**Int. Cl.³ A61B 5/04**
**U.S. Cl. 128—697** **34 Claims**

1. A recorder system, adapted for use with an automatic defibrillator system responsive to a patient's electrocardiagram (ECG) data and capable of detecting the occurrence of abnormal cardiac activity and render effective automatically in response thereto to generate and apply one or more defibrillation electrical impulses to the patient's heart intended to return the heart to normal functioning, said recorder system being responsive to the patient's ECG data and comprising, in combination,

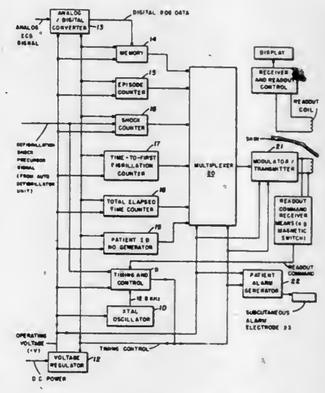
means for sampling and converting said ECG data from analog to digital form,

first and second ECG data digital storage means,

means for registering the occurrence of said abnormal cardiac activity as detected by said automatic defibrillator system,

storage control means controlled by said occurrence registering means responsive to the occurrence of said abnormal cardiac activity for selectively rendering effective said first and second ECG data storage means to store ECG digital data occurring respectively for a first time period just prior to the occurrence of said abnormal cardiac activity or for a second time period encompassing the application of said defibrillation impulse(s) by said automatic defibrillator system,

time registration means controlled by said occurrence registering means responsive to the occurrence of said abnormal cardiac activity for registering as a digital code the time of occurrence of said abnormal cardiac activity,




first counting means responsive to the generation of each defibrillation impulse by said automatic defibrillation system for registering as a digital code a count of the number of said defibrillation electrical impulses generated by said automatic defibrillator system,

second counting means responsive to said occurrence registering means for registering as a digital code a count of the number of occurrences of said abnormal cardiac activity, and

readout control means operable upon command for reading out

(a) the ECG digital data stored in each of said first and second storage means,

(b) the digital code time registration of said time registration means, and

(c) the digital code counts of each of said first and second counting means.

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**4,295,475**
**PROBE AND SYSTEM FOR DETECTING PROBE DISLODGEMENT**

**Terence A. Torzala, Warminster, Pa., assignor to Air Shields, Inc., Hatboro, Pa.**

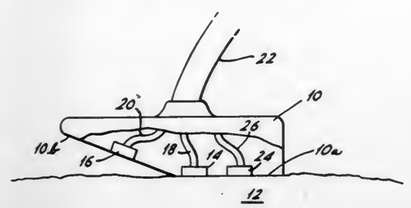
**Filed Oct. 26, 1979, Ser. No. 88,474**
**Int. Cl.³ A61B 5/00**
**U.S. Cl. 128—736** **13 Claims**

1. A probe comprising:

a probe housing having a contact surface adapted for contact with a body and a second surface adapted to be spaced from said body and upon which radiation reflected from

said body impinges when said contact surface is in contact with said body;

first radiation receiving means located in said contact surface for sensing an increased radiation level impinging on said contact surface when said probe housing is dislodged from said body and said contact surface is exposed to said increased radiation level and for developing an output representative of said increased radiation level;




second radiation receiving means located in said second surface for sensing (1) radiation reflected from said body, and (2) a decreased radiation level impinging on said second surface when said probe housing is covered and said second surface is exposed to said decreased radiation level and for developing an output representative of said decreased radiation level;

and means emanating from said housing for transmitting said outputs of said first and said second radiation receiving means to a remote location.

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**4,295,476**

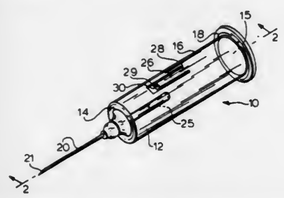
**BLOOD COLLECTION ASSEMBLY FOR PREVENTING OUTWARD MOVEMENT OF THE BLOOD CONTAINER**

**Gary F. Quaas, Rutherford, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Filed Dec. 19, 1979, Ser. No. 105,346**

**Int. Cl.³ A61B *5/14***

**U.S. Cl. 128—764** **7 Claims**




1. A holder assembly for use with a closed blood collection container one end of which includes a cannula-penetrable closure with a lip element associated therewith, said assembly comprising:

a receptacle having a closed end, side walls and an open end for the receipt of said blood collection container;

an interior cannula extending from said closed end into said receptacle;

an exterior cannula extending outwardly from said closed end, said interior and said exterior cannulae being in fluid communication with each other;

a spring-resilient, cannula-penetrable valve sheath covering said interior cannula adapted to expose said interior cannula to fluid flow therethrough when said blood collection container is inserted into said receptacle thereby causing said interior cannula to penetrate said closure and said sheath to become compressed against said closed end, said sheath serving as a loaded spring when compressed; and

said receptacle including a spring-depressible tongue located in a side wall thereof and being normally flush with the side wall and having a distal end depressible downwardly into the interior of said receptacle and a proximal end hingedly connected to said side wall, said distal end of said tongue being spaced a pre-determined distance from the closed end of said receptacle so that it, upon being downwardly depressed, is adapted to engage said lip element on said blood collection container after being inserted into said receptacle to thereby prevent said container from being pushed out of said receptacle under the influence of the spring force of said compressed valve sheath.

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**4,295,477**

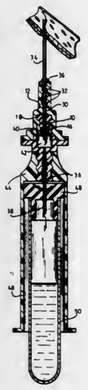
**MULTIPLE SAMPLING DEVICE HAVING MOLDED VALVE AND HUB**

**Werner Christinger, Franklin Lakes, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Filed Aug. 15, 1979, Ser. No. 66,818**

**Int. Cl.³ A61B *5/14***

**U.S. Cl. 128—766** **5 Claims**



1. A multiple blood sampling device adapted to be coupled with an evacuated container to obtain blood samples from a patient, said device comprising a housing having a first hub, a second hub and chamber therein, a first cannula attached to said first hub and adapted for penetrating a blood vessel, a second cannula attached to said second hub and adapted for piercing a stopper of an evacuated collection container, and a one-way valve provided within said housing, said cannulas and said chamber being in fluid communication when said valve is in an open position, characterized in that a first portion of said valve is connected in fixed position to said first hub, and a second portion of said valve freely extends into the chamber, said second portion capable of assuming an open position to allow the passage of blood therethrough when suction is applied within the chamber by means of the second cannula, and assuming a closed position when pressures within each cannula are equal, said valve positioned inside said first hub and said chamber to be free of contact with said second hub in both open and closed conditions.

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**4,295,478**

**COMPOSITE TIPPING STRUCTURE FOR USE ON AN AIR-VENTILATED CIGARETTE AND METHOD OF MANUFACTURING SAME**

**Roy E. Yeatts, Winston-Salem, N.C., assignor to RJR Archer, Inc., Winston-Salem, N.C.**

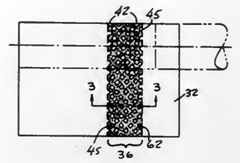
**Filed Apr. 11, 1979, Ser. No. 29,163**

**Int. Cl.³ A24C *5/56*; A24D *3/00, 3/18***

**U.S. Cl. 131—336** **9 Claims**

1. A composite structure for use as a tipping material for an air-ventilated smoking product comprising a non-porous paper web, a heat activatable adhesive coating on said non-porous paper web in a pattern including a zone having a width corresponding to a fraction of the length of said non-porous paper






web and intermediate two marginal areas, said zone having a plurality of intermingled discrete coated and void areas, and microscopic perforations interspersed only within the void areas in said zone.

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**4,295,479**

**METHOD AND DEVICE FOR MANUFACTURING CIGARS**

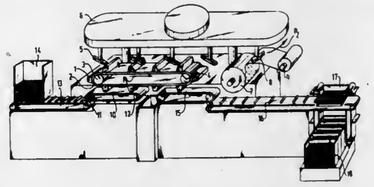
**Wilhelmus P. L. Boogers, Eindhoven, Netherlands, assignor to B.V. Arenco P.M.B., Best, Netherlands**

**Filed Nov. 29, 1978, Ser. No. 964,455**

**Claims priority, application Netherlands, Dec. 29, 1977, 7714544**

**Int. Cl.³ A24D *1/02*; A24C *1/26, 1/30***

**U.S. Cl. 131—60** **12 Claims**



2. A device for wrapping cigar filler material with a tobacco wrapper portion comprising at least two filler holders for receiving each one filler, and at least one wrapper portion carrier means for applying each tobacco wrapper portion in the stretched state to a filler characterized by a feeding conveyor (**13**) for feeding fillers from a stock to an adjoining transfer station (**10**), by a delivery station (**15**) arranged at a distance from the latter and by an advancing mechanism for carrying the filler holders (**1**) from the transfer station (**10**) to the delivery station (**15**) and conversely as well as by a guide path with a driving mechanism for advancing at least one wrapper portion carrier means in synchronism with the holders (**1**).

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**4,295,480**

**COMB AND THE METHOD OF MAKING SAME**

**John A. Biela, Niles, Ill., assignor to Jerome D. Schiffman, deceased, late of Wilmette, Ill.**

**Filed Jan. 27, 1977, Ser. No. 763,280**

**Int. Cl.³ A45D *24/00***

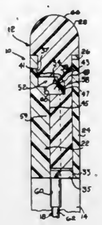
**U.S. Cl. 132—151** **4 Claims**

1. A comb, comprising:

an elongated hollow frame having front and rear walls and fixed end members for defining a hollow interior in said frame, said hollow interior having an elongated opening at the bottom thereof;

elongated means being disposed at least partially within said hollow interior in overlying engagement with the inside surface of said front and rear walls for closing the bottom opening in said frame and having a series of spaced-apart transversely extending openings;

a series of axially rotatable rod-like teeth having enlarged head and cylindrical body portions and disposed individually with their body portions within said openings and extending from said elongated means out of said hollow interior through the bottom opening thereof, said teeth receiving openings in said elongated means being larger in cross-sectional area than the cross-sectional area of said



cylindrical body portions of said teeth so that said shank cylindrical body portions adjacent said head portions fit entirely within their openings and said head portions fitting thereabove,

wherein each one of said teeth includes an enlarged head portion, each opening is a four-sided slot in cross-sectional shape, one of the sides being open and in the plane of said face, an open slot extending in a lengthwise direction in one side planar face of said elongated means for receiving enlarged head portions of said teeth.

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**4,295,481**

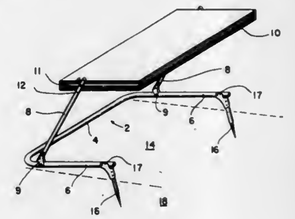
**CONVERTIBLE SUN SHADE**

**Charles E. Gee, 1481 Russell Dr. N., St. Petersburg, Fla. 33710**

**Filed Jul. 18, 1977, Ser. No. 816,339**

**Int. Cl.³ E04F *10/10***

**U.S. Cl. 135—5 R** **11 Claims**




1. A self-supporting sun shade, comprising:

a U-shaped support member having the bottom portion of the U as a rearward support for the shade and the legs of the U being forwardly positioned;

a pair of upright support members, one pivotally mounted on each of said legs of said U-shaped member, proximate to said bottom portion of the U;

a canopy pivotally mounted between said upright support members, on the upper ends thereof, for shielding sunlight from the region between said legs of said U-shaped member;

said pivotal mounting for said canopy to said upright support member, further comprising:

said upright support member being a hollow tubular structure;

a shaft rigidly mounted to said canopy and passing through a hole in the side of said upright support member;

a substantially U-shaped, resilient clamping member within

said hollow tubular structure at the upper end thereof, having two legs, one on each side of said shaft;

a screw passing through the side of said upright support member and through a first one of said legs of said clamp and threadably engaging a second one of said legs of said clamp, for tightening said clamp about said shaft;

a cap sealably engaging said upper end of said hollow tubular structure for protecting said clamping member from environmental elements;

whereby said canopy can be locked into a fixed position with respect to said upright support member.

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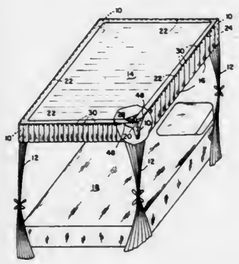
**4,295,482**
**VALANCE SUPPORT**
**Harold F. McMullen, 5009 E. Colonial Dr., Apt. 14, Tampa, Fla. 33611**
**Filed Mar. 31, 1980, Ser. No. 135,773**
**Int. Cl.³ A45F *3/52*; A47C *29/00***
**U.S. Cl. 135—8** **11 Claims**



1. A valance support for supporting a corner drapery from a ceiling, comprising in combination:

a first side portion;

a second side portion disposed at substantially right angles to said first side portion;

a first arm connected to said first side portion;

a second arm connected to said second side portion;

a valance gusset disposed in the upper corner formed by said first side portion and said second side portion;

means for hanging the corner drapery from said first and second side portions and said first and second arms; and

means for securing said valance support to the ceiling.

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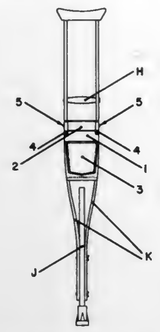
**4,295,483**
**CRUTCH-MOUNTED ACCESSORY POUCH**
**Samuel W. Smith, P.O. Box 317, Anthony, Fla. 32617**
**Filed Dec. 26, 1979, Ser. No. 106,007**
**Int. Cl.³ A61H *3/02***
**U.S. Cl. 135—66** **2 Claims**

1. In combination a pouch means and a Y-type crutch having two separate upright side members, with said pouch means comprising a fabric envelope body means fitting around a central portion of said crutch means, and with said pouch means comprising a fitted bottom closure means extending the width of the lower portion of said pouch means and the distance between the said upright side members of the said crutch means, and said pouch means comprising a central cavity within said side member means of said crutch means and said



fabric envelope body means whereby small articles may be transported therewithin without loss.

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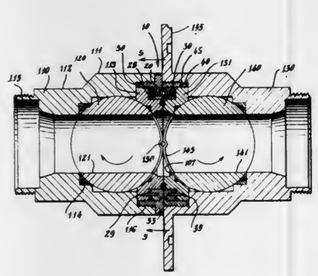
**4,295,484**
**FRANGIBLE CONNECTOR FOR SELF-CLOSING BREAKAWAY VALVE ASSEMBLIES OR SIMILAR STRUCTURES**
**Daniel T. Meisenheimer, Jr., 404 Longmeadow Rd., Orange, Conn. 06477**
**Filed Aug. 22, 1980, Ser. No. 181,386**
**Int. Cl.³ F16K *17/40***
**U.S. Cl. 137—68 R** **11 Claims**



1. A frangible connector for frangibly connecting the first and second housings of a self-closing breakaway valve assembly or the like, the frangible connector comprising:

(A) a first clamping ring and a second clamping ring secured together by frangible means, the first and second clamping rings together defining a radially outwardly opening peripheral channel;

(B) A first attachment sleeve received over the first clamping ring and having an inturned flange received in the radially outwardly opening peripheral channel, the first attachment sleeve being adapted for attachment to the first housing of the self-closing breakaway valve assembly; and

(C) a second flanged attachment sleeve received over the second clamping ring and having an inturned flange received in the radially outwardly opening peripheral channel and a radially outwardly protruding flange, whereby the flanged attachment sleeve is free for rotation relative to the clamping rings and the first attachment sleeve, the flanged attachment sleeve being threaded for attachment to the second housing of the self-closing breakaway assembly;

whereby the clamping rings capture and clamp the attachment sleeves together and the flanged attachment sleeve may be rotated by means of its radially protruding flange to thread it into the second housing of the self-closing breakaway valve assembly, thereby drawing the second housing into assembled relationship with the first housing without rotating the first housing so that a desired angular orientation between the first and second housings may be established.



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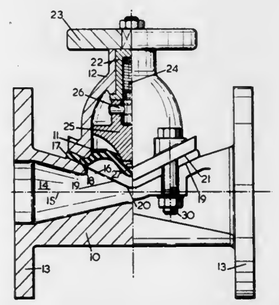
**4,295,485**
**DIAPHRAGM VALVE**
**Timothy O. W. Waterfield, Chandler's Ford, England, assignor to Waterfield Engineering Limited, Hampshire, England**
**Division of Ser. No. 900,393, Apr. 26, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,791**
**Int. Cl.³ F16K *7/16***
**U.S. Cl. 137—74** **7 Claims**



1. A diaphragm valve comprising a body traversed by a fluid passageway and having an opening in communication with the fluid passageway, a diaphragm for controlling fluid flow through the passageway and extending across the opening, a valve-operating mechanism including a spindle, a compressing member secured to the diaphragm and axially movably connected to the spindle, the compressing member being movable by the valve-operating mechanism at right angles to the passageway to control opening of the passageway through the intermediary of the diaphram, resilient means between the spindle and the compressing member to urge the compressing member axially of the spindle into sealing contact with the valve body if the diaphragm is destroyed, and a bonnet secured to the body to house the valve operating mechanism and with a peripheral portion of the diaphragm being clamped between the bonnet and body.

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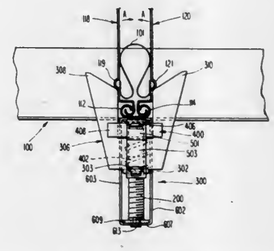
**4,295,486**
**LOW COST, DIFFUSER CONCEALABLE, VOLUME CONTROL, HEAT RESPONSIVE, RESETTABLE, BUTTERFLY DAMPER OPERATOR**
**Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.**
**Continuation-in-part of Ser. No. 900,620, Apr. 27, 1978, Pat. No. 4,263,930, which is a continuation-in-part of Ser. No. 896,299, Apr. 14, 1978, Pat. No. 4,195,384, Ser. No. 896,237, Apr. 14, 1978, Pat. No. 4,219,041, Ser. No. 792,525, May 2, 1977, Pat. No. 4,146,048, and Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,113,230, which is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 896,299, is a continuation-in-part of Ser. No. 779,044, Mar. 18, 1977, Pat. No. 4,099,292, which is a continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304. This application Sep. 21, 1979, Ser. No. 77,583**
**The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.**
**Int. Cl.³ F16K *17/38***
**U.S. Cl. 137—80** **30 Claims**



1. A damper operator for use with a damper having a frame and at least one blade, said blade being movable between open and closed positions with respect to said frame, said operator comprising:

(a) at least one pawl member associated with said frame;

(b) blade positioning means mounted for movement with respect to said frame for engaging said at least one blade of establishing, according to the relative position of said blade positioning means, the relative position of that blade with respect to said frame; and

(c) heat responsive means connected during normal conditions between said blade positioning means in at least one of said relative positions and said pawl member, for disconnecting from between said pawl member and said blade positioning means at least in response to a preselected increase in ambient temperatures.

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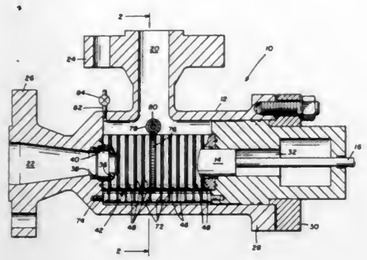
**4,295,487**
**CLEANOUT APPARATUS FOR FLOW CONTROL VALVES**
**Robert M. Purton, Cerritos, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.**
**Filed Nov. 1, 1979, Ser. No. 90,232**
**Int. Cl.³ F16K *51/00, 47/00***
**U.S. Cl. 137—242** **5 Claims**

1. Cleanout apparatus for a valve or the like that includes a hollow body having an inlet and an outlet, orifice means located in the body between the inlet and outlet, and a valve member operable to permit or prevent flow through the body and orifice means from the inlet to the outlet, said apparatus comprising:

a flow path through the orifice means including an annular orifice in the outer periphery of the orifice means;

a cleanout member mounted on the body and extending into a portion of said annular orifice; and,



means for rotating the orifice means whereby said cleanout member can traverse the full length of said annular orifice to dislodge any debri collected in said annular orifice.

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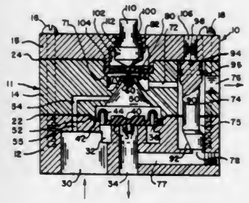
**4,295,488**

## DIAPHRAGM AND BALL VALVE

**Harold M. Book, P.O. Box 323, 15876 Beechwood Rd., Findlay, Ohio 45840**

**Filed Feb. 9, 1979, Ser. No. 10,692**
**Int. Cl.³ F16K** *31/18, 33/00*
**U.S. Cl. 137—414** **28 Claims**



1. A liquid flow valve comprising:
(A) an adjacent inlet and outlet,
(B) a diaphragm for simultaneously opening and closing said adjacent inlet and outlet on one side of said diaphragm,
(C) a substantially conical chamber on the other side of said diaphragm having an inlet duct continuously open at all times to said adjacent inlet regardless of the opening and closing of said adjacent inlet and outlet of said diaphragm, said open inlet duct normally pressurizing said chamber for causing said diaphragm to close said adjacent inlet and outlet, said chamber having a valved outlet at its apex,
(D) a freely movable ball in said chamber movable by the flow of the liquid through said conical chamber for directing and maintaining said freely movable ball adjacent said apex of said conical chamber at all times and for normally closing said valved outlet from said chamber when not obstructed by external means, and
(E) external means for moving said ball from said valved outlet to reduce the pressure in said conical chamber from said inlet duct to permit said diaphragm to be moved by said adjacent inlet pressure to open said valve by opening said adjacent inlet and outlet.

6. A valve according to claim **1** wherein said external means comprises a float and lever mechanism.

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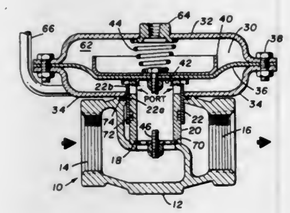
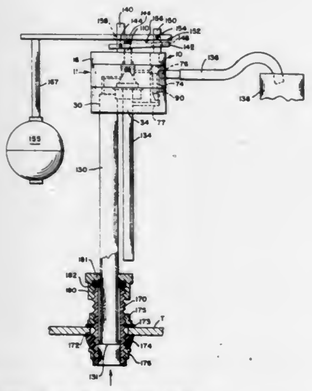
**4,295,489**

## PILOT-OPERATED BACK PRESSURE REGULATOR

**Roger R. Arends; Wayne B. Bailey, both of Marshalltown; John W. Duffy, Tama, and Brice D. Springer, Marshalltown, all of Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa**

**Filed Oct. 3, 1979, Ser. No. 81,587**
**Int. Cl.³ F16K** *31/365*
**U.S. Cl. 137—488** **2 Claims**





1. A pilot-operated back pressure regulator comprising:
(a) A regulator body having an inlet and an outlet, a valve seat located between said inlet and outlet and a valve plug guide above said valve seat;
(b) a pressure balanced valve plug within said valve plug guide adjacent to said valve seat and movable reciprocally toward and away from said valve seat, said valve plug being ported at the end thereof remote from the end which seats on said valve seat;
(c) an actuator having a flexible diaphragm forming a spring cavity and a lower cavity within said actuator, said spring cavity containing a spring for closing said valve plug against said valve seat and said lower cavity accepting said ported portion of said valve plug;
(d) said valve plug being directly attached to said diaphragm such tht flexure of said diaphragm operates said valve plug to open or close said back pressure regulator by moving said valve plug away from or toward, respectively, said valve seat;
(e) a plurality of bolts securing said actuator to said regulator body whereby removal of said plurality of bolts allows simultaneous removal of said actuator and said valve plug from said regulator body; and
(f) a pilot valve in communication with the inlet pressure, with said spring cavity, and with an exhaust whereby said pilot valve operates said actuator.

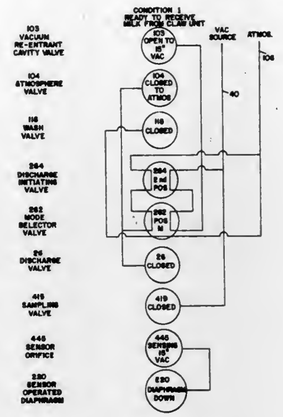


**4,295,490**

## MILKING APPARATUS

**Archie E. Boudreau, P.O. Box 1125, Modesto, Calif. 95353**

**Division of Ser. No. 906,425, May 16, 1978, Pat. No. 4,198,999.**
**This application Aug. 9, 1979, Ser. No. 65,172**
**Int. Cl.³ F16K** *11/10*
**U.S. Cl. 137—595** **14 Claims**



1. A vacuum control valve system including:
a valve system body which defines a first vacuum conduit communicating with a source of vacuum, and a first atmospheric conduit communicating with the atmosphere;
said valve system body further defining a second vacuum conduit and a second atmospheric conduit;
said first and second vacuum conduits defined by said body being out of fluid communication with said first and second atmospheric conduits defined by said body;
a first valve means for selectively providing communication between the first and second vacuum conduits;
a second valve means for selectively providing communication between the first and second atmospheric conduits;
a third valve means;
said valve system body defining a third vacuum conduit provided in communication with the third valve means and communicating with the source of vacuum and a third atmospheric conduit provided in communication with the third valve means and communicating with the atmosphere;
a fourth conduit for providing communication between the third valve means and the first valve means and a fifth conduit for providing communication between the third valve means and the second valve means;
wherein the third valve means has a first mode for providing communication between the fourth conduit and the third atmospheric conduit and between the fifth conduit and the third vacuum conduit; and
wherein the third valve means has a second mode for providing communication between the fourth conduit and the third vacuum conduit, and between the fifth conduit and the third atmospheric conduit.

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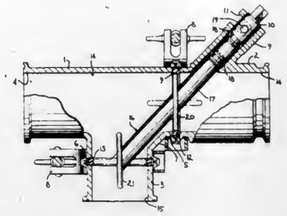
**4,295,491**

## DOUBLE ANGLED-DISC DIVERTER VALVE OR THE LIKE

**Tod R. Galloway, Menasha, Wis., assignor to Fox Valley Process Systems & Supply, Inc., Menasha, Wis.**

**Filed May 15, 1980, Ser. No. 150,085**
**Int. Cl.³ F16K** *11/02*
**U.S. Cl. 137—625.46** **5 Claims**

1. A double angled-disc valve comprising:
a valve body defining a a substantially straight through passage and a substantially straight branch passage substantially perpendicular to the through passage:
a single valve stem at least partially within the valve body, said valve stem having a longitudinal axis at substantially a 45S° angle relative to both passages and being reciprocally rotatable about its longitudinal axis;



and a pair of valve discs fixed to the valve stem at angles of substantially 45° relative to the longitudinal axis of the stem, each disc being disposed in a respective one of the passages and being actuable between parallel open and perpendicular closed positions with respect thereto, rotation of the valve stem about its longitudinal axis causing simultaneous actuation of the discs.

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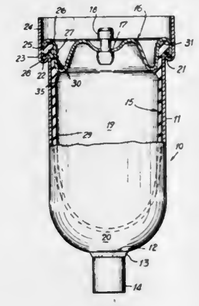
**4,295,492**

## LOW COST ACCUMULATOR DEVICE

**Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.**

**Filed Nov. 13, 1979, Ser. No. 93,624**
**Int. Cl.³ F16L** *55/04*
**U.S. Cl. 138—30** **4 Claims**



1. An accumulator device including a pressure vessel having an oil port at one end, and a gas charging port at the other end, and a resilient elastomeric bladder therein and dividing the same into two chambers in communication, respectively, with said oil and said gas ports, said pressure vessel being of a two part construction and comprising a generally cylindrical shell having a closed end carrying said oil port and having an open mouth portion, an upwardly directed annular trough member surrounding said mouth portion, said trough including a floor, a cylindrical skirt surrounding said trough, a circular cap member carrying said gas charging port mounted in said open mouth portion of said shell, said cap member including a downwardly facing surrounding annular trough member having a depending peripheral annular lip, said cylindrical skirt being spun inwardly over the trough defining portions of said cap member whereby said annular lip of said cap is biased into engagement with said floor of said upwardly directed trough member, said trough members together defining an annular chamber having an annular opening directed toward the inte-

rior of said vessel, said bladder assembly including a thickened rim portion maintained in compressed condition within said annular chamber and providing a seal between said cap and the open mouth portion of said shell, said bladder having side wall portions extending through said annular opening into the interior of said shell.

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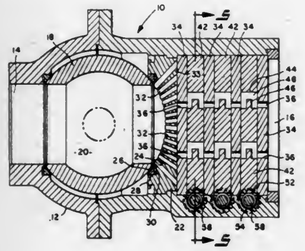
**4,295,493**

## DRAG BALL VALVE INCLUDING VARIABLE PRESSURE REDUCING MEANS

**Roger Bey, Illzach, France, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Division of Ser. No. 26,625, Apr. 2, 1979, Pat. No. 4,271,866.**
**This application Jan. 18, 1980, Ser. No. 113,148**
**Int. Cl.³ F16K *5/06*; F15D *1/02***
**U.S. Cl. 138—43** **1 Claim**



1. A variable fluid pressure reducing device comprising a plurality of fixed disks having apertures therein and a plurality of rotatable disks having apertures therein with means for diverting fluid passing therethrough, each of said rotatable disks being interposed between adjacent fixed disks, said diverting means in one or more of said rotatable disks being aligned with said apertures in said fixed disks adjacent said one or more of said rotatable disks causing a pressure reduction in said fluid passing therethrough when said one or more of said rotatable disks is rotated through a predetermined angle.

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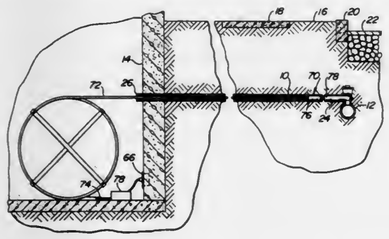
**4,295,494**

## METHOD AND APPARATUS FOR PLUGGING AND CUTTING A GAS LINE OR THE LIKE WITHOUT EXCAVATION

**John B. McGowan, and John Trimble, both of Malvern, Pa., assignors to UMAC, Inc., Paoli, Pa. and Brooklyn Union Gas Company, Brooklyn, N.Y., a part interest to each**

**Filed Jul. 16, 1979, Ser. No. 57,626**
**Int. Cl.³ B22D *19/10***
**U.S. Cl. 138—89** **13 Claims**



1. A method of sealing an underground pipeline or the like at or near the point where it connects to a main without excavation to obtain access to the pipe, comprising the steps of:

obtaining access to the underground pipe at a point beyond where it exits the earth:

mounting a thermally stabilized cross-linked preshrunk plug on a heater element, said heater element being mounted on a flexible elongate shaft having a diameter less than the diameter of the pipe, said shaft having sufficient rigidity to push said heating element through said line and sufficient flexibility to bend with curves in the line, said shaft being provided with electrical conductors passing longitudinally therethrough;

inserting said plug into said underground pipeline by feeding said flexible elongate shaft with said heater element mounted thereon into said underground pipeline;

positioning said plug into said line at or near said main by feeding said elongate flexible shaft into said line;

energizing said heating element by applying electrical energy to said electrical conductors causing said preshrunk cross-linked plug to expand to its cross-linked condition sealing said pipe; and

withdrawing said heater element and said shaft.

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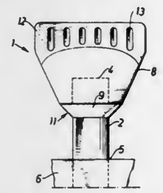
**4,295,495**

## CONNECTION NIPPLE

**Friedrich Rosemeier, Hechingen, and Horst Killmaier, Hechingen-Boll, both of Fed. Rep. of Germany, assignors to Gambro Dialysatoren GmbH & Co. KG., Fed. Rep. of Germany**

**Filed Sep. 11, 1979, Ser. No. 74,499**
**Claims priority, application Sweden, Sep. 13, 1978, 7809625**
**Int. Cl.³ F16L *55/10***
**U.S. Cl. 138—89** **29 Claims**



1. A connection nipple for providing fluid communication with the interior of a container, the connection nipple comprising:

a hollow member having a first open end and a second open end, the first open end being adapted to be sealingly disposed in fluid communication with the interior of the container, and the second open end being disposed exteriorly of the container;

a circumferential rib member interally disposed about the circumference of said hollow member, said rib member having a cross-sectional shape which tapers to substantially a point to define a connection line about the circumference of said hollow member, said connection line being axially spaced from said secord open end of said hollow member;

a releasable sealing member integrally connected to said rib member in proximity to said connection line and sealingly surrounding said second open end of said hollow member to completely enclose and seal said second open end;

said releasable sealing member being disconnectable from said hollow member to provide access to said second open end by breaking said releasable sealing member substantially along said connection line; and

said circumferential rib member extending laterally outward from the surface of said hollow member a distance sufficient so as to provide a support surface for a finger grip when said releasable sealing member is to be disconnected from said hollow member and thereafter.

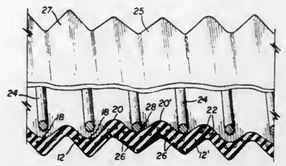


**4,295,496**

## HOSE WITH INTERNAL INSERT MEMBER

**Guy T. Bixby, Longmont, Colo., assignor to The Gates Rubber Company, Denver, Colo.**

**Filed Feb. 19, 1980, Ser. No. 122,784**
**Int. Cl.³ F16L *11/00, 9/00***
**U.S. Cl. 138—122** **25 Claims**



1. In a hose having an elongated polymeric body and a coiled insert member formed of a plurality of turns and positioned in the internal passageway of the hose body, said hose body having a tendency to swell during use under conditions of elevated temperature or pressure, the improvement comprising:

a filamentary annular band integral with the polymeric body and which extends generally circumferentially of the body, having filaments resistant to expansion at elevated temperature or pressure, the band having a width substantially less than that of the hose body and being positioned between at least two adjacent turns of the coiled insert member.

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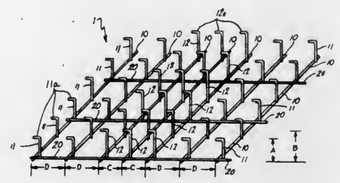
**4,295,497**

## VARIEGATED STIRRUP MAT

**Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423**

**Filed May 4, 1979, Ser. No. 36,170**
**Int. Cl.³ F16L *55/00*; B21F *27/20***
**U.S. Cl. 138—175** **13 Claims**



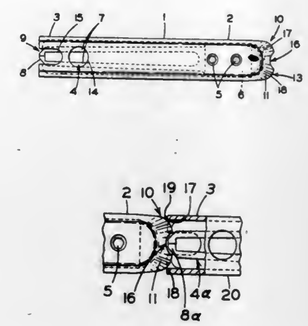
1. A concrete pipe comprising at least one cylindrical steel wire reinforcing cage, and concrete surrounding said cage, said cage including an additional reinforcing stirrup mat located in the area of the crown thereof and another located in the area of the invert thereof, each of said mats having lateral edges and a lateral center area and wherein stirrup projections project from each mat, said mats being defined by a network of interconnected wires, the improvement in said concrete pipe comprising: said cylindrical reinforcing cage being elliptical in lateral cross section and said stirrup projections being formed from steel and being taller in the lateral center area of said mat than towards the lateral edges thereof so as to concentrate more steel in the lateral center area of the mat than towards the lateral edges of the mat.

**4,295,498**

## GRIPPER SHUTTLES

**Charles D. Davis, Charlotte, N.C., assignor to Armstrong World Industries, Inc., Lancaster, Pa.**

**Filed Apr. 28, 1980, Ser. No. 144,418**
**Int. Cl.³ D03J *5/06***
**U.S. Cl. 139—196.2** **3 Claims**



1. In a gripper shuttle for picking weft threads in a weaving machine, said shuttle comprising a tubular housing substantially oblong in transverse cross-section and having a closed front end and an open trailing end, a gripper clamp mounted within said housing and having means positioned even with or in close proximity to the opening in the trailing end of said housing for gripping a weft thread, the improvement comprising a nose on said housing having an arcuate front end edge surface with a centrally located recess therein, said recess being so dimensioned as to preclude contact between the front end edge surface of said shuttle and the weft thread gripping means of a similar shuttle when the front and rear ends of the shuttles contact each other in the same plane.

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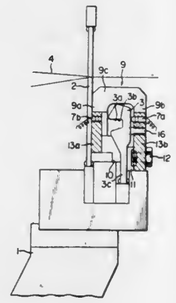
**4,295,499**

## DETECTION OF WEFT IN SHUTTLELESS LOOM

**Hajime Suzuki, Anjyo, and Yoshimi Iwano, Ohbu, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Dec. 5, 1979, Ser. No. 100,408**
**Claims priority, application Japan, Dec. 12, 1978, 53-152671; Dec. 12, 1978, 53-169878; Dec. 12, 1978, 53-169879**
**Int. Cl.³ D03D *51/34***
**U.S. Cl. 139—370.2** **8 Claims**



1. A shuttleless loom comprising:

a reed;

a plurality of guide plates arranged in spaced relationship

along said reed, said guide plates having aligned apertures forming a weft guide passage through which a weft thread is passed, said apertures of said guide plates including upper wall surfaces aligned in a plane;

slay means supporting said reed and said guide plates and mounted for pivotal movement for moving said guide plates from an operative position, whereat said guide plates are within a shed of warp threads and a weft thread is inserted through said guide passage, to an inoperative position outside of the shed, for thereby causing the weft thread to slide in a path realtive to said guide plates along said upper wall surfaces until the weft thread leaves said guide passage and remains in the shed when said guide plates are moved to said inoperative position, and for allowing beating by said reed; and

means for detecting whether or not the weft thread has been inserted properly through said guide passage when said guide plates are in said operative position thereof, said detecting means comprising a detecting unit including a mounting member mounted on said slay means for movement therewith and with said guide plates, light transmitter means, mounted on said mounting member on a first side of said guide plates, for emitting a single light beam through a space between two adjacent said guide plates along a path in or above said plane of said aligned upper wall surfaces of said apertures in said guide plates, such that during movement of said guide plates from said operative position to said inoperative position said light beam intersects said path of the weft thread when the weft thread leaves said guide passage and when the weft thread is properly inserted through said guide passage, and light receiver means, mounted on said mounting member on a second side, opposite said first side, of said guide plates, for receiving said single light beam from said light transmitter means.

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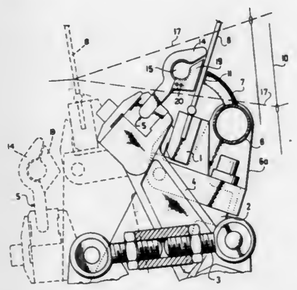
**4,295,500**
**METHOD OF AND A DEVICE FOR FORMING AN ADDITIONAL STREAM OF AIR IN A GUIDE COMB OF AN AIR JET LOOM**
**Vladimir Svaty, Liberec, Czechoslovakia, assignor to Zbrojovka Vsetin, Vsetin, Czechoslovakia**
**Filed Dec. 17, 1979, Ser. No. 104,393**
**Int. Cl.³ D03D *47/30***
**U.S. Cl. 139—435** **2 Claims**



1. In the method of operating an air jet loom having a guide comb, a reed, and means for forming a weft inserting supporting air stream which supplements a main weft supporting air stream in the guide comb, the improvement comprising

directing a stream of air via at least one nozzle through said reed; and

deflecting said stream of air to thereby direct it into the weft inserting direction in said guide comb.

**4,295,501**
**SPACER BAR AND RELATED METHOD FOR CONCRETE PIPE MANUFACTURE**
**Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423**
**Filed Jul. 11, 1979, Ser. No. 56,602**
**Int. Cl.³ B21F *3/00***
**U.S. Cl. 140—92.1** **25 Claims**

1. A method for spacing a generally cylindrical reinforcing wire cage from a concrete pipe form, said cage including generally circumferentially oriented wire reinforcement and generally longitudinally oriented wire reinforcement, said method comprising the steps of:

providing a plurality of spacer bars, each spacer bar having a tie rod and a plurality of links joined to and spaced along the length of said tie rod generally parallel to one another;

positioning said links along said tie rod;

securing said spacer bars to said cage at spaced points around the circumference thereof with said links projecting generally radially therefrom;

locating said cage within said pipe form with said links of said spacer bars engaging said form to hold said cage in properly spaced relationship with respect to said pipe form.

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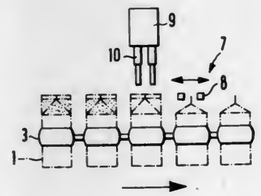
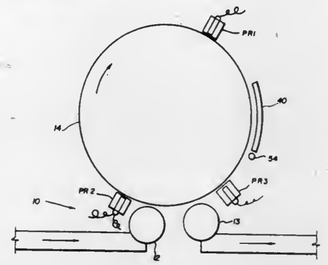
**4,295,502**
**METHOD AND APPARATUS FOR THE ELIMINATION OF FOAM ABOVE THE LEVEL OF A LIQUID, AND PARTICULARLY ABOVE A PACKAGED LIQUID SUCH AS MILK**
**Erwin Matzner, Krefeld, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany**
**Filed Oct. 23, 1979, Ser. No. 87,358**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926955**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—11** **20 Claims**



1. A method for the elimination of foam above the level of a liquid in a container comprising collapsing the foam by applying ultrasonic waves to the foam indirectly through the ambient atmosphere.



**4,295,503**
**AUTOMATIC GLASS FRAGMENTATION DECONTAMINATING SYSTEM FOR GLASS CONTAINERS**
**Alfred J. Gilmour, Waterloo, Canada, assignor to Auto-Flush Systems Ltd., Waterloo, Canada**
**Filed Dec. 12, 1979, Ser. No. 102,691**
**Claims priority, application Canada, Mar. 22, 1979, 323993**
**Int. Cl.³ B65B *3/04*; B08B *3/02***
**U.S. Cl. 141—90** **16 Claims**



1. In a bottle filling machine in which bottles travel a path from an infeed mechanism to an outfeed mechanism during filling under pressure by a plurality of bottle filling tube mechanisms and in which a bottle may explode due to said pressure, causing glass particles to adhere to its associated filler mechanism, apparatus for cleansing said filler tube mechanisms a plurality of times comprising a broken bottle sensor located between said infeed mechanism and said outfeed mechanism which, in the event of a broken bottle, provides a pulse to activate, for a predetermined period of time, a water spray assembly comprising a plurality of high pressure spray nozzles spaced apart along a portion of said path between said sensor and said outfeed mechanism, said pulse also feeding logic means to record a data bit to indicate each filling tube mechanism associated with a broken bottle, to track the location of said filling tube mechanisms as they move along said path, and to re-activate said spray for said predetermined period of time when each said filling tube mechanism again reaches said sensor.

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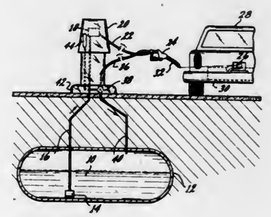
**4,295,504**
**GASOLINE VAPOR RECOVERY SYSTEM**
**Detlev E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075**
**Filed Dec. 26, 1979, Ser. No. 106,676**
**Int. Cl.³ B65B *3/04*; B67C *5/377***
**U.S. Cl. 141—290** **5 Claims**



1. Gasoline Vapor Recovery System comprising:

a gasoline storage tank;

a pump coupled to said storage tank;

a gasoline dispenser;

a first hose coupled at one end to said dispensers;

means said coupling said first hose through said dispenser to said pump;

a nozzle on the other end of said first hose;

a vapor sealing means on said nozzle for forming a vapor seal around an opening in a receptacle into which gasoline is being pumped through said nozzle;

a vapor recovery conduit extending from said nozzle to of said storage tank, said conduit having a rigid portion which is conected to said storage tank and a hose portion which is connected to said nozzle;

a valve in said vapor recovery conduit, said valve being positioned in said dispenser between the end of said first hose coupled to said dispenser and said pump;

means for opening said valve in response to predetermined conditions to allow gasoline vapors to flow from said receptacle;

said vapor sealing means comprises a resilient boot on said nozzle and spring means for resiliently urging the boot away from said nozzle, said spring having a force/deflection ratio in the range of 2 to 7 pounds per inch of deflection.

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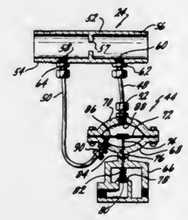
**4,295,505**
**GASOLINE VAPOR RECOVERY SYSTEM**
**Detlev E. M. Hasselmann, 519 S. Nardo Ave., Solana Beach, Calif. 92075, and Paul D. Labonte, 9371 Fermi Ave., San Diego, Calif. 92123**
**Filed Dec. 26, 1979, Ser. No. 106,668**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—301** **5 Claims**



1. A gasoline vapor recovery system comprising:

a gasoline storage tank;

a gasoline pump coupled to said storage tank;

a gasoline dispenser;

a vapor recovery nozzle;

a gasoline delivery conduit extending from said gasoline pump, through said gasoline dispenser, and terminating in said vapor recovery nozzle;

means on the end of said vapor recover nozzle for covering the opening in a receptacle in which gasoline is to be pumped;

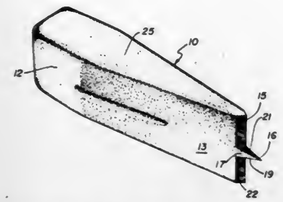
a vapor recovery conduit extending from said vapor recovery nozzle to said gasoline storage tank;

a pressure responsive valve in said vapor recovery conduit, said valve being positioned below said dispenser;

a flow sensor coupled to said gasoline delivery conduit above the lowest level of said dispenser; and

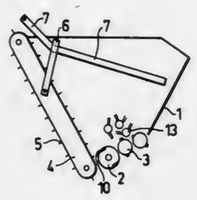
conduits coupling said flow sensor to said pressure responsive valve to open said pressure responsive valve when gasoline flows through said flow sensor.

**4,295,506**
**WEDGE**
William H. Nicholson, Sutton, Mass., assignor to Norman S. Blodgett, Worcester, Mass.
Continuation of Ser. No. 947,258, Sep. 29, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,450
Int. Cl.[3] B27L *1/00*
U.S. Cl. 144—193 D 10 Claims



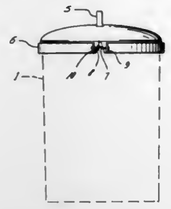
1. Wedge for splitting a wooden log, comprising:
(a) a main body having two plane face surfaces lying at an acute angle to one another, and terminating at a lower end of the wedge,
(b) two plane blade surfaces extending from the lower ends of said face surfaces said blade surfaces lying at an acute secondary angle to one another and terminating in a transverse edge, said secondary angle being substantially greater than the angle between said face surfaces, and
(c) an integral point bounded by two plane surfaces which are continuous with and lie in the respective planes of said face surfaces and extend beyond said transverse edge to assist in introducing the edge into the grain of the log.

**4,295,507**
**LIMBING AND BARKING DEVICE**
Einar Karlsson, 1208 Abyn, Burträsk, Sweden (S-937 00)
Filed Dec. 14, 1979, Ser. No. 103,943
Claims priority, application Sweden, Dec. 21, 1978, 7813195
Int. Cl.[3] B27L *1/00*
U.S. Cl. 144—208 B 4 Claims



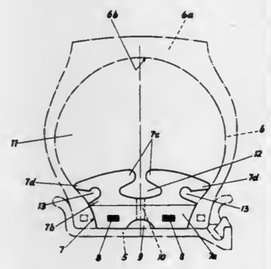
1. Apparatus for delimbing and barking trees or tree parts comprising a downwardly tapering trough for receiving the trees or tree parts, said trough having a generally horizontal axis and having one side formed by upwardly and outwardly inclined endless conveyor means which includes drivers projecting therefrom for circulating the trees or tree parts in the trough and for transporting wood upwardly; at least one elongated delimbing roll arranged parallel to the axis of the trough at the bottom thereof, said roll being adjacent the lower end of said conveyor means and rotatable in a direction such that its upper surface rotates toward said conveyor means; and at least one elongated barking roll arranged in side-by-side parallel relationship to said delimbing roll on the side thereof opposite said conveyor means and rotatable in a direction such that its upper surface rotates toward said delimbing roll, said barking roll having longitudinally extending planar peripheral ribs for orienting the stems of the trees or tree parts into parallelism with the barking and delimbing rolls.

**4,295,508**
**FLEXIBLE GARBAGE CAN LID**
Harold L. Metzger, 1402 Fredericksburg Rd., San Antonio, Tex. 78201
Filed Apr. 18, 1980, Ser. No. 141,288
Int. Cl.[3] B65D *65/02*; B65B *11/00*
U.S. Cl. 150—52 R 1 Claim



1. In a garbage can lid formed of flexible material, a peripheral flange on said lid, a strap integral with said flange and having means for releasably anchoring the lid on the can, said strap being of flexible material and said means for maintaining said strap in holding position on the lid when the lid is mounted on the can consists of integral rigid terminals on the respective ends of said strap, and a hook pivotally mounted on one terminal and an eye for receiving the free end of said hook mounted on the other terminal.

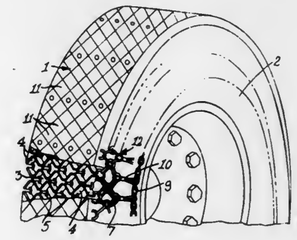
**4,295,509**
**EMERGENCY TRACK RING FOR PNEUMATIC VEHICLE TIRES**
Hermann Stein, Wuppertal-Barmen, Fed. Rep. of Germany, assignor to Vorwerk & Sohn GmbH & Co. KG., Wuppertal-Barmen, Fed. Rep. of Germany
Filed Nov. 26, 1979, Ser. No. 97,414
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851187
Int. Cl.[3] B60C *17/04*
U.S. Cl. 152—158 10 Claims



1. An emergency track ring for a tubeless pneumatic tire adapted to be mounted on a tire rim, comprising
(a) a bottom reinforced flange for mounting the ring on such rim,
(b) at least one opening in said ring to permit air to be admitted to the interior of the tire,
(c) groove means formed in said ring adapted to be filled with a lubricating material,
(d) sealing lips closing said groove means and sealing said lubricant therein when said tire is mounted on said rim and under pressure,
flange means integrally formed with said sealing lips and extending radially upwardly with respect to said sealing lips for engagement by the inside of the tire cover during loss of air,
said sealing lips and flange means being formed and arranged such that when said flange means are depressed, lever action causes said sealing lips to move so as to open said grooves and permit said lubricating material to be released to reduce friction between said tire cover and said track ring.



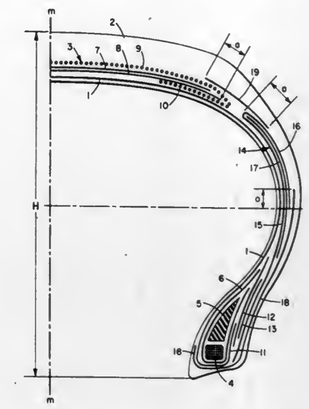
**4,295,510**
**PROTECTIVE TIRE CHAIN ASSEMBLY**
Garth Foxcroft, Wynberg, South Africa, assignor to Dirk Marinus Brink, White River, South Africa
Filed Jun. 29, 1979, Ser. No. 53,224
Claims priority, application South Africa, Jul. 7, 1978, 78/3906
Int. Cl.[3] B60C *27/22, 27/20*
U.S. Cl. 152—220 10 Claims



1. A tire chain assembly comprising a tire chain having an endless central belt region composed of wear accepting links with connecting links interconnecting said wear accepting links, and having sidewall protecting extensions along the edges of the central belt region and wherein the spaces between the links of the chain are, at least partly, occupied by a wear resistant elastomeric material such that the combination of the material and tire chain form said central belt region having the wear accepting links extending through substantially the entire thickness of such belt region, the tire chain being adapted to be removably located over a tire of suitable size.

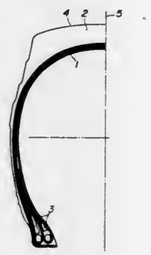
**4,295,511**
**RADIAL TIRES PROVIDED WITH A STIFFENING STRUCTURE IN THE SIDEWALLS**
Mario Mezzanotte, Milan, and Gianni Turchetti, Bresso, both of Italy, assignors to Societa Pneumatici Pirelli S.p.A., Milan, Italy
Filed Apr. 1, 1980, Ser. No. 136,352
Claims priority, application Italy, Apr. 10, 1979, 21708 A79
Int. Cl.[3] B60C *9/06*
U.S. Cl. 152—354 R 10 Claims

1. A pneumatic tire for vehicle wheels comprising a radial carcass provided with beads for assembly with a corresponding rim, a tread, and an annular reinforcing structure inserted between the carcass and tread, said annular reinforcing structure being substantially inextensible and having a width which is at least as wide as the tread, said carcass comprising at least one ply of textile or metallic cords lying in substantially radial planes and extending from one bead to another, and turned-up from the inside towards the outside of the tire, around a bead-core contained in each bead, said tire being characterized in that it comprises in each sidewall, a mixed textile-metallic reinforcement member comprising a strip of textile cords doubled over to provide two skirts having different widths, the cords of said skirts being inclined with respect to the radial direction of the carcass cord, and by a strip of metallic cords inclined with respect to said radial direction and narrower then the longer skirt inserted between said skirts to the folded-edge of said strips, said larger skirt being disposed axially outside of said carcass ply and its turned over portion and radially extended from the bead zone to the tire's shoulder, the smaller skirt extending radially towards the inside from said shoulder



to a point disposed in the sidewall, to a height between 66% and 20% of the tire's section height, said metallic cord strip extending from the folded edge of said textile strip to a point situated at a height between 50% and 20% of the section height of the tire.

**4,295,512**
**THICK-CORD LIGHTWEIGHT TIRE BODY HAVING AN IMPROVED FATIGUE LIFE**
Yasuyosi Kawaguchi, Higashiyamato; Munetoshi Shimotake, Kodaira, and Fujio Yamamoto, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Sep. 4, 1980, Ser. No. 183,900
Claims priority, application Japan, Sep. 4, 1979, 54-112366
Int. Cl.[3] B60C *9/06, 15/06*
U.S. Cl. 152—354 R 3 Claims



1. A thick-cord lightweight tire body having an improved fatigue life, comprising a bias-structured carcass composed of rubberized plies each including thick organic fiber cords having a cord diameter equal to or larger than Nylon 1,890 d/2 and rubber interposed between said carcass plies and having a thickness corresponding to hm/ho≦0.5 where hm is an average rubber gauge between said plies at a center position in the widthwise direction of the tire and ho is a diameter of said thick cord, said rubber being a rubber composition consisting essentially of 100 parts by weight of a rubber component and 50–70 parts by weight of carbon black, said rubber component being a mixture of 60–95 parts by weight of at least one rubber selected from the group consisting of natural rubber, synthetic polyisoprene rubber, polybutadiene rubber and styrene-butadi-

ene copolymer rubber and 5–40 parts by weight of at least one liquid polymer selected from the group consisting of liquid polybutadiene, liquid polyisoprene and liquid styrene-butadiene copolymer and having a viscosity-average molecular weight of $3\times10^4$–$10\times10^4$, said rubber composition having a dynamic modulus of elasticity at 100° C. under 2% elongation of not less than $6.0\times10^7$ dyne/cm$^2$, a dynamic loss angle tan $\delta$ of not more than 0.095 and a tensile strength of not less than 100 kg/cm$^2$ as properties after vulcanization and, an apex rubber for stiffening a turnup portion of said carcass wherein a ratio in the dynamic modulus of elasticity of said apex rubber to said rubber interposed between the plies is within a range of 0.9–1.3.

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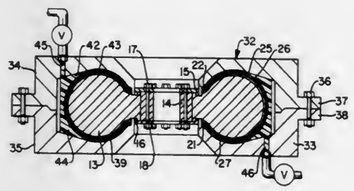
**4,295,513**

## TIRE AND METHOD OF REINFORCEMENT

**John A. Lovell, Munroe Falls, and Kenneth W. McIntosh, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Apr. 11, 1980, Ser. No. 139,411**
**Int. Cl.$^3$ B60C** *9/02*
**U.S. Cl. 152—358** **17 Claims**



1. A tire comprising an annular body of elastomeric material having a U-shaped cross section, an annular reinforcing sheet of tubular knit material stretchable into a toroidal configuration for placement in a mold and said reinforcing sheet being under tension in a molded and cured tire.

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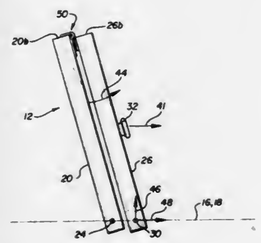
**4,295,514**

## BIFOLD DOOR HINGE ASSEMBLY

**Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.**

**Continuation of Ser. No. 910,106, May 30, 1978, abandoned. This application Nov. 14, 1979, Ser. No. 94,289**
**Int. Cl.$^3$ E06B** *3/00*; **E05D** *7/10*
**U.S. Cl. 160—206** **4 Claims**



1. In combination, a bifold door assembly comprising: a pivoted door and a guide door, mounted such that they will be in substantially co-planar relation in the closed condition and at least one hinge assembly interconnecting said doors along a vertical edge thereof, aperture means formed in the upper and lower horizontal edge surfaces of said pivoted door at a predetermined distance from the vertical edge of said door to be disposed adjacent a door frame, said aperture means adapted to receive pivot means for the pivotal mounting of said door, and aperture means formed in the upper and lower horizontal edge surfaces of said guide door at a predetermined distance from the vertical edge thereof remote from said pivoted door for the receipt of guide means to be disposed in horizontal linear track means to confine said edge for linear movement upon opening and closing of said assembly, the respective predetermined distances providing for the spacing of said aperture means from the said door edges being substantially equal, and said at least one hinge assembly including first and second interconnected leaf members each leaf member including a planar portion affixed to corresponding side surfaces of the pivoted and guide doors and each leaf member further including knuckle means, which knuckle means are disposed coaxially, said leaf members being mounted with said knuckle means offset from the interface of the respective door edges in a direction toward said pivot door, such that when said doors are in the mounted, fully open condition, said guide door will be disposed at an obtuse angle with respect to the associated track means, which facilitates closing movement, said obtuse disposition being attained with the use of door panels with identically positioned aperture means.

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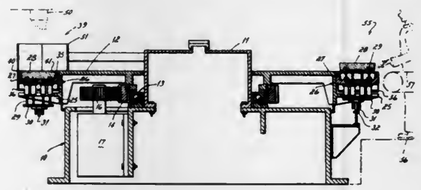
**4,295,515**

## AUTOMATIC CONE AND MOLD-MAKING MACHINE

**William L. Tordoff, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.**

**Filed Mar. 20, 1980, Ser. No. 131,915**
**Int. Cl.$^3$ B22C** *11/04, 13/14, 17/12*
**U.S. Cl. 164—158** **7 Claims**



1. A no-bake molding machine comprising,
a base,
a generally circular frame mounted for rotation on said base,
a plurality of concave patterns mounted around the circumference of said frame,
plate means surrounding said patterns and extending around the perimeter of said frame to form with said patterns a substantially flush, flat, continuous surface around the top of said frame surrounding said concave patterns,
means for continuously rotating said frame,
a mixer for filler located adjacent said frame and having a discharge spout overlying said patterns and continuous surface, said mixer and filler mixing sand with a no-bake binder and depositing sand and binder on said patterns and continuous surface,
and a stationary plow adjacent the mixer and filler engaging said plate means for scraping excess sand off said surface and leveling the sand in each pattern as it passes under said plow.

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**4,295,516**

## SYMMETRICAL HORIZONTAL CONTINUOUS CASTING

**Robert Wilson, Dundee, Scotland, assignor to Timex Corporation, Waterbury, Conn.**

**Continuation-in-part of Ser. No. 958,774, Nov. 8, 1978, Pat. No. 4,216,818. This application Dec. 7, 1979, Ser. No. 101,389**
**Int. Cl.$^3$ B22D** *11/124, 11/00*
**U.S. Cl. 164—464** **16 Claims**

1. In a horizontal continuous casting process wherein molten metal is continuously passed through a mold body having a substantially horizontal solidification chamber extending interiorly along the length thereof with an inlet end for receiving molten metal from a source and an outlet end through which solidified metal exits, the steps of:

(a) providing a plurality of cooling bores in the mold body spaced around the periphery of the solidification chamber from the bottom to the top thereof, each cooling bore having an open end on the outlet end of the mold body and extending toward the inlet end to define a peripheral cooling section adjacent said outlet end; and

(b) inserting an elongated cooling probe into the open end of each cooling bore to provide cooling to said peripheral cooling section with the cooling probe insertion distance into the bores increasing from the bottom to the top of the mold body such that a liquid/solid solidification front which intersects the top and bottom of said chamber at approximately the same location along its length is established in the molten metal, whereby hot tears, fissures and other surface defects resulting from asymmetric solidification of the bottom portion of molten metal ahead of the top portion are reduced.

8. A mold assembly for horizontally continuously casting molten metal comprising:



(a) a mold body having a substantially horizontal solidification chamber therethrough with an inlet end for receiving molten metal from a molten metal source and an outlet end through which solidified metal exits and having a plurality of longitudinal cooling bores spaced around the solidification chamber from the bottom to the top thereof, the cooling bores each having an open end on the outlet end of the mold body and extending only partially therethrough toward the inlet end to define an insulating section adjacent said inlet end to minimize heat removal from said molten metal source and a peripheral cooling section adjacent said outlet end, and

(b) a plurality of elongated cooling probes each of which is inserted into the open end of a cooling bore to provide cooling to said peripheral cooling section with the cooling probe insertion distance into the bores increasing from the bottom to the top of the mold so that a liquid/solid solidification front which intersects the top and bottom of said chamber at approximately the same location along its length is established in the molten metal, whereby hot tears, fissures and other surface defects resulting from asymmetric solidification of the bottom portion of molten metal ahead of the top portion are reduced.



**4,295,517**

## REUSABLE HEAT DEVICES CONTAINING XYLITOL AS THE HEAT-STORAGE MATERIAL

**Woldemar Guex, 4 Spechtweg, Bottmingen; Heinrich Klaeui, 77 Kilchgrundstrasse, Riehen; Horst Pauling, 39 Ruchholzstrasse, Bottmingen, and Felix Voirol, 26 Poolstrasse, Füllinsdorf, all of Switzerland**

**Division of Ser. No. 916,424, Jun. 16, 1978, abandoned. This application May 20, 1980, Ser. No. 152,056**
**Int. Cl.$^3$ F28D** *21/00*
**U.S. Cl. 165—1** **6 Claims**

1. A method for providing a source of heat which comprises
(a) adding, as a heat storage material, xylitol to a container;
(b) heating the xylitol in the container to a temperature above its melting point;
(c) cooling the resulting melt to a temperature below the melting point of xylitol without crystallizing the xylitol and
(d) initiating crystallization of the xylitol
whereby the release of the heat of crystallization of xylitol provides a source of heat.

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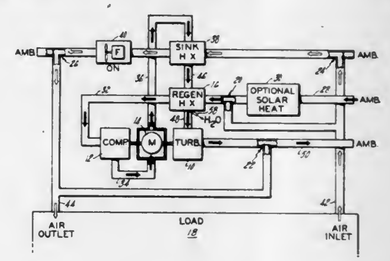
**4,295,518**

## COMBINED AIR CYCLE HEAT PUMP AND REFRIGERATION SYSTEM

**George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Jun. 1, 1979, Ser. No. 44,840**
**Int. Cl.$^3$ F25B** *13/00*
**U.S. Cl. 165—2** **11 Claims**




1. A combined air cycle heat pump and refrigeration system for a load comprising:
a source of low pressure refrigerant air at essentially ambient pressure, said refrigerant air being ambient air when said system is operating in the heat pump mode and being air returned from said load when said system is operating in the refrigeration mode;
a turbine driven compressor receiving said refrigerant air and increasing the temperature and pressure thereof;
means for conducting said compressed refrigerant air to said turbine for expansion therein and discharge therefrom whereby said refrigerant air is reduced in temperature;
means for conducting the refrigerant air discharged from said turbine directly to the ambient when said system is operating in the heat pump mode, and for conducting the refrigerant air discharged from said turbine directly to said load when said system is operating in the refrigeration mode;
a regenerative heat exchanger connecting through heat transfer surfaces within said regenerative heat exchanger the source of low pressure refrigerant air with the compressed refrigerant air upstream of said turbine whereby said compressed refrigerant air rejects some of its heat to said low pressure refrigerant air from said source and reduces the temperature of the compressed refrigerant air fed to said turbine so as to maximize the reduction in the temperature of the refrigerant air discharged from said turbine;
additional heat exchange means downstream of said com-

pressor and upstream of said regenerative heat exchanger on the high pressure side thereof, said compressed refrigerant air passing through said additional heat exchange means;

an additional fluid, said fluid being fluid returned from said load when said system is operating in the heat pump mode and said fluid being ambient air when said system is operating in the refrigeration mode;

means for passing said fluid through said additional heat exchange means in heat exchange relation with said compressed refrigerant air whereby said fluid absorbs heat from said compressed refrigerant air;

and means for returning said fluid to supply heat to said load when said system is operating in the heat pump mode and returning said fluid to ambient when said system is operating in the refrigeration mode.

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**4,295,519**

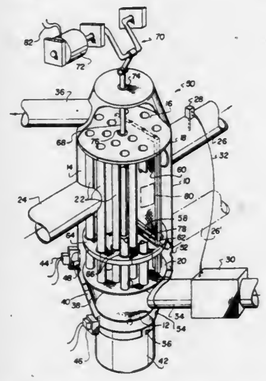
## HEAT RECLAIMER

**Leslie Bellaff, 416 Windsor Rd., River Edge, N.J. 07661**

**Filed Nov. 13, 1979, Ser. No. 93,873**

**Int. Cl.³ F28F** *19/00*

**U.S. Cl. 165—11 R** **18 Claims**



**1**. A heat reclaimer for the exhaust flue of a heating unit comprising; a housing having an air input space, an air output space and an exhaust space; tube means connected between and communicating said air input and output spaces, extending through said exhaust space; the exhaust flue of the heating unit connected to said housing and into said exhaust space; an exhaust output connected to said housing and into said exhaust space for venting exhaust coming from the heating unit through the exhaust flue, out of said exhaust space; and a level switch connected to said housing at a location spaced from the top of said exhaust space activated if water accumulates in said exhaust space from condensed water vapor in the exhaust; said housing having at least one hole therethrough communicating with said exhaust space in the vicinity of the level of said level switch for draining water in said exhaust space rising to the level of said hole.

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**4,295,520**

## HEAT TRANSFER SYSTEM

**Helmut Wulf, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Jul. 10, 1979, Ser. No. 56,234**

**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2834838**

**Int. Cl.³ F28D** *15/00*; **B60H** *1/04*

**U.S. Cl. 165—41** **24 Claims**

**23**. A heat pipe arrangement comprising a bundle of elastically deformable small tubes extending essentially parallel to one another and being operatively connected to each other so as to permit relative movement therebetween, at least one adjoining heat pipe means for accommodating one end of each of the tubes, each of said tubes is constructed as a heat pipe which is sealed toward the outside and open toward an interior

of at least one adjoining heat pipe means so as to enable vapor produced in a heat-emitting zone to flow inside of the respective tubes into a heat-consuming zone and condensate produced in the heat-consuming zone to return inside of the respective tubes to the heat-emitting zone.

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**4,295,521**

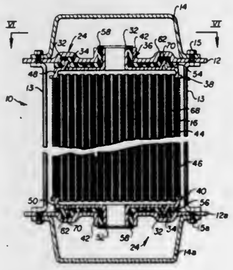
## HEAT EXCHANGER CORE MOUNTING APPARATUS

**Mark F. Sommars, Sparland, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Continuation of Ser. No. 99,143, Sep. 27, 1979, abandoned. This application Aug. 15, 1980, Ser. No. 178,278**

**Int. Cl.³ F28F** *9/26*

**U.S. Cl. 165—59** **7 Claims**



**1**. A heat exchanger comprising:

first and second frame members (**12**,**12***a*) each having a bore (**42**) therein;

a core (**16**) extending between the frame members (**12**,**12***a*) and having first and second opposed end portions (**38**,**40**), each end portion having a spout (**52**) extending outwardly into the bore (**42**) of the adjacent frame member (**12**,**12***a*);

resilient means (**36**) for resiliently and sealingly supporting the core (**16**) between the frame members (**12**,**12***a*), said resilient means including a pair of resilient pads (**54**,**56**) each positioned between one of the end portions (**38**,**40**) and the adjacent frame member (**12**,**12***a*); and

means (**24**) for locating the core (**16**) in a predetermined registration with the frame members (**12**,**12***a*), said means (**24**) including an imperforate protuberance (**34**) extending outwardly from one of said first end portions (**38**) and said first frame member (**12**) and spaced from the spout (**52**), and an imperforate recess (**32**) in the other of said first end portion (**38**) and said first frame member (**12**) and being in registry with the protuberance (**34**), said one resilient pad (**54**) positioned between said first end portion (**38**) and said first frame member (**12**) having a portion (**62**) resiliently accommodating the protuberance (**34**) and the recess (**32**).



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**4,295,522**

## PROCESS FOR THE PRODUCTION OF A TUBULAR HEAT EXCHANGER, AND A TUBULAR HEAT EXCHANGER PRODUCED ACCORDING TO THIS PROCESS

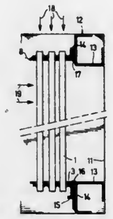
**Willi Frei, Zilstrasse 16, CH-9016, St. Gallen, Switzerland**

**Filed Aug. 2, 1978, Ser. No. 930,363**

**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2734958**

**Int. Cl.³ F28F** *9/16*

**U.S. Cl. 165—79** **3 Claims**



**1**. A heat exchanger comprising a housing, at least one tube bundle disposed in said housing, each tube bundle containing a plurality of substantially parallel tubes, the opposite end portions and a substantially intermediate portion of said tubes being disposed in troughs containing a plurality of holes for receiving said tube end portions, said troughs containing a solidified casting resin which extends into annular gaps between the holes and the tube end portions, a substantially horizontal flange being fixed to the inside of said housing, a lowermost trough resting on said flange and said tube bundle cooperating with the housing so that a gap is formed between the sidewalls of the troughs and the housing, said gap also containing the casting resin.

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**4,295,523**

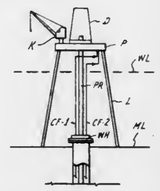
## WELL SAFETY SYSTEM METHOD AND APPARATUS

**James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.**

**Division of Ser. No. 2,197, Jan. 9, 1979. This application Dec. 12, 1979, Ser. No. 102,913**

**Int. Cl.³ E21B** *43/10*

**U.S. Cl. 166—250** **1 Claim**



**1**. A method of operably installing in a single trip a well safety system having a full opening remote controlled subsurface safety valve in the well, including the steps of:

connecting a subsurface tubing hanger in a string of well tubing;

connecting the full opening remote controlled subsurface safety valve in the well tubing above the subsurface tubing hanger;

connecting a full-strength safety joint in the well tubing above the full opening remote controlled subsurface safety valve;

connecting a predetermined amount of well tubing above the subsurface safety valve while moving the subsurface safety valve in the well;

mounting a wellhead hanger above the predetermined amount of well tubing;

positioning the wellhead hanger a predetermined distance above the wellhead;

determining the weight supported by the wellhead hanger when positioned the predetermined distance above the wellhead;

setting the subsurface tubing hanger in the well for supporting the string of well tubing below the subsurface tubing hanger;

lowering the wellhead hanger into the wellhead;

determining the weight supported by the wellhead hanger while lowering the wellhead hanger into the wellhead;

comparing the weight supported determinations to develop a sufficient difference to indicate the subsurface tubing hanger is supporting the portion of the well tubing suspended therefrom;

activating the safety joint to reduce the strength of the safety joint; and

operating the subsurface safety valve to enable flow through the well tubing.

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**4,295,524**

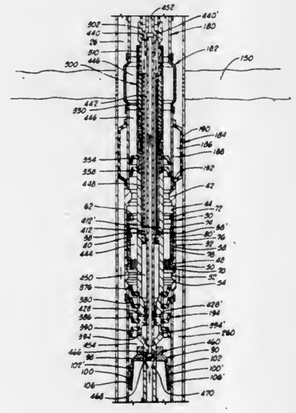
## ISOLATION GRAVEL PACKER

**Eugene E. Baker, and David D. Szarka, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Dec. 27, 1979, Ser. No. 107,739**

**Int. Cl.³ E21B** *43/04*

**U.S. Cl. 166—278** **57 Claims**



**1**. A well treatment apparatus of a type to be disposed within a conduit in a well bore, in fluid communication with first and second tubing means, said apparatus comprising:

treatment means containing first and second passage means, check valve means, and third passage means;

said first passage means in fluid communication with said first tubing means above said treatment means and with the bore of said conduit below said treatment means;

said second passage means in fluid communication with said second tubing means above said treatment means and with the annulus between said treatment means and said conduit;

said check valve means being disposed in said first passage means; and

said third passage means being longitudinally fixed and in

fluid communication with said annular and with said first passage means above said check valve means.

**38**. A method of gravel packing a producing zone in a well bore, comprising:

(a) placing a conduit having a gravel screen therein in said well bore, said gravel screen being positioned across said zone:

(b) pumping a gravel slurry down first tubing means to a location above said zone;

(c) routing said gravel slurry outside said conduit and down to the level of said gravel screen;

(d) arresting the flow of said gravel with said screen while allowing the slurry carrier fluid to pass therethrough;

(e) returning said carrier fluid to the surface via second tubing means;

(f) continuing steps (d) and (e) until a gravel pack is effected;

(g) pumping fluid down said second tubing means to the vicinity of said zone and returning said fluid to the surface via said first tubing means without inducing fluid movement within the conduit bore area defined by the top and bottom of said gravel screen.

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**4,295,525**

## METHOD AND APPARATUS FOR QUICK REPLACEMENT OF CARTRIDGE FILTERS USED IN WELL FLUID CLEANING OPERATIONS

**Edward R. Swift, Jr., Houston, and Philip W. Schmuck, Spring, both of Tex., assignors to Baker International Corporation, Orange, Calif.**

**Filed Feb. 6, 1980, Ser. No. 118,958**

**Int. Cl.**[3] **B01D** *27/00, 27/08, 29/10;* **E21B** *43/00*

**U.S. Cl. 166—312** **4 Claims**

**1**. In an apparatus for treating and removing contaminate particulate matter from fluid circulatable into, through and out of a subterranean well, the improvement comprising: a cylindrical housing adapted to receive and discharge said fluid; means disposed across said cylindrical housing for separating said cylindrical housing into a first fluid chamber for receiving fluid to be filtered and a second fluid chamber for receiving filtered fluid; at least one cartridge filter adapter receiving means disposed through said separating means; a cartridge filter adapter secured within each of said receiving means, said adapter having an elongated cylindrical housing, and having a fluid flow passageway therethrough communicable to each of said first and second fluid chambers, said elongated cylindrical housing having an enlarged cartridge positioning portion extending radially away from and about the axis of said elongated cylindrical housing, said cartridge positioning portion having first and second faces thereon; groove means on said adapter circumferentially extending around the exterior of said elongated cylindrical housing for sealingly securing one end of said cartridge filter thereon; cartridge filter means positionable on said adapter and extending within said first fluid chamber; and seal means disposed at one end of said cartridge filter and having an interiorly facing circumferentially extending flexible lip for contact with the exterior of said elongated cylindrical housing upon location of said cartridge filter on said adapter, said lip being sealingly securable within said groove.

**4**. A method for treating and removing contaminate particulate matter from fluid circulatable into, through and out of a subterranean well, comprising the steps of: (1) establishing a fluid flow path into, through and out of said well; (2) circulating fluid in said flow path; (3) introducing said circulated fluid into at least one filtering vessel, said vessel comprising: a cylindrical housing adapted to receive and discharge said fluid; means disposed across said vessel for separating said vessel into a first fluid chamber for receiving fluid to be filtered from said well and a second fluid chamber for receiving filtered fluid for subsequent circulation into said well; at least one cartridge filter adapter receiving means disposed through said separating means; a cartridge filter adapter secured within each of said receiving means, said adapter having an elongated cylindrical housing and having a fluid flow passageway therethrough communicable to each of said first and second fluid chambers, said elongated cylindrical housing having an enlarged cartridge positioning portion extending radially away from and about the axis of said elongated cylindrical housing, said cartridge positioning portion having first and second faces thereon; groove means on said adapter circumferentially extending around the exterior of said elongated cylindrical housing for sealingly securing one end of said cartridge filter thereon; cartridge filter means positionable on said adapter and extending within said first fluid chamber; and seal means disposed at one end of said cartridge filter and having an interiorly facing circumferentially extending flexible lip for contact with the exterior of said elongated cylindrical housing upon location of said cartridge filter on said adapter, said lip being sealingly securable within said groove; and (4) circulating into said well fluid discharged from said second chamber of said vessel.

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**4,295,526**

## METHOD AND APPARATUS FOR CONNECTING STEEL PIPE SECTIONS

**Ernest D. Hauk, Yucca Valley, and Larry Stewart, Joshua Tree, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.**

**Filed Feb. 21, 1979, Ser. No. 13,671**

**Int. Cl.**[3] **E21B** *43/10;* **B23P** *19/04;* **B23Q** *3/00;* **F16L** *21/04*

**U.S. Cl. 166—315** **15 Claims**

**1**. A method of forming a casing string in a well, comprising:

(a) providing a plurality of sections of casing pipe having a predetermined outer diameter,

(b) introducing one such section into the well hole,

(c) providing a joint ring formed of strong and elastic material,

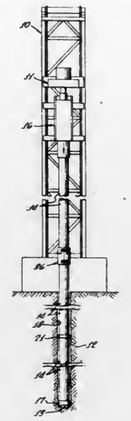
said joint ring having an inner diameter sufficiently smaller than said predetermined outer diameter of said pipe sections that entry of opposed ends of said pipe sections into said ring will expand said ring and thus cause it to frictionally grip said ends very tightly,

(d) providing a clasp means adapted to hold said joint ring and also adapted to receive and align the ends of said pipe sections whereby said ends may enter properly the opposite sides of said ring,

(e) placing said joint ring in said clasp means, and introducing the ends of said one casing section and a second casing section into said clasp means to thus cause said ends to be in coaxial relationship with said clasp means and coaxially aligned with each other,

(f) applying large axial forces to said coaxially-aligned pipe sections to cause said ends thereof to be forced into said ring and to be frictionally gripped therein while said ring is thus held in said clasp means,

(g) removing said clasp means, and



(h) repeating said steps (b) through (g) with additional ones of said joint rings and casing sections until the casing string has attained the desired length.

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**4,295,527**

## PROCESS AND DEVICE FOR THE CENTERING OF CASINGS AS USED FOR UNDERGROUND DRILLING

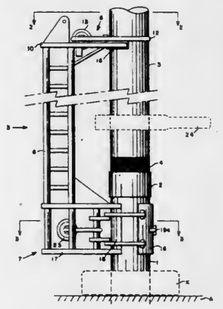
**Rolf A. Rüsse, Celle, Fed. Rep. of Germany**

**Filed Apr. 9, 1979, Ser. No. 28,007**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815705**

**Int. Cl.**[3] **B25B** *1/20;* **E21B** *19/16*

**U.S. Cl. 166—315** **12 Claims**



**1**. A method for centering casings for deep well drillings, particularly in the off-shore region, which comprises the steps of:

lowering the uppermost casing section of a casing string into the bore hole of a well until only the upper threaded end thereof is above a work platform;

securing the casing in the bore hole against rotational and longitudinal movement;

raising a next section of casing having a threaded section on each end to a vertical position and positioned over the upper end of the casing in the bore hole;

lowering the lower threaded end of the raised casing section into the upper threaded end of the uppermost casing in the bore hole by means of a crane and the like;

attaching a clamping means to the upper portion of the uppermost casing section in the bore hole, said clamping means having an upwardly-extending portion extending substantially parallel to the casing for a distance equal to a substantial portion of the length of a casing;

providing a second clamping means operably independent of said first clamping means fixedly supported on the upper extremity of the upwardly-extending portion, which clamping means is adapted to clamp and hold the raised section of casing in coaxial alignment with the casing in the bore hole;

rotatably securing the raised section of casing to the second clamping means, supported on the vertical extending portion, to engage, position and maintain the raised casing, at a point removed from said first clamp a substantial portion of the length of a casing, in coaxial alignment with the casing in the bore hole; and,

screwing the threads on the lower end of the raised casing section to the mating threads in the threaded end of the uppermost casing section to firmly secure the raised casing to the downhole casing by rotating the raised pipe casing.

**2**. Apparatus for centering and axial alignment of a superposed section of casing with an underlying casing section while being supported in a vertical position to permit the superposed section to be threadedly secured to the underlying casing section comprising:

first independently operated clamping means adapted to be securely clamped to the upper part of the underlying casing section;

extension means rigidly connected to said clamping means to extend upwardly alongside the casing for a substantial portion of the length of a superposed casing section;

said extension means being connected to said clamping means so as to extend in substantially parallel relation when the clamping means is fastened to the underlying casing section;

second independently operated clamping means mounted on the upper extremity of the extension means positioned and adapted to receive and support a superposed section of casing in coaxial alignment with the underlying casing section whereby the threads of the superposed casing section are aligned in mating relation with threads on the underlying casing section to permit threaded attachment of the superposed casing section to the underlying casing section essentially independent of a rig by turning the superposed casing;

wherein the first clamping means comprises a carrier plate, a pair of crank arms pivotally attached thereto, a pair of clamp elements having jaws operatively connected to one end of each crank arm and a piston and cylinder means operatively connected to the other ends of the crank arms adapted on actuation of the piston and cylinder means to clamp the clamp elements about said underlying casing section.

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**4,295,528**

## SELECTIVE LOCK WITH SETTING AND RETRIEVING TOOLS

**Michael Carmody, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.**

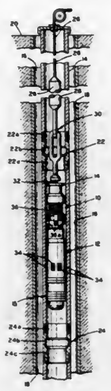
**Filed Jun. 16, 1980, Ser. No. 159,531**

**Int. Cl.**[3] **E21B** *23/02*

**U.S. Cl. 166—315** **20 Claims**

**1**. A lock for securing a well tool in a selected one a plurality of landing nipples in a well conduit, each said nipple defining an internal shoulder of diameter less than the conduit bore and an annular locking recess above the shoulder having a diameter greater than the conduit bore, comprising: an annular housing having a plurality of circumferentially spaced windows; a plurality of axially extending locking dogs having enlarged portions respectively aligned with and entering said windows; means in said housing for shiftably mounting said dogs to permit said enlarged portions to move through said windows

to project radially beyond said housing; a camming sleeve axially slidably mounted within said housing and having a series of axially spaced, external cylindrical cam surfaces selectively engagable with the inner surfaces of said dogs, said cam surfaces increasing in diameter downwardly, whereby relative upward movement of said camming sleeve will radially shift the locking dog ends successively from a fully retracted position, to a partially projecting no-go position, and then to a fully projecting locking position, the effective maximum diameter of said locking dog ends in said no-go position being greater than



said internal shoulder diameter but less than the conduit bore diameter; resilient means urging said camming sleeve upwardly, the top portions of said camming sleeve defining a plurality of peripherally spaced, resilient fingers having enlarged end portions; said enlarged finger end portions being arranged for detachable engagement by a running tool to successively shift the vertical position of said camming sleeve relative to said locking dogs from said fully retracted position, to said partially retracted position and then to said fully projecting position upon successive relative upward movements of said running tool.

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**4,295,529**

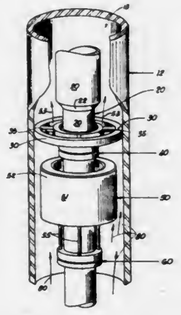
**BLOW-OUT PREVENTOR**

**William N. Strickland, 210 Tudor St., Houma, La. 70360**

**Filed Nov. 8, 1979, Ser. No. 92,573**

**Int. Cl.³ E21B** *21/10, 34/08*

**U.S. Cl. 166—325** **9 Claims**



1. A blow out preventor assembly for attachment to the drill stem placed within the drill casing during well drilling operations comprising:

a. a bottom seal assembly having attachment means for slideably attaching said bottom seal assembly to a section of drill stem, which has been placed during drilling operations within a section of drill casing, said bottom seal assembly flow opening area allowing fluids to flow thereby and providing an upper valve closure surface;

b. a first lower seat ring having an inner opening corresponding to the sectional configuration of the drill stem and providing an attachment opening for affixing said seat ring to the drill stem, said lower seat ring disallowing downward movement to said bottom seal assembly with respect to the drill stem;

c. port-ring means slideably attachable to the drill stem and having and outer diameter substantially equal to the inside diameter of the drill casing, for forming a flow closure between said drill stem and the drill casing with said port-ring having at least one flow opening allowing fluid to pass thereby and a valve seat at said opening; and

d. a second uppermost seat ring having an inner opening corresponding to the sectional configuration of the drill stem and providing an attachment opening for affixing said seat ring to said drill stem, said port-ring means resting upon said second uppermost seat ring, said second ring preventing downward movement of said port-ring means with respect to the drill stem.

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**4,295,530**

**LOWER LINK DRAFT SENSING SYSTEM ON TRACTOR**

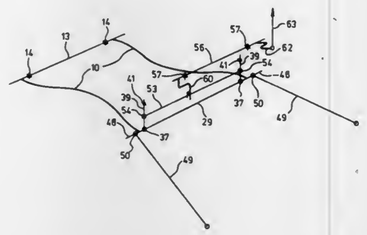
**Herbert E. Ashfield; Harry Horsfall, and Philip M. Wade, all of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England**

**Filed Mar. 24, 1980, Ser. No. 133,190**

**Claims priority, application United Kingdom, Mar. 30, 1979, 11309/79**

**Int. Cl.² A01B** *63/112*

**U.S. Cl. 172—7** **6 Claims**



1. A lower link draft sensing system, on an agricultural tractor having a hydraulic power lift mechanism, comprising two bowed rearwardly-extending leaf springs anchored to the tractor frame at their front ends and adapted to elongate in a rearward direction when under tension, two laterally-spaced arms pivotally connected at their upper ends to the tractor frame and universally connected at their lower ends to a cross-bar secured between the rear ends of the respective springs, two lower hitch links universally connected at their front ends to points on the cross-bar which points are laterally offset from said arms, a laterally-extending unstressed summating bar universally connected at its ends to the respective arms and disposed in parallel relationship to the cross-bar, and a draft signal transmitting member actuated by the summating bar at a point between the ends of said bar and adapted to control automatically the power lift mechanism by way of linkage.



**4,295,531**

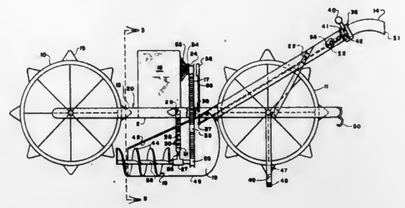
**AUGER-EQUIPPED PLOW**

**Hubert E. Strickland, 2205 Ardmore Ave., Chesapeake, Va. 23324**

**Filed Nov. 5, 1979, Ser. No. 91,652**

**Int. Cl.³ A01B** *33/04;* **B62D** *51/04*

**U.S. Cl. 172—42** **3 Claims**



1. A mechanically driven ground working implement comprising:

(a) a horizontally disposed rigid elongated framework,

(b) front and rear wheels rotatably mounted on said framework adjacent the opposite extremities thereof, said wheels provided with peripherally mounted projections which interact with the ground to provide traction for said implement,

(c) a pair of control handles attached to said framework and extending upwardly and rearwardly therefrom in symmetrically opposed relationship,

(d) a power source in the form of a fuel-powered engine mounted on said framework between said wheels,

(e) drive means extending downwardly from said power source,

(f) forwardly and substantially horizontally directed auger means pendantly supported by said framework said auger means being comprised of a center core and spiralled blade member having an outer edge, the rearward extremity of said auger means being engaged by said drive means,

(g) means to adjust the elevation of said auger means, and

(h) a truncated hollow V-shaped plowshare supported by said framework in a disposition closely above said auger means, said plowshare having an inside surface and a forward end,

(i) the forward end of said auger protruding in front of the forward end of said plowshare,

(j) the outer edge of said blade member being adjustably located between about 1" and 4" from the inside surface of said plowshare, and the lowermost portion of said outer edge being at a level adjacent the lowermost portion of said plowshare.

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**4,295,532**

**PLANTER WITH COOPERATING TRASH CLEARING DISCS**

**Donald E. Williams; Forrest E. Robertson; C. Dean Gigot, and Terry K. Gigot, all of Garden City, Kans., assignors to Acra-Plant, Inc., Garden City, Kans.**

**Filed Nov. 2, 1979, Ser. No. 90,790**

**Int. Cl.³ A01C** *5/06*

**U.S. Cl. 172—184** **9 Claims**

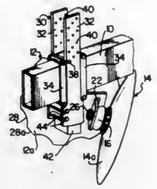
1. In a farm implement having a furrow-opening tool thereon, an attachment for moving debris outwardly in opposite directions ahead of said tool, said attachment including:

a pair of side-by-side convex-concavo discs having sharpened, circular peripheries adapted to penetrate the soil and disposed with their convex faces back to back,

at least one of the discs being peripherally notched;

a support between the discs and common thereto; and

means for each disc respectively rotatably mounting the same on the support with the discs converging relatively toward the normal path of travel of said support and with notched disc leading the other disc,



the discs being relatively overlapped at their zones of convergence and overlapping said path of travel at their zones of convergence.

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**4,295,533**

**PNEUMATICALLY OPERATED RAM BORER**

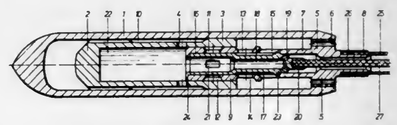
**Paul Schmidt, P.O.B. 20, 5940 Lennestadt/Saalhausen, Fed. Rep. of Germany**

**Filed Mar. 13, 1980, Ser. No. 129,835**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1970 2911837**

**Int. Cl.³ E21B** *11/02*

**U.S. Cl. 175—19** **7 Claims**



1. In a self-driven pneumatically operated ram borer, said ram borer including a tubular casing, a hose connected to said tubular casing for the supply of compressed air thereto, a percussion piston axially slidably mounted in said casing for reciprocating motion therein, means defining control ports in said piston, a control tube extending into said piston for controlling said reciprocating motion of said piston by opening and closing said control ports, means movably mounting said control tube and control means for moving said control tube between a first position in which said piston is caused to move so that it drives said borer forwards and a second position in which said piston is caused to move so that it drives said borer rearwardly, the improvement wherein said control means comprises elongate flexible actuating means extending through the inside of said hose into said casing, said flexible actuating means being coextensive with and extending within said hose to a location remote from said tubular casing, means connecting said flexible actuating means to said control tube, and said flexible actuating means being rotatable relative to said hose and having a cross-sectional area smaller than the cross-sectional area within said hose so that compressed air can flow through said hose for operating said ram borer.

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**4,295,534**

**WELL BORING RIGS AND SPOIL HANDLING CONVEYOR APPARATUS THEREFOR**

**Thomas R. Zachmeier, Box 131, Mandan, N. Dak. 58554**

**Filed Mar. 29, 1979, Ser. No. 25,026**

**Int. Cl.³ E21B** *21/06*

**U.S. Cl. 175—88** **8 Claims**

1. In an apparatus for boring holes in the earth, the apparatus including:

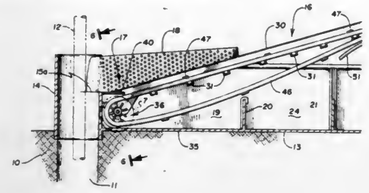
(1) rotary boring means for boring a hole;

(2) means for introducing drilling fluid to the boring area;

(3) fixed wall structure surrounding the boring means for receiving spoil laden drilling fluid from a hole being

bored, the wall structure having an opening for discharging the spoil-laden fluid, and

(4) continuous conveyor means having an inlet end located at the opening in the wall structure for receiving the discharged spoil-laden drilling fluid;



the improvement wherein the conveyor comprises

(5) a plurality of V-type conveyor belts defining a conveyor working surface, the belts being arranged in side-by-side yet spaced apart relationship for allowing drilling fluid to drain therebetween while the belts carry the spoil away.

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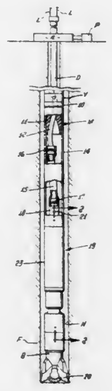
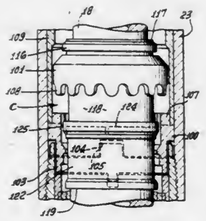
**4,295,535**

## IN-HOLE MOTOR DRILL WITH LOCKING BIT CLUTCH

**Gary M. Crase, Cypress, and Kurt M. Trzeciak, Irvine, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.**

**Filed Aug. 20, 1979, Ser. No. 68,212**
**Int. Cl.³ E21B *3/12***
**U.S. Cl. 175—101** **16 Claims**





1. An in-hole motor assembly adapted for connection with a rotatable pipe string and a bit, said assembly comprising: a motor stator including a housing structure connectable at one end to a pipe string; a rotor in said stator connected at one end to a shaft for rotation therewith and extending at the other end of said shaft from said housing for connection to a drill bit; thrust bearing between said shaft and said housing structure to transmit thrust from said housing to said shaft; a clutch engageable between said shaft and said housing to couple said housing structure and shaft for mutual rotation and a lock holding said clutch against disengagement on application of thrust between said housing and said shaft.

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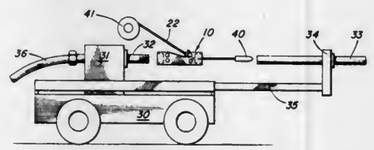
**4,295,536**

## PRESSURE SEAL FOR PUMPING INSTRUMENTS THROUGH DRILL ROD

**Emrys H. Jones, Jr., Westover, W. Va., and Stephen D. Lauer, Waynesburg, Pa., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Sep. 28, 1979, Ser. No. 80,352**
**Int. Cl.³ E21B *47/12***
**U.S. Cl. 175—214** **2 Claims**



1. In a system for taking surveys of borehole conditions in a generally horizontal borehole being drilled, said system comprising a drill rod, a survey probe in the drill rod adapted to be pumped through the drill rod and retrieved by reeling in a cable attached to the probe, a pump for pumping fluid through the drill rod to force the survey probe therethrough, a rotary motor between the pump and the drill rod, and a pipe extending from the rotary motor in alignment with the drill string;

the improvement wherein a sealing device positioned between said pipe and said drill rod is provided, said sealing device comprising:

(a) a housing having a central flow passage therethrough and an enlarged recessed opening in each end therethrough, said housing being of split construction and having two half sections;

(b) a first seal in one end of said housing adapted to sealingly engage said drill rod when pressed thereagainst;

(c) a second seal in the other end of said housing adapted to sealingly engage said pipe when pressed thereagainst;

(d) an instrument cable entrance opening extending from outside said housing to said flow passage, said opening being bisected by the connecting plane of said two half sections, said opening being at an acute angle with respect to said flow passage; and

(e) packing means in said opening allowing movement of an instrument cable therethrough and preventing leakage therefrom.

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**4,295,537**

## SPONGE MEASURING DEVICE

**James D. McAvinn, Chicago; Arthur R. Meister, Park Ridge, and Samuel M. Tucker, Barrington, all of Ill., assignors to The Kendall Company, Boston, Mass.**

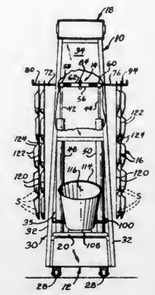
**Filed Mar. 21, 1980, Ser. No. 132,585**
**Int. Cl.³ G01G *19/40, 13/14, 19/52, 21/22*; A47F *7/08***
**U.S. Cl. 177—15** **18 Claims**

1. A device for measuring sponges, comprising:

measuring means for indicating the weight of an applied object;



means operatively applied to the measuring means for retaining a plurality of wetted sponges; and



electronic means operatively associated with the measuring means for determining the total weight of liquid in said retained sponges.

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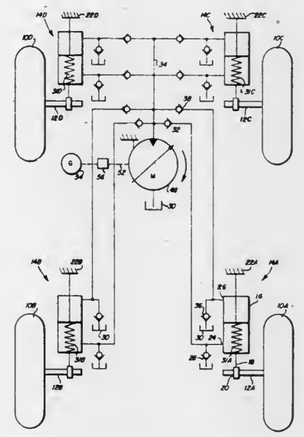
**4,295,538**

## AUXILIARY POWER SYSTEM FOR AUTOMOTIVE VEHICLE

**Alexander J. Lewus, 9844 N. 11th Ave., Phoenix, Ariz. 85021**

**Continuation of Ser. No. 926,373, Jul. 20, 1978, abandoned, which is a continuation of Ser. No. 812,528, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 633,825, Nov. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 453,293, Mar. 21, 1974, Pat. No. 3,921,746. This application Sep. 17, 1979, Ser. No. 76,081**
**The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.**
**Int. Cl.³ B60K *25/10***
**U.S. Cl. 180—165** **5 Claims**



1. A suspension and auxiliary power system for a vehicle having a frame, a power consuming load on said frame, and at least one supporting wheel adapted to move vertically relative to said frame, said system comprising: a fluid pump including a housing adapted to be connected to one of said frame and said wheel and a reciprocal piston adapted to be connected to the other of said frame and said wheel, said housing and piston forming at least one fluid pumping chamber whose volume is expanded and contracted by vertical movement between said frame and said wheel; a uni-directional fluid motor; said motor adapted to drive said power consuming load; and fluid circuit means connecting said chamber to said motor said circuit means including a first check valve for directing fluid only from said chamber directly to said motor and a second check valve for directing fluid only from a source of fluid to said chamber, whereby said pump acts as a fluid suspension system, supporting at least a part of the weight of said vehicle on said one wheel, and whereby the loading on said motor of said power consuming load causes said motor to act as a shock absorber to said pump.

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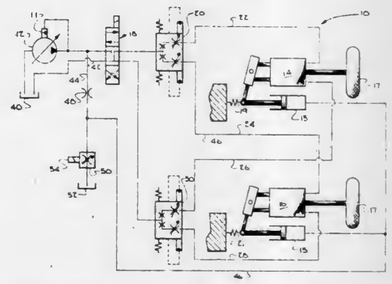
**4,295,539**

## AUXILIARY DRIVE SYSTEM

**Richard A. Beck, West LaFayette, and Glen T. Presley, Angola, both of Ind., assignors to Parno Corporation, Brookston, Ind.**

**Filed Dec. 5, 1979, Ser. No. 100,426**
**Int. Cl.³ B60K *25/04***
**U.S. Cl. 180—243** **11 Claims**



1. A hydraulic auxiliary drive system for the normally non-driven wheels of a vehicle in assistance with the main drive wheels, comprising:

at least one variable displacement motor having a tiltable swash plate driving at least one of said non-driven wheels;

a variable displacement pressure compensated pump supplying the motor with a constant pressure regardless of the vehicle speed;

spring means biasing each motor swash plate toward zero displacement;

servo means connected to the motor swash plate for varying displacement of the motor;

a pressure source supplying the servo means;

a manually operated pressure control means including a solenoid-controlled variable orifice controlling the pressure level supplied to the servo means to vary the torque output of the normally non-driven wheels; and

control valve means positioned between the pump and motor for disengaging and reversing the auxiliary drive.

5. A hydraulic auxiliary drive system for the normally non-driven wheels of a vehicle in assistance with the main drive wheels, comprising:

at least one variable displacement motor having a tiltable swash plate, said motor driving at least one of said non-driven wheels;

a variable displacement pressure compensated pump having a preset compensating level supplying the motor with a constant pressure regardless of the vehicle speed;

spring means biasing each motor swash plate toward zero displacement;

a first servo means connected to the motor swash plate for increasing the motor displacement;

a second servo means connected to the motor swash plate for decreasing the motor displacement;

a pressure source connected to said first servo means;

a sensing passage connecting the pump outlet with the second servo means;

a pressure operated valve means located in said sensing passage having a first position blocking pump pressure to

the second servo means at all pressure levels above the pressure compensating level of said pump, and a second position opening pump pressure to the second servo means at a preset pressure level below said pressure compensating level of said pump whereby when said pump reaches full stroke and is unable to maintain its pressure compensating level, the pressure operated valve means opens the second servo means to pump pressure causing the motor displacement to decrease its fluid demand; and a manually operated pressure control means controlling the pressure level supplied to the first servo means to vary the torque output of the variable displacement motor.

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**4,295,540**

## VEHICLE BRAKE AND ENGINE INTERLOCK

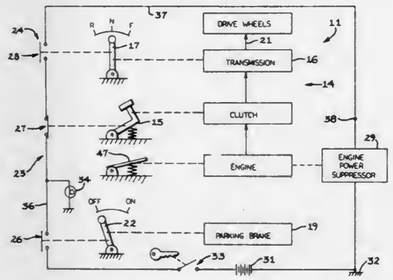
**Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio**

**PCT No. PCT/US79/00725, § 371 Date Sep. 14, 1979, § 102(e) Date Sep. 14, 1979, PCT Pub. No. WO81/00696, PCT Pub. Date Mar. 19, 1981**

**PCT Filed Sep. 14, 1979, Ser. No. 117,581**

**Int. Cl.³ B60K** *28/00*

**U.S. Cl. 180—271** **14 Claims**




1. In a brake protection interlock system (**23**, **23***a*) for a vehicle (**11**, **11***a*) having ground engaging means (**13**, **13***a*), a brake (**19**, **19***a*), an engine (**12**, **12***a*), and drive delivery means (**14**, **14***a*) for transmitting power from said engine (**12**, **12***a*) to said ground engaging means (**13**, **13***a*), said drive delivery means (**14**, **14***a*) having a transmission (**16**, **16***a*) with at least one nondrive transmitting condition and at least one drive transmitting condition and having a clutch (**18**, **18***a*) which may be engaged and disengaged, and including first means (**29**, **29***a*) for preventing initiation of powered travel of said vehicle (**11**, **11***a*) with said brake (**19**, **19***a*) engaged by suppressing power output from said engine (**12**, **12***a*), the improvement comprising:

second means (**28**, **28***a*) for causing said first means (**29**, **29***a*) to suppress power output from said engine (**12**, **12***a*) in response to said transmission (**16**, **16***a*) being in said drive transmitting condition while both of said brake (**19**, **19***a*) and said clutch (**18**, **18***a*) are engaged, and

third means (**27**, **27***a*) for enabling starting of said engine (**12**, **12***a*) with said transmission (**16**, **16***a*) in drive transmitting condition while said brake (**19**, **19***a*) is engaged by inactivating said second means (**28**, **28***a*) in response to said clutch (**18**, **18***a*) being in disengaged condition.

**4,295,541**

## APPARATUS FOR SUPPORTING LOADS

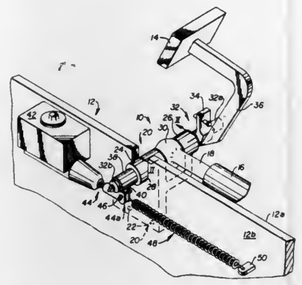
**Richard J. Malecha, St. Louis Park, Minn., assignor to Towmotor Corporation, Mentor, Ohio**

**PCT No. PCT/US79/00321, § 371 Date May 14, 1979, § 102(e) Date May 14, 1979, PCT Pub. No. WO80/02550, PCT Pub. Date Nov. 27, 1980**

**PCT Filed May 14, 1979, Ser. No. 89,116**

**Int. Cl.³ G05G** *1/14;* **74** *512;* **414** *635;636*

**U.S. Cl. 180—315** **9 Claims**



1. Apparatus (**10**) for mounting at least one tilt cylinder (**16**, **18**, **30**) and a brake pedal (**14**) for controlling a brake master cylinder (**42**), the apparatus (**10**) comprising:

a frame (**12**) having an inboard side (**12***a*) and an outboard side (**12***b*);

a bracket (**20**) mounted on the inboard side (**12***a*) of the frame (**12**) and having a bifurcated end of first (**24**) and second (**26**) spaced apart hollow ears, the first ear (**24**) of the bracket (**20**) extending to the outboard side (**12***b*) of the frame (**12**);

an elongated sleeve (**52** or **60** or **62**) having first (**52***a* or **60***a* or **62***a*) and second (**52***b* or **60***b* or **62***b*) end portions and a mid-portion (**52***c* or **60***c* or **62***c*), the first (**52***a* or **60***a* or **62***a*) and second (**52***b* or **60***b* or **62***b*) end portions of the sleeve (**52** or **60** or **62**) being supported on the frame (**12**) by the bracket (**20**);

an elongated cross pin (**32**) extending within the sleeve (**52** or **60** or **62**) and the ears (**24**, **26**) and having a first portion (**32***c*), a second portion (**32***d*) and a mid-portion (**32***e*) intermediate the first (**32***c*) and second (**32***d*) portions, the sleeve (**52** or **60** or **62**) and the cross pin (**32**) being constructed to be spaced apart (**58**, **61**, **68**) at the mid-portions (**52***c* or **60***c* or **60***c* and **32***e*) thereof, the tilt cylinder (**16**, **18**, **30**) being rotatably mounted on the sleeve mid-portion (**52***c* or **60***c* or **62***c*) and the brake pedal (**14**) being fixedly coupled to the cross pin (**32**);

means (**38**, **40**, **44**, **46**) for coupling the cross pin (**32**) to the master cylinder (**42**); and

means (**34**, **36**) for coupling the brake pedal (**14**) to the cross pin (**32**).

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**4,295,542**

## SEISMIC EXPLORATION WITH DISPOSABLE SEISMIC DETECTORS

**H. Neal Reeves; Roy E. Burnett; Leslie R. Denham, and George E. Shields, all of Houston, Tex., assignors to Seiscom Delta Inc., Houston, Tex.**

**Filed Aug. 27, 1979, Ser. No. 70,241**

**Int. Cl.³ G01V** *1/047, 1/13*

**U.S. Cl. 181—108** **7 Claims**

1. A method of seismic exploration of subsurface formations, comprising the steps of:

(a) arranging a series of shotholes along a course to be explored in a seismic line of profile above the subsurface formations;

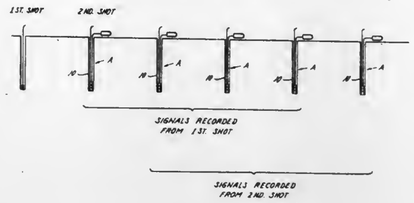


(b) positioning body members, each having both a seismic source and a seismic detector mounted therewith, in the series of shotholes along the course to be explored;

(c) activating one of the seismic sources in a first of the series of shotholes to emit seismic waves;

(d) detecting seismic waves from the subsurface formations with at least some of the remaining detectors located in a plurality of series of shotholes;

(e) activating another seismic source in a shothole subsequent to said step of detecting;




(f) detecting seismic waves from the subsurface formations with the remaining detectors located in a plurality of the shotholes subsequent to said step of activating another seismic source;

(g) activating additional seismic sources in each of a series of shotholes along the seismic line of profile in a predetermined sequence; and

(h) detecting seismic waves from the subsurface waves with the remaining detectors subsequent to each step of activating.

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**4,295,543**

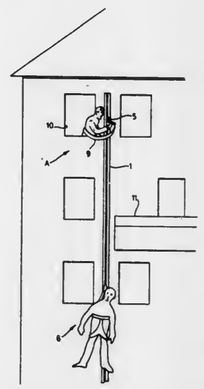
## FIRE ESCAPE APPARATUS

**Finlay M. Graham, The Coach House, High Rocks La., Tunbridge Wells, England**

**Filed Feb. 6, 1980, Ser. No. 119,086**

**Int. Cl.³ A62B** *1/20*

**U.S. Cl. 182—3** **5 Claims**



1. In a building, a fire escape apparatus comprising a vertically extending channel member secured to a wall of the building, the channel member defining a channel into which opens a vertical slot, two vertical rows of projections within the channel, each row being disposed adjacent a respective side of the slot and the projections in each row being staggered with respect to those in the other, and at least one harness support capable of being introduced into the channel through the slot and of co-operating with the projections so as to move stepwise down the channel member under the effect of the load applied to the harness support, said harness support including a "T"-shaped member having a cross-piece surmounting an upright, the upright having a projection to which the harness is attached.

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**4,295,544**

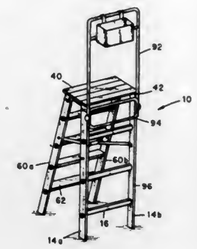
## PLATFORM STEPLADDER

**Donald J. Peterson, 2727 E. Fifth Ave., Knoxville, Tenn. 37914**

**Filed May 1, 1980, Ser. No. 145,475**

**Int. Cl.³ E06C** *7/18, 1/383*

**U.S. Cl. 182—106** **3 Claims**



1. A stepladder comprising a pair of elongated front leg members pivotably attached to a front platform, a pair of elongated rear leg members pivotably attached to a rear platform, said front platform being hingedly attached to said rear platform for movement between a coplanar position and a folded position, means for releasably locking said front leg members to said front platform in a position generally perpendicular to said front platform, means for releasably locking said rear leg members to said rear platform in a position in which said rear leg members form an angle of about 110° with said rear platform, a support member pivotally attached to said front leg member and means for securing said support member in a fixed position extending generally perpendicularly upwardly from said front platform including a cylindrical section secured to one of said front legs and a hemi-cylindrical cradle section defined on said support member, adapted to receive said cylindrical section.

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**4,295,545**

## LUBRICATOR

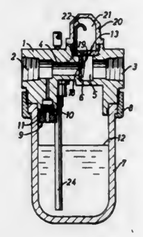
**Shoki Hiei, Aichi, Japan, assignor to Toyooki Kogyo Kabushiki Kaisha, Okazaki, Japan**

**Filed Dec. 4, 1979, Ser. No. 100,242**

**Claims priority, application Japan, Dec. 5, 1978, 53/150723**

**Int. Cl.³ F16N** *7/34*

**U.S. Cl. 184—55 A** **4 Claims**



1. In a lubricator for a pneumatically operated device, comprising:

a housing provided at opposite sides thereof with an inlet port for connection to a source of pneumatic pressure and an outlet port for connection to said pneumatically operated device and provided therein with an air passage for

allowing the flow of compressed air between said inlet and outlet ports, said air passage including a mixture chamber formed at the inlet side thereof with a vertical flat surface wall;

an oil dropping chamber provided on said housing for dropping lubricant into said mixture chamber; and

a throttle valve member of elastic material having a vertical valve port pressed into contact with the vertical flat surface wall of said mixture chamber to be displaced in accordance with the flow quantity of the compressed air through said air passage;

the improvement wherein the vertical valve part of said throttle valve member is provided with an orifice for permitting the compressed air flow therethrough, and a drop tube of elastic material is arranged along the vertical valve part of said throttle valve member and opens at its upper extremity into the interior of said oil dropping chamber and at its lower extremity adjacent to said orifice.

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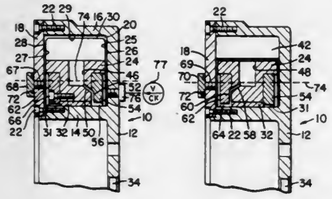
**4,295,546**

## TORSIONAL VIBRATION DAMPERS

**Eric M. Vollett, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England**

**Filed Oct. 2, 1979, Ser. No. 81,192**
**Int. Cl.³ F16F *15/16***
**U.S. Cl. 188—378** **9 Claims**



1. A torsional vibration damper comprising:

an annular hub member adapted for connection to a shaft which is subject to torsional vibrations;

an annular inertia member carried by and journaled for rotation relative to said hub member, at least one surface of the inertia member being in close spaced, face to face relation with at least one opposing surface of said hub member;

a viscous fluid contained between said opposing surfaces so that relative movement shears the fluid to damp torsional vibrations;

variable volume chamber means formed between said hub and inertia members comprising a plurality of a pair of first and second variable volume chambers whose volumes vary inversely in response to relative movement of said inertia member and said hub, said viscous liquid being contained within said variable volume chambers during operation of said damper,

a pocket connected to each of said respective first and second variable volume chambers and being defined by a blind bore, each of said pockets having a gas contained therein which is pressurized by liquid from said chambers when the volume thereof is reduced,

at least one of said members defining a gas reservoir radially inward from said gas pockets;

first and second vent passages connecting said gas reservoir to the pockets of said first and second variable volume chambers, respectively, through the other of said members, said vent passages having restricted cross sectional flow areas; and

a first gas interconnection means connecting the pockets of only said first variable volume chambers and being positioned between said pockets of said first variable volume chambers and one of said first and second vent passages; and a second gas interconnection means connecting the pockets of only said second variable volume chambers and being positioned between said pockets of said second variable volume chambers and the other of said first and second vent passages whereby the gas pockets for each series of variable volume chambers are all interconnected,

whereby a tuning effect is provided for said damper.

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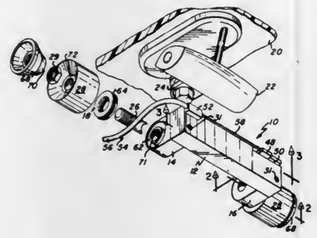
**4,295,547**

## BRAKE ASSEMBLY FOR SMALL VEHICLES

**D. Patrick Dungan, 901 Sherman St., #1322, Denver, Colo. 80203**

**Filed Mar. 31, 1980, Ser. No. 135,869**
**Int. Cl.³ B60T *1/04, 1/06***
**U.S. Cl. 188—2 R** **18 Claims**



1. A brake assembly for vehicles having a resilient wheel, comprising: a housing carried by the vehicle; a friction member connected to said housing and adapted to be positioned opposite a first side wall of the wheel for displacement against the wheel side wall; brake assisting means more rigid than the wheel and carried by the vehicle opposite a second side wall of the wheel for limiting the available lateral deformation of the wheel under lateral pressure from the friction member; and means for selectively activating the friction member to be displaced from the housing.

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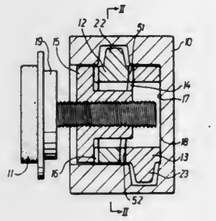
**4,295,548**

## BRAKE ACTUATOR

**Kenneth M. Quiney, Kings Heath, England, assignor to Girling Limited, Birmingham, England**

**Filed Nov. 29, 1979, Ser. No. 98,595**
**Claims priority, application United Kingdom, Dec. 9, 1978, 47852/78**
**Int. Cl.³ F16D *65/18***
**U.S. Cl. 188—72.7** **12 Claims**



1. A brake actuator comprising a body; first and second cam components rotatable in said body and having thereon respective helical cam tracks via which said cam components are in axial co-operative relationship with one another, said cam tracks being complementary to one another and axially confronting one another to form a helical thrust bearing; an output member axially displaceable relative to said body; a first thrust bearing axially operative between said first cam component and said output member; a second thrust bearing axially operative between the second cam component and said body; and means for rotating both of said cam components relative to said body, the operative relationship between said cam components, said thrust member and said body being such that turning of one of said cam components relative to said body by said rotating means yields a relatively low output force at said output member and turning of the other of said cam components relative to said body, with said one cam component not rotating, yields a relatively high output force at said output member.



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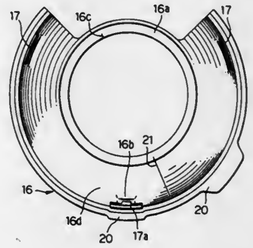
**4,295,549**

## ANTI-RUST COVER FOR A DISC ROTOR OF A VEHICLE DISC BRAKE

**Juichi Shibatani; Kenichi Nakamura; Wataru Izuhara, and Yuichiro Obu, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jun. 18, 1979, Ser. No. 49,748**
**Claims priority, application Japan, Dec. 26, 1978, 53-178685[U]**
**Int. Cl.³ F16D *65/00***
**U.S. Cl. 188—218 A** **14 Claims**



1. In an anti-rusting mechanism, for a disc rotor in a vehicle disc brake, including an anti-rust cover removably attached at the outer periphery thereof to the outer periphery of a dust cover which covers the inner surface of said disc rotor integrally rotatable with a wheel, said anti-rust cover covering the outer surface of said disc rotor to envelope said disc rotor in cooperation with said dust cover, an improvement wherein said anti-rust cover is provided with a plurality of engaging members disposed, for being engaged with the outer periphery of said dust cover, on the surface faced to said disc rotor and in the vicinity of the outer periphery of said anti-rust cover with a predetermined circumferential phase difference from each other, and a plurality of projections disposed on the surface of said anti-rust cover respectively in confrontation with each of said engaging members at a nearer position to the center of said anti-rust cover than said engaging member, and at least one of said engaging members has a recess portion large enough to allow at least a part of a human finger to be held therein when said anti-rust cover is removed, and said anti-rust cover can be removably attached to said dust cover by means of allowing the outer periphery of the latter to fit snappingly between said at least one engaging member and a corresponding one of said projections at each place.

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**4,295,550**

## VISCOUS FLUID COUPLING DEVICE

**Masaharu Hayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Nov. 21, 1979, Ser. No. 96,329**
**Claims priority, application Japan, Nov. 28, 1978, 53/147350**
**Int. Cl.³ F16D *35/00, 43/25***
**U.S. Cl. 192—58 B** **4 Claims**

1. A viscous fluid coupling device for controlling the revolutions per minute of a radiator cooling fan in response to the temperature of an engine, said coupling device comprising:

a rotor securely fixed to a shaft driven by an engine;

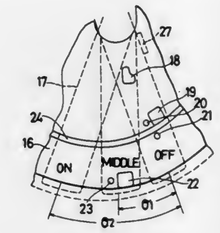
a casing member connected with said shaft for rotation relative thereto;

a cover member connected with said casing member;

a labyrinth formed between projections of said rotor and projections of said casing member;

a closed chamber being formed between said casing member and said cover member and containing said rotor and a quantity of operating oil;

a partition plate dividing said closed chamber into an operating chamber accommodating said rotor and a reservoir



chamber storing said operating oil; a valve plate rotatably attached on said cover member;

said partition plate provided in a first band of circumference thereof with first oil returning means and first pump means, and in a second band of circumference thereof with second oil returning means and second pump means, said second band being entirely radially outside said first band;

thermally responsive means connected with the valve plate to control movement thereof in response to temperature to control the oil returning means and thus control the shear force between the rotor and casing member; and

dam means formed between said first and second bands of circumference.

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**4,295,551**

## AUTOMATIC CLUTCH SYSTEM

**Frank Zimmermann, Brunswick; Paulus Heidemeyer, and Erhard Bigalke, both of Wolfsburg, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed Jul. 26, 1979, Ser. No. 61,059**
**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833961**
**Int. Cl.³ B60K *41/02***
**U.S. Cl. 192—0.076** **12 Claims**

1. An automatic clutch system, for use in a motor vehicle having an accelerator lever, for selectively connecting the output shaft of a vehicle engine to the input shaft of a multi-speed transmission, comprising:

a clutch mechanism, responsive to supplied signals, for selectively connecting said shafts;

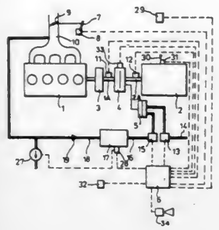
first means for sensing the rotational speed of said engine shaft,

second means for sensing the rotational speed of said transmission shaft;

third means for sensing the position of said accelerator lever;

and control means, responsive to said first, second and third sensing means, for developing said control signals, said control means having a first operating mode, operative when said vehicle is accelerated from a stationary condition, and wherein said control means activates said clutch mechanism

in said first mode to maintain said engine shaft speed within a selected speed range from a selected nominal engine speed



function and wherein said nominal engine speed function is determined as a function of said accelerator lever position.

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**4,295,552**

## MEANS FOR COUPLING A HAND DRIVE WITH A ROTATABLE SHAFT

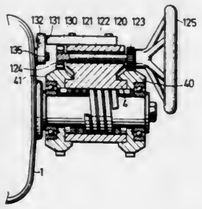
**Hans Erlach, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Jun. 29, 1978, Ser. No. 920,287**

**Claims priority, application Switzerland, Jul. 15, 1977, 8831/77**

**Int. Cl.³ F16D** *11/06*

**U.S. Cl. 192—81 C** **27 Claims**



27. A hand drive for mounting on a rotatable shaft, said drive comprising

a sleeve mounted concentrically about a shaft to define an annular gap therewith;

a helical spring concentrically within said sleeve and having convolutions radially biased into engagement with said sleeve;

a pair of entraining elements rotatably mounted on opposite ends of said sleeve, each said element being entrained with an opposite end of said spring and having external teeth thereon;

a hand wheel having a spindle passing through said sleeve;

a pair of pinions mounted on said spindle, each pinion being in meshing engagement with a respective entraining element; and

means for securing said sleeve to a fixed member.

**4,295,553**

## ELECTROMAGNETIC CLUTCH

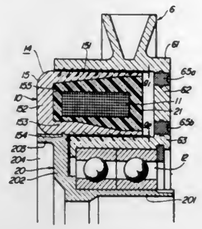
**Kosaku Sayo, Katsuta; Atsushi Suginuma; Hideo Tatsumi, both of Mito, and Hisanobu Kanamaru, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,259**

**Claims priority, application Japan, Jan. 8, 1979, 54-307**

**Int. Cl.³ F16D** *27/10*

**U.S. Cl. 192—84 C** **11 Claims**



1. In an electromagnetic clutch comprising:

a cylindrical rotor for introducing motive force from a drive source into the magnetic clutch formed at one end thereof with a surface for magnetic frictional engagement;

a motive force transmitting member located in spaced apart juxtaposed relation to said surface for magnetic frictional engagement of said cylindrical rotor and having a surface adapted to be brought into and out of magnetic frictional engagement with said surface of said cylindrical rotor;

a rotary shaft mechanically connected to said motive force transmitting member for rotation about an axis aligned with the axis of rotation of said cylindrical rotor;

energizing means including a fixed cylindrical casing, a holding member for fixedly securing said cylindrical casing in a predetermined position and a winding housed in said cylindrical casing, said energizing means being located in spaced juxtaposed relation to a surface of said end of said cylindrical rotor opposite to said surface thereof adapted to be brought into and out of magnetic frictional engagement with said motive force transmitting member, said cylindrical casing including a cylindrical outer wall and a cylindrical inner wall disposed in spaced juxtaposed relation to cylindrical walls of said cylindrical rotor and extending toward said motive force transmitting member, said cylindrical outer wall and said cylindrical inner wall each having as seen in cross section a planar surface on the side thereof which faces one of said cylindrical walls of said cylindrical rotor and a surface inclined at an acute angle with respect to said planar surface on the side of the wall which faces the winding so that the outer and inner cylindrical walls taper in the direction toward said motive power transmitting member, said motive power transmitting member being magnetically attracted into engagement with said surface of said cylindrical rotor when a current is passed to said winding to transmit motive force from said cylindrical rotor to said rotary shaft;

the improvement comprising a first portion of said cylindrical casing of said energizing means forming a bottom of said cylindrical casing interconnecting said cylindrical outer wall and said cylindrical inner wall at ends thereof remote from said motive force transmitting member, and a second portion of said cylindrical casing contiguous with said first portion and extending upwardly from said first portion along the cylindrical wall and beyond a portion of said inner wall which contacts with the holding member, said first portion and said second portion being substantially equal to each other and larger than other portions of the cylindrical walls of said cylindrical casing in thickness.



**4,295,554**

## CENTRIFUGAL FRICTIONAL CLUTCH

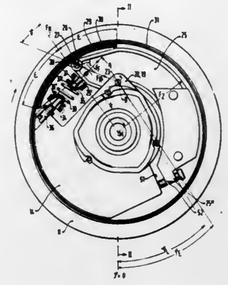
**Walter Schlagmüller, Schwieberdingen, and Rudolf Babitzka, Kirchberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 16, 1979, Ser. No. 67,163**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837922; Jul. 10, 1979, 2927730**

**Int. Cl.³ F16D** *43/14*

**U.S. Cl. 192—105 CE** **16 Claims**



1. A centrifugal frictional clutch including a housing rotatable about a first axis; a frictional member arranged about said housing concentrically with said first axis; a weight lever rotatably supported on said housing to rotate in response to a centrifugal force about a second axis radially spaced apart from said first axis; spring means supported on said housing to act on said lever against the direction of the centrifugal force; a coupling jaw rotatably supported on said weight lever for rotation about a third axis and being engageable with said frictional member, said second and third axes defining a connection line forming with the resultant normal line of action of the force of friction between said jaw and said frictional member an angle $\gamma$ which corresponds to the angle of static friction between said jaw and said frictional member.

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**4,295,555**

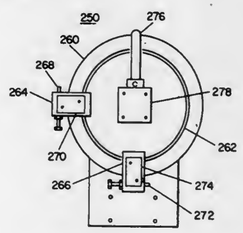
## LIMIT SWITCH ASSEMBLY MANUFACTURING MACHINE

**Lawrence J. Kamm, 2775 Kurtz St., San Diego, Calif. 92110**

**Division of Ser. No. 752,107, Dec. 20, 1976, Pat. No. 4,137,432, which is a division of Ser. No. 468,260, May 10, 1974, Pat. No. 3,998,316. This application Dec. 6, 1978, Ser. No. 967,059**

**Int. Cl.³ F16D** *71/00*

**U.S. Cl. 192—139** **2 Claims**



1. A rotary motion module for imparting controlled, rotary motion to an element comprising, in combination:

a rotary cylinder including a housing and a rotor,

controllable drive means which, when energized, drives the rotor of the rotary cylinder,

clampable module support means secured to the housing of the rotary cylinder,

an arm secured to the rotor of the rotary cylinder,

limit means secured to the housing of the rotary cylinder at a predetermined position around the rotor in the path traversed by the arm when the drive means is energized,

control means responsive to the arm contacting the limit means to provide a control signal indicating that the arm has contacted the limit means, and

module output clamp means secured to the rotor to support the element to be moved and adapted to receive the clampable module support means of the rotary motion module, whereby a plurality of rotary motion modules may be connected in a chain to form a compound motion machine.

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**4,295,556**

## PASSENGER CONVEYOR

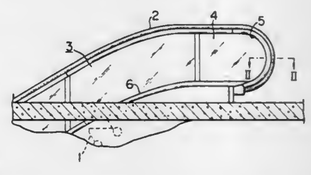
**Cyuichi Saito, and Katsuya Teranishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 24, 1979, Ser. No. 32,756**

**Claims priority, application Japan, Apr. 24, 1978, 53-47746**

**Int. Cl.³ B65G** *15/00, 9/14*

**U.S. Cl. 198—325** **4 Claims**



1. A passenger conveyor comprising a plurality of steps each including a treadboard provided with a number of cleats and grooves defined therebetween, the cleats being adapted to mesh with teeth of a comb-like plate provided at each terminal of said conveyor, and a frame to which said treadboard is secured; handrails adapted to run in synchronism with the travel of said steps; handrail frames disposed beneath said handrails; and balustrade panels, wherein said treadboard is formed of a corrugated stainless steel sheet and is reinforced by at least one reinforcement member attached to the underside of said treadboard, comb-like end pieces are attached to the leading and trailing ends of said treadboard, each end piece including a plurality of projections extending and fitted into the vacant spaces formed under said cleats of said treadboard, cleat sections extending substantially in alignment with the cleats of said treadboard, and a frame section secured to said reinforcement member, wherein said handrail frame is formed by first and second members both made of stainless steel sheets and having U-shaped cross-sections, said first and second members being welded together in back-to-back relationship so that the open side of said first member is directed toward said handrail while the open side of said second member is directed toward said balustrade panels, and wherein said comb-like end pieces are made of a colored plastic material to mark dangerous zones of the step.

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**4,295,557**

## APPARATUS AND METHOD FOR ALIGNING ELONGATED LIGNO-CELLULOSIC STRANDS INTO PARALLELISM

**Roland Etzold, Mountain View, Calif.; Julius S. Impellizzeri, New York, N.Y., and Thomas W. Vaughan, Mountain View, Calif., assignors to Elmendorf Research, Inc., Palo Alto, Calif.**

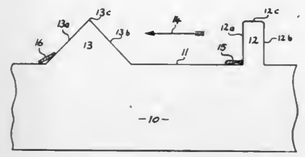
**Filed Mar. 17, 1977, Ser. No. 778,412**

**Int. Cl.³ B65G** *47/14*

**U.S. Cl. 198—382** **6 Claims**

1. Apparatus for orienting wood strands into parallelism comprising: a group of elongated spaced, generally parallel guide members presenting open top spaces therebetween and

defining the side boundaries for the spaces; means coupled with the guide members for moving each pair of adjacent guide members in opposite directions relative to each other and longitudinally of the spaces, said group having spaced first and second projections thereon, each first projection having an end edge extending upwardly from and substantially perpendicular to the upper margin of a corresponding guide member, each second projection having an inclined edge extending upwardly from the upper margin of a corresponding guide



member, the end edge of each first projection being operable to engage and move a wood strand in the direction of movement of the corresponding guide member, the inclined edge of each second projection defining an inclined path permitting one part of a wood strand to be raised with respect to the corresponding guide member as a function of the movement of the latter when projections of other guide members engage other parts of the wood strand, whereby strands spanning more than two guide members can be tilted, turned and moved into alignment with adjacent spaces without damage to the wood strands.

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**4,295,558**

## DEVICE FOR CONVEYING CONTAINERS

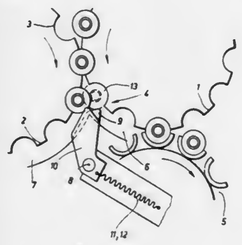
**Werner Heckmann, Dortmund, Fed. Rep. of Germany, assignor to Holstein und Kappert GmbH, Dortmund, Fed. Rep. of Germany**

**Filed Oct. 9, 1979, Ser. No. 82,626**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853696**

**Int. Cl.³ B65G** *47/22*

**U.S. Cl. 198—440** **1 Claim**



1. A device for conveying containers into separate paths comprising at least two conveyor wheels mounted for rotational movement and having circular recesses in their circumferential peripheries for receiving and conveying containers when said wheels are rotated, said wheels being arranged to rotate and having a location at which said wheels are arranged tangentially of each other to define a transfer region wherein a circular recess in the circumferential periphery of each conveyor wheel registers with a corresponding circular recess in the other said conveyor wheel so that a container is held in the registering recesses whereby containers can be conveyed selectively over either a main path of movement downstream from said transfer region on one of said conveyor wheels for containers to be used or a shunt path of movement downstream from said transfer region on the other one of said conveyor wheels for containers to be removed, and a pair of tongue members located downstream of the location of tangency of said wheels in the path of containers leaving the location of tangency and each said tongue member being mounted for individual pivotal movement from a neutral position in the vicinity of said transfer region whereat said tongue members confront said containers, said pair of tongue members being supported separately from said wheels and being spring biased into the neutral position confronting oncoming containers, said tongue members comprising an elongated first tongue member and an elongated second tongue member, each said first and second tongue member having a first end arranged to contact the containers and a second end spaced out of contact with the containers with the elongated direction of said first and second tongues in the neutral position extending tangentially of said conveyor wheels at the location of tangency, the first end of first tongue member being wedge-shaped with the wedge-shaped surfaces conforming generally with the contour of said containers to engage and confine containers moving along either one of said paths to said circular recesses, the first end of said second tongue member being arranged in the neutral position in the path of the containers positioned along one of said main path and shunt path and pivoting out of the neutral position due to the contact with a container and pivoting against the spring biasing action for confining the container within the recess over a certain path of movement of the respective conveyor wheel and when the certain path of movement has been traversed said second tongue member is spring biased back into the neutral position, and a common bearing axle pivotally mounting both of said first and second tongues thereon adjacent the second ends thereof.

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**4,295,559**

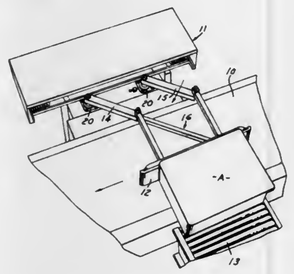
## CONVEYOR SYSTEM WITH DIVERTER

**Warren D. Neal, and Robert N. Nicodemus, Jr., both of Walkersville, Md., assignors to Acco Industries Inc., Trumbull, Conn.**

**Filed Jan. 31, 1980, Ser. No. 117,368**

**Int. Cl.³ B65G** *47/34, 47/82*

**U.S. Cl. 198—598** **18 Claims**



1. A conveyor system comprising

a conveyor having a horizontal surface upon which articles move past a given area,

diverter means adjacent said area for removing said articles from the conveyor comprising a paddle member,

means for mounting said paddle member for movement in an arcuate path over said conveyor to engage articles on the conveyor and remove them from the conveyor,

and means for operating said last-mentioned means in a cycle,

said last-mentioned means including anti-backup ratchet means operable to hold the paddle member in a predetermined position alongside the conveyor, a drive shaft, said ratchet means being mounted on said frame and operating on said drive shaft and a linear type air motor operable on the drive shaft.



**4,295,560**

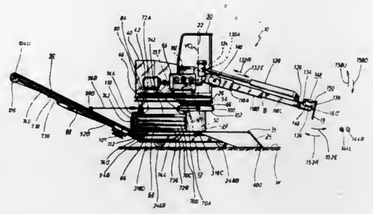
## MATERIAL HANDLING APPARATUS

**Billy J. Cross, 3316 Cedar Crest, Pasadena, Tex. 77503, assignor to Billy J. Cross, Pasadena, Tex.**

**Continuation-in-part of Ser. No. 949,736, Oct. 10, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 69,732**

**Int. Cl.³ B65G** *65/10*

**U.S. Cl. 198—517** **63 Claims**



1. A material handling apparatus comprising:

a chassis;

a material conveyance surface mounted for a predetermined rate of rotation with respect to the chassis; and

a loading boom having a loading device at the end thereof, the boom being mounted to but extendable from the chassis for loading material onto the material conveyance surface, and the boom being rotatable in a horizontal plane about a vertical axis which extends from the chassis and is coincident with the axis of rotation of the material conveyance surface to dispose the loading device at any angular position in a predetermined sector of the horizontal plane measured from the vertical axis.

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**4,295,561**

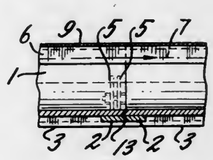
## CONVEYOR WITH SCRAPERS

**Masaru Yasukawa, and Soji Yasukawa, both of 122, Sanmaidencho, Tenrishi, Nara, Japan**

**Filed Jul. 18, 1977, Ser. No. 816,756**

**Int. Cl.³ B65G** *19/28*

**U.S. Cl. 198—735** **4 Claims**



1. A conveyor disposed adjacent a machine tool comprising a plurality of interconnected chutes for transporting machining refuse, said chutes in combination comprising a channel-like vessel having upright side walls, a concave bottom extended therebetween at the lower end and a cover extended therebetween at the upper end, said cover having a plurality of spaced openings therein through which said refuse may be introduced to said chutes, supporting bases for said vessel affixed to the exterior of said concave bottom, said supporting bases including means for connecting adjacent chutes, guide means for supporting an endless chain interconnecting all of said chutes, said guide means being secured to one of said upright walls, and said guide means being a channel bar positioned about said endless chain with its opening facing downward, a plurality of spaced scrapers affixed to said endless chain for moving said refuse in said chutes, each said scraper having a configuration substantially the same as the configuration of the bottom portion of said chutes, drive means for said endless chain to continuously move it in one direction, the end faces at the interface between adjacent interconnected chutes being slanted oppositely to the advancing direction of said scrapers, underlaid supporting bands at each end of each chute positioned to abut the underlaid bands of each adjacent chute, the end faces at the interface between adjacent underlaid bands being slanted in the same direction as the advancing direction of said scrapers, whereby each end of each chute has a V-shaped configuration which cooperatively engages with the opposed V-shaped end of the next adjacent chute.

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**4,295,562**

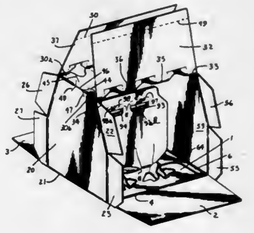
## ARTICLE CARRIER AND BLANK THEREFOR

**Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio**

**Filed Jan. 7, 1980, Ser. No. 109,768**

**Int. Cl.³ B65D** *5/16, 5/46, 5/54*

**U.S. Cl. 206—158** **23 Claims**



1. An article carrier comprising a bottom wall (**1**), side wall means (**2,3,32,37**) secured to the side edges of said bottom wall, a pair of end walls (**20,53**) secured respectively to the ends of said bottom wall, a top panel (**30**) secured to said side wall means and said end walls and disposed substantially parallel to said bottom wall, and characterized by a secondary bottom panel (**6**) disposed in flat face contacting relation with the upper surface of said bottom wall, and handle means (**8,11**) struck at least in part from said secondary bottom panel and secured thereto and disposed substantially perpendicular thereto.

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**4,295,563**

## PACKAGING SHEATH WITH CONTENTS

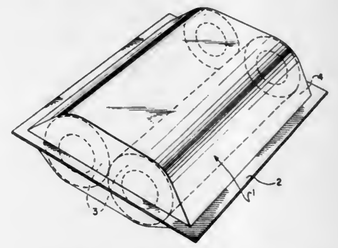
**Reinhold Becker; Wolfgang Michel, and Gerhard Hartmann, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 26, 1980, Ser. No. 134,313**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912720**

**Int. Cl.³ B65D** *81/18, 81/22, 81/24, 85/08*

**U.S. Cl. 206—205** **11 Claims**



1. An article of manufacture, comprising: a hollow rod comprised of a longitudinally gathered tube of cellulose hydrate-based material, said hollow rod having a latent water

content of between about 25% and 100% by weight based upon the total weight of the hollow rod and being free of chemical anti-bacteriocidal agents;

a closed, substantially gas impermeable packaging sheath having a hollow interior chamber therein, said hollow rod being positioned in said hollow interior chamber, whereby the hollow rod is completely enveloped by said packaging sheath, said packaging sheath being comprised of a flexible film of material which is substantially impermeable to gases; and

a protective gas essentially filling the remaining portion of said hollow interior chamber, said gas protecting said hollow rod against the formation of aerobic microorganisms on said water-containing cellulose hydrate-based material of said hollow rod.

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**4,295,564**

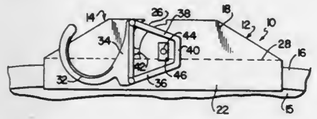
## HANGER ASSEMBLY FOR MERCHANDISE

**Fred J. Miller, Memphis, Tenn., assignor to Arthur Fulmer of Mississippi, Inc., Memphis, Tenn.**

**Filed Jan. 18, 1980, Ser. No. 113,332**

**Int. Cl.³ B65D *85/18***

**U.S. Cl. 206—279** **4 Claims**



1. A hanger assembly for displaying merchandise, comprising:

a label including a pair of juxtaposed flaps adapted to receive therebetween merchandise to be displayed, and a normally upstanding tab secured to at least one of said flaps and extending above said merchandise;

structure defining an arcuate slot in said tab;

a hook for suspending said assembly and merchandise;

means pivotally mounting said hook to said tab for selective movement of the hook between an upright operative position and a lowered, recessed position below the upper margin of the tab,

said slot being configured and arranged to accommodate pivoting of said hook between said positions,

said hook and mounting means therefor comprising—

an arcuate section having a base;

a pair of spaced apart marginal legs secured to the base of said arcuate section and extending away from the same;

a segment connecting the ends of said marginal legs remote from said arcuate section;

a central leg disposed between said marginal legs and extending away from said section;

a laterally extending stub secured to the end of said central leg remote from said section for defining a pivot axis for said hook,

there being structure defining an aperture through said at least one flap receiving said stub;

retainer means secured to said stub and adjacent the face of said one flap remote from said central leg,

said slot being oriented for receiving a portion of said central leg during said pivoting of the hook.

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**4,295,565**

## FILM CONTAINING MAGAZINE

**Kiyoyuki Takeuchi, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Aug. 24, 1979, Ser. No. 69,512**

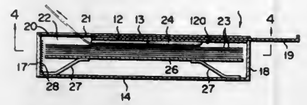
**Claims priority, application Japan, Aug. 31, 1978, 53/106449**

**Int. Cl.³ B65D *85/30, 83/08***

**U.S. Cl. 206—455** **10 Claims**

1. A film containing magazine for containing a number of sheet films in a stack for use in an X-ray photographing machine, comprising:

(a) top and bottom walls and paired side walls arranged along the longitudinal axis of the magazine, and front and back walls arranged crosswise of the longitudinal axis, those components cooperatively defining a space containing a number of films;



(b) an opening formed in the top wall near said front wall, through which sheet films are taken in and out;

(c) a plate like resilient buffering member mounted on the inner surface of said top wall, said buffering member including a pair of spaced arm sections extending longitudinally of said magazine and to said opening.

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**4,295,566**

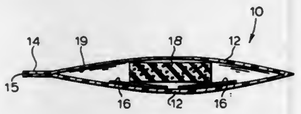
## AIR-EVACUATED PACKAGE WITH VACUUM INTEGRITY INDICATOR MEANS

**Robert C. Vincek, Clifton, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Filed May 7, 1980, Ser. No. 147,698**

**Int. Cl.³ B65D *81/20*; G01L *19/12***

**U.S. Cl. 206—457** **9 Claims**



1. An evacuated article-containing package assembly with vacuum integrity indicator means comprising:

an air-impervious, flexible package having an access for the placement of an article therein;

an article inside said package;

a compressible member inside said package being compressible under the influence of pressure less than atmospheric pressure; and

a closure seal on said package sealing said access after said article and said compressible member are within said package under air-evacuated conditions, said sealed package being air-evacuated, said compressible member adapted to expand against said flexible package to thereby outwardly expand said flexible package if the pressure inside said package should substantially equal the pressure outside said package, said expanded flexible package thereby serving as a visual indicator that there is no vacuum condition inside said package.

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**4,295,567**

## MEDICAMENT CONTAINER

**Eric T. Knudsen, Cobham, England, assignor to Beecham Group Limited, England**

**Filed Nov. 9, 1979, Ser. No. 92,922**

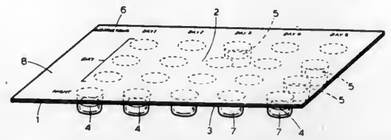
**Claims priority, application United Kingdom, Nov. 10, 1978, 44099/78**

**Int. Cl.³ B65D *83/02, 85/56*; G09F *3/08***

**U.S. Cl. 206—534** **9 Claims**

1. A pharmaceutical dispensing container, which contains two dosage units which are symptomatic treatments for respiratory tract disorders, the first of these dosage units being non-sedative, and the second of these dosage units being sedative, and an indicia for distinguishing between said first and second dosage units is provided on at least one of the container and said dosage units.





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**4,295,568**

## PRESSURE FRAME WITH BOWED SIDE MEMBERS

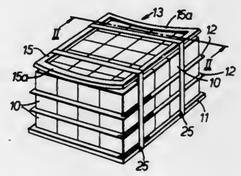
**Kenneth S. E. Orpen, 2 Oak Lodge La., Westerham, Kent, England**

**Filed Aug. 8, 1979, Ser. No. 64,825**

**Claims priority, application United Kingdom, Aug. 15, 1978, 33352/78**

**Int. Cl.³ B65D *19/00***

**U.S. Cl. 206—597** **13 Claims**



1. A holding frame as hereinbefore defined, for use in securing a stack of articles together, wherein two side members at opposite sides of the frame are bowed, the flange-defining parts thereof being upwardly concave when the frame is disposed horizontally, flange uppermost, the frame being elastically deformable whereby the bowing and tilting of the said two side members is reduced when force is applied to the other side members which reduces the tilting of the latter side members.

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**4,295,569**

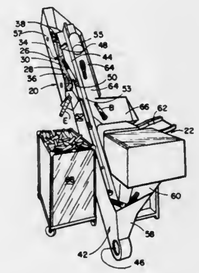
## APPARATUS FOR SORTING TEXTILE BOBBINS

**Kurt W. Niederer, Charlotte, N.C., assignor to The Terrell Machine Company, Charlotte, N.C.**

**Filed Sep. 25, 1979, Ser. No. 78,700**

**Int. Cl.³ B07C *5/04***

**U.S. Cl. 209—634** **32 Claims**



1. An apparatus for sorting textile bobbins into groups comprises respectively of empty bobbins and bobbins having residual yarn wrapped thereabout, comprising:

(a) sorting conveyor means having a yarn engaging surface and being arranged for upwardly inclined movement of said yarn engaging surface for upward conveyance and discharge therefrom of bobbins having residual yarn wrapped thereabout by engagement of the yarn by said yarn engaging surface and for downward sliding discharge therefrom of empty bobbins,

(b) means for driving said sorting conveyor means, and

(c) means for feeding bobbins onto said sorting conveyor means including transporting conveyor means passing closely adjacent said sorting conveyor means and being higher than said sorting conveyor means at the location of adjacency for transporting bobbins to the location of adjacency and depositing said bobbins at said location onto said sorting conveyor means, bobbins being carried on said transporting conveyor means in generally axial alignment with the longitudinal extent thereof, said bobbin feeding means including side wall means extending between said transporting conveyor means and said sorting conveyor means, said side wall means having an opening therein at the location of adjacency of said transporting conveyor means to said sorting conveyor means, and said transporting conveyor means being oriented in cross-section at the location of adjacency thereof to said sorting belt means at a downward incline toward said side wall means such that bobbins being transported along said transporting conveyor means move toward said side wall means and fall through said opening therein onto said sorting conveyor means.

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**4,295,570**

## AUTOMATIC SELECTION AND DELIVERY APPARATUS OF ASSEMBLED MECHANICAL PARTS

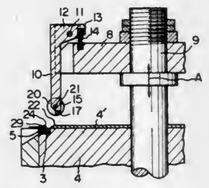
**Tsutomu Hakoi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Dec. 21, 1979, Ser. No. 105,939**

**Claims priority, application Japan, Dec. 26, 1978, 53-161534**

**Int. Cl.³ B07C *9/00***

**U.S. Cl. 209—657** **6 Claims**



1. An automatic selection and delivery apparatus for assembled mechanical parts which comprises:

a base having at least one recess for receiving an assembled body the correctness of which is to be detected;

a first delivery arm having an end which includes a portion for engaging a projection which will exist on a correctly assembled body but not on an incorrectly assembled body;

said end being made to move over said base along said recess,

said base having a disk-shaped configuration and provided about its circumference with a plurality of recesses spaced apart at a fixed angular pitch for receiving assembled bodies,

said base being rotated step-wise by said fixed angular pitch, and

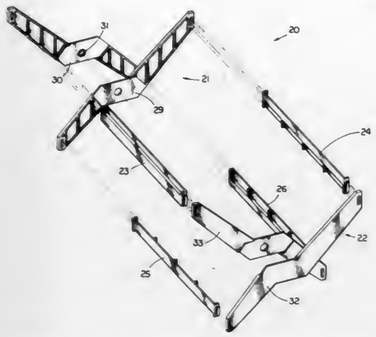
said first delivery arm being driven radially of said disk-shaped base along one of said recesses in said base whenever said base comes to a stop.

**4,295,571**

## FILE FOLDER SUPPORT RACK

**Stephen T. Meyer, Carmel, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.**

**Filed Apr. 27, 1979, Ser. No. 34,174**
**Int. Cl.³ A47B** *3/02;* **B42F** *15/00*
**U.S. Cl. 211—200** **6 Claims**



1. A support device for retaining file folders of the type having a support hook on each corner in a suspended upright orientation, said support device comprising:

two aligned, oppositely disposed end frame members each having a configuration which provides a four-corners arrangement, the upper two corners of each end frame member having substantially the same first distance of separation and the lower two corners of each end frame member having substantially the same second distance of separation, said second distance of separation being different than said first distance of separation, each of said end frame members includes a first offset arm portion and a second offset arm portion pivotally connected to said first offset arm portion at a generally central location, said arm portions being movable with respect to each other between an unfolded offset X-shaped configuration and a folded closed configuration wherein said first distance of separation and said second distance of separation are substantially reduced to zero; and

a plurality of side rails extending between corners of one end frame member and corresponding corners of the other end frame member, each of said side rails having an edge portion suitable to receive said support hooks.

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**4,295,572**

## CANNULA PIERCEABLE SELF-SEALING CLOSURE

**Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.**

**Division of Ser. No. 942,113, Sep. 13, 1978, Pat. No. 4,226,333, which is a division of Ser. No. 880,474, Feb. 23, 1978, Pat. No. 4,136,794, which is a division of Ser. No. 729,643, Oct. 5, 1976, Pat. No. 4,111,326, which is a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application May 8, 1980, Ser. No. 147,948**
**Int. Cl.³ B65D** *39/04*
**U.S. Cl. 215—247** **1 Claim**

1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises:

(a) a tubular elastomeric body having

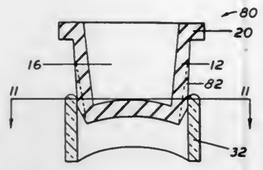
(i) flexible, elastic sidewalls;

(ii) an open first end; and

(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls; said sidewalls bearing a plurality of grooves in the outer surface thereof and in the direction of the vertical axis of said closure; and

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;



whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

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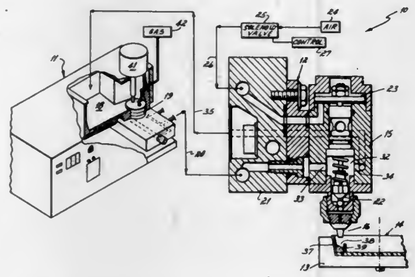
**4,295,573**

## METHOD OF OBTAINING A SEAL UPON THE INTERIOR SURFACE OF A CONTAINER CLOSURE AND RESULTING PRODUCT

**Robert R. Terry, Dunwoody, Ga., and Jacob J. Boone, Vermilion, Ohio, assignors to Nordson Corporation, Amherst, Ohio**

**Filed Dec. 21, 1979, Ser. No. 101,502**
**Int. Cl.³ B65D** *53/06;* **B32B** *5/18;* **B05B** *7/16*
**U.S. Cl. 215—348** **2 Claims**



1. The method of obtaining a seal upon the interior surface of a closure for a container, which method comprises

heating a thermoplastic adhesive material which is solid at room temperature so as to convert said adhesive material to the molten state,

creating a mixture of gas and molten thermoplastic adhesive,

pressurizing said mixture of gas and molten thermoplastic adhesive so as to force said gas into solution with said molten thermoplastic adhesive,

dispensing the pressurized mixture of gas and molten adhesive at atmospheric pressure onto the interior surface of a container closure, whereby said gas comes out of solution with said molten thermoplastic adhesive and forms a foamed molten adhesive bead upon said interior surface, and

cooling said foamed molten adhesive bead while maintained as a foam on said interior surface of said closure so as to form a cellular seal adhered to said interior surface of said closure.



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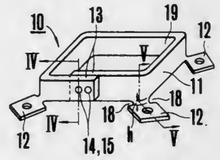
**4,295,574**

## BANDED-TYPE IMPLOSION PROTECTION CATHODE RAY TUBES

**Kooichi Nakazima, Chosei; Keizo Kazama, Mobara, and Hiroshi Oki, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 974,057, Dec. 28, 1978, abandoned. This application May 13, 1980, Ser. No. 149,380**
**Claims priority, application Japan, Feb. 20, 1978, 53-17664**
**Int. Cl.³ H01J** *31/00*
**U.S. Cl. 220—2.1 A** **2 Claims**



1. A combination of a cathode ray tube and an implosion protection tension band mounted on the periphery of the face plate of the cathode ray tube, said band comprising an annular reinforcing band which is so shaped, in advance of mounting of the same, as to be fitted to the periphery of the face plate, said annular reinforcing band being formed from an integral stamped flat metal strip, one end of which overlaps the other end substantially parallel to the adjacent periphery of said face plate and having lugs projecting from the edge of said strip; and interfitting means formed at the overlapped ends of said strip, said one end having an integral raised portion and said other end having an integral recess mating with said raised portion and adapted to be engaged for coupling together the opposite ends of said strip in fixed peripheral relation determined by said raised portion and said recess for accurately determining the inner peripheral length of said annular band, and a joint securing said overlapped ends to form said annular band with accurate said inner peripheral length which is sized to be under tension when thermally shrunk fit on said periphery of said face plate.

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**4,295,575**

## SURFACE RACEWAY BOX

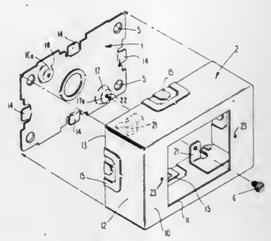
**Charles T. Flachbarth, Parkersburg, W. Va., assignor to Butler Manufacturing Co., Kansas City, Mo.**

**Continuation of Ser. No. 718,590, Aug. 30, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,945**
**Int. Cl.³ H02G** *3/12*
**U.S. Cl. 220—3.92** **1 Claim**

1. In a surface raceway box of the known type having a flat base and a hollow, open-ended cover to be secured to the base, the base being for use in mounting the box on a building wall or a like surface and the cover having a top and a continuous wall extending away from the top with the outer edge of the wall forming said open-end and the top also having access opening means providing access to the cover interior, the improvement for securing the cover to the base which comprises:

a pair of spaced bosses on said base, each boss having a raised section including a hole for receiving the threads of a screw, the bosses being dimentioned so that each raised section is spaced away from the base so as to be located inside said cover when the cover is secured to the base in a position close to said outer edge and substantially spaced away from the underside of said top;

a pair of tabs respectively secured to the inside of said cover wall, each tab being located closely adjacent said outer edge and substantially spaced away from the underside of said top and each tab having a screw captured and rotatably mounted thereon, the tabs being located so that when the cover is positioned over the base to be secured thereto the tabs are respectively positioned over and closely adjacent said raised section whereby the screws are respectively aligned with said holes in condition to be turned into threaded engagement for holding the cover secure to the base;



said top access opening means and said captured screws being aligned with said holes in condition to be turned into threaded engagement providing for easy assembly of the cover to the base by that a screw driver can extend through said top access opening means and through the cover interior to contact and turn said screws into said threaded engagement;

the length of each said screw being made so that when the screw is turned into said threaded engagement the screw extends into the boss less than the full depth of the boss; and

said disposition of said tabs closely adjacent said outer edge providing for single length screws to be employed irrespective of the length of said wall taken between said top and said outer edge.

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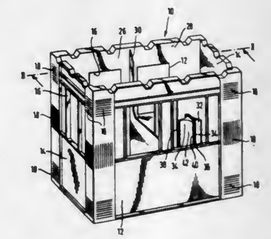
**4,295,576**

## MOLDED CASE FOR RETURNABLE BEVERAGE BOTTLES

**Rudolf F. Steinlein, Munich, Fed. Rep. of Germany, assignor to Alexander Schoeller & Co., AG., Switzerland**

**Filed Oct. 30, 1979, Ser. No. 89,304**
**Claims priority, application Canada, Oct. 31, 1978, 315579; Fed. Rep. of Germany, Apr. 12, 1979, 7910849[U]**
**Int. Cl.³ B65D** *1/24*
**U.S. Cl. 220—21** **12 Claims**



1. A molded thermoplastic resin case for transporting bottle carriers or minicases filed with beverage bottles or single beverage bottles, including:

a box structure having side walls and a floor; and

at least one separator column extending upwardly from said floor within said box structure, said column being subdivided into partial pillars defining a slot therebetween for receiving therein a dividing wall of a bottle carrier or minicase with bottles contained therein to be inserted into the case;

each of said pillars being formed from a web-like, profiled, single wall having opposed inner and outer surfaces, said outer surface of each said profiled wall facing said side walls of said box structure and forming concave, vertically extending bottle contact faces for separating bottles inserted in said box structure, said inner surface of each said profiled wall defining said slot at a top portion thereof.

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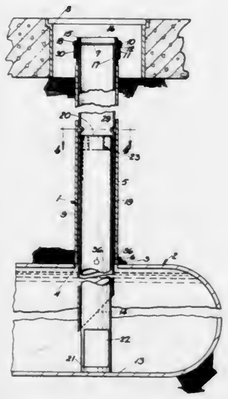
**4,295,577**

## ANTI-THEFT DEVICE FOR LIQUID STORAGE TANKS

**Michael G. Schmid, 5383 North St., Rte. 48, Lebanon, Ohio 45036, and Roger W. Hurt, 5604 Lesourdsville-Westchester Rd., Hamilton, Ohio 45011**

**Filed May 23, 1980, Ser. No. 152,672**
**Int. Cl.³ B65D *3/00*; B67C *3/00***
**U.S. Cl. 220—86 AT** **3 Claims**



1. A device for preventing theft of liquid from a storage tank of the type having a liquid fill opening positioned on the upper surface of the tank, a hollow fill tube extending upwardly from the opening, and filling means associated with the upper end of the fill tube for introducing liquid into the tank, said theft preventing device comprising:

an elongated hollow tube-like stanchion positionable within the fill tube, the lower end of said stanchion being configured to rest upon the bottom of the liquid storage tank, said stanchion including an opening to permit flow of the liquid from the fill tube to the tank interior;

and

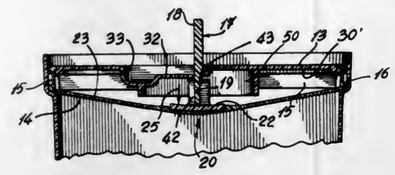
a grid-like baffle plate having a plurality of transversely extending web members forming adjacent openings dimensioned to prevent the introduction of a siphon tube of greater than a predetermined size, attached to the interior of said stanchion.

**4,295,578**

## CONTRACTABLE CLOSURE MEMBER

**Daniel Parent, St-Hyacinthe, Canada, assignor to Plastiques Modernes Ltee., Quebec, Canada**

**Filed Mar. 10, 1980, Ser. No. 128,452**
**Int. Cl.³ B65D *53/00***
**U.S. Cl. 220—234** **20 Claims**



1. A contractable closure member for sealing an open-ended container, said closure member comprising a top wall, a bottom wall formed from an elastic material and having an integral continuous side wall, seal means in said side wall, said side wall being securable to said top wall with said bottom wall held in spaced relationship therewith, a retracting lever pivotally secured below said top wall and having an engagement end and a pusher end, said pusher end being arcuately displaceable against a central portion of said bottom wall to distend said bottom wall whereby said side wall will be drawn inwardly to remove sealing pressure of said seal means when said closure member is positioned for sealing engagement with an open-ended container.

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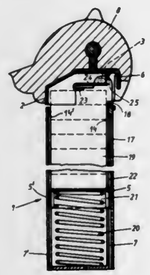
**4,295,579**

## TABLET DISPENSER

**Eduard Haas, Vienna, Austria, assignor to Centromint Company Establishment, Vaduz, Liechtenstein**

**Filed Apr. 7, 1980, Ser. No. 138,224**
**Claims priority, application Austria, Sep. 26, 1979, 6305/79**
**Int. Cl.³ B65D *83/04*; B65H *1/00, 1/08*; G07F *11/16***
**U.S. Cl. 221—229** **5 Claims**



1. A tablet dispenser comprising a housing part and a tablet storage receptacle part coaxially displaceably mounted in the housing part, the storage receptacle part including a spring biased to press a stack of tablets stored in the receptacle part upwards towards a dispensing end of the receptacle part, one of the parts having an end remaining in contact with the other part in an outer end position of the receptacle part in relation to the housing part, the one part providing a space defining a free play between the parts terminating short of the contacting end, and the other part having a catch arranged close to an end of said other part contacting the end of the one part in the outer end position, a tolerance remaining between the catch and the space, and the catch having a height corresponding to the tolerance, a sloping run-up section extending between the catch and the space adjacent the contacting ends.



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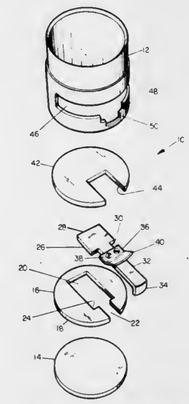
**4,295,580**

## CLOSURE DISPENSER

**Christopher P. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Aug. 16, 1979, Ser. No. 66,942**
**Int. Cl.³ B65G *59/06***
**U.S. Cl. 221—268** **1 Claim**



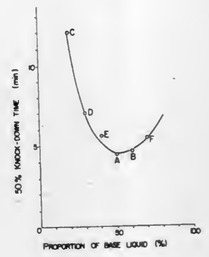
1. A dispenser for a flexible disk shaped closure with an attached rim, including an elongate cylindrically shaped closure storing chamber for storing a vertically oriented stack of closures, a bottom plate positioned adjacent one end of said storing chamber and attached thereto, a slide bar retaining plate positioned next to and in juxtaposed relationship with respect to said bottom plate, an elongated slot, formed with reentrant corners, positioned along a diameter of said slide bar retaining plate, a slide bar positioned and guided for movement within said slot, said movement being limited by engagement of said slide bar with said reentrant corners, a closure engagement foot attached to and positioned intermediate the ends of said slide bar, an upturned edge on said closure engagement foot cantilevered at an angle with respect to said slide bar for engaging the inside rim of a closure, a cover plate containing a slotlike aperture for surrounding a portion of said closure engagement foot, said cover plate positioned adjacent to and above said slide bar, a circumferentially positioned aperture in said storing chamber wall opposite said slot in said slide bar retaining plate, a notch formed in a bottom edge of said aperture for providing specific ingress and egress for said slide bar and its closure engagement foot, said slide bar passing through and movable within said notch so that when said slide bar is moved from an inward to an outward position a closure will be partially withdrawn from said dispenser through said aperture and when said slide bar is moved from an outward to an inward position said cantilevered upturned edge will cam beneath the rim of a closure positioned within said storing chamber and assume a position whereby the next closure can be extracted from said dispenser.

**4,295,581**

## INSECTICIDAL AEROSOL FORMULATION HAVING A LIQUIFIED PETROLEUM GAS PROPELLANT

**Takashi Yamaguchi, Nishinomiya; Yoshitoshi Okuno, Toyonaka, and Chuji Hirose, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Continuation of Ser. No. 857,801, Dec. 5, 1977. This application Mar. 24, 1980, Ser. No. 133,600**
**Claims priority, application Japan, Dec. 9, 1976, 51-148426**
**Int. Cl.³ B65D *83/14***
**U.S. Cl. 222—192** **1 Claim**




1. An insecticidal aerosol formulation comprising a pressure-proof container equipped with a valve having a housing orifice of 0.46–0.64 mm in diameter, button, stem and vapor tap orifices of 0.33–0.41 mm in diameter wherein the stem orifice diameter ≦ vapor tap orifice diameter ≦ button orifice diameter, filled with a base liquid consisting essentially of at least one pyrethroid type insecticide dissolved in kerosene having a boiling point of 180° to 260° C. and a propellant consisting essentially of a liquified petroleum gas wherein the volume ratio of the base liquid to the liquified petroleum gas is 50:50 to 60:40.

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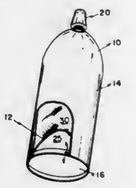
**4,295,582**

## DISPENSING CONTAINER WITH IMPROVED AIR VALVE

**Alexander D. Acres, 368 Glenrose Dr., London, Ontario, Canada (N6K 2A8)**

**Filed Aug. 9, 1979, Ser. No. 65,269**
**Int. Cl.³ B65D *37/00***
**U.S. Cl. 222—213** **5 Claims**



1. An improved air valve for a dispensing container, the container including a resilient housing, a bottom, and a resilient expandable membrane mounted between the housing and the bottom to internally partition the container into an ingredient dispensing chamber and an air chamber, the housing defining an ingredient dispensing orifice that communicates with the ingredient containing chamber, the improvement comprising:

(a) the bottom formed to matingly seal marginal edges of the membrane with peripheral walls of the container, the bottom forming a recess and having an inclined sloped portion, an aperture formed in said inclined sloped por-

tion, the sloped portion forming an acute angle with the housing, whereby on flexing of the housing, a portion of the membrane is caused to be sealingly urged against the aperture and hence to sealingly close the same whereby air in the air chamber is urged against the membrane to urge ingredients in the ingredient chamber out of the ingredient orifice.

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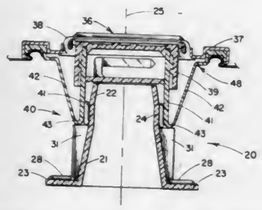
**4,295,583**
**CLOSURE CAP VENT**
**Robert E. Schurr, Garrett, Ind., assignor to Rieke Corporation, Auburn, Ind.**
**Filed Aug. 9, 1979, Ser. No. 65,183**
**Int. Cl.³ F65D 25/44**
**U.S. Cl. 222—478** **8 Claims**



1. A venting device for use with and secured to a container pour spout of the style having an outer base portion and a smaller inner cylindrical portion with an invertible fold portion therebetween, said venting device arranged to allow the entry of air into the corresponding container at a location exterior to the exiting fluid flow stream, said venting device comprising:

a hollow central body portion having a top end which includes a generally cylindrical section and joined thereto and in end-to-end relationship therewith a frustoconical section, each section extends above said invertible fold portion and into said smaller inner cylindrical portion and said top end of said hollow central body portion is arranged substantially concentric with said container pour spout in a uniformly spaced-apart manner, the resultant space between the outside surface of said top end and the inside surface of said smaller inner cylindrical portion providing a generally annular air flow passageway for entering venting air, said hollow central body portion further comprising a base and an interior passageway extending therethrough, said central body portion tapering inwardly as it extends from said base to said top end resulting in a progressively reduced cross-sectional area; and

a substantially flat flange portion integral with said base and including a spaced plurality of outwardly radiating ribs.

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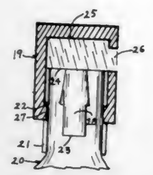
**4,295,584**
**SIDE DISPENSING CLOSURE**
**Raymond P. Borowitz, Rte. 6, Box 2067, Escondido, Calif. 92026**
**Filed Jan. 22, 1979, Ser. No. 5,340**
**Int. Cl.³ B65D 47/28**
**U.S. Cl. 222—519** **1 Claim**

1. A dispensing closure and container comprising: a closure with a top and side wall portion or skirt; said skirt having an opening or openings of any size constructed or molded therein for the dispensing of container's contents; said skirt also having inward facing projections; a container with an open-end neck portion; said neck having external longitudinally extending pillars cooperating with the inward facing projections of the cap skirt to define a guidepath of axial reciprocation; there being at least two pillars forming the guidepath; each pillar having vertically positioned stop lugs to limit the extent of outward opening axial movement of the cap; and alternate pillars having a length less than an adjacent pillar to receive the inward projections of the cap skirt in the inward closed position of the cap upon partial rotation of the cap to seal the cap in the closed position.



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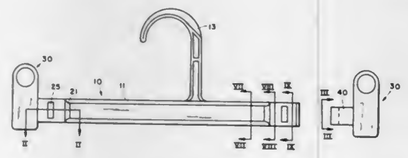
**4,295,585**
**MULTI-PIECE HANGER**
**Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.**
**Filed Apr. 16, 1979, Ser. No. 30,287**
**Int. Cl.³ A47J 51/14**
**U.S. Cl. 223—96** **5 Claims**



1. An article hanger having a frame and an article engaging member; said frame having means by which it can be suspended, said article hanger characterized in that said article engaging number and said frame are separate components and two-part means are provided for locking said article engaging member and frame together, said means including a track opening through one end of said frame and said article engaging member having a tongue adapted to be slidably and telescopically received in said track, said track and tongue being shaped to hold said article engaging member against rotation in any direction with respect to said frame.

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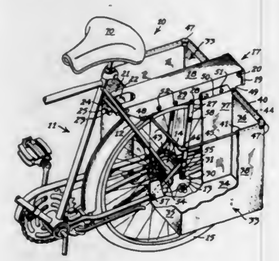
**4,295,586**
**RECEPTACLE SUPPORT APPARATUS FOR BICYCLE**
**Norman E. Shockley, 1119 Murfreesboro Rd., H-3, Nashville, Tenn. 37217**
**Filed Jan. 24, 1980, Ser. No. 115,013**
**Int. Cl.³ B62J 9/00**
**U.S. Cl. 224—32 R** **8 Claims**



1. A receptacle support apparatus for a bicycle having a rear wheel and a bicycle frame including a rear fork straddling and connected to the rear wheel, comprising:

(a) a support frame,

(b) means mounting said support frame on said bicycle frame over said rear wheel,

(c) at least one receptacle made of flexible sheet material having a bottom wall, end walls, and inboard and outboard side walls, said end walls and said side walls having upper margins defining an open top,

(d) rod means comprising an outboard rod portion cooperatively engaging the upper margin of said outboard side wall, and end rod portions cooperatively engaging the upper margins of said respective end walls,

(e) each of said end rod portions having inboard end portions and having outboard ends connectable to said outboard rod portions, and

(f) means for detachably mounting said inboard end portions to said support frame.



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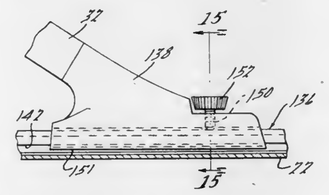
**4,295,587**
**ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES**
**John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236**
**Division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Jul. 10, 1979, Ser. No. 56,154**
**Int. Cl.³ B60R 11/00**
**U.S. Cl. 224—321** **6 Claims**



1. In an article carrier for an automotive vehicle,

a plurality of at least two parallel arranged slats fixedly secured on a generally horizontally extending exterior body surface of the vehicle and lying closely adjacent said surface,

each of said slats having major and minor dimensions, with said major dimension being arranged substantially parallel to said body surface,

each of said slats having a clamping surface extending longitudinally on the exterior surface thereof,

an article supporting member mounted on at least one of said slats and having clamping means clampingly engageable with said one slat for securing said member thereto, said clamping means being operable to apply a first vertically downwardly directed force against said one slat and a second vertically upwardly directed force against said one slat and being readily loosened for the movement of said member longitudinally of said slats and for the removal and reattachment of said article supporting member solely at the longitudinal end extremes of said slat.

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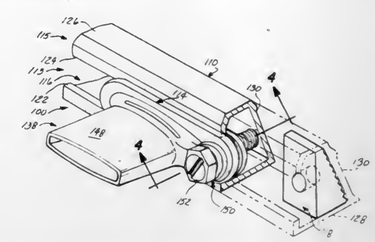
**4,295,588**
**SLOTTED SIDE RAIL AND MOVABLE BRACKET FOR ARTICLE CARRIER**
**Daniel J. Kowalski, Ortonville, and Ray G. Mareydt, Warren, both of Mich., assignors to Four Star Corporation, Troy, Mich.**
**Filed Sep. 4, 1979, Ser. No. 71,938**
**Int. Cl.³ B60R 9/00**
**U.S. Cl. 224—321** **2 Claims**



1. An adjustable cross-rail assembly for a vehicle-mounted article carrier of the type including a hollow side rail supported upon a vehicle surface, said rail including transversely spaced inner and outer walls, said inner wall including a longitudinally extending slot, a bracket slidably supported within said slot and including a cross-rail supporting portion projecting transversely inwardly of the inner wall of said side rail and means for releasably locking said bracket to said side rail, the improvement comprising:

(a) said bracket being bifurcated to provide inner and outer portions straddling said side rail slot, a threaded bore formed through said inner and outer portions and extending transversely through said side rail slot;

(b) a member slidably disposed within said side rail and including a recess adapted to be transversely aligned with said bracket bore, said member being transversely spaced outwardly from the outer portion of said bracket and including an outer surface disposed proximate the outer wall of said side rail; and

(c) an element extending through and threadable within said bracket bore and projecting within the member recess whereby rotation of said element in one direction respectively causes the outer surface of said member to engage with the outer wall of the side rail and the outer portion of said bracket to engage with the inner wall of said side rail to adjustably fix the longitudinal position of said bracket relative to the side rail.

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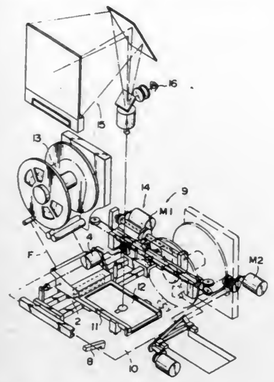
**4,295,589**
**DEVICE FOR FEEDING WEB WITH TEMPERATURE COMPENSATING MEANS**
**Shigenori Oosaka, and Makoto Murakoshi, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**
**Filed May 22, 1980, Ser. No. 152,190**
**Claims priority, application Japan, May 25, 1979, 54-64623**
**Int. Cl.³ B65H 17/26**
**U.S. Cl. 226—122** **4 Claims**

1. A device for feeding a web comprising a rubber roller for feeding a web, a stepping motor for driving the rubber roller by way of a power transmission means, a pulse generator connected wih the stepping motor for driving the stepping motor by the pulses generated thereby, a temperature detecting means for detecting the temperature of the rubber roller directly or indirectly, and a temperature compensating means for controlling the number of pulses generated by the pulse generator according to the temperature detected by said temperature detecting means in such a manner that the speed of

rotation of said rubber roller is controlled to effect the constant speed of web feeding irrespective of the temperature detected,



whereby the web is fed at a constant speed irrespective of the temperature of the rubber roller.

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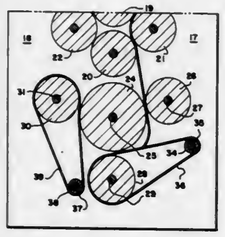
**4,295,590**

## APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIALS

**Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090**

**Filed Jun. 10, 1980, Ser. No. 158,248**
**Int. Cl.³ B65H *17/22*; G03B *1/56***
**U.S. Cl. 226—183** **6 Claims**



1. In apparatus for processing photographic material by conveying an elongated web for turnaround in a confined space comprising

spaced frame members,

means carried by said spaced frame members for directing the web in an arcuate path,

said means comprising an endless web guiding belt for engagement by the leading edge of the web and by the web.

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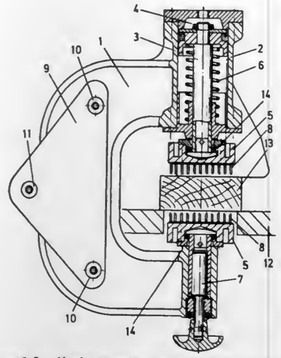
**4,295,591**

## NAIL PRESS

**Sten Lundström, Boras, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden**

**Filed Jan. 22, 1980, Ser. No. 114,251**
**Claims priority, application Sweden, Jan. 30, 1979, 7900785**
**Int. Cl.³ B27F *7/15***
**U.S. Cl. 227—142** **5 Claims**

1. A nail press assembly comprising a yoke of generally C-shaped configuration, a hydraulic actuated piston mounted at one end of the said yoke, a shaft member aligned with said piston at the opposite end of said yoke, the confronting ends of said piston and shaft member mounting confronting first and second press plates including means for removably supporting first and second nail plates, said first and second press plates



being mounted for limited universal pivotal movement on said piston and shaft member respectively.

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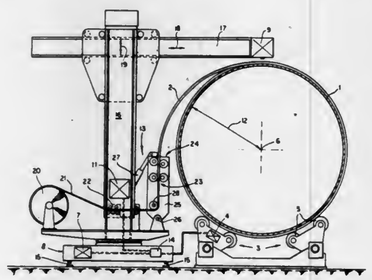
**4,295,592**

## APPARATUS FOR JOINING AND CLADDING PIPE SECTIONS

**August W. Schäfer, Wilnsdorf-Wilden, Fed. Rep. of Germany, assignor to Wilhelm Schäfer Maschinenbau, Wilnsdorf-Wilden, Fed. Rep. of Germany**

**Filed Oct. 9, 1979, Ser. No. 82,624**
**Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847966**
**Int. Cl.³ B23K *37/02, 37/04***
**U.S. Cl. 228—17** **6 Claims**



1. An apparatus for joining pipe sections and for forming around the joined pipe sections a helical passage, said apparatus comprising:

means including a cradle for holding two cylindrical pipe sections with their ends abutting axially and their axes coaxial;

means including a roller in said cradle for jointly rotating said sections about said axes with said ends abutting;

a track extending parallel to said axes;

a carriage displaceable axially on said track adjacent said cradle and including an upright post and a horizontal outrigger carried on said post;

means including a primary welding tool on said carriage for welding together the ends of said pipe sections as same rotate;

a supply of flat metal strip on said carriage;

means on said carriage for withdrawing said strip from said supply, bending said strip into a U-section, arcing said strip to a radius of curvature substantially equal to that of said sections, and helically applying the arced strip to said pipe sections as same rotate with the concave side of said strip turned toward said sections, whereby said strip forms with said sections a helical passage;

means including a secondary welding tool on said carriage for welding the arced strip helically to said pipe sections as same rotate;

means for vertically displacing said outrigger on said post for displacing said tools radially of said axes and for retaining said tools in any of a multiplicity of radially offset positions on said carriage, said tools being downwardly directed and effective, whereby welding is effected at the highest parts of said sections; and

control means connected to all of said means for synchronously axially displacing said carriage on said track and rotating said pipe sections during welding of the arced and U-section strip to said sections.



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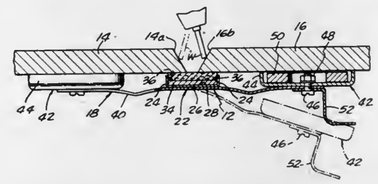
**4,295,593**

## WELDING SEAM BACK-UP MEANS

**Milo M. Kensrue, 601 Lido Park Dr., 8B, Newport Beach, Calif. 92663**

**Filed Sep. 24, 1979, Ser. No. 78,339**
**Int. Cl.³ B23K *37/06***
**U.S. Cl. 228—50** **12 Claims**



1. A welding seam back-up means for mounting on the back side of the adjacently positioned edge margins of members to be joined by a weld seam, comprising:

a. an elongated tape of flexible material adapted to be positioned in straddling relation over said adjacent edge margins and extending longitudinally therealong;

b. tape holding means adapted to be positioned over said tape; and

c. means for releasably securing said tape holding means and applying pressure in a direction to force the tape against the adjacent edge margins comprising a plurality of attaching brackets for mounting at spaced intervals longitudinally of the tape holding means and adapted to transversely straddle the tape holding means, each of said brackets including:

an elongate longitudinally bowed strap-like spring; and

a magnet connected to each end of said spring;

whereby with the bowed spring engaged between its ends with the tape holding means, the magnets will be initially respectively in spaced relation to the members to be joined by the weld, and upon movement of the magnets into engagement with said members, will deform and activate the bowed spring so as to apply a holding pressure against said tape holding means.

10. A welding seam back-up means for mounting on the back side of the adjacently positioned edge margins of members to be joined by a weld seam, comprising:

a. an elongate tape of flexible material adapted to be positioned in straddling relation over the adjacent edge margins and extending longitudinally therealong;

b. tape holding means comprising an elongate channel member having a low heat sink capability adapted to be positioned over and to receive said tape therewithin and extending therealong;

c. an elongate separate bar of a material having a high heat conducting characteristic positioned in the channel in underlying relation to said tape to provide a high heat sink capability;

d. means for releasably retaining said bar within said channel including a screw rotatably supported in said channel and having threaded engagement with said bar; and

e. means for releasably securing said tape holding means and applying pressure in a direction to force the tape against the adjacent edge margins.

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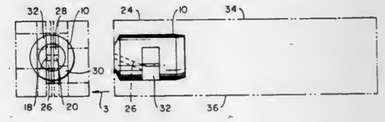
**4,295,594**

## LAMINATED JET PIPE RECEIVER PLUG ASSEMBLY METHOD AND STRUCTURE

**Robert D. Nicholson, Birmingham, and Alger T. Daniel, Clawson, both of Mich., assignors to Koehring Company, Brookfield, Wis.**

**Filed May 22, 1979, Ser. No. 41,494**
**Int. Cl.³ B23K *1/20*; B23P *13/00***
**U.S. Cl. 228—160** **8 Claims**



2. The method of manufacturing a receiver plug assembly structure comprising preparing a plurality of plates with openings extending therethrough which are positioned to provide passages through the receiver plug assembly when the plates are positioned adjacent to each other in surface to surface contact, said plurality of plates including at least one centrally located divider plate having spaced apart transverse openings therethrough and at least one port plate positioned on each side of the divider plate having transverse openings therethrough, which openings are aligned with the openings through the divider plate and a transverse opening extending through the end of each of the port plates in communication with separate ones of the aligned openings through the divider plate, placing a brazing compound on selected surfaces of the plates, assembling the plates in surface to surface contact to provide the passages through the receiver plug assembly, subjecting the assembled plates to brazing temperature and pressure to braze them together, and machining the brazed-together plates into the desired exterior form of the receiver plug assembly.

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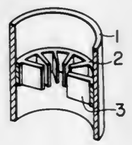
**4,295,595**

## METHOD OF PRODUCING MAGNETRON ANODE

**Kuninori Imai, Shiroyamamachi, and Soji Takahashi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 25, 1979, Ser. No. 6,484**
**Claims priority, application Japan, Jan. 25, 1978, 53-6198; Jan. 27, 1978, 53-7251**
**Int. Cl.³ B23K *28/02***
**U.S. Cl. 228—161** **14 Claims**



1. A method of producing a magnetron anode having a plurality of copper vanes which extend radially inward from the inner peripheral surface of said copper anode toward the center of said copper anode comprising:

a first step of cleaning the outer peripheral surface of a

copper blank and the inner peripheral surface of a straight steel cylinder blank material;

a second step of fitting said copper blank to the inside of said straight steel cylinder blank material so that the cleaned outer peripheral surface of said copper blank and the cleaned inner peripheral surface of said straight steel cylinder blank material contact each other, and then compacting said copper blank to said steel cylinder blank material;

a third step of preheating said copper blank compacted to said steel cylinder blank material and press working said copper blank by penetrating said copper blank with a shaping punch so that said steel cylinder blank material is raised in a direction opposite to the penetration of the shaping punch within a time region between the instant at which the shaping punch contacts said copper blank and the instant at which the shaping flow of said copper blank becomes steady, so as to maintain a constant length between the upper end of said steel cylinder blank material and the upper end of the peripheral portion of said copper blank after the compaction without causing relative sliding between said steel cylinder blank material and said copper blank; and

a fourth step of effecting a post-treatment on the press-shaped copper blank and steel cylinder blank material so as to obtain a tight bonding and desired shape of said anode;

wherein said third step is carried out such that said steel cylinder blank material is made to move upward during said press working, the amount of rise of said steel cylinder blank material in said pressworking of said third step being ((extrusion ratio)−1)×0.7 times as large as the penetration of said shaping punch.

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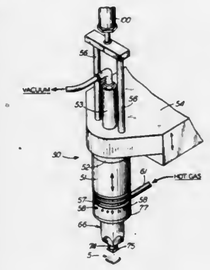
**4,295,596**

## METHODS AND APPARATUS FOR BONDING AN ARTICLE TO A METALLIZED SUBSTRATE

**Bradford O. Doten, Hopewell Township, Mercer County, N.J., and John J. Svitak, Lower Makefield Township, Bucks County, Pa., assignors to Western Electric Company, Inc., New York, N.Y.**

**Filed Dec. 19, 1979, Ser. No. 105,463**
**Int. Cl.³ B23K *1/12*; H01S *21/60***
**U.S. Cl. 228—180 A** **9 Claims**




1. A method of bonding an article to a metallized substrate, at least one of which has a predeposited reflowable bonding material thereon, the method comprising the steps of:

positioning the article on the metallized surface of the substrate;

directing at least one stream of hot gas towards the substrate;

redirecting the gas stream laterally, substantially parallel to the surface of the substrate, towards the article to reflow the material; and

resolidifying the material to form a bond between the article and the metallized surface of the substrate.

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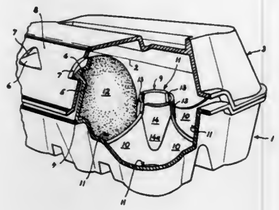
**4,295,597**

## TRAY BLANK FOR EGGS

**Jorgen N. Petersen, Lyngby, Denmark, assignor to Aktieselskabet Brodrene Hartmann, Lyngby, Denmark**

**Continuation of Ser. No. 624,965, Oct. 22, 1975, abandoned.**
**This application Sep. 28, 1977, Ser. No. 837,533**
**Claims priority, application Denmark, Jan. 27, 1975, 25219/75**
**Int. Cl.³ B65D *1/24, 85/32***
**U.S. Cl. 229—2.5 EC** **5 Claims**



1. A tray blank especially for eggs comprising an egg carrier section and a cover, said carrier section having a plurality of egg-receiving compartments, each of said compartments being in part defined by a projection extending upwardly from the bottom of said carrier section, each projection having an open top, each projection having lateral wall portions, each lateral wall portion having an upper free edge at said open top, at least two slits in each projection, said slits extending downwardly from said upper free edge, said slits defining the lateral extent of said wall portions at and adjacent said upper free edge, each wall portion extending downwardly beyond said slits into a compartment, said wall portion being resilient due to the presence of said slits, said slits being free of engagement with said cover when said cover is in its closed position, said slits also being free when said cover is in its closed position to become reduced in size due to flexing of said wall portions, said wall portions in part defining an egg-receiving compartment only on one side of said wall portions, and the opposite side of said wall portions in part defining a space at all times free of eggs, whereby said wall portions may at all times give to support eggs of different sizes.

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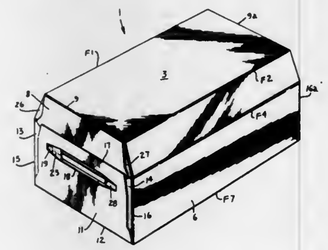
**4,295,598**

## CARTON WITH CARRYING STRAP

**Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio**

**Filed Jun. 20, 1980, Ser. No. 161,408**
**Int. Cl.³ B65D *5/46, 25/28***
**U.S. Cl. 229—52 AL** **15 Claims**



1. An article carton having top, bottom, side and end walls interconnected to form an enclosure which is generally cubical in configuration, means defining an aperture in one of said walls, and a carrying strap having an anchoring part disposed entirely within the carton and arranged in enveloping relation to at least a part of an article disposed within the carton, said strap having a handle part normally disposed within the carton and adjacent said aperture and said handle part being accessible for grasping to facilitate carrying the carton.

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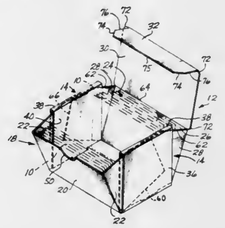
**4,295,599**

## FILE BOX

**John D. Locatelli, 3340 59th Ave. SW., Seattle, Wash. 98116, and Gary M. Gunderson, Seattle, Wash., assignors to John D. Locatelli, Seattle, Wash.**

**Filed May 16, 1980, Ser. No. 150,343**
**Int. Cl.³ B65D *5/22***
**U.S. Cl. 229—34 R** **2 Claims**



1. In a file box having a flat, rectangular bottom panel; a pair of hollow side walls extending upwardly from each side edge portion of the bottom panel, the side walls having front and rear entrance openings; an upright front panel pivotally connected along its bottom edge portion to a front edge portion of the bottom panel to enable the front panel to pivot between a closed, substantially vertical position and an open, forward tilted position; an upright rear panel pivotally connected along its bottom edge portion to a rear edge portion of the bottom panel to enable the rear panel to pivot between a closed, substantially vertical position and an open, rearwardly tilted position; and the improvement comprising:

unitary, substantially rigid and flat front sliding panels extending rearwardly from each side edge portion of the front panel to slidably extend through a corresponding side wall front opening a substantial distance into the hollow interior of the side wall;

unitary, substantially rigid and flat rear sliding panels extending forwardly from each side edge portion of the rear panel to slidably extend through a corresponding side wall rear opening a substantial distance into the hollow interior of the side wall to overlap said front sliding panels;

wherein said front and rear sliding panels slide relative to each other within the hollow side walls and said front and rear sliding panels pivot with their corresponding front and rear panels between a closed position wherein said front and rear sliding panels are disposed in maximum overlapping relationship and substantially entirely within a corresponding side wall, and an open position wherein said sliding panels are disposed in substantially overlapping relationship and extend outwardly from the side walls to form, respectively, front and rear extensions of the side walls; and

a unitary, substantially rigid, flat top panel having front, rear and side edge portions, said top panel being pivotally connected along its rear edge portion to the top portion of the rear panel to pivot between a first, closed position closely overlying the side walls to substantially close off the top of the file box and second, open position extending upwardly from the rear panel to provide unhindered access to the file box.

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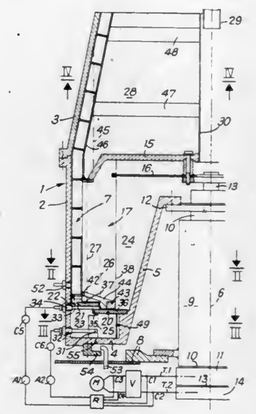
**4,295,600**

## APPARATUS FOR THE CENTRIFUGAL SEPARATION OF AT LEAST TWO LIQUID PHASES AND ONE SEDIMENTARY PHASE OF A MIXTURE

**Pierre L. Saget, 36, avenue de la Grande Armee, Paris, France (75017)**

**Filed Feb. 19, 1980, Ser. No. 122,472**
**Claims priority, application France, Feb. 23, 1979, 79 04748**
**Int. Cl.³ B04B *1/04, 1/20***
**U.S. Cl. 233—7** **11 Claims**



1. An improved apparatus for the centrifugal separation of at least two liquid phases and one solid sedimentary phase from a mixture, the said apparatus comprising: a rotating enclosure, first rotational means for rotating said enclosure, said rotating enclosure disposed around a nozzle supplying the mixture to be treated, said rotating enclosure being closed by a coronal base and coupled to said first rotation means for driving it in rotation, the said enclosure being integral with an angular partition therein which plunges into the mixture beyond the interface of the phases thereof, said partition separating a first chamber in said enclosure containing only the heavy phase from a second chamber in said enclosure containing the light phase "floating" on the heavy phase, said partition providing a peripheral annular passage for the transfer of the said heavy phase from the second chamber towards the first chamber, said first chamber being defined by a peripheral wall, said coronal base and said partition wall, the enclosure further presenting separate thresholds for the draining of the phases, a helical sediment conveyor within said enclosure, a second rotation means coupled to said conveyor via a plate which plunges into the mixture beyond the said interface, said plate separating the second chamber from a cavity in said enclosure with which said second chamber communicates on the periphery via a space near the conveyor for transferring the sediments through the heavy phase,

a first centrifuge device housed in the first chamber and integral with said peripheral wall, said partition wall and said base thereof provided with surfaces extending inside the entire treated volume, across their circular movement, in order to transmit the rotation of the first driving means to the heavy phase according to an angular speed which is scrupulously constant throughout its whole mass and in every one of its points;

a second centrifuge device housed in the second chamber and integral with said plate and with said conveyors, said second centrifuge device plunging at least into the light phase of the second chamber, said second centrifuge device extending along the said second chamber to arrive as close as possible to the partition wall, to the light phase draining threshold and to the annular passage of the heavy phase, and being provided with surfaces extending

through the entire treated volume, across their circular movement, in order to transmit the rotation of the second driving means to at least the light phase, according to an angular speed which is scrupulously constant throughout its whole mass and in every one of its points, thus opposing the natural tendency of this type of flow with constant angular speed to degenerate into an irrotational vortex flow with tangential speed inversely proportional to the radius, which would destroy the stability of the interface and would lead to a re-mixing of the phases,

a device for controlling the two means for driving the centrifuge devices for stabilizing and regulating the ratio of their respective rotation speeds.

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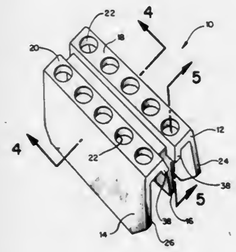
**4,295,601**

## CENTRIFUGE TUBE HOLDER

**Mark J. Cowell, Mountain View, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Nov. 13, 1979, Ser. No. 93,725**
**Int. Cl.³ B04B *15/00***
**U.S. Cl. 233—26** **12 Claims**



1. A centrifuge tube holder comprising:
a first section for holding at least one centrifuge tube;
a second section for holding at least one centrifuge tube, each of said first and second sections having a support leg;
a central support post; and
means for pivotally connecting said first and second sections to allow respective movement between said first and second sections, the bottom edges of said central post, said first section support leg and said second section support leg being positionable in the same general horizontal plane, so that said support legs of said first and second sections with said central support post will support said tubes vertically on a workbench, said bottom edges of said central post, said first section support leg and said second section support leg being positionable in general alignment with a concave cylindrical surface so that said support legs and said central post will hold said tubes horizontally in a rotor with said tubes having different radial orientations with respect to the spin axis of said rotor.

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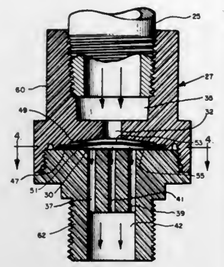
**4,295,602**

## CONTROL VALVE

**Charles H. Priesmeyer, Park Ridge, Ill., assignor to Mark Controls Corporation, Evanston, Ill.**

**Filed Nov. 13, 1979, Ser. No. 93,063**
**Int. Cl.³ G05D *23/10***
**U.S. Cl. 236—93 B** **16 Claims**

13. In a shower of the type including an inlet pipe carrying water and a shower head secured to and communicating with said pipe, the improvement comprising:
a valve for restricting the flow of water with said shower head said valve comprising:
a housing;
a chamber in said housing;
an inlet port communicating with said chamber;
at least one outlet port communicating with said chamber; and
a bimetallic concave-convex circular plate having an aperture therethrough and having a surface, said plate subdividing said chamber into an inlet section containing said inlet port and an outlet section containing said outlet port, said inlet section and said outlet section communicating



substantially only through said aperture, said aperture being offset with respect to at least one outlet port, said plate deflecting when its temperature substantially reaches a first predetermined value to a restricting position in which the surface thereof restricts the flow of water into said outlet port and deflecting into open position when its temperature substantially reaches a second predetermined value to permit the flow of said water into said outlet port.

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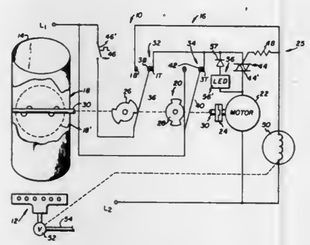
**4,295,603**

## MEANS CONTROLLING A FLUE DAMPER

**Michael T. Clouser, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.**

**Filed Nov. 13, 1979, Ser. No. 93,785**
**Int. Cl.³ G05D *23/00***
**U.S. Cl. 236—1 G** **13 Claims**



1. In a heating system wherein a flue damper regulates gas flow through a conduit from a heat source in accordance with temperature demand means actuating a heat source, an improved means controlling said flue damper comprising: a control means connected to said flue damper to rotate same to selectively open and close same at about 90° increments, including alternating current motor drive means; timing means driven by said motor drive means; and electrical circuit means including switch means responsive to said timing means and controlling electrical power in said control system and solid state switching means having a gate means connected to said heat source and selectively energizing and deenergizing said motor drive means wherein said gate means de-energizes said solid state switching means when said heat source is actuated.

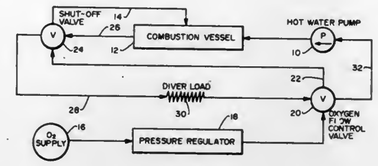


**4,295,604**

## AUTOMATIC TEMPERATURE CONTROL SYSTEM FOR DIVER HEATING SYSTEM

**Sergius S. Sergev, Ventura, and Theodore J. Roster, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 24, 1980, Ser. No. 143,079**
**Int. Cl.³ F23N *5/06***
**U.S. Cl. 236—21 R** **7 Claims**




1. A thermally controlled gas flow valve in which the gas flow through said valve is a function of the temperature of a first fluid comprising:
seat means having an orifice therethrough, a gas being fed under pressure into one end of said orifice;
means for transferring heat between the first fluid and a second fluid having a high coefficient of thermal expansion, including:
a reservoir filled with said second fluid; and
a plurality of tubes disposed within said reservoir, said plurality of tubes being coupled to receive said first fluid so that said first fluid passes through said tubes, said first and second fluid being in thermal contact with each other through said tubes so that heat may be transferred between said fluids;
means for varying the cross-sectional area of said orifice through which gas may flow as a function of the volume of the second fluid, including
expansion bellows means communicating with said reservoir to receive said second fluid so that an increase or decrease in the volume of said second fluid produces an expansion or contraction, respectively, of said bellows means along its longitudinal axis; and
a needle coupled to said bellows means so that expansion and contraction of said bellows means moves said needle into and out of said orifice to vary the cross-sectional area of the passage therethrough, thereby varying the gas flow through said orifice;
a carrier member having an elongated cavity, said bellows means being fixed to said carrier member with the expandable portion of said bellows means being disposed in said cavity, said cavity communicating with said orifice so that the gas passing through said orifice may flow to surround said bellows means within said cavity; and
a valve body having an elongated chamber in which said carrier is disposed, said chamber having inlet means and outlet means so that the first fluid may be circulated through said chamber, the first fluid surrounding said carrier within said chamber.

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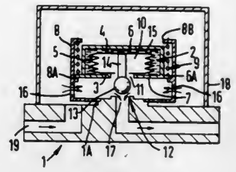
**4,295,605**

## STEAM TRAPS

**Edward R. C. Clayton, Martock, and Alan F. Bennett, Cheltenham, both of England, assignors to Spirax Sarco Limited, Gloucestershire, England**

**Filed Jan. 22, 1980, Ser. No. 114,408**
**Claims priority, application United Kingdom, Jan. 26, 1979, 02777/79**
**Int. Cl.³ F16T *1/10***
**U.S. Cl. 236—56** **6 Claims**

1. A thermostatic steam trap comprising a base; a cover mounted on the base, the base and cover defining a hollow interior of the trap; a casing within said interior fast with the base and cover; a housing movably mounted in the casing; resilient means urging the housing to seat in the casing; a balanced pressure thermostatic element mounted in the housing; a valve member carried by the thermostatic element; an inlet port to said interior; an outlet port from said interior; and a valve seat in the outlet port; the casing locating the housing and the thermostatic element with respect to the outlet port so that the valve member carried by the thermostatic element co-operates with the valve seat in the outlet port for opening and closing the trap; the element defining an internal void that is open to steam/condensate within the trap and that is sealed from the interior of the housing in which the element is



mounted; the housing having its interior sealed from said interior of the trap and containing volatile fluid which entirely fills the housing outside the element when the trap is fully open thereby to support the element; the element being moved by the pressure exerted by the volatile fluid upon heating of the fluid to urge the valve member carried by the element on to the valve seat to close the trap with the element, in the trap fully-closed condition, being in a nearly nesting condition; the housing moving away from its seating condition in the casing, against the action of said resilient means; to permit the element to adopt a fully nesting condition if further heating of the volatile fluid occurs.

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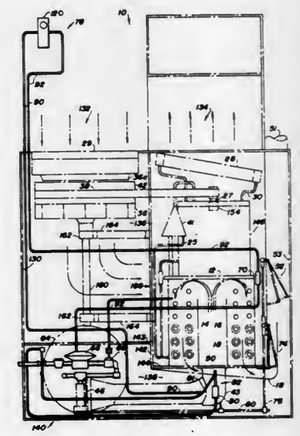
**4,295,606**

## HEATING SYSTEM

**Paul F. Swenson, 25525 Edgecliffe, Euclid, Ohio 44132**

**Filed Aug. 14, 1978, Ser. No. 933,500**
**Int. Cl.³ F24D *5/00***
**U.S. Cl. 237—12.1** **12 Claims**



1. A self-contained, self-starting, heat powered air heating system for residential use comprising:
a vapor generator for converting a liquid to a vapor;
a rotary vapor turbine mounted in a container and connected for receiving all of the vapor coming from said vapor

generator and producing work during the expansion of the vapor passing therethrough;

a heat exchanger mounted at an elevation above said vapor generator for receiving all of the vapor exhausting from said turbine and operating at subatmospheric pressure for condensing said vapor;

feed pump means directly driven by said turbine and mounted at an elevation below the heat exchanger and between the heat exchanger and the vapor generator in a fluid flow relationship and connected to return said condensed vapor from said heat exchanger to said vapor generator;

fa means located exteriorly of said turbine container for conducting air over said heat exchanger to extract heat therefrom;

hermetically sealed drive means connecting said turbine to drive said fan means without shaft penetration of said container;

said vapor generator, said turbine, and said heat exchanger being connected in a hermetically sealed closed-loop cycle;

a gas burner for heating said vapor generator; and,

control means for controlling the flow of fuel to said burner including a thermostat responsive to the demand for heat at the point of use.

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**4,295,607**

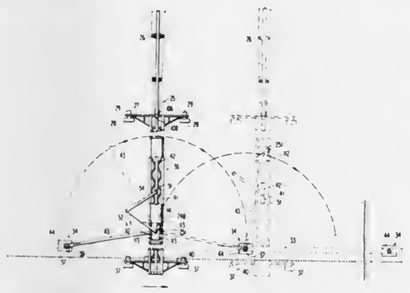
## LAND IRRIGATING SYSTEM AND METHOD

**Allen T. Noble, P.O. Box 1201, Boise, Id. 82701**

**Continuation-in-part of Ser. No. 923,291, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Jun. 15, 1979, Ser. No. 48,886**

**Int. Cl.³ A01G** *25/09*

**U.S. Cl. 239—1** **14 Claims**



1. In connection with land irrigation wherein a moving sprinkler means having a water inlet means at one point moves along the length of a stationary water supply means having a plurality of water outlet valve means at spaced intervals along the length thereof, the method of successively connecting water outlet valve means of the stationary water supply means with water inlet means of the water sprinkler means to obtain substantially continuous water supply to the water sprinkler means comprising

providing a conveyance means for movement along the length dimension of the stationary water supply means at the same overall rate of movement as the moving water sprinkler means, the conveyance means carrying a support means supporting an elongated water conduit means for rotation of the elongated water conduit means around one end portion of the elongated water conduit means, the elongated water conduit means including water flow control valve means for closing the elongated water conduit means to water flow and having connecting means at the other end portion of the elongated water conduit means for rotatable water flow connection of the elongated water conduit means with any water outlet valve means, the elongated water conduit means being rigid from one end portion to the other end portion and having water outlet means connecting said one end portion of the elongated water conduit means for continuous water flow from the elongated water conduit means to the water inlet means of the water sprinkler means during water flow connection of the other end portion of the elongated water conduit means with a water outlet means, the steps including

closing the elongated water conduit means water flow control valve means,

rotating the elongated water conduit means around the one end portion of the elongated water conduit means to bring the other end portion of the elongated water conduit means into contiguity with a water outlet valve means,

rotatably connecting the connecting means at the other end portion of the elongated water conduit means to the contiguous water outlet valve means for water flow through the elongated conduit means to the sprinkler means,

opening the elongated water conduit means water flow control valve means,

subsequently rotating the so-connected elongated conduit means around the connected water outlet valve means while moving the conveyance means along the length dimension of the stationary water supply means, and

accommodating the rigidity of the elongated water conduit means during movement of the conveyance means by supporting the support means for movement toward and away from the stationary water supply means on a movable support means carried by the conveyance means, the movement being between a position of the support means closest to the water supply means when the conveyance means is far from any one of the water outlet valve means and a position of the support means farthest from the water supply means when the conveyance means is close to any one of the plurality of water outlet valve means.

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**4,295,608**

## SNOWMAKING NOZZLE

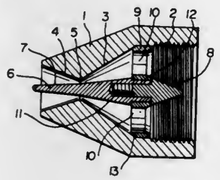
**Jeffrey A. White, 1 Westmorland Rd., London, Ontario,, Canada (N6J 3N2)**

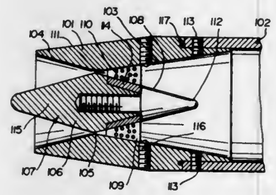
**Filed Feb. 1, 1980, Ser. No. 117,468**

**Claims priority, application Canada, Nov. 8, 1979, 339450**

**Int. Cl.³ F25C** *3/04;* **B05B** *7/10*

**U.S. Cl. 239—14** **6 Claims**





1. A snowmaking nozzle for use in the production of artificial snow and adapted to be connected to a pressurized supply of air and water for the concurrent flow of air and water therethrough, said snowmaking nozzle comprising

a nozzle housing (**1, 101**) having a nozzle axis;

an elongate tubular passageway in said nozzle housing coaxial with said nozzle axis and which, relative to the flow direction of air and water therethrough, has an upstream conically convergent section (**3, 103**), a central throat section (**5, 105**) and a downstream conically divergent section (**4, 104**);

an elongate restrictor (**6, 106**) which is a body of revolution positioned in said passageway coaxial with said nozzle axis and which along said nozzle axis is radially spaced apart from said nozzle housing, and having a conically convergent portion (**7, 107**);

said elongate restrictor being positioned in said passageway, relative to said flow direction, with the conically convergent portion (**7, 107**) located in said downstream conically divergent section of said passageway, and, a portion of said elongate restrictor also being positioned in said upstream conically convergent section of the passageway, said elongate restrictor being positioned in the passageway such that the widest part of the conically convergent portion is positioned no further downstream than the narrowest part of the cental throat section; and

attachment means (**9, 109**) between said nozzle housing and said elongate restrictor (**6, 106**) for fixedly positioning said elongate restrictor in said passageway.



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**4,295,609**

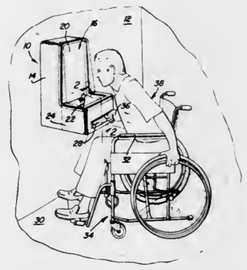
## WALL MOUNTED DRINKING FOUNTAIN WITH PUSH BAR ACTUATOR

**Frank Brown, Jr., Wilmington, Del., assignor to Sunroc Corporation, Glen Riddle, Pa.**

**Filed Nov. 6, 1978, Ser. No. 958,146**

**Int. Cl.³ E03B** *9/20*

**U.S. Cl. 239—29** **2 Claims**



2. A control for a drinking fountain having a generally horizontally disposed basin with a waste water drain and a bubbler for discharging water in a vertical arcuate path, said control comprising a horizontally elongated push bar, means supporting said push bar enabling inward movement by a small force applied thereto at any point along the length thereof and in a position below the level of the basin and bubbler at a height generally equal to the heights of the arms of a wheelchair whereby the push bar is readily accessible to a handicapped occupant of a wheelchair when the wheelchair is rolled to a position adjacent the drinking fountain, and means associated with the push bar and bubbler to control flow of water from the bubbler, said basin being disposed atop a wall mounted cabinet structure terminating above the floor surface a distance to enable a wheelchair to move partially under the cabinet with the arms of the wheelchair adjacent the lower edge thereof, said push bar being movably disposed in a slot-like opening adjacent the bottom of the cabinet in a position adjacent the hands of a handicapped occupant of a wheelchair whose arms are positioned on the arms of a wheelchair to enable the wheelchair occupant to control water flow, said control including a valve controlling flow of water to the bubbler, said valve including a generally horizontally disposed actuator rod oriented generally perpendicular to the push bar and inwardly thereof and above the plane of the push bar, said means supporting the push bar including a pivot plate, means supporting the pivot plate for swinging movement about a horizontal axis parallel to the push bar, generally perpendicular to the actuator rod and located above the actuator rod, said pivot plate including means engaging the actuator rod for operating the valve upon inward movement of the push bar, said means supporting said push bar including light force spring means connected with the pivot plate to return the pivot plate and push bar to a position to stop flow of water to the bubbler, said pivot plate being generally vertically disposed and horizontally elongated for supporting engagement with the push bar over a substantial portion of the length thereof with the pivot plate stabilizing the push bar to retain it in parallel relation to its "at rest" position regardless of where forces are exerted on the push bar along its length.

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**4,295,610**

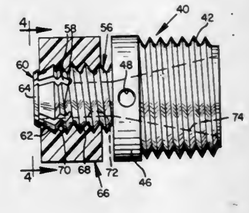
## IRRIGATION SPRINKLERS

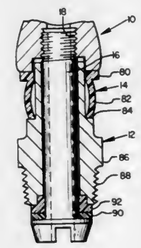
**Lloyd W. Clements, 49 W. Lincoln Ave., Woodland, Calif. 95695**

**Continuation-in-part of Ser. No. 786,987, Apr. 13, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,222**

**Int. Cl.³ B05B** *3/02*

**U.S. Cl. 239—230** **6 Claims**





1. In a swiveled irrigation sprinkler,

a vertical bearing housing having an upwardly facing annular shoulder,

a swivel tube rotatable in the bearing housing,

seal means at the lower end of the housing between the swivel tube and the housing,

a sprinkler body secured to the upper end of the swivel tube and having an annular shoulder facing the first-mentioned annular shoulder,

a thin walled cylindrical tube loosely surrounding the housing and forming a spring sleeve of low friction material,

an upper wedge ring having a tapered portion extending into the upper end portion of the sleeve and engaging the annular shoulder of the body,

and a lower wedge ring engaging the shoulder of the housing and having a tapered portion extending into the lower end portion of the sleeve.

3. In an improved sprinkler nozzle structure,
a tubular nozzle having a discharge portion having segments defining a generally cylindrical orifice at its discharge end,
and adjustment means for pressing the segments inwardly to conical form to constrict the orifice,
the segments being spaced circumferentially from each other to define wedge-shaped auxiliary orifice slots and having cam surfaces,
the adjustment means comprising a nut screwed onto the nozzle and having a ring-like actuator portion engaging the cam surfaces,
the nozzle comprising a tube having the discharge end portion thereof longitudinally slotted to define the segments and having an externally threaded portion to receive the nut,
the slots extending from a point within the nut outward beyond the nut,
the nozzle having an unslotted cylindrical entrance portion of a predetermined internal diameter,
the discharge portion being of a substantially lesser internal diameter than said predetermined diameter,
the nozzle having a tapered transition portion connecting the entrance portion and the discharge portion,
the nut covering the major portion of the length of the segments.

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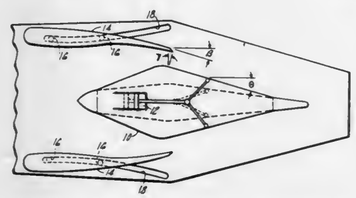
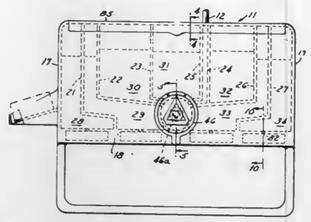
**4,295,611**
**TWO-DIMENSIONAL NOZZLE**
**Thomas A. Wynosky, Madison, Conn., and Charles A. Campbell, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.**
**Filed Dec. 11, 1978, Ser. No. 968,598**
**Int. Cl.³ F02K 1/10**
**U.S. Cl. 239—265.37** **3 Claims**



1. A two-dimensional exhaust nozzle construction for aircraft powered by a turbine type power plant receiving the fluid working medium exhausting in the ambient, a collapsible plug centrally mounted in said two-dimensional nozzle, at least one flap adjacent said nozzle and in spaced relationship defining a wall of said two-dimensional nozzle, said flap being a rigid member and said flap and said plug defining a passageway for conducting the fluid in said two-dimensional nozzle exhausting to ambient, said flap and said plug defining a throat angle and (throat are in the passageway, said flap movable in concomitant radial and axial directions to define a first geometry for optimizing the exhaust stream in a subsonic condition by making the throat angle substantially perpendicular at the exit of said flap relative to the plug surface and a second geometry for optimizing the exhaust stream in a supersonic condition by moving the throat within the flap and having its angle greater than the perpendicular relative to the plug surface, and means for scheduling the throat angle and throat area independent of each other.

**4,295,612**
**SHOWER APPARATUS**
**James D. Betsinger, 19585 Rolling Acres Dr., South Bend, Ind. 46614, and James P. Bailey, 552 Apache Dr., Batavia, Ill. 60510**
**Filed Oct. 17, 1979, Ser. No. 85,722**
**Int. Cl.³ B05B 7/32**
**U.S. Cl. 239—310** **24 Claims**



1. A shower apparatus comprising
a shower head which is to be adapted to be connected to a source of water,
means in said head operable by the flow of water to produce a vacuum,
a housing having a plurality of reservoirs for containing diverse liquids,
a line extending from said vacuum producing means to said housing,
first valve means in said housing for selectively connecting one of said reservoirs to said line,
second valve means in said housing operable to isolate a portion of the liquid from the selected reservoir and thereafter provide communication to said line so that said predetermined quantity may be drawn by suction to said shower head.

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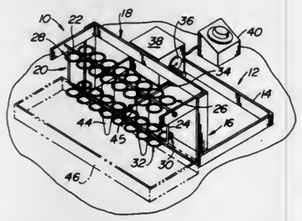
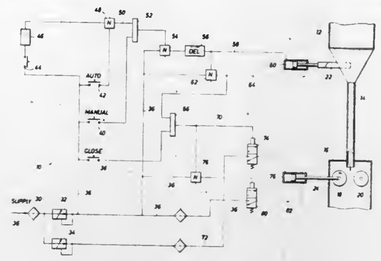
**4,295,613**
**APPARATUS FOR BREAKING BACTERIAL CELLS**
**W. Edward C. Moore, Blacksburg, and James A. Blanks, Norfolk, both of Va., assignors to VPI Educational Foundation, Blacksburg, Va.**
**Filed Oct. 3, 1979, Ser. No. 81,415**
**Int. Cl.³ B02C 17/14**
**U.S. Cl. 241—2** **9 Claims**



1. A method of breaking bacterial cells within upright tubes having a tapered closed end comprising harvesting a culture containing bacterial cells in tubes, placing beads in the tubes containing bacterial cells to be broken, oscillating the tubes about a horizontal axis adjacent their upper ends at a rate of approximately 1725 to 1800 cycles per minute, and preventing destruction of proteins and enzymes released during cell breakage by immersing the closed ends of the tubes in a bath of cool liquid during said oscillating step.



**4,295,614**
**PNEUMATICALLY OPERATED GRAIN HANDLING APPARATUS**
**Ned J. Bond, III, P.O. Box 40246, Houston, Tex. 77040**
**Filed Oct. 15, 1979, Ser. No. 84,831**
**Int. Cl.³ B02C 25/00**
**U.S. Cl. 241—34** **9 Claims**



1. An apparatus for controlling the delivery of grain which comprises:
(a) a grain hopper having a restricted grain flow outlet;
(b) movable gate means operatively positioned relative to said grain hopper for selectively controlling the flow of grain from the grain flow outlet thereof, said gate having open and closed positions;
(c) grain processing equipment connected to receive grain from said grain flow outlet and which is operated by axial movement of a piston rod where extension thereof operates the equipment and retraction thereof modifies the operation of the grain processing equipment;
(d) grain flow sensor means adapted to be installed in a path of flow for the grain through said hopper and which sensor means forms a pneumatic binary output indicative of the presence or absence of grain flow and further wherein said sensor means is installed in the flow path of grain flowing through said hopper; and
(e) pneumatically powered control means connected to said sensor means and responsive to the signal provided thereby to form a control signal for operation of said gate means, said gate means being opened in the presence of grain flow and being closed in the absence of grain flow by said control means.

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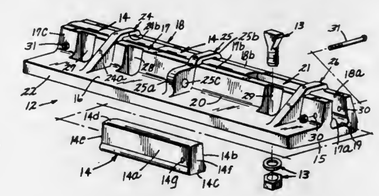
**4,295,615**
**SHELL LINER ASSEMBLY FOR ORE COMMINUTING MACHINE**
**James E. Mishek, Arden Hills, Minn., assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.**
**Filed Sep. 27, 1979, Ser. No. 79,385**
**Int. Cl.³ B02C 17/22**
**U.S. Cl. 241—182** **24 Claims**



1. A liner assembly for the shell of an ore grinding machine having a predetermined axis of rotation, the liner assembly comprising:
a plurality of longitudinal holder segments having first and second ends and each defining a mounting surface constructed for mounting engagement with the inner surface of said shell, and a grinding surface;
each holder segment further defining a longitudinal channel extending from one end to the other, said longitudinal channel having a closed bottom and opening at the grinding surface, and being further defined by longitudinal sides that converge at least in part toward the grinding surface;
and a plurality of longitudinal wear inserts for the holder segments, each insert sized for lengthwise insertion into one of said longitudinal channels and being one piece with a cross section that substantially fills the channel, and each insert further comprises longitudinal sides that converge at least in part in conformance with the channel sides so that the insert is retained within the channel;
and means for securing the holder segments to the shell of the ore grinding machine, the holder segments being arranged in the assembly with the longitudinal channels and wear inserts extending axially of the shell.

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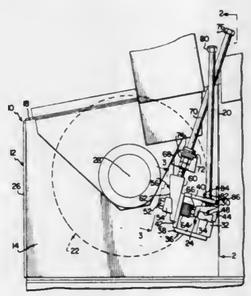
**4,295,616**
**CHOPPING MECHANISM WITH REMOTE SHEARBAR ADJUSTER**
**Amos G. Hill, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.**
**Filed Oct. 4, 1979, Ser. No. 81,839**
**Int. Cl.³ B02C 18/16**
**U.S. Cl. 241—241** **8 Claims**



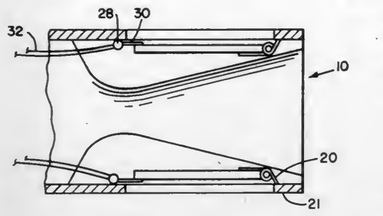
1. In combination with a rotary chopper and a cooperating shearbar assembly that includes a shearbar and a shoulder movable with said shearbar during adjustment of the latter, an adjuster for controlling the position of said shearbar with respect to said chopper comprising:
a support mounting said shearbar for shifting thereof along a first path of travel extending toward and away from the chopper;
a stationary shoulder disposed in spaced opposition to said movable shoulder and held against said shifting with the shearbar; and
a cam wedge operably drivable between said shoulders in engagement therewith along a second, rectilinear path of travel in a direction to effect said shifting of the shearbar, said assembly including means for maintaining said movable shoulder engaged with said wedge.

**4,295,617**

## SELECTABLE DRAG BRAKES FOR ROCKET RANGE CONTROL

**Herman R. Oswell, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 2, 1979, Ser. No. 81,302**
**Int. Cl.³ F42B** *13/32*
**U.S. Cl. 244—3.29** **3 Claims**




1. Apparatus for controlling the range of a free-flight artillery rocket comprising:
(a) a plurality of drag brakes disposed around the periphery of the motor of said rocket;
(b) means for retaining said drag brakes in unextended position said means including a pin for engagement with each of said drag brakes for secured relation thereof;
(c) actuating means for selectively releasing predetermined pairs of said drag brakes; and,
(d) means for releasing said drag brakes to an extended position responsive to energization of said actuating means said means for releasing said drag brakes to said extended position being a spring secured to one end of each said drag brake and said rocket.

**4,295,618**

## DEVICE FOR FIXING PIPES, RODS AND OTHER ELONGATED BODIES

**Kazutoshi Morota, Fujisawa, and Takuo Yuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd. and Nifco, Inc., both of Yokohama, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,389**
**Claims priority, application Japan, Nov. 15, 1978, 53-156074[U]**
**Int. Cl.³ F16L** *3/08*
**U.S. Cl. 248—73** **3 Claims**

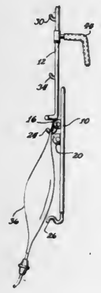
1. In a device for fixing a tube, rod or other elongated object comprising a base plate, an anchor provided on the bottom surface of said base plate, at least two vertical walls provided on the top surface of said base plate and standing thereon parallel to each other to define at least one upward diverging "U"-shaped housing portion, a pair of opposite engaging projections provided on the upper parts of the inner surfaces of each pair of adjacent vertical walls defining each said housing portion, a foldable fitting portion which is adapted to embrace the object to be fixed, a flexible supporting portion extending from one of said two adjacent vertical walls and connected to said foldable fitting portion for thereby supporting said foldable fitting portion above said housing portion, and a pair of engaging pawls provided on the outer sides of the opposite ends of said fitting portion, thus permitting said device to positively hold said object through engagement of said engaging pawls with said engaging projections when said fitting portion embracing said object is pushed into said housing portion, the improved device having the members of at least one pair selected from said pair of engaging projections and said pair of engaging pawls provided at different levels thereby making it possible to bring said device to a provisionally fixing position in which one of said engaging pawls is caught by the counter engaging projection when said fitting portion embracing said object is partly pushed in said housing portion, and making it possible to bring said device to a final and completely fixing position when the other engaging pawl is caught by the counter projection when said fitting portion embracing said object is completely pushed in said housing portion.

**4,295,619**

## SOLUTION CONTAINER HANGER

**Ralph Kulin, Marengo, and Ronald C. Stauber, Hawthorn Woods, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Nov. 13, 1979, Ser. No. 93,356**
**Int. Cl.³ B65B** *67/12*
**U.S. Cl. 248—95** **6 Claims**




1. A solution container hanger comprising:
(a) a first member;
(b) a second member rotationally affixed to the first member to enable the solution container hanger to be placed in an infusion, drain, or storage position;
(c) support means attached to the first member to suspend and support a solution container in an infusion position in which the first and second members are substantially parallel;
(d) support means attached to the second member to suspend and support a solution container in a drain or infusion position in which the first and second members are substantially perpendicular in a drain position and substantially parallel in an infusion position; and
(e) hanger means attached to the second member to enable the solution container hanger to be hung in an infusion position from a door or other elevated structure.

**4,295,620**

## DEVICE FOR ANCHORING A VESSEL IN A HORIZONTAL FOUNDATION RAFT

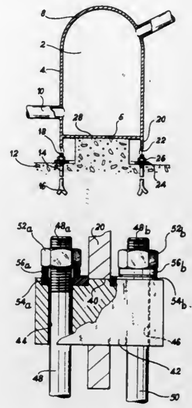
**Andre LeClou, Saint Remy les Chevreuse, France, assignor to Commissariat a l'Energie Atomique, Paris, France**

**Filed Feb. 16, 1979, Ser. No. 12,730**
**Claims priority, application France, Feb. 17, 1978, 78 04577**
**Int. Cl.³ A47G** *23/02*
**U.S. Cl. 248—154** **3 Claims**

1. A device anchoring a cylindrical vessel having a vertical axis in a foundation raft, wherein said device comprises n



orifices formed at the lower end of a lateral wall of said vessel and uniformly spaced along its periphery and n mounting elements, each mounting element being constituted by a horizontal cross-pin extending through one of said orifices so that one end of said element is located inside said vessel and the



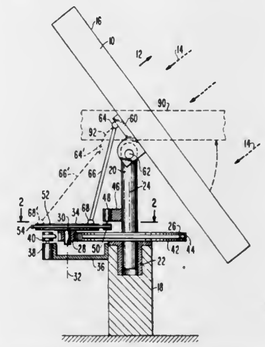

other end is located outside said vessel and by two identical assemblies for anchoring said vessel in said raft, each anchoring assembly being a rocker-arm system of two tie-bolts anchored in said foundation raft and by a cross-member in which one end of said horizontal cross-pin is rotatably mounted.

**4,295,621**

## SOLAR TRACKING APPARATUS

**Bohdan W. Siryj, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Mar. 18, 1980, Ser. No. 131,517**
**Int. Cl.³ F16M** *11/12;* **G02B** *21/24*
**U.S. Cl. 248—183** **1 Claim**



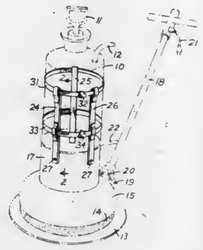

1. In a solar tracking apparatus the combination comprising:
a base;
a support member, rotatably secured to the base for rotation about a first vertical axis;
means for rotating said support member about said first vertical axis, said means including a first horizontal pulley secured to the support member, and pulley drive means secured to the base and pulley for rotating the pulley with respect to the base;
a pivot member rotatably secured to said support member for rotation about a horizontal axis;
elevation drive means for rotating said pivot member about said horizontal axis, said elevation drive means including a second horizontal pulley rotatably secured to the first pulley for rotation about a second vertical axis, and means secured to the support member for rotatably driving said second pulley about said second axis; and
a link member pivotally secured to said second pulley at a point spaced from the second vertical axis and to said pivot member at a point spaced from said horizontal axis.

**4,295,622**

## FRAMEWORK HOLDER FOR ATTACHING CONTAINER TO FLOOR MACHINE

**Barry L. Cutler, 7 Stanford Ct., East Windsor, N.J. 08520**

**Filed May 23, 1980, Ser. No. 152,617**
**Int. Cl.³ A47K** *1/08*
**U.S. Cl. 248—313** **4 Claims**




1. A holder of framework structure for removably attaching a fluid container to floor and carpet cleaning and polishing machines which comprises at least three parallel elongated upright standards spaced from each other around a circle, an adjustable, encircling strap at the lower ends of the standards for drawing the standards closer together to press them frictionally against a machine for detatchably securing them to such a machine, retaining means carried by the standards and forming recesses for receiving and holding said lower encircling strap in place on the standards, an adjustable top encircling strap at the upper ends of said standards to draw them into frictional engagement with a fluid container, and retaining means at said upper ends of the standards and forming recesses for receiving and for holding said top encircling strap in place.

**4,295,623**

## VARIABLE POSITION ARTICLE HOLDER

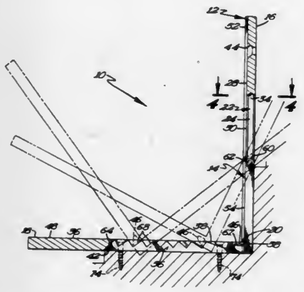
**Eduard H. Schweizer, Dusseldorf, Fed. Rep. of Germany, assignor to Investment Rarities, Inc., Bloomington, Minn.**

**Filed Feb. 12, 1979, Ser. No. 11,280**
**Int. Cl.³ A47F** *5/12;* **A47G** *1/24*
**U.S. Cl. 248—456** **45 Claims**

1. A variable position tape holder for holding cassette, 8-track, or video tape boxes comprising, in combination: a first L-shaped member for holding at least one tape box and including first and second legs, a second L-shaped member including first and second legs, with the first L-shaped member including an L-shaped aperture of a shape and size corresponding to and for receiving the second L-shaped member such that the first leg of the first L-shaped member is U-shaped and includes a central portion and first and second leg portions and the second leg of the first L-shaped member is also U-shaped and includes a central portion and first and second leg portions, with the ends of the leg portions of the first and second legs of the first L-shaped member being joined together forming a corner, with the inside surfaces of the first and second leg portions of the first leg of the first L-shaped member including longitudinal slots, with the second leg of the second L-shaped member including a series of angular support positions comprising a washboard series of angular peaks, with the first

L-shaped member including means for engaging with the angular support positions comprising ratchet levers extending from the ends of the first and second leg portions of the second leg of the first L-shaped member into the aperture along the corner, thus giving the second leg of the first L-shaped member a C-shape, and means for slidably and pivotally mounting the first leg of the first L-shaped member to the first leg of the second L-shaped member comprising detents extending along the end of the first leg of the second L-shaped member which extend into the slots of the first L-shaped member for slidable and pivotal movement therein allowing the first L-shaped member to be slid and pivoted with respect to the second L-shaped member allowing the ratchet levers to engage with one of the angular support positions to thereby hold the first L-shaped member in any one of several angular positions.

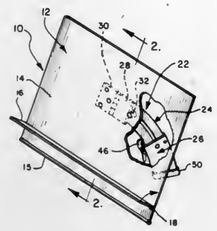
**38**. In an article holder characterized by a member having at least one surface to support at least one article thereon, the improvement comprising a variable position article holder consisting only of: a first member of an unchanging shape; a second member of an unchanging shape substantially the same as the unchanging shape of the first member; with the first member and the second member having an interfitting relation such that in a first position the first member and the second member interfit to form an article holder of a single outline and in a second position the first member and the second member interfit to have an angular relationship with respect to each



other such that one of the first member and the second member forms a base and the other of the first member and the second member forms an article holder and holds articles at any of various angular relationships with respect to the base, and wherein the interfitting relationship between the first member and the second member includes a pivotal and slidable relation.

**39**. In an article holder characterized by a member having at least one surface to support at least one article thereon, the improvement comprising a variable position article holder consisting only of: a first member of an unchanging shape; a second member of an unchanging shape substantially the same as the unchanging shape of the first member; with the first member and the second member having an interfitting relation such that in a first position the first member and the second member interfit to form an article holder of a single outline and in a second position the first member and the second member interfit to have an angular relationship with respect to each other such that one of the first member and the second member forms a base and the other of the first member and the second member forms an article holder and holds articles at any of various angular relationships with respect to the base, wherein the interfitting relationship includes a plurality of angular support positions formed on the second member and means immovably attached on the first member for engaging with the angular support positions of the second member to thereby position the first member at any one of various angular relationships with respect to the second member.

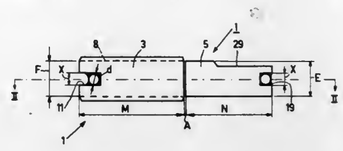
**4,295,624**
**READING STAND**
**Wilfredo A. Granada, 2600Elisha, Zion, Ill. 60099**
**Filed Sep. 22, 1980, Ser. No. 189,892**
**Int. Cl.³ A47G *1/24***
**U.S. Cl. 248—456** **4 Claims**



1. A collapsible stand for retaining books and similar materials in an inclined position for reading and the like comprising:
a plate-like planar member having a supporting surface and an opposed rearward surface;
a planar strip member hinged to a lower portion of said supporting surface and extending generally horizontally to form a ledge for retaining a book or similar material, said strip being hinged so that in the open position the ledge extends to form a surface generally perpendicular to the support surface and in the closed position folds against the support surface so that it abuts and is generally parallel thereto;
a first arcuate strip section hinged to the rearward surface of said support plate, said strip section being hinged so that in an open position, the arcuate strip extends generally perpendicular from the rearward surface, and in the closed position, the strip folds against the rearward surface so that it abuts and is generally parallel thereto;
a retaining member attached to said hinged end of said arcuate strip having a surface which abuts the rearward surface when the strip is in the open position;
a catch pivotally mounted on said rearward surface to move along an arc allowing engagement of the catch with said retaining member to retain the arcuate strip in said open position;
an arcuate slot extending between opposite ends in said arcuate strip;
a plurality of saw-like teeth formed along one edge of the arcuate strip and extending the length thereof;
an arcuate female member constructed to receive said arcuate strip in sliding engagement therewith;
a pin extending through opposite sides of said female member and through said slot for sliding engagement therewith;
a plurality of roller members positioned in spaced apart relation along one edge of said female member and positioned for sliding engagement with an edge of said arcuate strip;
a ratchet arm pivotally mounted to an opposite edge of said female member;
a spring biasing the ratchet arm so that one end is pivoted to engage the saw teeth on the edge of the arcuate strip; and
a resilient restraining member attached to the opposite end of said female member to form a foot, said arcuate strip and arcuate female member cooperating to form a telescoping leg which is adjusted by sliding said female member over said strip and adjusting their relative positions with said ratchet arm, said telescoping leg adjustably varying the angle of inclination of said support surface relative to a horizontal surface.



**4,295,625**
**PRECISION ADJUSTING DEVICE**
**Wolter W. J. Degger, and Adrianus C. Van Kasteren, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Jul. 18, 1979, Ser. No. 58,413**
**Claims priority, application Netherlands, Jul. 31, 1978, 7808045**
**Int. Cl.³ A47F *7/14***
**U.S. Cl. 248—466** **4 Claims**



1. A precision adjusting device, comprising a screw body, a holder body and a connecting, elongated torsion member which can be deformed by rotation of the screw body, the torsion member being made of a plastically deformable material, the ends of said member being connected to the screw body on the one side and to the holder body on the other side, the part of the torsion member situated between the two ends being twistable.

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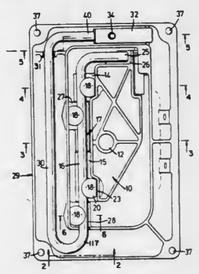
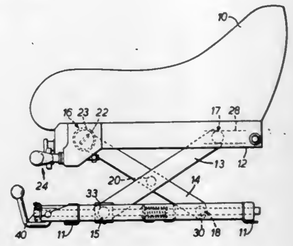
**4,295,626**
**RESILIENT MOUNTING FOR A RECLINING SEAT**
**Eddie A. J. Large, Bayton Rd, Exhall, Coventry, West Midlands, England (CV7 9DT)**
**Filed Mar. 30, 1979, Ser. No. 25,368**
**Int. Cl.³ A47B *1/02***
**U.S. Cl. 248—575** **10 Claims**



1. A resilient mounting for a reclining seat, said mounting comprising a first member to be secured to a supporting base for the seat, a second member to be secured to the seat and a torsion bar pivotally connecting the second member to the first member, said torsion bar forming a pivot for the two members and providing a return bias when one of the members is tilted relative to the other, said torsion bar having a first bent over free end section which reacts against the first member, a second bent over free end section which reacts against the second member and an elongate rectilinear portion intermediate said free end sections which forms the pivot for the two members, aligned cradles on said first and second members which locate a portion of said elongate rectilinear portion of said torsion bar which forms the pivot, and retainers on said first and second members for rotatably retaining said elongate portion of the torsion bar in said cradles.

**4,295,627**
**SPRING SUSPENSIONS FOR VEHICLE SEATS**
**Kevin Graves, Cogenhoe, England, assignor to UOP Inc., Des Plaines, Ill.**
**Filed Oct. 15, 1979, Ser. No. 84,925**
**Claims priority, application United Kingdom, Oct. 19, 1978, 41225/78**
**Int. Cl.³ B60N *1/02*; A47C *3/22***
**U.S. Cl. 248—588** **5 Claims**



1. A spring suspension for a vehicle seat, the suspension comprising a seat frame, a base frame, a scissor-action linkage arm system interconnecting said seat frame and base frame, the system including two pairs of scissor-action linkage arms spaced apart on a common pivot axis, pivotal connections interconnecting the ends of said arms and said frames to permit the frames to move towards and away from one another, each pivotal connection on one pair of arms being coaxial with a corresponding pivotal connection on the other pair of arms, and a biassing spring connected between parts of the suspension which pivot relatively to one another during relative movement of the frames towards or away from each other to bias the two frames away from one another, all of the pivotal connections between one of said seat and base frames and the adjacent ends of the linkage arms connected to said one frame being displaceable connections extending in a common direction to permit both relative pivotal movement between the linkage arms of each pair and relative translational movement between all the linkage arms and said one frame and a motion limiting resilient coupling, including an anchoring spring of limited expansion and contraction connected between said one frame and one of said displaceable connections to the linkage arm system to permit relatively free fore and aft translational movement along said common direction between the whole linkage arm system and said one frame within the limits of expansion and contraction of the spring thereby reducing the transmission of vibration in said common direction between the base frame and the seat frame.

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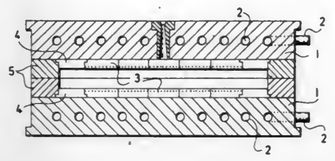
**4,295,628**
**MOLD FOR THE INJECTION MOLDING OF OBJECTS OF LARGE DIMENSION AND COMPLICATED SURFACES FROM PLASTIC MATERIAL**
**Lubomir Kupf, Prague; Jiri Travnicek, Celakovice; Radomil Adamek, Pardubice, and Josef Kyzlink, Brno, all of Czechoslovakia, assignors to Statni vyzkumny ustav materialu, Prague, Czechoslovakia**
**Filed Nov. 9, 1979, Ser. No. 93,130**
**Int. Cl.² B29C *5/00***
**U.S. Cl. 249—80** **13 Claims**

1. A mold for forming injection moldings of large dimensions and complicated surfaces from plastic material, comprising a pair of opposed metal base plates, spaced circumferential strips defining a mold cavity, cooling grids composed of tubes embedded in said base plates, shaped forming plates and forming strips removably fixed by fixing means to the internal surface of the base plates forming a part of the active surface of the mold, said active surface of the forming plates and forming

strips, together with the surface of said fixing means which is flush with said forming plates, and the forming strips being



provided with the required surface pattern, and mobile cores for the mold provided on parts of the mold.

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**4,295,629**

## MOULD ASSEMBLY FOR USE IN THE MANUFACTURE OF SPHERICAL OR SUBSTANTIALLY SPHERICAL ARTICLES

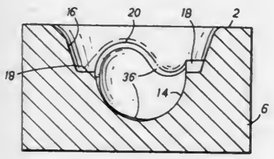
**William Williams, Queniborough, England, assignor to Delta Mouldings (Leicester) Limited, Leicester, England**

**Filed Aug. 11, 1980, Ser. No. 176,791**

**Claims priority, application United Kingdom, Aug. 17, 1979, 28822/79**

**Int. Cl.³ B29C *1/00***

**U.S. Cl. 249—160** **4 Claims**



1. A moulding assembly comprising two mould members having mutually confronting surfaces each surrounding a part-cavity, a generally spherical mould cavity being defined when confronting surfaces are in contact with one another, lip portions of said surface defining a continous parting line around a diametral zone of the cavity, said parting line having four portions, comprising two substantially S-shaped portions with two at least substantially straight-line portions, said portions being arranged alternately around the diametral cavity zone, each portion of the line meeting its adjacent portion to include an angle of not substantially less than a right-angle.

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**4,295,630**

## FAIL-SAFE ACTUATOR AND HYDRAULIC SYSTEM INCORPORATING THE SAME

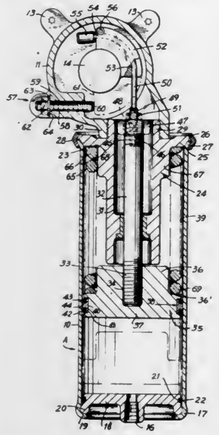
**Lorin P. Card, Sepulveda, and Otto W. Borsting, Long Beach, both of Calif., assignors to Greer Hydraulics, Incorporated, Chatsworth, Calif.**

**Filed Aug. 9, 1979, Ser. No. 65,368**

**Int. Cl.³ F16K *31/143*; F15B *13/044***

**U.S. Cl. 251—14** **2 Claims**

1. A fail-safe rotary actuator member for imparting rotary movement to the shaft of a rotary valve responsive to a failure condition and for enabling unimpeded conventional operation of said valve during normal operating conditions comprising, in combination, a casing having a cylindrical bore formed therein and having a port at one end thereof, a piston mounted for reciprocal movement within said bore between extended and contracted positions and defining with said bore a variable volume fluid pressure chamber, spring means in said casing biased between said piston and the other end of said casing for urging said piston to said extended position whereat said piston lies adjacent said port end of said chamber, pilot valve means connected with said port for selectively introducing and bleeding fluid from said chamber, thereby to control the position of said piston in said chamber, a housing on said casing, a drive shaft journalled in said housing and connected to said valve shaft for rotation between first and second positions about an axis of rotation perpendicular to the axis of said bore, a quadrant-shaped yoke member mounted on said drive shaft and including an outwardly open peripheral guide track coaxially arranged with respect to said drive shaft, a flexible cable having one end operatively connected to said piston, said cable being disposed in said guide track of said yoke member, the other end of said cable being operatively connected to said yoke member at a position to induce rotation of said drive shaft



from said first to said second position responsive to movement of said piston from said retracted to said extended position, said cable, when said drive shaft is in said second position, being in a slack condition when said piston is in said retracted position and in a tautened condition when said piston is in said extended position, drive handle means operatively associated with said drive shaft for imparting rotary movement thereto whereby said drive shaft may be rotated by said handle means between said positions without interference from said cable when said piston is in said retracted position, and said cable is effective to rotate said drive shaft to said second position when said piston is shifted by said spring means to said extended condition as a result of outward flow of fluid from said chamber through said port.

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**4,295,631**

## SOLENOID OPERATED VALVE

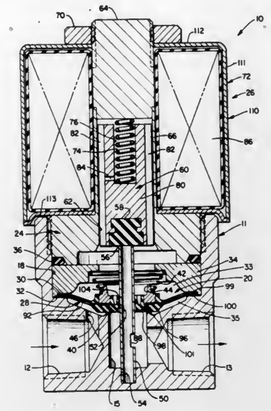
**Walter E. Allen, 9 Barry La., Prospect, Conn. 06511**

**Filed Mar. 21, 1980, Ser. No. 131,950**

**Int. Cl.³ F16K *31/02***

**U.S. Cl. 251—30** **13 Claims**

1. In a valve assembly having a primary valve and a solenoid operated pilot valve with respective linear primary and pilot valve members, each shiftable linearly between open and closed alternate operating positions thereof, the solenoid operated pilot valve being connected to the primary valve for operating the primary valve member to its said alternate operating positions upon operation of the pilot valve member to its said alternate operating positions respectively, the improvement wherein the primary valve member has an axial opening, and wherein the pilot valve comprises a fixed linear pilot valve tube mounted coaxially with and extending through the axial opening of the primary valve member and has an inner fluid passageway through the primary valve member to provide fluid communication between opposite axial sides of the primary valve member, the primary valve member having fluid sealing means around its said axial opening which remains in sealing engagement with the fixed linear pilot valve tube as the primary valve member shifts linearly between its open and closed operating positions, and the pilot valve member in its



alternate operating positions being operable for selectively opening and closing the said inner fluid passageway of the pilot valve tube for selectively connecting the opposite axial sides of the primary valve member through the primary valve member for controlling the pressure drop across the primary valve member.

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**4,295,632**

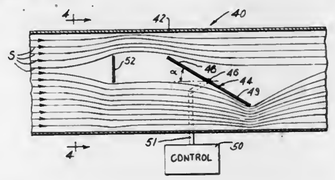
## METHOD AND APPARATUS FOR REDUCING TORQUE ON AN AIR DAMPER

**Roger P. Engelke, Roscoe, Ill., assignor to Barber-Colman Company, Rockford, Ill.**

**Filed Sep. 28, 1978, Ser. No. 946,478**

**Int. Cl.³ F16K *1/22, 47/08***

**U.S. Cl. 251—127** **8 Claims**




1. A volume air flow controller comprising a duct, a butterfly damper mounted in the duct, said damper movable about a pivot and having leading and trailing portions, and control means adapted to position said damper to control air flow through the duct, and a fixed air flow impedance located in said duct upstream from said damper and extending across said duct generally in the direction of the damper axis, said air flow impedance medially positioned within said duct offset to the leading portion-side of the axis of said damper and displaced from substantially opposite duct wall portions so as to permit portions of the air flow to pass between said opposite duct wall portions and respective sides of said air flow impedance in the directions of said leading and trailing portions respectively, said impedance changing the air velocity profile within the duct so that the velocity of air acting upon at least a portion of the leading portion of said damper is reduced whereby the damper-closing torque resulting from the aerodynamic forces produced by air flow past said damper is reduced.



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**4,295,633**

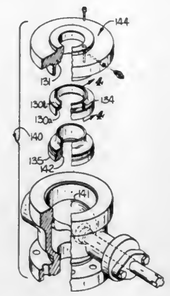
## EXPANSIBLE DEVICE

**James W. Sigmon, 2415 Knollwood Rd., Charlotte, N.C. 28211**

**Filed Jan. 26, 1979, Ser. No. 6,892**

**Int. Cl.³ F16K *25/00***

**U.S. Cl. 251—172** **24 Claims**



1. A force transmitting device capable of sealing against fluid flow while accommodating a limited range of movement and comprising an annular thin wall member having stepped diameter cylindrical portions joined by a force transmitting surface portion which portions cooperate to impart a generally "S" shaped cross-section to said thin wall member, restraining means engaging said thin wall member for supporting inner and outer axial and circumferential terminal end portions thereof agsinst movement, a movable member having a surface contoured to engage one side of said thin wall member for supporting said portions thereof against tensile stress, and means for exerting force against the other side of said thin wall member for transmission therethrough to said movable member, said thin wall and movable members cooperating for accommodating movement by displacement of the material of said thin wall member from one to another of the portions thereof.

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**4,295,634**

## STRUT COMPRESSOR

**Phillip A. Spainhour, Waukegan; Leonard A. Morrison, Chicago, and Robert S. Hampton, Jr., Wadsworth, all of Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.**

**Filed Jun. 30, 1980, Ser. No. 164,801**

**Int. Cl.³ B23P *19/04***

**U.S. Cl. 254—10.5** **5 Claims**

1. Apparatus for use in assembling and disassembling a strut assembly of the type having a shock absorber axially disposed within a coil spring, comprising in combination

a plurality of upright support rails,

a first platen fixedly mounted to said support rails,

a second platen slidably disposed on said support rails,

a plurality of stand-off members depending from said second platen toward said first platen for engagement with said strut,

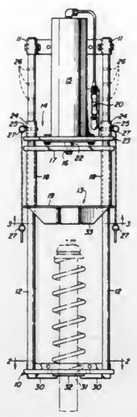
an opening centrally disposed with respect to said stand-off members through which a tool may be inserted for disassembly of said strut,

said first and second platens including means for holding said coil spring in a compressed condition therebetween,

a third platen slidably disposed on said support rails,

a fluid operated piston-cylinder assembly mounted between said second and third platens for moving said platens apart, and

means for fixedly connecting said second and third platens to said support rails at adjustable positions thereon to restrain



said second and third platens against movement relative to said first platen.

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**4,295,635**

## UNIVERSAL PNEUMATIC BELLOWS JACK LIFTER

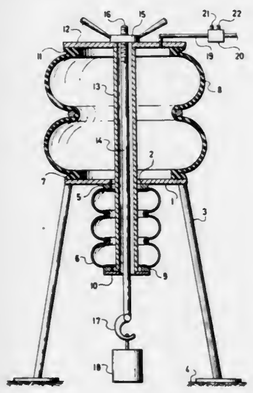
**Zdenek Pustka, and Oldrich Krejcir, both of Liberec, Czechoslovakia, assignors to Vysoka skola strojni a textilni, Liberec, Czechoslovakia**

**Filed Aug. 28, 1980, Ser. No. 182,302**

**Claims priority, application Czechoslovakia, Aug. 30, 1979, 5907-79**

**Int. Cl.³ B66F *3/24***

**U.S. Cl. 254—93 HP** **5 Claims**



1. Universal pneumatic bellows jack lifter comprising two coaxial elastic bellows of different diameter, one end of each of said bellows being provided with a common closing cover adapted to be fixed to a suitable base, said common closing cover having a central opening, the remaining ends of both bellows being closed by further covers mutually connected by a bar, said bar being provided with at least one termination for the manipulation of a load and means for selectively introducing fluid under pressure into both of the bellows and exhausting it therefrom.

**4,295,636**

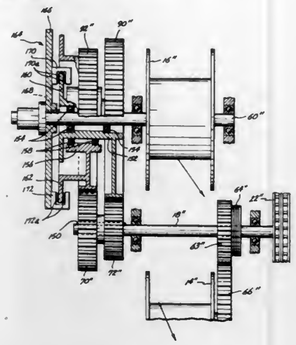
## SYSTEM FOR INHAULING AND OUTHAULING LINES

**Frederic E. Langford, Redmond, Wash., assignor to Washington Logging Equipment, Inc., Auburn, Wash.**

**Filed Nov. 16, 1978, Ser. No. 961,224**

**Int. Cl.³ B66D *1/26***

**U.S. Cl. 254—304** **2 Claims**



1. In a system for inhauling and outhauling lines including
a drive shaft, a prime mover operably coupled to rotatively drive said drive shaft, and a reversible transmission means operably interposed between said prime mover and said drive shaft for selectively reversing the rotational direction of said drive shaft,
a haulback drum mounted in a haulback shaft and a line wrapped on said haulback drum, and
a main drum mounted on a main shaft and a line wrapped on said main drum, the improvement comprising:
a first gear mounted on and arranged in driven relationship with said drive shaft and a second gear arranged in driven relationship with said first gear mounted on one of said main shaft and said haulback shaft, and clutch means operatively associated with said first and second gears for selectively coupling said drive shaft to said one shaft in driving relationship to rotate the corresponding one of the main drum and the haulback drum mounted on said one shaft to take in a pay out line at a first line speed,
a third gear mounted on and arranged in driven relationship with said drive shaft and a fourth gear arranged in driven relationship with said third gear and mounted on the other of said main shaft and haulback shaft to rotate the corresponding one of the main drum and the haulback drum mounted on said other shaft to take in and pay out line at an effective line speed less than said first line speed,
a fifth gear mounted on and arranged in driven relationship with said drive shaft and a sixth gear arranged in driven relationship with said fifth gear and mounted on the other of said main shaft and said haulback shaft, to rotate the corresponding one of said main drum and said haulback drum mounted on said other shaft to take in and pay out line at an effective line speed greater than said first line speed, said third and fifth gears forming a first gear set and said fourth and sixth gears forming a second gear set, one of said first and second gear sets being affixed to the shaft on which they are mounted, the other of said first and second gear sets being mounted for rotation relative to the shaft on which they are mounted, and
an energy-absorbing clutch means affixed to the shaft on which said other of said first and second gear sets is mounted for selectively and alternately coupling one of the gears of said other set in driving relationship to the shaft on which it is mounted and for selectively allowing restrained, relative movement between said one of the gears of said other set and the shaft on which it is mounted so that the line speed to and from the haulback drum can be substantially equalized with the line speed respectively from and to the main drum.



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**4,295,637**

## GUARD RAIL

**Anton Hulek, Goglerfeldgasse 15, A-4020 Linz, Austria**

**Filed May 15, 1980, Ser. No. 150,075**

**Claims priority, application Austria, May 23, 1979, 3775/79**

**Int. Cl.³ A01K *3/00***

**U.S. Cl. 256—13.1** **5 Claims**

1. In a guard rail for use alongside a road, which comprises a sheet material profiled to form two substantially U-shaped side portions extending longitudinally of the guard rail and a web interconnecting the side portions, the two side portions and the web defining a substantially U-shaped recess therebetween and the side portions projecting substantially perpendicularly from a plane defined by the web, the U-shaped side portions having the base of the U radially spaced from and substantially parallel to said plane, the improvement of the web being a grid.

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**4,295,638**

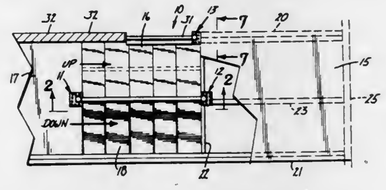
## NEWAL POST ASSEMBLY

**Gene H. Eldeen, 521 Oak St., Farmington, Minn. 55024**

**Filed Feb. 22, 1980, Ser. No. 123,841**

**Int. Cl.³ E04H *17/14***

**U.S. Cl. 256—59** **9 Claims**




1. A newal post assembly for installation with respect to a floor type surface comprising:
an elongate wooden newal post for intended use in a generally upright orientation and having a transverse bottom surface;
a newal post base comprised as a metal plate member generally rectangular in shape defined by first, second, third and fourth edges respectively and having top and bottom sides with transverse dimensions greater than the bottom surface of the newal post;
a first set of mounting holes in said plate member, said bottom surface of the newal post being positioned over said first set of mounting holes in surface contact with the upper side of the plate member, and a first set of linear fastening members extended from the bottom side of the plate member upwardly through the first holes into the bottom surface of the newal post to secure the newal post with respect to the base, said first set of mounting holes being positioned near the first of said edges centrally between adjacent edges and positioned to orientate a side of the newal post in flush relationship with said edge;
a second set of mounting holes located in said plate member and located proximate the second, third and fourth edges of said plate member in surrounding relationship to said newal post, and second linear fastening means extending from the upper surface of said plate member through the second set of mounting holes with respect to the floor type surface.
said holes of the first and second sets of holes being generally arranged in three rows on said plate member, a first row being disposed adjacent the first edge of said plate member and having two outer holes from said second set of holes and two intermediate holes from said first set of holes disposed centrally between the outer holes, a second row disposed intermediate between the first and third edges of said plate member and having two outer holes from said second set of holes and two intermediate holes from said first set of holes disposed centrally between the two outer holes, and a third row of holes disposed adjacent the third edge of said plate member comprised of four spaced apart holes from said second set of holes.

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**4,295,639**

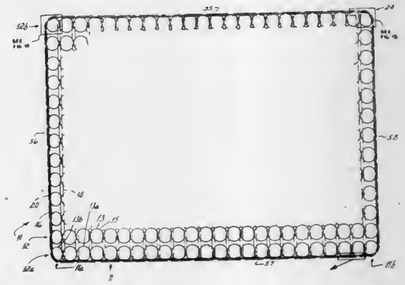
## COIL SPRING ASSEMBLY AND FORMING METHOD

**Thomas J. Wells, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.**

**Filed Oct. 4, 1979, Ser. No. 81,818**

**Int. Cl.³ F16F *3/04***

**U.S. Cl. 267—91** **36 Claims**



20. A coil spring assembly comprising a spring matrix, a border wire, and lacing wire,
said matrix comprising a plurality of rows of coil springs having end loops located in a common plane, said matrix having corner and edge coil springs located around the peripheral edge of the matrix,
said border wire having sides and corners located in close adjacency to border segments of the end loops of said edge and corner coil springs, and
said lacing wire being generally helical in configuration and being wrapped around said border wire and said border segments of said corner and edge coil springs to connect said border wire to said corner and edge coil springs, said lacing wire being operative to maintain the border segment of said corner coil springs in a deflected arcuate configuration contiguous to an arcuate corner section of said border wire, said deflected arcuate border segment of said corner coil springs being of different radius from the remainder of said end loop of said corner coil springs, said spring assembly being manufactured by the method of
locating said border wire in close adjacency to the outer peripheral border segments of said end loops of said corner and edge coil springs,
deflecting said border segments of said corner coil springs out of an initial configuration into a different configuration in which said border segments of said corner coil

springs are contiguous to and of approximately the same radius as an adjacent corner segment of said border wire, wrapping said helical lacing wire around said border wire and around said border segments of said edge coils and around said deflected segments of said corner coil springs while maintaining the border segments of said corner coil springs deflected into said different configurations, and releasing said corner coil springs end loop segments from said deflected configurations after lacing the end loops of said sides and corner coil springs to said border wire.

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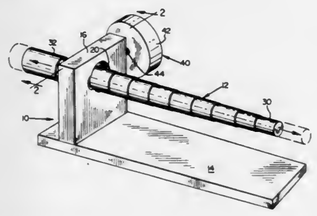
**4,295,640**

## JEWELER'S TOOL

**Charles E. Merrell, 6318 SE. Aldercrest, Milwaukie, Oreg. 97222**

**Filed Jan. 7, 1980, Ser. No. 109,843**
**Int. Cl.³ B23Q *1/00***
**U.S. Cl. 269—47** **4 Claims**



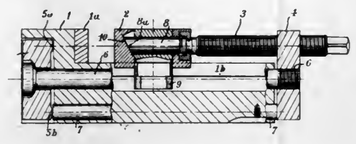
1. A jeweler's kit comprising:
a base;
a mandrel holder rigidly securable to the base, the holder including walls defining an opening for receiving a mandrel, one wall of the holder including a threaded hole extending therethrough into the opening;
an elongated ring mandrel provided with a plurality of working positions having circular cross-sections of differing diameters, the ring mandrel being insertable into the opening in the holder and selectively positional therein to permit each working position to be disposed in close proximity to the holder with the mandrel secured therein;
a bracelet mandrel provided with an oval-shaped working surface and having a shank extending outward from the working surface, the shank being insertable into the opening of the holder to secure the mandrel to holder, the shank including a threaded hole in an end thereof;
a fastener having a head and a threaded stud affixed to the head, the stud of the fastener cooperating at one time with the threaded hole in the holder to permit the ring mandrel to be rigidly secured in selected positions by selectively clamping the mandrel within the opening by adjusting the extension of the stud into the opening, the stud of the fastener cooperating at another time with the threaded hole in the shank of the bracelet mandrel to permit the bracelet mandrel to be rigidly secured in the holder by turning the stud until the head of the fastener and a wall of the bracelet mandrel are clamped tightly against opposite sides of the holder.

**4,295,641**

## DEVICE FOR HOLDING A WORKPIECE TO BE MACHINED IN A SPECIFIC POSITION IN RELATION TO A MACHINE-TOOL ON WHICH IT MAY BE FIXED

**Pierre Boucher, Objat, France, assignor to Etablissements Boucher Frères, France**

**Filed Feb. 20, 1980, Ser. No. 122,867**
**Claims priority, application France, Feb. 20, 1979, 79 04613**
**Int. Cl.³ B23Q *3/00***
**U.S. Cl. 269—136** **11 Claims**



1. A device for holding a workpiece to be machined in a specific position in relation to a machine-tool on which this device may be fixed, even when it is subjected to a substantial clamping force, comprising a fixed jaw having two orthogonal reference surfaces, a jaw movable perpendicularly to one of these surfaces, and a clamping screw, also perpendicular to this surface, for clamping the machined workpiece between the fixed jaw and the movable jaw, and comprising furthermore a structure for receiving the reactions of the stresses exerted on the fixed and movable jaws, this structure having for this purpose a front part against which the fixed jaw bears and a rear part having therethrough a tapped orifice, through which the threaded portion of the clamping screw is meshingly engaged, the improvement consisting in the front and rear parts of this structure being each formed by a flange, and these two flanges being connected to one another, in the central part thereof, by at least one stay-rod parallel to the clamping screw and, in the lower part thereof opposite that where the clamping screw is to be found, by means of at least one compression bar.

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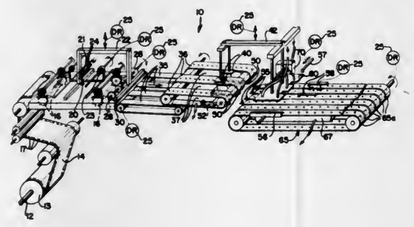
**4,295,642**

## ROLL FED SHINGLING MACHINE WITH PREDETERMINED NUMBERING

**Robert J. Kelly, Dayton, Ohio, assignor to The Reynolds and Reynolds Company, Dayton, Ohio**

**Filed Oct. 15, 1979, Ser. No. 84,492**
**Int. Cl.³ B65H *39/02*; B42B *2/00***
**U.S. Cl. 270—53** **11 Claims**



1. A unitary apparatus for processing a roll of a continuous web of forms into controlled sets of shingled forms, comprising:
(a) unwinding and advancing means for holding a roll of the web and unwinding and advancing the web from the roll,
(b) numbering means for receiving the web as it is advanced, numbering the forms in groups of predetermined count of at least two forms each, giving the forms in each group related numbers, and numbering the forms in consecutive groups consecutively,



(c) cutting means receiving the web and separating the numbered forms individually from the web,
(d) fastening means for securing together the separated individual forms of each group into separate, shingled, overlapped sets,
(e) said fastening means including a predetermined indexing position in said apparatus,
(f) conveyor means for receiving the separated forms from the cutting means and transporting them to a predetermined shifting location,
(g) means for transferring the separated forms individually from the shifting location to the indexing position, and
(h) shifting means for removing the forms from said conveyor and depositing them on said transferring means.

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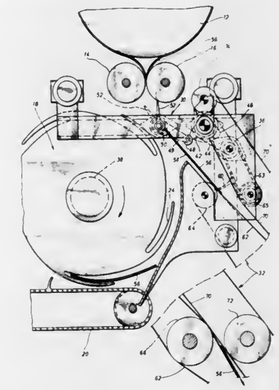
**4,295,643**

## APPARATUS AND METHOD FOR HANDLING JACKETS OF PRINTED MATTER

**Alejandro J. de la Vega, 629 Ote. Washington St., Monterrey, Nuevo Leon, Mexico**

**Continuation of Ser. No. 48,064, Jun. 13, 1979, abandoned, which is a continuation of Ser. No. 897,022, Apr. 17, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,591**
**Int. Cl.³ B65H *5/30***
**U.S. Cl. 270—57** **16 Claims**



1. A method for feeding jackets of printed matter into an inserting machine which is synchronously driven directly by a rotary printing press, comprising the steps of:
diverting alternate jackets from a single press stream into multiple streams of slower throughput;
directing each of said multiple streams to a respective conveyor;
delivering the jackets on each conveyor to an inserting line of an inserting machine; and
prior to entering the inserting line, driving said conveyors at such speed so as to cause said jackets to be spaced apart at such distance so as to be compatible with the operation of the inserter.

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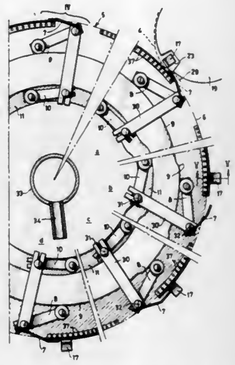
**4,295,644**

## DEVICE FOR STACKING THIN-WALLED BAGS

**Leonard van der Meulen, Immeuble Saadi, Apt. 22A, Ariana, Tunisia**

**Filed Jul. 5, 1979, Ser. No. 54,937**
**Claims priority, application Netherlands, Dec. 9, 1978, 7807513**
**Int. Cl.³ B65H *39/08***
**U.S. Cl. 270—60** **14 Claims**

1. In a device for assembling bags made of thin-walled material comprising
(a) a rotatable stacking drum which cooperates with a supply means and a discharge means, and which has one or more locations on the periphery of the drum for stacking material;
(b) primary clenching means for retaining stacked material against the periphery, the primary clenching means traveling in the rotational direction of the drum; and
(c) secondary clenching means which travel in a closed path outside the drum, part of the path following a portion of the periphery of the drum; the improvement comprising
(i) first primary clenching movement means for moving the primary clenching means tangentially relative to the stacking drum periphery between a first position adjacent a location for stacking material and a second position tangentially separated from said location; and



(ii) second primary clenching movement means for moving the primary clenching means radially relative to the stacking drum periphery between a first position pressing against the drum periphery or stacked material and a second position radially separated from the drum or stacked material; such that the movement of the primary clenching means in each of the radial and tangential directions is separately controllable and occurs sequentially, whereby the primary clenching means moves, in sequence, tangentially of the drum periphery, and then radially outwardly from the drum periphery.

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**4,295,645**

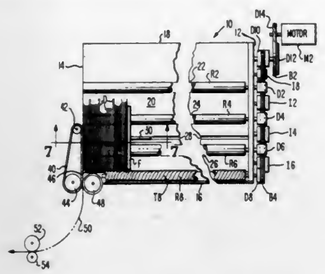
## DOCUMENT HOPPER WITH ECCENTRIC FLOOR CYLINDERS AND A FRONT AUGER

**Rathindra Nahar, Wayne, and Robert H. Dietze, Bloomfield Hills, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Feb. 19, 1980, Ser. No. 122,508**
**Int. Cl.³ B65H *3/04***
**U.S. Cl. 271—34** **5 Claims**

1. A feeder hopper for feeding documents into the feeder nudger belts of a document sorter, comprising:
a base including an open-topped box having a bottom and walls for receiving stacks of documents;
a plurality of openings forming slots through the bottom of said box;
a plurality of rollers extending through the slots in the bottom of the box to serve as low friction supports for the edges of documents placed in the box;
means causing said rollers to rotate and contact edges of documents placed on edge in the box, thereby driving the documents in a first direction to force first ends of the documents against one wall of the box;
an opening forming a slot through said one wall of said box;
an additional roller extending through the slot in the one wall of the box in a position enabling it to engage said first ends of the documents;

means causing said additional roller to rotate in a manner to enable it to contact the first ends of the documents;
each of the plurality of rollers having an eccentric axis about which it rotates;
each eccentric axis enabling a roller, as it rotates, alternately to lift up and drop documents in contact with said roller, thereby lessening the effects of friction on and between the documents to prepare them for ready movement in a second direction substantially orthogonal to the first;




said additional roller having an eccentric axis about which it rotates;
said eccentric axis enabling the additional roller, as it rotates, to push against the ends of documents causing them to move between positions determined by motion of the plurality of rollers and positions determined by the eccentricity of the additional roller; and
flag means aligned to engage the stack of documents and biased to force the documents in the second direction, thereby driving the documents in the second direction.

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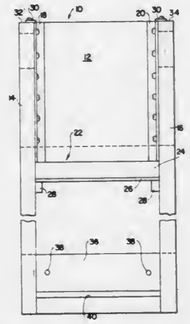
**4,295,646**
**KARATE BOARD HOLDING AND STORAGE DEVICE**
**Dereck Squire, 265 Grove St., Apt. C-30, Elizabeth, N.J. 07202**
**Filed Nov. 5, 1979, Ser. No. 91,236**
**Int. Cl.[3] A63B *69/00***
**U.S. Cl. 272—76** **8 Claims**



1. A board holding and storage device comprising a first shelf and a second shelf, a frame, said frame including four posts, said first shelf and said second shelf disposed in parallel spaced apart relationship and secured to said frame, said four posts including a first pair of posts and a second pair of posts, said first pair of posts joined to said second pair by a pair of angle members, said first shelf extending transverse to the longitudinal axis of said four posts, said second shelf being juxtaposed to said first shelf, means to mount said frame to a vertical supporting surface, means to removeably secure the marginal edges of a board to said frame disposing said board parallel and spaced apart from said supporting surface, whereby said first shelf is disposed located in a horizontal plane extending below said board when said board is positioned having said marginal edges thereof secured to said frame and whereby said second shelf is configured to provide vertical support to said board when said board is disposed having a lateral surface thereof resting on an uppermost lateral surface of said second shelf.

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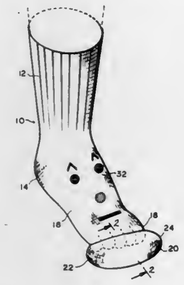
**4,295,647**
**GAME AND ARTICLE FOR USE THEREWITH**
**James E. Daly, 321 A. Howell Rd., Malvern, Pa. 19355**
**Filed Mar. 17, 1980, Ser. No. 131,231**
**Int. Cl.[3] A63B *67/00***
**U.S. Cl. 273—1 G** **1 Claim**



1. An amusement article comprising:
(a) an open top sock having an ankle encasing portion, and a toe enclosing portion; and
(b) a padded enlargement at the toe enclosing portion of said sock, said padded enlargement including,
I. a tubular structure of textile material having its opposite ends closed, said tubular structure disposed transversely of said open top sock and disposed so as to protrude beyond the toe enclosing portion thereof, and
II. a soft padding material in said tubular structure.

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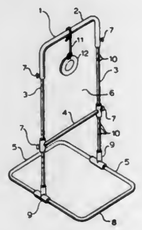
**4,295,648**
**BASEBALL PITCHER'S TARGET**
**Theodore D. Stromback, 20000 Delaware Ave., Detroit, Mich. 48240**
**Filed Nov. 22, 1978, Ser. No. 962,925**
**Int. Cl.[3] A63B *61/00***
**U.S. Cl. 273—26 A** **5 Claims**



1. A portable baseball pitcher's target for use as a game or practice device whereby said device may be readily assembled and adjusted comprising: a pair of vertical members spaced apart in fixed relationship to each other so that the distance between said members corresponds to the width of a baseball batter's strike zone; a pair of crossmembers spaced apart and extending across the vertical members with the end portions of at least one of the crossmembers in slideable engagement with



the vertical members so that the vertical distance between the crossmembers corresponds to the height of said strike zone and may be adjusted for a range of batter sizes; a means for locking the ends of said crossmembers to said vertical members; a target suspended within the strike zone bounded by said vertical members and said crossmembers whereby a particular area of said zone may be designated, a means for suspending the target within the strike zone comprising a cord having one end portion thereof attached to the target and the other end portion attached to one of the crossmembers whereby the target may be repositioned within the strike zone by varying the length of said cord and the point of attachment to said crossmember; and a means for supporting said vertical members to which the lower end portions of vertical members thereof are attached.

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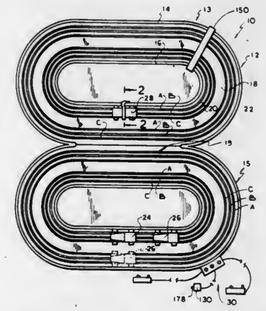
**4,295,649**
**TOY MINIATURE VEHICLE RACING GAME**
**Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.**
**Filed May 23, 1980, Ser. No. 152,904**
**Int. Cl.[3] A63F *9/14***
**U.S. Cl. 273—86 B** **16 Claims**



11. A toy vehicle race game comprising a relatively flat slotless track having at least two track portions each having separate inner and outer lanes defining separate paths of travel, said track sections including unobstructed cross-over sections located adjacent each other defining a cross-over being at least four lanes wide through which toy vehicles may pass from one track section to another, a pair of controllable toy vehicles, means for selectively and independently controlling the controllable toy vehicles to cause them to switch lanes within a track portion and at said cross-over thereby to pass one another and cross from one path of travel to another; a drone vehicle and means for restraining the drone vehicle for movement in one of the lanes of one track portion thereby to provide an obstacle to vehicles crossing into said one track portion.

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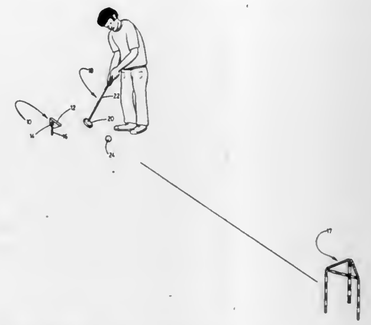
**4,295,650**
**SURFACE PROJECTILE GAME WITH MALLETS AND THREE-SIDED TARGETS**
**Joseph D. Keeble, 17829 Lazy Dog Rd., Nevada City, Calif. 95959**
**Filed Apr. 7, 1980, Ser. No. 137,719**
**Int. Cl.[3] A63B *71/02, 59/10***
**U.S. Cl. 273—118 R** **1 Claim**

1. An amusement system for a plurality of player-contestants comprising:
A. a ball of a dimension suitable to permit the ball to be struck by a mallet, when positioned on a playing surface and propelled in rolling motion along segments of a course defined on said surface;
B. a plurality of portable, unitary three-sided targets adapted to be positioned on said playing surface in mutually spaced relation for dividing said surface into mutually spaced course segments, each of said targets being characterized by three legs of a substantially common length arranged in mutually spaced parallelism defining a pair of adjacent portals arranged in a pair of horizontally converging planes for accommodating passage of the ball, said legs being interconnected by three arms horizontally extended between adjacent ends of the legs and welded thereto;
C. a plurality of course markers, each marker being adapted to be positioned in spaced relation with one target of said plurality for indicating a segment of said course; and
D. a plurality of mallets for use by said player-contestants,



each mallet being characterized by an elongated head and a handle projected perpendicularly from the head, having defined at each of its opposite ends a planar striking surface of an area less than the cross-sectional area of the head and having a resilient covering affixed thereto, said head being tapered at its ends along three sides and said cross-sectional area being substantially of a half-round shape, with the curvature thereof being oppositely related to the handle, and said handle being of a length sufficient to permit a contestant to grasp the end portion of the handle opposite head and swing the head through an area having a length of at least 90°.

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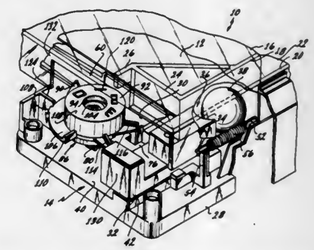
**4,295,651**
**PINBALL ACTUATOR AND FEED MECHANISM**
**Yukio Konta, Gardena, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan**
**Filed Jan. 21, 1980, Ser. No. 114,019**
**Claims priority, application Japan, Aug. 28, 1978, 53-117472**
**Int. Cl.[3] A63F *7/24***
**U.S. Cl. 273—121 D** **14 Claims**



1. In a game having a playing surface an object feed and propulsion apparatus for propelling an object across said playing surface which comprises:
a housing associated with said playing surface;
an actuator means movably mounted on said housing and capable of moving from a rest position to an activated position, said actuator means including an actuator-object

contact surface, said actuator means capable of propelling said object across said playing surface when said actuator means moves from said activated position to said rest position and said object is located in an abutting relationship with said actuator-object contact surface;

an object feed means movably mounted on said housing and capable of contacting an object when said object is in a first position wherein said object is located adjacent to said object feed means and moving said object from said first position to a second position wherein said object is located in said abutting relationship with said actuator-object surface;

connecting means operatively associated with said actuator means and said object feed means and capable of translating motion of said actuator means into motion of said object feed means as said actuator means moves from said rest position to said activated position to cause said object feed means to move moving said object from said first position to said second position;

movable means mounted on said housing in association with said object feed means and capable of moving independent of movement of said object feed means;

engagement means located on said movable means and capable of moving said movable means in respect to a force applied to said engagement means;

said object capable of simultaneously cooperatively engaging both said engagement means and said object feed means transferring force from the movement of said object feed means to said engagement means and to said movable means to move said movable means simultaneously as said object is transferred from said first position to said second position.

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**4,295,652**

## GOLF BALL

**Tasuku Saito, Tokorozawa; Tutomu Noma, Higashimurayama; Tsutomu Matsunaga, Iruma; Nagayoshi Naito, Nagoya; Chiaki Tanaka, Chita, and Motoki Hiratsuka, Nagoya, all of Japan, assignors to Bridgestone Tire Co., Ltd. and Toray Industries, Inc., both of Tokyo, Japan**

**Filed Feb. 8, 1980, Ser. No. 119,640**

**Claims priority, application Japan, Feb. 15, 1979, 54-16339**

**Int. Cl.³ A63B** *37/12*

**U.S. Cl. 273—235 R** **7 Claims**

1. A golf ball comprising a thread-wound central core and an outer cover for the core, said cover being formed of, as a main ingredient, a block copolyetherester comprising (A) a terephthalic acid unit, (B) a 1,4-butanediol unit, (C) a unit of a dicarboxylic acid, other than terephthalic acid, or a short-chain diol, other than 1,4-butanediol, having a number-average molecular weight of not more than 300 and (D) a poly(alkylene oxide) glycol unit having a number-average molecular weight of from 500 to 3000, the amount of the component (C), being 25/75 through 60/40 in terms of mol ratio to either component (A) or (B), and the amount of the component (D) being 35 through 70% by weight based on the total weight of the copolymer.

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**4,295,653**

## PRESSURE-COMPENSATED DIAPHRAGM SEALS FOR ACTUATORS, WITH SELF-EQUALIZATION

**Carl R. Coles, Michigan City, Ind., assignor to Zero-Seal, Inc., Arlington Heights, Ill.**

**Filed Apr. 7, 1980, Ser. No. 138,199**

**Int. Cl.³ F04B** *21/00;* **F16J** *15/50*

**U.S. Cl. 277—2** **12 Claims**

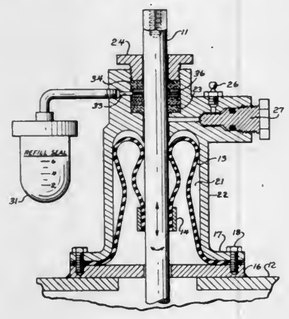
1. A sealed transmission device for use in conjunction with apparatus having a working environment therein to be sealed reliably from the external environment and expected to exhibit substantial pressure and within which a function is to be performed by the transmission device; said transmission device including:

a. a seal housing for sealed communication with the working environment and having an opening exposed to the external environment;

b. a movement transmission means extending movably through said opening;

c. a pressure-withstanding seepage-prone seal normally preventing substantial leakage through said opening while permitting movement of the transmission means, and subject to possible leakage-causing impairment by such movement;

d. an impervious flexible membrane, cooperating with said housing and said transmission means to allow said transmission means to perform a function in the working environment, and to form a hermetic seal between the working environment and said opening and to form a confined space for a sealing liquid between said opening and said membrane; the housing characteristics being such that the



volume of the confined space is substantially constant except for movement of the membrane;

said membrane having a portion free to move, extensively and independently of movement of the transmission means, under influence of pressure of the working environment to accommodate itself to the volume of the confined sealing liquid to maintain that liquid at a pressure on the outer face of the membrane substantially equal to the pressure exerted on the inner face by the working environment;

said device including means effective, in the event of failure of said pressure-withstanding seal, to limit the yielding of the membrane to a safe amount and maintaining a protective pressure on the outer face of the membrane, and at the same time to form a temporary seal between the confined space and the opening permitting the servicing of said pressure-withstanding seal.

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**4,295,654**

## SEAL ASSEMBLY FOR A LINKAGE

**Toshio Kawamura, Isehara; Noboru Harashima; Hideo Ueda, both of Hiratsuka, and Seijiro Sano, Ninomiya, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed May 12, 1980, Ser. No. 148,585**

**Claims priority, application Japan, May 11, 1979, 54-61766[U]; Oct. 5, 1979, 54-137432[U]; Oct. 5, 1979, 54-137433[U]**

**Int. Cl.³ F16J** *15/34, 15/32*

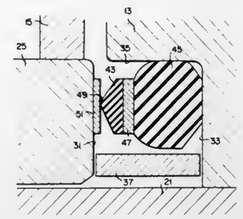
**U.S. Cl. 277—92** **6 Claims**

1. A seal assembly in an annular cavity formed by first and second members which are subject to relative rotation, the first member forming an axially facing end wall and a radially facing side wall of the cavity, the second member having an end face forming another axially facing end wall of the cavity opposite the one axially facing end wall, said seal assembly comprising:



a load ring of resilient elastomeric material disposed in said cavity adjacent the end wall of said first member;

a seal ring of wear-resistant elastomeric material bonded to said load ring, said seal ring having a lip formed thereon; and



a wear-resistant annular plate bonded to the end face of said second member whereby said load ring is axially compressed between said first and second members thereby urging said lip into sealing contact with said wear-resistant annular plate.

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**4,295,655**

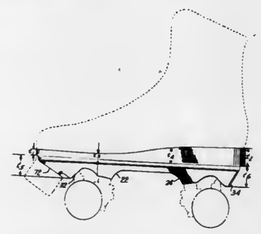
## ROLLER SKATING SHOE

**David L. Landay, Brookline, and Alvan H. Wolf, Worcester, both of Mass., assignors to Brookfield Athletic Shoe Company, Inc., East Brookfield, Mass.**

**Filed Jul. 18, 1979, Ser. No. 40,093**

**Int. Cl.³ A63C** *17/02*

**U.S. Cl. 280—11.2** **10 Claims**



1. A roller skating shoe comprising

an integral sole-chassis unit injection molded from semi-rigid plastic material,

an upper which is in-situ bonded to said sole-chassis unit during molding thereof,

front and rear threaded connecting means,

each said threaded connecting means being permanently embedded within the interior of said injection-molded sole-chassis unit during molding thereof,

each said connecting means including one or more transversely extending portions embedded within said sole-chassis unit for resisting pull out and other forces on said connector means,

front and rear skate wheel hangers connected to and retained by said threaded connector means,

each of said hangers also including a strut element forming a second connection between said hanger and said sole-chassis unit, and

roller skate wheels rotatably mounted on said hangers,

said sole-chassis unit providing a substantial mass of semi-rigid plastic material in the region of said front and rear hangers for structurally supporting said hangers.

**4,295,656**

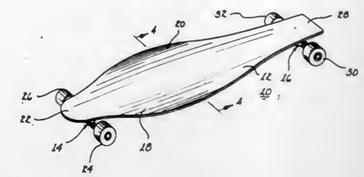
## SKATEBOARD HAVING FLEXIBLE SIDES

**Arlan G. Moore, Vail, Colo., assignor to C. Robert von Hellens, Phoenix, Ariz.**

**Filed Jul. 2, 1979, Ser. No. 53,688**

**Int. Cl.³ A63C** *17/02*

**U.S. Cl. 280—87.04 A** **4 Claims**



1. A road skateboard, said skateboard having a wheel truck vertically dependingly mounted at the nose and at the tail of said skateboard, said skateboard comprising in combination:

(a) a board;

(b) a flexible upwardly convexly curved spine extending along the longitudinal axis of said board for providing structural support intermediate the wheel trucks;

(c) a pair of flexible wing sections for modifying the resilient resistance to flexing of said board and for establishing a supporting surface for a skater's feet and for providing a shock absorber to smooth the ride and for providing a lateral moment arm to encourage tilting of said board about the longitudinal axis in response to a lateral weight shift by the skater, each wing section of said flexible pair of wing sections extending laterally and upwardly from one side of said spine intermediate the nose and tail of said board in the quiescent state and being flexibly deflectable downwardly relative to the spine of said board and with respect to its configuration in the quiescent state in response to any force applied by the skater and thereby proportionally modifying the resilient resistance of said board; and

(d) means incorporated within the wheel trucks for reorienting the wheel axles of the wheel trucks in opposed angular deviations in response to tilting of said board and flexing of said board when tilted;

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**4,295,657**

## STEERING APPARATUS FOR VEHICLES

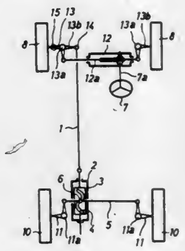
**Shoichi Sano, Tokorozawa, and Yoshimi Furukawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 28, 1979, Ser. No. 107,718**

**Claims priority, application Japan, Dec. 29, 1978, 53-163681**

**Int. Cl.³ B62D** *7/00*

**U.S. Cl. 280—91** **8 Claims**



1. A steering apparatus for a four-wheeled vehicle wherein a rotational movement of a steering wheel of the vehicle is

converted into a straight-line motion through a steering gear for turning the front wheels of the vehicle, wherein:

the rear wheels of the vehicle are also dirigible; and

means are provided for changing a turning direction of said rear wheels with respect to the front wheels of the vehicle, in response to the amount of rotation of said steering wheel, such that said rear wheels are concurrently turned in the same direction as said front wheels when said steering wheel is rotated through a relatively small angle, and in the opposite direction of said front wheels when said steering wheel is rotated through a relatively large angle.

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**4,295,658**

## FRONT END SHOCK ABSORBING APPARATUS FOR WHEELED VEHICLE

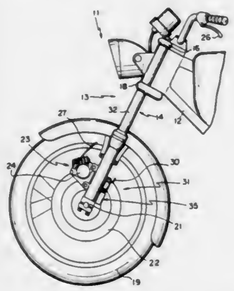
**Mitsuhiro Kashima, Gifu, Japan, assignor to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 16, 1979, Ser. No. 29,999**

**Claims priority, application Japan, Apr. 17, 1978, 53-45021**

**Int. Cl.³ B62K *25/08***

**U.S. Cl. 280—276** **9 Claims**



1. A shock absorbing suspension apparatus for a front end of a wheeled vehicle having brake means, the apparatus including a telescopic shock absorber having a first fluid chamber and a second fluid chamber containing a fluid which is urged to flow from the first chamber to the second chamber upon compression of the shock absorber for shock absorption, wherein the improvement comprises:

valve means disposed between the first and second chambers;

actuator means responsive to the brake means for controlling the valve means to progressively restrict fluid flow therethrough as a degree of braking force applied by the brake means to the vehicle increases;

the valve means comprising a check valve which is normally closed and urged to open by fluid pressure in the first chamber, the actuator means being constructed to progressively increase a pressure required to open the check valve as the degree of braking force increases;

the brake means comprising a fluid pressure actuated brake and a high pressure line for supplying high pressure actuating fluid to the brake, the actuator means being connected to the high pressure line and constructed so as to increase the pressure required to open the check valve as the actuating fluid pressure increases;

the valve means comprising a valve element and a compression spring urging the valve element toward a closed position, the actuator means comprising an actuator rod, the actuator rod being urged by the high pressure actuating fluid to compress the compression spring;

the actuator means further comprising a stop, the compression spring urging the actuator rod toward engagement with the stop; and

an adjustment spring urging the actuator rod toward the stop and adjustment means for adjusting a force exerted by the adjustment spring on the actuator rod.

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**4,295,659**

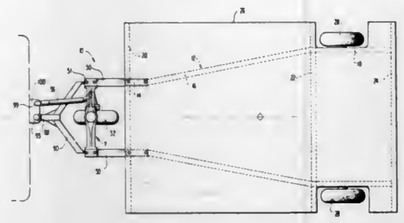
## STEERABLE SELF-SUPPORTING TRAILER

**Joseph Mergen, Goshen, Ind., assignor to Bangor Punta Corporation, Greenwich, Conn.**

**Filed Nov. 15, 1979, Ser. No. 94,526**

**Int. Cl.³ B62D *13/00***

**U.S. Cl. 280—405 R** **18 Claims**



1. A self-supporting trailer system for coupling at its forward end to a towing vehicle comprising:

an elongated frame,

at least a pair of wheels carried by said frame,

a yoke connected to said frame at its forward end and having a pair of arms,

a front wheel,

means connecting said front wheel and said yoke one to the other for pivotal movement of said front wheel about a substantially vertical axis extending substantially medially between the outer ends of said yoke arms,

means for steering said front wheel in accordance with the turning movement of the towing vehicle including a steering link having pivotal connections at its opposite ends for pivotally connecting said connecting means and said steering link on the one hand and said steering link and the towing vehicle on the other hand,

a hitch assembly including a bifurcated drawbar having a tongue at its forward end and a pair of laterally spaced arms extending rearwardly from said tongue, means carried by said tongue adjacent its forward end for releasably coupling said trailer to the towing vehicle, and means for pivotally coupling each of the drawbar arms and a corresponding yoke arm one to the other for relative pivotal movement about a generally horizontal axis,

the pivotal connections carried by said tongue and the coupling means between said drawbar arms and said yoke arms defining a plane, the pivotal connections carried by said steering link constituting universal joints lying in said plane whereby the steering link connections are maintained in said plane throughout the range of relative pivotal movement between said drawbar and said yoke.

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**4,295,660**

## ACTIVE SUSPENSIONS ASSEMBLY FOR A MOTOR CAR

**Gabriele Toti, Milan; Giuliano Lenzi, Arese, and Paolo Monti, Lazzate, all of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy**

**Filed May 30, 1979, Ser. No. 43,793**

**Claims priority, application Italy, Jun. 8, 1978, 24338 A/78; Mar. 29, 1979, 21421 A/79**

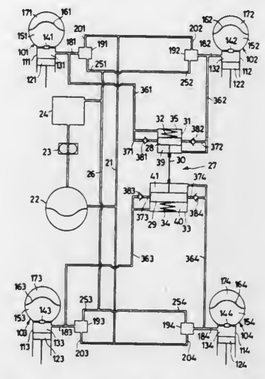
**Int. Cl.³ B60G *11/26***

**U.S. Cl. 280—714** **10 Claims**

1. Active suspensions for a motor vehicle equipped with a car body which is the suspended mass and wheels which are the non-suspended mass, said suspensions comprising usual resilient means and shock-absorbing means inserted between the car body and the wheel hubs, telescopable stay tubes filled



with liquid and inserted, each, between the car body and the hub of a car wheel, level-adjusters operatively connected to said telescopable stay tubes, said level-adjusters being composed by valve means for establishing communication between said telescopable stay tubes alternately with a source of pressurized liquid and with a sump, said valve means comprising means responsive to the variations of the mutual distance between the car body and every wheel, said responsive means being connected to the car body itself and to the hub of every wheel through means for filtering off the signals indicative of said variations of such mutual distance so that the signals originated by shocks due to road unevenness are not detected, said responsive means being operatively connected to said valve means to command them to establish a communication



between said stay tubes and the source of pressurized liquid when a depression of the car body relative to the respective wheel is detected and for commanding them to establish a communication between said stay tubes and the sump when a lift of the car body relative to the respective wheel is detected, said suspensions being characterized in that each of said telescopable stay tubes is operatively connected to a level-adjuster of its own and is also operatively connected to a load-shift adjuster, said load-shift adjuster being means for controlling the distribution ratio of the load shifts between heavily loaded wheels and lightly loaded wheels in the front and the rear wheel assemblies under combined conditions of vehicle pitching and of vehicle rolling by properly interconnecting the stay tube relative to the respective wheel of at least on wheel assembly.

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**4,295,661**

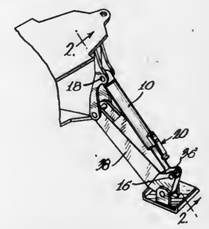
## LATCHING MECHANISM FOR MACHINE STABILIZER ARMS USING HYDRAULIC CYLINDERS

**Herman J. Maurer, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.**

**Filed Jan. 10, 1980, Ser. No. 111,099**

**Int. Cl.³ B66C *5/10***

**U.S. Cl. 280—765** **6 Claims**



1. In a mobile machine having at least one outrigger arm pivotally mounted thereon and movable between a lower ground-engaging position and a raised and inactive position powered by a hydraulic cylinder including a cylinder housing and a cylinder rod, said outrigger arm being adapted to provide lateral stabilization for the machine; a latching mechanism for the hydraulic cylinder releasably latching the cylinder rod in a retracted position, the latching mechanism comprising:

a generally flat spring having a generally V-shaped raised portion at one end and mounted at its other end to the cylinder housing so that the raised portion end of the spring extends beyond the end of the cylinder housing with the raised portion extending generally toward the cylinder rod without contacting the rod; and

a radial protrusion at the end of the cylinder rod extending beyond the diameter of the rod such that the radial protrusion contacts and coacts with the raised portion of the spring as the cylinder rod is retracted,

whereby movement of the cylinder rod from an extended position end of the spring, which is otherwise free from contacting the cylinder rod, to contact and slide completely over the protrusion at the end of the cylinder rod when the cylinder rod reaches a preselected retracted position relative to the cylinder housing, and whereby the cylinder rod is held from extension by a spring retention force less than the hydraulic actuation force of the cylinder, until an unlatching extension force larger than the spring retention force is exerted upon the cylinder rod to overcome the spring retention force and allow extension of the rod beyond the preselected retracted position.

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**4,295,662**

## IMAGE WISE DEVELOPABLE SYSTEM

**Geoffrey C. Tutty, Christchurch, New Zealand, assignor to INCA Limited, Christchurch, New Zealand**

**Division of Ser. No. 79,258, Sep. 27, 1979, which is a continuation-in-part of Ser. No. 930,013, Aug. 1, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,435**

**Claims priority, application New Zealand, Aug. 2, 1977, 184811; Feb. 8, 1978, 186415**

**Int. Cl.³ B41M *5/16, 5/18, 5/20, 5/22***

**U.S. Cl. 282—27.5** **6 Claims**

1. An imagewise developable system comprising (I) a substrate supported mixture of (1) a free base of a cationic solvent dye in $OH^-$ form, said dye being capable of developing a color or a more intense color upon reaction with an organic acid developing agent, and (2) a binder which (i) is non-polar and non-acid, (ii) does not develop said free base and (iii) is soluble in ASTM class 1 solvents; and (II) a substrate supported organic acid developing agent which is substantially non-crystalline and melts, sublimes or decomposes at a temperature between 50° C. and 400° C., said organic acid developing agent not being in the reactive presence of said free base of a cationic solvent dye in $OH^-$ form, but being selectively migratable to imagewise develop the said free base under an action selected from the group consisting of (a) applying selective imagewise pressure to the system, (b) applying selective imagewise heat to the system and (c) applying selective electrical discharge to the system.

**4,295,663**

## 3-INDOLYL-3-BIS-AMINO-PHENYL-PHTHALIDE COMPOUNDS

**Jean C. Petitpierre, Kaiseraugst, Switzerland, and Robert Garner, Bury, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

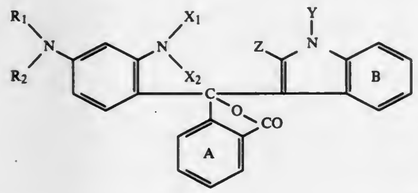
**Division of Ser. No. 971,768, Dec. 21, 1978, Pat. No. 4,252,975, which is a division of Ser. No. 758,259, Jan. 10, 1977, Pat. No. 4,153,609. This application Aug. 25, 1980, Ser. No. 181,016**

**Claims priority, application Switzerland, Jan. 16, 1976, 516/76**

**Int. Cl.³ B41M** *5/16, 5/18, 5/22*

**U.S. Cl. 282—27.5** **9 Claims**

1. A pressure- and/or heat-sensitive recording material comprising a support which contains, or has coated thereon as colour former at least one 3-indolyl-3-bis-aminophenyl-phthalide colour former of the formula



wherein

$R_1$ represents alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or unsubstituted or substituted phenyl or benzyl wherein the substituents are halogen, nitro, lower alkyl or lower alkoxy,

$R_2$ represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, cycloalkyl, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, or

$R_1$ and $R_2$ together with the nitrogen atom linking them represent a 5- or 6-membered heterocyclic radical,

$X_1$ and $X_2$ independently of one another represent hydrogen, lower alkyl, cycloalkyl, benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy, or acyl having 1 to 8 carbon atoms, and $X_1$ also represents phenyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Y represents hydrogen, alkyl which has at most 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl or cyano, or benzyl which is unsubstituted or substituted by halogen, nitro, lower alkyl or lower alkoxy,

Z represents hydrogen, lower alkyl or phenyl, and the rings A and B independently of one another are unsubstituted or substituted by halogen, nitro, amino or lower alkylamino.

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**4,295,664**

## MEDICATION RECORD-KEEPING PACKAGE

**Gloria T. Cutting, 1426 Camden Ave., Los Angeles, Calif. 90025**

**Continuation of Ser. No. 741,454, Nov. 12, 1976, abandoned. This application Oct. 11, 1978, Ser. No. 950,306**

**Int. Cl.² B42D** *15/00*

**U.S. Cl. 283—1 A** **16 Claims**

1. A medication record-keeping package for hospital use comprising:

a retention sheet having a plurality of parallel, spaced-apart, adhesive strips thereon;

a plurality of elongated, separately removable protective strips overlying and adhering to said adhesive strips;

a cover sheet overlying said retention sheet and said protective strips;

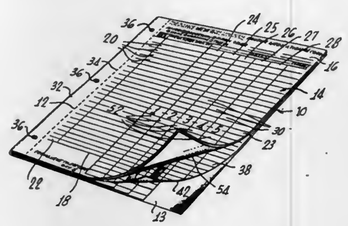
a plurality of transfer sheets each of a different size, said transfer sheets being arranged between said cover sheet and said retention sheet in order of increasing size;

pressure sensitive duplication coating means for reproducing on said retention sheet and said transfer sheets information recorded on said cover sheet;

binding means for releasably attaching said retention sheet, said transfer sheets, and said cover sheet in a predetermined overlying relationship; and

a plurality of administration columns delineated on said cover sheet and at least one such column delineated on each of said transfer sheets, each of said columns providing a space for recording the administration of medicine during a particular time period, each successively wider transfer sheet including at least one more of said columns than the preceding transfer sheet, the spacing of said columns corresponding to the spacing of said adhesive strips,

whereby said retention sheet can be detached from said binding means, and said transfer sheets can be sequentially detached from said binding means and attached to said retention sheet along said adhesive strips and thereby combined to provide a progressively updated supplemental record of the information recorded on said cover sheet.



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**4,295,665**

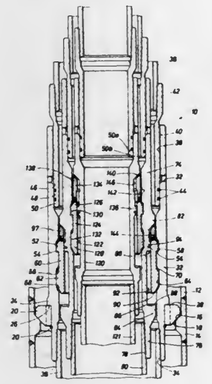
## WELL CASING SUSPENSION SYSTEM

**Elwood K. Pierce, Coldspring, Tex., assignor to Petroleum Designers, Inc., Houston, Tex.**

**Filed Sep. 4, 1979, Ser. No. 72,068**

**Int. Cl.³ F16L** *35/00*

**U.S. Cl. 285—3** **13 Claims**



1. A well casing suspension mechanism for suspending an inner well casing within and from an outer well casing, said casing suspension mechanism comprising:

casing suspension coupling means adapted to be connected to outer well casing extending into a well bore, said coupling means being formed internally to define an internal key recess means and internal lock recess means, said lock recess means defining upwardly directed stop shoulder surface means and said key recess means defining internal tapered surface means;

a tubular hanger body being receivable within said coupling means and being connectable to said inner well casing and defining an external lock receiving recess, an external key receiving recess and an external lock positioner recess, said tubular hanger body further defining external tapered downwardly directed shoulder means;

a split ring type locking element being movably positioned about said tubular hanger body and defining lock means adapted to be received within said lock recess means and in engagement with said stop shoulder surface means, said locking element defining key means adapted to be received within said key recess means, said key means defining external tapered surface means being engagable with said internal tapered surface means of said key recess means, said locking element being of spring nature and being normally expanded to a position locating said lock and key means respectively within said lock and key recess means, said locking element being radially contractable by externally applied mechanical force by reaction of said internal and external tapered surface means to withdraw said lock and key means from said lock and key recess means, in said radially contractable condition said locking element being at least partially received within said external lock receiving recess of said tubular hanger body; and

split ring type lock positioning means being received between said tubular hanger body and said casing suspension coupling means and being of spring nature normally contacting said lock positioning element into said lock positioner recess of said tubular hanger body, said lock positioning element being positioned for contact by said tapered downwardly directed shoulder means upon downward movement of said hanger body relative thereto and being radially movable by reacting engagement thereof by said downwardly directed shoulder means against the spring tension thereof into load supporting engagement with said casing suspension coupling and into load transferring engagement with said locking element, said locking element supporting said lock positioning means during said radial movement of said lock positioning means.



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**4,295,666**

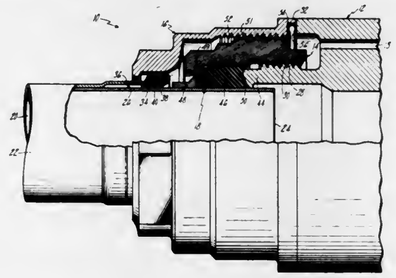
## SHROUDED TUBE AND COUPLING THEREFOR

**Donald G. Melanson, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Nov. 5, 1979, Ser. No. 91,680**

**Int. Cl.³ F16L** *19/02*

**U.S. Cl. 285—14** **3 Claims**



1. A coupling fabricated from aluminum for attaching an inner fuel carrying tube and an outer containment tube, said coupling having an attaching member having a central passage in axial alignment with the opening in the inner fuel carrying tube, a seating surface at the mating end of said attaching member, a concentric threaded surface axially spaced from said seating surface, a flexible rubber composite sealing element, toroidal in shape frictionally fitted on the outer diameter of said inner fuel carrying tube, a collar on said latter mentioned tube axially restraining said sealing element,

an inner nut having a concentric threaded surface on its inner diameter and a concentric threaded surface on its outer diameter both of said threaded surfaces being disposed on the end adjacent said concentric threaded surface on said attaching member and said threaded surface on the inner diameter being threadably engageable therewith,

an outer nut having a concentric threaded surface on its inner diameter threadably engaging said outer threaded surface of said inner nut,

said inner nut having a depending shoulder engageable with said collar for urging said sealing element in sealing engagement with said seating surface and urging the end of said inner tubes into said central passage, said outer diameter of said inner fuel carrying tube and said inner nut upon coupling said outer nut to bear against said attaching member and a ferrule at the end of said sealing element mounted on the end of said inner fuel carrying tube for preventing the rubber composite material from extruding when said sealing element engages said seating surface.

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**4,295,667**

## ROTARY PIPE SWITCH

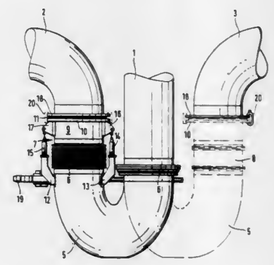
**Gernot Zahs, and Hans-Jürgen Wahle, both of Dortmund, Fed. Rep. of Germany, assignors to Vacmetal Gesellschaft für Vakuum-Metallurgie mbH, Dortmund, Fed. Rep. of Germany**

**Filed Aug. 2, 1979, Ser. No. 62,933**

**Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 7825611[U]**

**Int. Cl.³ F16L** *55/00*

**U.S. Cl. 285—18** **8 Claims**



1. A rotary pipe switch for selectively interconnecting a central pipe to a selected one of a plurality of distributing pipes arranged in a circular pattern around said central pipe comprising a pipe elbow having a first end and a second end with a curved portion therebetween, rotary joint means at said first end for connecting said pipe elbow to a central pipe and for enabling rotary motion of said pipe elbow relative to said central pipe, axial compensator means located intermediate said curved portion and said second end of said pipe elbow, connector means attached at said second end of said pipe elbow for enabling connection and disconnection of said second end of said elbow to and from a distributing pipe, and at least two adjusting devices attached to said connector means, said adjusting devices and said axial compensator means being structured to enable axial movement of said connector means toward and away from each of a plurality of distributing pipes to enable said connector means to be attached with and detached from said distributing pipes, said rotary pipe switch also including means at said second end for driving said pipe elbow

to enable selective attachment and detachment of said central pipe and said distributing pipes.

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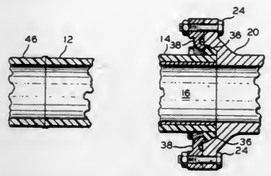
**4,295,668**

## ADAPTER FOR CONNECTING PLASTIC PIPE SYSTEM TO CAST IRON PIPE SYSTEM

**Jean H. Louthan, Dallas, Tex.; Russell C. Cox, Taylor, S.C., and William V. Crawford, Williamstown, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jun. 27, 1979, Ser. No. 52,900**
**Int. Cl.³ F16L *55/00***
**U.S. Cl. 285—21** **18 Claims**



**1**. Adapter means for connecting a plastic pipe system to a metallic pipe system, comprising:

(a) an elongated, plastic sleeve having a substantially equal wall thickness throughout its length and having a first end adapted to be joined to said plastic pipe system and a second end adapted to be joined to said metallic pipe system; and

(b) an elongated, metallic reinforcing sleeve, having an outside diameter substantially equal to the inside diameter of said second end of said plastic sleeve and a length less than the length of said plastic sleeve and mounted in said second end of said plastic sleeve with a first end thereof terminating inside said plastic sleeve intermediate the ends of said plastic sleeve and a second end thereof terminating flush with said second end of said plastic sleeve, said first end of said metallic reinforcing sleeve having a significant length thereof tapered from the diametric exterior and an intermediate point along the length thereof inwardly toward the central axis and to said first end thereof.

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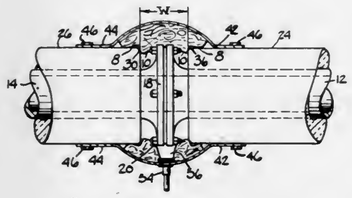
**4,295,669**

## THERMAL INSULATION ESPECIALLY FOR PIPE, FLANGES AND FITTINGS

**Steve A. LaPrade, and John M. Pallo, both of Englewood, Colo., assignors to Johns-Manville Corporation, Denver, Colo.**

**Filed Apr. 11, 1977, Ser. No. 786,746**
**Int. Cl.³ F16L *11/12***
**U.S. Cl. 285—47** **9 Claims**



**1**. A thermal insulation device for insulating irregularly shaped objects such as pipe flanges and fittings which comprises:

(a) a single flexible thermal insulation member which has a width at least equal to the width of the object to be insulated and a length equal to the circumference of the object to be insulated;

(b) a single flexible cover sheet having a width and length each greater than the respective width and length of said thermal insulation member, and to one side of which said thermal insulation member is adhered, said cover sheet forming the outer surface of said thermal insulation device when said device is installed;

(c) detection means passing through said thermal insulation member and said cover sheet to detect leakage of fluid from said object to be insulated and to provide observable indication outside of said thermal insulation device that leakage has occurred from said object; and

(d) securing means to removably secure said device in position surrounding said object to be insulated.

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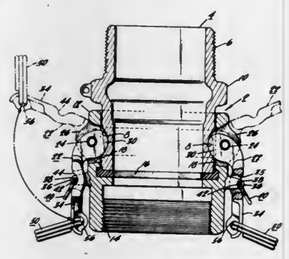
**4,295,670**

## QUICK-DISCONNECT CAM LOCKING SAFETY COUPLING

**Richard B. Goodall, Worton, and Richard L. Goodall, Chestertown, both of Md., assignors to Dixon Valve & Coupling Co., Chestertown, Md.**

**Filed Jun. 11, 1980, Ser. No. 158,501**
**Int. Cl.³ F16L *37/18***
**U.S. Cl. 285—91** **3 Claims**



**1**. A quick-disconnect cam locking safety coupling comprising:

a hollow male plug having an external peripheral groove,

a socket receiving said male plug and having a pair of opposed side openings opposite said peripheral groove,

a gasket for sealing between the male plug and the socket,

a pair of cam members each having a lever with an opening and lying adjacent the socket and a cam portion passing through one of said side openings and engaging said peripheral groove and each being pivotally connected to the socket for outward movement of the levers away from the socket to disengage the cam portions from the said peripheral groove,

a lug on the socket adjacent each cam member lever and extending through the opening in the lever,

the exterior of each of said levers having a recessed portion adjacent the opening in the lever to minimize the distance the lug must protrude from the body of the socket,

each lug having an opening therethrough lying substantially in a plane perpendicular to the axis of the coupling, and

a wire pin clipped to the lug with a straight arm of the pin passing through each lug opening and accommodated in the recessed portion of the adjacent lever to hold the adjacent cam member in the groove engaging position, and a bent arm of the pin outside the lug and having a bent portion on each side of the lug to center and lock the pin onto the lug.



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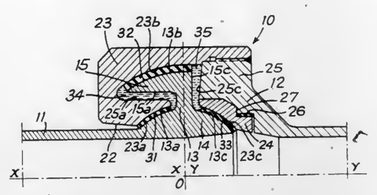
**4,295,671**

## FLEXIBLE UNION WITH PASSIVE COMPENSATION

**Jean C. Clebant, Carbon-Blanc, France, assignor to Societe Europeenne de Propulsion, Puteaux, France**

**Filed Aug. 27, 1979, Ser. No. 69,738**
**Claims priority, application France, Sep. 19, 1978, 78 26846**
**Int. Cl.³ F16L *27/10***
**U.S. Cl. 285—223** **5 Claims**



**1**. A flexible union for connecting together first and second rigid tubular sections capable of oscillating with respect to each other about a central point with a limited angular amplitude, said union comprising:

a first rigid body fast with or forming part of said first tubular section, said first body having an annular projecting portion at one end of said first tubular section, and said projecting portion having a front external surface directed toward said second tubular section and a back external surface directed toward said first tubular section;

a second rigid body fast with or forming part of said second tubular section, said second body having an annular recess completely surrounding said projecting portion and defining therewith an annular gap, said first and second bodies being entirely separated from each other by said annular gap bordered by first and second surfaces belonging respectively to said first and second bodies;

at least a first and a second separate elastic annular elements located in said gap, each element being formed in one piece and having inner and outer faces bound to annular surfaces having the shape of spherical surface parts belonging respectively to said first and second surfaces; and

at least one closed annular chamber formed in said gap between said first and second elastic elements and having opposite walls belonging respectively to said first and second bodies, said chamber being completely filled with a substantially non-compressible liquid and being adjacent to at least a portion of the rearward surface of said projecting portion so as to allow the transmission of axial traction forces between said first and second tubular sections through said liquid.

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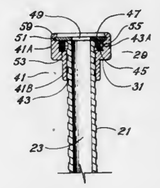
**4,295,672**

## FLEXIBLE TUBE TERMINATING MEANS

**Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107**

**Filed May 14, 1979, Ser. No. 38,650**
**Int. Cl.³ F16L *13/08***
**U.S. Cl. 285—287** **8 Claims**



**1**. A fitting located around the end portion of a tube and having a shoulder for engagement by a threaded coupling member, said fitting having a first annular portion located around the end of said tube and a second annular portion located around said tube and extending from said first annular portion, said first annular portion having a diameter greater than that of said second annular portion defining said shoulder therebetween, comprising:

first and second annular members attached together and to said tube by fused metallic means,

said first annular member comprising annular means connected to said first annular portion and defining a generally flat annular surface engaging the end face of the terminal end of said tube and extending radially outward therefrom defining one end of an annular cavity surrounding the exterior of said tube,

said second annular member comprising an annular portion connected to said second annular portion and spaced axially inward from said generally flat annular surface of said annular means and defining an opposite end of said cavity spaced axially inward from said one end of said cavity,

said fused metallic means being located in said cavity bonding said first and second annular members together and to said tube.

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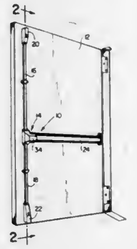
**4,295,673**

## VERTICAL ROD EXIT DEVICE

**Theodore H. Miller, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.**

**Filed Oct. 9, 1979, Ser. No. 82,538**
**Int. Cl.³ E05C *9/04, 15/02***
**U.S. Cl. 292—21** **16 Claims**



**1**. In a vertical rod exit device for securing an outwardly opening door in closed position and having at least one latch, means for mounting the one latch on the inner face of the door, a vertically extending latch operating rod having one end portion operably connected to said one latch, a latch rod shift mechanism operably connected to the other end portion of the latch operating rod, means for mounting said shifting mechanism on the inner face of the door, a rotary outside latch operator for attachment to the outer face of the door and journalled for angular movement about a horizontal axis normal to the faces of the door; the vertical extending latch operating rod being horizontally offset from said horizonal axis and in the direction of the free side edge of the door, the rod shifting mechanism being operable to shift the latch operating rod in one vertical direction and to a latch releasing position in response to operation of the rotary outside latch operator, and an inside latch actuator operably associated with the latch shifting mechanism and at all times operable independently of the outside latch operator to shift the latch operating rod in the one direction and to a latch releasing position in response to pressure applied in a door opening direction to the inside latch actuator, the improvement wherein said rod shifting mechanism includes a frame assembly comprising said mounting means, a rod connector, means supporting said rod connector for limited reciprocal vertical movement on and relative to said frame assembly, means for connecting said latch operating

rod to said rod connector, actuating means for moving said rod and said rod connector in said one vertical direction in response to pressure applied in a door opening direction to said inside latch actuator, a key plate, means supporting said key plate for vertical movement on said frame assembly, said key plate being engageable with said rod connector for moving said rod connector and said rod in said one vertical direction and to a latch releasing position in response to angular movement of said outside latch operator and independent of the movement of said actuating means, and a key center operably engaged with said key plate and said outside operator and journalled on said frame assembly for coaxial angular movement with said outside operator, and wherein said rod connector overlies an associated marginal portion of said key plate and said key center underlies another marginal portion of said key plate.

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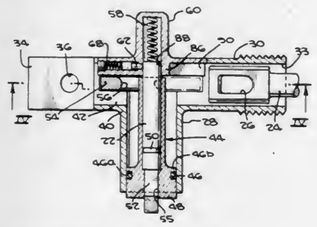
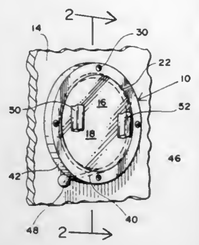
**4,295,674**
**LATCH MECHANISM**
**John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.**
**Filed Oct. 1, 1979, Ser. No. 80,246**
**Int. Cl.³ E05C 3/14**
**U.S. Cl. 292—190** **15 Claims**



1. A latch mechanism which comprises:
a housing;
a rotor assembly rotatably journaled within said housing and rotatable between fully locked and unlocked positions, said rotor assembly having an interior latching surface and an exterior surface;
a flag mounted in longitudinally slidable relation with said rotor assembly, said flag having an exterior portion and an interior end and slidable between recessed and extended positions wherein rotation of said flag is restricted to common rotation with said rotor assembly;
biasing means for normally biasing said flag to said extended position wherein said exterior portion extends out of said rotor assembly;
coupling means for coupling said flag to said housing to prevent rotatable movement of said flag and rotor assembly only when said rotor assembly is in said fully locked position and said exterior portion of said flag is not visible externally of said rotor assembly, said coupling means including a plunger slidably mounted within said housing substantially perpendicular to said flag and slidable between flag engaged and flag disengaged positions, biasing means for biasing said plunger to said flag engaged position and a single indention having a bottom and wall located on said flag for receiving said plunger only when said rotor is in said fully locked position and said exterior portion of said flag is not visible externally of said rotor assembly; and
disengaging means for disengaging said flag from said housing.

**4,295,675**
**COVER FOR PORT LIGHT**
**Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140**
**Filed Feb. 26, 1980, Ser. No. 124,828**
**Int. Cl.³ E05C 17/54**
**U.S. Cl. 292—256.6** **4 Claims**



1. A locking and sealing arrangement for a port light of a floating vessel, comprising:
said port light;
a cover member with an outwardly facing rim having formed thereon a pair of spaced-apart, peripheral grooves, a first groove and a second groove;
a cover mounting member adapted to be secured to said floating vessel in surrounding relationship to said port light;
said cover mounting member having an inwardly facing surface dimensioned and configured to substantially conform to the said outwardly facing rim of said cover member;
at least portions of said inwardly facing surface having dimensions larger than said port light to provide a ledge when said cover mounting member is secured to said floating vehicle;
said inwardly facing surface having a third groove formed therein, said third groove being aligned to be in opposed relationship to said first groove to form a channel when said cover mounting member is in abutting relationship to said ledge;
an access bore extending through said cover mounting member and connecting with said channel;
an elongated and pliable locking member being adapted to be threaded through said access bore into said channel, whereby said pliable member spans the juncture of said cover member and said cover mounting member; and
a resilient sealing gasket being mounted in said second groove, whereby said gasket forms a substantially watertight seal with said inwardly facing surface of said cover mounting member;
said cover mounting member being formed of a plastic;
said cover member being formed of a transparent plastic material;
said cover member having at least one handle mounted thereon for disengaging said cover member from said cover mounting member;
said locking member terminating at one end with an enlarged portion, said enlarged portion having dimensions greater than the cross-sectional dimensions of said access bore.

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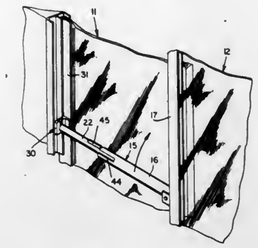
**4,295,676**
**PATIO DOOR SECURITY LOCK**
**James A. Smith, 1314 Kingstown Pkwy., Smyrna, Ga. 30080**
**Filed Jan. 15, 1980, Ser. No. 112,216**
**Int. Cl.³ E05C 17/30**
**U.S. Cl. 292—262** **11 Claims**

1. Locking apparatus for use with a pair of panels at least one of which is mounted for sliding movement between an open position and a closed position in parallel relation to the other panel, said locking apparatus comprising:
a first member disposed to be stationary with respect to said sliding panel;
a second member selectably connectable to the sliding panel and being selectably extensible with respect to said first member to occupy at least two positions relative to said first member;



said second member when in one such position cooperating with said first member to maintain said sliding panel at a closed position; and
said second member when in another such position cooperating with said first member to permit said sliding panel to occupy a partially open position, and operatively associated with said sliding panel to prevent disconnection of said second member from said partially open sliding panel.

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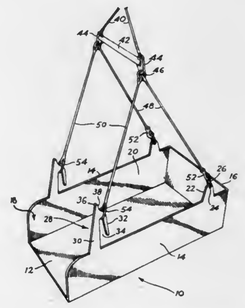
**4,295,677**
**SELF-DUMPING HOISTING BUCKET ASSEMBLY**
**Jerome A. Petrin, 9105 SW. Mt. View La., Tigard, Oreg. 97223**
**Filed Nov. 14, 1979, Ser. No. 94,046**
**Int. Cl.³ E04G 21/02**
**U.S. Cl. 294—73** **4 Claims**



1. A self dumping hoisting bucket assembly of the class releasable for dumping upon slackening a flexible hoisting suspension by which it is supported, the bucket assembly comprising:
(a) a box comprising a bottom, two upstanding side walls, an upstanding rear wall and a front end providing a discharge chute which is substantially open the width and depth of the front of the box and configured to receive a dump truck for loading the bucket;
(b) a pair of downwardly opening hooks adjacent the front of the box and substantially exterior of the space vertically above the interior of the box, one being attached to one side wall and the other being attached to the other side wall, each hook comprising an upright shank segment attached at its base to the front portion of one of the side walls, and a retainer segment attached to the top of the shank segment and arranged reversely to form a recess between the shank segment and the retainer segment; and
(c) a hoisting suspension for the box comprising
(1) a cross beam substantially as long as the box is wide and suspendable horizontally by a hoist above the box,
(2) at least one flexible rearward suspensory member connecting the rear of the box to the cross beam,
(3) a pair of flexible forward suspensory members connecting the front of the box to the cross beam, each including a coupler configured and dimensioned for releasable engagement with one of the hooks, and each being attached to the cross beam at a location such that it lies substantially exterior of the space vertically above the box, each hook having a coupler guard segment extending outwardly from the top of the shank and arranged upon slackening of the suspension to be engaged by the coupler to effect disengagement of the coupler from the hook.

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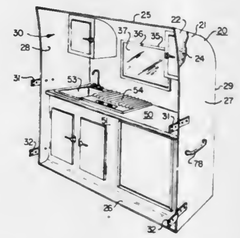
**4,295,678**
**VAN MODIFIERS**
**Robert L. Morris, c/o Morr-Van Products, 322 Division La., Beaver, Pa. 15009**
**Filed Sep. 12, 1978, Ser. No. 941,477**
**Int. Cl.³ B60P 3/34**
**U.S. Cl. 296—156** **5 Claims**



1. An apparatus for rearwardly extending a van body having a rear door opening with vertically spaced apart rear door hinge mountings at each side of the opening comprising an integral hollow generally quadrangular module having a continuous outer shell free from supporting structural framework attached to the vehicle and having a top, spaced side walls, a bottom and a back wall and an inner shell laminated to and supporting said outer skin over at least a major portion of the total area of each of said top, side walls, bottom and back to form a unitary self-supporting structure, said module including spaced apart roof and bottom members connected by a back wall and two side walls, a front wall opening corresponding to width of the rear door opening in the van and defined by said roof, bottom and side walls and vertically spaced fastening means on said module on each side thereof entering said rear door opening and replacing said hinges in said rear door opening for fastening said module therein.

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**4,295,679**
**VAN STRUCTURE**
**Wolfgang Artweger, Windischgarsten, and Walter Freller, Sierning, both of Austria, assignors to "Wohn-Art" Freizeitartikel Gesellschaft m.b.H., Windischgarsten, Austria**
**Filed Jul. 17, 1979, Ser. No. 58,184**
**Claims priority, application Austria, Jul. 20, 1978, 5293/78**
**Int. Cl.³ E04B 1/346**
**U.S. Cl. 296—171** **24 Claims**

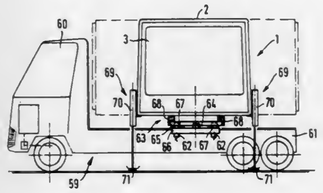
1. A van structure comprising
(a) a box-like main cabin having a floor, two side walls and a roof, the opposite ends of the main cabin being open,
(b) two box-like extension cabins each having a floor, two

side walls, a roof and an end wall interconnecting the side walls, an open end of each extension cabin opposite the end wall thereof being received in a respective one of the open ends of the main cabin,

(c) longitudinally extending guide means slidingly guiding the extension cabins for sliding movement relative to the main cabin and to each other whereby the extension cabins may be telescopingly moved into and out of the main cabin,

(d) means for moving the extension cabins out of the main cabin under a tensile force, and

(e) a utility unit in the main cabin centered between the opposite ends thereof and constituting a vertically extending separation substantially parallel to the opposite open ends and dividing the main cabin into two compartments, the utility unit including



(1) two load-bearing carrier elements affixed to the main cabin and spaced from each other in a longitudinal direction and facing the two open ends of the main cabin, the moving means being anchored to the carrier elements and the carrier elements being capable of sustaining the tensile force,

(2) two transverse walls extending perpendicularly to the side walls of the main cabin and supported by the carrier elements, the transverse walls defining a space with one of the main cabin side walls sufficient to permit passage of a person,

(3) a wash room facility arranged between the transverse walls,

(4) a kitchen facility and

(5) a storage facility, the transverse walls constituting rear walls for the kitchen and storage facilities, respectively, the kitchen and storage facilities facing the respective open ends of the main cabin.

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**4,295,680**

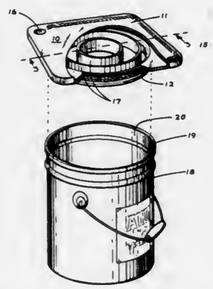
**UTILITY BUCKET SEAT**

**Michael Grasso, 24 Laurie Rd., Brentwood, N.Y. 11717**

**Filed Nov. 7, 1979, Ser. No. 92,109**

**Int. Cl.³ A47C** *31/00;* **B63C** *9/08*

**U.S. Cl. 297—193** **1 Claim**



1. A seat used in association with a pail for sitting, for use as a buoy, for use as a table top and for use as a cover, which comprises:

(a) a top seat section for sitting;

(b) a weight bearing flange for resting on the open end of a pail;

(c) a buoyant internal section so that the seat will float; and

(d) means to attach and store a rope to said seat.

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**4,295,681**

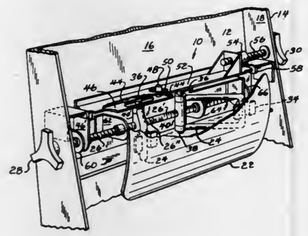
**SEAT HAVING LUMBAR SUPPORT AND VERTICAL HEIGHT ADJUSTMENT MECHANISM THEREFOR**

**Leslie A. Gregory, Northampton, England, assignor to UOP Inc., Des Plaines, Ill.**

**Filed Feb. 19, 1980, Ser. No. 122,152**

**Int. Cl.³ A47C** *3/00, 7/46*

**U.S. Cl. 297—284** **8 Claims**



1. A seat backrest comprising a rigid back portion and a resilient upholstered cushion member attached to said back portion, a generally horizontal lumbar pad having an elongated, convex-shaped forward surface located between said back portion and said cushion, said pad being pivotally mounted to one end of a pair of spaced link members; each of said link members being supported at its other end for pivotal movement about trunnions located on each of a pair of threaded adjusting nuts; an adjusting shaft having a left handed thread portion in engagement with one of said adjusting nuts and a right handed thread portion in engagement with the other of said adjusting nuts; spaced bearing means for rotationally mounting said adjusting shaft relative to said backrest; first control means for rotating said shaft to cause said adjusting nuts to move toward or away from each other to cause said links to move, respectively, toward a generally parallel position or toward a generally perpendicular position relative to said lumbar pad, said lumbar pad being fully extended when said links are in said generally perpendicular position and fully retracted when said links are in said generally parallel position, and second control means mounted on said rigid back portion for producing a limited degree of rotation of said adjusting nuts about said adjusting shaft and causing a corresponding pivotal movement of said link members and said lumbar pad so as to tilt said lumbar pad and vary the vertical position of the forwardmost portion of its convex-shaped forward surface relative to the back portion.

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**4,295,682**

**SUPERFINE TOOTH SEAT BACK ADJUSTER**

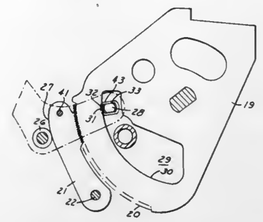
**Bernd A. Kluting, Radevormwald, Fed. Rep. of Germany, and Vikram H. Zaverni, Springfield, Mich., assignors to Keiper U.S.A., Inc., Battle Creek, Mich.**

**Filed Nov. 1, 1979, Ser. No. 90,343**

**Int. Cl.³ A47C** *1/026*

**U.S. Cl. 297—367** **25 Claims**

1. A hinge fitting for vehicle seats having a tiltable backrest member comprising a first hinge member connectable to a seat rest member, a second hinge member connectable to a backrest member, pivot means connecting said hinge members for relative pivoting movement, an adjustment quadrant for regulating the operative position of said second hinge member relative to said first having a toothed sector centered on said pivot means provided with fine pitch teeth, toothed pawl means and integral dual side tension linkage mounted on said first hinge member on either side of said pawl and toothed sector and in relatively movalbe compressively clamping and release relationship with said pawl and toothed sector, and manual means for effecting said clamping and release relationships.



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**4,295,683**

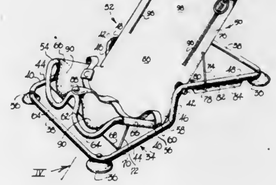
**ORTHOPEDIC CHAIR**

**David T. Dubbink, 1339 N. Sultana, Ontario, Calif. 91764, and Lynda L. Vogler, 8855 Mustang Ave., Alta Loma, Calif. 91701**

**Filed Jul. 11, 1979, Ser. No. 56,532**

**Int. Cl.³ A47C** *5/06*

**U.S. Cl. 297—377** **2 Claims**



1. An orthopedic chair particularly adapted for bathing handicapped persons comprising:

(a) a frame assembly having a pair of spaced side members, a bottom member connected between said side members on one of the ends of said side members, and a top member connected in parallel to said bottom member between said side members on the ends thereof opposite said bottom member, said frame assembly further including support means for supporting said frame assembly and for maintaining the top and bottom members horizontal with said top member above said bottom member when said frame assembly is placed on a substantially horizontal surface, said bottom member further being in the shape of two upward facing U-shaped sections; and,

(b) a body portion of flexible sheeting connected to said frame assembly between said bottom member and said side members to a point close adjacent the top member to form a sling chair wherein the person can sit supported from a point about the knees up to and including the person's head, said body portion including means for selectively releasing only a portion of said connection of said body portion between said side members adjacent the top portion sufficient to not support the person's head and provide access for washing the back of the person's head and hair while continuing to support the remainder of the person's torso, said releasing means comprising a pair of zippers extending from an edge of said body portion adjacent said top member toward said bottom member and disposed to have respective ones of said zippers on opposite sides of the head of the person in the seat, said body portion further being attached to said bottom member so as to form a U-shaped sling in each of said U-shaped sections whereby the legs of the person when placed in respective ones of said slings are supported and separated.

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**4,295,684**

**SAFETY BELT WIND-UP DEVICE**

**Katsumi Naitoh, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan**

**Filed Nov. 14, 1979, Ser. No. 94,200**

**Claims priority, application Japan, Jan. 19, 1979, 54-3874**

**Int. Cl.³ A62B** *35/00;* **B65H** *75/48*

**U.S. Cl. 297—475** **8 Claims**



1. A safety belt wind-up device including an engageable and disengageable buckle, comprising: a rotatable webbing wind-up shaft driven in a direction for winding up a webbing of the device, wind-up force lock means capable of assuming interlocked and uninterlocked positions with said wind-up shaft, said lock means in said interlocked position preventing a drawn webbing from being further wound up but providing for said webbing to be drawn and wound up within a predetermined length of said drawn webbing, and means for bringing said lock means into said interlocked and uninterlocked positions, respectively, depending upon engagement and disengagement of the buckle of said device, said wind-up force lock means comprising (1) a first member engaged with and being rotatively driven by said wind-up shaft while said wind-up force lock means are in said interlocked position, (2) a first cam rotating together with said first member, (3) a second member engaged with and being rotatively driven by said first member, and (4) a second cam rotating together with said second member, said first and second cams being substantially in a first engagement position when said wind-up force lock means are brought into said interlocked position and said first and second cams being substantially in a second engagement position when said wind-up force lock means are in said interlocked position and said webbing has been drawn said predetermined length out of the device, whereby in the first engagement position even if said first member is rotatively driven by said wind-up shaft in a webbing wind-up direction so as to be rotated together with said first cam, the rotation of said first member is prevented by the first and second cams in the first engagement position, and in the second engagement position even if said first member is rotatively driven by said wind-up shaft in a webbing drawing out direction so as to be rotated together with said first cam, the rotation of said first member is prevented by the first and second cams in the second engagement position.

**4,295,685**

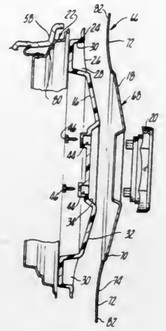
## PLASTIC AND METAL WHEEL TRIM ASSEMBLY

**Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185**

**Continuation of Ser. No. 856,309, Dec. 1, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,938**

**Int. Cl.³ B60B** *7/00*

**U.S. Cl. 301—37 P** **4 Claims**



1. A composite wheel trim assembly of metal and plastic for attachment to a vehicle wheel, comprising: a unitary disc-shaped body member of plastic material having axially outwardly disposed primary surfaces and deep recesses having axially extending walls forming secondary surfaces extending from adjacent said primary surfaces for reinforcing said body member, said primary surfaces occupying a substantial portion of the area within the circumference of the body member, a metal cover member of thin sheet metal having an outline and axially inward surface configuration corresponding to the shape of said primary surfaces, fastening means coacting with said metal cover member and an inboard surface portion of said plastic body member to hold said cover member to said primary surface to reinforce said body member and provide a decorative metal layer having substantially all of its said inner surface in contacting relationship with all of said primary surface area and leaving said secondary surfaces exposed, and a retainer assembly attached to said body member for attachment to a vehicle wheel.

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**4,295,686**

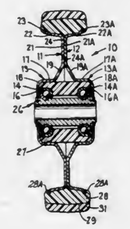
## DISK WHEEL WITH RESILIENT BEARING SUPPORT AND RIGID ANNULAR TREAD MOUNTING SURFACE

**John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.**

**Continuation of Ser. No. 964,130, Nov. 27, 1978, abandoned. This application May 5, 1980, Ser. No. 146,895**

**Int. Cl.³ B60B** *1/06;* **F16C** *33/00*

**U.S. Cl. 301—63 DD** **5 Claims**



1. A wheel construction, comprising:

rigid circular disk means having means thereon defining a hole in approximately the center thereof, said disk means having a radially outwardly facing surface thereon, a pair of laterally spaced axially outwardly facing surfaces contiguous with said radially outwardly facing surface and at least a pair of laterally spaced, radially inwardly facing surfaces on opposite axial sides thereof each contiguous with an axially facing surface;

bearing means and resilient means for mounting said bearing means in said hole to facilitate the rotation of said rigid circular disk means about a defined axis of rotation;

an annulus made of a rigid first moldable synthetic resin material and securing means for fixedly securing said annulus to said rigid circular disk means, said securing means comprising at least a pair of integral portions of the material of said annulus on opposite lateral sides thereof extending radially inwardly around said axially facing surfaces and axially inwardly and in contact with said axially facing and said radially inwardly facing surfaces on said disk means, said annulus having no fusion bonding affinity to the material of said disk means, said annulus also having a peripheral surface thereon defining a tread mounting surface; and

an annular tread made of a second moldable synthetic resin material in close and intimate contact with said peripheral surface on said annulus and fusion bonding said tread and said annulus together thereby to firmly and securely lock said tread to said annulus.

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**4,295,687**

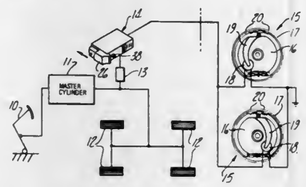
## ELECTRIC BRAKE SYSTEM

**James Becker, Ann Arbor, and Daniel L. Neill, Belleville, both of Mich., assignors to Kelsey Hayes Company, Romulus, Mich.**

**Filed Feb. 26, 1979, Ser. No. 15,572**

**Int. Cl.³ B60T** *13/68*

**U.S. Cl. 303—20** **7 Claims**




1. A braking system for controlling electrically operated brakes for a driver controlled vehicle comprising braking means electrically energizable for applying a braking force to the brakes, an electric energy source, control means selectively adjustable by the driver in accordance with a desired braking force, said control means developing a control signal only after a predetermined initial adjustment that varies rapidly from a threshold magnitude to a certain magnitude and thereafter varies linearly with a further adjustment thereof, controller means operative to couple said braking means to said source in response to such control signal, said controller means developing a pulsating output for energizing said brake means having a predetermined frequency and having a pulse width determined by the magnitude of such control signal, and excessive current protection means operative in response to a predetermined high current level in such controller means output for inhibiting such controller means output for a predetermined limited period of time including an AND gate having a plurality of inputs and an output, means supplying the pulsating output to one of said gate inputs, means connecting said gate output to energize said brake means, and means connected to another of said gate inputs for blocking said gate output for such predetermined limited time period in response to such predetermined high current level in the controller output.



**4,295,688**

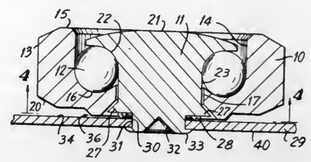
## BEARING CONSTRUCTION

**William Blasnik, Demarest, N.J., assignor to Hardware Designers, Inc., Mt. Kisco, N.Y.**

**Filed Feb. 25, 1980, Ser. No. 124,094**

**Int. Cl.³ F16C** *19/16, 29/04, 35/06*

**U.S. Cl. 308—3.8** **5 Claims**



1. A bearing device for supporting drawers or the like for translatory movement, said device comprising a generally disk-shaped polymeric tire member including a circular peripheral surface defining a runner, an enlarged bore portion extending axially from one end face of said tire member and terminating in an outer bearing race directed toward said one end face, a reduced bore portion extending from the other end face of said tire member and merging with said outer race at the radial innermost end of said race, an annular recess formed on the outer face of said other end of said tire member and forming a radial outward extension of said reduced bore portion, a metallic stud member forming a fixed component of said bearing member, said stud member including an enlarged head portion at one end disposed within said enlarged bore portion and a generally cylindrical shank extending outwardly through said reduced bore portion, an inner bearing race formed on said stud member at the transition between said head portion and shank portion, a plurality of spherical members interposed between said outer and inner bearing races, an annular collar member formed at the other end of said stud member and projecting outwardly beyond said reduced diameter bore, a plurality of tab portions struck from said collar member, said tab portions being disposed within said recess at positions axially outwardly of said reduced diameter bore whereby the axially outwardly directed face of said collar member, after formation of said tab portions, presents an axially directed, discontinuous crown configuration, the axial terminal portions of said crown configuration lying in a plane axially beyond all portions of said other face of said tire member, said stud member including, in addition, a cylindrical deformable attachment member extending axially beyond said plane of said crown configuration whereby said bearing member may be mounted within an aperture in a bracket with said crown configuration engaging one face of said bracket and turned-over increments of said attachment member engaging the opposite face of said bracket.

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**4,295,689**

## ADJUSTABLE CLEARANCE FOIL JOURNAL BEARING AND METHOD OF MANUFACTURING FOIL ELEMENT THEREFOR

**Lazar Licht, San Mateo, Calif., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Aug. 30, 1979, Ser. No. 71,508**

**Int. Cl.³ F16C** *32/06*

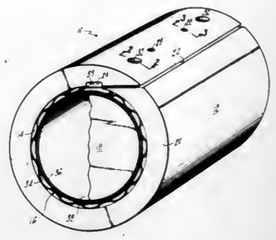
**U.S. Cl. 308—9** **13 Claims**

1. A hydrodynamic foil journal bearing comprising

a stationary retaining member having a bore and a slit communicating with said bore;

a resilient foil insert assembly mounted on said retaining member in said bore and having a first bearing surface;

a rotatable journal disposed within said bore and having a second bearing surface cooperative with said first bearing surface to induce a fluid film therebetween; and



means on said retaining member associated with said slit for varying the size of said bore to provide desired clearance and loading in said journal bearing.

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**4,295,690**

## HYDROSTATIC BEARING FOR A RADIAL PISTON MACHINE

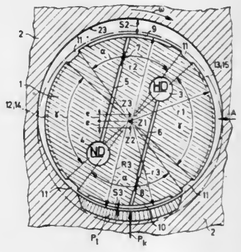
**Peter Rutz, Brunnelihohestrasse 2, CH-8400 Winterthur, Switzerland**

**Filed Jan. 29, 1980, Ser. No. 116,492**

**Claims priority, application Switzerland, Mar. 1, 1979, 2029/79**

**Int. Cl.³ F16C** *32/06*

**U.S. Cl. 308—9** **7 Claims**



1. A hydrostatic bearing for a radial piston machine, said bearing comprising

a stationary cylindrical pintle having at least one bore therein for conducting a flow of high pressure medium, a hydrostatic bearing pocket in one surface thereof and a throttle communicating said bore with said bearing pocket to deliver a throttled flow of pressure medium thereto, said surface having a radius larger than the adjacent surfaces on either side of said bearing pocket; and

a member rotatably mounted on said pintle, said member having a circular cylindrical bore of a radius approximately equal to said radius of said one surface.

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**4,295,691**

## MOUNTING GROMMET

**Randall J. Rubenthaler, Lincoln, Nebr., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**Continuation of Ser. No. 742,145, Nov. 15, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,009**

**Int. Cl.³ F16C** *27/00*

**U.S. Cl. 308—238** **2 Claims**

1. A mounting grommet comprising:

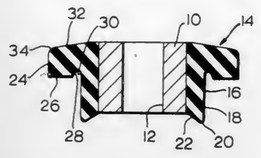
a sleeve of hard material;

a tubular, elastomeric element extending about and along the

length of said sleeve, said element having a length greater than that of said sleeve and including

a cylindrical shank having an enlarged head at one end, said head having an axial length considerably shorter than that of said element;

an axially opening and extending annular recess in said head at its interface with said shank, the radially inner wall of said recess being of the same diameter as said shank,




said head having a generally frusto-conical surface on its side opposite said recess, the radially outer portion of said frusto-conical surface being located intermediate the ends of said elastomeric element; and

means for axially compressing said element to a length about equal to that of said sleeve;

whereby said recess will deflect radially inwardly to a location partly in said head and partly in said shank.

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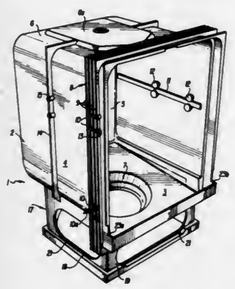
**4,295,692**

**DISHWASHER TUB ASSEMBLY**

**Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**

**Filed Dec. 5, 1979, Ser. No. 100,682**
**Int. Cl.³ A47B *77/06*; B08B *3/00***
**U.S. Cl. 312—228** **12 Claims**



**10**. A dishwasher tub assembly comprising a plastic open front tub having a generally rectangular cross-section;

a plastic supporting rib frame comprising a plurality of ribs extending parallel to and spaced equidistantly from each other formed on the external periphery of said tub adjacent the front opening thereof;

a plurality of plastic cross-ribs formed on the external periphery of said tub and intersecting said rib frame at an angle thereto;

plastic support ribs formed on the external periphery of each side of said tub spaced apart from said rib frame;

a plastic base mounted on the bottom of said tub comprising a generally hollow box-like structure with horizontal dimensions approximating those of the lower wall of said tub, and having an open bottom generally rectangular cut-outs in the front and two side sections, and a generally semielliptical cut-out in the rear section; and

said plastic tub, rib frame, cross-ribs, support ribs, and base comprising a single unit of homogeneous one-piece construction.

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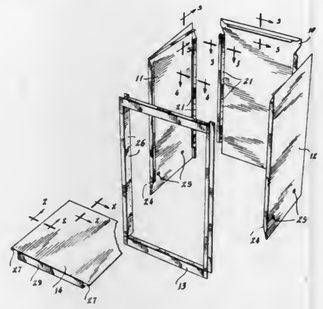
**4,295,693**

**KNOCKED-DOWN CABINET**

**Ake E. Viklund, Säffle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Nov. 14, 1979, Ser. No. 94,181**
**Claims priority, application Sweden, Apr. 9, 1979, 7903119**
**Int. Cl.³ A47B *43/00***
**U.S. Cl. 312—257 R** **5 Claims**



**1**. A cabinet which is assembled without the use of fastening means and having a rear wall, two side walls, and a frame-shaped front wall which are all interconnected to form a box-like structure, the adjacent edges of said rear and side walls having bent portions which upon abutment and pivoting hook one another to form a joint which prevents separation of said side walls and rear wall wherein said adjacent edges of said rear wall and side walls are bent to extend generally vertically to said rear wall and abut each other, aligned apertures in each of said generally vertical edges, and shelf supports having means for insertion through said apertures in order to lock said rear and side walls together, said rear wall having an edge which is generally bent at right angles to the plane of said rear wall and which projects into the interior of the cabinet, an outer portion of said edge having a reverse bend, said adjacent side walls having a bent edge which is inserted in a groove formed between said outer portion of the edge of said rear wall and the reverse bend portion, and a portion intermediate said bent edge and said side wall which forms an extension to said rear wall and is coextending therewith to form an outer even surface of the rear wall of said cabinet, and a top part having opposite edge portions that are bent at an angle to said top part and are adapted to slide over adjacent edges of said side walls and interconnect with said frame-shaped front wall, and rear and side walls.

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**4,295,694**

**INTERCEPTOR PLUG**

**Robert E. Manning, 310 Siesta Ave., Thousand Oaks, Calif. 91360**

**Filed Jun. 21, 1979, Ser. No. 50,709**
**Int. Cl.³ H01R *15/00***
**U.S. Cl. 339—8 P** **1 Claim**

**1**. An interceptor plug for intercepting an phone signal available at a standard electrical jack comprising:

(A) a central shaft of electrically conductive material having an integral interior tip, said tip being eccentric relative to said central shaft;

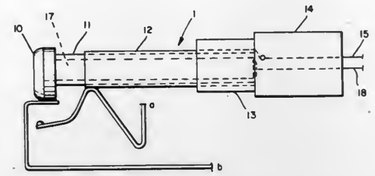
(B) an electrically insulating sleeve concentric and coextensive with said central shaft except for said tip;

(C) an electrically conductive sleeve concentric and coestensive with and exterior to said insulating sleeve except



that the length of said conductive sleeve is adjusted to expose said insulating sleeve at said interior tip end;

(D) a positioning sleeve of electrically insulating material surrounding the combination of said central shaft, insulating sleeve and conductive sleeve so as to insulate said conductive sleeve from the body of said jack;




(E) a grip of nonconductive material firmly affixed to said positioning sleeve, said grip surrounding two conductive wires running lengthwise through said grip and extending beyond the ends of said grip; and,

(F) a connection means for connecting one of said wires to said exterior end of said central shaft and the other of said wires to said exterior end of said conductive sleeve.

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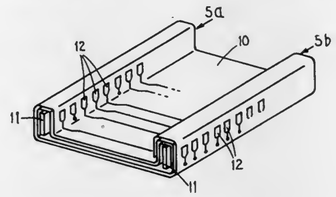
**4,295,695**

**ELECTRICAL CONNECTORS**

**Robert J. Dodds, Crewe, England, assignor to International Computers Limited, London, England**

**Filed Oct. 5, 1979, Ser. No. 82,095**
**Claims priority, application United Kingdom, Oct. 12, 1978, 40355/78; Oct. 21, 1978, 41471/78**
**Int. Cl.³ H01R *1/11***
**U.S. Cl. 339—17 F** **9 Claims**




**1**. An electrical connector cable assembly having an integrally formed edge connector element at each end thereof for electrically interconnecting first and second edge type connector units each having first and second contact arrays located on opposite sides of a connector unit receiving region so that the first contact arrays of the first and second connector units are interconnected and the second contact arrays of the first and second connector units are interconnected, the assembly comprising;

two elongate connector element stiffening members each providing first and second surfaces separated by a predetermined distance; a length of electrically non-conductive substrate folded about the two stiffening members so that the first and second surfaces of the stiffening members are covered by the substrate material and are interconnected by at least three side-by-side layers of the substrate;

the substrate having on a first surface thereof two groups of contact areas each including first and second arrays of electrical contact areas, extending across the width of the substrate, the arrays being so located on the substrate first surface that when the substrate is folded about the stiffening members a said first contact array coincides with each of the stiffening member first surfaces and a said second contact array coincides with each of the stiffening member second surface;

a first electrical conductor system provided on the substrate first surface interconnecting the first arrays of the first and second groups and a second electrical conductor system provided on the substrate first surface interconnecting the second arrays of the first and second groups.

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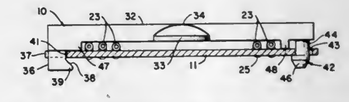
**4,295,696**

**STRAIN RELIEF FOR CONNECTOR WIRES**

**Vincent F. Gray, Oklahoma City, Okla., assignor to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 104,241**
**Int. Cl.³ H01R *13/58***
**U.S. Cl. 339—17 C** **1 Claim**




**1**. A connector and strain relief assembly, which comprises:

a flat circuit board for mounting the connector, said board having an array of terminals interconnected to said connector;

a cable comprising a jacket and a plurality of insulated wires, the ends of which extend beyond the end of the jacket and are fanned across the board and solder secured to the terminals;

a T-shaped strain relief having a crossarm overlaying the wires and a stem with a knob formed thereon and positioned beneath an end section of said cable jacket, the crossarm of said strain relief being provided at one end section thereof with a projecting member that is undercut along one edge to form a nub, said undercut extending as a bevel surface to a straight line post section which is approximately equal in length to the thickness of the board, and the other end section of the crossarm being provided with a projecting cylindrical boss having a frusto-conical head, the central axes of the boss and the head being offset with respect to each other so that a lobe portion of the head overhangs the boss;

said board having a slot formed across one edge to receive the projecting member with the nub thereof underlying the circuit board, and said board having a hole formed therein to receive the projecting boss with the lobe portion underlying the circuit board, said hole and cylindrical boss being so positioned that the lobe deflects the boss when the strain relief is pressed to move and snap the lobe through the hole into the circuit board underlying position, said movement of the frusto-conical head through the hole acting to move, the bevel surface of the projecting member along the bottom edge of the slot to seat the straight line post section, against the bottom of the slot, and

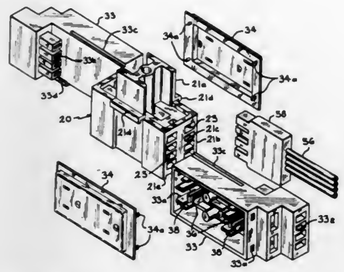
means projecting from the crossarm to limit the movement of the crossarm toward the circuit board and thus limit the strain relief force applied to the array of wires by the assembled circuit board and strain relief while holding both the overhanging lobe portion of the frusto-conical head and the juncture of bevel surface with the post in close proximity to the underside of the board.

**4,295,697**

## ELECTRICAL POWER DISTRIBUTION SYSTEM PRINCIPALLY FOR SPACE-DIVIDING PANELS IN OFFICE BUILDINGS

**Paul R. Grime, Erie, Mich., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Jan. 31, 1980, Ser. No. 117,405**
**Int. Cl.³ H02G** *3/28*
**U.S. Cl. 339—22 R** **5 Claims**



1. An electrical power distribution kit comprising an elongated molded plastic electrical power distribution block having electrically conductive members molded therein, the conductive members of the block having terminals accessible respectively from opposite ends of the block, and an elongated molded plastic slide-in duplex receptacle having electrically conductive members molded therein, each of the block and receptacle members having aligning and interlocking means thereon cooperable with aligning and interlocking means on the other, the receptacle being fastenable to the block by sliding the receptacle in the direction of its length along one side of the block in the direction of the length of the block and thereby engaging the cooperable aligning and interlocking means with each other, the receptacle being engaged with a portion of one end of the block and with the one side of the block when fastened thereto, the conductive members of the receptacle having terminals cooperatively engageable respectively with terminals of the conductive members of the block adjacent the one end thereof as the receptacle is fastened to the block by engagement of the cooperable aligning and interlocking means with each other, the terminals of the conductive members of the block being recessed within the block respectively in recesses therein, the terminals of the conductive members of the receptacle respectively being shielded by plastic sleeve portions of the receptacle, the plastic sleeve portions being receivable respectively in recesses of the block as the terminals of the conductive members of the receptacle are cooperatively engaged respectively with terminals of conductive members of the block, the conductive members of the receptacle also having two sets of socket terminals accessible from a front face of the receptacle parallel to the sides of the block when the receptacle and block are assembled, the two sets of socket terminals being spaced longitudinally of the receptacle, and the cooperable aligning and interlocking means being an aligning means when the receptacle is being fastened to the block and an interlocking means when a service cord is being pulled out of one of said sets of socket terminals.

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**4,295,698**

## ELECTRICAL CONNECTOR HOUSING

**Weichien Chow, Park Forest, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Continuation of Ser. No. 949,843, Oct. 10, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,228**
**Int. Cl.³ H01R** *13/42*
**U.S. Cl. 339—59 R** **6 Claims**

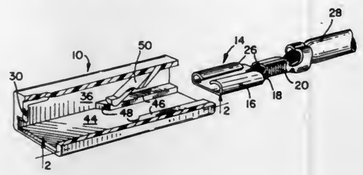
1. An electrical connector housing for retaining an electrical contact having a forward engagement section, a rearward termination section and contact shoulders disposed between the engagement and termination sections, the housing comprising:

a dielectric body having a passageway for receiving a contact, said passageway being defined by a bottom wall, a top wall and two side walls;

a forward stop positioned at the mating end of said passageway to limit forward movement of a contact inserted therein;

an abutment shoulder within said passageway positioned on said bottom wall at a distance to the rear of said forward stop generally equal to the length of the contact engagement section and at a distance from one side wall generally less than the width of the contact engagement section and greater than the width of the contact termination section, said abutment shoulder limiting rearward movement of the contact; and

flexible latching means deflected by the contact engagement section during insertion of the contact into said passageway, for engaging the contact without interference from the contact termination section, said latching means biasing the engagement section against said bottom wall within the space defined by said forward stop and said abutment shoulder, said latching means further co-operating with said abutment shoulder and said forward stop to retain the contact within said passageway.



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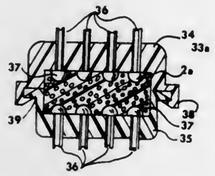
**4,295,699**

## PRESSURE SENSITIVE COMBINATION SWITCH AND CIRCUIT BREAKER CONSTRUCTION

**Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.**

**Continuation of Ser. No. 857,941, Sep. 15, 1969, abandoned. This application May 22, 1974, Ser. No. 472,582**
**Int. Cl.³ H01R** *13/24*
**U.S. Cl. 339—61 M** **19 Claims**



1. In an electrical system comprising first and second electrical devices, each of said first and second electrical devices having a plurality of spaced apart contacts, at least one of said plurality of contacts comprising raised land portions, a one piece sheet connector having elastomericlike properties positioned between the devices and overlapping superimposed contacts of said first and second devices, means to compress the sheet connector between superimposed contacts of said first and second devices on opposite surfaces of said sheet connector, said sheet connector having a low resistance through the volume between superimposed contacts where compressed and a high resistance where not directly compressed between said superimposed contacts so that each pair of superimposed contacts are electrically isolated from every other pair of superimposed contacts, said sheet connector of a thickness X and has the property that when adjacent contacts on opposite sides of said sheet are positioned as close as the distance X apart and compression is applied by pressing superimposed contacts on opposite sides of the sheet together, the resistance through the sheet between superimposed contacts is low relative to the resistance between adjacent contacts, where X is 5 to 100 mils and said sheet connector comprises a homogeneous mixture of electrically conductive particles and a nonconductive binder material having elastomeric properties.



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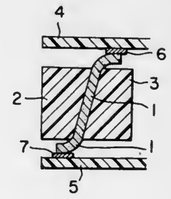
**4,295,700**

## INTERCONNECTORS

**Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,719**
**Claims priority, application Japan, Oct. 12, 1978, 53-140085**
**Int. Cl.³ H01R** *9/09*
**U.S. Cl. 339—61 M** **2 Claims**



1. An interconnector comprising

(a) a rectangular connecting piece of a film or sheet made of an elastic material having anisotropical electro-conductivity in the direction parallel to one edge line thereof, and formed from alternating sandwiched stripes of conductive and nonconductive elastomer, and

(b) a couple of holder members made of an electrically insulating material holding said rectangular connecting piece of an elastic material having anisotropical electroconductivity as sandwiched therebetween in such a manner that the two opposite peripheral portions of said rectangular connecting piece at the edge lines perpendicular to the direction of the anisotropical electroconductivity are each extended out of the surfaces of the holder members in the direction forming an angle between 10° and 80° with said surface of the holder member by a height at least equal to the thickness of said rectangular connecting piece.

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**4,295,701**

## ELECTRICAL CONNECTOR FOR SUBMARINE REPEATERS OR THE LIKE

**Duncan A. Gunn, Saffron Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Sep. 4, 1979, Ser. No. 71,876**
**Claims priority, application United Kingdom, Sep. 7, 1978, 35914/78**
**Int. Cl.³ H01R** *13/52*
**U.S. Cl. 339—94 A** **4 Claims**

1. A detachable electrical connector assembly including a pair of mateable connector sub-assemblies providing an electrical connection between separated high and low fluid pressure environments, the combination comprising:

a bulkhead separating said high and low pressure fluid environments and having an aperture therethrough;

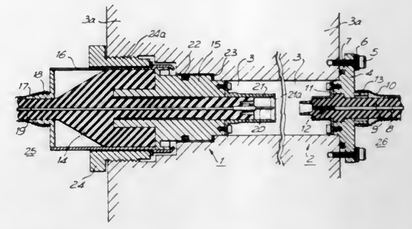
a first connector assembly;

first means for mounting said first connector sub-assembly partially through said bulkhead aperature and adjacent the low pressure side of said bulkhead, said first means including means providing a resilient compressive retaining force between a surface of the body of said first connector sub-assembly and the surface of said bulkhead low pressure side when said sub-assemblies are not mated;

second means including a first seal compressed between said first connector sub-assembly body surface and said bulkhead low pressure side in response to said retaining force,

an inert gas present against said low pressure side of said bulkhead;

a second connector assembly mateable from the high pressure side of said bulkhead into said first connector assembly, the dimensions of said bulkhead and said connectors being such that, upon mating of said connector assemblies said first connector overtravels against said resilient compressive retaining force to an extent permitting said inert gas to readily flow past said first seal into the volume surrounding the electrical connection between said connector assemblies, said first seal being restored by said resilient compressive force to retain said low pressure fluid when said second connector sub-assembly is withdrawn to break said electrical connection.



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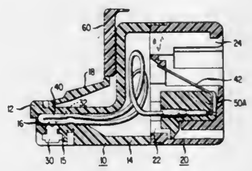
**4,295,702**

## MULTI-OUTLET ADAPTER FOR PLUG-IN TELEPHONES

**Dennis R. Snyder, Des Moines, Iowa, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation of Ser. No. 912,467, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 714,525, Aug. 16, 1976, Pat. No. T958,009. This application Dec. 21, 1979, Ser. No. 105,900**
**Int. Cl.³ H01R** *13/514*
**U.S. Cl. 339—97 P** **7 Claims**



1. A multi-outlet adapter for plug-in telephones comprising:

a male member including a plug portion having a plurality of troughs respectively communicating with a like plurality of slots in the plug portion;

a plurality of conductors totally contained within the adapter, each conductor being doubled over within an individual trough in the plug portion and both ends of each conductor being terminated with a wire spring jack contact;

a plurality of blade-like plug contacts respectively positioned within the slots in the plug portion, each plug contact making electrical connection with the conductor positioned in the associated trough whereby the jack

contacts terminating the ends of the conductor are connected in parallel to the associated plug contact;

a pair of contact carriers, each contact carrier having one of the jack contacts mounted therein; and

a female member joined to the male member, the female member having a pair of jack openings open to the outside of the adapter, the female member also having means for accommodating an individual carrier adjacent to each of the jack openings such that the jack contacts mounted in the carriers are exposed within the jack openings.

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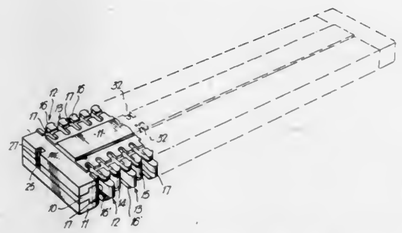
**4,295,703**

## CONNECTOR BLOCK

**Brian T. Osborne, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Nov. 27, 1978, Ser. No. 963,935**
**Int. Cl.³ H01R *13/38***
**U.S. Cl. 339—98** **12 Claims**



1. An electrical connector block for interconnecting two pluralities of wires fanned along two opposite edges thereof comprising:

an elongate layered structure of three elements, a flat center element for supporting two staggered rows of flat, slotted, electrical connectors one on each surface thereof, and two insulating covers substantially coextensive, and compatible, with the center element, one on each side thereof and secured thereto, for positively retaining said connectors in place; said center element being an insulator having transversal slots in both of said opposite edges aligned with slots in said connectors for guiding and retaining wires to be inserted into the slots of said connectors for establishing electrical contact therewith.

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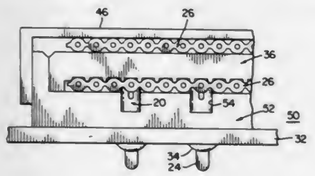
**4,295,704**

## SIDE PROBEABLE CONNECTOR USING FLAT CABLE

**Ronald S. Narozny, Panorama City, and Robert P. Wyss, Manhattan Beach, both of Calif., assignors to Thomas & Betts Corporation, Raritan, N.J.**

**Filed Dec. 3, 1979, Ser. No. 99,521**
**Int. Cl.³ H01R *13/50***
**U.S. Cl. 339—99 R** **18 Claims**



1. A side probeable electrical connector for terminating a multiconductor electrical cable comprising: a body portion having a first and a second surface in parallel spaced apart relationship and first and second walls spaced apart from each other and generally orthogonal with said first and second surfaces; said body portion defining at least two spaced bores from said first to said second surface; at least two electrical contacts, one such contact positioned in an associated bore and extending from said second surface to and beyond said first surface; a cover portion for locking engagement with said body portion and having a first surface and a second surface spaced apart from and generally parallel with said first surface of said cover portion; at least two annular recesses in said first surface of said cover portion for receipt respectively of a portion of said electrical contacts after same passes through an electrical cable placed between said first surfaces of said body portion and said cover portion; and at least one passage in said body portion having an axis transverse to the longitudinal axes of said bores and extending from one of said first and second walls to and communicating with said bores to permit said contacts to be probed by probe means inserted from outside of said body portion.

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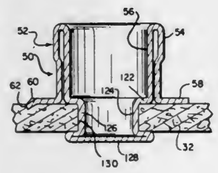
**4,295,705**

## ONE PIECE CONNECTOR

**Frank L. Ciliberti, Jr., Ossining, N.Y., assignor to Duracell International Inc., Bethel, Conn.**

**Division of Ser. No. 787,683, Apr. 14, 1977. This application Mar. 26, 1979, Ser. No. 24,122**
**Int. Cl.³ H01R *13/415***
**U.S. Cl. 339—220 R** **6 Claims**



1. A connector assembly comprising a one piece connector attached to a support; said connector having a connecting means with an integral bottom wall; said connecting means comprising a generally cylindrical outer wall, the diameter of said outer wall adjacent said support being less than the diameter thereof at a point nearer its opposite end, said outer wall being adapted to be received within and to make good contact with the inner wall of a mating connecting means; said bottom wall having an integral boss with a closed end protruding from said bottom wall in a direction away from said connecting means; an inner wall joining the top edge of the outer wall to the bottom wall; said support having an aperture therein through which the boss extends; the bottom end of said boss being pressed flat against and in intimate contact with the surface of said support remote from said connecting means in the form of an outwardly extending shoulder having a diameter greater than the diameter of said aperture; whereby said support is secured between the shoulder of said boss and said bottom wall in sealing relationship and whereby said one piece connector is securely attached to said support.

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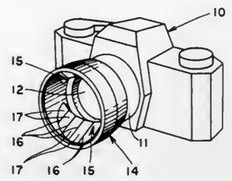
**4,295,706**

## COMBINED LENS CAP AND SUNSHADE FOR A CAMERA

**George H. Frost, 544 Ivan Dr., Kent, Ohio 44240**

**Filed Jul. 30, 1979, Ser. No. 61,840**
**Int. Cl.³ G02B *11/04***
**U.S. Cl. 350—58** **11 Claims**

1. A compact and collapsible sunshade and lens cover for a camera having a tubular mount extending around and outwardly of the lens of the camera comprising ring means attachable to the tubular mount, sunshade means collapsible from a first position outward of the tubular mount to a second position around the tubular mount to be compact therewith, lens cover means movable from a first position exposing the lens to a second position covering the lens as said sunshade means is being collapsed, means connecting said ring means to said



sunshade means to maintain said lens cover means in said first and second positions, and means connecting said ring means to said lens cover means to move said lens cover means from said first to said second position.

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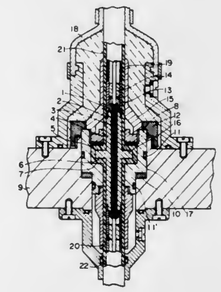
**4,295,707**

## FEED THROUGH FOR OPTICAL SUBMERGED REPEATER

**Taiichiro Nakai, Fujisawa; Kahei Furusawa, Kamifukuoka, and Yoshihiro Ejiri, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan**

**Filed Oct. 3, 1979, Ser. No. 81,466**
**Claims priority, application Japan, Oct. 6, 1978, 53-122503**
**Int. Cl.³ G02B *5/14*; H02G *3/00***
**U.S. Cl. 350—96.20** **4 Claims**



1. In a feedthrough for an optical submerged repeater, which is disposed on an end face plate of the pressure resisting casing of the repeater for introducing an optical fiber and a power supplying feeder of an optical fiber submarine cable into a repeater circuit disposed in the pressure resisting casing of the repeater of an optical fiber submarine cable repeating system, the improvement comprising:

a metal coating deposited on the clad part of at least one optical fiber to be introduced through the feedthrough;

a metal pipe into which said optical fiber deposited with said metal coating is introduced for reinforcement and hermetically fixed therein;

a disc sleeve connected to the power supplying feeder of the optical fiber submarine cable at the outside and inside of the end face plate to form a part of the power supplying feeder and having at least one insertion hole for inserting and air-tightly fixing therein said metal pipe;

a metal body air-tightly fixed to said end face plate for housing therein said disc sleeve; and

an insulator layer molded in a gap between said disc sleeve and said metal body and further molded together at at least the seawater side of said disc sleeve.

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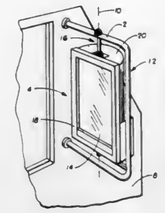
**4,295,708**

## ELECTRO-MECHANICALLY ROTATABLE MIRROR

**Robert D. Albrecht, Bethany; Michael Presley, Shawnee; William E. Waller, Ardmore; Gerald L. Cook, and William E. Presley, both of Stroud, all of Okla., assignors to Presley, Waller & Presley, Ardmore, Okla.**

**Filed Nov. 30, 1979, Ser. No. 98,754**
**Int. Cl.³ G02B *7/18***
**U.S. Cl. 350—289** **10 Claims**



1. An apparatus connectible to a vehicle for providing rearward vision to a driver of the vehicle at a plurality of selectable angles on either side of a neutral position, said apparatus comprising:

a support member connectible to said vehicle;

a rearview structure connected to said support member, said rearview structure including:

a housing;

a mirror;

means for rotatably connecting said mirror to said housing;

a motor having a drive shaft extending therefrom in acute angular relationship to said mirror;

means extending from said mirror for engaging said drive shaft in a fixed angular relationship;

means for maintaining said fixed angular relationship during periods of interaction between said motor drive shaft and said drive shaft engaging means;

means associated with said rearview structure operable by said driver for actuating said rotating means wherein said drive shaft includes a first segment secured to the rotor of said motor, a second segment having one end portion threadedly connected to said drive shaft engaging means in said fixed angular relationship, and said fixed angular relationship maintaining means includes a flexible sleeve element for pivotably coupling said first segment to said second segment so that said second segment pivots with respect to said first segment to maintain said fixed angular relationship during said interaction.

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**4,295,709**

## PARABOLIC REFLECTOR COMPRISING A PLURALITY OF TRIANGULAR REFLECTING MEMBERS FORMING A REFLECTING SURFACE SUPPORTED BY A FRAMEWORK HAVING A PARTICULAR GEOMETRIC PATTERN

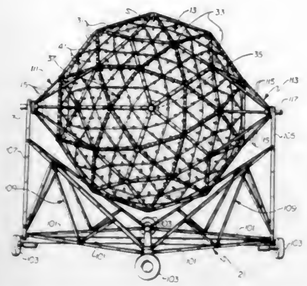
**Douglas E. Wood, Box 32, Fox Island, Wash. 98333**

**Filed Aug. 29, 1979, Ser. No. 70,914**
**Int. Cl.³ G02B *5/10***
**U.S. Cl. 350—292** **33 Claims**

1. A parabolic reflector apparatus, comprising:

(a) a rigid support matrix of substantially parabolic configuration, comprising a plurality of strut-like members jointed together in a geometric pattern which is substantially identical to the pattern of lines on a parabolic surface created by

projecting an icosahedron or a subdivided portion thereof onto the parabolic surface;
(b) a plurality of reflecting members;



(c) means on said support matric for supporting said reflecting members in such an arrangement that said reflecting members form a substantially parabolic reflecting surface.

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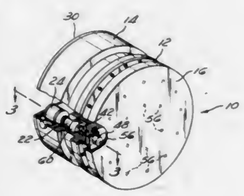
**4,295,710**
**DEFORMABLE MIRROR WITH DITHER**
**Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**
**Filed Sep. 4, 1979, Ser. No. 71,898**
**Int. Cl.³ G02B *7/18, 5/08***
**U.S. Cl. 350—310** **9 Claims**



1. A deformable mirror for correcting wavefront aberrations in a laser fusion optical system, which comprises:
support means;
at least one ball screw mirror actuator interconnected with said support means;
a faceplate, which comprises:
a reflecting surface for reflecting a signal; and
a flex strut mounted at one end to said reflecting surface and at the other end to said ball screw mirror actuator; and
a dither actuator connected in series with said ball screw mirror actuator for either tagging or for real time dynamic correction.

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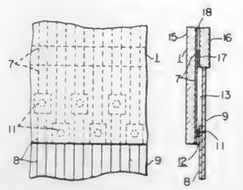
**4,295,711**
**LIQUID CRYSTAL DISPLAY DEVICE**
**Hironari Tanaka; Shigeru Matsuyama; Tadashi Ishibashi; Kiyoshige Kinugawa, and Yukihiro Sato, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Aug. 22, 1979, Ser. No. 68,576**
**Claims priority, application Japan, Aug. 23, 1978, 53-101776**
**Int. Cl.³ G02F *1/133***
**U.S. Cl. 350—334** **4 Claims**

1. A liquid crystal display device comprising:
a liquid crystal portion disposed between upper and lower substrates,
a plurality of electrode terminals provided on said upper substrate,
insulating binder material connected to said electrode terminals and including electrically conductive islands penetrating through said insulating binder material, and
a plurality of lead electrodes provided on a sheet, wherein



said insulating binder material bonds said electrode terminals to said lead electrodes with said lead electrodes connected through said electrically conductive islands to said plurality of electrode terminals.

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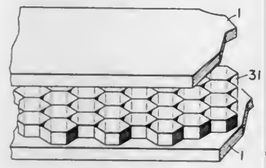
**4,295,712**
**LIQUID CRYSTAL DISPLAY DEVICE**
**Masumi Ishiwatari, Zushi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Jul. 25, 1979, Ser. No. 60,281**
**Claims priority, application Japan, Aug. 19, 1978, 53-99994**
**Int. Cl.³ G02F *1/133***
**U.S. Cl. 350—344** **3 Claims**



1. A liquid crystal display device comprising:
a pair of flexible, transparent plates each having a transparent electrode on one surface; and
a spacer interposed between said plate surfaces for maintaining a constant space gap therebetween, said spacer being a honeycomb-shaped structure which extends over the entire display device surface.

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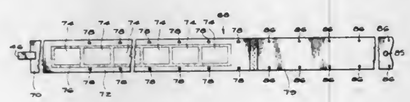
**4,295,713**
**FILM AND PHOTOGRAPHIC APPARATUS**
**Evan A. Edwards, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Division of Ser. No. 20,283, Mar. 14, 1979. This application Apr. 9, 1980, Ser. No. 138,481**
**Int. Cl.³ G03C *1/76***
**U.S. Cl. 352—235** **2 Claims**



1. In a photographic filmstrip having an image portion and a leader; the improvement comprising:
at least one row of perforations of a pre-determined size along the image portion; and
at least one row of perforations in the leader, said perforations in the leader being aligned with and smaller in a direction longitudinally of said filmstrip than the perforations along the image portion.

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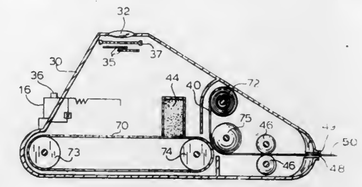
**4,295,714**
**ELECTROSTATIC CAMERAS**
**John M. Payne, Northborough, Peterborough, England**
**Continuation-in-part of Ser. No. 896,823, Apr. 17, 1978, Pat. No. 4,198,139. This application Feb. 19, 1980, Ser. No. 122,636**
**Claims priority, application United Kingdom, Apr. 16, 1977, 15873/77; Dec. 13, 1977, 51901/77**
**The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.**
**Int. Cl.³ G03G *15/00*; G03B *9/02***
**U.S. Cl. 354—3** **4 Claims**



1. A portable electrostatic camera comprising:
a light-tight housing having an aperture for admitting light;
a surface within the housing;
a shutter for controlling the passage of light through said aperture to said surface to form an optical image thereon;
a single point discharge electrode disposed within said housing between the aperture and the surface for electrically charging said surface prior to the formation of the optical image thereon, which surface modifies the charge to form an electrical image corresponding to the optical image;
a piezo-electric crystal generator disposed within said housing;
means for activating said piezo-electric generator to produce a high voltage charge for application to said single point discharge electrode;
means for ensuring that charge of only one polarity is applied to said single point discharge electrode;
means disposed within said housing for applying a printing medium to said surface for retention thereon in dependence on the level of electrical charge remaining at different points over said surface; and
an additional electrode situated within the camera housing and close to said surface on which the electrical image is formed to assist in the transfer of printing medium thereto.

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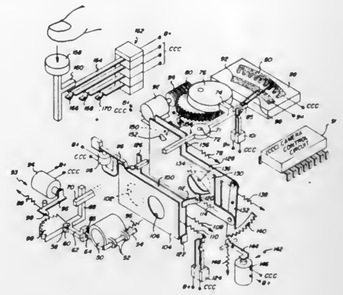
**4,295,715**
**CAMERA MECHANISM EMPLOYING A MULTIFUNCTION CONTROL MEMBER**
**John J. Breen, West Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Dec. 13, 1979, Ser. No. 103,259**
**Int. Cl.³ G03B *3/10***
**U.S. Cl. 354—25** **4 Claims**

1. A control mechanism for use in a photographic camera, comprising:
a multifunction control member moveable between an initial position and a final position;
means for moving said control member from said initial position to said final position;
position sensor means, responsive to the movement of said control member for producing a signal representing the position of said control member;
adjustable lens means moveable from an initial position to a final position for providing a plurality of focus adjustments, said lens means including control member follower means for moving said adjustable lens means in concert with movement of said control member;
lens arresting means responsive to a focus control signal for arresting movement of said lens mean at one of said plurality of focus adjustments;
adjustable aperture means, moveable from an initial position to a final position for providing a plurality of aperture adjustments, said aperture means including control member follower means for moving said aperture means in concert with movement of said control member;
aperture arresting means responsive to an aperture control signal for arresting movement of said aperture means at one of said plurality of aperture adjustments; and
control circuit means responsive to measured scene parameter inputs, including at least subject distance and brightness, and responsive to said position signal for producing said focus control signal and said aperture control signal.



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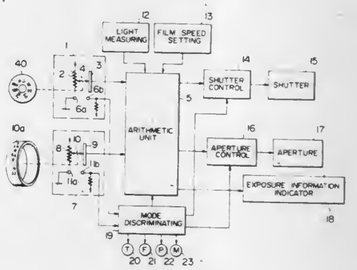
**4,295,716**
**MODE CHANGE-OVER DEVICE FOR AUTOMATIC EXPOSURE CONTROL CAMERA**
**Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan**
**Filed Apr. 25, 1979, Ser. No. 33,217**
**Claims priority, application Japan, Apr. 28, 1978, 53-51985**
**Int. Cl.³ G03B *7/14***
**U.S. Cl. 354—30** **3 Claims**




1. In a dual priority automatic exposure control camera in which mode is selected among aperture priority, shutter speed priority, program control and manual control comprising a shutter speed setting means, an aperture size setting means, a light measuring means, a film speed setting means, a shutter speed control means, an aperture control means, and an exposure control means having input means connected with said shutter speed setting means, aperture setting means, light measuring means and film speed setting means and output means connected with said shutter speed control means and aperture size control means for controlling the shutter speed and the

aperture size in accordance with information inputed thereinto, each of said shutter speed setting means and said aperture size setting means comprising a variable resistor having a brush slidable therealong,

a mode change-over device comprising a first signal generating means which gives a first signal indicating whether the shutter speed is automatically controlled or manually selected, a second signal generating means which gives a second signal indicating whether the aperture size is automatically controlled or manually selected, and a mode discriminating means having input means connected with said first and second signal generating means and output means connected with said exposure control means, said first signal generating means comprising a first pair of contacts located at an end of the variable resistor of said shutter speed setting means, at least one of the first pair of contacts being connected with said mode discriminating means, and a second pair of contacts located at an end of the variable resistor of said aperture size setting means, at least one of the second pair of contacts being connected with said mode discriminating means, wherein said brush is selectively put into contact with said variable resistor or said pair of contacts in each of said first and second signal generating means, wherein the mode of aperture priority, shutter speed priority, program control and manual control is represented by the combination of said first and second signal.

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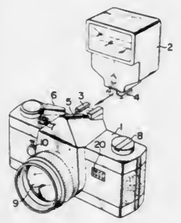
**4,295,717**
**CAMERA WITH OPERATION INDICATOR FOR AUTO-STROBO UNIT**
**Masahiro Kitagawa, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan**
**Filed Apr. 25, 1979, Ser. No. 33,165**
**Claims priority, application Japan, May 31, 1978, 53-65128**
**Int. Cl.³ G03B** *15/05, 17/18*
**U.S. Cl. 354—33** **28 Claims**



1. A camera with means to receive an auto-strobo unit, said auto-strobo unit including a first light emitting element for indicating the completion of a proper flashlight illumination and a second light emitting element for indicating the completion of a charging operation of said strobo unit; a viewfinder; and an operation indicator comprising a third light emitting element which is located within said viewfinder and which is responsive to a current flow through said first and second light emitting elements provided within said auto-strobo unit for providing an indication within said viewfinder that said charging operation and said flashlight illumination of the strobo unit have been properly completed.

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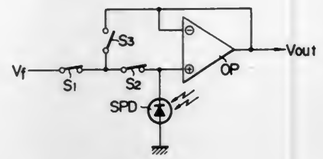
**4,295,718**
**EXPOSURE CONTROL CIRCUIT OF CAMERA**
**Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan**
**Filed Jan. 7, 1980, Ser. No. 109,763**
**Claims priority, application Japan, Mar. 2, 1979, 54/24147**
**Int. Cl.³ G03B** *7/081*
**U.S. Cl. 354—50** **11 Claims**




1. An exposure control circuit for a camera, comprising:

a photoelectric transducer element for determining the amount of light being received by a camera containing said transducer element from an object being photographed, and for generating a current proportional to the amount of said light;

an operational amplifier having its non-inverting input terminal connected to said transducer element and its output terminal coupled to its inverting input terminal for generating an output voltage representative of the integral of said current when an object is being photographed;

a first trigger switch comprising semiconductor switch means of the type which is capable of exhibiting a leakage current when the voltage across first and second terminals of said switch means is other than zero, said first terminal of said switch means being connected to said non-inverting input terminal of said operational amplifier and to said transducer element for applying a trigger signal to said transducer element which enables said transducer element to produce said current when an object is being photographed; and

potential equalizing means for maintaining said second terminal of said trigger switch at said output voltage of said operational amplifier at all times while said transducer element is generating said current, thereby to apply a zero voltage drop across said trigger switch and eliminate the flow of leakage current therethrough.

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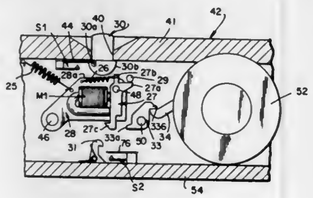
**4,295,719**
**BATTERY CONSERVATION BY CONTROL OF THE CHARGING CIRCUIT FOR A BUILT-IN ELECTRONIC FLASH**
**Karl H. Lange, Bünde, Fed. Rep. of Germany, assignor to Balda-Werke, Bünde, Fed. Rep. of Germany**
**Filed Jan. 25, 1980, Ser. No. 115,191**
**Int. Cl.³ G03B** *7/08, 15/05*
**U.S. Cl. 354—50** **4 Claims**



1. In a photographic camera system having a shutter and a flash unit for providing momentary artificial illumination of the photographic subject, the combination comprising means adaptable for connection of said camera system to a D.C.



power source, a shutter release member movable from a rest position through an intermediate position to a fully depressed position, a pivotally mounted holder member mounting an electromagnet and movable in response to said movement of said shutter release member from a rest position, through an intermediate position to a fully extended position respectively, an armature pivotally mounted on said holder member and operative to move into first and second positions into and out of contact with said electromagnet in response to the energization and deengerization of said electromagnet respectively, and latching means for latching and releasing said shutter in response to said movement of said armature into and out of conctact with said electromagnet, whereby when said holder member is in said intermediate position and said armature is in said second position said shutter is released.

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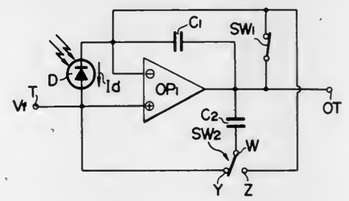
**4,295,720**
**APPARATUS FOR DETERMINING LIGHT REFLECTION FROM A FOCAL PLANE SHUTTER**
**Kazunori Mizokami, and Masahiro Kitagawa, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan**
**Filed Jan. 7, 1980, Ser. No. 109,762**
**Claims priority, application Japan, Mar. 9, 1979, 54/27848**
**Int. Cl.³ G03B** *7/083*
**U.S. Cl. 354—51** **10 Claims**




1. An apparatus for determining light reflection from a focal plane shutter of the type that includes a first shutter blind which initiates exposure of a photographic film and which has a light-reflective surface facing a direction from which light is to be admitted for exposing a photographic film, and a second shutter blind which terminates said exposure; said apparatus comprising:

a photoelectric transducer element for determining the amount of light that is reflected from the surface of the shutter blind and also from the surface of a negative when a camera that includes said apparatus contains photographic film in a position which will cause said film to be exposed by the light; said photoelectric transducers element further being for generating a photocurrent which is representative of the amount of light being received;

an integrating capacitor for integrating said photocurrent for determining proper exposure time;

a correcting capacitor for compensating for the different reflectivities of the surface of the first shutter blind and the film surface;

switch means for connecting said correcting capacitor in parallel with said integrating capacitor a predetermined time after a shutter operation; and

means for charging said correcting capacitor in such a manner that the voltage thereacross is the same as the voltage across said integrating capacitor at the time said corrrecting capacitor is connected in parallel with said integrating capacitor.

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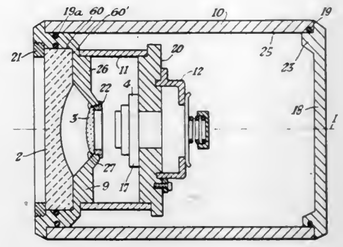
**4,295,721**
**HIGH PRESSURE AND HIGH SPEED OPTICAL ENCLOSURE SYSTEM**
**Dimitri Rebikoff, 3060 SE 4th Ave., Ft. Lauderdale, Fla. 33315**
**Filed Apr. 23, 1980, Ser. No. 143,140**
**Int. Cl.³ G03B** *17/08*
**U.S. Cl. 354—64** **3 Claims**



1. A high pressure and high speed optical enclosure system for use with a film loaded camera comprising:

an external housing cylinder;

said external cylinder having a closed end and an open end;

correcting lens system means for correcting the focus of the camera when said external cylinder is submerged;

pressure resistant means for sealingly covering said open end;

said correcting lens system means operably connected to said pressure resistant means;

an internal cylinder;

a primary lens, said primary lens connected to said internal cylinder;

connecting means for connecting said internal cylinder to said pressure resistant means;

mounting means for mounting the camera within said internal cylinder;

said connecting means incudes a support which centers said internal cylinder and the primary lens of the camera mounted therein on its optical axis and holds said internal cylinder independently of said external cylinder and therefore maintains a constant distance between said primary lens and the film focal plane, and constant distance between said correcting lens system and said primary lens, connected to said pressure resistant means.

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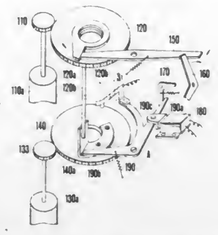
**4,295,722**
**CAMERA FOR DAYLIGHT AND FLASH PHOTOGRAPHY**
**Uchiyama Takashi; Tokuichi Tsunekawa, both of Yokohama, and Takehiko Kiyohara, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 10,904, Feb. 9, 1979, Pat. No. 4,268,139, which is a continuation of Ser. No. 638,084, Dec. 5, 1975, abandoned. This application Dec. 17, 1979, Ser. No. 104,691**
**Claims priority, application Japan, Dec. 10, 1974, 49-141740**
**Int. Cl.³ B03B** *15/03*
**U.S. Cl. 354—146** **2 Claims**

1. In a camera comprising a film gate, a focal plane shutter having leading and trailing shutter curtains and a control means for triggering movement of the trailing shutter curtain, a flash synchronizing device for enabling the flash illumination of a flash unit, comprising:

(a) motion transmitting means to be driven in association with the movement of the leading shutter curtain, said motion transmitting means being located at a first position when the film gate is covered by the leading shutter curtain, and being located at a second position when the film gate is fully opened by the running of the leading shutter curtain; and

(b) a single synchronous contact switch for enabling the

flash illumination of the flash unit when the single synchronous switch is set to an operative state, said single synchronous switch being located at a position where it is driven to an operative state in response to arrival at the second position of the motion transmitting means before



the control means triggers the movement of the trailing shutter curtain, and being fixedly mounted on a part of the control means in such a positional relation that it is located at a position beyond the second position of the motion transmitting means after the control means has triggered the movement of the trailing shutter curtain.

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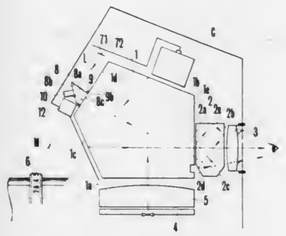
**4,295,723**

## SINGLE LENS REFLEX CAMERA

**Kikuo Momiyama, Yokohama, and Kenichi Kumazawa, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 26, 1979, Ser. No. 97,833**
**Claims priority, application Japan, Nov. 24, 1978, 53-145114**
**Int. Cl.³ G03B** *17/20, 19/12*
**U.S. Cl. 354—155** **4 Claims**



1. A single lens reflex camera comprising:
an objective lens for forming an image of an object on a photosensitive surface and a focusing plate;
a viewfinder optical system including a pentagonal roof prism having a front non-reflecting surface and an eyepiece for observing the object's image formed on the focusing plate;
a first photographic data indicating means mounted on a lens barrel of said objective lens;
a second photographic data indicating means located on the camera off said lens barrel;
two information bearing light introducing windows on a front non-reflecting surface of said pentagonal roof prism, said two information bearing light introducing windows being arranged laterally of said front non-reflecting surface of the prism, one of said information bearing light introducing windows being offset from the middle section of said front non-reflecting surface and having a relatively small opening area, the other window being disposed across the middle section of the front non-reflecting surface and being of a laterally elongated shape having a relatively large opening area;
first optical means facing said first data indicating means for deflecting first information bearing light from said first data indicating means either to the left or right of said front non-reflecting surface of the pentagonal roof prism and for directing the first information bearing light to one of said two information bearing light introducing windows on said front non-reflecting surface;
second optical means for directing second information bearing light from said second data indicating body to the other information bearing light introducing window on said front non-reflecting surface; and
third optical means for directing said first and second information bearing light to said eyepiece.

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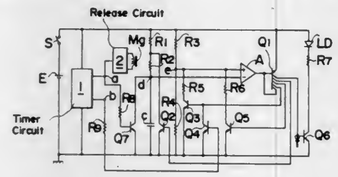
**4,295,724**

## ELECTRIC SELF-TIMER DEVICE FOR CAMERAS

**Masayoshi Sahara, Sennan, and Masaaki Nakai, Nara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 940,107, Sep. 6, 1978, abandoned. This application Jul. 9, 1979, Ser. No. 55,518**
**Claims priority, application Japan, Sep. 12, 1977, 52/123438**
**Int. Cl.³ G03B** *17/18, 17/40*
**U.S. Cl. 354—238** **6 Claims**




1. An electronic self-timer device for a camera having a shutter comprising:
a manually operable self-timer starter;
a timer circuit including means for generating a first signal after a first predetermined time duration from the actuation of said self-timer starter and before commencement of an exposure;
an oscillator responsive to the actuation of said self-timer starter for generating a first oscillating signal of a predetermined frequency, said oscillator being also responsive to said first signal for generating a second oscillating signal of a frequency distinguishably different from that of the first oscillating signal, a variable time constant R-C circuit, a circuit for generating an oscillating signal having a frequency dependent upon the value of the time constant of said R-C circuit, and a switching circuit responsive to said first signal from said timer circuit for changing the time constant of said R-C circuit from one value to another; and
luminous indicating means responsive to the first and second oscillating signals to be lit intermittently in accordance with the respective frequencies of the first and second oscillating signals.

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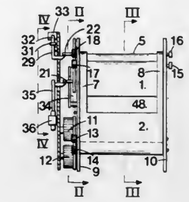
**4,295,725**

## PHOTOGRAPHIC SHUTTER

**Roger Durand, Ballaigues, Switzerland, assignor to Pignons S.A., Ballaigues, Switzerland**

**Filed Oct. 11, 1979, Ser. No. 83,614**
**Claims priority, application Switzerland, Oct. 19, 1978, 10808/78**
**Int. Cl.³ G03B** *9/34*
**U.S. Cl. 354—244** **4 Claims**

1. A photographic shutter comprising two flexible curtains, each curtain attached by one of its edges to a first roller urged in a winding direction by a spring, each of said curtains connected by two flexible strips to a second roller which is connected, on the one hand, to a setting mechanism for drawing the curtain against the action of the said spring and on the other hand, to a trip locking mechanism, said locking mechanism operating to successively unlock said second rollers, each curtain made of synthetic material and formed integrally with said flexible strips, means connecting each said first roller at one of its ends to a spring loaded device located at the end of said roller, said second rollers having at one of their ends a coupling device which can be tripped and connecting them to said setting mechanism, said second rollers co-operating with



said locking mechanism at their end opposite the end having said coupling device, each second roller provided at one of its ends with a toothed pinion engaging with a toothed wheel of larger diameter, said toothed wheel including a stud projecting from one side thereof, said stud co-operating on the one hand with the locking mechanism and, on the other hand, with a stop fixing the position of the curtain at the end of operation of the shutter, said stop comprising a pawl of an arm forced against said stop by a spring, said arm having a ramp adjacent to said pawl, said ramp exerting a resilient rubbing action against said stud before it butts against said pawl.

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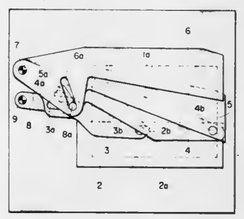
**4,295,726**

## BLADE TYPE FOCAL PLANE SHUTTER

**Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan**

**Filed Sep. 18, 1980, Ser. No. 188,286**
**Claims priority, application Japan, Sep. 20, 1979, 54-130844**
**Int. Cl.³ G03B** *9/40, 9/08*
**U.S. Cl. 354—246** **7 Claims**



1. A focal plane shutter comprising a shutter plate having a rectangular exposure aperture formed therein, a plurality of auxiliary shutter blades rotatably supported on said shutter plate at one side of said exposure aperture to open and close said exposure aperture and having cam slots therein, an actuating member rotatably supported on said shutter plate at one side of said exposure aperture and having thereon a driving pin fitted in said cam slots, and a main shutter blade rotatably supported on two said auxiliary shutter blades adjacent to said main shutter blade with each other to open and close said exposure aperture in cooperation with said plurality of auxiliary shutter blades and capable of forming an exposure slit on said exposure aperture.



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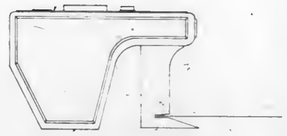
**4,295,727**

## ELECTRICAL APPARATUS FOR COMPARING DARK AND LIGHT AREAS ON A SUBSTRATE AND WHICH SUBSTRATE IS IN A LIQUID

**Douglas K. Robinson, 7512 Beverly, Edmonds, Wash. 98020**

**Filed Oct. 17, 1978, Ser. No. 952,202**
**Int. Cl.³ G03D** *13/08*
**U.S. Cl. 354—298** **15 Claims**



1. An apparatus for comparing opaque area and clear area on a substrate with a predetermined standard of transparency to light, said apparatus comprising:
a. a source of infra-red light and a solid state device with a spectral response peak in the infra-red region;
b. said source of infra-red light and said solid state device being spaced apart so as to be capable of receiving an edge of said substrate between them;
c. said substrate being immersed in a developing solution;
d. said infra-red light continuously travels through the developing solution between the source of said infra-red light and the edge of the substrate, the edge of the substrate and the developing solution between the edge of the substrate and the solid state device;
e. said predetermined standard of transparency being a dot structure in the substrate;
f. an indicator, operatively, connecting with said solid state device; and,
g. said indicator indicating when the dot structure in said substrate meets said predetermined standard of transparency.

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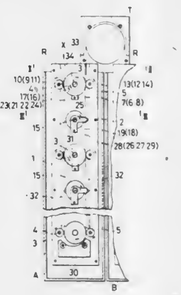
**4,295,728**

## CONVEYING SYSTEM WITH SNAKE MOTION PREVENTION MEMBERS INCORPORATED THEREIN FOR PHOTO TREATMENT APPARATUS OF LONG LENGTH PHOTO-SENSITIVE SHEET MATERIALS

**Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan**

**Filed Aug. 28, 1979, Ser. No. 70,539**
**Claims priority, application Japan, Sep. 5, 1978, 53-108104**
**Int. Cl.³ G03D** *3/13*
**U.S. Cl. 354—321** **7 Claims**



1. In an improved automatic developing apparatus for long-

length photo-sensitive sheet materials of the type having a treatment bath containment means into which means are immersed and suspended for directing, locating and controlling the path of travel of a plurality of long-length photo-sensitive sheet materials attached to the trailing end of a wide leader, said means including a plurality of roller means to fix the path of travel of a wide leader, and guide means to position said leader along said directing means, the improvement which comprises:

(a) said directing means has a plurality of free roller means rotatably mounted on respective shafts;

(b) a plurality of guide means for guiding and curl prevention extending parallel to the path of travel and spaced in juxtaposition to said free roller means which confine the long-length photo-sensitive sheet materials to a narrow gap path of travel between said free roller means and said guide means;

(c) a plurality of motion prevention means for prevention of relative sideways motion of said sheet materials, each said means being rotatably mounted on respective said shafts and having a pair of arms extending horizontally forming a space between each pair of arms into which fit said free roller means and which horizontal arms extend toward said guide means to close up the sides of the narrow gap formed between said guide means and said free roller means so as to limit the amount of relative sideways motion in the long-length photo-sensitive sheet materials by further defining the desired travel path; and

(d) a plurality of counter balancing means respectively associated with the rotatably mounted plurality of said motion prevention means which normally locate the said pairs of arms thereof in the horizontal position and which provide forces to return said motion prevention means to the original position after the arms are displaced by contact with a wide leader so as to allow the wide leader to pass by.

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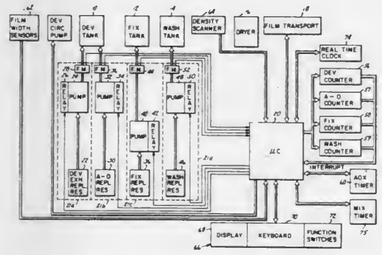
**4,295,729**

## AUTOMATIC ANTI-OXIDATION REPLENISHER CONTROL

**Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.**

**Filed Jul. 14, 1980, Ser. No. 168,020**
**Int. Cl.³ G03D** *3/06*
**U.S. Cl. 354—324** **8 Claims**




1. In a processor of photosensitive material in which anti-oxidation replenishment is provided to processor fluid to compensate for changes in chemical activity of the processor fluid due to aerial oxidation, the improvement comprising:

real time clock means for providing time of day signals;

storage means for storing an operating schedule of the processor; and

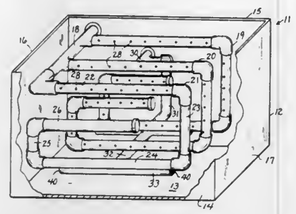
control means for controlling anti-oxidation replenishment as a function of the time of day signals and the operating schedule.

**4,295,730**

## WASHER FOR RESIN-COATED PHOTOGRAPHIC PRINTS

**David R. Fraser, Davis, Calif., assignor to The United States of America as represented by the Secretary of Health and Human Services, Washington, D.C.**

**Filed Jul. 31, 1980, Ser. No. 174,238**
**Int. Cl.³ G03D** *3/04*
**U.S. Cl. 354—325** **16 Claims**



1. A print-washing apparatus comprising a tank; a water inlet conduit mounted in the upper portion of said tank; a plurality of spaced parallel vertically arranged looped spray pipes located beneath the upper liquid level of said tank and communicatively connected to said water inlet conduit and defining vertical print-receiving spaces therebetween below the upper surface level of said tank; said looped spray pipes each having a plurality of water jet-forming apertures located along the entire length thereof; means to force water through said water inlet conduit and through said looped spray pipes and through said plurality of water jet-forming apertures so as to provide water jets on the surface of prints received in said vertical print-receiving spaces; means to soften the impact of said water jets to achieve a gentle washing action when in use, said means comprising a level of water in said tank when in use above the upper level of said looped spray pipes; a horizontally extending drain pipe array in the bottom portion of said tank and having a plurality of spaced inlet ports to receive waste water; and vertically arranged siphon discharge conduit means communicatively connected to said drain pipe array.

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**4,295,731**

## ELECTROSTATIC COPYING APPARATUS

**Koichi Sasaki, Osaka; Yasuji Sumida, Nara, and Hiroshi Ishida, Ibaragi, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan**

**Filed Apr. 11, 1979, Ser. No. 29,053**
**Claims priority, application Japan, Apr. 17, 1978, 53-45490; Apr. 17, 1978, 53-50972[U]; Apr. 17, 1978, 53-50973[U]; Apr. 19, 1978, 53-47309; May 23, 1978, 53-61822; May 23, 1978, 53-70043[U]; May 23, 1978, 53-70044[U]; May 23, 1978, 53-70045[U]; May 23, 1978, 53-70046[U]; May 23, 1978, 53-70047[U]; May 30, 1978, 53-65949; May 30, 1978, 53-74580[U]; May 30, 1978, 53-74581[U]; May 30, 1978, 53-74582[U]; May 31, 1978, 53-66119[U]**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—14 R** **6 Claims**

1. An electrostatic copying apparatus comprising:

an original document carrier;

an optical device including an exposure lamp;

an endless loop member mounted for movement about first and second wheels and connected to a part of one of said original document carrier or said optical device;

a moving member fixed to said part for movement thereby in an exposure moving direction;

a roll supply of copying paper from which copying paper is movable along a path sequentially through a paper cutting zone including a paper cutting unit, a charging zone including a charging device, an exposure zone including an exposure device, a developing zone including a developing device, and a fixing zone including a fixing device;

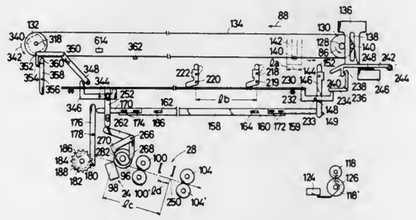
paper feed means for feeding copying paper from said supply to said paper cutting zone whereat said paper cutting unit severs said copying paper into predetermined lengths;

pivotally mounted paper feed detecting, exposure detecting, paper cut detecting and de-energization detecting members sequentially disposed along the path of said moving member in said exposure moving direction and spring biased to locations to be sequentially contacted by said moving member and moved thereby to respective actuated positions;

copying paper feed linkage means, associated with said paper feed detecting member and with said paper feed means, for, upon said moving member moving said paper feed detecting member to said actuated position thereof, actuating said paper feed means to initiate feeding of said copying paper;

exposure linkage means, associated with said exposure detecting and de-energization detecting members and with





said exposure lamp, for, upon said moving member moving said exposure detecting member to said actuated position thereof, actuating said exposure lamp, and for, upon said moving member moving said de-energization detecting member to said actuated position thereof, de-energizing said exposure lamp;

paper cut linkage means, associated with said paper cut detecting means and paper cutting unit, for upon said moving member moving said paper cut detecting member to said actuated position thereof, actuating said paper cutting unit to sever copying paper being fed by said paper feed means;

position detecting means for adjusting and setting the positions of said paper cut detecting member and of said de-energization detecting member along said path of said moving member; and

the distance between said paper cut detecting member and said de-energization detecting member being at least as great as the distance between the cutting position of said paper cutting unit and the upstream end of said exposure zone in the direction of feeding of said copying paper.

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**4,295,732**

## BOUND DOCUMENT APPARATUS LATCHING MECHANISM

**Charles J. Hull, Fairport; James E. Hutton, Webster, and Teri J. Mahuson, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

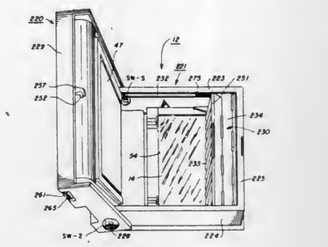
**Filed Oct. 30, 1979, Ser. No. 89,341**
**Int. Cl.³ G03G** *15/00*
**U.S. Cl. 355—14 R** **9 Claims**

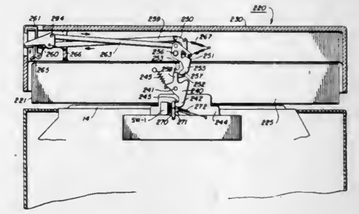
1. In an electrostatographic reproduction machine having a support frame, document handling apparatus for advancing document sheets from a stack to an exposure platen, and an electrostatographic processor for processing copy sheets of the document sheets when exposed, the improvement comprising:

a housing for containing the document handling apparatus,

pivotal support means on the machine frame and connected to said housing for permitting the pivotal movement of the document handling apparatus toward and away from the exposure platen,

a bound document cover assembly detachably retained by said housing, said cover assembly being connected to said pivotal support means and movable as a unit with said housing to expose the exposure platen for manual use, said housing being pivotally related to said cover assembly





whereby the latter may be maintained on said platen while said housing is in a pivoted raised position, so as to permit bound document copying,

a latching arrangement including a first latch mechanism associated with said housing for attaching the same to said cover assembly and a second latch mechanism associated with said cover assembly for attaching the same to the support frame of the machine.

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**4,295,733**

## AUTOMATIC ERROR COLLATOR CAPACITY CONSTRAINTS USING SPARE BIN STRATEGY

**Donovan M. Janssen, and William S. Seaward, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 10, 1979, Ser. No. 101,678**
**Int. Cl.³ B65H** *31/24;* **G03G** *15/00*
**U.S. Cl. 355—14 SH** **12 Claims**

1. In a copying system having a cycling automatic document feed and an automatic unloading apparatus, a device to recover from an overflow collator condition comprising in combination:

a sorter means for containing a plurality of copy sheets of an original document, said sorter means having an advertised set of bins and a number of spare bins for containing overflow copies from the advertised bins;

a loading means associated with the sorter means and operable to load an optimum number of copies into the advertised bins and overflow copies into the spare bins; and

an unloading means including an automatic unloading apparatus for forming a complete collated set of copies by merging copies from the advertised bins and the spare bins.

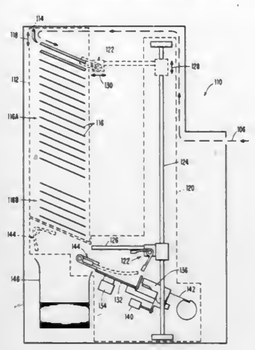
10. A method for controlling the operation of a sheet collator when the capacity M of each primary bin is less than the

number of sheets N to be collated in one set, said method comprising of the following steps:

(1) providing a set of auxiliary bins for containing overflow copy sheets;

(2) loading each primary bin to its capacity with M copy sheets;

(3) loading the auxiliary bins with the (N-M) copy sheets;



(4) forming collated copy sets by combining sheets from the primary and secondary bins;

(5) increasing the initial set of auxiliary bins by adding newly emptied primary bins; and

(6) loading the newly emptied primary bins with (N-M) copy sheets.

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**4,295,734**

**FILTER ASSEMBLY FOR COLLECTING USED TONER OF ELECTROPHOTOGRAPHIC COPYING MACHINE**

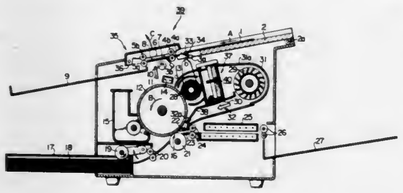
**Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita, Hachioji; Masaji Nishikawa, Hachioji; Akira Shimizu, Hachioji, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Company Ltd., Japan**

**Filed Dec. 17, 1979, Ser. No. 104,444**

**Claims priority, application Japan, Feb. 1, 1979, 54/10912**

**Int. Cl.³ G03G** *15/00*

**U.S. Cl. 355—15** **11 Claims**



1. In an electrophotographic copying machine including a brush which rotates while maintaining its contact with a member which carries an electrostatic latent image to remove any residue of unnecessary toner which remains attached to said member, a suction fan for producing an airstream which conveys the toner removed by said brush, and a filter assembly disposed in the path of the airstream for collecting used toner; the improvement comprising:

(a) a one piece filter cassette having a toner receiver compartment and a separate filter holder compartment formed therein, said filter holder compartment receiving a replaceable filter element therein, said toner receiver compartment being located upstream of said filter holder compartment in a position which permits toner which strikes said filter element and falls down in front of said filter element to form a pile therein; and

(b) means for positioning said filter cassette in the path of the airstream formed within the copying machine, said filter cassette and positioning means cooperating in such a manner that said filter cassette can be slidably placed in and slidably removed from said positioning means, said positioning means including a labyrinth arrangement for forming a labyrinth seal between said filter cassette and said positioning means when said filter cassette is mounted in said positioning means such that said airstream passes through said cassette but does not pass between said cassette and said positioning means.

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**4,295,735**

**OPTICAL PROJECTION SYSTEM HAVING A PHOTOREPETITION FUNCTION**

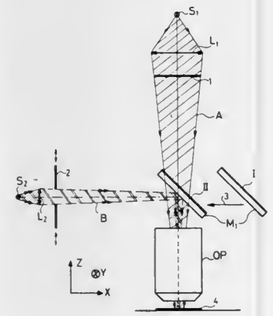
**Michel Lacombat, and Andre Gerard, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Feb. 26, 1980, Ser. No. 124,743**

**Claims priority, application France, Feb. 27, 1979, 79 05008**

**Int. Cl.³ G03B** *27/52, 27/70*

**U.S. Cl. 355—43** **9 Claims**



1. An optical system for projecting patterns in order to reproduce the image of at least one modulating object on a semiconductor wafer coated with photo-sensitive material or on a mask, said optical system being provided with a projection objective and with at least one source of light energy for the illumination of the modulating object, wherein said projection system comprises at least one first reticle and a second reticle each adapted to carry a modulating object, and reflecting optical means comprising at least one movable plane mirror adapted to permit the formation of at least one first optical path and a second optical path in order that the image of said modulating objects carried by said first and second reticles may be projected alternately on said semiconductor wafer or on said mask by switching said movable mirror.

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**4,295,736**

**OPTICAL ASSEMBLY FOR USE IN COPYING MACHINE**

**Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

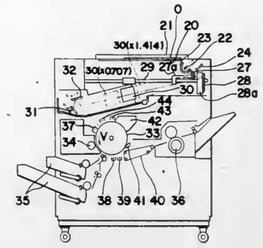
**Filed Nov. 14, 1979, Ser. No. 94,313**

**Claims priority, application Japan, Nov. 14, 1978, 53-157174**

**Int. Cl.³ G03B** *27/34, 27/40, 27/70*

**U.S. Cl. 355—57** **10 Claims**

1. An optical assembly for use in a copying machine of a type including an enlarged size reproduction mode and a reduced size reproduction mode each having the same conjugate distance, said assembly comprising: a projecting lens assembly, a reflective mirror assembly, a drive mechanism connected to said projecting lens assembly for driving said lens assembly between first and second lens assembly positions corresponding to the positions of said lens assembly for the respective reproduction modes, a mechanism connected to said mirror assembly for driving said mirror assembly to a single predetermined mirror assembly position which is the position of said mirror assembly for both reproduction modes, means for adjusting the mirror assembly position of said mirror assembly for proper focal adjustment for the condition in which said projecting lens assembly is at the first lens assembly position



corresponding to the one reproduction mode, and means for adjusting the second lens assembly position of said projecting lens assembly for proper focal adjustment for the condition in which said projecting lens assembly is at the second lens assembly position for the other reproduction mode and said mirror assembly is in the adjusted mirror assembly position.

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**4,295,737**

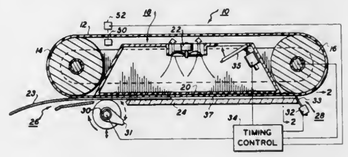
**GROOVED BELT DOCUMENT REGISTRATION SYSTEM**

**Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 10, 1980, Ser. No. 111,062**

**Int. Cl.³ G03B** *27/62, 27/64*

**U.S. Cl. 355—76** **8 Claims**




1. In an original document handling apparatus for moving successive individual document sheets on the surface of a movable belt into a registered position for copying at a copier imaging station, including registration means cooperatively engaging said belt and movable into and out of the path of said documents for their registration, the improvement wherein:

said movable belt has a plurality of narrow elongated permanent grooves therein,

said grooves extend in the direction of movement of said belt below said surface thereof,

said grooves are transversely spaced on said belt,

said grooves have gently sloped walls to avoid reproducible shadows thereof at said copier imaging station, and

said registration means comprises at least two registration fingers transversely spaced corresponding to at least two of said grooves and narrower than said grooves and adapted to interfit into said grooves for the registration of said documents against said registration fingers without slippage between said documents and said fingers.



**4,295,738**

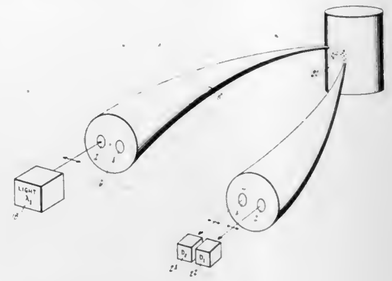
**FIBER OPTIC STRAIN SENSOR**

**Gerald Meltz, Avon, and Elias Snitzer, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Continuation-in-part of Ser. No. 71,512, Aug. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,283**

**Int. Cl.³ G01B** *11/16*

**U.S. Cl. 356—32** **11 Claims**



1. A strain monitor, comprising:

strain responsive means including an optical fiber positionable where strain is to be measured, said optical fiber having a plurality of cores which are spaced apart from each other in a cladding, said cladding and each of said plurality of cores being sized and fabricated from such materials as to support only the lowest order propagation mode, thereby allowing cross-talk to occur between said cores;

source means for generating light to be coupled into one of said cores, said light being cross-talked to adjacent cores in a manner related to strain acting on said optical fiber;

detector means for receiving light energy emerging from each of said plurality of cores, and for providing an electrical signal related to the intensity of said emerging light; and

whereby a strain acting on said optical fiber causes a change in the dimensions and refractive indices of said plurality of cores and said cladding such that mode interference between the modes of propagating light energy within said plurality of cores produces a change in the intensity of light emerging from said cores which is uniquely related to such strain acting on said optical fiber.

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**4,295,739**

**FIBER OPTIC TEMPERATURE SENSOR**

**Gerald Meltz, Avon, and Elias Snitzer, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Continuation-in-part of Ser. No. 71,512, Aug. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,284**

**Int. Cl.³ G01J** *5/38*

**U.S. Cl. 356—43** **11 Claims**

1. A temperature monitor, comprising:

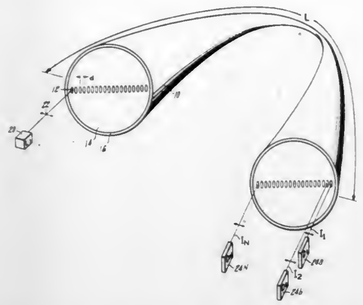
temperature responsive means including an optical fiber having a plurality of cores in a cladding, said plurality of cores being positioned in an array and extending continuously along the entire length of said optical fiber to allow cross-talk therebetween, said cladding and each of said plurality of cores being sized and formed from such materials as to support only the lowest order mode;

source means for generating light to be coupled into one of said plurality of cores, said light being cross-talked to adjacent cores in a manner related to the temperature along the length of said optical fiber;

detector means for receiving light energy emerging from

each of said plurality of cores and for providing an electrical signal indicating the intensity of said emerging light; and

whereby a temperature change along the length of said optical fiber causes a change in dimensions and refractive



indices of said optical fiber such that the beat phase of light propagating along said plurality of cores varies as a function of temperature causing a change in intensity of light emerging from said plurality of cores of said optical fiber which is uniquely related to the temperature along said optical fiber.

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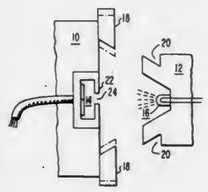
**4,295,740**

## PHOTOELECTRIC DOCKING DEVICE

**Robert H. Sturges, Jr., Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 5, 1978, Ser. No. 939,555**
**Int. Cl.³ G01B *11/26*; B64G *1/62***
**U.S. Cl. 356—152** **13 Claims**



1. A photoelectric docking device for remotely positioning in three dimensional space a first member relative to a second member comprising:

a point light source fixedly connected to the first member and directed to focus a narrow beam of light along a pre-established path;

a photosensor fixedly connected to the second member, which is responsive to the reception of light from the point light source on the first member to provide electrical outputs representative of the relative position of the point source with respect to the photosensor in three dimensional space, the photosensor having at least three electrical outputs taken from substantially symmetric locations over the photosensitive area of the cell;

means for processing the photosensor outputs into a second set of electrical outputs representative of the cartesion coordinates of the first member with respect to the second;

means for displaying the electrical outputs as a pictorial representation of the relative position of the first and second members in three dimensional space;

means for detecting physical contact between the first and second members and providing an electrical signal representative thereof; and

means responsive to the signal to provide a remote indication of such contact.

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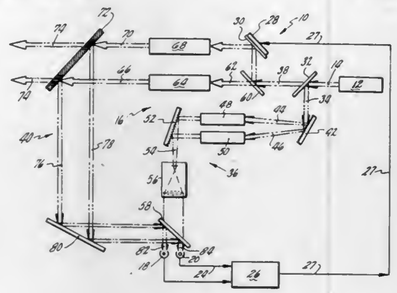
**4,295,741**

## TWO-WAVELENGTH PHASE CONTROL SYSTEM

**Gary E. Palma, Rocky Hill, and Francois M. Mottier, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Aug. 30, 1979, Ser. No. 71,509**
**Int. Cl.³ G01B *9/02***
**U.S. Cl. 356—349** **12 Claims**



1. An adaptive optics control system for mitigating $2\pi N$ ambiguity in error signals for the control of the phase distribution of an output beam from a multi-line laser comprising:

an interferometer having a reference leg, a phase leg, means for directing a first portion of an input beam having a multi-line spectrum from a laser to the phase leg for providing phase beams and for directing a second portion of the input beam to the reference leg for providing a reference beam and means for combining the reference beam and phase beams for providing signal beams;

means disposed within the reference leg for separating from the second portion of the input beam at least a first beam at a first wavelength and a second beam at a second wavelength and for directing said first beam to a first frequency shifter and said second beam to a second frequency shifter;

a first frequency shifter disposed within the reference leg for providing a first frequency shift of the first beam;

a second frequency shifter disposed within the reference leg for providing a second frequency shift of the second beam;

means for combining the first beam and the second beam into a reference beam having two frequency shifted wavelengths and for directing said reference beam to the means for combining the reference and phase beams;

means disposed within the phase leg for separating the first portion of the input beam into at least two amplifier beams and for directing said amplifier beams to at least two optical amplifiers;

at least two optical amplifiers disposed within the phase leg for amplifying each of said amplifier beams to provide at least two output beams having high power;

coupler means for passing a first portion of each of the output beams out of the interferometer as target beams and for directing a second portion of the output beams through the phase leg as phase beams to the means for combining the reference beam and the phase beams;

at least two detectors in optical alignment with the signal beams wherein each detector is in register with the output beam of one of the optical amplifiers for providing electrical output signals and wherein one detector is a standard detector;

a phase control system responsive to the electrical output signals for providing fine error signals and coarse error signals to actuator means; and

actuator means responsive to the fine and coarse error sig-



nals attached to the means for directing said amplifier beams to the optical amplifiers for adjusting the optical path difference between each of the output beams for providing phase-matching of the phase distribution of each of the output beams for providing target beams having high optical quality.

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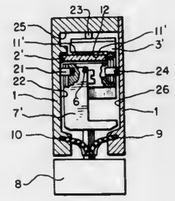
**4,295,742**

## LONGITUDINAL MEASURING DEVICE

**Gunther Nelle, Bergen, and Gunter Swassek, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany**

**Filed Mar. 2, 1979, Ser. No. 17,057**
**Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810341**
**Int. Cl.³ G01B *11/14***
**U.S. Cl. 356—373** **6 Claims**



1. An apparatus for positioning a scanning unit in a longitudinal measuring device, said measuring device including a measuring scale, a driving unit for connecting the device to an object whose position is to be measured, and first and second mutually perpendicular guide surfaces for guiding the scanning unit along the scale, said apparatus comprising:

a support structure positioned alongside the scale;

means for connecting the scanning unit to the driving unit in a flexible manner, said connecting means including a coupling element connected between the scanning unit and the driving unit and operative to maintain a substantially constant spacing therebetween;

first spring means positioned to exert a spring force between the scanning unit and the support structure, for biasing the scanning unit into contact with the first guide surface formed by the scale and substantially in no other direction; and

second spring means positioned to exert a spring force between the scanning unit and the support structure, for biasing and scanning unit into contact with the second guide surface formed by the support structure ane substantially in no other direction, said two spring means operating substantially independently of each other.

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**4,295,743**

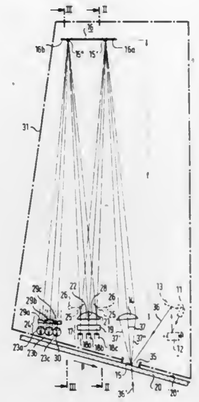
## APPARATUS FOR DETERMINING FAULTS IN STRIP MATERIAL

**Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH, Optik-Elektronik, Fed. Rep. of Germany**

**Filed Jun. 18, 1979, Ser. No. 49,534**
**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827705**
**Int. Cl.³ G01B *11/30***
**U.S. Cl. 356—431** **18 Claims**

2. Apparatus for determining faults in a strip of material comprising means for generating a scanning light bead on the strip, a first cylindrical lens extending over the scanning region with its focal line extending optically parallel to the direction of movement of the scanning light bead on the strip, first and second strip-like cylindrical mirrors arranged behind the focal line and optically spaced apart from one another by the distance of their focal lengths and with their focal lines optically at right angles to the direction of movement of the scanning light bead on the strip, a second cylindrical lens cooperating with the first and second cylindrical mirrors, and a light receiving device illuminated from the second cylindrical lens and having at least one light conducting rod for receiving light from the second cylindrical lens along a surface region and for transmitting this light to at least one photoelectric converter arranged at an end face of the light conducting rod the arrangement being such that:

(a) the first cylindrical lens images the scanning light bead on the first cylindrical mirror;



(b) the first cylindrical mirror reflects the incident light to the second cylindrical lens which is arranged parallel to the first cylindrical lens and spaced from the first cylindrical mirror by its focal length;

(c) a plane mirror is arranged behind the cylindrical lens at least along a part of its length and reflects the incident light through the second cylindrical lens to the second cylindrical mirror; and

(d) the second cylindrical lens is passed through twice on account of the arrangement of the plane mirror and images the surface of the first cylindrical mirror on the surface of the second cylindrical mirror.

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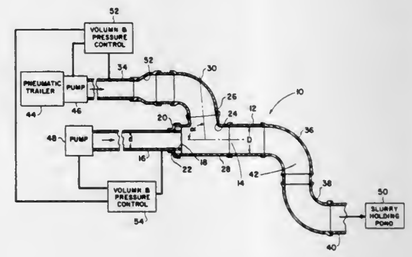
**4,295,744**

## SLURRY GUN

**William F. Scriminger, Muskogee, Okla., assignor to Muskogee Environmental Conservation Co., Muskogee, Okla.**

**Filed Apr. 23, 1979, Ser. No. 32,165**
**Int. Cl.³ B28C *5/06***
**U.S. Cl. 366—3** **3 Claims**




1. A method for mixing a slurry of fly ash and a wetting agent comprising the steps of:

(a) introducing the wetting agent horizontally into an intro-

duction chamber under pressure and at a controlled volume;

(b) introducing aerated fly ash downwardly into said chamber under a pressure less than that of the wetting agent and at a controlled volume of air and a controlled amount of fly ash carried by the air; and

(c) creating turbulence downstream of the introduction chamber by passing the wetting agent and aerated fly ash through a contorted path for thoroughly mixing the fly ash and wetting agent.

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**4,295,745**

## APPARATUS FOR CONDITIONING BIOINJURIOUS WASTE

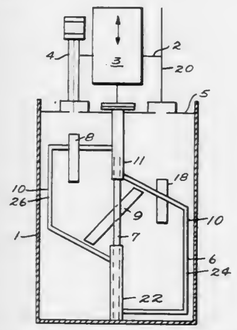
**Herbert Brunner, Hanau, Fed. Rep. of Germany, assignor to Nuken GmbH, Hanau, Fed. Rep. of Germany**

**Filed Mar. 10, 1980, Ser. No. 128,815**

**Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910878**

**Int. Cl.³ B01F** *7/32*

**U.S. Cl. 366—302** **6 Claims**



**1**. In apparatus for conditioning bioinjurious pumpable waste, especially radioactive waste, by forced mixing with a settable binder in a final storage container having stirrer means installed therein, the improvement comprising:

said stirrer means being constructed of a rotatable portion and a portion fixed to the container,

said rotatable portion comprising closed frame means providing at least two opposite stirrer arm means secured to a hollow central shaft having at least two axially spaced parts,

said fixed portion comprising a rod-like part extending upright from the central portion of the bottom of the container with said hollow shaft being journalled thereon, said rod-like part being provided with at least one mixing element secured thereto at a location thereon between said shaft parts.

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**4,295,746**

## ARRANGEMENT FOR FEEDING ELECTRODES IN METAL PAPER PRINTERS

**Kurt Hartmann, Calw-Heumaden, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 25, 1980, Ser. No. 143,691**

**Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935595**

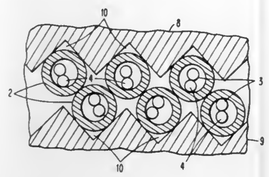
**Int. Cl.³ B41J** *3/02*

**U.S. Cl. 400—119** **4 Claims**

**4**. Apparatus for allowing the withdrawal of one of a pair of contacting electrodes with respect to the other comprising:

at least one first and one second elongate electrode;

a flexible tube surrounding said electrodes for holding said electrodes in contacting juxtaposition, said tube being of an electrically insulative material; and



guide means having at least one groove therein adapted to receive a said tube, said groove being a depth less than the diameter of a said tube.

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**4,295,747**

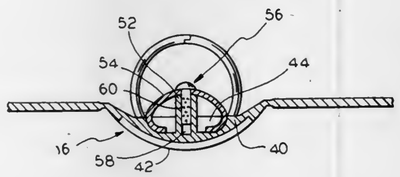
## INTEGRALLY MOLDED, LOOSELEAF BOOKS WITH RING-BINDER-MOUNTING POSTS MOLDED ON SPINE

**Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108**

**Filed Aug. 6, 1979, Ser. No. 63,864**

**Int. Cl.³ B42F** *13/12;* **B42D** *3/00*

**U.S. Cl. 402—75** **5 Claims**



**1**. An integrally molded looseleaf book constructed of a thermoplastic polymer material having a snap-ring assembly mounted therein, said looseleaf book comprising:

a spine having front and rear cover panels hingedly mounted on respective opposite, longitudinal edges thereof by means of living hinges;

two or more posts formed in the inner front face of said spine;

means for mounting the matrix strip of said snap-ring on said posts; and

a longitudinal cavity formed in the inner front face of said spine and extending substantially the full length of said spine, said posts being integrally molded in the bottom wall of said spine cavity, and said matrix strip being positioned longitudinally in said cavity.

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**4,295,748**

## MOUNTING STRUCTURE FOR MAGNETRONS

**Ichiro Ohara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

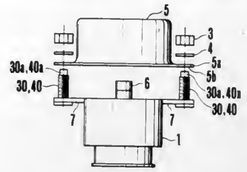
**Filed Jan. 18, 1979, Ser. No. 4,292**

**Claims priority, application Japan, Jun. 9, 1978, 53-77920[U]**

**Int. Cl.³ F16B** *17/00*

**U.S. Cl. 403—24** **1 Claim**

**1**. A mounting structure for magnetrons comprising a flange having bolting bore-holes therein secured to a wave guide to provide a surface side to be mounted with the magnetron, a mounting plate secured to said magnetron, and a plurality of stud bolts each having a head, a mounting portion adjacent said head, threads and a tip portion without threads having a diameter which is equal, at the most, to the diameter of bottom of thread of said stud bolt, fastening means operative on said mounting portion of said stud bolts with said tip aligned with said bore-holes for permanently fixing said stud bolts integral with said mounting plate and clamping means aligned by said



tips for engaging said threads on said stud bolts passed through said bore-holes and tightened by rotating said clamping means on said tips as an axis on the other side of said flange.



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**4,295,749**

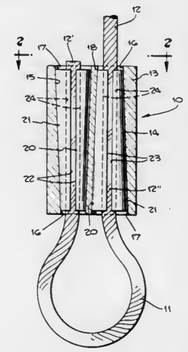
## EYE SPLICE FITTING

**Jack L. McBride, 3622 Barbara St., San Pedro, Calif. 90731**

**Filed Aug. 15, 1979, Ser. No. 66,621**

**Int. Cl.³ F16G** *11/04*

**U.S. Cl. 403—211** **3 Claims**



**1**. A fitting for anchoring therein a section of a rope-like strand comprising a housing having a hole extending therethrough, said hole having a frustoconical interior shape with a small end thereof greater in diameter than the diameter of said rope-like strand, a pair of longitudinally separated wedge sections which when placed together comprise a composite plug having a furstoconical exterior complementary to the frustoconical interior of the hole in the housing, each said wedge section having a semi-cylindrical recess presenting an arcuate surface extending from end to end with a curvature substantially matching the curvature on the surface of the strand, said wedge sections being adapted to fit around opposite sides of the strand and jamb into the hole whereby to anchor the strand in the housing, the combined depths of the semi-cylindrical recesses being less than the diameter of the rope-like strand, said housing having a second hole substantially parallel to the first hole, said second hole having a smooth interior of diameter greater than the diameter of said rope-like strand.

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**4,295,750**

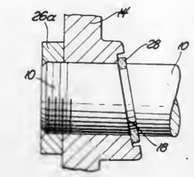
## SHAFT-COMPONENT CONNECTION MEANS

**Erwin F'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 23, 1980, Ser. No. 152,920**

**Int. Cl.³ B25G** *3/00*

**U.S. Cl. 403—259** **5 Claims**



**1**. In an assembly comprising a circular shaft, a mechanical component having two external planar faces and a circular bore extending therebetween, said shaft extending through the bore as a non-wobble fit therein: the improvement wherein at least one of the aforementioned external planar faces is acutely angled to the bore axis; first abutment means carried by the shaft in facial engagement with the acutely angled planar face on the mechanical component; and second abutment means carried by the shaft in facial engagement with the other planar face on the mechanical component; the angle taken by the acutely angled planar face being sufficient to prevent relative rotation between the shaft and the mechanical component; said first abutment means being a snap ring seated in a peripheral groove in the shaft so that a side surface of the ring engages the acutely angled planar face on the mechanical component.

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**4,295,751**

## THREAD STRUCTURE FOR PERCUSSION DRILL ELEMENTS

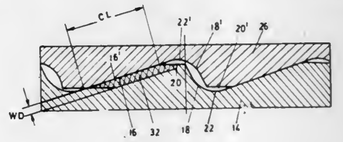
**John M. Holmberg, Selcourt Springs, South Africa, assignor to Boart International Limited, Johannesburg, South Africa**

**Filed Sep. 21, 1979, Ser. No. 77,549**

**Claims priority, application South Africa, Sep. 21, 1978, 78/5370**

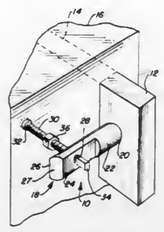
**Int. Cl.³ F16B** *7/00*

**U.S. Cl. 403—306** **20 Claims**



**1**. A coupling thread structure for percussion drill elements including a rod having an external thread and a sleeve having an internal thread with the threads, when the rod and sleeve are coupled together, presenting abutting and non-abutting flanks and with the flanks being joined by crest and bottom portions, wherein the thread has at least two starts; the abutting flanks are straight along their whole abutting contact portions; the abutting flank portions form an angle of between 10° and 25° with the drill axis; and the pitch angle of the threads is between 9° and 20°.

**4,295,752**
**RETAINING ASSEMBLY**
**John A. Lerch, Signal Mountain, Tenn., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.**
**Filed Jan. 29, 1979, Ser. No. 7,316**
**Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00***
**U.S. Cl. 403—317** **12 Claims**



1. A retaining assembly for retaining a key in a housing of a ram or the like wherein said housing includes a slot in which said key is to be retained, said assembly comprising,
a mechanical connecting member secured to said key, said connecting member including an aperture,
a force application member including a first end extending through said aperture and a second end abutting said housing, and
a force generating element mounted on said force application member between said housing and said mechanical connecting member, said force generating member adapted to generate a force against said mechanical coupling member and said housing whereby said key is retained in said slot.

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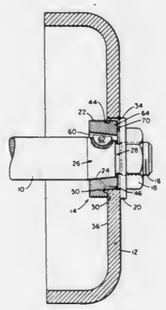
**4,295,753**
**TORQUE TRANSMITTING APPARATUS**
**Adolf Luerken, Palos Verdes, and William D. Vogel, Arcadia, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.**
**Filed Nov. 10, 1977, Ser. No. 850,137**
**Int. Cl.³ F16D *1/08***
**U.S. Cl. 403—365** **12 Claims**



1. Apparatus for mounting a rotatable component on a tapered rotating drive shaft comprising
an intermediate torque transmitting hub member having
a tapered internal bore extending in a longitudinal directional from a shaft receiving aperture at a first surface of said member to a narrowed exit aperture at a second surface of said member,
a recessed shoulder extending around a peripheral surface of the member, for seating said rotatable component, said shoulder being substantially concentric with the longitudinal axis of said bore,
a shoulder cutout around an inner periphery of said shoulder,
a plurality of narrow, longitudinally extending rib members spaced-apart on and supported by an outside peripheral surface of said member,
whereby said tapered drive shaft passes through said intermediate member, the internal taper of the intermediate member matches the taper of the drive shaft, said rotatable component, when it is seated, contacts said shoulder only at an outside annulus of said shoulder, and the rotatable component, when seated against said recessed shoulder for the first time, mechanically distorts the original shape of said rib members, and
drive torque is transferred from said drive shaft to said intermediate member through the interior surface of the member tapered bore, and from the member shoulder, through friction contact, to the rotatable component.

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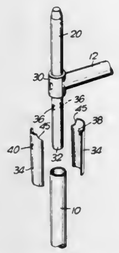
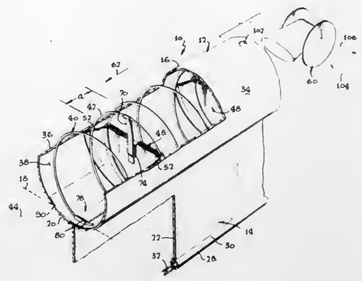
**4,295,754**
**DISPLAY STRUCTURES AND THE LIKE**
**Christopher J. Ashton, Kimpton; Andrew C. Diamond, Wellwyn Garden City, and Derek H. Greenhill, Bromsgrove, all of England, assignors to Marler Haley Exposystems Limited, England**
**Filed Mar. 29, 1979, Ser. No. 24,943**
**Claims priority, application United Kingdom, Apr. 7, 1978, 13831/78**
**Int. Cl.³ F16B *2/14***
**U.S. Cl. 403—369** **5 Claims**



1. A plug and socket connection including a first member defining a socket and a second member defining a plug which is received in said socket, a diametrically split collet being disposed in the socket and being wedged between, and resiliently deformed between, a surface constituted by the periphery of the plug and a surface constituted by an opposing socket wall, at least one of the surfaces between which the collet is disposed being substantially cylindrical, the collet being formed by two similar half-round parts, whereby in the assembled plug and socket connection the collet has a said longitudinal slit in opposite longitudinal sides thereof, each said half-round part of the collet being of greater curvature at one end than at the other so that each said edge of each said slit forms a cutting edge which penetrates said substantially cylindrical surface and is forced into the member providing said surface, thereby preventing relative rotation, about the axis of said substantially cylindrical surface, between, on the one hand, the collet and, on the other hand, the member providing said substantially cylindrical surface, said two parts of the collet being nonrotatably engaged with the other of the members between which the collet is wedged, whereby relative rotational movement of the collet is prevented.



**4,295,755**
**REEL MOUNTABLE BOOM ARRANGEMENT**
**Frank Meyers, 317 Calle Mayor, Redondo Beach, Calif. 90277**
**Filed Apr. 30, 1980, Ser. No. 145,217**
**Int. Cl.³ E02B *15/04***
**U.S. Cl. 405—66** **66 Claims**



1. In an improved containment boom section, the improvement comprising, in combination:
flotation means having a predetermined buoyancy to provide upper portions thereof above the surface level of a liquid body for the condition of the boom section deployed in said liquid body, and a lower portion, below the surface level of said liquid body;
said flotation means comprising:
a longitudinally elongated, flexible, generally tubular member having walls defining an internal cavity, upper portions and lower portions and said tubular member transversely collapsible-expandable, between a transversely flattened, storage condition and a transversely expanded, deployed condition, and said elongated, flexible, generally tubular member windable on a reel in said transversely flattened storage condition;
a resilient, generally spring-like member having a plurality of helical coil means about a longitudinally extending helix axis and said helical coils having a predetermined helix angle in a helical condition thereof, and said spring-like member extending longitudinally in said cavity of said tubular member, and said helical coils maintaining said walls of said tubular member in said transversely expanded, deployed condition thereof for said spring-like member in said helical condition thereof, and said spring-like member resiliently deformable from said helical condition to a transversely flattened condition for said tubular member in said transversely flattened storage condition thereof, and said spring-like member having a predetermined energy stored therein in said transversely flattened condition, and said predetermined energy having a value at least equal to the energy required to cause said spring-like member to move from said transversely flattened condition to said helical condition thereof for said flotation means deployed in said liquid body;
a plurality of pocket means in said cavity of said tubular member, and coupled to the walls thereof in a predetermined, spaced array, each of said pocket means having walls defining a coil receiving cavity having side edges extending a predetermined distance around said walls of said tubular member, from regions adjacent said lower portions thereof toward regions adjacent said upper portions thereof, and said side edges of said pocket means positionable adjacent said walls of said tubular member for said tubular member in said transversely expanded, deployed condition thereof, and one of a first group of said plurality of coil means of said spring-like member in said coil receiving cavity of each of said pocket means, and each of said pocket means movable from a transversely upright position for said tubular member in said transversely expanded, deployed condition thereof to a flattened position for said tubular member in said transversely flattened condition thereof.

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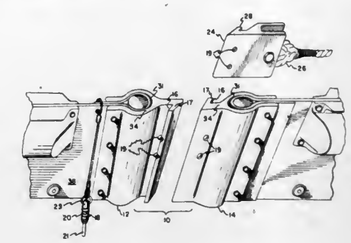
**4,295,756**
**FLOATING BOOM END CONNECTORS**
**Russell M. Blair, Westport, Conn., assignor to Slickbar, Inc., Southport, Conn.**
**Filed Apr. 24, 1979, Ser. No. 32,748**
**Int. Cl.³ E02B *15/04***
**U.S. Cl. 405—70** **7 Claims**



1. A tension transmitting connector for the end of a flat vertically arrayed fin of an elongated floating material containment boom, for joining said end thereof to a tension-applying towing or anchoring plate or to the juxtaposed end of a similar boom, comprising:
A. a vertically elongated central tow flange portion juxtaposed to said flat fin end and incorporated a distal engaging portion for interlocking engagement with the adjacent distal towing plate or anchoring plate of an adjacent connector, wherein the engaging portion comprises a raked, tension-carrying scarph jaw forming a scarph joint interlocking the tow flange with a mating scarph jaw of a tow flange of the adjacent connector;
B. two intermediate vertically elongated sidewall portions extending laterally divergingly from the central flange portion to define an enlarged vertical central cavity embracing the vertical fin end and reconverging to form facing proximal end flanges sandwiching the fin end therebetween in a narrow vertical proximal entrance portal slot; and
c. a vertically elongated anchoring core positioned inside the central cavity co-acting with the fin end and blocking its withdrawal through the portal slot.

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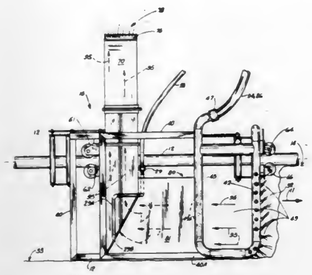
**4,295,757**
**JET SLED SPOIL SCOOP APPARATUS**
**Randal Gaspar, P.O. Box 2352, Morgan City, La. 70380**
**Filed Aug. 23, 1979, Ser. No. 68,919**
**Int. Cl.³ E02F *5/02*; F16L *1/04***
**U.S. Cl. 405—163** **11 Claims**

1. A pipe burying apparatus comprising:
a. a frame;
b. means on said frame adapting said frame for undersea towing;
c. left and right jetting means on said frame for cutting at least the left and right side walls of an undersea pipe trench as said frame is towed;
d. left and right air lift conduit means, each providing spoil intake and spoil discharge portions for removing soil cuttings from the trench cut by said jetting means, said spoil intake portions being placed generally behind and between said left and right jetting means;
e. spoil collection scoop means surrounding said spoil intake portions on at least four sides including at least the rear side thereof for collecting soil cuttings about said spoil intake portions of said left and right air lift conduit means, said spoil collection means having independently movable

rear and bottom door portions which move to a first open position to allow placement of said frame about a pipeline



to be buried, and subsequent closure of said rear and bottom door portions after said frame is placed about a pipeline to be buried.

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**4,295,758**

## WORKING PLATFORM FOR OIL DRILLING OPERATIONS IN ICE COVERED SEA AREAS

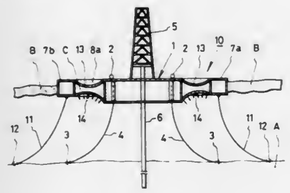
**Nobuyoshi Yashima, Funabashi, Japan, assignor to Mitsui Engineering and Shipbuilding Co., Ltd., Tokyo, Japan**

**Filed Nov. 27, 1979, Ser. No. 97,933**

**Claims priority, application Japan, Nov. 30, 1978, 53-148875; Nov. 30, 1978, 53-14876**

**Int. Cl.³ E02D** *17/00*

**U.S. Cl. 405—201** **13 Claims**



1. A working platform for oil drilling operations in ice-covered sea areas, said working platform comprising a platform means floating on the surface of the sea-water, oil drilling equipment mounted on said platform means, an oil drilling pipe extending from said oil drilling equipment to the bottom of said sea, a buoyant floating frame disposed around said platform means such that said frame is spaced from said platform means, said frame enclosing the surface of the sea water surrounding said drilling pipe, wherein said frame has sufficient strength to withstand the pressure of the ice and is movable in accordance with the movements of the ice, and heat insulating means for heat insulating the surface of the sea-water inside of said floating frame and is between said frame and said platform means.

**4,295,759**

## DEVICE FOR THE CONTROL OF THE INTERNAL PRESSURE IN A DRILL PIPE FOR THE CONSTRUCTION OF FOOTINGS

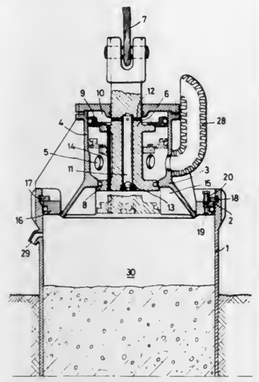
**Hans Mathieu, and Jürgen Hochstrasser, both of Saarbrücken, Fed. Rep. of Germany, assignors to Elisabeth Hochstrasser geb. Wack and Jürgen Hochstrasser, both of, Fed. Rep. of Germany**

**Filed Feb. 4, 1980, Ser. No. 118,504**

**Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2905042**

**Int. Cl.³ E02D** *15/04*

**U.S. Cl. 405—243** **9 Claims**



1. Device for the control of the internal pressure in a drill pipe for the construction of footings especially of compressed concrete footings with a valve, which valve is located in a lid, which lid serves for the tight seal of the drill pipe, which valve is equipped with venting holes, which valve is subjected to the internal pressure of the drill pipe in the direction of closing, which valve is subjected to a counterpressure, the effective power of which counterpressure is greater than the effective power of the internal pressure and where a hoisting cable is connected to the valve stem, the power of which hoisting cable is adjustable in the closing direction, and the power of which hoisting cable under normal operating conditions in combination with the internal pressure of the drill pipe is large enough to overcome the counterpressure, and where the valve shaft is equipped with a valve hat of a smaller diameter, which valve hat serves to seal the inner space of the drill pipe, and where the valve shaft is further equipped with a ring-shaped piston of larger diameter, which ring-shaped piston forms a counterpressure chamber with the valve housing, and where the counterpressure chamber is connected with the inside of the drill pipe by means of a drilled hole, which drilled hole is axially located in the valve shaft, and which drilled hole extends through the valve hat, characterized by the fact that a check valve (**13**) is located in the axial drilled hole (**11**) and that a parallel line (**14**) is provided which extends through the valve hat (**8**) and the ring-shaped piston (**9**), and which parallel line constitutes a restrictor.

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**4,295,760**

## ROCK BOLT ANCHOR

**Clifford C. Warner, 7381 Bryant St., Westminster, Colo. 80030**

**Continuation-in-part of Ser. No. 898,632, Apr. 21, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 86,994**

**Int. Cl.³ E21D** *21/00;* **F16B** *13/04*

**U.S. Cl. 405—259** **19 Claims**

1. A rock bolt anchor, comprising:

a head of a diameter to fit within a borehole in rock;



a stem connected to said head and extending axially therefrom, said head extending laterally beyond said stem;

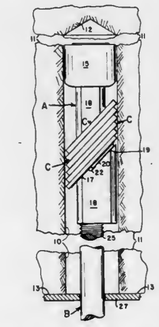
a foot connected to said stem opposite said head, said foot having a lateral dimension less than said head and an inclined surface spaced from said head but comprising a surface of said foot nearest said head, said surface being inclined with respect to the axis of said anchor;

a longitudinal hole in said head, said hole being provided with threads for engaging corresponding threads of a bolt by which said anchor may be moved into said borehole in said rock, said bolt extending through said foot and said stem;

a series of adjoining cam discs surrounding said stem and having a width less than the diameter of said borehole and a length greater than the diameter of said borehole, said cam discs having apertures therein permitting said discs to surround said stem and engaging said inclined surface of said foot in an angular position on said foot during movement of said anchor into said borehole, said stem having a length sufficient to accomodate said angular position of said cam discs;

said anchor being movable into said borehole by said bolt with said cam discs in said angular position to a predetermined point in said borehole;

said anchor being rotatable with said bolt at a sufficient speed to cause said ends of said discs to engage the wall of said borehole and terminate rotation of said discs; and



said inclined surface of said foot being constructed so as to then be engageable with the disc remote from said head to terminate rotation of said head and permit said bolt to thread through said head and said head then retracted by rotation of said bolt, whereby said head engages said cam discs and forces the ends thereof outwardly into the rock of said borehole to restrain further downward movement of said anchor.

14. A method of installing a rock bolt anchor in a borehole in rock, comprising:

mounting a series of adjoining cam discs on a foot having an inclined surface and surrounding a stem connecting said foot and a head of a diameter to fit within said borehole;

said stem extending axially from said head and said inclined surface being spaced from said head but comprising a surface of said foot having an apex nearest said head, said surface being inclined with respect to the axis of said anchor;

said head having a longitudinal hole provided with threads for engaging corresponding threads of a bolt by which said anchor is moved into said borehole in said rock, said bolt extending through said foot and said stem;

said cam discs having a width less than the diameter of said borehole and a length greater than the diameter of said borehole, said cam discs having apertures therein permitting said discs to surround said stem and engaging said inclined surface of said foot in an angular position on said foot during movement of said anchor into said borehole, said stem having a length sufficient to accommodate said angular position of said cam discs;

moving said anchor into said borehole by said bolt with said cam discs in said angular position to a predetermined point in said borehole; and

rotating said bolt at a sufficient rate to cause said cam discs to begin movement toward a position perpendicular to the axis of said bolt and thereby cause the ends of said cam discs to engage the wall of said borehole and terminate rotation of said cam discs, whereby further rotation of said foot causes said apex of said inclined surface to engage the cam disc remote from said head and reduce rotation of said head, thereby permitting said bolt to thread into said head and draw said head into engagement with said cam discs to force the ends thereof outwardly into the rock of said borehole.

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**4,295,761**

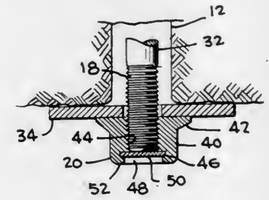
## POST TENSIONABLE GROUTED ANCHOR ASSEMBLY

**Roger M. Hansen, Birmingham, Ala., assignor to Stratabolt Corporation, Pelham, Ala.**

**Filed Dec. 10, 1979, Ser. No. 101,723**

**Int. Cl.³ E21D** *20/02*

**U.S. Cl. 405—261** **9 Claims**



1. A post tensionable rock and mine roof anchor and nut assembly of the grouted or resin anchored type to be installed in a bore hole in a mine roof rock formation or the like and tensioned after mixing and setting of the grouting or resin for strengthening the same, comprising an elongated anchor including a generally cylindrical portion at its upper end having a shorter length than the depth of the bore hole in which it is to be fitted and having an elongated externally threaded rod portion at its lower end adapted to project a predetermined short distance externally of the bore hole when the anchor is normally positioned in substantially fully inserted condition in the bore hole, an internally threaded nut member to threadably receive the threaded rod portion therein providing companion thread surfaces forming a screw thread coupling assembling said nut member and anchor together and said nut member having an end surface to exert bearing force against the face of the rock formation, the anchor being adapted to be introduced into the bore hole in assembled relation with the nut member after insertion of a destructible cartridge containing quick-setting adhesive resin or grouting material therein to crush the cartridge and mix and distribute the resin or grouting material throughout the space outwardly surrounding most of the anchor and fixing the anchor in the bore hole upon hardening of such material thereabout, the nut member having a bore therethrough including a first smaller diameter bore portion extending from said end surface through a major portion of the axial depth of the nut member threaded to mate with the threads of the external threaded rod portion and having a second enlarged diameter bore portion forming the exit end of the bore communicating with the first bore portion, a disc seated in the second bore portion, and inwardly crimped lip formations integral with the nut surrounding the exit end of the bore and inwardly lapping the periphery of the disc in said second bore portion to retain the disc therein in position to bar penetration of the anchor rod portion through the nut until a predetermined torque force level is exceeded, the nut member being

initially assembled in threaded relation with the threaded rod portion of the anchor to occupy an initial assembled position wherein the disc restrains relative rotation of the nut member with respect to the anchor until said predetermined torque force level is exceeded, and said crimped lip formations releasing the disc and accommodating further threaded insertion of the rod portion through the bore of the nut when the anchor is restrained against rotation by setting of the adhesive resin or grouting material and torque force in excess of the predetermined torque force level is applied to the nut member.

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**4,295,762**

## GROUTING-SOIL CONDITIONING SYSTEMS USING POLYOXYETHYLENE DIACRYLATES

**Manuel Slovinsky, Woodridge, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Continuation-in-part of Ser. No. 13,105, Feb. 21, 1979, abandoned. This application Sep. 18, 1980, Ser. No. 188,185**

**Int. Cl.³ C09K** *17/00*

**U.S. Cl. 405—264** **10 Claims**

1. A process of stabilizing soil which comprises contacting from about 3 to about 20 parts by weight of such soil with about one part by weight of an aqueous solution containing at least 0.5 weight percent of a water-soluble diacrylate ester of a polyoxyalkylene glycol monomer having a molecular weight of at least 300, which solution also contains a water-soluble free radical polymerization catalyst capable of polymerizing the monomer into a water-insoluble gel.

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**4,295,763**

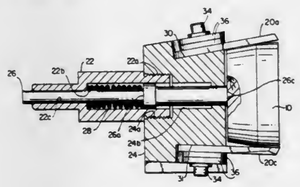
## PLUG CUTTER

**James J. Cunniff, 46 Lynnrich Dr., Thomaston, Conn. 06787**

**Continuation-in-part of Ser. No. 960,603, Nov. 14, 1978, abandoned. This application May 29, 1979, Ser. No. 43,364**

**Int. Cl.³ B27C** *5/00*

**U.S. Cl. 408—86** **17 Claims**



1. A plug cutter adapted for use in a drill press or the like, said cutter comprising

a holder having one portion adapted to be held for rotation on an axis coincident with the spindle of a drill press, and a second portion defining at least two symmetrically arranged sets of sockets with lands of each set circumaxially spaced and oriented at the same angle to said axis, each set having lands oriented at different angles with respect to said axis,

cutting blades with portions adapted to be received in said sockets and having projecting portions extending beyond said holder in parallel relationship to said lands to produce a multitapered plug, and

means for securing said blades in said sockets.

**4,295,764**

## MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

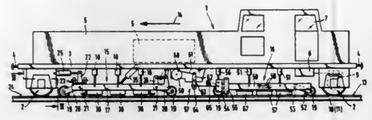
**Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Filed Dec. 11, 1978, Ser. No. 968,264**

**Claims priority, application Austria, Dec. 30, 1977, 9451/77**

**Int. Cl.³ B23D** *1/10;* **B24B** *23/00;* **B23D** *7/06*

**U.S. Cl. 409—296** **18 Claims**



1. A mobile machine mounted on a track having two rails including heads and the machine being arranged for advancement along the track for removing irregularities from the surfaces of the rail heads to a predetermined depth, which comprises

(a) a machine frame,

(b) an elongated tool carrier extending in a plane substantially parallel to the track and rigidly resistant to bending out of said plane, and vertically adjustably mounted on the machine frame and arranged thereon for vertical and lateral guidance without play along a respective one of the track rails,

(c) a cutter head on the tool carrier, the cutter head having

(1) a cutting tool capable of machining the surface of the head of the respective track rail continuously upon advance of the tool carrier along the track rail, and

(d) a hydraulic jack unit linking the tool carrier to the machine frame for vertically adjusting the tool carrier and subjecting the tool carrier to a vertically directed loading force sufficient to obtain the predetermined machining depth.

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**4,295,765**

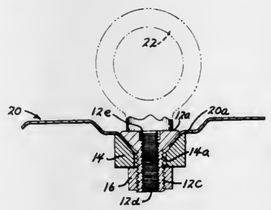
## TIE-DOWN STRUCTURE

**Michael R. Burke, 1017 Poplar Ct., Mt. Carmel, Ill. 62863**

**Filed Apr. 23, 1979, Ser. No. 32,551**

**Int. Cl.³ A62B** *35/00;* **B61D** *45/00*

**U.S. Cl. 410—101** **6 Claims**



1. A tie-down structure comprising a body member having a head with a top wall and an outwardly flaring side wall and a threaded stem, said threaded stem adapted to extend through an opening formed in a supporting surface, and a plug member and threaded means disposed on said threaded stem on a side of said supporting surface opposite to that of said head, said plug member freely movable on said threaded stem of said body member and having an outwardly flaring inner wall complementary in shape to said outwardly flaring side wall of said head and said threaded means in a stopping relationship therewith, where said top wall of said head is substantially flush



with a deformed portion of said opening in said supporting surface at an installed position.

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**4,295,766**

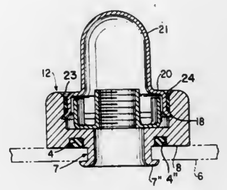
## SELF-ALIGNING DOME NUT

**Francis Shaw, Old House Landing and Bianca Rd., East Hampton, N.Y. 11937**

**Continuation-in-part of Ser. No. 928,542, Jul. 27, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,667**

**Int. Cl.³ F16B** *37/14, 39/00*

**U.S. Cl. 411—113** **17 Claims**



1. A self-aligning dome nut comprising:

(a) a base member having:

(1) a neck portion extending from one side thereof for attachment into an aperture of a support member with at least part of the one side of said base member resting directly on the support member,

(2) a hole extending through said neck portion in the direction of the extension thereof, and

(3) a cavity in the other side of the base member in communication with the hole in the neck portion;

(b) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity; and

(c) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member radially inwardly of its outer periphery to leave generally the entire other side of the base member available for direct application of a clamping force during attachment of the dome nut to the support member, the available portion being in alignment with the part of the one side of the base member resting directly on the support member.

11. A lightning-safe connection between a self-aligning dome nut and a support member comprising:

(a) an electrically conductive support member having an aperture therethrough;

(b) a dome nut including:

(1) an electrically conductive base member having:

(i) a neck portion extending from one side thereof and secured in the aperture of the support member with the one side of said base member facing the support member,

(ii) a hole extending through said neck portion in the direction of extension thereof, and

(iii) a cavity in the other side of the base member in communication with the hole in the neck portion,

(2) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity, and

(3) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member; and

(c) a non-conductive insulating washer disposed around said neck portion and between the one side of the base member and the underlying side of the support member, said washer being dimensioned to electrically isolate the base member from the radially surrounding area of the underlying support member by a distance sufficient to prevent electrical arcing therebetween from an electrical discharge passing through the base member from the other side of said support member.

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**4,295,767**

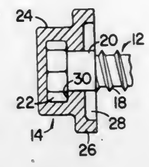
## CORROSION RESISTANT FASTENER

**John W. Temple, Jr., Box 43, Signal Mountain, Tenn. 37377**

**Filed Nov. 26, 1979, Ser. No. 97,361**

**Int. Cl.³ F16B** *27/00*

**U.S. Cl. 411—377** **7 Claims**



1. A corrosion resistant screw-type fastener comprising a ferrous metal body having an axially extending shank with external threads and a retaining head, said retaining head having a cylindrical portion adjacent said threads and a retaining portion adjacent said cylindrical portion remote from said threads, said retaining portion having a larger radial cross-sectional configuration than that of said cylindrical portion, a non-ferrous metal head fixedly disposed in engagement with and encapsulating the retaining portion and an adjacent part of the cylindrical portion, said non-ferrous head having an axially depending skirt spaced radially from the non-encapsulated part of the cylindrical portion to define an annular recess between the skirt and the non-encapsulated cylindrical portion, and a disk shaped seal positioned about said non-encapsulated, cylindrical portion wholly within the circumferential confines of said recess and extending partly outside the axial confines of said recess.

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**4,295,768**

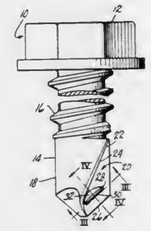
## CHIP BREAKER SCREWS

**Edwin J. Skierski, Campbellsville, Ky., assignor to USM Corporation, Farmington, Conn.**

**Filed Sep. 21, 1979, Ser. No. 77,664**

**Int. Cl.³ F16B** *25/00*

**U.S. Cl. 411—387** **8 Claims**



1. A drilling and thread-forming screw comprising a threaded shank and a pilot end disposed on a common centerline, a pair of flutes extending longitudinally of said pilot end to provide a pair of cutting surfaces disposed substantially parallel to a common plane and a pair of drag surfaces substantially perpendicular to said cutting surfaces, each of said cutting surfaces terminating at a cutting edge forming an angle with said common centerline, each of said cutting surfaces further having disposed thereon a discrete chip breaker in the form of a truncated cyiindrical element having its cylindrical centerline substantially perpendicular to said cutting edge, and an end surface having an arcuate periphery, said surface forming

initially assembled in threaded relation with the threaded rod portion of the anchor to occupy an initial assembled position wherein the disc restrains relative rotation of the nut member with respect to the anchor until said predetermined torque force level is exceeded, and said crimped lip formations releasing the disc and accommodating further threaded insertion of the rod portion through the bore of the nut when the anchor is restrained against rotation by setting of the adhesive resin or grouting material and torque force in excess of the predetermined torque force level is applied to the nut member.

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**4,295,762**

## GROUTING-SOIL CONDITIONING SYSTEMS USING POLYOXYETHYLENE DIACRYLATES

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**Int. Cl.³ C09K** *17/00*
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**Int. Cl.³ B27C** *5/00*
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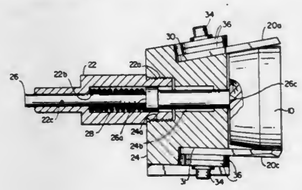

1. A plug cutter adapted for use in a drill press or the like, said cutter comprising

a holder having one portion adapted to be held for rotation on an axis coincident with the spindle of a drill press, and a second portion defining at least two symmetrically arranged sets of sockets with lands of each set circumaxially spaced and oriented at the same angle to said axis, each set having lands oriented at different angles with respect to said axis,

cutting blades with portions adapted to be received in said sockets and having projecting portions extending beyond said holder in parallel relationship to said lands to produce a multitapered plug, and

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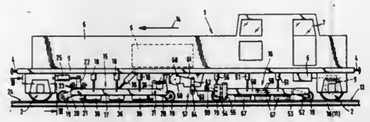
## MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

**Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Filed Dec. 11, 1978, Ser. No. 968,264**
**Claims priority, application Austria, Dec. 30, 1977, 9451/77**
**Int. Cl.³ B23D** *1/10;* **B24B** *23/00;* **B23D** *7/06*
**U.S. Cl. 409—296** **18 Claims**



1. A mobile machine mounted on a track having two rails including heads and the machine being arranged for advancement along the track for removing irregularities from the surfaces of the rail heads to a predetermined depth, which comprises

(a) a machine frame,

(b) an elongated tool carrier extending in a plane substantially parallel to the track and rigidly resistant to bending out of said plane, and vertically adjustably mounted on the machine frame and arranged thereon for vertical and lateral guidance without play along a respective one of the track rails,

(c) a cutter head on the tool carrier, the cutter head having

(1) a cutting tool capable of machining the surface of the head of the respective track rail continuously upon advance of the tool carrier along the track rail, and

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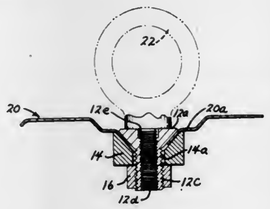

1. A tie-down structure comprising a body member having a head with a top wall and an outwardly flaring side wall and a threaded stem, said threaded stem adapted to extend through an opening formed in a supporting surface, and a plug member and threaded means disposed on said threaded stem on a side of said supporting surface opposite to that of said head, said plug member freely movable on said threaded stem of said body member and having an outwardly flaring inner wall complementary in shape to said outwardly flaring side wall of said head and said threaded means in a stopping relationship therewith, where said top wall of said head is substantially flush



with a deformed portion of said opening in said supporting surface at an installed position.

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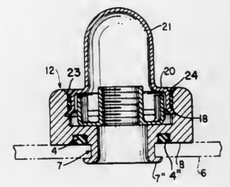

1. A self-aligning dome nut comprising:

(a) a base member having:

(1) a neck portion extending from one side thereof for attachment into an aperture of a support member with at least part of the one side of said base member resting directly on the support member,

(2) a hole extending through said neck portion in the direction of the extension thereof, and

(3) a cavity in the other side of the base member in communication with the hole in the neck portion;

(b) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity; and

(c) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member radially inwardly of its outer periphery to leave generally the entire other side of the base member available for direct application of a clamping force during attachment of the dome nut to the support member, the available portion being in alignment with the part of the one side of the base member resting directly on the support member.

11. A lightning-safe connection between a self-aligning dome nut and a support member comprising:

(a) an electrically conductive support member having an aperture therethrough;

(b) a dome nut including:

(1) an electrically conductive base member having:

(i) a neck portion extending from one side thereof and secured in the aperture of the support member with the one side of said base member facing the support member,

(ii) a hole extending through said neck portion in the direction of extension thereof, and

(iii) a cavity in the other side of the base member in communication with the hole in the neck portion,

(2) a nut member loosely positioned within said cavity and in adjustable alignment with the hole in said neck portion, said nut being held against extended rotation within the cavity, and

(3) a protective covering dome enclosing said cavity and covering the nut member, said dome having an open end connected to the base member; and

(c) a non-conductive insulating washer disposed around said neck portion and between the one side of the base member and the underlying side of the support member, said washer being dimensioned to electrically isolate the base member from the radially surrounding area of the underlying support member by a distance sufficient to prevent electrical arcing therebetween from an electrical discharge passing through the base member from the other side of said support member.

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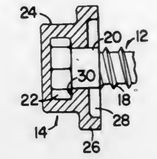
**4,295,767**

## CORROSION RESISTANT FASTENER

**John W. Temple, Jr., Box 43, Signal Mountain, Tenn. 37377**

**Filed Nov. 26, 1979, Ser. No. 97,361**
**Int. Cl.³ F16B** *27/00*
**U.S. Cl. 411—377** **7 Claims**



1. A corrosion resistant screw-type fastener comprising a ferrous metal body having an axially extending shank with external threads and a retaining head, said retaining head having a cylindrical portion adjacent said threads and a retaining portion adjacent said cylindrical portion remote from said threads, said retaining portion having a larger radial cross-sectional configuration than that of said cylindrical portion, a non-ferrous metal head fixedly disposed in engagement with and encapsulating the retaining portion and an adjacent part of the cylindrical portion, said non-ferrous head having an axially depending skirt spaced radially from the non-encapsulated part of the cylindrical portion to define an annular recess between the skirt and the non-encapsulated cylindrical portion, and a disk shaped seal positioned about said non-encapsulated, cylindrical portion wholly within the circumferential confines of said recess and extending partly outside the axial confines of said recess.

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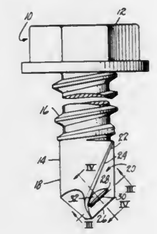
**4,295,768**

## CHIP BREAKER SCREWS

**Edwin J. Skierski, Campbellsville, Ky., assignor to USM Corporation, Farmington, Conn.**

**Filed Sep. 21, 1979, Ser. No. 77,664**
**Int. Cl.³ F16B** *25/00*
**U.S. Cl. 411—387** **8 Claims**



1. A drilling and thread-forming screw comprising a threaded shank and a pilot end disposed on a common centerline, a pair of flutes extending longitudinally of said pilot end to provide a pair of cutting surfaces disposed substantially parallel to a common plane and a pair of drag surfaces substantially perpendicular to said cutting surfaces, each of said cutting surfaces terminating at a cutting edge forming an angle with said common centerline, each of said cutting surfaces further having disposed thereon a discrete chip breaker in the form of a truncated cylindrical element having its cylindrical centerline substantially perpendicular to said cutting edge, and an end surface having an arcuate periphery, said surface forming

an angle greater than 90° with said cutting surface to thereby form a ramp to direct a continuous chip formed by said cutting surface away from said surface to form a small radius of curvature and thereby cause breakage of the chip, said chip breaker being spaced from the edges of said cutting surface, including said cutting edge whereby the configuration of said pilot end is substantially unchanged by the addition of said discrete chip breaker.

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**4,295,769**

## COPPER AND NITROGEN CONTAINING AUSTENITIC STAINLESS STEEL AND FASTENER

**Joseph A. Douthett, Monroe, and Ronald H. Espy, West Chester, both of Ohio, assignors to Armco Inc., Middletown, Ohio**

**Filed Feb. 28, 1980, Ser. No. 125,551**
**Int. Cl.³ C22C *38/16*; F16B *53/06***
**U.S. Cl. 411—411** **8 Claims**

**1**. Austenitic stainless steel having good hot working properties, a 0.2% offset yield strength of 165 to 182 ksi and an elongation in 5 cm of at least 10% if cold reduced 60%, said steel consisting essentially of, in weight percent, 0.05% maximum carbon, 1.5% to 3.0% manganese, about 0.06% maximum phosphorus, about 0.035% maximum sulfur, about 1% maximum silicon, about 15% to about 20% chromium, 3% to 4.7% nickel, 1.75% to 3% copper, 0.10% to 0.30% nitrogen, up to about 0.3% columbium, titanium, tantalum or mixtures thereof, and balance essentially iron, said steel having an austenite stability factor ranging between about 30 and about 33 calculated by the formula $30\times\%C+\%Mn+\%Cr+\%Ni+\%Cu+30\times\%N$.

**4**. The steel claimed in claim **1** in the form of cold headed fasteners fabricated from 60% cold reduced wire.

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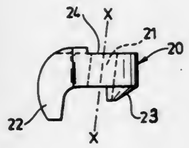
**4,295,770**

## HOOKBOLT ADAPTER

**Gordon H. S. Alderton, Bingley, England, assignor to Henry Lindsay Limited, Shipley, England**

**Filed Oct. 11, 1979, Ser. No. 83,831**
**Claims priority, application United Kingdom, Oct. 16, 1978, 40653/78**
**Int. Cl.³ F16B *43/02***
**U.S. Cl. 411—531** **8 Claims**




**1**. A hookbolt adapter for use with a bolt in order to convert the latter into a hookbolt, the hookbolt adapter comprising:

a member having therein a hole of circular cross-section through which a shank of a bolt can be taken, said hole having an entrance thereto and a wall;

a nose portion and a tail portion of said member diametrically opposed to one another with respect to said hole;

a support surface of said member surrounding said entrance to said hole to be engaged by a head or by a nut of a bolt, said hole having an axis which is slightly inclined to a line perpendicular to said support surface; and

two diametrically opposed substantially semi-circular contact portions of said member provided on said wall of said hole and each associated with a respective one of said nose portion and said tail portion, said contact portions being made of malleable material so as to allow a bolt to take-up a position in which the axis of such a bolt will extend substantially perpendicular to said support surface and such a bolt will be held rigidly with the hookbolt adapter by said contact portions.

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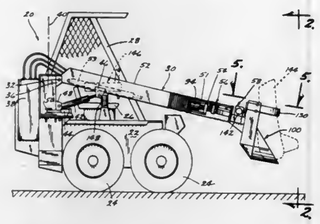
**4,295,771**

## PORTABLE LOAD HANDLING APPARATUS

**Thomas C. Mehesan, Jr., Hospers, Iowa, assignor to Banner Industries, Inc., Hospers, Iowa**

**Filed Aug. 20, 1979, Ser. No. 68,201**
**Int. Cl.³ B60P *3/00*; B65G *61/00***
**U.S. Cl. 414—5** **9 Claims**



**1**. A load handling apparatus comprising,

a movable vehicle including a frame,

an elongated boom arm having opposite end portions,

means for operatively connecting said boom arm to said frame for pivotal movement about a first generally horizontal axis and a first generally vertical axis,

primary power means connected to said boom arm and frame for pivotally moving said boom arm about said first horizontal axis and first vertical axis,

said boom arm being longitudinally extendable and retractable for movement of one end portion toward and away from said first horizontal axis and said primary power means including means for longitudinally extending and retracting said boom arm,

a load support member,

wrist means interconnecting said load support member and said one end portion of said boom arm for pivotal movement of said load support member adjacent said one end portion of said boom arm and about first and second axes disposed generally perpendicular to one another and to the longitudinal centerline of said boom arm,

means for supporting said wrist means on said one end portion of said boom arm for pivotal movement of said wrist means about a third axis disposed generally parallel to the longitudinal centerline of said boom arm,

secondary power means connected to said wrist means for pivotally moving said load support member about said first and second axes and for pivotally moving said wrist means about said third axis, and

control means for selectively actuating said primary and secondary power means for movement of at least one of said boom arm and load support member about at least a selected one of said axes, said control means including

an elongated control arm having opposite ends,

means for connecting said control arm to said frame for pivotal movement about a second generally horizontal axis and a second generally vertical axis,

means for extending and retracting said control arm for movement of said one end toward and away from said second horizontal axis,

means for actuating said primary power means to pivotally move said boom arm about said first horizontal axis and first vertical axis in response to pivotal movement of the control arm about the second horizontal axis and second vertical axis respectively and means for actuating said primary power means to longitudinally extend and retract said boom arm in response to extension and retraction of said control arm such that said boom arm follows the movements of said control arm,



a control handle operatively connected to said one end of said control arm with freedom of pivotal movement of at least a portion of said handle about fourth and fifth axes disposed generally perpendicular to one another and to the longitudinal centerline of said control arm,

means for supporting said control handle on said one end of said control arm for pivotal movement of said control handle about a sixth axis disposed generally parallel to the longitudinal centerline of said control arm, and

means for actuating said secondary power means to pivotally move said load support member about said first and second axes in response to pivotal movement of at least said portion of the control handle about said fourth and fifth axes respectively and to pivotally move said wrist means about said third axis in response to pivotal movement of said control handle about said sixth axis such that said load support member follows the movements of said control handle.

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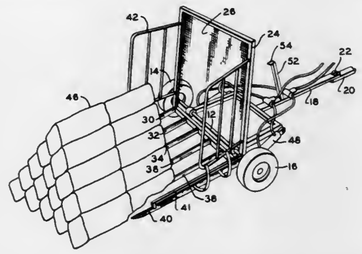
**4,295,772**

## HAY BALE STACKER

**Lawrence Zimmerman, R.F.D 2, New Richmond, Wis. 54017**

**Filed May 7, 1980, Ser. No. 147,463**
**Int. Cl.³ A01D *87/12*; B65G *57/28***
**U.S. Cl. 414—38** **8 Claims**



**1**. A tiltable device for stacking bales behind a hay baler and for lifting and transporting stacks of bales so formed comprising in combination,

(a) a trailer assembly comprising an axle provided with wheels at each end and a hitch unit attached thereto adapted to be attached to a towing vehicle;

(b) a bale carrying bed of generally "L" shaped cross-section pivotably attached to said axle, said bed being attached to said axle at a point on the forward leg of said "L", spaced from the junction of said legs a distance which is less than the radius of said wheels; the angle between the legs of said "L" being greater than 90°,

(c) the more forward leg of said "L" forming a platform suitable to support a standing person and being equipped with side rails,

(d) the rearward leg of said "L" comprising a plurality of bale supporting tines adapted to support a stack of bales manually assembled there-against, the extremities of said tines on said rearward leg adapted to touch the ground on pivoting of said assembly, and

(e) means for pivoting said assembly about said axle.

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**4,295,773**

## APPARATUS AND METHOD FOR INTRODUCING SOLIDS INTO A SOLIDS UPFLOW VESSEL

**Roland O. Dhondt, Long Beach, Calif., assignor to Union Oil Company of California, Brea, Calif.**

**Filed Nov. 9, 1979, Ser. No. 92,688**
**Int. Cl.³ C10B *31/02***
**U.S. Cl. 414—187** **24 Claims**

**1**. An apparatus for introducing particulate solids upwardly into a solids upflow vessel having a bottom solids inlet, which comprises:

a stationary feed cylinder mounted below said upflow vessel in coaxial alignment with said solids inlet, said feed cylinder having a substantially solids-tight upper cylindrical section of a preselected height and a lower cylindrical section having at least one solids inlet opening;

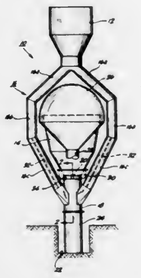
at least one solids feed chute mounted adjacent said upflow vessel and having a discharge end communicating with said feed cylinder through said inlet opening, said feed chute having an inlet end communicating with an elevated feed reservoir and being adapted to transport particulate solids from said feed reservoir into said lower section by mechanically unassisted gravity flow through said feed chute;

a piston movably mounted in said feed cylinder for vertical reciprocation along the common axis of said feed cylinder and said solids inlet;

piston actuator means for reciprocating said piston along said common axis;

backflow prevention means interposed between said feed cylinder and said solids inlet, said backflow prevention means being adapted to prohibit backflow of solids from said upflow vessel during the filling of said feed cylinder and to allow displacement of solids from said feed cylinder upwardly through said solids inlet; and

sealing means for sealing the inlet opening of said feed cylinder during the displacement of said solids into said upflow vessel.



**12**. A method for transporting particulate solids from an elevated solids feed reservoir and introducing said solids upwardly into a solids upflow vessel having a bottom solids inlet, said method comprising:

(a) transporting a charge of particulate solids by mechanically unassisted gravity flow from said feed reservoir downwardly through at least one solids feed chute into a lower cylindrical section of a stationary feed cylinder mounted below and in coaxial alignment with said solids inlet, said feed cylinder being fitted with a piston axially reciprocatable among at least three piston positions along the common axis of said feed cylinder and said solids inlet;

(b) extending said piston from a lowermost first piston position upwardly to a second piston position so as to displace said charge of particulate solids from said lower section upwardly into a substantially solids-tight upper cylindrical section of said feed cylinder;

(c) communicating said upper section of said feed cylinder with said solids inlet;

(d) thereafter further extending said piston upwardly to an uppermost third piston position so as to displace substantially all of said charge of particulate solids upwardly into said solids upflow vessel;

(e) thereafter positioning a backflow prevention element directly below said solids inlet so as to prevent backflow of said solids downwardly through said solids inlet; and

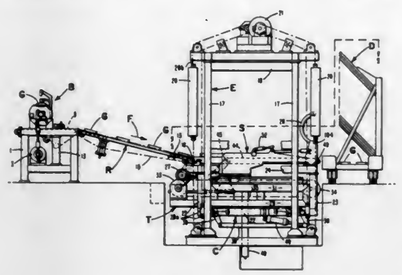
(f) retracting said piston to said first piston position.

**4,295,774**

## APPARATUS FOR AUTOMATICALLY TURNING OVER AND FOR STORING SECTIONS OF ELASTOMERIC MATERIAL

**Silvio Manini, and Antonio Pacciarini, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milano, Italy**

**Continuation of Ser. No. 825,764, Aug. 18, 1977, which is a division of Ser. No. 577,459, May 14, 1975, Pat. No. 4,062,458. This application Jul. 26, 1979, Ser. No. 61,047**
**Claims priority, application Italy, Jun. 28, 1974, 24491 A/74**
**Int. Cl.[3] B65G 1/00**
**U.S. Cl. 414—331** **9 Claims**



1. An apparatus for handling sections of elastomeric material having first and second side comprising:

a frame;

a first transporting device and a means for receiving said sections which advance on a given plane and according to a stated direction along the line of arrival, and for transferring them onto said first transporting device;

means for overturning each section about an axis parallel to one of said sides of said section;

means for collecting each section coming from a first given direction and for positioning it on said overturning means;

means for blocking said section on said overturning means;

means for releasing and transferring said section from said overturning means in an overturned position onto said first transporting device;

said overturning means comprising a substantially cylindrical member mounted on said frame and rotatable about its substantially horizontal longitudinal axis;

said collecting means comprising at least one supporting surface for said section, obtained by means of two planes mating together along a side parallel to said longitudinal axis of the cylindrical member and having a length equal to that of said cylindrical member, said two planes forming together an obtuse angle having its concavity directed towards the outside of said cylindrical member, said supporting surface defining a portion of the peripheral surface of said cylindrical member;

said blocking means comprising pliers for blocking the sections, having one end pivoted to said cylindrical member along a second axis arranged parallel to the side common to the two planes, and of such a shape whereby the other end of said pliers upon rotation of said second axis contacts said side common to the two planes at the side of the concavity;

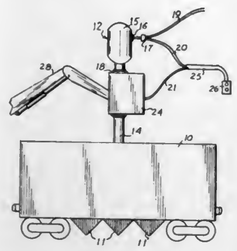
said transferring means comprising first and second rollers rotatably mounted on said frame and a first system of laterally spaced conveyor belts wound about said first and second rollers, said system of belts defining a transport plane situated below said cylinder, said rollers being defined with respect to the direction of motion of the plane as a front roller and a back roller respectively, the motion of said transport plane taking place from the front to the back roller, said belts and pliers being situated so that said pliers are situated at the spaces between said conveyor belts.

**4,295,775**

## UNLOADER FOR HOPPER CARS AND METHOD

**William P. Cottrill, Tampa, Fla., and Andrew J. Cisternino, Atlanta, Ga., assignors to Evacuators, Inc., Tampa, Fla.**

**Filed Oct. 9, 1979, Ser. No. 82,963**
**Int. Cl.[3] B65G 67/24**
**U.S. Cl. 414—375** **7 Claims**



2. A method for unloading material from a hopper car or the like wherein said material is normally flowable and is packed, which retards such flowing, said method including the steps of opening the gate to one hopper of said hopper car, placing a tube through the top of said hopper car into said hopper car and in said material with the end of said tube generally at said one hopper, and discharging a blast aerator through said tube for discharging some of said material through said one hopper and fluidizing material within said car to render such material flowable, and including the steps of rotating said tube about its axis while urging said material away from said end of said tube to prevent entry of material into said tube, and inserting said tube into said material in order to perform the step of placing a tube in said material.

4. Unloading apparatus for facilitating material flow from a hopper car or the like, said hopper car having an open top, at least one hopper on the bottom thereof through which material is to flow for unloading said material, said apparatus comprising a housing disposable over said open top of said hopper car, a tube rotatably carried by said housing and depending therefrom, said tube being of sufficient length to extend from said housing through said material generally to said hopper of said hopper car, a blast aerator receivable on said housing in communication with said tube, and means for discharging said blast aerator through said tube, and including seal means fixed to said housing, said seal means rotatably receiving said tube in one end thereof, said seal means communicating with said blast aerator at the other end thereof, and further including a tip carried by said tube, said tip including a plurality of flanges disposed across the lower end of said tube generally radially of said tube and pointed at their lowermost ends, said flanges converging to a common point.

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**4,295,776**

## PORTABLE INVERTER FOR TRANSFERRING BULK GOODS BETWEEN PALLETS

**Alan Payne, Poplar Lodge, Beeston, Kings Lynn, Norfolk, and Robin G. Bunning, Willow House, Gressenhall, East Dereham, Norfolk, both of England**

**Continuation of Ser. No. 945,278, Sep. 25, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,869**
**Int. Cl.[3] B65G 7/00**
**U.S. Cl. 414—405** **4 Claims**

1. A free-standing, portable palletized load inverter for transferring bulk goods, packed in a plurality of sacks, boxes and the like and supported on a first generally rectangular pallet, to a second similar pallet, said palletized load inverter comprising:

a unitary, three-sided load platform of sheet metal adapted to be selectively rotated as a unit between an upright attitude and an inverted attitude, said load platform when in its said upright attitude being adapted to receive and support bulk goods stacked onto the first pallet, said load platform including a sheet metal floor constituting one side of said three-sided platform onto which the first pallet can be placed, a sheet metal side wall constituting a second side of said three-sided platform for retaining the stacked bulk goods resting against it, said sheet metal side wall being disposed at substantially right angles to said floor and being located in abutment with one end edge of said floor, and a sheet metal rear wall constituting the third side of said platform and disposed at substantially right angles to said floor and side wall, said rear wall having edges which are in abutment with edges of said floor and side wall and having a length corresponding to that of said floor and a height corresponding to that of said side wall, and said sheet metal floor, side wall and rear wall being fixedly attached to one another at their abutting edges respectively in a unitary configuration which defines a three-sided load receiving region and which is rotatable as a unit between said upright and inverted attitudes, said rear wall being longer than said side wall so that the first pallet can be loaded widthwise onto the load platform from the front thereof;

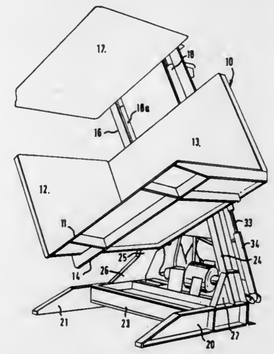
a plurality of intersecting horizontal and transverse reinforcing ribs attached to said floor, to said side wall, and to said rear wall on the faces thereof which are remote from said



bulk goods therebetween have been loaded into said load platform;

a stand having a rotatable shaft mounted thereon and affixed to said sheet metal rear wall for supporting the load platform rotatably above ground level, said stand including a ground-contacting base which extends underneath the load platform to provide stable support therefor and an upstanding support frame for the load platform, said ground-contacting base having at least one structural portion thereof location above ground level and adapted to receive the forks of a fork lift truck in lifting engagement therewith for moving said load transfer device from one location to another; and

means in driving engagement with said rotatable shaft for selectively rotating said load platform between its said upright attitude and its said inverted attitude, the direction of rotation being such that said rib reinforced side wall supports said bulk goods during the rotation of said load platform from its said upright attitude into its said inverted attitude.



three-sided load receiving region, at least some of said ribs extending across said faces at positions thereon inward of the boundary edges of said faces;

means defining a slideway on said rear wall directed parallel to the rear wall at right angles to said floor;

a sliding member in said slideway which slideably supports a sheet metal lid projecting therefrom in overlying relation to said three-sided load receiving region and in spaced parallel relationship to said sheet metal floor for rotation as a unit with said load platform and for movement along a line normal to the plane of said floor, said lid also having intersecting reinforcing ribs attached to the face thereof remote from said load receiving region, said lid being adapted in the said inverted attitude of the load platform to support the second pallet which had previously been placed in said load platform, when said load platform was in its said upright attitude, with the load accepting surface of the second pallet resting on the top of the said bulk goods;

hydraulic ram actuating means connected directly between said load platform and said lid and operative to selectively extend said lid away from said floor while said load platform is in its said upright attitude to allow the first and second pallets to be loaded into said load platform, and said actuating means also being operative selectively to retract said lid towards said floor to engage the base of the second pallet after the first and second pallets and the said

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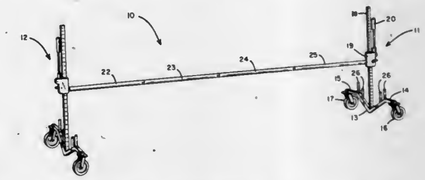
**4,295,777**

## ROLL LIFTING DOLLIES

**Dwain C. Bell, 1400 Marshall St. NE., Minneapolis, Minn. 55413, and Lloyd E. Anderson, 6408-74th Ave. North, Minneapolis, Minn. 55428**

**Filed Oct. 6, 1980, Ser. No. 194,619**
**Int. Cl.[3] B60P 3/00**
**U.S. Cl. 414—458** **2 Claims**



1. Lifting apparatus comprising, in combination:

(A) first and second jack assemblies each comprising

(a) an elongated frame member having first and second caster wheels supported on the undersurface and at opposite ends thereof;

(b) a jack shaft affixed to the upper surface of said frame member generally midway between said opposite ends and extending perpendicularly to said upper surface of said frame members;

(c) a jack runner mounted on said jack shaft for reciprocal motion therealong upon operation of a jack handle;

(d) a stub member of a predetermined length affixed to said jack runner and extending generally perpendicularly to the longitudinal axis to said jack shaft;

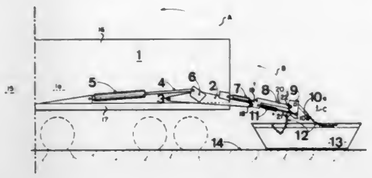
(B) an elongated tubular member coupled between the stub member on said first jack assembly and the stub member on said second jack assembly, said tubular member comprising a plurality of tubular sections coupled end-to-end and further including a plurality of relatively short stem elements connected to at least one of said frame members, projecting generally parallel to said jack shaft, said stem elements having a diameter to telescopically receive one or more of said tubular segments for storage when not in use.

**4,295,778**

## APPARATUS FOR LIFTING WASTE CONTAINERS ON TO TRUCKS

**Claude Hergaux, 6 & 8 Rue de l'Avenir, 76120 Grand Quevilly, France**

**Filed Dec. 13, 1978, Ser. No. 969,072**
**Claims priority, application France, Mar. 17, 1978, 78 08249**
**Int. Cl.³ B60P *1/00***
**U.S. Cl. 414—525 R** **8 Claims**



1. Apparatus for unloading the contents of a relatively large waste container onto a vehicle comprising a lifting assembly located on each side of said vehicle, each of said assemblies comprising a first elongated lever member pivotably mounted at one end to said vehicle and extending along the side of the vehicle for pivotable movement in a generally vertical plane; first means mounted on said vehicle for applying a force to said first lever member to effect pivotable movement thereof; a second elongated lever member carried at one end by the extended end of said first lever member for movement conjointly therewith in said vertical plane and for pivotable movement relative thereto; second means for applying a force to said second lever member mounted on said first lever member to effect pivotable movement thereof: a third lever member carried on the extended end of said second lever member for conjoint movement therewith in said vertical plane and also for pivotable movement relative thereto, said third lever member including means for supporting at least two chains or cables in spaced relation; and third means for applying a force to said third lever member mounted on said second lever to effect pivotable movement thereof, said lever members in each of said assemblies being selectively movable from a first position in which said levers extend along a substantially horizontal axis at the sides of the vehicle and a second position wherein said levers are articulated in said vertical plane to carry the containers above said vehicle, said second and third levers being selectively movable with respect to each other and the first lever to tilt said container in said second position said third lever being movable in an arc sufficient to invert said container beyond the vehicle.

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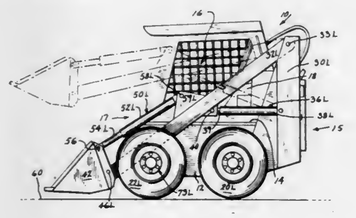
**4,295,779**

## STRAIGHT ARM LOADER

**John F. Shumaker, Mt. Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.**

**Filed Apr. 8, 1980, Ser. No. 138,331**
**Int. Cl.³ E02F *3/70***
**U.S. Cl. 414—685** **7 Claims**



1. A loader comprising: a frame having a rearwardly disposed support member; a material handling element disposed adjacent the front end of said frame; a pair of substantially straight lift arms disposed on opposite sides of said frame, each lift arm is pivotally joined at one end to said support member and at the opposite end to said material handling element; means, interconnecting said frame and at least one lift arm, for moving said lift arms between a raised and a lowered position; and wheel means for movably supporting said frame relative to the ground, said wheel means defining two channels at the front end of said frame adapted to receive said lift arms in their lowered position.

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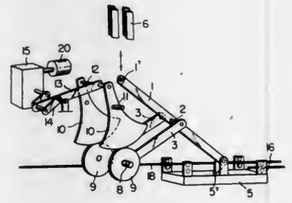
**4,295,780**

## APPARATUS FOR AUTOMATICALLY TRANSFERRING WORKPIECES

**Yoshimasa Wada, 2411 Ietomi-cho, Ashikaga-shi, Tochigi-ken; Sigeki Yamazaki, 382-36 Oaza-Takabayashi; Isamu Kobayashi, 837 Dainosato, both of Ota-shi, Gunma-ken; Noriyuki Haraguchi, 2-3717 Sakae-cho, Ashikaga-shi, Tochigi-ken, and Minoru Fukuda, 1048 Ishihara, Ota-shi, Gunma-ken, all of Japan**

**Filed Jul. 6, 1979, Ser. No. 55,167**
**Claims priority, application Japan, Sep. 24, 1978, 53-117008**
**Int. Cl.³ B65G *47/34***
**U.S. Cl. 414—749** **4 Claims**



1. An apparatus for automatically transferring workpieces, said apparatus comprising;

a long arm having a first end that is adapted to reciprocally move in the lengthwise direction of the apparatus and a second end which is adapted to reciprocate in a direction perpendicular to the movement direction of said first end;

a carriage mounted on said first end for movement together therewith;

a guide for engaging and guiding said second end of said long arm only in an end position thereof remote from the path of said first end;

a pair of short arms having a length equal to one half of the length of said long arm and disposed in each side of said long arm, one end of each said short arm being pivotally mounted on said long arm at the midpoint thereof and the other end of each said short arm being pivotally located at each side of a crossing point of the movement path of said first end of said long arm and the movement path of said second end of said long arm; and

a combination crank mechanism and transmission means adapted to oscillate each said short arm about said other end thereof, the second end of said long arm being adapted to move out of engagement with said guide in order to oscillate each said short arm in an angular range up to about 180° from one direction of the movement path of said first end of said long arm to the opposite direction of the same by means of said crank mechanism, both said long arm and said short arms being disposed in the same direction and in a common plane at each stroke end to thereby enable highly smooth carriage movements and accurate positioning thereof at each stroke end.

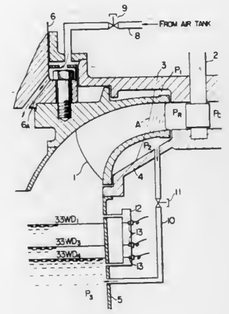


**4,295,781**

## METHOD FOR OPERATING FLUID MACHINES IN SPINNING-IN-AIR MODE

**Kenzyu Ogiwara; Minoru Kawada, and Teiji Ashida, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Service Engineering Co., Ltd., Ibaraki, both of, Japan**

**Filed Jun. 22, 1979, Ser. No. 51,173**
**Claims priority, application Japan, Jul. 21, 1978, 53-88401**
**Int. Cl.³ F01D *17/00, 19/00***
**U.S. Cl. 415—1** **9 Claims**



1. A method for operating a fluid machine in a spinning-in-air mode in synchronism with a transmission system, wherein the fluid machine includes a serial arrangement of working fluid inlet valve, closeable guide vanes, runner within a runner chamber of a casing and draft pipe, so as to define a water retaining chamber immediately adjacent the outer peripheral portion of the runner that will tend to retain water during rotation of the runner in spinning-in-air mode and further includes a leak-water exhaust valve in a pipe having an inlet in the water retaining chamber and a discharge in the draft tube, comprising the steps of:

with the runner drivingly connected in synchronism with the system and drivingly connected with a rotary machine having power to rotate the runner, and with the runner operating under no load with the inlet valve and guide vanes open and passing working fluid toward and through the runner, closing the guide vanes to shut off the flow of working fluid through the runner;

thereafter feeding compressed air to the runner chamber to fill the runner chamber within the casing with compressed air and lower the working fluid level in the draft pipe below the runner while continuing rotating the runner in synchronism so that the runner is rotating primarily in compressed air with working fluid remaining in the water retaining chamber between the runner and closeable guide vanes and closing the inlet valve; and

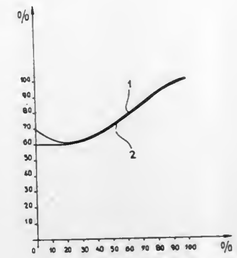
thereafter opening the leak-water exhaust valve to simultaneously pass the water from the water retaining chamber directly to the draft tube while bypassing the runner, which such opening being conducted after the inlet valve has closed and the pressure within the water retaining chamber substantially equals the pressure within the draft tube while maintaining the synchronized rotational speed of the runner so as to prevent excess rise of water within the draft pipe.

**4,295,782**

## STARTING OF PUMPS OR TURBOPUMPS

**Pierre Boussuges, Grenoble, France, assignor to Neyrpic, Grenoble, France**

**Filed Oct. 19, 1979, Ser. No. 86,675**
**Claims priority, application France, Oct. 20, 1978, 78 29899**
**Int. Cl.³ F03B *3/10***
**U.S. Cl. 415—1** **2 Claims**



1. A method of starting pumps with immersed wheels, said pumps being of the type with a fixed distributor-diffuser, and according to which the curve of variation of the power at working speed as a function of the flow of fluid passes through a minimum which is between the zero-flow point and the operating point, wherein the method comprises the following sequence:

putting the pumps into rotation, at a speed lower than operating speed of the motor of the pump with a flow valve closed,

when the pressure on either side of the said flow valve has reached a differential value which is sufficiently low for its opening to be effected without risk of damage, opening said flow valve to such an extent that it allows, when the unit approaches its operating speed, the flow corresponding to the said minimum of the curve of power-flow at operating speed, and

progressively opening of said flow valve until it allows the operating flow to pass.

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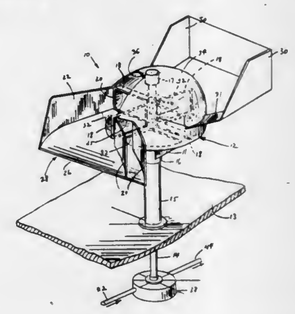
**4,295,783**

## FLUID TURBINE

**Barry A. Lebost, 1116 Warburton Ave., Apt. 1K, Yonkers, N.Y. 10701**

**Filed Feb. 9, 1978, Ser. No. 876,217**
**Int. Cl.³ F03D *1/04***
**U.S. Cl. 415—2 R** **25 Claims**



1. A fluid turbine for generating power when disposed in a free flowing fluid, comprising

a rotor means including

a housing, and

a plurality of rotor blades within said housing adapted to rotate in a reference plane about a longitudinal axis when exposed to said free flowing fluid,

said housing being provided with a first fluid entrance passage therein for allowing fluid to enter said turbine in a direction lying within said reference plane to engage at least certain ones of said rotor blades, said housing being further provided with a second fluid entrance passage therein contiguous with said first fluid entrance passage for allowing fluid to enter said turbine in another direction oblique to said reference plane,

means operatively connected to said rotor blades for generating power in response to rotation of said rotor blades, and

means on said housing adjacent said first and second fluid entrance passages for directing fluid from said passages in a direction lying essentially within said reference plane to impinge upon said rotor blades, and in a direction oblique to said reference plane toward said blades to impinge upon all of said rotor blades, said means on said housing including

side wall means spaced from said reference plane and inclined with respect to said longitudinal axis, said side wall means extending at least approximately two quandrants around the rotational path of said rotor blades to provide a space adjacent said rotor blades for producing spiral flow of fluid within said housing and between said wall means adjacent said rotor blades.

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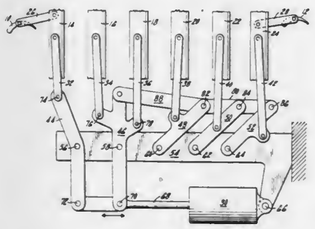
**4,295,784**

**VARIABLE STATOR**

**Frank B. Manning, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Sep. 26, 1979, Ser. No. 78,980**
**Int. Cl.³ F01D** *17/16*
**U.S. Cl. 415—162** **4 Claims**



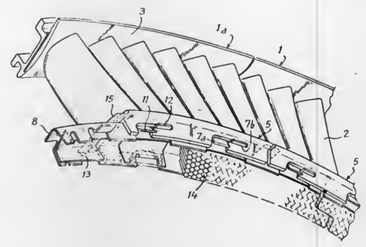
1. A stator vane actuation system for a compressor of a gas turbine engine including a plurality of axially spaced rows of circumferentially pivotally mounted vanes, an actuator having a connecting rod, a synchronizing ring for each row of vanes mounted external of the engine connecting each vane for pivotal movement, means interconnecting said connecting rod and at least one of said synchronizing rings for positioning each of said vanes in said row upon actuation of said actuator, linkage means connecting said interconnecting means and at least a second synchronizing ring so that actuating said actuator positions said one synchronizing ring for moving said one row of vanes at a given rate and the movement of said second synchronizing ring for moving the attached row of vanes to said second synchronizing ring at a different rate, a fixed elongated member, bell crank means for each of said synchronizing rings pivotally mounted on said fixed elongated member, means interconnecting said bell crank and said synchronizing rings, the bell crank means actuating said one synchronizing ring and the bell crank means actuating said second synchronizing ring being disposed at respectively different angles relative to said elongated member.

**4,295,785**

**REMOVABLE SEALING GASKET FOR DISTRIBUTOR SEGMENTS OF A JET ENGINE**

**Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France**

**Filed Mar. 18, 1980, Ser. No. 131,459**
**Claims priority, application France, Mar. 27, 1979, 79 07590**
**Int. Cl.³ F01D** *11/02*
**U.S. Cl. 415—174** **8 Claims**



1. In a removable seal for guide vane segments of a jet engine wherein a plurality of blades are interconnected by an outer ferrule engageable with a turbine housing and by an inner ferrule upon which the seal is mounted, the improvement comprising:

said seal being mounted in an inwardly facing channel-shaped member removably attached to said inner ferrule, said inner ferrule being an inwardly facing channel-shaped member having, in its outer sides, a plurality of L-shaped recesses each having a leg opening radially inwardly to the inner edge of said outer sides and a circumferentially extending leg, said recesses being engaged by locking tongues on said channel-shaped member.

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**4,295,786**

**COMPOSITE SEAL FOR TURBOMACHINERY**

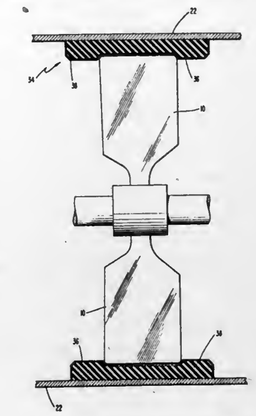
**Robert C. Bill, Rocky River, and Lawrence P. Ludwig, Fairview Park, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Division of Ser. No. 931,090, Aug. 8, 1978, Pat. No. 4,207,024, which is a division of Ser. No. 801,290, May 27, 1977, Pat. No. 4,135,851. This application Nov. 20, 1979, Ser. No. 96,255**
**Int. Cl.³ F01D** *11/08*
**U.S. Cl. 415—174** **10 Claims**

1. A gas path seal for a turbine or the like having a plurality of blades mounted for rotation about an axis comprising

a stator shroud having an aerodynamic smooth surface on a thin layer of a deformable metallic material that is wearable relative to said blades and closely spaced to the blade tips whereby said shroud is deformed when said blades rub against said surface,

a yieldingly deformable porous backing surrounding said layer to receive said deformed shroud thereby reducing said blade wear by limiting the magnitude of normal forces measured radially inward which are developed between the blade tips and the shroud, and



a rigid mounting housing surrounding said backing and being secured to the outermost surface of said backing.

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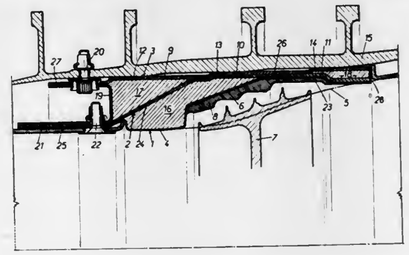
**4,295,787**

**REMOVABLE SUPPORT FOR THE SEALING LINING OF THE CASING OF JET ENGINE BLOWERS**

**Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France**

**Filed Mar. 21, 1980, Ser. No. 132,642**
**Claims priority, application France, Mar. 30, 1979, 79 08583**
**Int. Cl.³ F04D** *29/54;* **F01D** *11/08*
**U.S. Cl. 415—197** **7 Claims**



1. In a removable support for sealing linings in the blower casings of jet engines, the casing being at least partially attached to acoustic panels, the improvement comprising: at least two concentric ferrules; an inner ferrule having a part of its internal surface conforming to the flow of the air stream and the other part extending over a zone covered by blades of a rotor, said inner ferrule supporting a lining, an outer ferrule being provided on its external surface with cylindrical surfaces adapted to engage surfaces provided on the internal surface of the casing by means of force fitting, the space between the two ferrules being filled with a filler material, and at least one ferrule of U-shaped cross section, connecting the two concentric ferrules at their ends, with the integral part of the outer ferrule receiving securing means, which immobilize said support against rotation relative to the casing.

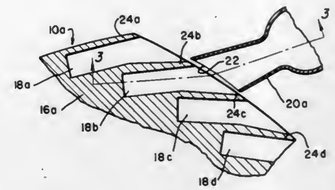


**4,295,788**

**TURBINE WHEEL AND NOZZLE ARRANGEMENT**

**Jules L. Dussourd, Princeton, and George W. Pfannebecker, Skillman, both of N.J., assignors to Terry Corporation, Windsor, Conn.**

**Filed Mar. 10, 1980, Ser. No. 129,038**
**Int. Cl.³ F01D** *9/02*
**U.S. Cl. 415—202** **2 Claims**



1. An improved milled-bucket turbine wheel and nozzle arrangement, for a machine comprising:

a milled-bucket turbine wheel mounted for rotation; and

an energized-fluid-discharging nozzle mounted in adjacency to the periphery of said wheel, for discharging energized fluid onto said periphery; wherein

said wheel has a plurality of substantially parallel, arcuate buckets formed in, and in traverse of, the periphery thereof; and

said nozzle has a fluid-exit orifice opening onto, and in aligned registry with a given side portion or area of said periphery whereat there subsist lateral terminations of said buckets; wherein the improvement comprises:

said buckets are substantially semicircular in cross-section, having a given radius; and

said orifice has a width, measured along a plane traversin said wheel periphery, which is not less than approximately fifteen and one third percent, nor more than approximately eighteen and one fifth percent of twice said given radius.

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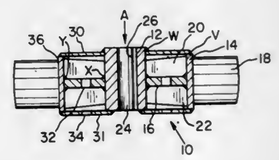
**4,295,789**

**COVER PLATES FOR TANK HEADS**

**Howard L. Gutzwiller, Zelienople, Pa., assignor to Robinson Industries, Inc., Zelienople, Pa.**

**Filed Aug. 9, 1979, Ser. No. 65,122**
**Int. Cl.³ F04D** *29/18, 29/32*
**U.S. Cl. 416—213 A** **4 Claims**



1. An axial flow fan comprising:

A. a hub having a central axis;

B. an annular rim concentrically positioned and spaced from the hub;

C. a disc extending normal to the central axis substantially midway of the hub and connecting the hub to the rim said disc being a structural member providing the primary structural support for the rim;

D. a plurality of blades, each blade extending outward from the rim and angularly disposed thereto to form a leading and trailing edge;

E. first and second reinforcement plates extending radially

outward in opposite directions and spaced from and along the central axis, said plates welded to the hub, disc and rim, said first plate extending subjacent the leading edge of each blade and said second plate extending subjacent the trailing edge; and

F. a pair of nonstructural disc-shaped cover plates, each plate welded to the hub and to a terminal edge of the annular rim, wherein said nonstructural cover plates protect structural members, is sacrificial in relation thereto and is accessible and refurbishable in the field.

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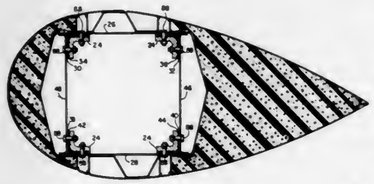
**4,295,790**

## BLADE STRUCTURE FOR USE IN A WINDMILL

**Walter S. Eggert, Jr., Huntington Valley, Pa., assignor to The Budd Company, Troy, Mich.**

**Filed Jun. 21, 1979, Ser. No. 50,687**
**Int. Cl.³ F03D 1/06; B64C 11/26**
**U.S. Cl. 416—226** **10 Claims**



1. A tapered blade structure for use in a windmill including a spar assembly extending the full length of said blade structure and twisted along its length to a predetermined angle and having leading and trailing edge assemblies attached thereto comprising:

(a) top and bottom spaced flat tapered elongated longitudinally extending metal sheets,

(b) a pair of tapered angle metal strip elements secured to each of said extending sheets along opposite longitudinal edges thereof,

(c) a plurality of relatively short pairs of flat metal shear web channels secured to said angle strip elements between said top and bottom sheets along the length of said sheets,

(d) said tapered angle strip elements extending from the inner end of said blade structure towards the tip of said blade structure more than one-half and less than the length of said blade structure,

(e) said metal sheets, tapered strip elements, and web channels forming a said spar assembly having a substantially rectangular cross-section,

(f) a fitting secured to the ends of said sheets and said shear web channels,

(g) a leading edge assembly secured to one side of said spar assembly extending outwardly from one of said pairs of flat metal shear web channels,

(h) said leading edge assembly including an outer fiberglass plastic sheet having edge portions extending partly over said top and bottom flat tapered metal sheets,

(i) a reinforcing plate bonded to said fiberglass plastic sheet to prevent impact damage,

(j) a trailing edge assembly secured to the side opposite said one side of said spar assembly extending outwardly from the other of said pairs of flat metal shear web channels, and

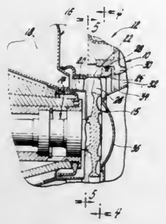
(k) said trailing edge assembly including top and bottom fiberglass sheets each having edge portions extending partly over said top and bottom flat tapered metal sheets to join the edge portions of said outer fiberglass plastic sheet of said leading edge assembly.

**4,295,791**

## SCALLOPED CERAMIC TURBINE

**Jesse F. Johnson, St. Clair Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 20, 1979, Ser. No. 67,797**
**Int. Cl.³ F01D 5/14, 5/28**
**U.S. Cl. 416—241 B** **1 Claim**



1. A unitary ceramic gas turbine wheel comprising: a hub with a radially extending disc thereon, a wheel rim having a plurality of spaced, fore face segments and an aft face, a neck integrally joining said wheel rim to said disc, a plurality of blades with roots integrally joined to said rim at the outer surface thereof, each of said blades having a leading edge and a trailing edge, concave convex airfoil surfaces joining said leading and trailing edges, said wheel rim having an axial length less than that of said blade roots, each of said blades having its leading edge located upstream of said fore faces and being joined to said neck and fore faces by a faired root region, said faired root regions and said fore faces on said rim forming scallops in said wheel between each of said leading edges to reduce differential thermal expansion strain at the leading edges to prevent excessive thermal stress concentrations in said blades and wherein said scallops further are configured to reduce the polar movement of inertia of said turbine wheel to improve the acceleration characteristics thereof.

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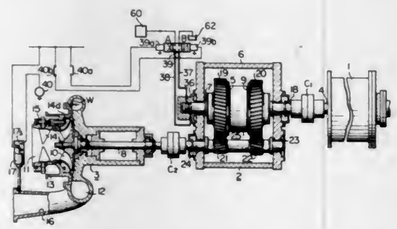
**4,295,792**

## APPARATUS FOR CONTROLLING OPERATION OF FLUID PRESSURE RAISING SYSTEM

**Keiji Tachibana, Tokyo; Yoshihiko Nakayama, Shimoinayoshi; Junichi Kaneko, Amimachi, and Susumu Ishii, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 29, 1978, Ser. No. 937,806**
**Claims priority, application Japan, Sep. 9, 1977, 52-107830**
**Int. Cl.³ F04B 49/00; F16D 25/063**
**U.S. Cl. 417—15** **25 Claims**



1. An apparatus for controlling the operation of a fluid pressure raising system including at least a motor having a constant rotational speed and a centrifugal fluid machine connected to said motor, said centrifugal fluid machine including a casing provided with a suction passage and a discharge passage, inlet guide vanes disposed in said suction passage, an impeller shaft connected to said motor and rotatably mounted in said casing and at least one impeller carried by said impeller



shaft, so that a fluid may be sucked through said suction passage and pressurized by said impeller as said impeller is driven by said motor and then discharged through said discharge passage, said apparatus comprising:

an overdrive gear having a variable overdrive ratio and disposed between said motor and said centrifugal fluid machine, said overdrive gear including a gear box, a driven shaft connected to said impeller shaft of said centrifugal fluid machine and rotatably carried by said gear box, at least two pinions having different numbers of gear teeth and carried by said driven shaft, a drive shaft extending substantially in parallel with said driven shaft and rotatably carried by said gear box, said drive shaft being connected to said motor, gears rotatably carried by said drive shaft and adapted to engage their respective corresponding pinions, and clutch means adapted to connect selected one of said gears to said drive shaft, whereby said driven shaft is rotated at least at two overdrive ratios of a set overdrive ratio and a low overdrive ratio;

detecting means for detecting a condition of said fluid pressure raising system to produce a signal representative of said condition; and

an actuator for actuating said clutch means in response to said signal delivered by said detecting means,

said fluid pressure raising system further includes a condenser having an inlet communicating said discharge passage and an outlet, and an evaporator having an inlet communicating said outlet of said condenser and an outlet communicating said suction passage, and

wherein said detecting means detects the pressure at said inlet of said condenser.

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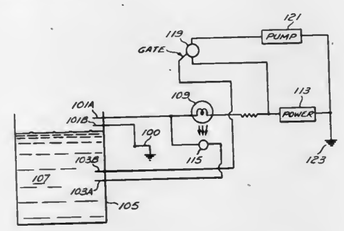
**4,295,793**

## FLUID SENSITIVE SWITCHING CONTROLLER

**James D. McGalliard, 11171 Fenwick Pl., Santa Ana, Calif. 92705**

**Filed Nov. 6, 1978, Ser. No. 958,143**
**Int. Cl.³ F04B 49/06**
**U.S. Cl. 417—36** **2 Claims**




1. A device for controlling the level of fluid in a container comprising:

a first fluid probe;

a second fluid probe;

a unitary light source;

a unitary light sensor illuminated by said unitary light source;

means for initiating illumination of said unitary light source when one of said probes contacts said fluid, regardless of the conductive state of said unitary light sensor;

means responsive to said unitary light sensor for maintaining illumination of said unitary light source whenever said sensor is illuminated and the other of said probes contacts said fluid; and

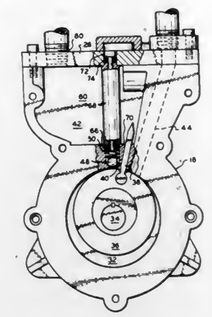
means for controlling the level of fluid in said container, said means being connected in series with said sensor.

**4,295,794**

## SELECTIVE MODE MULTI-STAGE VACUUM PUMP

**Robert L. Cain, Bryan, Ohio, assignor to Robinair Manufacturing Corporation, Montpelier, Ohio**

**Filed Jan. 22, 1979, Ser. No. 5,604**
**Int. Cl.³ F04B 23/04**
**U.S. Cl. 417—62** **2 Claims**



1. In a rotary vacuum pump having a pair of pump casings each having a pumping chamber defined therein housing a rotary displacer, an electric motor in driving connection with said displacers, an inlet defined in each of said casings in communication with the associated chamber, an oil reservoir defined in each of said casings above the associated chamber, an outlet passage interconnecting the chamber and reservoir of a common casing, a single head superimposed upon said casings enclosing the reservoirs thereof, the improvement comprising a cross-over conduit mounted upon one of said pump casings within the oil reservoir thereof having a first end communicating with the outlet passage of said one casing and a second end communicating with a cross-over passage defined in said head, said conduit including sealing means adjacent said ends, said cross-over passage communicating with the inlet of the other pump casing whereby said cross-over conduit and passage establish a series interconnection between the pumping chambers of said casings, and an outlet port defined in said head in communication with said oil reservoir of said other casing.

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**4,295,795**

## METHOD FOR FORMING REMOTELY ACTUATED GAS LIFT SYSTEMS AND BALANCED VALVE SYSTEMS MADE THEREBY

**John C. Gass, Wichita, Kans.; Noell C. Kerr, Liberty, and Robert W. Pittmann, Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 889,470, Mar. 23, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,657**
**Int. Cl.³ F04F 1/20; F16K 31/08**
**U.S. Cl. 417—111** **5 Claims**

1. A remotely actuated gas lift system for improved efficiency in lifting oil in a production tube internally of a well casing comprising,

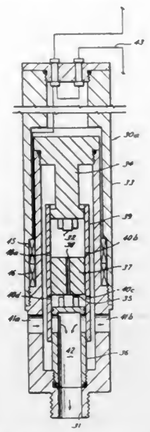
(a) remote valve control means at the surface,

(b) valve means having a magnetic core in the well responsive to said remote valve control means for being opened to eject casing fluid through a passage into the production tube for lifting the oil in the production tube and for being closed for stopping flow of casing fluid into the production tube,

(c) said valve means has means for equalizing the casing fluid pressure on both ends of said magnetic core for reducing resistance to movement and providing a balanced valve means requiring a minimum of energy for operation thereof, and

(d) said means for equalizing said casing fluid pressure on

both ends of said magnetic core comprising casing fluid passage means extending completely through said mag-



netic core for the length thereof for circulating casing fluids freely to both ends thereof.

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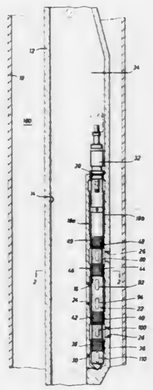
**4,295,796**

## GAS LIFT APPARATUS

**Howard H. Moore, Houston, Tex., assignor to McMurry/-Hughes, Inc., Huntsville, Tex.**

**Filed Jun. 29, 1979, Ser. No. 53,302**
**Int. Cl.³ F04F** *1/20*
**U.S. Cl. 417—115** **18 Claims**



13. A gas lift valve assembly including a valve body having central longitudinal bore means, said valve body having a first lateral opening therethrough from said bore means, a second lateral opening therethrough from said bore means and longitudinally spaced from said first lateral opening, and a third lateral opening therethrough from said bore means disposed longitudinally between but spaced from said first and second lateral openings;

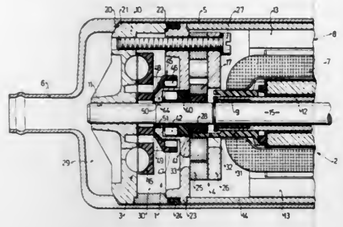
a first valve element movably mounted on said valve body for opening and closing said bore means between said first and third lateral openings; and a second valve element movably mounted on said valve body for opening and closing said bore means between said second and third lateral openings.

**4,295,797**

## FUEL SUPPLY PUMP

**Karl Ruhl, Gerlingen, and Ulrich Kemmner, Sachsenheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 932,388, Aug. 9, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,775**
**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745818**
**Int. Cl.³ F02M** *37/08;* **F04B** *23/14, 17/00*
**U.S. Cl. 417—203** **13 Claims**



1. In a fuel supply pumping system arranged together with a driving electromotor in a common housing, said system including a first pumping stage, a second pumping stage, a first rotary coupling connection between said first and second pumping stages, and a second rotary coupling connection between said electromotor and one of said pumping stages, the improvement wherein said first rotary coupling includes oppositely extending hub portions, each hub portion being provided with a permanent magnet element, said permanent magnet elements together forming a magnetic coupling.

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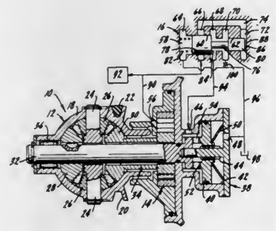
**4,295,798**

## AUTOMATIC TWO-SPEED PUMP ASSEMBLY

**Arthur M. McIntosh, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Oct. 1, 1979, Ser. No. 80,767**
**Int. Cl.³ F04B** *35/00*
**U.S. Cl. 417—212** **11 Claims**



1. An automatic two-speed pump assembly comprising a transmission shiftable to first and second operating modes, said transmission including fluid operated means movable between first and second positions for respectively shifting said transmission to said first and second modes, and means biasing said fluid operated means toward its first position; a pump engaged with said transmission so as to be driven thereby; and means operative in response to pump pressure for controlling the shift of said transmission from said first to said second mode at a first pump pressure and from said second to said first mode at a second pump pressure, said controlling means including valve means movable between first and second positions, said valve means in its first position communicating said fluid operated means with a fluid reservoir such that said fluid operated means is moved to its first position by said biasing means, and said valve means in its second position communicating said pump with said fluid operated means such that said fluid operated means is moved to its second position in opposition to said biasing means, said controlling means also including resilient means biasing said valve means toward its first position, said valve means defining a relatively small surface area subject to pump pressure when in its first position and a relatively large surface area subject to pump pressure when in its second position such that said valve means is movable from its first to its second position by a relatively high jump pressure and from its second to its first position by said resilient means in opposition to a relatively low pump pressure.



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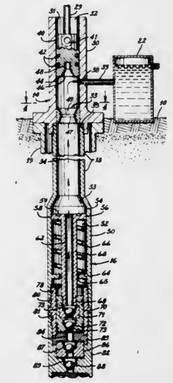
**4,295,799**

## SONIC PRESSURE WAVE SURFACE OPERATED PUMP

**Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201**

**Filed Nov. 8, 1978, Ser. No. 958,552**
**Int. Cl.³ F04B** *47/12*
**U.S. Cl. 417—240** **18 Claims**



1. A sonic pressure wave surface operated single tube pump for pumping liquid from an underground level to a ground surface comprising:

(a) a sonic pressure wave generator including,

I. a vertical cylinder having a bore for containing liquid in the lower portion thereof and having a port extending laterally from that bore,

II. a piston reciprocal in the bore of said cylinder for opening and closing the port thereof and for reciprocally impacting the liquid contained therein,

III. said piston having a liquid impacting end face with a central recess formed therein which generates a sonic pressure wave upon impacting the liquid containable therein,

IV. a sonic nozzle located in the lower portion of the bore of said vertical cylinder;

(b) a power operated drive means coupled to said piston for reciprocal driving thereof;

(c) a metallic tube having one of its ends coupled to the lower end of said cylinder, said tube having a bore formed therethrough for containing liquid with that bore in communication with the bore of said cylinder for receiving and transmitting the sonic pressure waves upon generation in said cylinder; and

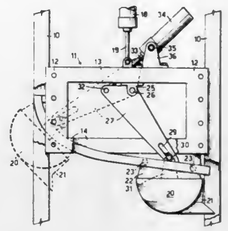
(d) pumping mechanism means connected to the other end of said tube and in communication with the liquid to be pumped, said pumping mechanism means including a reciprocally operable plunger for impingingly receiving the sonic pressure waves when transmitted by said tube and reflecting those waves into a centrally and upwardly moving column.

**4,295,800**

## ENERGY CONVERTOR

**Bernard A. Packer, 328 Duthie Ave., Rockhampton North, Queensland, 4701, Australia**

**Filed Sep. 4, 1979, Ser. No. 72,162**
**Claims priority, application Australia, Sep. 7, 1978, PD5859; Nov. 10, 1978, PD6730; Mar. 9, 1979, PD7983**
**Int. Cl.³ F04B** *17/00*
**U.S. Cl. 417—333** **4 Claims**



1. In an energy conversion device of the type including:

a support frame;

a carriage member which is movable in an upward or downward direction relative to the support frame;

track means associated with said carriage member whereby the track means is orientated at an angle relative to the horizontal so as to define a downward location and an upward location, said track means being curved towards the upward location from the downward location, the radius of curvature decreasing from the downward location to the upward location; and

a float member movable on said track means from said downward location to said upward location due to pressure from ocean waves or swells whereby energy generated by movement of said float member may be converted to mechanical or other forms of energy; the improvement comprising: a pump means pivotally mounted on said carriage member, and linkage means pivotally attached to said pump means and to said float member.

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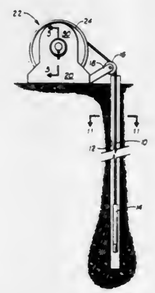
**4,295,801**

## FLUID-POWERED SUBMERSIBLE SAMPLING PUMP

**Robert W. Bennett, 5116 Bonham, Amarillo, Tex. 79110**

**Filed Jul. 31, 1979, Ser. No. 62,364**
**Int. Cl.³ F04B** *47/08*
**U.S. Cl. 417—397** **25 Claims**



1. A fluid-powered sampling pump system comprising:

a tube bundle reel assembly;

a tube bundle reeled upon said reel assembly and including: a fluid sample tubing;

a power fluid charging tubing; and
an exhaust power fluid tubing;
a pump connected to one end of said tube bundle for lowering into the earth, said pump comprising:
a hollow cylindrical upper motor piston chamber defining an axially extending fluid passageway in the wall thereof for receiving pressurized power fluid from said power fluid charging tubing, and further defining an axially extending fluid passageway in the wall thereof for delivering exhaust power fluid to said exhaust power fluid tubing;
an upper motor piston in said upper motor piston chamber;
a hollow cylindrical lower motor piston chamber;
means detachably interconnecting said upper and lower motor piston chambers and positioned therebetween to facilitate independent removal of said motor piston chambers from the pump;
a lower motor piston in said lower motor piston chamber;
means interconnecting said upper and lower motor pistons for concurrent movement within their respective piston chambers;
a lower pump piston chamber connected to said lower motor piston chamber;
an upper pump piston chamber connected to said upper motor piston chamber;
an upper pump piston connected to said upper motor piston and having a portion positioned in said upper pump piston chamber for reciprocation therein during the concurrent reciprocation of said upper motor piston;
a lower pump piston having a portion positioned in said lower pump piston chamber and connected to said lower motor piston for reciprocation in said lower pump piston chamber when said lower motor piston undergoes reciprocation;
a lower pump valve subassembly connected to said lower pump piston chamber and including an intake valve and a discharge valve;
an upper pump valve subassembly connected to said upper pump piston chamber and including an intake valve and a discharge valve;
manifold tubing means commonly interconnecting said discharge valves to said fluid sample tubing of said tube bundle;
a pilot valve subassembly interposed between said upper and lower motor piston chambers and detachably mounted on said means interconnecting said upper and lower motor piston chambers;
a distribution valve subassembly interposed between said upper motor piston chamber and said lower motor piston chamber and detachably mounted on said means interconnecting said upper and lower motor piston chambers, said distribution valve subassembly being operatively connected to said pilot valve subassembly and to said motor pistons to respond to shifting movement of said pilot valve subassembly during operation of the pump, and to distribute power fluid to said motor pistons; and
means interconnecting said pilot valve subassembly and said distribution valve subassembly with said axial fluid passageways in said upper motor piston chamber.

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**4,295,802**

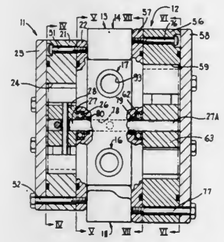
## VAPOR CONTROL SYSTEM

**Norman Peschke, Kentwood, Mich., assignor to Dover Corporation, Grand Rapids, Mich.**

**Filed Jul. 2, 1979, Ser. No. 53,808**
**Int. Cl.³ F04B** *17/00*
**U.S. Cl. 417—405** **7 Claims**

1. In an apparatus for withdrawing vapors from the zone adjacent the fill opening of a fuel tank, said apparatus having a motor-pump unit for association with a fuel conducting conduit and a vapor conducting conduit, the improvement comprising:

a central component defining a central housing having first and second enlarged end walls which face in opposite directions and are substantially parallel, said central housing being bounded by peripheral sidewall means;
said central housing having a fuel inlet port connectible to the fuel conduit and communicating with a first fuel passage which extends interiorly of the central housing and terminates in a first opening formed in said first end wall, and a fuel discharge port connectible to the fuel conduit and communicating with a second fuel passage which extends interiorly of said central housing and terminates in a second opening formed in said first end wall;
said central housing also including a vapor inlet port connectible to the vapor conduit and communicating with a first vapor passage which extends interiorly of said central housing and terminates in a third opening formed in said second end wall, and a vapor discharge port connectible to the vapor conduit and communicating with a second vapor passage which extends interiorly of said central housing and terminates in a fourth opening formed in said second end wall;
elongate shaft means rotatably supported on said central housing so that the rotational axis of said shaft means is substantially perpendicular to said first and second end walls, said shaft means having first and second end portions which respectively project outwardly beyond said first and second end walls;



a motor component connectible into the fuel-flow path for rotating or stopping as the fuel flows or stops flowing, respectively;
said motor component including a motor housing removably but fixedly attached to said central housing directly adjacent said first end wall, said motor housing having an elliptical central cavity, and a vane-carrying rotor rotatably mounted within said cavity and nonrotatably secured to the first end portion of said shaft means, said first and second openings respectively communicating with high and low pressure zones of said cavity adjacent said rotor;
a pump component drivingly connected for rotation with said motor component and introducible into the vapor flow path for creating a vapor withdrawing suction in said vapor conduit simultaneous with the flow of fuel in the fuel conduit;
said pump component comprising a pump housing removably and fixedly secured to said central housing adjacent said second end wall, said pump housing defining an elliptical central cavity, and a vane-carrying rotor rotatably mounted within said cavity, and nonrotatably secured to the second end portion of said shaft means, said third and fourth openings respectively communicating with low and high pressure zones within said pump cavity.

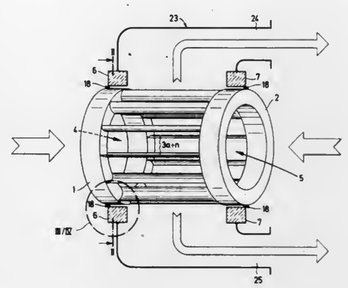


**4,295,803**

## SEPARATING MACHINE

**Ulrich Barthelmess, Niederstotzingen, Fed. Rep. of Germany, assignor to Omya GmbH, Cologne, Fed. Rep. of Germany**

**Filed Jun. 1, 1979, Ser. No. 44,623**
**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825400**
**Int. Cl.³ F04B** *17/00, 35/04*
**U.S. Cl. 417—423 R** **10 Claims**



1. A flow machine for separating particles in a flowable medium, the machine having a rotor rotatably mounted in a housing, said rotor comprising two face rings spaced apart in the axial direction of the rotor and a plurality of blades extending axially therebetween, said rings being supported for rotation about their outer circumferences in the housing and at least one of the rings being driven, and an inlet and an outlet in the housing for flowable medium, said flowable medium being drawn through the flow machine so that it flows axially through the rotor and traverses the blades substantially radially as it flows between the inlet and the outlet effecting a separation of particles in the flowable medium.

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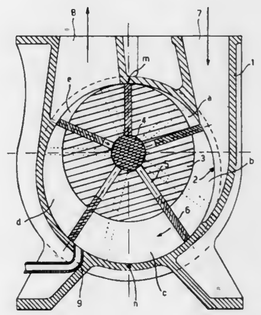
**4,295,804**

## INTERMEDIATELY COOLED AIR VACUUM PUMP WITH BALANCING OF THE PRESSURES

**Adriano Pezzot, Via Udine, 8, 33094 Cordenons (Pordenone), Italy**

**Filed Jul. 5, 1979, Ser. No. 54,842**
**Claims priority, application Italy, Nov. 7, 1978, 83499 A/78**
**Int. Cl.³ F04C** *18/00, 29/04*
**U.S. Cl. 418—15** **1 Claim**



1. An improved pump apparatus of the type having a stator body with an internal chamber for suction and compression, an input port, an output port, an eccentrically mounted rotor located within the chamber, the rotor including a plurality of radial lamellae mounted thereon, the lamellae adapted to make contract with the inside of the chamber through the influence of centrifugal force, and passageway means for venting the chamber at the location where the chamber formed by adjacent lamellae has its largest volume, wherein the improvement comprises:

(a) the passageway means is positioned such that a first arc between the passageway means and the output port is as long as an arc between points at which adjacent lamellae contact the inside chamber including the thickness of one lamella;
(b) the output port subtends an angle as large as the arc between the points at which adjacent lamellae contact the inside of the chamber;
(c) the input port is positioned such that a second arc from the output port to the input port is as long as the arc between the points at which adjacent lamellae contact the inside of the chamber;
(d) the input port subtends an angle smaller than the arc between the points at which adjacent lamellae contact the inside of the chamber; and,
(e) the passageway is positioned such that a third arc between the passageway and the input port is as long as the arc between the points at which adjacent lamellae contact the inside of the chamber, including the thickness of one lamella,

whereby, as each succeeding chamber volume is swept past the passageway means and on toward the output port, there occurs no significant compression of fluid enclosed within such chamber.

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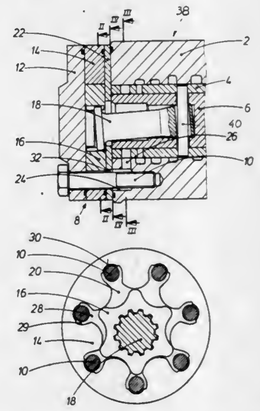
**4,295,805**

## HYDRAULIC ROTARY TOOTHED PISTON ENGINE WITH FLOW THROUGH THE TOOTHED GAPS

**Karl-Heinz Liebert, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany**

**Filed Oct. 12, 1979, Ser. No. 84,183**
**Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845648**
**Int. Cl.³ F03C** *2/08;* **F04C** *2/10, 15/02*
**U.S. Cl. 418—61 B** **4 Claims**



1. In a combined fluid displacing device (**8**) and control valve assembly having a radially outer ring gear (**14**) provided with internal teeth spaced from each other by gaps in fluid communication with fluid displacing pockets formed between said ring gear and an inner member (**20**), valve means a valve housing therefor (**2**) within which axial flow passages (**24**) are formed, a fixed spacer (**22**) positioned axially between the ring gear and the housing and elongated assembly fasteners (**10**) extending through the ring gear and the spacer into the valve housing through the axial flow passages therein, the improve-

ment residing in said ring gear being formed with radial extensions (28) of said gaps between the internal teeth receiving the fasteners therethrough with flow clearance in substantial axial alignment with the axial flow passages in the valve housing, said spacer being formed with axial flow openings (32) through which the fasteners extend with partial radial clearance to conduct axial flow between the radial gap extensions and the axial flow passages in the housing without directional change with the fluid flow being into and out of said fluid displacing pockets through said gaps, radial gap extensions, openings, axial flow passages and valve means.

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**4,295,806**

## ROTARY COMPRESSOR WITH WIRE GAUZE LUBRICANT SEPARATOR

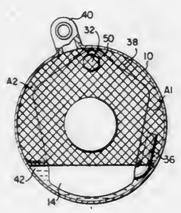
**Naoki Tanaka, Amagasaki; Kunihiko Tsuchiya, and Toshizo Nishizawa, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 27, 1979, Ser. No. 34,009**

**Claims priority, application Japan, May 26, 1978, 53/63088; Dec. 29, 1978, 53/179398[U]**

**Int. Cl.³ F04C** *29/02;* **B01D** *50/00*

**U.S. Cl. 418—97** **8 Claims**




1. A rotary compressor comprising: a horizontal cylindrical shell having a lubricant sump disposed at the bottom thereof; a compressor unit mounted within said shell for compressing a gaseous refrigerant, the size of the compressor unit being less than the size of the interior of said shell for leaving a space within said shell; a delivery tube connected to the main body of said compressor unit to deliver the compressed gaseous refrigerant to said space; a discharge tube connected to said shell to discharge the compressed refrigerant from said space to the exterior of said shell; a wire gauze positioned in said space within said shell perpendicular to the longitudinal axis of said shell and extending fully across said space within said shell to a level below the level of lubricant in said sump, thereby dividing said space into a first space containing said compressor unit and a second space, for separating lubricant from the compressed refrigerant and for directing said separated lubricant back to said lubricant sump; and means in said first space for blocking passage of refrigerant between said compressor unit and said shell for dividing the first space into two portions, said delivery tube opening into one of said space portions and said discharge tube opening out of the other space portion, whereby compressed refrigerant is delivered from said delivery tube to said one space portion, passes through the wire guaze to the second space, and then again passes through the wire guaze to said other space portion and said discharge tube

**4,295,807**

## INTERNAL COMBUSTION ENGINE WITH OIL PUMP GEAR SURROUNDING AND DRIVEN BY CRANKSHAFT

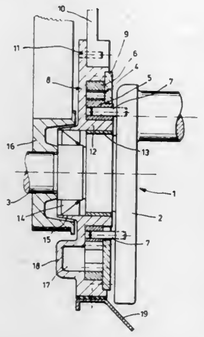
**Hermann Krüger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed Jul. 20, 1979, Ser. No. 59,475**

**Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836766**

**Int. Cl.³ F04C** *2/10;* **F04B** *17/00;* **F01M** *1/02*

**U.S. Cl. 418—170** **8 Claims**




1. In an internal combustion engine having a crankshaft mounted for rotation on at least one main crankshaft bearing and having a gear oil pump directly driven by said crankshaft and including at least one gear surrounding said crankshaft and rotationally driven by said crankshaft, the improvement wherein said gear also surrounds said main bearing and forms an operative gear of said pump whereby said bearing and said oil pump occupy common axial space on said crankshaft.

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**4,295,808**

## APPARATUS FOR THE PRODUCTION OF HIGH-PURITY METAL POWDER BY MEANS OF ELECTRON BEAM HEATING

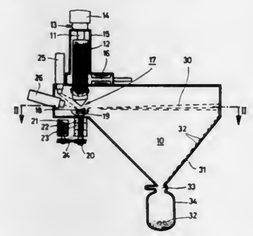
**Herbert Stephan, Bruchköbel; Hans Aichert, Hanau am Main, and Joseph Heimerl, Altenhässlau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany**

**Division of Ser. No. 902,475, May 7, 1978, Pat. No. 4,218,410, which is a continuation of Ser. No. 697,283, Jun. 17, 1976, abandoned. This application Oct. 15, 1979, Ser. No. 85,155**

**Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528999**

**Int. Cl.³ B22F** *9/00*

**U.S. Cl. 425—8** **12 Claims**




1. An apparatus for making high-purity metal powder from high purity metal while maintaining the initial high purity of the starting material, comprising:

a. a circular plate having a given diameter and a circumferential marginal area and means for rotating same at a high speed about a vertical axis of rotation corresponding to the center of the plate;

b. means for electron beam melting high purity metal starting material in rod form in vacuo into molten metal droplets directed onto the circular plate;

c. means for producing an electron beam focusable to a given focal spot on the plate and for focusing the focal spot such that its diameter is many times smaller than the given diameter of the plate and deflecting the beam between the rotational center of the spinning plate and the marginal area to effect the scanning of the plate in a zone that extends radially of the axis of rotation of the plate to said marginal area when the plate is spinning to direct the molten metal droplets by centrifugal force from the plate when it is spinning in a controlled manner within a fixed narrow angular portion of the circumference of the spinning plate to define a fixed narrow angular range of flight paths of the molten metal droplets leaving the plate; and

d. means for collecting the metal particles formed from the droplets undergoing cooling and solidification due to loss of heat due to radiation during flight to form the metal powder.



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**4,295,809**

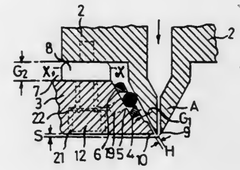
## DIE FOR A MELT BLOWING PROCESS

**Takashi Mikami; Shigeo Fujii; Shuji Okano, and Tokuzo Ikeda, all of Ooi, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 14, 1979, Ser. No. 75,816**

**Int. Cl.³ D01D** *3/00*

**U.S. Cl. 425—72 S** **16 Claims**




1. An extrusion die assembly for a melt blowing process with a nose piece having a triangular cross-section and extrusion holes along the apex thereof, for extrusion of melted thermoplastic resin, said assembly having gas lips defining gas slots at either side of the apex and having movable spacers provided in the gas slots said spacers contacting said nose piece and said gas lips for determination of the gap of the gas slots.

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**4,295,810**

## APPARATUS FOR INSULATING BUILDING BLOCKS

**Heinz Dennert, Bischberg, and Hans V. Dennert, Schlüsselfeld, both of Fed. Rep. of Germany, assignors to Veit Dennert KG Baustoffbetriebe, Schlüsselfeld, Fed. Rep. of Germany**

**Filed Jun. 5, 1979, Ser. No. 45,732**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825508**

**Int. Cl.³ B29C** *27/30;* **B29D** *27/00*

**U.S. Cl. 425—110** **11 Claims**

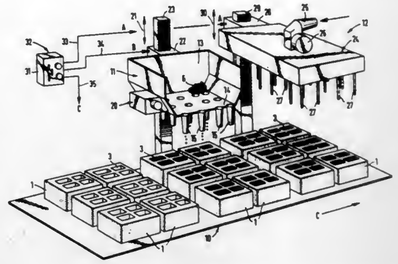
1. Apparatus for producing building blocks comprising

conveying means for transporting building blocks each having at least one hollow chamber therein,

a filling station for filling the chambers of said building blocks with particles of preformed thermoplastic synthetic material,

a fusing station for fusing the surfaces of said particles of thermoplastic synthetic material together, and

synchronizing means for controlling the movements of said conveying means, filling station and fusing station to fill the chambers of said building blocks with said particles of



thermoplastic synthetic material and then fuse said particles together.

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**4,295,811**

## APPARATUS FOR MAKING MULTILAYERED CONTAINERS

**Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 608,177, Aug. 27, 1975, which is a division of Ser. No. 448,191, Mar. 5, 1974, abandoned. This application Jul. 19, 1979, Ser. No. 58,781**

**Int. Cl.³ B29C** *17/07*

**U.S. Cl. 425—112** **5 Claims**




1. In apparatus for forming a hollow multilayered thermoplastic article using a normally closed blow slot equipped core rod having a porous metal section incorporated into a forward outer surface portion thereof and wherein an internal fluid passageway longitudinally extends from a rear portion of said core rod to each of said blow slot and said porous metal section, said apparatus additionally including liner loading station means for loading a liner over said core rod, injection mold station means for forming a parison over said liner on said core rod to form a multilayered preform, blow mold station means for blow molding said preform on said core rod to form a blown article, blown article removal station means for removing said blown article from said core rod, core rod transfer means including rotary means and coacting stationary means for relatively moving said core rod between said liner loading station means, said injection mold station means, said blow mold station means and said removal station means, and control means for operating said core rod transfer means, said liner loading station means, said injection mold station means, said blow mold station means, and said blown article removal station means for producing a hollow multilayered thermoplastic article by injection blow molding, the improvement which comprises:

(A) means for opening and then closing said blow slot when said core rod is located functionally adjacent said blow station means,
(B) first detachable connection means, located at said liner loading station means, for connecting said internal fluid passageway with a vacuum source,
(C) second detachable connection means located at said blow mold station means for connecting said internal fluid passageway with a pressurized fluid source,
(D) means to effectuate connection between said first detachable connection means and said internal passageway when said rotary means has moved said core rods into position at said liner loading station and between said second detachable connection means and said internal passageway when said rotary means has moved said core rods into position at said blow mold station means, and
(E) valve means associated with said rotary means for closing said internal fluid passageway to maintain a vacuum in said liner loaded core rod during the period when (a) said internal fluid passageway is detached from said first detachable connection means, (b) said rotary means is advanced first to said injection mold station means and then to said blow mold station means, and (c) said second detatchable connection means is so connected with said internal fluid passageway.

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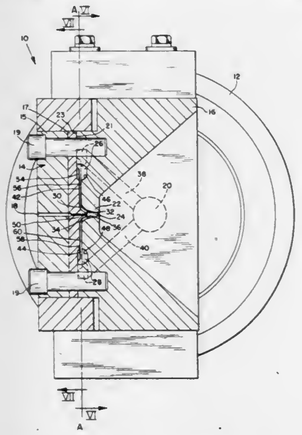
**4,295,812**
**RIBBON CABLE EXTRUSION CROSSHEAD**
**David C. Hoddinott, Preston, Conn., assignor to Crompton & Knowles Corporation, New York, N.Y.**
**Filed Jun. 18, 1980, Ser. No. 160,416**
**Int. Cl.³ B29F *3/10***
**U.S. Cl. 425—114** **8 Claims**



1. An extrusion crosshead for encapsulating a sheet of parallel co-planar conductor wires with plastic insulating material, said extrusion head comprising:
(a) an extrusion die having a plurality of interconnected extrusion passages dimensioned to accommodate the sheet of conductor wires, each extrusion passage having an inlet opening to receive a conductor wire;
(b) a guide-block having a plurality of holes axially aligned with the die passages for receiving the wires and guiding the wires to the die;
(c) an inlet bore for receiving plasticized insulating material from an extruder, the longitudinal axis of said bore being at an angle to the longitudinal axes of the extrusion passages extending through the die;
(d) an elongated top distribution channel extending above the full width of said sheet and having a longitudinal axis that is transverse to the longitudinal axes of the extrusion passages, said top distribution channel having an inlet opening at one end and an elongated outlet opening that extends at a downward angle from the inlet opening to the opposite end of the top distribution channel, the cross-sectional area of said top distribution channel gradually diminishing from the inlet opening to the opposite end thereof;
(e) an elongated bottom distribution channel extending below the full width of said sheet and having a longitudinal axis that is transverse to the longitudinal axes of the extrusion passages, said bottom distribution channel having an inlet opening at one end and an elongated outlet opening that extends at an upward angle from the inlet opening to the opposite end of the bottom distribution channel, the cross-sectional area of the bottom distribution channel gradually diminishing from the inlet opening to the opposite end thereof;
(f) an upper flow channel located above the full width of said sheet and having an inlet opening and an outlet opening that is connected to the inlet openings of the die passages;
(g) a lower flow channel located below the full width of said sheet and having an inlet opening and an outlet opening that is connected to the inlet openings of the die passages;
(h) a top feed bore connecting the inlet bore to the inlet opening of the top distribution channel;
(i) a bottom feed bore connecting the inlet bore to the inlet opening of the bottom distribution channel;
(j) a top flow compensating passage connecting the outlet opening of the top distribution channel to the inlet opening of the upper flow channel; and
(k) a bottom flow compensating passage connecting the outlet opening of the bottom distribution channel to the inlet opening of the lower flow channel.

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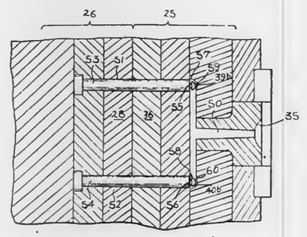
**4,295,813**
**APPARATUS FOR MOLDING STRAND-MOUNTED PLASTIC MEMBERS**
**Irving Levine, 23555 Park Belmonte, Calabassas Park, Calif.**
**Filed Oct. 1, 1973, Ser. No. 401,979**
**The portion of the term of this patent subsequent to Oct. 20, 1994, has been disclaimed.**
**Int. Cl.³ B29F *1/00***
**U.S. Cl. 425—121** **5 Claims**



4. An apparatus for simultaneously fabricating a plurality of thermoplastic elements on a supporting string comprising:
(a) a first plate having a first insert, said insert comprising a plurality of parallel pairs of element fabricating members, each pair of element fabricating members including a plurality of aligned element cavities, each element cavity being in communication with an adjacent element cavity by a supporting string channel, all of said support string channels being in alignment with one another, and being adapted to receive the supporting string therein whereby each of said cavities is sealed, a thermoplastic runner channel parallel to and intermediate the support string channels of the pair of element fabricating members, a plurality of thermoplastic subrunner channels depending from and communicating with said thermoplastic runner channels, and gating means for providing communication between said thermoplastic subrunner channels and said bead cavities;
(b) a second plate having a second insert adapted to be forced adjacent said first insert, said second insert having element cavities, support string channels, thermoplastic runner channels and thermoplastic subrunner channels complementary to those disposed in said first insert, and including thermoplastic input means for receiving flowable thermoplastic material, said thermoplastic input means being disposed through said second plate and in communication with said thermoplastic runner channels;
(c) a severing pin secured to said first plate and adapted to be slidably engaged through said second plate in communication with said thermoplastic input means, the terminus of said pin adjacent said thermoplastic input means depending into a first axial member having a predetermined diameter, said first axial member depending into a second axial member having a diameter which is larger than that of said first axial member whereby the thermoplastic disposed in the thermoplastic input means is fractured in the vicinity of said first and second axial members when the first and second plates are separated;
(d) supply means for supplying a pressurized source of flowable thermoplastic, said supply means coupled to said thermoplastic input means;
(e) support string supply means for supplying a source of support string for each of said plurality of element fabricating members; and
(f) means for imposing opposing forces upon said first and second plates whereby the complementary bead cavities, support string channels, thermoplastic runner channels and thermoplastic subrunner channels of said first and second inserts are adjacent one another.

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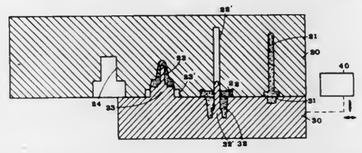
**4,295,814**
**METHOD AND APPARATUS FOR PRODUCING AND ASSEMBLING ARTICLES OF MOLDED PLASTIC PARTS**
**Peretz Rosenberg, Moshav Beit Shearim, Israel**
**Filed Jun. 27, 1979, Ser. No. 52,504**
**Claims priority, application Israel, Feb. 28, 1979, 56761**
**Int. Cl.³ B29C *24/00***
**U.S. Cl. 425—517** **6 Claims**



1. Apparatus for producing articles constituted of at least two plastic parts, characterized in that the apparatus includes: a pair of mold plates one overlying the other; means for effecting relative movement between said pair of mold plates towards and away from each other to close and open them; each of said pair of mold plates including at least two forming surfaces defining, in one closed position of the plates during a molding stroke of the apparatus, at least two cavities having shapes corresponding to the parts of the article, with one plate of said pair adapted to retain one of the molded parts and the other plate of said pair adapted to retain the other part when the pair of plates are open, the two forming surfaces of each plate of said pair being laterally spaced from each other; and means for effecting relative movement between said pair of plates in the lateral direction to align the two parts retained thereby in the open position of the pair of plates, such that in a subsequent closing of the pair of plates during an assembling stroke of the apparatus, the part retained by one plate of said pair is applied to the part retained by the other plate of said pair.



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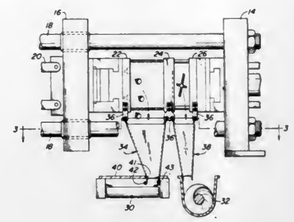
**4,295,815**
**GUIDE SKIRT**
**Frank Eltvedt, 5 Lake Dr., Lake In The Hills, Ill. 60102**
**Filed Jul. 21, 1980, Ser. No. 170,847**
**Int. Cl.³ B29F *1/14***
**U.S. Cl. 425—556** **18 Claims**



1. Apparatus for producing parts and for ejecting said parts from an ejection location, comprising
receptacle means mounted below said ejection location, and
a generally tubular, limp flexible skirt mounted to said apparatus with a top opening disposed below and in proximity to said ejection location and with a bottom opening opening into said receptacle.

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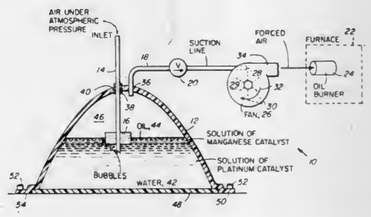
**4,295,816**
**CATALYST DELIVERY SYSTEM**
**B. Joel Robinson, 501 Boylston St., Brookline, Mass. 02146**
**Continuation of Ser. No. 862,411, Dec. 20, 1977, abandoned. This application Jun. 27, 1980, Ser. No. 163,865**
**Int. Cl.³ F23J *7/00***
**U.S. Cl. 431—4** **6 Claims**



1. A system for the delivery of a catalyst containing not more than 9 mg of a platinum group metal per kg of fuel to a combustion system having an intake port for air comprising:
means for dispensing said catalyst in a liquid; and
means for passing a portion of said air via said liquid for absorbing said catalyst into said air.

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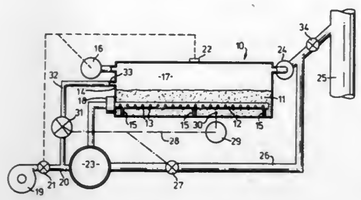
**4,295,817**
**METHOD AND MEANS FOR CONTROLLING THE OPERATION OF FLUIDIZED BED COMBUSTION APPARATUS**
**Peter B. Caplin, Sunbury-on-Thames, and Maurice Harman, Milton Keynes, both of England, assignors to The Energy Equipment Co. Ltd., Olney, England**
**Filed Jul. 31, 1979, Ser. No. 62,340**
**Claims priority, application United Kingdom, Aug. 4, 1978, 32214/78; Dec. 11, 1978, 48028/78**
**Int. Cl.³ F23D *19/02***
**U.S. Cl. 431—7** **21 Claims**

1. A fluidised bed combustion apparatus comprising means for supplying fuel to said fluidized bed, means for injecting combustion air into the fluidised bed of the apparatus to cause fluidisation of the bed material and to support combustion of

fuel fed to the bed, means for measuring at least one of the temperature of the bed and the thermal demand placed upon the apparatus, means for augmenting said supply of combustion air, prior to its injection into the fluidised bed with waste



gas drawn from a waste gas outlet of the apparatus, said augmenting means being operable to enable the volume of waste gas mixed with the combustion air to be varied in dependence upon at least one of the temperature of the fluidised bed and the thermal demand placed on the apparatus.

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**4,295,818**

## CATALYTIC MONOLITH AND METHOD OF ITS FORMULATION

**Meredith J. Angwin, Palo Alto, Calif.; William C. Pfefferle, Middletown, N.J., and John P. Kesselring, Mountain View, Calif., assignors to United States of America, Washington, D.C.**

**Filed May 27, 1980, Ser. No. 153,056**
**Int. Cl.³ F23D** *3/40;* **B01J** *23/10, 23/74, 35/04*
**U.S. Cl. 431—7** **9 Claims**

1. A monolithic catalytic structure formed by the steps of homogeneously interspersing throughout a carrier structure of ceramic composition a base metal oxide which upon calcination becomes catalytically active, forming the ceramic composition interspersed with the oxide into the shape of a monolithic structure, and calcining the shaped structure with the interspersed metal oxide at a temperature of at least about 1,000° C.

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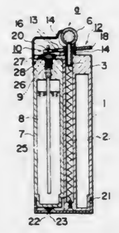
**4,295,819**

## GAS LIGHTER

**Goro Sugiyama, No. 17-5, 5-chome, Toro, Shizuoka-shi, Shizuoka-ken, Japan**

**Filed Aug. 11, 1978, Ser. No. 932,960**
**Claims priority, application Japan, Aug. 12, 1977, 52-108314**[U]; Mar. 31, 1978, 53-43218[U]
**Int. Cl.³ F23Q** *2/00*
**U.S. Cl. 431—143** **2 Claims**



1. A gas lighter comprising:

(a) a body having a tooth-like support portion on an upper portion thereof and an ignition portion disposed on another upper portion thereof,

(i) said ignition portion comprising a projecting cylinder having a slantly stepped portion on either side thereof and containing a recessed portion, a flint disposed in said cylinder and partially projecting therefrom, and an ignition file,

(b) a bomb filled in its interior with a gas-evolving liquid detachably secured to said body,

(ii) said bomb being provided with a nozzle for discharging vaporized gas and a rotatably adjustable valve means communicating said interior with said nozzle, said nozzle being normally biased in a downward position whereby said valve means is closed,

(c) a member adapted to engage said nozzle for raising the same to thereby open said valve,

(iii) said member comprising a lever having a longitudinal hole on its intermediate portion and flanges on either side of said hole, said flanges being adapted to engage and recessed portions, said projecting cylinder thereby projecting through said hole, one end of said lever slidingly engaging said nozzle, and

(d) a flame-adjusting member comprising a rotatable tooth form portion fixed to said valve means and engaging said tooth-like support portion, whereby rotation of said bomb causes adjustment of said valve.

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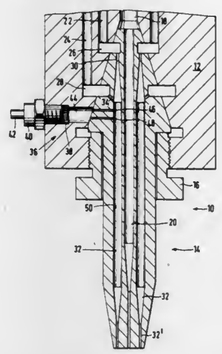
**4,295,820**

## GAS BLENDING FLAME CUTTER

**Georg Röeder, and Helmut Sachs, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 29, 1979, Ser. No. 25,287**
**Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819132**
**Int. Cl.³ H01M** *6/18;* **F23Q** *7/06*
**U.S. Cl. 431—191** **8 Claims**



1. A gas-mixture flame cutter comprising a cutting torch having a torch head, a cutting nozzle detachably engaged to said torch head, said cutting nozzle having an upstream end and a downstream end, a cutting oxygen channel extending through said torch head and through said cutting nozzle and terminating at said downstream end of said cutting nozzle, a plurality of spaced combustible mixture blend passages in said cutting nozzle and terminating at said downstream end of said cutting nozzle adjacent said cutting oxygen channel whereby said cutting oxygen channel and said blend passages are exposed at said downstream end of said cutting nozzle, heating oxygen passage means in said torch head communicating with said blend passages for supplying heating oxygen to said blend passages, fuel gas passage means in said torch head communicating with said blend passages for supplying fuel gas to said blend passages, one of said blend passages being an ignition blend passage, an ignition device being in flow communication with said ignition blend passage at said upstream end of said cutting nozzle, and the remaining blend passages being out of flow communication with said ignition device whereby actuation of said ignition device causes the combustible mixture in said ignition blend passage to ignite and to be extinguished after igniting the combustible mixture exiting from said remaining blend passages with the ignited combustible mixture from said remaining blend passages then re-igniting the combustible mixture from said ignition blend passage.



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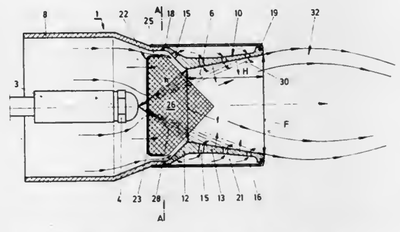
**4,295,821**

## APPARATUS FOR BURNING LIQUID FUEL

**Siegfried Schilling, Volketswil, Switzerland, assignor to Oertli AG Dubendorf, Zurich, Switzerland**

**Filed Aug. 21, 1979, Ser. No. 68,404**
**Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836534**
**Int. Cl.³ F23D** *15/02*
**U.S. Cl. 431—353** **5 Claims**



1. A liquid fuel burner particularly suited for low rates of fuel combustion, comprising an atomizer nozzle having a mouth at its front from which liquid fuel issues as a spray that is mainly in the form of a forwardly divergent cone of droplets substantially coaxial with said nozzle, and a combustion air duct through which combustion air flows forward to be mixed and combusted with the sprayed fuel, said fuel burner being characterized by:

A. an annular flame holder coaxial with the nozzle and spaced a small distance forward from it, having a central aperture through which substantially all of said spray passes;

B. a duct-like fuel vaporizer defining a zone in which combustion takes place, said fuel vaporizer being substantially concentric to the nozzle, spaced a small distance forward from said flame holder and

(1) having a forwardly convergent inlet section,

(2) having a diffuser section which extends forwardly from said inlet section and which has an inner surface that diverges forwardly and is so spaced from the mouth of the nozzle that between about 20% and about 40% of said spray can impact the same,

(3) being of a material that conducts heat readily so as to be quickly heated by combustion in said zone to a temperature at which spray droplets impacting said surface are vaporized, and

(4) being supported by said combustion air duct in thermally insulated relation thereto; and

C. said combustion air duct having a portion connected with the inlet section of the fuel vaporizer and coaxially surrounding the flame holder in radially spaced relation thereto to cooperate with the periphery of the flame holder in defining an annular passage, said portion of the combustion air duct thus constraining all combustion air from said combustion air duct to enter the inlet section of the fuel vaporizer, part of such air through said central aperture in the flame holder and the remainder through said annular passage.

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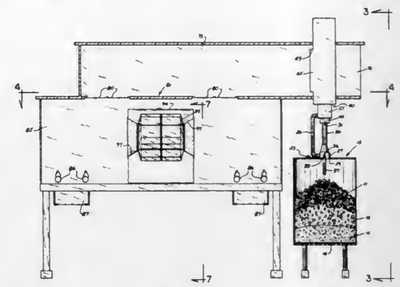
**4,295,822**

## PRODUCER GAS FUELED BURNER SYSTEM AND DRYING APPARATUS

**Crom B. Campbell, 222 Glenview Dr., Des Moines, Iowa 50312**

**Filed Oct. 1, 1979, Ser. No. 80,207**
**Int. Cl.³ F24H** *1/00*
**U.S. Cl. 432—29** **38 Claims**



1. In combination with a gas producer, said gas producer being suitable for generating a combustible producer gas from the combustion of organic materials, said combustible producer gas comprising a producer gas flow traveling through a portion of said organic materials, said producer gas flow including distillates which distill out of said organic materials and comprising a producer gas/distillate flow, said distillates have a condensation temperature, comprising:

a burner means for combustion of said combustible producer gases externally disposed with respect to said gas producer; and

a burner throat means for providing fluid communication with and disposed between said producer and said burner means, said burner throat means carrying said producer gas/distillate flow from said producer to said burner means, said burner throat means including a superheating means for superheating said producer gas/distillate flow to a superheated temperature, said superheated temperature being above said condensation temperature, said superheated producer gas/distillate flow having a temperature above said condensation temperature while flowing through said burner throat means.

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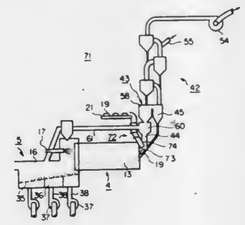
**4,295,823**

## APPARATUS FOR CONTINUOUSLY PRODUCING A CEMENT CLINKER

**Tadashi Ogawa, Ichikawa; Shunichiro Ono, Musashino, and Kyoichi Shibuya, Narashino, all of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan**

**Filed Mar. 27, 1980, Ser. No. 134,461**
**Claims priority, application Japan, Apr. 3, 1979, 54-39337**
**Int. Cl.³ F27B** *7/02*
**U.S. Cl. 432—106** **9 Claims**



1. An improved apparatus for continuously producing a cement clinker, comprising:

means for feeding a cement material;
means for preheating or calcining said cement material, which means is located downstream from said feeding means and is provided with a preheating or calcining chamber therein;
a rotary kiln for converting said cement material to a cement clinker, which kiln is located downstream from said preheating or calcining means, said kiln comprising a heating chamber connected to said preheating or calcining means;
means for cooling said cement clinker with air, which means is located downstream from said rotary kiln and comprises a cooling chamber connected to said heating chamber and air-blowing means connected to a lower portion of said cooling chamber, and;
means for flowing an exhaust gas from said heating chamber through said preheating or calcining chamber, which apparatus is characterized by means for heat-decomposing a combustible material, which means is located between said preheating or calcining means and said rotary kiln and which means is provided with a heat-decomposing chamber which is connected to means for feeding said combustible material so that said combustible material is allowed to be fed into said heat-decomposing chamber, which heat-decomposing chamber is connected to said heating chamber in said rotary kiln in such a manner that at least a portion of the exhaust gas from said heating chamber is allowed to flow into said heat-decomposing chamber and a solid residue produced from said combustible material in said heat-decomposing chamber is allowed to be introduced into said heating chamber, and which heat-decomposing chamber is connected to said pre-heating or calcining chamber so that a combustible gas generated from said combustible material in said heat-decomposing chamber is allowed to flow into said preheating or calcining chamber.

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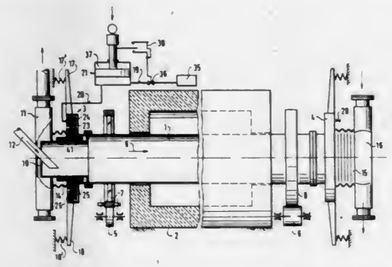
**4,295,824**
**SYSTEM FOR SEALING OF KILNS**
**Johannes C. Wens, Nijmegen, Netherlands, assignor to Smit Ovens Nijmegen B.V., Nijmegen, Netherlands**
**Filed Oct. 17, 1979, Ser. No. 85,526**
**Claims priority, application Fed. Rep. of Germany, Oct. 25, 1978, 2846387**
**Int. Cl.³ F27B** *7/24;* **F27D** *1/18;* **F26B** *25/00*
**U.S. Cl. 432—115** **9 Claims**



1. In a rotating furnace, an internal rotating means carrying parts subjected to heat and internal gases, an outer supporting stationary means supporting the inner rotating means, a sealing assembly means for limiting the leakage of gas and heat from said rotating means, said sealing assembly means comprising: at least one outer sealing sleeve positioned for sealing engagement between said rotating means and said stationary means, means for delivering a barrier gas under pressure to urge said sealing sleeve by pressure contact into said sealing engagement, and an intermediate bearing ring between said internal rotating means and said outer supporting means for absorbing the compression pressure forces therebetween and for acting as a spacer ring between said rotating and stationary means, said intermediate ring sealing a portion of said internal gas from flowing to said outer sealing sleeve.

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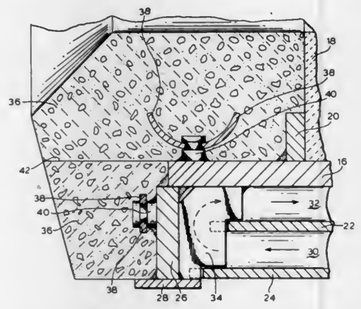
**4,295,825**
**SYSTEM FOR THE PROTECTION OF THE DELIVERY END OF A ROTARY KILN**
**Alain Chielens, Marcq en Baroeul, and Bernard Boussekey, Lille, both of France, assignors to Fives-Cail Babcock, Paris, France**
**Filed Dec. 4, 1979, Ser. No. 100,239**
**Claims priority, application France, Dec. 7, 1978, 78 34456**
**Int. Cl.³ F27B** *7/38*
**U.S. Cl. 432—116** **8 Claims**



1. A tubular rotary kiln having a discharge end and comprising
(a) metal shell having an internal and an external surface, the metal shell terminating in an end adjacent the discharge end,
(b) a refractory lining covering the internal shell surface up to a distance from the shell end and leaving a remaining portion of the internal shell surface uncovered,
(c) a flange fastened to the shell end at the discharge end of the kiln and extending radially outwardly from the shell, the flange having a front face and a rear face,
(d) a discharge end protective device including a refractory concrete ring covering the uncovered portion of the internal shell surface and the front face of the flange, the refractory concrete ring being anchored to the shell and to the flange, and
(e) means for circulating cooling air along the rear face of the flange and the external shell surface.

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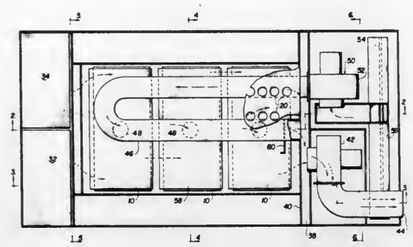
**4,295,826**
**INFRARED DRYER**
**Michael Vasilantone, 34 Columbia Rd., Somerville, N.J. 08876**
**Filed Jun. 20, 1980, Ser. No. 161,488**
**Int. Cl.³ F27B** *17/00;* **F26B** *19/00*
**U.S. Cl. 432—185** **28 Claims**

1. A heating device comprising:
(a) a heating chamber in which objects are to be exposed to heat;
(b) at least one heater in said heating chamber;
(c) a first air trough disposed above said heating chamber;
(d) first means of fluid communication for communicating effluent air from said heating chamber to said first air trough;
(e) a second air trough disposed above said first air trough, extending along the upper surface or cover of the heating device, and serving to continually cool the upper surface or cover of the heating device;
(f) a header disposed above said heating chamber, said header being ported to permit air from said header to be directed onto the objects to be exposed to heat; and



(g) second means for recirculating air from said heating chamber into said header.

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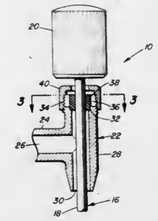
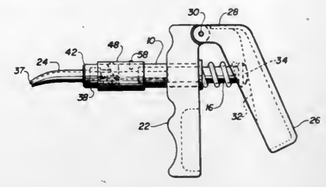
**4,295,827**
**ENDODONTIC FLOW THROUGH ULTRASONIC INSTRUMENT HOLDER ATTACHMENT**
**Howard Martin, 909 Pershing Dr., Silver Spring, Md. 20907, and James P. Norris, 1207 Frederick Rd., Catonsville, Md. 21228**
**Filed Dec. 31, 1979, Ser. No. 108,969**
**Int. Cl.³ A61C** *5/02*
**U.S. Cl. 433—81** **12 Claims**



1. In combination, an endodontic instrument, an ultrasonic transducer device, a holder attachment for said instrument and ultrasonic transducer device, and an instrument locking means, said holder attachment consisting of a first hollow tube-like member and a second hollow tube-like member, said first and second hollow tube-like members being permissively and selectively capable of being set at any one of a plurality of angular relationships to each other, said ultrasonic transducer being coupled to one end of said first hollow tube-like member and with the opposite end of said first hollow tube-like member being coupled and affixed to said second hollow tube-like member at one selected position of said plurality of angular relationships, the interior of said first hollow tube-like member communicating with the interior of said second hollow-tube-like member, said instrument locking means being coupled to one end of said second hollow tube-like member, said endodontic instrument being mounted in said instrument locking means, the opposite end of said second hollow tube-like member being open for passing said endodontic instrument therethrough, said opposite end of said second hollow tube-like member also being open for passing a solution therethrough as and when received from said first hollow tube-like member.

**4,295,828**
**EJECTOR HOLDER FOR SYRINGE-TYPE CARTRIDGE**
**Helmut Rudler, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.**
**Filed Sep. 25, 1980, Ser. No. 190,681**
**Int. Cl.³ A61C** *5/04*
**U.S. Cl. 433—90** **6 Claims**



1. A manually-operable ejector holder for a loaded syringe-type cartridge provided with an annular collar on one end and a discharge tip on the other, said holder comprising in combination, an elongated barrel, a plunger reciprocable therein and one end thereof projecting beyond one end of said barrel, manually engageable means on said one end of said barrel operable to reciprocate said plunger toward and from the other end of said barrel, said other end of said barrel having a curved transverse recess positioned and operable to receive a portion of said collar on said cartridge, a locking member having one end pivotally connected to said barrel and also having a curved transverse recess complementary to said opposite recess in said other end of said barrel and operable to receive an opposite portion of said collar on said cartridge, and a securing member slidable over said locking member and along the other end of said barrel to releasably connect said cartridge to said holder and the other end of said plunger being slidable toward said cartridge in axial alignment with said collar of said cartridge to penetrate said cartridge and effect discharge to the contents thereof.

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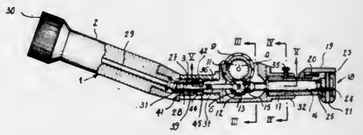
**4,295,829**
**TOOL HOLDER**
**Claude Martinelli, and Marcelle Martinelli epouse Boisson, both of 5, Place du Marche, Gracay, France (18310)**
**Filed Jul. 17, 1979, Ser. No. 58,379**
**Claims priority, application France, Aug. 8, 1978, 78 23369**
**Int. Cl.³ A61C** *1/02;* **B25G** *3/00*
**U.S. Cl. 433—99** **18 Claims**



1. A tool holder for holding a tool, said tool holder having a bent handle and having first and second ends; said holder comprising:
(a) a head comprising means for receiving said tool, said head being arranged at said first end of said tool holder;
(b) an operating knob arranged intermediate said first and second ends, said operating knob being operatively associated with said head whereby rotation of said operating knob results in movement of said tool;
(c) securing means for securing said head to said holder in a fixed angular position relative thereto, and whereby the angular position of said head is adjustable relative to said handle;
(d) an auxiliary operating knob arranged at the second end of said holder on said handle, said auxiliary operating knob

being operatively associated with said head whereby rotation of said auxiliary operating knob results in movement of said tool; and

(e) a multiplier system for providing the desired magnitude of movement to said tool in response to movement of said operating knob.

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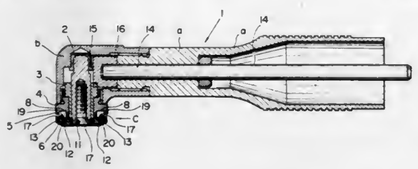
**4,295,830**

## MOTORIZED DENTAL HANDPIECE

**Sakae Uchida, Machida, Japan, assignor to Setagayaseiki Co. Ltd., Tokyo, Japan**

**Filed Mar. 26, 1980, Ser. No. 134,254**
**Claims priority, application Japan, Nov. 14, 1979, 54/147493**
**Int. Cl.³ A61C *1/12***
**U.S. Cl. 433—115** **3 Claims**



1. A motorized dental handpiece having a head and a head cap portion connectable therewith, said head cap portion comprising:

a head gear shaft including a threaded section;

a head gear rotatable with said head gear shaft;

a head cap having a threaded section;

a flange rotatable with said head gear shaft, said flange including a threaded section cooperable with said threaded section of said head gear shaft;

a seal ring positionable between said head cap and said flange, said head cap being provided with a circumferentially extending groove in the axially outer peripheral surface thereof for reception of the axially inner portion of said seal ring, said flange being provided on the axially inner surface thereof with a circumferentially extending guide groove for reception of the axially outer portion of said seal ring, said seal ring having a V-shaped groove formed in the outer peripheral surface thereof and thereby forming radially inner and outer circumferentially extending edges, said edges being engageable with opposing surfaces of said flange, a wall of said seal ring proximate said radially inner edge thereof being at least coextensive and engageable with the radially inner wall of said guide groove, said regions of engagement thereby providing a plurality of circumferential seals preventing the admission of water and dust to the interior of said cap portion;

said head gear shaft, head cap, seal ring and flange constituting releasably connected members of a unitary head cap portion assembly, said cap portion assembly being releasably connectable to the head of the handpiece, said threaded section of said head cap being cooperable with a threaded section on the head of the handpiece for releasably connecting said unitary assembly thereto.

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**4,295,831**

## COMPUTER PROGRAMMING TRAINING DEVICE

**Frederick C. Matt, 1566 Campus Dr., Maple Glen, Pa. 19002**

**Filed Apr. 16, 1979, Ser. No. 30,321**
**Int. Cl.³ G09B *19/00***
**U.S. Cl. 434—118** **10 Claims**

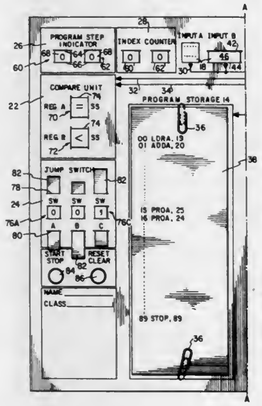
1. A computer programming training device for teaching an operator the fundamentals of computer programming and operation, said device being operated by the operator to duplicate the physical functions performed by a programmable computer, said device comprising:

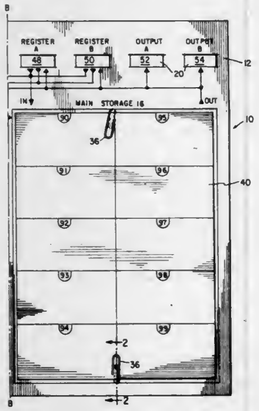
a base member serving as a console for said device;

a substantially planar program storage member mounted on said base member to be detachable as a unit, said program storage member having a plurality of storage compartments each bearing a unique address identification, each compartment having written therein a word comprising a step in a program to be executed by the operator in simulating the operation of a programmed computer, said program storage member being adapted to contain the entire program to be executed;

means on said base member for detachably receiving said program storage member;

a program step indicator on said main member, said program step indicator including means adjustable by the operator to display a number corresponding to the address of the storage compartment which contains a particular program step concurrently with the execution of said program step;




a substantially planar main storage member mounted on said base member, said main storage member having a plurality of storage compartments each bearing a unique address which is different from any address borne by a compartment of said program storage member, the operator providing intercommunication between said program storage member and said main storage member so that, upon instruction by one of the program steps in a compartment of said program storage member, data from a compartment of one thereof may be transferred and written into a compartment of the other;



means on said base member for receiving said main storage member;

input means on said base member for receiving data from the operator, said data being written by the operator directly into one of the compartments of said main storage member upon instruction by one of the program steps stored in a compartment of said program storage member;

output means for receiving data directly from a compartment of said main storage member, said output means including means for receiving data, said data being copied by the operator from said main storage means upon instruction from a program step stored on said program storage member; and

operational register means on said base member for storing data, the operator providing intercommunications between said register means and said main storage member so that, upon instructions by a program step stored on said program stored means, data from said register means is written into a prescribed compartment of said main storage member and data from prescribed compartment of said main storage member may be provided to said register means.

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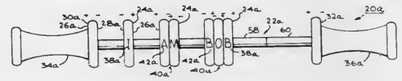
**4,295,832**

## EDUCATIONAL TOY

**Manuel L. Karell, 17925 Devonshire, Apt. 21, Northridge, Calif. 91325**

**Filed Nov. 5, 1979, Ser. No. 91,586**
**Int. Cl.³ G09B *1/06***
**U.S. Cl. 434—168** **5 Claims**




1. A novel educational toy comprising in combination:

a. an elongated support rod;

b. a plurality of separate magnetic members slideably received on said rod, each said member having a pair of opposite sides of opposite magnetic polarity, said members being mutually magnetically attracted into separate groups on said rod, said groups being mutually magnetically repelled from each other so as to be spaced along said rod;

c. wherein some of said members bear identifying indicia;

d. wherein members of each of said groups collectively provide a separate distinctive group indicium; and

e. wherein said indicia are letters of the alphabet.

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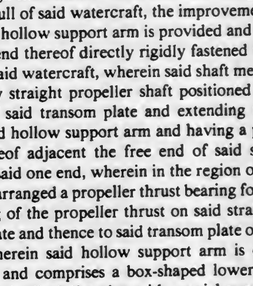
**4,295,833**

## INBOARD-OUTBOARD DRIVING MECHANISM INCLUDING A HYDRAULICALLY ASSISTED STEERING SYSTEM

**Gaylord M. Borst, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Oct. 23, 1978, Ser. No. 953,566**
**Int. Cl.³ B63H *1/14, 5/06, 25/42***
**U.S. Cl. 440—63** **9 Claims**

1. An inboard-outboard driving mechanism for a boat, said mechanism including a support adapted to be fixed relative to a boat hull, a propulsion leg including a rotatably mounted propeller, means connecting said propulsion leg to said support for pivotal steering movement about a steering axis, and means for causing pivotal steering movement of said propulsion leg including a steering shaft having a second axis transverse to said steering axis and rotatably journaled in said support, means connecting said steering shaft and said propulsion leg for pivoting said propulsion leg in response to rotation of said steering shaft, a lever mounted for pivotal movement about an axis transverse to said steering axis and having a first end and a second end, gear means connecting said first end of said lever and said steering shaft and operable, in response to rotation of said lever, to rotate said steering shaft at an angular rate greater than the rate of rotation of said lever, a fluid motor connected



to said second end of said lever, and means for actuating said fluid motor to cause pivotal movement of said lever.

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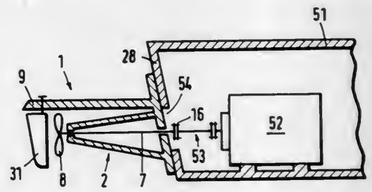
**4,295,834**

## DRIVE MECHANISM FOR A WATERCRAFT WITH A SURFACE PROPELLER

**Fabio Buzzi, Annone Brianza Como, and Sergio Carniti, Oggiono Como, both of Italy, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany**

**Filed Jul. 17, 1979, Ser. No. 58,168**
**Claims priority, application Italy, Jul. 18, 1978, 25840 A/78**
**Int. Cl.³ B63H *5/16***
**U.S. Cl. 440—76** **14 Claims**



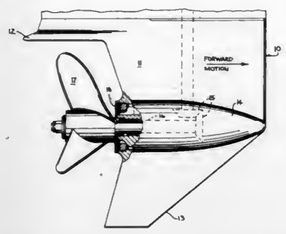

1. In a drive mechanism for a watercraft having a surface propeller rotatingly driven by a drive motor arranged inboard thereof through shaft means which extends through a transom plate on the hull of said watercraft, the improvement comprising wherein a hollow support arm is provided and has a flange plate on one end thereof directly rigidly fastened to said transom plate of said watercraft, wherein said shaft means includes a substantially straight propeller shaft positioned on the outboard side of said transom plate and extending through the interior of said hollow support arm and having a propeller on one end thereof adjacent the free end of said support arm remote from said one end, wherein in the region of said flange plate there is arranged a propeller thrust bearing for facilitating a transmitting of the propeller thrust on said straight shaft to said flange plate and thence to said transom plate of said watercraft, and wherein said hollow support arm is of a unitary construction, and comprises a box-shaped lower part which extends in longitudinal direction with coaxial openings therein to facilitate the support of said propeller shaft therein and of a box-shaped upper part which also extends in longitudinal direction and is provided thereabove, which upper part is designed as a cavitation plate and projects at its rear end beyond the lower part, and wherein rib means are provided for connecting said upper and lower parts together, said rib means extending in longitudinal direction and on the front end thereof merging into said flange plate.

**4,295,835**

## HIGH SPEED OUTBOARD DRIVE UNIT

**Charles W. Mapes, and Richard H. Snyder, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.**

**Filed Oct. 9, 1979, Ser. No. 83,176**
**Int. Cl.³ B63H** *1/14, 5/06, 21/32*
**U.S. Cl. 440—78** **8 Claims**




1. An engine driven outboard drive unit for attachment to a watercraft comprising:
(A) a generally vertical housing;
(B) a generally vertical drive shaft journalled for rotation within said housing and driven by said engine;
(C) a generally horizontal propeller shaft driven by the lower end of said drive shaft;
(D) a propeller mounted on the aft end of said propeller shaft;
(E) a streamlined torpedo of generally cylindrical shape fixed to the lower end of said housing with said propeller shaft journalled for rotation within said torpedo forward of said propeller, said torpedo comprising an engine exhaust passage for discharging exhaust gases through the plane of said propeller; and
(F) an annular projection substantially encircling the aft end of said torpedo to prevent blowout at high speeds.

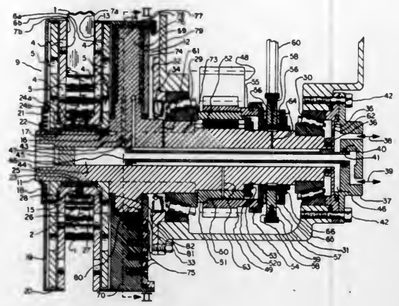
**4,295,836**

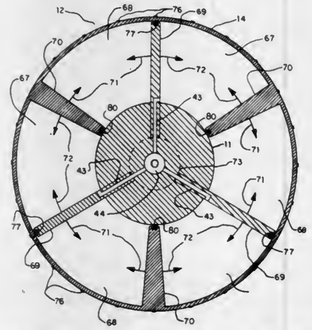
## FLAT BELT TRANSMISSION WITH ROTARY ACTUATOR AND INTEGRATED CONTROL SYSTEM

**Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, Ariz. 85282**

**Filed Jun. 1, 1979, Ser. No. 44,747**
**Int. Cl.³ F16H** *11/02, 55/54*
**U.S. Cl. 474—51** **6 Claims**

1. A variable diameter pulley comprising two spaced, axially fixed sheaves, each having an inner and outer rotatable disc, said inner discs being rigidly interconnected and said outer discs being rigidly interconnected, means in said inner and outer discs defining oppositely angled, intersecting guideways, and drive elements having means for movably engaging said guideways at their intersections, said inner and outer rotatable discs including at least one pair of first and second chambers and means for exerting variable fluid pressure within said chambers, whereby, responsive to changes in the differential fluid pressure of said first and second chambers, said inner and outer discs rotate relative to each other for producing a radial shift of position of the intersections of said guideways and their





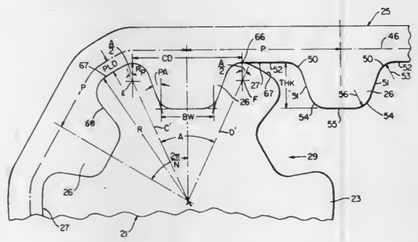
associated drive elements, thereby changing the effective diameter of said pulley.

**4,295,837**

## SYNCHRONOUS BELT DRIVE SYSTEM

**Richard L. Marsh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio**

**Filed Mar. 17, 1980, Ser. No. 130,661**
**Int. Cl.³ F16H** *7/02;* **B21D** *53/28*
**U.S. Cl. 474—153** **20 Claims**



1. In a toothed pulley for use in a synchronous drive power transmission system with a toothed endless power transmission belt made primarily of a polymeric material, the improvement wherein said toothed pulley has an optimum radius for its pulley teeth addendum circle having a size between the limits of a maximum radius determined by the radius of a circle through the points of a regular polygon having N equal sides and a minimum radius determined by the radius of a circle having N arcs each equal in arcuate length to the length of each side of said polygon.

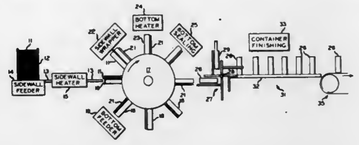


**4,295,838**

## METHOD OF PRODUCING CYLINDRICAL CONTAINERS

**Frank P. Richards, Prairie Village, Kans., and Raymond C. Taylor, Grandview, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 853,651, Nov. 21, 1977, Pat. No. 4,204,462, which is a division of Ser. No. 630,555, Nov. 10, 1975, Pat. No. 4,072,226. This application Dec. 31, 1979, Ser. No. 108,437**
**Int. Cl.³ B31C** *1/06*
**U.S. Cl. 493—105** **6 Claims**




1. A method for forming a tubular container, said method comprising:
forming a closure blank into a closure member having a desired shape;
maintaining said closure member adjacent the end of a tubular mandrel;
heating opposing side margins of a sidewall blank having a thermoplastic coating on both sides thereof;
wrapping said sidewall blank around said mandrel to overlap and thermally bond said previously heated opposing side margins and to bring a continuous end of said sidewall blank into contact with a portion of said closure member;
heating said end of said sidewall blank and the adjacent portion of said closure member;
rolling said end of said sidewall blank and the adjacent portion of said closure member together to seal said closure member to said sidewall blank to form a container;
removing said container from said mandrel;
successively advancing individual containers of a series of open-topped containers so removed to a container finishing station;
gripping a bottom portion of the container located at said finishing station;
finishing the thus gripped container by altering the configuration of the open container top while said bottom portion is so gripped;
releasing said bottom portion upon completion of the finishing of said container; and
removing the thus released container from said finishing station.

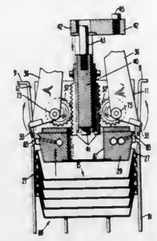
**4,295,839**

## METHOD AND APPARATUS FOR FORMING A FLANGED TRAY

**Thomas R. Baker, and Peter C. Collura, both of Los Altos, Calif., assignors to Kliklok Corporation, Greenwich, Conn.**

**Filed Jul. 6, 1979, Ser. No. 55,050**
**Int. Cl.³ B31B** *1/48*
**U.S. Cl. 493—143** **16 Claims**

1. A method of forming a tray from a paperboard blank or the like having inherent resiliency, the tray including a base panel, two pairs of wall panels attached to the base panel, panels formed at the corners of the wall panels, and flanges formed along the outer edge of each wall panel, comprising the steps of:
providing adhesive on at least one of each adjacent wall panel and corner panel;
forming said tray wall panels into an erected position;
folding each said corner panel to contact an adjacent wall panel such that the adhesive is in the area of contact;
folding said flanges outwardly and downwardly from said erected tray wall panels into an overbroken position to lie in an acute angle with respect to said wall panels, said flanges being folded through an angle sufficient to overbreak the flanges with respect to said walls such that said folded flanges may relax to a raised, approximately horizontal position when said tray is released;



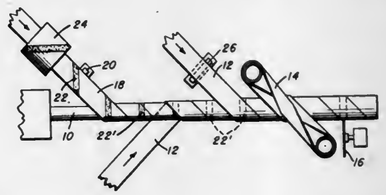
retaining said flanges against the resiliency of the blank in said overbroken position over and in contact with said corner panels to retain said panels in contact with the adjacent wall panels for a time sufficient to allow an adhesive bond to form therebetween; and
releasing said tray to allow upward movement of the flanges to the raised position, whereby a tray is formed with a substantially continuous horizontal flange around the periphery thereof to allow sealing of a cover to the tray.

**4,295,840**

## METHOD OF CONSTRUCTING COMPOSITE CONTAINERS

**Jerry F. Sansbury, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.**

**Division of Ser. No. 865,799, Dec. 30, 1977, Pat. No. 4,158,425. This application Nov. 2, 1978, Ser. No. 957,107**
**Int. Cl.³ B31C** *3/04*
**U.S. Cl. 493—278** **10 Claims**

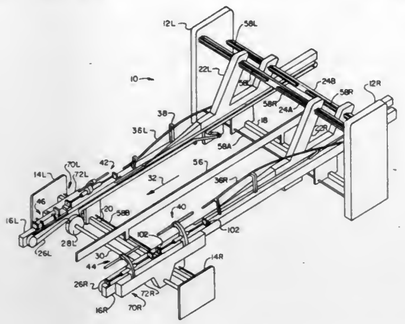


5. A method of forming a lined tubular body of composite construction comprising forming a liner of a tubular configuration with spaced adhesive bands about the exterior thereof, forming a composite tube about said liner, adhesively securing the composite tube to the liner solely by the spaced adhesive bands while retaining the liner, between the spaced adhesive bands, free of attachment to the composite tube and capable of movement relative thereto, and transversely severing the composite tube and liner through each adhesive band to define individual tubular bodies with liners secured solely at the opposed ends thereof.

## 4,295,841
## BOX BLANK FOLDING APPARATUS

Henry D. Ward, Jr., Cockeysville, Md., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Oct. 19, 1979, Ser. No. 86,600
Int. Cl.³ B31B *1/42, 1/54*
U.S. Cl. 493—295 10 Claims



1. Box blank folding apparatus comprising in combination:
advancing means for serially advancing box blanks continuously through said apparatus;
first folding means near an upstream end of said advancing means for folding outer panels of said box blanks to a substantially upright position as said blanks advance through said apparatus,
said first folding means comprising pivotable bar folder means near an upstream end of said advancing means and reciprocable in the direction of travel of said blanks for engaging substantial portions of said outer panels during the advance of said blanks through said apparatus; and
second folding means downstream from said first folding means for folding said outer panels from said upright position to a substantially horizontal position against inner panels of said blanks,
said second folding means comprising pivotable bar folder means reciprocable in the direction of travel of said blanks for engaging substantial portions of said outer panels during the advance of said box blanks through said apparatus.

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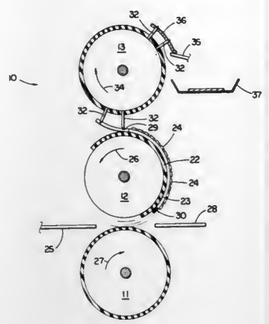
## 4,295,842
## STRIPPING DEVICE FOR REMOVING WASTE SHEET BOARD

Clinton C. Bell, Carmel, Ind., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Dec. 31, 1979, Ser. No. 108,803
Int. Cl.³ B26D *7/18*
U.S. Cl. 493—342 8 Claims

1. In a stripping device for removing waste sheet wedged within the cutting portion of a sheet cutting die rotatable about an axis comprising: a frame; a stripping pin holder rotatably mounted on said frame and having an axis of rotation extending in the same direction and parallel to said axis of said sheet cutting die; a plurality of stripping pins mounted to said stripping pin holder and extending outwardly therefrom, said stripping pins have length and are positionable adjacent said sheet cutting die as said stripping pin holder rotates to extend into said sheet cutting die piercing said waste sheet and removing said waste sheet from said sheet cutting die upon continued rotation of said sheet cutting die and said stripping pin holder; and means operably engaged with said stripping pin holder to rotate said stripping pin holder in synchronization with said sheet cutting die; the improvement comprising: means causing the stripping pins to exert lifting action pressure against said waste sheet, including the radial distance from said stripping pin axis of rotation to the outermost extremity of each said



stripping pin exceeding the radial distance from said sheet cutting die axis of rotation to said sheet cutting die cutting portions.

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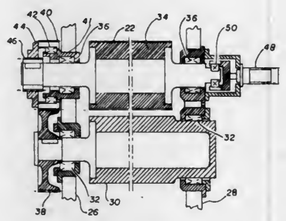
## 4,295,843
## ROTARY DIE CUTTER

Tadao Otomaru, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 108,232
Claims priority, application Japan, Jan. 8, 1979, 54-815
Int. Cl.³ B31B *9/14*
U.S. Cl. 493—354 6 Claims



1. A rotary die cutter comprising:
(a) a knife cylinder having a punching blade on its peripheral surface;
(b) an anvil cylinder positioned adjacent said knife cylinder and arranged to be engaged by said blade for punching a cardboard sheet passing between said cylinders;
(c) first and second meshing gears for driving said cylinders, said first gear being arranged at one end of said knife cylinder and said second gear being arranged at one end of said anvil cylinder;
(d) first and second interengaging helical gears disposed at said one end of said anvil cylinder, said first helical gear being mounted on said anvil cylinder, said second helical gear being connected to said second meshing gear;
(e) mechanism engaging said anvil cylinder for moving said anvil cylinder axially;
(f) said axial movement of said anvil cylinder causing relative axial movement of said helical gears to impart a rotational shift to said anvil cylinder; and
(g) adjusting means engaging one of said helical gears to move said one of said helical gears axially for imparting a further rotational shift to said anvil cylinder.



## 4,295,844
## PROCESS FOR THE THERMAL STABILIZATION OF ACRYLIC FIBERS

Steven B. Warner, Bernardsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,706
Int. Cl.³ D06Q *1/02*
U.S. Cl. 8—115.5 12 Claims

1. An improved process for the thermal stabilization of an acrylic fibrous material selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers containing at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith comprising:
(a) contacting said fibrous material with a dilute solution of aniline and Group IA metal hydroxide which is provided at an elevated temperature for a residence time of approximately 5 to 30 minutes whereby said fibrous material is rendered capable of undergoing thermal stabilization on a more expeditious basis,
(b) removing the excess quantity of said solution adhering to said fibrous material following said contact, and
(c) heating said resulting fibrous material in an oxygen-containing atmosphere at a temperature of approximately 200° to 360° C. until a stabilized fibrous material formed which is black in appearance, retains its original configuration substantially intact and which is non-burning when subjected to an ordinary match flame.

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## 4,295,845
## PRETREATMENT COMPOSITION FOR STAIN REMOVAL

Ralph R. Sepulveda, Suffern, N.Y., and Lynn H. Lander, Harrington Pk., N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 49,774, Jun. 18, 1979. This application May 19, 1980, Ser. No. 151,227
Int. Cl.³ C11D *3/46, 7/26;* D06L *1/02, 1/22*
U.S. Cl. 8—139.1 4 Claims

1. A method for the pre-laundering treatment of stained fabrics comprising contacting said fabric with an active composition containing little or no water and having little tendency to exhibit separation, said composition comprising at least one ester formed of a fatty acid of about eight to about twenty-two carbon atoms chain length, and
(1) an alcohol of one to about four carbon atoms chain length or
(2) a polyalkylene glycol which is a polyethylene or polypropylene glycol; and wherein said ester is a di-ester.

4. A method for the pre-laundering treatment of stained fabrics comprising contacting said stained fabric with an active composition containing little or no water and having little tendency to exhibit separation with an active composition, said composition comprising:
(a) about 25% to about 90% of at least one ester formed of a fatty acid of about eight to about twenty-two carbon atoms chain length, and
(1) an alcohol of one to about four carbon atoms chain length or
(2) a polyalkylene glycol which is a polyethylene or polypropylene glycol; and wherein said ester is a di-ester;
(b) 0 to about 75% of at least one nonionic surface-active agent; and
(c) 0 to about 60% of at least one anionic surface-active agent.

## 4,295,846
## PROCESS FOR THE PRODUCTION OF FORMALDEHYDE-FREE FINISHING AGENTS FOR CELLULOSIC TEXTILES AND THE USE OF SUCH AGENTS

Harro Petersen, Frankenthal, Fed. Rep. of Germany; Panemangalore S. Pai, Charlotte, N.C.; Friedrich Klippel, Ludwigshafen, and Friedrich Reinert, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,409
Int. Cl.³ D06M *13/34*
U.S. Cl. 8—186 2 Claims

1. A process for the production of formaldehyde-free, easy-care finishing agents with a long shelf life for textiles containing or consisting of cellulose on the basis of urea or N,N'-disubstituted ureas and glyoxal, comprising in the first stage of the process, reacting 1 to 1.1 mole of urea or symmetrically disubstituted urea of the general formula I

$$R^1—HNCONH—R^2 \qquad I$$

where
$R^1$ and $R^2$ are $-[(CH_2)_nO]_mR^3$ or hydrogen,
$R^3$ is $C_{1-4}$ alkyl or, if m>O, hydrogen, n is 2 to 4
m is 0 to 10,
for three hours in aqueous solution with 1 mole of glyoxal, in the presence of buffer mixtures sufficient to maintain the pH of the solution between 4 and 6.8, at a temperature of from 20° to 60° C., and, in the second stage, reacting the solution resulting from the first stage, after admixing, with at least 0.5 mole of an alcohol $R^4OH$, where $R^4$ is $[(CH_2)_nO]_mR^3$, where $R^3$, except for hydrogen; m and n are defined above, and an acid, for one to three hours at a pH of between 2 and 4.5 and a temperature of from 30° to 65° C., and finally adjusting the pH of the solution to 4 to 7.

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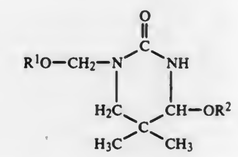
## 4,295,847
## FINISHING PROCESS FOR TEXTILES

Harro Petersen, Frankenthal, Fed. Rep. of Germany; Panemangalore S. Pai, and Manfred Reichert, both of Charlotte, N.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,264
Int. Cl.³ D06M *13/38, 15/38, 15/54, 1/02*
U.S. Cl. 8—189 2 Claims

1. A process for finishing a cellulosic textile which has been pretreated with liquid ammonia, by impregnating the textile with a finishing agent based on an aminoplast intermediate and heating for from 10 seconds to 6 minutes at from 110° to 230° C. in the presence of an acid or latent acid catalyst, wherein the finishing agent employed is a water-soluble compound of the formula III



III

where $R^1$ and $R^2$ independently of one another are hydrogen, methyl, ethyl, propyl or methoxyethyl and $R^2$ may also be the radical of an ethylene oxide and/or propylene oxide polymer chain comprising from 1 to 20 monomer units.

**4,295,848**

## COMPOSITION FOR HAIR DYEING WHICH CONTAINS A PARA BASE AND AN ORTHO BASE

**Jean F. Grollier, Paris; Andree Bugaut, Boulogne-Billancourt; Patrick Andrillon, Aulnay-sous-Bois, and Chantal Fourcadier, Paris, all of France, assignors to L'Oreal, Paris, France**

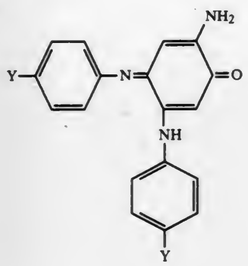
**Division of Ser. No. 27,363, Apr. 5, 1979. This application Oct. 29, 1980, Ser. No. 201,505**

**Claims priority, application France, Apr. 6, 1980, 78 10278**

**Int. Cl.³ C07C** *50/80, 119/12*

**U.S. Cl. 8—421** **4 Claims**

1. A compound of the formula:



(IV)

in which: Y represents

$R'_1$ and $R'_2$ independently of one another denoting an alkyl, mesylaminoalkyl, piperidinoalkyl or hydroxyalkyl group, the alkyl groups containing 1 to 6 carbon atoms, or a cosmetically acceptable salt thereof.

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**4,295,849**

## PROCESS FOR THE PREPARATION OF DYESTUFF FORMULATIONS

**Konrad Nonn; Karlheinz Wolf; Artur Haus, and Reinhold Hörnle, all of Bayer AG, Leverkusen, Fed. Rep. of Germany (D-5090)**

**Filed Mar. 9, 1977, Ser. No. 775,898**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610094**

**Int. Cl.³ C09B** *67/38;* **D06P** *1/645*

**U.S. Cl. 8—524** **7 Claims**

1. Process for the preparation of pulverulent formulations suitable for use in transfer printing, which can be dispersed easily in organic media, of dyestuffs which are sublimable at 100°-230° C., wherein aqueous dispersions of said dyestuffs or aqueous solutions or dispersions of precursors of said dyestuffs are mixed with compounds of the formula

R—Z

wherein

R is $C_{10}$-$C_{20}$-alkyl, and

Z is $NH_2$, $NH(CH_2)_3$—$NH_2$ or OH, converting any of said precursors into the corresponding dyestuffs, and drying the resulting aqueous solution or dispersion into a dry pulverulent product.

**4,295,850**

## COMMERCIAL PREPARATIONS OF DRY ORGANIC SUBSTANCES

**Roland Häberli, Würenlingen; Hans Mollet, Reinach, and Gustaaf Scherer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 14,194, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 846,041, Oct. 27, 1977, abandoned, which is a continuation of Ser. No. 713,556, Aug. 11, 1976, abandoned, which is a continuation of Ser. No. 521,309, Nov. 6, 1974, abandoned. This application May 23, 1980, Ser. No. 152,951**

**Claims priority, application Switzerland, Nov. 13, 1973, 15962/73**

**Int. Cl.³ D06P** *67/02*

**U.S. Cl. 8—524** **6 Claims**

1. Stable dust-free commercial preparations of organic substances, which preparations comprise an organic dyestuff, optical brightener or dyeing auxiliary substance in dry powder form enclosed in a covering having a thickness of 10 to 80μ, said covering forming a sack or bag sealed on all sides, made from polyethylene oxide having a molecular weight of more than 200,000.

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**4,295,851**

## PROCESS FOR THE PRODUCTION OF NEGLIGIBLY DUSTY PREPARATION

**Konrad Neumann, Wyhlen; Ernst Schenkenberger, Rheinfelden, and Friedrich Resch, Lörrach, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 858,031, Dec. 6, 1977, abandoned. This application Jun. 17, 1980, Ser. No. 160,256**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656408**

**Int. Cl.³ C09B** *67/06, 67/08, 67/24, 67/32*

**U.S. Cl. 8—524** **14 Claims**

1. A process for the production of negligibly dusty preparations by spray drying an aqueous suspension consisting essentially of water, at least one water-soluble dye or optical brightner, at least one water-soluble adhesive containing at least five hydroxyl groups per molecule wherein said adhesive softens or melts in the temperature range of 30°-150° C., and in the presence or absence of diluting agents, dispersing agents, stabilisers against oxidative or reductive effects, pH-adjusting acids, bases or buffering agents; and wherein a dust-binding water-soluble surface-active agent is added to said aqueous suspension, or said dust-binding water-soluble surface-active agent is added to the spray-dried product, or partially to said aqueous suspension and partially to the spray-dried product.

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**4,295,852**

## PROCESS FOR DYEING POLYAMIDE FIBRES

**Klaus Walz, Leverkusen, and Joachim Fiegel, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 3, 1980, Ser. No. 202,907**

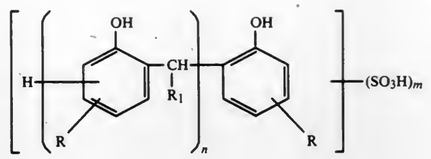
**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945102**

**Int. Cl.³ D06P** *3/24*

**U.S. Cl. 8—560** **3 Claims**

1. Process for dyeing polyamide fibre materials with acid dyestuffs and/or metal complex dyestuffs, characterised in that the dyeing is carried out in the presence of compounds of the formula





in which

R represents a $C_4$-$C_{12}$-alkyl, $C_1$-$C_{12}$-alkoxy, phenyl, cyclohexyl or $C_2$-$C_{10}$-hydroxyalkoxy radical,

$R_1$ represents hydrogen or a $C_1$-$C_4$-alkyl radical,

n represents an integer from 1 to 10 and

m represents a number from 1 to n+1,

or water-soluble salts thereof.

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**4,295,853**

## METHOD FOR MEASURING PEROXIDIC SUBSTANCES

**Shizuka Kasahara, Amagasaki; Kazuhiko Yamanishi, Tokyo; Toshiro Hanada; Kuniaki Tokuda, both of Kawagoe, and Shinzo Kobatake, Ibaraki, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan**

**Filed Dec. 29, 1978, Ser. No. 974,148**

**Claims priority, application Japan, Dec. 29, 1977, 52-159070; Feb. 28, 1978, 53-22313**

**Int. Cl.³ G01N** *31/22, 33/52, 33/92*

**U.S. Cl. 23—230 B** **8 Claims**

1. A method for determining lipoperoxides in a fluid sample obtained from a human being or other animal comprising:

(a) extracting a lipoperoxide from a sample of serum, blood plasma or blood with a solvent selected from the group consisting of a hydrocarbon, an alcohol, a halogenated hydrocarbo dimethylformamide, dimethylsulfoxide and N-methyl-pyrrolidone;

(b) contacting the extracted lipoperoxides with an oxidizable color reagent in the presence of a metallic compound produced from a metal which is able to have two or more valences to produce color; and

(c) measuring the degree of coloring.

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**4,295,854**

## APPARATUS AND METHODS FOR SAMPLE ENRICHMENT FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

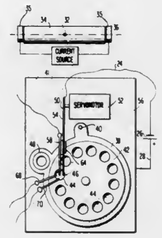
**Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany**

**Filed Sep. 24, 1979, Ser. No. 78,367**

**Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903246**

**Int. Cl.³ G01J** *3/02;* **G01N** *31/02*

**U.S. Cl. 23—230 PC** **14 Claims**



1. A method of forming an atomic cloud of a looked-for element in a graphite tube through which a measuring beam of an atomic absorption spectrometer may be passed for the flameless atomic absorption spectroscopic measurement thereof, said method comprising the steps of:

inserting an electrode into a sample vessel containing a solution including said looked-for element;

passing an electric current through said solution to deposit components of said solution, including said looked-for element, on said electrode;

transferring said electrode having said looked-for element electrodeposited thereon from said sample vessel to said graphite tube such that said graphite tube and said electrode are in a heat transfer relationship, said transferring step including inserting said tip of said electrode carrying said electrodeposition into said graphite tube, via a lateral bore in the wall thereof, such that said tip is located inside said graphite tube; and

heating said graphite tube to a temperature whereat said components are atomized to form said atomic cloud.

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**4,295,855**

## METHOD FOR SEPARATING FIBRINOGEN AND ITS CONSTITUENT COMPONENTS

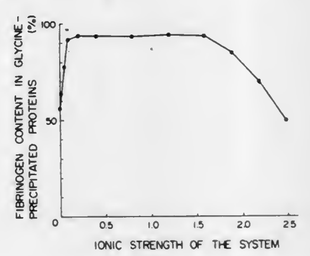
**Susumu Sasaki, Nagoya; Kyoji Kito, Seto, and Akio Koide, Ichinomiya, all of Japan, assignors to Meito Sangyo Kabushiki Kaisha and Susumu Sasaki, both of Aichi, Japan**

**Filed Jan. 10, 1980, Ser. No. 110,946**

**Claims priority, application Japan, Jan. 16, 1979, 54/2162**

**Int. Cl.³ G01N** *33/50, 33/68*

**U.S. Cl. 23—230 B** **14 Claims**




1. A method for obtaining fibrinogen or its constituent components, which comprises contacting a fibrinogen-containing composition with at least one aminocarboxylic acid of the formula

$$H_2N(CH_2)_nCO_2H \quad (I)$$

wherein n is a positive integer,

in an aqueous medium in the presence of an ionic strength controlling agent capable of adjusting the ionic strength of the system to from about 0.02 to about 2.2 to collect at least one member selected from the group consisting of fibrinogen fraction 1 and fibrinogen fraction 2.

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**4,295,856**

## NITROSAMINE SPECIFICITY FOR ELECTROLYTIC CONDUCTIVITY DETECTOR

**Rollen J. Anderson, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.**

**Filed Apr. 21, 1980, Ser. No. 141,900**

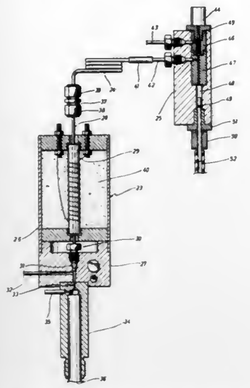
**Int. Cl.³ G01N** *31/08, 27/26*

**U.S. Cl. 23—232 E** **29 Claims**

1. A method for selectively pyrolyzing N-nitrosamines to ammonia from a sample containing other nitrogen compounds, which comprises:

contacting said sample with hydrogen at a temperature ranging from about 500° to about 700° C., in a non-

catalytic environment, which environment is free of nickel and is a reactor having a metallic surface exposed to



said sample during pyrolysis wherein said metal surface is gold or platinum.

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**4,295,857**

## PROCESS FOR THE CRYSTALLINE PRECIPITATION OF CHROMOGENS

**Peter Schuler, Am Knie 7, 8000 München 60, BRD, and Erwin Braun, Unteranger 1, 8132 Tutzing, BRD, both of Fed. Rep. of Germany**

**Filed Apr. 3, 1980, Ser. No. 136,911**

**Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913889**

**Int. Cl.³ B01D** *9/02;* **G01N** *33/15*

**U.S. Cl. 23—301** **19 Claims**

1. A process for crystalline precipitation of a chromogen from solution thereof in a solvent and within a capillary, comprising the steps of initiating a course of crystalline precipitaton of the chromogen by initially and locally supersaturating the solution within the capillary, and thereafter evaporating the solvent at a rate and in an environment sufficient for further crystallization to proceed unimpeded by local supersaturation.

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**4,295,858**

## PROCESS FOR REMOVING SULFUR FROM COAL

**Jui-Yuan Sun, South Holland; Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmoor, all of Ill., and George P. Masologites, Columbus, N.C., assignors to Atlantic Richfield Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 944,452, Sep. 21, 1978, Pat. No. 4,249,910. This application Mar. 3, 1980, Ser. No. 126,248**

**Int. Cl.³ C10L** *9/02*

**U.S. Cl. 44—1 SR** **19 Claims**

1. A process for reducing the sulfur and ash content of coal comprising the steps of:

(1) contacting coal particles containing ash and iron pyrite mineral matter with a promoting amount of at least one conditioning agent, said conditioning agent having a ferrous component maintained at a pH of from about 5.5 to 11.0 and being capable of modifying or altering the existing surface characteristics of the pyrite under conditions to effectuate alteration of modification of at least a portion of the contained pyritic sulfur;

(2) agglomerating the coal particles while said pyrite surfaces are altered or modified in an aqueous medium with hydrocarbon oil to form coal-hydrocarbon oil agglomerates;

(3) separating said coal-hydrocarbon oil agglomerates from pyrite mineral matter and ash to recover coal-hydrocarbon oil agglomerates wherein the coal exhibits reduced sulfur and ash content.

2. The process of claim 1 wherein the conditioning agent is prepared externally and added to the coal particles.

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**4,295,859**

## FUELS AND HEATING OILS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

**Günther Boehmke, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 30, 1979, Ser. No. 99,124**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854437**

**Int. Cl.³ C10L** *1/18*

**U.S. Cl. 44—51** **6 Claims**

1. A fuel for a combustion engine or heating oil comprising a hydrocarbon, water and a non-ionic emulsifier, said non-ionic emulsifier containing less than 1,000 ppm of salt constituents and less than 1 percent by weight of polyalkylene glycol ethers.

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**4,295,860**

## MULTIFUNCTIONAL GASOLINE ADDITIVES

**Michael E. Childs, Wilmette, Ill., assignor to UOP Inc., Des Plaines, Ill.**

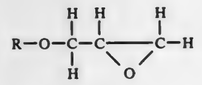
**Filed Jun. 23, 1980, Ser. No. 161,828**

**Int. Cl.³ C10L** *1/18, 1/22*

**U.S. Cl. 44—63** **3 Claims**

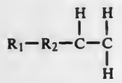
1. A composition comprising a major amount of a fuel oil and an additive consisting of from about 10 ppm up to 100 ppm of the reaction product of:

(a) a glycidyl ether presented by the formula:



wherein R is either

(i) a saturated hydrocarbyl group possessing from about 6 to about 20 carbon atoms or



(ii)

wherein $R_1$ and $R_2$ are saturated hydrocarbyl radicals containing from 1 to 17 carbon atoms and wherein the sum of $R_1$ and $R_2$ is from about 4 to about 18 carbon atoms

with

(b) an N-monosubstituted alkylenediamine having from 2 to about 8 carbon atoms in the alkylene moiety.

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**4,295,861**

## MOTOR FUEL

**Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 24, 1980, Ser. No. 200,293**

**Int. Cl.³ C10L** *1/22*

**U.S. Cl. 44—63** **9 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of 2-(dimethylaminomethyl)-3-hydroxypyridine (I), 2-(diethylaminomethyl)-3-hydroxypyridine (II), 2-(pyrolidinomethyl)-3-hydroxypyridine (III), 2-(piperidinomethyl)-3-hydroxypyridine (IV), and 2-(morpholinomethyl)-3-hydroxypyridine (V).



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**4,295,862**

## MOTOR FUEL

**Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 24, 1980, Ser. No. 200,292**

**Int. Cl.³ C10L** *1/22*

**U.S. Cl. 44—72** **6 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of (I) N-methylpropargylamine, (II) N-benzylpropargylamine, (III) N-phenylpropargylamine, (IV) dipropargylamine, and (V) N,N'-diethyl-2-butyne-1,4-diamine.

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**4,295,863**

## METHOD FOR AUTOMATING AND OPTIMIZING THE OPERATIVE CYCLE IN ADSORPTION DEHYDRATION PLANTS

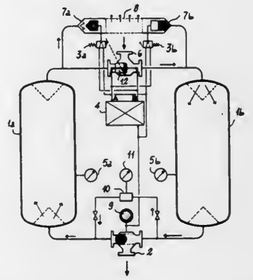
**Sergio Lattuada, Bergamo, Italy, assignor to S.T.I. Strumentazione Industriale S.p.A., Gorle, Italy**

**Filed May 27, 1980, Ser. No. 153,265**

**Claims priority, application Italy, Jun. 6, 1979, 2912 A/79**

**Int. Cl.³ B01D** *53/04*

**U.S. Cl. 55—21** **2 Claims**



1. A method for automating and optimizing the steps of the working cycle in adsorption gas dehydration plants of the heatless regeneration type, having two tanks storing an adsorbing medium and alternating with each other in the function of adsorption and regeneration of the adsorbing medium, with a sequence of steps sequentially comprising the regeneration of the adsorbing medium in a tank by a small amount of dried gas drawn from the other tank that is in adsorption step, the repressurization of that tank which was in regeneration step and which is, therefore, brought to the same pressure as that of the tank that was in adsorption step, the exchange or reversal of the functions of the two tanks, whereby that tank that was in regeneration step is changed to adsorption step, while the tank that was in adsorption step is decompressed and then regenerated, repeating the above disclosed sequence, in which repressurization valves are provided for opening and closing at suitable time the passage to atmosphere, and the sequence and duration of the several steps are controlled by a programmer, wherein said operations of repressurization and reversal are effected upon a single pulse or control signal simultaneously requesting that the repressurization and reversal steps to be carried out, and wherein said single control signal for the repressurization and reversal steps is supplied to the servocontrol of a two- or three-way valve having an unbalanced type of shutter, in which the changeover of the shutter occurs only when a balance is provided between the force generated by the servocontrol and the force generated by the pressure differential acting upon the shutter, that is the pressure differential between the two tanks.

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**4,295,864**

## PROCESS OF TREATING PRESSURIZED CONDENSATE

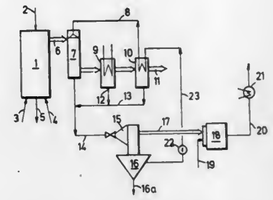
**Paul Rudolph, Bad Homburg, and Paul D. Becker, Eschborn, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Nov. 30, 1979, Ser. No. 99,179**

**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853989**

**Int. Cl.³ B01D** *53/14, 19/00*

**U.S. Cl. 55—40** **5 Claims**



1. In a process of treating aqueous condensate which has been formed as a result of the cooling of raw gas produced by a gasification of a solid fuel by treatment with a gasifying agent which contains oxygen, water vapor and/or carbon dioxide under a pressure of 5 to 150 bars, which raw gas is cooled in at least one cooling stage, the improvement wherein at least part of said condensate which has formed as a result of the cooling and is at a temperature of at least 110° C. and a pressure of at least 2 bars is pressure-relieved, the flashed-off vapor is removed and said flashed-off vapor is burned in a combustion chamber at a temperature exceeding 800° C. and phenols, fatty acids and/or ammonia are removed from said flashed-off vapor by said burning, the pressure-relieved condensate is fed to a separator, and a condensate phase consisting mainly of water is withdrawn from the separator and used as a cooling fluid for the raw gas.

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**4,295,865**

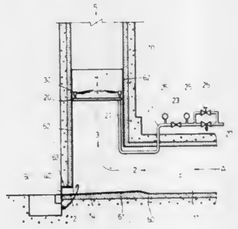
## METHOD FOR REMOVING DUST FROM FLUE GASES

**Wen-Shen Su, 9, Lane 29, Chung-Hau Rd., Cheng Hua City, Taiwan**

**Filed Sep. 24, 1979, Ser. No. 78,303**

**Int. Cl.³ B01D** *47/06*

**U.S. Cl. 55—84** **7 Claims**



1. A method for removing dust and noxious materials from flue gases within a tall chimney communicating with a flue, comprising the steps of:

forming mist layers above a location where said chimney communicates with said flue by spraying water with a spraying device assembly provided around the inner wall of said chimney;

heating a part of said mist layers to form saturated vapor layers by the latent heat of said flue gases;

catching fine particles and noxious materials entrained in said flue gases which pass through the mist layers;
permitting condensed droplets from said mist layers to flow down to an inclined surface located at the bottom of said chimney to form a liquid-sludge;
discharging said liquid-sludge along said inclined surface through an outlet positioned at the lower end of said inclined surface into a precipitating vessel; and
inhibiting cold air from entering the chimney through said outlet by disposing a checkered plate at an opening for said outlet in a wall of said chimney
said method removing dust and noxious materials without appreciably affecting the normal ventilation of said chimney.

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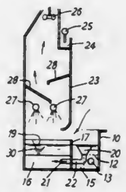
**4,295,866**

## PAINT SPRAY BOOTH WITH WATER WASH

**Thomas J. Kearny, 8 Oaklands, Green Lane, Malvern Wells, Worcester, England**

**PCT No. PCT/GB78/00022, § 371 Date Jun. 7, 1979, § 102(e) Date Jun. 7, 1979, PCT Pub. No. WO79/00209, PCT Pub. Date Apr. 19, 1979**
**PCT Filed Oct. 11, 1978, Ser. No. 46,475**
**Int. Cl.³ B01D** *47/06*
**U.S. Cl. 55—228** **10 Claims**



1. A paint spray booth installation comprising
a water tank,
pump means for withdrawing water from the tank,
a washing system for washing sprayed paint from the booth into the tank, said pump means feeding water to said washing system,
a baffle plate dividing the tank into two communicating regions, said baffle plate extending from one end wall of the tank over a major part of the width of the tank and from the bottom of the tank to a height sufficient to break the surface of the water,
an inlet for said pump means located near the said end wall in a first of said regions,
a surface removal device located close to the pump inlet and arranged to transfer floating paint from the vicinity of the pump inlet into the second of the said regions, the water in the second region being subject to agitation by water falling onto the surface from said washing system, and
a surface baffle extending between the baffle plate and a wall of the tank and arranged to hold back floating material while allowing free circulation below the surface baffle away from the second region towards the pump inlet.

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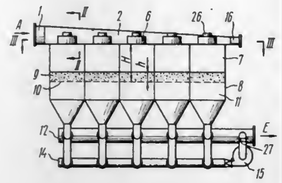
**4,295,867**

## APPARATUS FOR SEPARATING CARBON BLACK FROM CARBON-BLACK AEROSOL

**Viktor M. Shopin, ulitsa 50 let VLKSM, 3, kv. 8; Leonid G. Turenko, ulitsa ozero Khasan, 12; Vitaly F. Surovikin, ulitsa Lermontova, 20, kv. 80, and Konstantin V. Suponev, prospekt Mendeleeva, 11, kv. 40, all of Omsk, U.S.S.R.**

**Filed Jun. 8, 1979, Ser. No. 46,650**
**Int. Cl.³ B01D** *41/02, 39/16*
**U.S. Cl. 55—288** **7 Claims**

1. A filtering system for separating carbon black from a carbon-black aerosol, comprising: a plurality of compartments, each compartment partitioned by a fixed screen, having a mesh size ranging from about 50 to about 200 microns, into first and second chambers, each of said screens supporting a granular bed of carbon black grains arranged on said screen; the ratio of the height of the granular bed of carbon black grains to the height of said first chamber being within 0.1–0.5; an intake manifold, for admission of the carbon-black aerosol, communicating with each said first chambers; first shutoff means, an exit manifold, for a cleaned discharge gas, communicating with



each of said second chambers and with said first shutoff means, second shutoff means; an entry manifold, for a regenerating gas, communicating with each of said second chambers, said exit manifold and with said second shut off means; blower means communicating with said exit manifold to enable said regenerating gas to flow from said exit manifold through said entry manifold.

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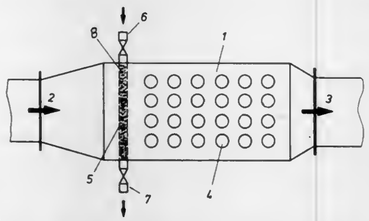
**4,295,868**

## FILTER FOR CLEANING HOT GASES

**Heinz Hölter, Gladbeck; Heinz Gresch, Dortmund-Derne; Heinrich Igelbüscher, Gladbeck; Kurt Hübner, and Ekkehard Weber, both of Essen, all of Fed. Rep. of Germany, assignors to Industrie-Wert Beteiligungsgesellschaft mbH, Fed. Rep. of Germany**

**Filed Mar. 9, 1979, Ser. No. 19,371**
**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811641; May 22, 1978, 2822274; Jul. 5, 1978, 2829412; Jul. 5, 1978, 2829413; Sep. 4, 1978, 2838476**
**Int. Cl.³ B01D** *27/30, 33/30, 39/06*
**U.S. Cl. 55—302** **4 Claims**



1. An apparatus for cleaning hot gases comprising a filter housing having an inlet for unfiltered gas and an outlet for filtered gas, and a plurality of filter inserts placed within the housing in a manner capable of filtering undesirable components from the gas feed stream, each said filter insert comprising a fibrous filter material, the fibers consisting of silicic-acid glass fibers with a silicic-acid content of at least 90%, absorbed into the pores of which and coated upon which is a metal oxide of at least one of the group consisting of aluminum, titanium, zirconium, chromium, nickel, or cobalt, further comprising a cage of a honeycombed structure filled with expanded high temperature resistant perlite located within the housing between the gas inlet and the filter inserts, wherein the cage has an inlet and an outlet, both external to the housing, for effecting replacement of the perlite, and further comprising a combustion chamber mounted within said housing having a discharge nozzle located so that said nozzle is directed at the filter inserts, said combustion chamber having means for the insertion of combustible air connected thereto, whereby combusting materials in the chamber causes an explosive backflow of gases through the filter inserts.



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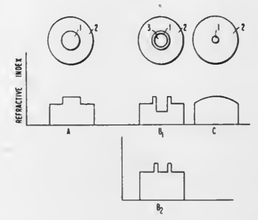
**4,295,869**

## PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER

**Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 648,997, Jan. 14, 1976, Pat. No. 4,161,505, which is a division of Ser. No. 419,011, Nov. 26, 1973, abandoned. This application Feb. 8, 1979, Ser. No. 10,644**
**Claims priority, application Japan, Nov. 25, 1972, 47-118345; Nov. 25, 1972, 47-118346**
**The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.**
**Int. Cl.³ C03C** *25/02*
**U.S. Cl. 65—3.11** **12 Claims**




1. A process for producing an optical transmission fiber comprising depositing a doped fused silica layer containing F and then a fused silica layer on to the inner surface of a pipe of fused silica or water-repellant glass and melting and spinning said pipe into a fiber, said doped fused silica layers being formed by (A) oxidizing halides, hydrides or organic compounds of Si with $OF_2$ or oxygen containing a gaseous fluorine compound, or (B) by the oxidation of $SiF_4$ to form doped fused silica containing F and depositing said doped fused silica containing F as a layer.

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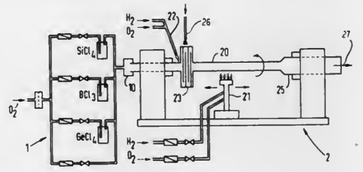
**4,295,870**

## PROCESS FOR THE PRODUCTION OF GLASS FOR A GLASS WORKPIECE FOR USE IN DRAWING A GLASS LIGHT CONDUCTING FIBER OF A LOW ATTENUATION

**Hartmut Schneider, and Egon Lebetzki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jul. 18, 1980, Ser. No. 169,951**
**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935347**
**Int. Cl.³ C03B** *37/075*
**U.S. Cl. 65—3.12** **7 Claims**




1. In a process for the production of a workpiece from which a glass fiber light waveguide of a low attenuation is drawn, said process comprising providing a body, providing a reaction gas, producing an amorphous glass powder from the reaction gas by a chemical reaction, precipitating said amorphous glass powder on the body, and subsequently transforming the precipitated powder into a clear glass layer, the improvement comprising the step of providing the reaction gas including the steps of providing a filter composed of a powder of amorphous glass of an identical nature to the amorphous glass being precipitated on the body from the chemical reaction of the reaction gas, and contacting the reaction gas with the powder of the filter prior to the step of producing the amorphous glass powder by the chemical reaction.

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**4,295,871**

## SIZING COMPOSITION AND GLASS FIBERS TREATED WITH THE AID OF SUCH COMPOSITION

**Michel Droux, La Ravoire, and Gilbert Bocquet, Challes les Eaux, both of France, assignors to Saint-Gobain Industries, Paris, France**

**Filed Apr. 2, 1979, Ser. No. 26,430**
**Claims priority, application France, Apr. 3, 1978, 78 09726**
**Int. Cl.³ C03C** *25/02*
**U.S. Cl. 65—3.41** **4 Claims**

1. In a method of manufacturing coated glass fiber comprising the following operations in sequence:
(a) mechanically drawing filaments of molten glass at high speed
(b) coating said filaments with an aqueous sizing composition
(c) collecting said coated glass filaments during the drawing operation in the form of strands which are wound into cakes, dried and then collected into roving slivers in the shape of a ball, or directly collected into ball-shaped rovings and dried;
the improvement which comprises coating the filaments with an aqueous sizing composition comprising a system of cross-linking adhesive agents consisting essentially of at least one compound having a number of functional groups which are N-methylol functions or N-$CH_2OR$ functions or both, with R being an alkyl radical, at least one acrylic polymer which may be modified or unmodified, and an amino-alkoxy-silane.

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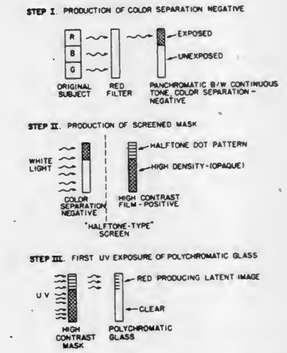
**4,295,872**

## PRODUCING A MULTI-COLOR IMAGE IN POLYCHROMATIC GLASS

**George A. Luers, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Mar. 10, 1980, Ser. No. 128,831**
**Int. Cl.³ C03B** *25/00, 32/00;* **C03C** *3/22, 3/26*
**U.S. Cl. 65—30.11** **14 Claims**




11. An improved method of producing a multicolor image in polychromatic glass wherein the glass is initially exposed to develop a latent image, then heat treated to develop nuclei, and thereafter further exposed and heat treated to develop a full color image, characterized in that the initial exposure is made

through at least one high contrast film positive embodying a subject pattern in the form of a half tone transparency, and being further characterized by the fact that the glass is melted under reducing conditions so that opal formation occurs in unexposed areas of the glass.

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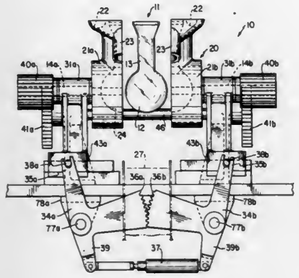
**4,295,873**

## METHOD AND APPARATUS FOR REWORKING A HOLLOW WORKPIECE

**Donald G. Trutner, Chatham, N.J., and Luke Thorington, Easton, Pa., assignors to Duro-Test Corporation, North Bergen, N.J.**

**Filed Apr. 12, 1979, Ser. No. 29,310**
**Int. Cl.³ C03B *23/00***
**U.S. Cl. 65—108** **27 Claims**



**1**. A method of reworking a hollow workpiece comprising the steps of

providing a first fluid of temperature sufficient to soften said workpiece,

placing said workpiece within the cavity of a mold, and

introducing said first fluid into the interior of said workpiece to soften said workpiece, said first fluid of sufficient density so that the static pressure thereof forces said softened workpiece into contact with the interior surface of said mold.

**13**. Apparatus for reworking a hollow workpiece having an opening therein comprising means defining first and second joinable mold portions, the interior portions thereof aligned upon joining to define a mold cavity for receiving therein said hollow workpiece,

a source of liquid,

means for heating the liquid to a molten state,

means for introducing the heated liquid through the workpiece opening into the interior of the workpiece at a temperature to soften the workpiece and to produce a hydrostatic pressure to expand the workpiece into the mold cavity shape, and

means for separating said first and second mold portion a distance sufficient to allow placement of the original workpiece therebetween and removal of the expanded workpiece therefrom, and

means for removing the heated liquid contained within said workpiece.

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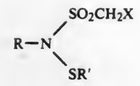
**4,295,874**

## N-ALKYL OR ARYL-N-(TRICHLOROVINYLTHIO)-HALOMETHANE SULFONAMIDES

**Laroy H. Edwards, Napa, Calif., assignor to Chevron Research, San Francisco, Calif.**

**Filed Jan. 28, 1980, Ser. No. 115,590**
**Int. Cl.³ A01N *33/00, 59/02*; C07C *143/74***
**U.S. Cl. 71—67** **9 Claims**

**1**. A compound of the formula



(I)

wherein R is alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 8 carbon atoms substituted with up to 2 alkyl of 1 to 3 carbon atoms, or phenyl substituted with up to 2 fluoro, chloro, bromo, iodo or alkyl of 1 to 4 carbon atoms; X is fluoro, chloro, bromo or iodo and R′ is trichlorovinyl.

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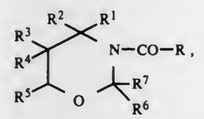
**4,295,875**

## TETRAHYDRO-1,3-OXAZINES

**Karl Eicken, Wachenheim; Wolfgang Rohr, Mannheim; Hans J. Pander, Roedersheim-Gronau, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation of Ser. No. 57,129, Jul. 12, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,986**
**Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832890**
**Int. Cl.³ A01N *43/86*; C07D *265/04, 265/12***
**U.S. Cl. 71—88** **10 Claims**

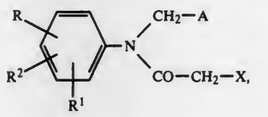
**1**. A tetrahydro-1,3-oxazine of the formula



II

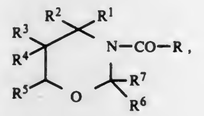
where R denotes linear or branched haloalkyl of up to 3 carbon atoms, $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are identical or different and each denotes hydrogen or linear or branched alkyl of up to 3 carbon atoms, $R^6$ denotes hydrogen, or $R^7$ denotes hydrogen.

**4**. A herbicidal agent comprising, as herbicidal active ingredient, at least one substituted acetanilide of the formula



I

where R denotes hydrogen, linear or branched alkyl or alkoxy of up to 5 carbon atoms, $R^1$ denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, $R^2$ denotes hydrogen, halogen, or linear or branched alkyl or alkoxy of up to 5 carbon atoms, R together with $R^2$ denotes an alkylene chain of up to 6 carbon atoms which is linked in the o-position and may be substituted by linear or branched alkyl of up to 4 carbon atoms, X denotes chlorine or bromine, and A denotes azole which is attached via a ring nitrogen atom and may be mono- or polysubstituted by halogen, phenyl, alkyl, alkoxy, alkylthio or perfluoroalkyl, each of up to 4 carbon atoms, cyano, carboxy, carbalkoxy of up to 4 carbon atoms in the alkoxy, or alkanoyl of up to 4 carbon atoms, or A denotes salts of azoles containing 2 or 3 nitrogen atoms, and, as antagonistic agent, at least one tetrahydro-1,3-oxazine of the formula



II



where R denotes linear or branched haloalkyl of up to 3 carbon atoms, $R^1$, $R^2$, $R^3$, $R^4$ and $R^5$ are identical or different and each denotes hydrogen or linear or branched alkyl of up to 3 carbon atoms, $R^6$ denotes hydrogen, or $R^7$ denotes hydrogen.

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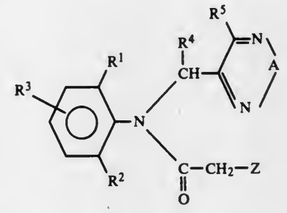
**4,295,876**

## N-(2,5-DIAZOLYL)-ALKYL-HALOACETANILIDES, COMPOUNDS AND HERBICIDAL COMPOSITIONS

**Jörg Stetter; Klaus Ditgens; Rudolf Thomas, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 23, 1980, Ser. No. 143,053**
**Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919293**
**Int. Cl.³ A01N *43/64, 43/82*; C07D *249/04, 271/08***
**U.S. Cl. 71—90** **38 Claims**

**1**. N-(2,5-diazolyl) alkyl-haloacetanilide compounds of the formula



(I)

wherein

A is oxygen, sulfur or the grouping >N-R in which R is alkyl with up to 4 carbon atoms;

$R^1$ is hydrogen, alkyl with up to 4 carbon atoms, or alkoxy with up to 4 carbon atoms;

$R^2$ is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, or fluorine, chlorine, or bromine;

$R^3$ is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, or fluorine, chlorine or bromine;

$R^4$ is hydrogen or alkyl with up to 4 carbon atoms;

$R^5$ is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 4 carbon atoms, dialkylamino with up to 4 carbon atoms in each alkyl group, fluorine, chlorine or bromine, cyano or alkoxycarbonyl with up to 4 carbon atoms in the alkoxy group; and

Z is chlorine, bromine or iodine.

**32**. Herbicidal composition comprising a herbicidally acceptable carrier and, in herbicidally effective amounts, an N-(2,5-diazolyl)alkyl-haloacetanilide compound as claimed in claim **1**.

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**4,295,877**

## SELECTIVE HERBICIDAL METHOD IN COTTON AND SOYBEANS

**Andre Thizy; Pierre Poignant, and Daniel Pillon, all of Lyons, France, assignors to Philagro, Lyons, France**

**Continuation of Ser. No. 809,903, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 162,643, Jul. 14, 1971, abandoned. This application Dec. 13, 1978, Ser. No. 969,003**
**Int. Cl.³ A01N *47/30***
**U.S. Cl. 71—120** **8 Claims**

**1**. A method for weed control in dicotyledonous crops comprising pre-emergence and post-emergence application of a herbicidally effective amount of N-(4-isopropylphenyl)-N′,N′-dimethylurea to a dicotyledonous crop selected from the group consisting of soybeans and cotton.

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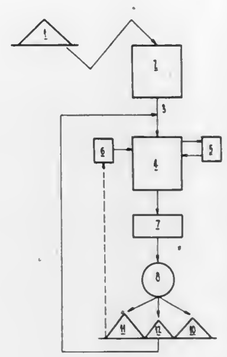
**4,295,878**

## PROCESSES OF IRON SEGREGATION

**Donald J. Fensom, South Yarra, Australia, assignor to ICI Australia Limited, Melbourne, Australia**

**Continuation of Ser. No. 922,351, Jul. 6, 1978, abandoned. This application Oct. 10, 1979, Ser. No. 83,516**
**Claims priority, application Australia, Jul. 8, 1977, PD0750**
**Int. Cl.³ C22B *1/8***
**U.S. Cl. 75—1 T** **16 Claims**



**1**. A process for the beneficiation of particles of titaniferous material comprising as a first component titanium oxide and as a second component metallic iron, said first and second components being in intimate association in said particles which process comprises first subjecting said particles to a non-oxidizing environment, said environment being characterized in that it is at an elevated temperature and comprises vapour derived from an iron chloride salt so that at least part of the said metallic iron is segregated by translocation from within said particles to the outside of said particles and secondly in a separation step separating the thus segregated metallic iron and relicts of said particles, wherein the particles of titaniferous material are the product of reduction of ores comprising iron titanium oxides, and substantially all of the iron component is reduced to the metallic state, wherein the elevated temperature used in said segregation step is in a range from the melting point of the iron salt to 1000° C., and wherein said segregation step takes place in the absence of a solid carbonaceous reducing agent and a flux.

**2**. A process for the beneficiation of pre-reduced particles of titaniferous material comprising as a first component titanium oxide and as a second component metallic iron, said first and second components being in intimate association in said particles which process comprises the steps of: (i) segregating at least part of said metallic iron from said pre-reduced particles by contacting said pre-reduced particles in a non-oxidizing environment at an elevated temperature with vapour derived from an iron chloride salt, whereby segregated metallic iron is translocated from within said particles to the outside of said particles; and (ii) separating the thus segregated metallic iron and relicts of said particles, wherein the elevated temperature used in said segregation step (i) is in a range from the melting point of the iron salt to 800° C.

**3**. A process according to claim **2** wherein said titaniferous material is ilmenite.

**4,295,879**

## MANUFACTURE OF ACICULAR FERROMAGNETIC IRON PARTICLES

**Werner Steck, Mutterstadt; Wilhelm Sarnecki, Limburgerhof; Laszlo Marosi, Ludwigshafen; Manfred Ohlinger, Frankenthal, and Horst Autzen, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jul. 31, 1980, Ser. No. 174,240**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935357**

**Int. Cl.³ B22F *9/00***

**U.S. Cl. 75—0.5 AA** **2 Claims**

1. A process for the manufacture of acicular ferromagnetic iron particles, comprising:

(a) coating the surface of acicular particles of iron(III) oxide hydroxide and consisting of 20 to 100 percent by weight of lepidocrocite and 0 to 80 percent by weight of geothite with an alkaline earth metal compound and a monobasic, dibasic or tribasic aliphatic carboxylic acid of up to 6 carbon atoms, or an alkaline earth metal chelate of an organic compound containing at least two groups capable of chelating an alkaline earth metal cation, or a hydrolysis-resistant substance consisting of a phosphorus oxyacid, its ester or its inorganic salt and an aliphatic mono-, di- or tribasic carboxylic acid of 1 to 6 carbon atoms,

(b) heating the so-coated particles at a temperature of from 250° to 390° C. for a period of from 10 minutes to 10 hours in an atmosphere containing water vapor at a partial pressure of from 30 to 1013 mbar, and

(c) reducing the iron(III) oxide particles thus obtained with hydrogen at temperatures of from 275° to 425° C. to form acicular ferromagnetic iron particles.

**4,295,880**

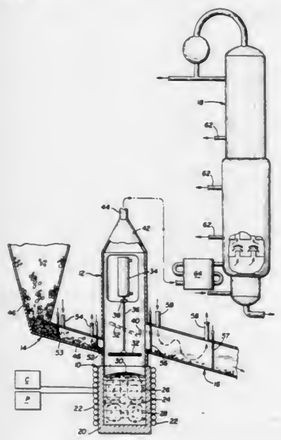
## APPARATUS AND METHOD FOR RECOVERING ORGANIC AND NON-FERROUS METAL PRODUCTS FROM SHALE AND ORE BEARING ROCK

**John W. Horner, Jr., 150 Martin St., Longmont, Colo. 80501**

**Filed Apr. 29, 1980, Ser. No. 144,831**

**Int. Cl.³ C22B *4/00***

**U.S. Cl. 75—10 R** **16 Claims**



1. An apparatus for extracting organic products from mineral raw materials, comprising:

an electric induction furnace of the type having a refractory crucible and capable of maintaining a charge of non-ferrous metal in a molten state with natural induction stirring thereof;

an extraction chamber closing said induction furnace crucible against free entry of oxygen and providing a space above the crucible for receiving a batch of mineral raw material to be processed;

a fractionating tower means for collecting organic vapors that, in use, may be generated from mineral raw material by the furnace;

a connecting means for directing organic vapors from the extraction chamber to the fractionating tower means;

skimming means for removing processed mineral raw material from the crucible charge and extraction chamber;

intake means for delivering mineral raw material to the crucible;

outlet means for receiving spent raw material from said skimming means and discharging the raw material from the extraction chamber; and

means for substantially preventing oxygen entry during inlet and discharge of the raw material.

**4,295,881**

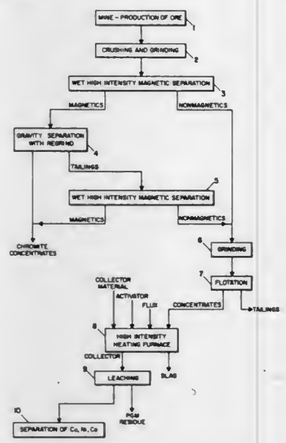
## PROCESS FOR EXTRACTION OF PLATINUM GROUP METALS FROM CHROMITE-BEARING ORE

**James Saville, Stamford, Conn., assignor to Texasgulf Inc., Stamford, Conn.**

**Continuation of Ser. No. 38,820, May 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 32,680, Apr. 23, 1979, abandoned. This application Jun. 10, 1980, Ser. No. 158,184**

**Int. Cl.³ C22B *4/04***

**U.S. Cl. 75—10 R** **18 Claims**




1. A process for recovering platinum group metals from chromite-bearing ores, comprising the steps of:

(a) subdividing chromite-bearing ore containing one or more platinum group metals;

(b) subjecting a slurry of said subdivided ore to high intensity magnetic force to separate said ore into a magnetic fraction containing a substantial quantity of the chromite originally present in the ore and a non-magnetic fraction containing a substantial quantity of the platinum group metals originally present in the ore;

(c) subjecting said non-magnetic ore fraction containing a substantial quantity of the platinum group metals originally present in the ore to a flotation process to produce a concentrated fraction containing platinum group metals;

(d) smelting the concentrate in a high intensity heating furnace in the presence of one or more collector materials for the platinum group metals to produce a slag layer and collector material layer containing the platinum group metals in association with said collector metal;

(e) separating said collector material from said slag layers; and

(f) separating platinum group metal from the collector material layer.



**4,295,882**

## STEEL MAKING PROCESS

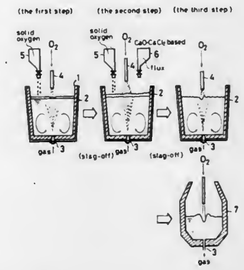
**Ryoji Arima, Kobe; Kazushige Umezawa, and Tokuzo Nisugi, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Oct. 16, 1979, Ser. No. 85,255**

**Claims priority, application Japan, Oct. 24, 1978, 53-130039; Nov. 2, 1978, 53-134584; Dec. 15, 1978, 53-154769; Dec. 30, 1978, 53-162538; Dec. 30, 1978, 53-162539; Jan. 13, 1979, 54-1780**

**Int. Cl.³ C21C *7/02***

**U.S. Cl. 75—52** **16 Claims**




1. A steelmaking process for desiliconizing, dephosphorizing, desulfurizing and decarburizing molten iron from a blast furnace, comprising the following sequence of steps:

(1) a first step of agitating the molten iron in a vessel, supplying the molten iron with both gaseous oxygen and, an iron oxide contanitive material reducing the Si content in the iron to a value between 0.05 and 0.20% at a controlled bath temperature between 1480 and 1480° C., and discharging the resulting slag;

(2) a second step of agitating the molten iron from the first step having a bath temperature between 1380° and 1380° C., supplying the molten iron with a flux consisting essentially of CaO and 0.2 to 0.5 parts by weight of $CaCl_2$ or KCl or both $CaCl_2$ and KCl per part by weight of CaO and a source of oxygen, maintaining the basicity of the processing slag between 3.5 and 8.0 and the T.Fe value between 3 and 10%, desulfurizing and dephosphorizing the iron with the same slag to reduce the P, S and Si contents to no higher than 0.025%, 0.020% and a trace, respectively, and to hold the C content not lower than 3.8%, and discharging the resulting slag; and

(3) a third step of decarburizing the molten iron from the second step by blowing oxygen onto the melt without using a refining flux.

**4,295,883**

## DEVICE AND METHOD FOR INTRODUCING GASES INTO MOLTEN METAL

**Rajko Lajh, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland**

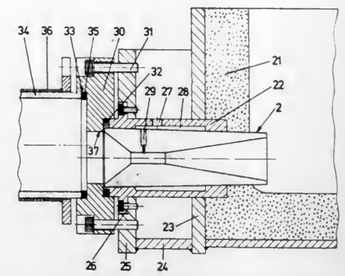
**Filed Jun. 26, 1980, Ser. No. 163,177**

**Claims priority, application Switzerland, Jul. 10, 1979, 6447/79**

**Int. Cl.³ C22C *1/02***

**U.S. Cl. 75—68 R** **13 Claims**

1. A device for introducing gas into a metal melt comprising a fluid/gas-jet-mixing facility having a converging conical inlet, a cylindrical hollow center piece having a passageway of substantially constant diameter and a diverging conical outlet all disposed sequentially along a first axis, said cylindrical hollow center piece being provided with a plurality of channels for passing a gas to said passage, first feeding means for feeding said melt to said converging conical inlet and into said passage such that said melt sucks said gas through said channels and into said passage for mixing said gas with said melt in said passage wherein the angle of said diverging conical outlet measured from said first axis is equal to about 7° to 15°, the




ratio of the diameter of said passage to the maximum diameter of both said converging conical inlet and said diverging conical outlet is about 1:4 to 1:6 and the ratio of the length of said converging conical inlet plus the length of said passage to the length of said diverging conical outlet is about 1:5 to 1:8.

**4,295,884**

## PROCESS FOR TREATING A MOLTEN METAL OR ALLOY USING LIQUID AND SOLID FLUX

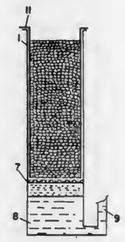
**Jean-Marie Hicter, Coublevie-Voiron, and Pierre Guerit, Chambery, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France**

**Filed Jul. 26, 1979, Ser. No. 61,023**

**Claims priority, application France, Jul. 31, 1978, 78 23197**

**Int. Cl.³ C22B *9/12, 21/06***

**U.S. Cl. 75—93 R** **6 Claims**




1. A process for treating molten metal for the removal of inclusions by means of liquid and solid metal halide-based fluxes comprising the steps of:

establishing in a column having an inlet end and an outlet end a complex treatment bed comprising a packing of granules at least in part comprising solid flux supported upstream of the column outlet and immersed in a bath of liquid flux, the melting point of the solid flux being higher than the melting temperature of the liquid flux and the temperature of the molten metal to be treated;

establishing downstream and adjacent the supported end of the solid flux granules a molten metal droplet coalescence zone comprising liquid flux;

passing molten metal as a dispersion of droplets through the liquid flux-immersed solid flux granules and into the coalescence zone while maintaining the granules immersed in liquid flux; and

recovering treated coalesced molten metal.

**4,295,885**

## MATERIAL AND METHOD FOR SECURING BORON FILAMENTS TO EACH OTHER AND TO A SUBSTRATE AND CUTTING TOOLS THEREFROM

**William T. Kaarlela, Fort Worth, Tex.**

**Division of Ser. No. 644,005, Dec. 24, 1975. This application Sep. 11, 1978, Ser. No. 941,513**

**The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.**

**Int. Cl.³ B22F** *1/00, 3/00*

**U.S. Cl. 75—208 R** **16 Claims**

1. A method of bonding of boron filaments to a substrate by a modified brazing which comprises:

A. providing a substrate for receiving boron filaments to be bonded thereto;

B. cleaning said substrate;

C. providing boron filaments of a desired length;

D. at least partially coating said filaments with a liquidized metals containing slip formulated from a metals mixture consisting essentially of from about 60% to about 75% by weight of copper, tin in an amount between about 20% to 35% by weight, the remainder being essentially titanium;

E. said slip being further prepared from about 4 parts of the copper, tin and titanium mixture to about 1 part of about a ¼% to about a 1% liquid solution of a suspension agent for holding said metals mixture in suspension in said solution;

F. placing said at least partially coated filaments on said substrate;

G. drying said coated filaments;

H. bonding said coated filaments to said substrate by liquid-phase-sintering; and

I. cooling said coated filaments on said substrate.

9. A method of bonding together a plurality of boron filaments to hold them fixed in an alloy metal matrix which comprises:

A. providing boron filaments of a desired length;

B. at least partially coating said filaments with a liquidized metals containing slip formulated from a metals mixture consisting essentially of from about 60% to about 75% by weight of copper, tin in an amount between about 20% to 35% by weight, the remainder being essentially titanium;

C. said slip being further prepared from about 4 parts of the copper, tin and titanium mixture to about 1 part of about a ¼% to about a 1% solution containing a suspension agent for holding said metals mixture in suspension in said solution;

D. placing said at least partially coated filaments juxtaposed together in a group;

E. drying said juxtaposed group of coated filaments to at least partially remove the liquid vehicle of said solution;

F. bonding said coated filaments together by liquid-phase-sintering to alloy the metals mixture about the filaments; and

G. cooling said filaments and said metals.

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**4,295,886**

## FLAME-RETARDANT POLYESTER FIBER COMPOSITIONS

**John T. Gresham, Somerset, N.J., assignor to Avtex Fibers Inc., Valley Forge, Pa.**

**Filed Oct. 9, 1973, Ser. No. 404,198**

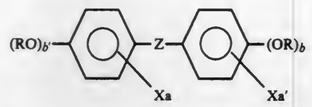
**Int. Cl.³ C08K** *5/53*

**U.S. Cl. 106—18.19** **8 Claims**

6. Flame retardant yarns and fabrics comprising a combination of the flame-retardant polyester fiber composition and a member of the group consisting of cotton, rayon, nylon, acetate and acrylic fibers, and further comprising from about 95 to 80 parts by weight of the fiber-forming polyester which is a member of the group consisting of poly(ethylene terephthalate), poly (1,4-cyclohexylenedimethylene terephthalate) and poly (ethylene 2,6-naphthalenedicarboxylate), and 5 to 20 parts by weight of a two-component flame-retardant additive consisting essentially of, by weight:

(a) from about 20 to 80% of 3,9-diphenyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide, and

(b) from about 80 to 20% of a polychlorinated or polybrominated diaryl compound containing at least 40% by weight chlorine or bromine and having the general formula




where X represents chlorine or bromine and a and a' are integers, the sum of which is from 3 to 10; b and b' represent zero and 1; R represents a member selected from the group consisting of $C_1$–$C_4$ alkyl radicals, $C_1$–$C_4$ acyl radicals, phenyl and benezoyl radicals and chlorinated and brominated phenyl and benzoyl radicals; Z represents a direct bond or a member selected from the group consisting of oxygen, carbonyldioxy, sulfonyl, $C_1$–$C_4$ alkylene, phenylene, and chlorinated phenylene, and ether linkages of the formula $—CH_2O—$, $—CH_2OCH_2—$ and $—C_6H_4CH_2OCH_2C_6H_4—$.

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**4,295,887**

## METHOD FOR THE CONTROL OF MICRO-ORGANISMS

**Alan J. Buckley, and Michael Singer, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England**

**Continuation of Ser. No. 922,361, Jul. 5, 1978, abandoned, which is a continuation of Ser. No. 841,908, Oct. 13, 1977, abandoned, which is a continuation of Ser. No. 667,439, Mar. 16, 1976, abandoned. This application Jun. 25, 1979, Ser. No. 51,853**

**Claims priority, application United Kingdom, Apr. 10, 1975, 14795/75**

**Int. Cl.³ C08K** *5/16, 5/36;* **C09D** *5/14*

**U.S. Cl. 106—18.33** **3 Claims**

1. A water-based paint or adhesive which is susceptible to infection with Pullularia pullulans when applied to a substrate, and which has been protected against infection by Pullularia pullulans and other microorganisms by adding to the paint or adhesive an effective amount, in the range 1 to 10,000 parts per million based on the weight of the paint or adhesive, of 2,2'bis-(methylaminocarbonyl)diphenyldisulfide, said paint or adhesive being in a container.

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**4,295,888**

## SOLVENT COMPOSITIONS

**Gillian M. Greenwood, and Alan Woodstock, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Dec. 27, 1976, Ser. No. 757,776**

**Claims priority, application United Kingdom, Jan. 19, 1976, 1999/76**

**Int. Cl.³ C09D** *11/00*

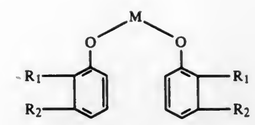
**U.S. Cl. 106—21** **11 Claims**

1. A composition comprising a chlorinated substantially straight chain paraffin solvent having a range of carbon atoms between 7 and 35 and of chlorine content 10% by weight to 72% by weight, a compound capable of colour forming on contact with an electron-acceptive substance, an antioxidant for said chlorinated paraffin solvent, and at least one of the following adjuvants present in said solvent in amount sufficient to at least reduce the tendency of the solution of paraffin, antioxidant and colour-forming compound to discolor:

(a) a barium, calcium or magnesium sulphonate;

(b) a barium, calcium or magnesium phenate of the structure:






where M is an atom of barium, calcium or magnesium, $R_1$ is hydrogen or an alkyl group containing 1 to 10 carbon atoms and $R_2$ is an alkyl group containing 1 to 10 carbon atoms; and

(c) a nitrogen containing derivative of an alkenyl succinic anhydride, said derivative being obtained by the reaction of polyisobutylene with maleic anhydride followed by further reaction with tetraethylene pentamine.

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**4,295,889**

## RECORDING LIQUID COMPOSITION

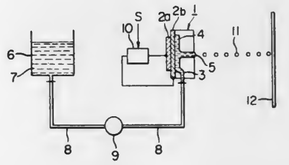
**Tsuyoshi Eida, Chiba; Masahiro Haruta, Funabashi; Yasuhiro Yano; Yoji Matsufuji, both of Tokyo, and Tokuya Ohta, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 28, 1979, Ser. No. 97,920**

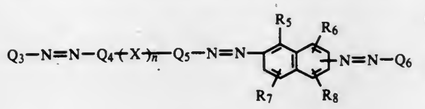
**Claims priority, application Japan, Dec. 1, 1978, 53-148679; Jun. 22, 1979, 54-78952; Jun. 22, 1979, 54-78953; Sep. 11, 1979, 54-116427**

**Int. Cl.³ C09D** *11/00*

**U.S. Cl. 106—22** **30 Claims**




1. A recording liquid composition for use in a recording system of the type in which the recording liquid composition is jetted from a small orifice in a form of droplet flying toward a recording material on which an image is to be printed, said recording liquid composition comprising, as its recording agent component, a compound of the general formula (B):




(B)

wherein

$Q_3$ and $Q_6$ each represents a substituted or unsubstituted phenyl or naphthl group; $Q_4$ and $Q_5$ each represents a substituted or unsubstituted 1,4-phenylene or 1,4-naphthylene group;

$R_5$ and $R_6$ are selected from hydrogen, hydroxyl and amino group;

$R_7$ and $R_8$ each represents hydrogen atom or sulfo group in a form of sodium salt or quaternary ammonium salt;

X is —NH—, —N=N— or —CH=CH— and

n is 0 or 1 provided that when n is 0, $Q_4$ and $Q_5$ are not unsubstituted 1,4-phenylene at the same time.

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**4,295,890**

## SUBMICRON BETA SILICON CARBIDE POWDER AND SINTERED ARTICLES OF HIGH DENSITY PREPARED THEREFROM

**Frederick G. Stroke, McMurray, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation of Ser. No. 637,342, Dec. 3, 1975, abandoned. This application Oct. 31, 1977, Ser. No. 847,347**

**Int. Cl.³ C04B** *35/56*

**U.S. Cl. 501—90** **25 Claims**

1. A substantially pure submicron boron-containing beta silicon carbide powder composition consisting essentially of silicon carbide powder substantially all of the beta crystalline form, said powder having a surface area of between about 3 and about 15 square meters per gram, the number mean particle size of the silicon carbide particles comprising the powder being between 0.08 and 0.8 microns, coformed homogeneously distributed boron-containing additive in an amount equivalent to between 0.15 and 0.25 weight percent boron, based on the silicon carbide, and between 0.05 and 1.5 weight percent free carbon, based on the silicon carbide.

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**4,295,891**

## BLANKET POWDER FOR COVERING A MOLTEN METAL BATH

**Jean-Charles Daussan; Gerard Daussan, both of Metz, and André Daussan, Longeville les Metz, all of France, assignors to Daussan et Compagnie, Woippy, France**

**Filed Aug. 5, 1980, Ser. No. 175,680**

**Claims priority, application France, May 16, 1980, 80 10983**

**Int. Cl.³ C04B** *35/52*

**U.S. Cl. 501—99** **9 Claims**

1. A blanket powder for covering a molten metal bath, comprising a cereal-hull ash, wherein said powder further contains approximately 5 to 50% by weight of non-calcined cereal hulls.

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**4,295,892**

## CORDIERITE CERAMIC HONEYCOMB AND A METHOD FOR PRODUCING THE SAME

**Tadaaki Matsuhisa; Shigeo Soejima, and Noboru Yamamoto, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan**

**Continuation of Ser. No. 772,953, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 674,933, Apr. 8, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,485**

**Int. Cl.³ C04B** *35/18*

**U.S. Cl. 501—120** **3 Claims**

1. Cordierite ceramic honeycomb having a softening shrinkage at 1,450° C. of not more than 0.5% which consists mainly of cordierite in crystal phase and contains 8 to 20% by weight of at least one crystal selected from the group consisting of spinel, mullite and corundum has a thermal expansion coefficient at a temperature range of 25°–1,000° C. being not more than $22\times10^{-7}$(1/°C.).

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**4,295,893**

## ALUMINA-CONTAINING CALCIUM SILICATE AND PROCESS FOR PRODUCING SAME

**Akira Takahashi, and Kenichi Oohashi, both of Gifu, Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan**

**Filed Nov. 15, 1979, Ser. No. 94,500**

**Int. Cl.³ C04B** *7/02*

**U.S. Cl. 106—120** **21 Claims**

1. Super-lightweight secondary particles of alumina-containing calcium silicate characterized in that the particles are composed of alumina-containing calcium silicate crystals having an index of crystallite antigrowth of at least 8 and interlocked with one another in the form of a globular shell, the particles being about 5 to about 70 μm in diameter, up to about 0.13

g/cm$^3$ in apparent density and at least 10 g per particle in initial breaking load.

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**4,295,894**

## METHOD OF PREPARING SOLUBLE COLLAGEN FIBERS

**Gheorge Cioca, Belleville, and Marcel Siegler, North Bergen, both of N.J., assignors to Seton Company, Newark, N.J.**

**Filed Nov. 19, 1979, Ser. No. 95,391**
**Int. Cl.$^3$ C08L *89/06*; C08K *3/24, 3/20, 3/30***
**U.S. Cl. 106—155** **16 Claims**

1. A method of forming soluble collagen fiber from a raw animal hide comprising:
- treating a raw hide with an aqueous solution of an alkali metal hydroxide and an organic dehydrating agent to remove the hair and fat therefrom, to yield a substantially hair and fat-free corium;
- stabilizing the interfibular bonds of the collagen in the corium with an aqueous solution of an alkali sulfate;
- neutralizing the corium;
- dissolving the corium in an aqueous acid solution to yield a collagen solution;
- precipitating collagen fibers from the solution; and
- drying the collagen fibers.

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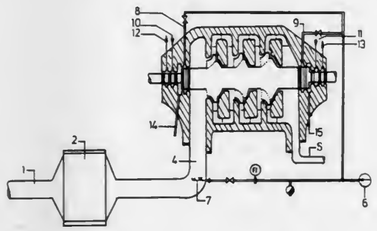
**4,295,895**

## METHOD FOR STEAM CLEANING OF COMPRESSORS

**Gunnar Kongshaug, Porsgrunn, Norway, assignor to Norsk Hydro a.s., Oslo, Norway**

**Filed Mar. 28, 1980, Ser. No. 136,070**
**Int. Cl.$^3$ B08B *3/00***
**U.S. Cl. 134—22 R** **8 Claims**



1. In a method for removing and preventing the formation of salt deposits in critical sections of a plant where process gases containing impurities including ammonium nitrate are transferred and compressed, the improvement which comprises supplying steam to said sections in such amounts that a water vapour pressure is established in excess of the saturated water vapour pressure above the salt deposits at the existing temperatures.

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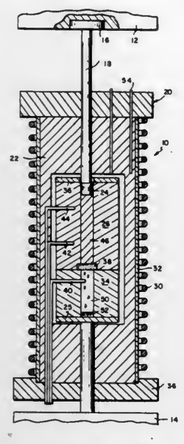
**4,295,896**

## METHOD FOR MAKING METAL ALLOY COMPOSITIONS AND COMPOSITION

**Merton C. Flemings, and Frank E. Goodwin, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 20,101, Mar. 12, 1979, abandoned. This application May 14, 1979, Ser. No. 39,226**
**Int. Cl.$^3$ C22F *1/04***
**U.S. Cl. 148—1** **34 Claims**

1. The process for forming a metal alloy composition free of oxide inclusions, free of porosity and containing solutes derived from said alloy composition in an amount greater than 90 weight percent of the amount soluble at the temperature of maximum solubility and containing less than 2 volume percent of undissolved second phase which comprises heating a first alloy from the nonequilibrium solidus temperature to form a solid-liquid composition, subjecting said solid-liquid composition to pressure for a time sufficient to overcome the inherent strength of the solid, to convert dendrites in the solid to a fine grain structure, to homogenize and compact the composition of the dendrites, and to cause the liquid to flow through and out of said solid and preventing the formation of secondary



phase material either by rapidly quenching said solid or by cooling said solid followed by heat treating said cooled solid at a temperature less than that at which liquid metal from said alloy forms for a period of time to dissolve substantially all said secondary phase into said primary phase and rapidly quenching said heat treated solid to form a cooled solid.

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**4,295,897**

## METHOD OF MAKING CMOS INTEGRATED CIRCUIT DEVICE

**Graham S. Tubbs, Houston, and James E. Ponder, Cat Spring, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 3, 1979, Ser. No. 81,513**
**Int. Cl.$^3$ H01L *21/22, 29/78***
**U.S. Cl. 148—1.5** **4 Claims**

1. A method of making complementary insulated gate field effect transistors in an integrated circuit comprising the steps of:
- (a) introducing N-type impurity into a selected area of a face of a P-type semiconductor body to provide a tank region for forming a P-channel transistor,
- (b) selectively growing thick field oxide using an oxidation mask to provide a first enclosed surface area on said face spaced from said tank region and a second enclosed surface area on said face within said tank region,
- (c) depositing a layer of polycrystalline silicon on said face over a thin gate insulator and patterning the polycrystalline silicon to provide a gate of an N-channel transistor in said first surface area and a gate of a P-channel transistor in said second surface area,
- (d) introducing P-type impurity into the second surface area to produce source and drain regions of the P-channel transistor while masking the first surface area,
- (e) and introducing N-type impurity into the first surface area to produce source and drain regions of the N-channel transistor while making said second surface area, both the gate of the N-channel transistor and the gate of the P-channel transistor being doped with N-type impurity upon the step of introducing N-type impurity into the first surface area.

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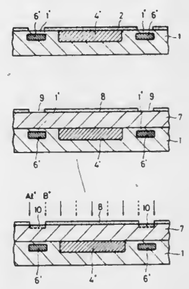
**4,295,898**

## METHOD OF MAKING ISOLATED SEMICONDUCTOR DEVICES UTILIZING ION-IMPLANTATION OF ALUMINUM AND HEAT TREATING

**Masakatsu Yoshida, Ibaraki; Yoshihiko Tochio, Kyoto, and Atsutomo Tohi, Hirakata, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan**

**Filed May 8, 1980, Ser. No. 147,715**
**Claims priority, application Japan, May 15, 1979, 54-60131**
**Int. Cl.$^3$ H01L *21/265, 21/20***
**U.S. Cl. 148—1.5** **3 Claims**



1. Method of making semiconductor device comprising the steps of
- ion-implanting Al-ions in a predetermined part of the surface of a p-type silicon substrate,
- heat treating said substrate to diffuse said Al-ions thereby forming $p^+$-type buried region in said substrate,
- epitaxially growing an n-type epitaxial layer having a predetermined thickness on said p-type silicon substrate,
- ion-implanting Al-ions on the part of the surface of said n-type epitaxial layer over said $p^+$-type buried region thereby to form $p^+$-type surface ion-implanted region,
- heat treating said substrate and the n-type epitaxial layer thereby to make diffusions of Al-ions from said buried region and said surface ion-implanted region into said n-type epitaxial layer, thereby forming a $p^+$-type isolation region continuously across said n-type epitaxial layer.

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**4,295,899**

## PROCESS FOR COATING IRON AND STEEL

**Dieter Oppen, Rodgau, Fed. Rep. of Germany, assignor to Hooker Chemicals & Plastics Corp., Madison Heights, Mich.**

**Filed Feb. 19, 1980, Ser. No. 122,403**
**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907093**
**Int. Cl.$^3$ C23F *7/10***
**U.S. Cl. 148—6.16** **5 Claims**

1. A process for producing non-metallic electrical resistance coatings on the surface of iron or steel, comprising contacting a composition free of organic components and comprising an alkali silicate water-glass, an alkali polyphosphate and insoluble $Cr_2O_3$ pigment wherein the molar ratio of $Cr_2O_3$:$P_2O_5$ (equivalent):$SiO_2$ is 0.005 to 1.5:0.005 to 0.1:1 with the surface at a viscosity of between 400 and 1000 mPa.S, (as measured at 20° C.), and baking the thus treated surface at a temperature of between 150° and 500° C.

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**4,295,900**

## ROLLED WIRE HAVING A FINE-GRAIN STRUCTURE

**Nils-Gunnar Malmgren; Barry Solly, both of Fagersta, and Stig Tärnblom, Söderbärke, all of Sweden, assignors to Fagersta AB, Sweden**

**Filed May 26, 1978, Ser. No. 909,959**
**Claims priority, application Sweden, Jun. 14, 1977, 7706881**
**Int. Cl.$^3$ C21D *9/52***
**U.S. Cl. 148—12 B** **2 Claims**

1. A hot rolled wire rod of fine-grain structure consisting of stainless steel and intended for the manufacture of drawn spring wire and rope wire of high mechanical strength and high ductility, characterized in that said wire rod contains 0.04–0.07% C, 18–19% Cr and 8–9.5% Ni wherein a Cr-content of 18% corresponds to a Ni-content of 8.0–8.8% when the C-content is 0.04% and to a Ni-content of 8.8–9.5% when the C-content is 0.07%, and a Cr-content of 19% corresponds to a Ni-content of below 8.3% when the C-content is 0.04% and to a Ni-content of 8.4–9.2% when the C-content is 0.07%, said wire rod having a uniform grain size along said wire rod, said grain size being 8–13 ASTM.

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**4,295,901**

## METHOD OF IMPARTING A FINE GRAIN STRUCTURE TO ALUMINUM ALLOYS HAVING PRECIPITATING CONSTITUENTS

**Wayne M. Robertson, and John A. Wert, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 5, 1979, Ser. No. 91,234**
**Int. Cl.$^3$ C22F *1/04***
**U.S. Cl. 148—12.7 A** **5 Claims**

1. An improvement in a method of imparting a fine grain structure to an aluminum alloy having a precipitating constituent, said method having steps of:
- providing an aluminum alloy having a precipitating constituent;
- dissolving at least some of said precipitating constituent in said alloy by heating said alloy to a solid solution temperature;
- cooling said alloy to a temperature below said solid solution temperature;
- overaging said alloy at an overaging temperature to form precipitates;
- plastically straining said alloy; and
- recrystallizing said alloy by heating it above the minimum recrystallization temperature, whereby said precipitates form nuclei for the recrystallization and controlled growth of a fine grain structure;
- said improvement being characterized in that said step of plastically straining said alloy comprises:
- heating said alloy to a temperature in the range above said overaging temperature and below said alloy's solvus temperature and reducing its cross-sectional area a total of 40% minimum at a sufficiently high rate to introduce strain energy into said alloy so that complete recovery of said alloy does not occur.

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**4,295,902**

## METHOD OF MANUFACTURING ROLLED STEEL PRODUCTS WITH HIGH ELASTIC LIMIT

**Marios Economopoulos, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium**

**Filed Feb. 26, 1980, Ser. No. 124,794**
**Claims priority, application Belgium, Feb. 28, 1979, 874535**
**Int. Cl.$^3$ C21D *1/18*; C22C *38/46***
**U.S. Cl. 148—144** **4 Claims**

1. A method of manufacturing a rolled steel product having an elastic limit in the range from about 500 to about 1200 MPa, the method comprising subjecting a rolled steel product to intense cooling from above its austenitization temperature in

such a way that at least part of the surface of the product is subjected to martensitic and/or bainitic quenching while the remainder of the product stays at a temperature sufficient to allow tempering of the quenched surface to occur subsequently by conduction of heat from the said remainder to the quenched surface, the rolled steel product containing 0.10 to 0.50% C, 0.90 to 1.50% Mn, 0.10 to 0.45% Si, 0.20 to 0.70% Ni, 0.10 to 0.80% Cr, and 0.02 to 0.10% V.

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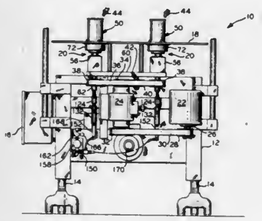
**4,295,903**

## CONTAINER SPINNING APPARATUS FOR CONTAINER MANUFACTURING MACHINE OR THE LIKE

**Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed May 17, 1979, Ser. No. 39,929**
**Int. Cl.³ B65B *7/28;* B05B *13/02***
**U.S. Cl. 156—69** **19 Claims**



1. Apparatus for clamping and rotating containers comprising:

a support;

table means rotatably positioned on said support for supporting a container for rotation about an axis of rotation intersecting said container;

means on said support for mounting said table means on said support whereby said table means is free to rotate about said axis of rotation;

drive means operatively connected to said table means for rotating said table means about said axis of rotation;

a plurality of jaw means each movably mounted on said table means for moving between a first position wherein said jaw means are retracted out of engagement with a container, and a second position wherein said jaw means are actuated into engagement with a container;

jaw-positioning means engageable with said plurality of jaw means and adapted for reciprocal movement coaxial with said axis of rotation of said table means for positioning said plurality of jaw means in the first positions thereof in a first position of said jaw-positioning means and, alternatively, for positioning said plurality of jaw means in the second positions thereof in a second position of said jaw-positioning means; and

actuator means operatively related to said jaw-positioning means for actuating said jaw-positioning mens into said first position thereof and, alternately, actuating said jaw-positioning means into said second position thereof.

12. A method of applying sealant to the inside of a container at the juncture between the inner surfaces of the bottom closure member and the side wall thereof, comprising:

(a) positioning the container on a table adapted for rotation about an axis of rotation intersecting said container;

(b) mechanically clamping the container on said table so that the container rotates with said table;

(c) rotating said table and the container clamped thereto about the axis of rotation;

(d) dispensing a stream of sealant on the juncture between the inner surfaces of the bottom closure member and the side wall of the container during rotation thereof so as to apply a continuous coating of sealant along the full length of said juncture;

(e) stopping the rotation of said table and the container after dispensing the stream of sealant; and

(f) releasing the container from thus stopped table.

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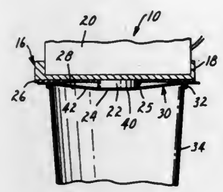
**4,295,904**

## METHOD OF HEAT SEALING A FILM TO THE LIP OF A CUP

**Paul F. Schmit, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 917,586, Jun. 21, 1978, Pat. No. 4,216,050.**
**This application Apr. 28, 1980, Ser. No. 144,613**
**Int. Cl.³ B29C *27/02;* B65B *7/28***
**U.S. Cl. 156—69** **2 Claims**



1. A method for sealing to the lip of a cup a piece of heat sealable film which will shrink a small amount when heated to normal heat sealing temperatures so as to draw attention to a feature in the film, said method comprising the steps of:

positioning a piece of the film adjacent the lip of the cup and over the cup opening with the feature surrounded by the lip of the cup;

pushing the piece of film slightly into the opening of the cup;

pressing the film into contact with the lip of the cup while heating the film to a first temperature adapted to fuse it to the lip; and

heating a first portion of the film around the feature to a second temperature which exceeds said first temperature to shrink said first portion of the film and gather a portion of the piece of film surrounding said first portion into outwardly radially extending ridges and grooves.

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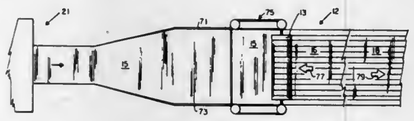
**4,295,905**

## FILL STRAND TRANSFER PROCESS FOR MAKING NON WOVEN FABRICS

**Hollis H. Bascom, Livermore; Stephen Matweyou, Oakland; Alan J. Andersen, Livermore, and John J. Greci, Livermore, all of Calif., assignors to Orcon Corporation, Union City, Calif.**

**Filed Dec. 14, 1979, Ser. No. 103,621**
**Int. Cl.³ B65N *81/00***
**U.S. Cl. 156—174** **14 Claims**



1. A method of transferring fill strands to form a non woven fabric and comprising,

guiding warp strands into the nip of a set of pressure rolls,

supporting a preformed, planar set of adhesive coated or impregnated fill strands in a fixed orientation, a fixed spacing, and a fixed tension of the fill strands near the pressure rolls so that said set of fill strands can be subsequently transferred as a set with said fixed orientation, spacing and tension to said warp strands in the nip of the pressure rolls,



feeding said preformed, planar set of fill strands having said fixed orientation, spacing and tension into the nip of the pressure rolls with the warp strands, and

transferring the fill strands with said fixed orientation, spacing and tension to the warp strands to form the fabric by causing the adhesive on the fill strands to adhere to the warp strands under the effect of the pressure produced in the nip of the pressure rolls.

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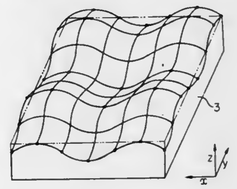
**4,295,906**

## METHOD FOR PRODUCING A MOTION PICTURE SCREEN

**Wataru Shimada; Susumu Hoshinouchi; Kenji Kawaguchi, and Akio Yoshida, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 28, 1980, Ser. No. 125,744**
**Claims priority, application Japan, Mar. 27, 1979, 54-36631**
**Int. Cl.³ G03B *21/56, 21/60***
**U.S. Cl. 156—214** **6 Claims**



1. A method for producing a motion picture screen comprising the steps of preparing a two-dimensional cutter the cutting edge of which comprises a number of circular arcs, connected together in a smooth wavy line, in the X-Z plane in a space coordinate system, each of said arcs having a predetermined curvature and a predetermined center angle, and the centers of the neighbouring ones of said circular arcs being located on opposite sides of said line, placing a workpiece from which said motion picture screen is to be produced and said two-dimensional cutter in the X-Z and X-Y planes, respectively, and machining the surface of said workpiece by said two-dimensional cutter while moving said workpiece and said cutter for producing a relative motion therebetween for forming a machined surface which comprises smooth connected wavy curves in sections parallel with both the X-Z and Y-Z planes, said curves respectively comprising a number of circular arcs, each of said last mentioned circular arcs having a predetermined curvature and a predetermined center angle, and the centers of the neighbouring ones of said circular arcs being positioned on opposite sides of said curves.

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**4,295,907**

## METHOD OF MAKING GLASS FIBER REINFORCED LAMINATE

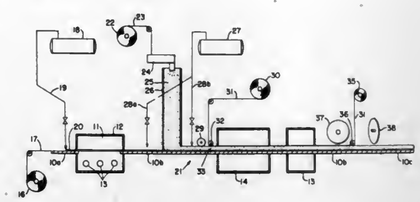
**Howard P. Cordts, Grafton, and Joan E. Karloske, Saukville, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.**

**Filed Dec. 28, 1979, Ser. No. 107,834**
**Int. Cl.³ B29C *19/00***
**U.S. Cl. 156—246** **5 Claims**

1. In the method for manufacturing glass fiber reinforced plastic laminate which comprises applying glass fibers and unpolymerized unsaturated polyester resin syrup between two carrier films and thereafter heating the resulting sandwich until the said unsaturated polyester resin syrup is cured and thereafter removing the carrier films and recovering as a product a sheetlike mass of glass fibers which are embedded within the cured unsaturated polyester resin syrup, the improvement comprising:

applying to a first of said carrier films a resin layer of UV curable resinous composition containing an ultraviolet radiation sensitizer,

exposing the said resin layer and the said first carrier film to ultraviolet radiation until the said resin layer is at least partially polymerized,



thereafter applying the said glass fibers and unsaturated polyester resin syrup to the said resin layer and thereafter applying the second of said carrier films to complete the sandwich; and subsequently heating the sandwich to cure the said unsaturated polyester resin syrup and to polymerize any unpolymerized components of the said resin layer.

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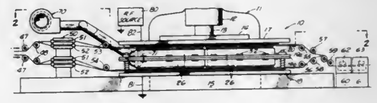
**4,295,908**

## METHOD AND APPARATUS FOR HEAT SEALING A PLURALITY OF SETS OF CONTINUOUS PLASTIC STRIPS TOGETHER BY RADIO FREQUENCY ENERGY

**Hans G. Schaefer, Lakewood, and Alfred Langer, Westminster, both of Calif., assignors to Manhattan R. F. Die Company, South Gate, Calif.**

**Filed Dec. 10, 1979, Ser. No. 102,130**
**Int. Cl.³ B29C *27/04;* B32B *31/18, 31/20***
**U.S. Cl. 156—251** **27 Claims**



1. Radio frequency powered apparatus for heat sealing a plurality of sets of plastic sheets together to form simultaneously a plurality of separate items comprising:

at least three superimposed platens including an upper platen, a lower platen and an intermediate platen normally resiliently supported between and spaced from said upper and lower platens and including means electrically isolating said platens from one another;

heat sealing die means on the opposed faces of said intermediate platen shaped to cooperate with the juxtaposed face of the adjacent one of said upper and lower platens to heat seal the sheets of each set of plastic sheets together in areas thereof held in pressurized contact with one another;

a source of radio frequency energy having the output thereof connected to energize said platens when the same are held pressed against respective sets of plastic sheets on the remote sides of said sealing die means; and

means supporting said platens for reciprocation toward one another to compress the sheets of said sets of sheets together in areas in contact with said die means while said platens are energized with radio frequency energy to heat seal the sheets of each of said sets of sheets together.

22. That method of simultaneously heat sealing two sets of a plurality of superimposed plastic strips together in predetermined selected areas thereof in successive heat sealing cycles which comprises:

advancing separate sets of superimposed plastic strips past the opposite faces of a platen having heat sealing and tear forming dies fixed to and protruding from a respective face thereof and which platen is floatingly positioned directly between and electrically isolated from the upper

and lower platens of a radio frequency powered heat sealing press; and

closing said upper and lower platens toward one another while energizing the same with radio frequency power thereby to heat seal said sets of strips together in predetermined selected areas before indexing said sets of strips forwardly for the next heat sealing cycle.

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**4,295,909**

## CURABLE POLYBUTADIENE-BASED RESINS HAVING IMPROVED PROPERTIES

**Louis J. Baccei, Farmington, Conn., assignor to Loctite Corporation, Newington, Conn.**

**Continuation of Ser. No. 64,170, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 813,207, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 546,250, Feb. 3, 1975, abandoned. This application Oct. 10, 1980, Ser. No. 195,986**

**Int. Cl.³ C09J** *5/02;* **C08F** *8/30;* **C08L** *75/04*

**U.S. Cl. 156—307.3** **27 Claims**

1. An adhesive and sealant composition having improved thermal and impact properties and curable through gaps of more than 40 mils, comprising:

I. a polymerizable product corresponding in structure to a reaction product of:

(a) a polybutadiene polyol of polyamine comprising about 5 to about 150 butadiene units and having at least about 70 percent of the butadiene units in the 1,4-configuration and selected from the group consisting of polybutadiene, butadiene-acrylonitrile copolymers, and butadiene-styrene copolymers, and,

(b) a molar excess of a reaction product of: a molar excess of an aromatic or cycloaliphatic polyisocyanate with a compound selected from the group consisting of an aromatic or cycloaliphatic polyol,

the product of (a) and (b) subsequently being reacted with a molar excess of a hydroxyalkyl acrylate, a hydroxyalkyl methacrylate, an aminoalkyl acrylate, or an aminoalkyl methacrylate; and

II. a free radical initiator.

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**4,295,910**

## PROCESS FOR PRODUCTION OF VINYL FILM-CELLULOSIC LAMINATES AND LAMINATES PRODUCED THEREBY

**James Cooley, and Ozzie Fogle, both of Orangeburg, S.C., assignors to Champion International Corporation, Stamford, Conn.**

**Filed Apr. 25, 1980, Ser. No. 143,625**

**Int. Cl.³ C09J** *5/04*

**U.S. Cl. 156—314** **9 Claims**

1. A process for bonding a polymeric film to a cellulosic substrate which comprises:

(A) coating said substrate with an organic polyisocyanate having at least two active isocyanate groups per molecule;

(B) coating vinyl acetate-ethylene copolymer emulsion adhesive onto said polyisocyanate to form an interlaminate adhesive layer; and

(C) applying a vinyl polymeric film to said interlaminate adhesive layer; whereby a permanently bonded laminate is formed.

**4,295,911**

## PROTECTIVE LAYER FOR SURFACE SEALS IN BUILDING CONSTRUCTION, UNDERGROUND CONSTRUCTION, AND CIVIL ENGINEERING CONSTRUCTION

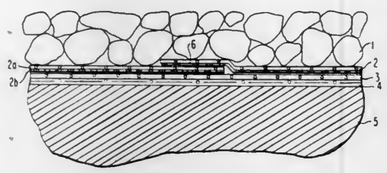
**Karl Haage, Troisdorf-Spich, and Dieter Scharff, Troisdorf-Sieglar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany**

**Division of Ser. No. 818,232, Jul. 22, 1977, Pat. No. 4,239,795, which is a continuation of Ser. No. 596,765, Jul. 17, 1975, abandoned. This application May 30, 1980, Ser. No. 155,000**

**Claims priority, application Fed. Rep. of Germany, Jul. 17, 1974, 2434328**

**Int. Cl.³ C09J** *5/04, 5/02*

**U.S. Cl. 156—315** **2 Claims**




1. A process for the continuous production of a protective covering, wherein a first topcoat layer is applied as a soft PVC plastisol onto an endless carrier web at room temperature; gelling is initiated during a short-term heat application of about 160°–200° C.; whereupon a second topcoat layer is applied to the first topcoat layer and a lattice-like fabric is placed on said second topcoat layer, which is still in the un-gelled condition; then gelling is initiated in the first and second topcoat layers by heating in a temperature range of between 160° C. and 250° C., while simultaneously the bonding to the lattice-like fabric is taking place, said lattice-like fabric being a resilient fabric having fibers joined together at junctions that yield under the effect of a load, and said topcoat layers having differing composition, the first topcoat layer having a higher weatherability due to the addition of stabilizers and a lower filler content as compared to the second topcoat layer.

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**4,295,912**

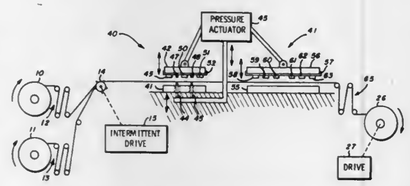
## APPARATUS AND PROCESS FOR LAMINATING COMPOSITE TAPE

**Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 921,644, Jul. 3, 1978, abandoned. This application Jul. 17, 1979, Ser. No. 58,404**

**Int. Cl.³ B32B** *31/08, 31/20;* **B65H** *17/40*

**U.S. Cl. 156—324** **17 Claims**




1. The process for precision laminating at least a pair of strips having substantially dissimilar mechanical properties and at least one of which has a surface coating of unactivated but activatable adhesive, said strips further having mating edge located perforations, said process comprising:

advancing said strips together in intermittent fashion, said intermittent advancing operating to advance said strips a predetermined distance in a cyclic manner having a predetermined rest interval;

aligning said strips to obtain registry therebetween;

pressing a first bonding tool against said strips during said rest interval, said first bonding tool being contoured to contact a limited area of said strips;

heating said strips to at least partly activate said adhesive during said rest interval and while said strips are in registry to create a tack bond between said strips;

pressing a second bonding tool against said strips to heat and activate said adhesive during said rest interval, said second bonding tool being contoured to contact said strips over an area having a length of at least said predetermined distance; and

heating said strips to a second temperature to activate said adhesive over the area of said second bonding tool whereby said strips are fully laminated together.

9. Apparatus for precision laminating at least a pair of strips having substantially dissimilar mechanical properties and at least one of which has a surface coating of unactivated but activatable adhesive, said strips further having mating edge located perforations, said apparatus comprising:

means for advancing said strips simultaneously through said apparatus on an intermittent cycle having a transport interval and a rest interval, said transport interval producing a predetermined advance;

means for locating said strips to register said perforations;

means for pressing a first bonding tool against said strips during said rest interval said first bonding tool having a surface that contacts said strips over a limited area portion;

means for heating said strips to a first temperature to at least partly activate said adhesive and tack said strips together over a limited area;

means for pressing a second bonding tool against said strips, said second bonding tool having an area including the width of said strips and a length at least equal to said predetermined advance; and

means for heating said strips to a second temperature to activate said adhesive and to laminate said strips substantially over their entire area.

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**4,295,913**

## ELECTRICALLY OPERATED DEVICE, ESPECIALLY DUPLICATING DEVICE, WITH A RECEPTACLE TO ACCOMMODATE FLUID FOR THE CHEMICAL TREATMENT OF OBJECTS

**Horst Purr, Tennenbronn; Manfred Kistler, Eisenbach, and Rolf Müller, St. Georgen, all of Fed. Rep. of Germany, assignors to Mathias Bauerle GmbH, Georgen, Fed. Rep. of Germany**

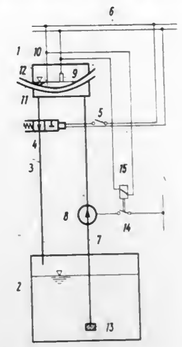
**Filed Feb. 28, 1980, Ser. No. 125,666**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908283**

**Int. Cl.³ B41C** *1/10*

**U.S. Cl. 156—345** **15 Claims**

1. An electrically operated offset printer including means for etching offset printing films, said means for etching comprising a dip tank having means for passing said offset printing films therethrough, a storage tank for storing the etching fluid, a supply conduit connecting said dip tank and said storage tank for passing etching fluid from said storage tank to said dip tank, pump means for causing etching fluid to pass from said storage tank to said dip tank, an automatic charging and metering unit for controlling said pump means to pump etching fluid into said dip tank when the fluid level in the dip tank is below a predetermined level, and a drain conduit, connecting the storage tank with the dip tank, for draining the etching fluid from the dip tank, said drain conduit including a solenoid valve which is adapted to be opened for draining the etching fluid from the dip tank, whereby the dip tank can be drained when the printer is turned off and the dip tank will be filled to operating level when the printer is operated, without continuous operation of said pump means.



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**4,295,914**

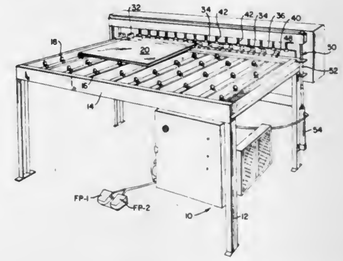
## APPARATUS FOR APPLYING SEALANT MATERIAL TO A WORKPIECE

**John C. Checko, 5 Northern Dr., Bridgewater, N.J. 08807**

**Filed Aug. 22, 1979, Ser. No. 68,691**

**Int. Cl.³ B32B** *31/04, 31/14*

**U.S. Cl. 156—357** **13 Claims**



1. Apparatus for applying sealant material to a workpiece assembly, wherein said workpiece assembly includes two planar members separated by at least one spacer, comprising:

a work supporting surface for receiving said workpiece assembly;

means for aligning said planar members and said spacer of said workpiece assembly relative to each other and in a fixed position relative to a sealant applying means;

said aligning means including stop members for engaging an exposed edge of said workpiece assembly;

means for moving said stop members out of engagement with said exposed edge of said workpiece assembly;

means for clamping said workpiece assembly in said fixed position on said supporting surface with at least one edge exposed for receiving sealant material;

means for applying sealant material being mounted to face the exposed edge of said workpiece assembly and operable to apply sealant material when said stop members are moved out of engagement with the exposed edge of said workpiece assembly; and

means for moving said sealant applying means relative to said workpiece assembly to apply sealant material along the edge of said workpiece assembly.

## 4,295,915
## LABEL HANDLING APPARATUS

Tadahiro Sakaguchi, Nishinomiya; Masamichi Hino, Suita; Setsuo Tsuji, Hashimoto; Akiyoshi Hashido, Yao, and Kazuyoshi Enomoto, Kawachinagano, all of Japan, assignors to Kubota Ltd., Osaka, Japan

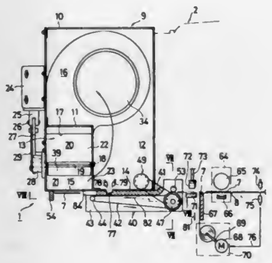
PCT No. PCT/JP79/00042, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO80/00827, PCT Pub. Date May 1, 1980

PCT Filed Feb. 22, 1979, Ser. No. 103,948

Claims priority, application Japan, Oct. 13, 1978, 53-126332; Oct. 13, 1978, 53-126333; Oct. 13, 1978, 53-126335

Int. Cl.³ B65H *25/00*

U.S. Cl. 156—361 51 Claims



1. A label handling apparatus comprising label preparing means for preparing labels each being temporarily retained on a backing strip through an adhesive agent applied to one surface thereof and having desired data visibly borne on the other surface thereof by stripping said labels from said backing strip in preparation for sticking said stripped labels to objects, sticking means for sticking said prepared labels to objects, said sticking means comprising air current producing means for producing air currents to produce a positive pressure atmosphere and a negative pressure atmosphere, an atmosphere chamber adapted to selectively communicate with either said positive pressure atmosphere or said negative pressure atmosphere produced by said air current producing means, said atmosphere chamber formed with a portion communicating with the ambient air, said ambient air communicating portion being provided with a label retaining port for blowing off and projecting labels and for sucking and retaining labels, gate means for selecting said negative pressure atmosphere or said positive pressure atmosphere, said gate means comprising two gate members, said two gate members comprising opposed end edge portions, said gate members operable in a symmetrical manner so that opposed end edges are brought close to each other in a path closing state and so that said end edges are moved away from each other in a path opening state, gate means driving apparatus for driving and controlling said gate means whereby labels are blown off and projected or sucked and retained at the label retaining port depending upon the position of said gate members, transfer means for transferring said labels from said label preparing means to said sticking means, said transfer means including a moving portion which contacts only a portion of the surface of said label having said adhesive agent applied thereto so as to contact withdraw and transfer said label, and controlling means for controlling the relative timing between the label preparing operation in said label preparing means and the label sticking operation in said sticking means.

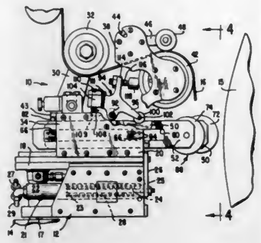
## 4,295,916
## TAPE BRAKE FOR TAPE WRAPPER

Samuel B. Stevens, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 11, 1979, Ser. No. 133,634

Int. Cl.³ B29H *17/00*

U.S. Cl. 156—397 11 Claims



1. In an apparatus (**10**) for severing a tape (**16**) being applied to a body (**15**) as said body (**15**) is moved past said apparatus (**10**), a housing (**20**), an applicator roller (**42**) carried by said housing (**20**) for applying tape (**16**) to said body (**15**), a holder (**50**) movably carried on said housing (**20**), a stitching roller (**72**) rotatably mounted on said holder (**50**) and projecting outward from said housing (**20**) to a predetermined position relative to said applicator roller (**42**), resilient means (**66**) urging said holder (**50**) and said stitching roller (**72**) outward from said housing (**20**) to position said stitching roller (**72**) outboard of said applicator roller (**42**), in combination: brake means (**94**) carried by said housing (**20**) for arresting rotation of said applicator roller (**42**), and means (**80**) on said holder (**50**) for activating said brake means (**94**) in response to said holder (**50**) and stitching roller (**72**) being extended a predetermined amount outboard of said applicator roller (**42**) whereby the tape (**16**) extending from said applicator roller (**42**) to said stitching roller (**72**) is severed as said body (**15**) is moved past said stitching roller (**72**).

## 4,295,917
## WINDING OF FIBRES

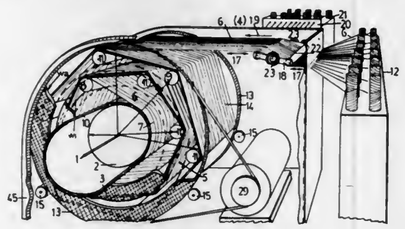
Wolf W. Stinnes, 31 Johann Rissik Dr., Waterkloof Ridge, Pretoria, South Africa

Filed Dec. 29, 1978, Ser. No. 974,422

Claims priority, application South Africa, Dec. 29, 1977, 77/7700

Int. Cl.³ B65H *8/00*

U.S. Cl. 156—428 8 Claims



1. A machine for continuously winding endless fibres onto an object, the machine having an open ended hollow rotating fibre carrier and guide around the object, the carrier being adapted for the accumulation of turns of fibre on its outside, the guide being adapted to lead the fibre from underneath layers of the turns accumulated on the outside of the hollow carrier inwardly to the object and means adapted to rotate the carrier with the guide wherein the outside of the carrier comprises fibre support means adapted for the easy rotation of the accumulated turns of fibre relative to the carrier, and further comprising a stationary fibre bank for supplying the carrier with fibre, means adapted to reverse the direction of rotation of the carrier and buffer means intermediate between the carrier and the fibre bank adapted to take up turns from the carrier during reverse rotation,

the buffer means comprising an outer hollow open-ended rotating carrier and guide, the fibres proceeding from the bank to the outer hollow carrier, being accumulated in several turns on this outer carrier, then proceeding from underneath layers of the turns of the outer carrier inwardly over a guide thereof to an inner hollow carrier, and means adapted to rotate the outer carrier with guide at rotational speeds bearing a constant ratio to rotational speeds at which the inner carrier is rotated both in forward and reverse direction.



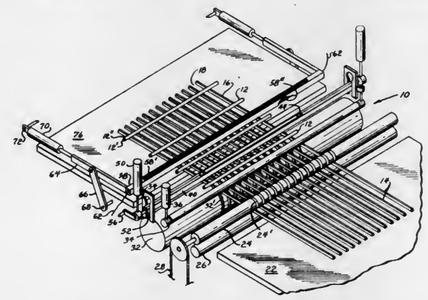
## 4,295,918
## APPARATUS FOR ASSEMBLING A PLASTIC MINING SCREEN

Henry E. Benson, Long Lake, and Terrence D. Moravec, Minneapolis, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 26, 1979, Ser. No. 107,488

Int. Cl.³ B07B *1/46;* B32B *1/00*

U.S. Cl. 156—434 9 Claims



1. An assembly apparatus for assembling and thermally welding an elongated support rod having at least a thermoplastic coating simultaneously to a plurality of spaced, profiled screen surface members having at least a thermoplastic coating and which are arranged in a plane so as to be parallel to each other and transverse to said support rod; said apparatus having a pair of cooperating feed rollers, at least one of which is driven, for engaging and feeding said profiled members to a welding station wherein they are supported by a support roller; at least one of said feed rollers being grooved to accept said profiled members and to establish their spacing relative to each other; an elongated support rod positioning bar having at least one surface which includes a groove for receiving a support rod and retaining it, said support rod positioning bar being located above the welding station and said at least one surface comprising its bottom surface during a welding operation; an elongated welding bar mounted for movement into and out of a position in a vertical plane in the welding zone area between said support rod positioning bar and said profiled members, said welding bar containing heater means and having upper and lower heated portions for simultaneously heating the bottom side of said support rod carried by said support rod positioning bar and a top portion of each of said profiled members; and means for forcing said support rod positioning bar and the support rod positioned thereunder downwardly as the welding bar is removed from said welding zone area, said downward movement causing the intersecting portions of said support rod and profiled members which are at least partially melted or softened by the welding bar to flow together into an intimate fused relationship.

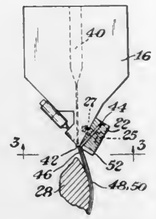
## 4,295,919
## FORMING AN INTEGRAL CLOSURE FOR A THERMOPLASTIC CONTAINER

Thomas A. Sutrina, Rockford, Ill., and R. Douglas Behr, Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 969,911, Dec. 15, 1978. This application May 14, 1980, Ser. No. 149,861

Int. Cl.³ B29D *7/04*

U.S. Cl. 156—498 8 Claims



1. An apparatus for forming an integral thermoplastic fastening means on a cast film or sheet, said apparatus comprising an extrusion die having an extrusion channel ending in extrusion die lips, said die lips presenting a surface defining a plane, a side of said die presenting a face angularly disposed towards said extrusion channel and die lips, an extrusion die block located adjacent said face, a die plate secured to the die block, said die plate having a leading edge, said leading edge located out of the plane of the die lips, said die block having an extrusion channel disposed angularly adjacent the exit of said die block so as to increase the acuteness of the angularity of the extrudate issuing from the die plate with respect to the extrudate issuing from said die lips, and cooling means located below said extrusion die and die plate.

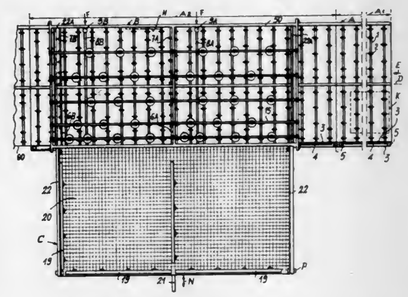
## 4,295,920
## APPARATUS FOR AUTOMATICALLY PRODUCING GLAZED INSULATING WINDOW OR DOOR PANELS

Luigi Bovone, 15070 Belforte Monferrato, Alessandria, Italy

Filed Nov. 26, 1979, Ser. No. 97,789

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—557 10 Claims



1. An apparatus for automatically manufacturing glazed insulating window or door panels constituted by two glass panes spaced apart by a frame interposed therebetween, comprising:

first means for situating a first pane in a predetermined position;

second means located in operative relationship to said first means for raising the first pane from a predetermined position to an elevated position;

mobile plate means located in operative relationship to said first means for situating a frame provided with at least a partial coating of adhesive in a certain position below the first pane when the latter is in its elevated position;

said second means further comprising means for lowering the first pane from the elevated position when the frame is situated in a certain position until the first pane contacts one side of the frame to form an assembly therewith and for thereupon raising the assembly;

said first means further comprising means for situating the second pane in a predetermined position below said assembly whereupon said second means lowers said assembly until the frame contacts the other side of the frame to form a panel.

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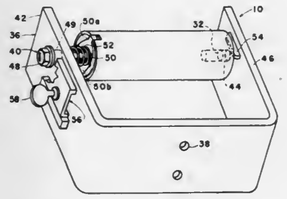
**4,295,921**

## SYSTEM FOR CONTROLLING THE MOVEMENT AND LOCKING OF TAPE APPARATUS

**John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228**

**Filed Apr. 16, 1980, Ser. No. 140,858**
**Int. Cl.³ B44C** *7/00*
**U.S. Cl. 156—577** **1 Claim**




1. In a tape reel system having a spool for unreeling tape therefrom and means for mounting the spool rotatably, the improvement comprising: the means for mounting including means for adjustably retarding rotation of the spool; means for locking the spool for preventing said rotation of the spool; the means for mounting including a spindle with first and second ends, the spool being cylindrical and having aperture-defining means in the circumference of a first end thereof, the spindle having spool-aperture engaging means adjacent the second end thereof for connecting the spool for rotation therewith; the mounting means further including a bracket comprising a base and first and second arms integral with the base, the means for adjustably retarding rotation including resilient means on the spindle; means for causing the resilient means to exert adjustable force against the first arm including said spool-aperture engaging means having threaded connection with the spindle; the spool aperture defining means defining first and second slots diametrically opposed in said first end of the spool, the aperture engaging means detachably engaging both said slots; the spool having a second end with an end cover thereover having a hole in the center thereof, said means for rotatably mounting the spool, mounting said end cover, by engagement at said hole, to the second arm of the bracket; means for exerting a retarding force on the spool at said second end, comprising a fixed protrusion from the second arm extending against the end cover adjacent the hole; the means for locking including the spindle having a shape permitting engagement of the first end thereof, means on the first arm for engaging said spindle shape, the shape being polygonal and the means on the first arm having an open-end wrench shape proportioned for fitting to said polygonal shape; the means on the first arm having a sliding engagement with the first arm and means for adjustably fixing the sliding position of said sliding engagement; the sliding engagement being on the outside of the first arm and the resilient means comprising a compression spring held on said spindle in a space between said first arm and said spool aperture engaging means; the spindle second end having a closure with a hole therein, means protruding from the second arm into the hole, and means permitting ready removal and reloading of a spool comprising the compression spring having sufficient length to permit a spool to be thrust thereagainst and compress the spring to an extent clearing the second end of the spool from said means protruding.

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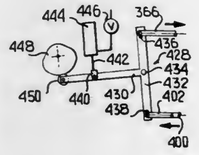
**4,295,922**

## TUBE SIDE SEAM HEAT SEALER

**Jack R. Evers, Torrance, Calif., assignor to Developak Corporation, Redondo Beach, Calif.**

**Filed Sep. 17, 1979, Ser. No. 76,449**
**Int. Cl.³ B30B** *5/02*
**U.S. Cl. 156—583.1** **14 Claims**




1. A heat sealer comprising first and second support members, mounting means mounting said support members in parallel relation for axial movement, opposed heat sealing members carried by said support members, drive means interconnecting said support members for axial movement in unison; and said drive means including fluid pressure means urging said support members to positions wherein said heat sealing members are in closed operative positions, and selectively operable mechanical means operable to overcome said fluid pressure means and to move said support members to positions separating said heat sealing members for receiving an article to be heat sealed therebetween.

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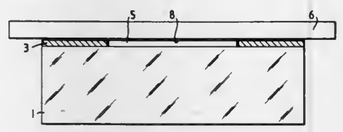
**4,295,923**

## METHOD OF MANUFACTURING A SEMICONDUCTOR/GLASS COMPOSITE MATERIAL

**Erich Kasper, Senden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 13, 1980, Ser. No. 130,122**
**Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909985**
**Int. Cl.³ H01L** *21/306*
**U.S. Cl. 156—630** **5 Claims**




1. A method of manufacturing a semiconductor/glass composite material, in which at least one semiconductor layer is permanently connected to a plate-shaped glass substrate comprising the steps of covering the glass substrate at least partially by a second layer on its surface facing the semiconductor; bringing the semiconductor and the glass substrate into contact in the surface areas not provided with the second layer; connecting them by means of the action of pressure and heat; and etching away the semi-conductor layer to the thickness of the second layer by means of etch polishing.

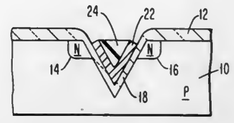


**4,295,924**

## METHOD FOR PROVIDING SELF-ALIGNED CONDUCTOR IN A V-GROOVE DEVICE

**Richard R. Garnache, South Burlington, and Donald M. Kenney, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 103,981**
**Int. Cl.³ H01L** *21/308*
**U.S. Cl. 156—643** **10 Claims**




1. The method of providing a conductive electrode for a semiconductor device comprising the steps of:

providing a semiconductor substrate having a surface containing at least one recessed groove to which an electrode is to be provided;

depositing a substantially uniform layer of electrode forming material over at least a portion of said surface including all of said groove;

dispensing a layer of mask-forming organic material over said layer of electrode forming material and said surface to a depth sufficient to provide a substantially planar upper surface;

heating said substrate to harden said layer of mask-forming organic material;

selectively etching said layer of organic material in preference to said electrode forming material to a depth below the level of the surface of said substrate to expose the portion of said layer of electrode forming material outside of the area of said groove;

applying a blocking mask over at least a part of said exposed layer of electrode forming material adjacent to, and extending over one end of the area of said groove;

selectively etching and removing said layer of electrode forming material in preference to said masking material and said blocking mask to provide an electrode on said substrate having a first etch-defined portion terminating within said groove below said surface of said substrate and a second connected portion remaining on said surface; and

removing both said masking material and said blocking mask.

9. The method of claim 1 wherein the step of providing said substrate further comprises the steps of:

providing a silicon semiconductor substrate of a predetermined conductivity type;

forming a first dielectric layer on said first surface of said silicon semiconductor substrate;

providing at least one opening in said dielectric layer to expose a region of said first surface; and

anisotropically etching said exposed region to form said groove therein.

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**4,295,925**

## TREATING PULP WITH OXYGEN

**Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jun. 15, 1979, Ser. No. 48,935**
**Int. Cl.³ D21C** *9/04, 9/10;* **D21D** *5/28*
**U.S. Cl. 162—19** **40 Claims**

1. A wood pulp process comprising

continuously digesting wood chips with chemicals under heat and pressure to form delignification products and delignified wood chips,

removing at least a part of said delignification products,

forming wood pulp from said delignified wood chips by partially releasing the pressure from said wood chips,

transporting a slurry containing said wood pulp and remaining delignification products under pressure to a storage tank, and

storing said slurry in said tank,

prior to said storage, adjusting the pH of said slurry to a pH in the range of 8 to 14,

between said pH adjustment and said storage, adding oxygen to said slurry,

between said pH adjustment and said storage, mixing said oxygen with said slurry in a mixing zone in which a plurality of rotating members pass through said slurry in a direction transverse the direction of travel of said slurry,

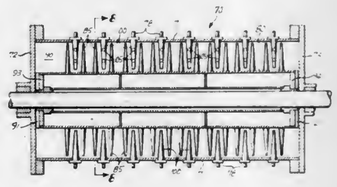
said members having a major axis extending in the direction of rotation,

said members providing a swept area through said slurry of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

23. A pulping apparatus comprising

a continuous digester for continuously digesting wood chips to form delignification products and delignified wood chips, and



a washer associated with said digester for removing at least a part of said delignification products,

said digester having a pressure relief valve for forming wood pulp from said delignified wood chips by partially releasing the pressure from said wood chips,

a pipe for transporting a slurry containing said wood pulp and remaining delignification products under pressure from said digester to a storage tank, and

said storage tank,

means, prior to said storage tank, for adding a pH adjustment chemical to said slurry,

means, between said pH adjustment chemical addition means and said storage tank, for adding oxygen to said slurry, and

means, prior to said storage tank, for mixing said oxygen with said slurry, said mixing means having

a mixing zone,

a plurality of rotors in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

said rotors having a major axis extending in the direction of rotation,

said rotors being rotatable through said slurry in a direction transverse to the direction of travel of said slurry,

means for rotating said rotors, and

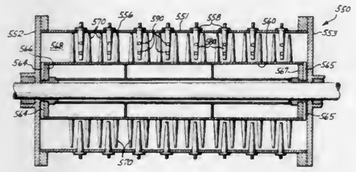
said rotors providing a swept area of from 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

**4,295,926**

## METHOD AND APPARATUS FOR TREATING PULP WITH OXYGEN

**Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jun. 15, 1979, Ser. No. 49,001**
**Int. Cl.³ D21C 9/10; D21D 5/28**
**U.S. Cl. 162—57** **88 Claims**



1. The process of creating intimate current between wood pulp having a consistency of 7 to 15% and a pH in the range of 8 to 14 and treating said pulp with said oxygen, comprising

adding oxygen to said pulp,

mixing said oxygen with said pulp, said mixing occurring in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,

said members having a major axis extending in the direction of rotation,

said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

transporting said pulp to a washer, and

washing said pulp in said washer.

53. A apparatus for creating intimate contact between a pulp having a consistency of 8 to 15% and oxygen and treating said pulp with said oxygen, comprising

means for transporting said pulp to a washing means,

said means for washing said pulp,

before said washing means,

means for adding alkali to said pulp,

means for adding oxygen to said pulp, and

means for mixing said oxygen with said pulp, said mixing means having a mixing zone,

a plurality or rotors on said shaft in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

said rotors being rotatable through said slurry in a direction transverse in the direction of travel of said slurry,

said rotors having a major axis extending in the direction of rotation,

means for rotating said rotors, and

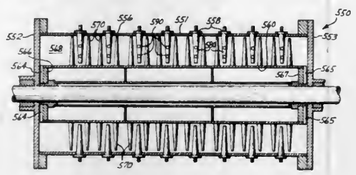
said rotors providing a swept area of from 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

**4,295,927**

## METHOD AND APPARATUS FOR TREATING PULP WITH OXYGEN AND STORING THE TREATED PULP

**Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way, both of Wash.; Henry Bepple, Kamloops, Canada; Louis O. Torregrossa, Puyallup, Wash.; Howard R. Battan, Auburn, Wash., and Dennis H. Justice, Everett, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jun. 15, 1979, Ser. No. 48,917**
**Int. Cl.³ D21C 9/10; D21D 5/28**
**U.S. Cl. 162—57** **88 Claims**



1. The process of creating contact between a wood pulp having a consistency of 8 to 15% and a pH in the range of 8 to 14 and oxygen, and treating said pulp with said oxygen, comprising

adding oxygen to said pulp,

intimately mixing said oxygen with said pulp, said mixing occurring in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,

said members having a major axis extending in the direction of rotation,

said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

transporting said pulp to a storage tank, and

storing said pulp in said storage tank.

53. An apparatus for intimately mixing a pulp having a consistency of 8 to 15% with oxygen, and treating pulp with said oxygen, comprising

means for transporting said pulp to a storage tank, and

a storage tank,

before said storage tank,

means for adding alkali to said pulp,

means for adding oxygen to said pulp, and

means for mixing said oxygen with said pulp, said mixing means having a mixing zone,

a plurality of rotors in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

said rotors being rotatable through said pulp in a direction transverse to the direction of travel of said pulp,

said rotors having a major axis extending in the direction of rotation,

means for rotating said rotors, and

said rotors providing a swept area of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

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**4,295,928**

## PHENOLIC COMPOUNDS AS VISCOSITY PRESERVATIVES DURING HYPOCHLORITE PULP BLEACHING

**Michael D. Breslin, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Aug. 7, 1980, Ser. No. 176,229**
**Int. Cl.³ D21C 9/14**
**U.S. Cl. 162—73** **5 Claims**

1. In a method for the bleaching of aqueous slurries of chemically produced cellulosic materials utilizing a hypochlorite bleaching agent selected from the group consisting of sodium hypochlorite and calcium hypochlorite, the improvement comprising maintaining in the aqueous slurry of the chemically produced cellulosic material during treatment with said bleaching agent from 0.01–0.5% by weight of an aromatic compound selected from the group consisting of: thymol and hydroquinone.



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**4,295,929**

## PROCESS FOR ACID SULFITE DIGESTION OF WOOD

**Phyllis C. Leithem, McCleary, Wash., assignor to International Telephone and Telegraph Corp., New York, N.Y.**

**Continuation-in-part of Ser. No. 54,425, Jul. 3, 1979, abandoned. This application Mar. 19, 1980, Ser. No. 131,813**
**Int. Cl.³ D21C 3/06**
**U.S. Cl. 162—83** **13 Claims**

1. In a process of digesting wood to produce chemical pulp by the acid sulfite digestion process in which the ratio by weight of total $SO_2$ to combined $SO_2$ is at least 4 to 1 comprising heating in a closed vessel wood chips in an acid sulfite cooking liquor having a concentration of free $SO_2$ no greater than 16% to a maximum cooking temperature no greater than 180° C. and at a maximum pressure no greater than 170 psig for a period of time sufficient to defiber the wood,

the improvement in which the ratio by weight of one part of combined $SO_2$ to 100 parts of dry wood is from 4 to 12 and the minimum average rate of heating to a temperature which is the substantially maximum cooking temperature is 40° C. per hour.

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**4,295,930**

## ALKOXYLATED DIOXOLANES AS PAPER SIZING AGENTS

**Thomas Aitken, Chicago; David J. Kowalski, Clarendon Hills, and K. G. Srinivasan, Oak Park, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Mar. 17, 1980, Ser. No. 130,666**
**Int. Cl.³ D21H 3/02**
**U.S. Cl. 162—158** **41 Claims**

1. A composition for sizing paper comprising the acid catalysed reaction product of an aqueous solution of glyoxal containing no less than 40 wt % and no more than 80 wt % glyoxal, and a hydrophobe chosen from the group consisting of:

(A) linear and branched, saturated and unsaturated fatty alcohols containing from 10 to 30 carbon atoms, and mixtures of such alcohols; and

(B) esters of polyols containing from 2 to 5 carbon atoms with fatty acids containing from 10 to 30 carbon atoms which esters contain at least one free hydroxyl group, and mixtures of such esters;

and wherein from 0.1 mole to 3.0 moles of glyoxal is used per hydroxyl group in the hydrophobe.

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**4,295,931**

## SIZING METHOD AND SIZING COMPOSITION FOR USE THEREIN

**David H. Dumas, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**Continuation of Ser. No. 33,618, Apr. 26, 1979, abandoned, which is a continuation of Ser. No. 875,663, Feb. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 665,140, Mar. 8, 1976, abandoned. This application Jun. 2, 1980, Ser. No. 155,040**
**Int. Cl.³ D21H 3/02**
**U.S. Cl. 162—158** **4 Claims**

1. In the method of producing sized paper wherein there is employed in the internal or external sizing thereof an aqueous emulsion of a hydrophobic cellulose reactive sizing agent selected from the group consisting of ketene dimers, acid anhydrides, and organic isocyanates, the improvement wherein there is employed in combination with the sizing agent a sizing accelerator, said accelerator being selected from a water-soluble poly(diallylamine)-epihalohydrin resin and a water-soluble poly(N-methyldiallylamine)-epihalohydrin resin in an amount sufficient to increase the off-the-machine sizing effect of the sizing agent, the amount of epihalohydrin used in reaction with the poly(diallylamine) being from about 0.5 mole to about 1.5 moles per mole of secondary amine present in the polymer and the amount used in reaction with the poly(N-methyldiallylamine) being from about 0.5 mole to about 1.5 moles per mole of tertiary amine present in the polymer.

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**4,295,932**

## SYNERGISTIC BLEND OF BIOCIDES

**Frances C. Pocius, Westmont, Ill., assignor to Naloc Chemical Company, Oak Brook, Ill.**

**Filed Jul. 14, 1980, Ser. No. 168,858**
**Int. Cl.³ D21H 5/22**
**U.S. Cl. 162—161** **5 Claims**

1. A method for controlling aqueous systems heavily contaminated with microorganisms comprising treating such systems with 0.5–10 ppm of a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one and 25% 2-methyl-4-isothiazolin-3-one and an effective amount of chlorine or chlorine dioxide, such amount being substantially effective with said mixture to control microorganisms in the aqueous system.

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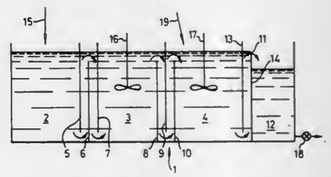
**4,295,933**

## PRODUCING DISPERSIONS OF PREFLOCCULATED FILLERS FOR USE IN PAPERMAKING

**David E. Smith, Longfield, England, assignor to Blue Circle Industries Limited, London, England**

**Continuation of Ser. No. 923,347, Jul. 10, 1978, abandoned. This application Apr. 3, 1980, Ser. No. 137,476**
**Claims priority, application United Kingdom, Jul. 12, 1977, 29209/77**
**Int. Cl.³ D21H 3/82**
**U.S. Cl. 162—168 NA** **25 Claims**



1. In a method of supplying filler to a papermaking furnish which comprises the steps of forming preflocculated filler and then adding it to papermaking furnish, the improvement which comprises forming the preflocculated filler by continuously forming a suspension of polymeric binder in particulate form in water in which the concentration of the binder solids in the suspension is at least 0.5 percent by weight, said binder being a starch-based polymer; continuously passing the formed suspension through a zone wherein the suspended particulate polymeric binder is allowed to swell in the water and is subjected to shear; regulating the rate of continuous flow of the resulting dispersion through the zone, and the degree of shear applied, so that the residence time of the dispersed polymeric binder in the zone is at least sufficient for optimum swelling of said polymeric binder in the water and the resulting solution of polymeric binder in the water is visually homogeneous; continuously passing said solution to the papermaking furnish; and introducing filler into the water sufficiently in advance of contact of said solution with the papermaking furnish such that said filler is preflocculated prior to contact thereof with the papermaking furnish.

**4,295,934**

## LIQUID-METAL-COOLED NUCLEAR REACTOR

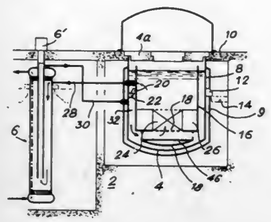
**Marcel Robin, 25, Avenue de l'Europe, 92310 Sevres, France**

**Filed Jun. 22, 1979, Ser. No. 51,517**

**Claims priority, application France, Jun. 23, 1978, 78 18823**

**Int. Cl.³ G21C** *15/00, 11/08*

**U.S. Cl. 376—203** **6 Claims**



1. A liquid metal cooled nuclear reactor comprising:

a core constituted by a plurality of fuel-assemblies provided with a tubular bottom fitting and by its neutronic protection means;

a main vessel comprising a bottom portion, a lateral wall and first supporting means arranged at a determined level, said first means being integral with the outer surface of said lateral wall;

a primary vessel, mounted inside said main vessel and coaxial therewith, said primary vessel comprising a corediagrid for supporting and feeding the reactor core, a lateral wall and second supporting-means integral with the primary vessel lateral wall and with the main vessel lateral wall, respectively, the two laterial walls of said two vessels defining an annular space;

a semi-tight horizontal partition in said annular passage;

at least one heat-exchanger outside said vessels for ensuring a heat-exchange between said hot liquid metal and cold water;

a first connection duct for the hot metal between the inlet of said exchanger and the inside of the primary vessel above said core, said first duct opening into said primary vessel above said core and passing through said annular space above said horizontal partition by means for passing through said space;

a second connection duct for said cold metal, between the outlet of the said exchanger and said annular space, said second duct opening into said annular space, so as to cause said cold liquid metal to flow in said core diagrid, then through said core, via the bottom-fittings of the fuel-assemblies, wherein:

said first supporting means and said second supporting means are substantially at the same horizontal level, said level being, in addition, in the vicinity of the level of said first and said second connecting ducts;

said primary vessel is constituted by an inner sleeve extending over at least a portion of the height of the lateral wall of the primary vessel, and an outer sleeve, parallel with said inner sleeve, said sleeves defining an interstice, containing thermally insulating means, said interstice being connected, in the lower portion thereof, to a manifold mounted under said core diagrid, for collecting the leaks of the liquid metal at the core bottom and the outer sleeve comprises a plurality of orifices opening into said annular space above said semi-tight horizontal partition;

the portion of said first duct passing through said annular space is surrounded by thermally insulating means adapted to withstand the differential expansion between said two vessels;

said semi-tight horizontal partition is constituted by said second supporting means, the latter being provided with calibrated orifices.

**4,295,935**

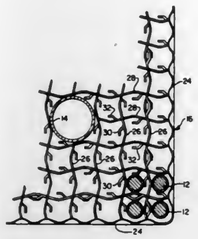
## BIMETALLIC SPACER MEANS FOR A NUCLEAR FUEL ASSEMBLY

**Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Mar. 29, 1979, Ser. No. 25,228**

**Int. Cl.³ G21C** *3/30*

**U.S. Cl. 376—285** **7 Claims**



1. In a fuel assembly of the type that is employable in a nuclear reactor core and has a definable exterior surface, the fuel assembly including a multiplicity of fuel rods and at least one nuclear fuel assembly spacer grid, said nuclear fuel assembly spacer grid including perimeter means and first and second means each structurally associated with said perimeter means, said perimeter means including a plurality of perimeter strips each made of zircaloy and having their ends interconnected together to form a closed perimetric structure positioned in surrounding relation to said multiplicity of fuel rods thereby defining the exterior surface of the fuel assembly, said first means being operable to provide lateral support to said multiplicity of fuel rods, said second means being operable to effect the proper spacing between said multiplicity of fuel rods, the improvement comprising expandable means cooperatively associated with said perimeter means so as to be operable to preclude in-reactor bowing of the fuel assembly, said expandable means comprising a plurality of expandable strips each being formed from a material having a high thermal coefficient of expansion than zircaloy, said plurality of expandable strips being attached to said plurality of perimeter strips in equally spaced relations one to another, said plurality of expandable strips being thermally expandable between a first position wherein said plurality of expandable strips are located in relatively close proximity to the exterior surface of the fuel assembly and a second position wherein said plurality of expandable strips are displaced laterally relative to the exterior surface of the fuel assembly so as to preclude in-reactor bowing of the fuel assembly by occupying the space adjacent to the exterior surface of the fuel assembly otherwise available for receiving portions of the fuel assembly that have undergone bowing.

**4,295,936**

## FRACTIONATION APPARATUS PROVIDING IMPROVED HEAT RECOVERY FROM BOTTOM STREAM

**Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jun. 28, 1979, Ser. No. 53,124**

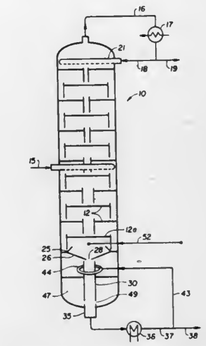
**Int. Cl.³ B01D** *3/38*

**U.S. Cl. 202—153** **9 Claims**

1. In a fractionation apparatus comprising a vertically elongated fractionation column having a plurality of trays disposed therein, including a lowermost tray in a lower portion of said column, means for introducing a feed stream into the column at a point between the top and bottom thereof, means for removing a stream from a portion of said column above said feed means, means for removing a bottoms stream from a portion of said column below said feed means, and means for providing a recycle portion of said bottoms stream to a lower portion of said column,

the improvement which comprises a perforated generally annular baffle positioned within a lower portion of said column for directing fluid from the generally cylindrical fluid-retaining space within said baffle to said bottoms stream removal means, said baffle (a) extending upwardly from the bottom portion of said column and forming between said baffle and the lower side portion of said column a generally annular fluid-retaining space, (b) said cylindrical fluid-retaining space being in fluid communication via said perforations with said annular fluid-retaining space, and (c) the lower portion of said cylindrical fluid-retaining space being in fluid communication with said bottoms stream removal means; means for directing fluid from said lowermost tray into said cylindrical fluid-retaining space, said fluid-directing means being positioned above and spaced apart from said baffle and being in open fluid communication with the top of said cylindrical fluid-retaining space; and said bottoms stream recycle means providing said portion of said bottoms stream to said annular fluid-retaining space.





**4,295,937**

## RECTIFIER

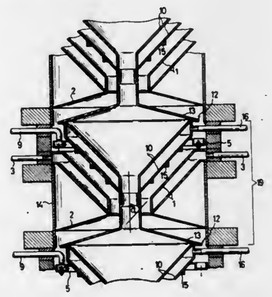
**Manfred Mayer, Niedernhausen, and Roland Volz, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 20, 1980, Ser. No. 132,294**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911214**

**Int. Cl.³ B01D** *3/14*

**U.S. Cl. 202—155** **10 Claims**



1. A rectifier for separating a refineable substance by evaporation to a vapor and condensation to a liquid, the rectifier being comprised of a plurality of individual modules arranged atop one another, each such module comprising:

a peripheral module wall;

evaporator means for vaporizing said substance and having a surface inclined downward in the direction of the axis of the module, an upper rim, a lower rim, and a liquid guide element for said liquid at the lower rim thereof inclined downward toward said module wall;

a distributor channel disposed above the upper rim of the evaporator means for distributing the liquid thereto, the distributor channel being positioned to receive the liquid from the guide element of the module just above;

condenser means for condensing said vapor to a liquid, having at least one drain element thereon for channelling the condensed liquid; and

a vapor guide element for guiding to the condenser means vapor from the module just below.

**4,295,938**

## COKE-OVEN DOOR ASSEMBLY

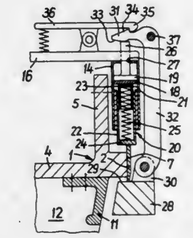
**Friedhelm Haaf, Velbert, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany**

**Filed Sep. 23, 1980, Ser. No. 190,166**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939070**

**Int. Cl.³ C10B** *25/06*

**U.S. Cl. 202—248** **10 Claims**



1. A coke-oven door assembly comprising:

a doorjamb having an outwardly facing annular doorjamb surface;

a rigid door body having an annular outer edge aligned with and generally perpendicular to said doorjamb surface;

an annular and hollow rigid frame juxtaposed with said edge;

an annular seal strip engaging said edge and bearing inwardly on said doorjamb surface;

a rail inside said frame and movable toward and away from said doorjamb surface;

a plurality of elastically compressible biasing devices engaged between said rail and said strip and urging same toward said doorjamb surface; and

means including a plurality of spacers engaged between said doorjamb and said rail for maintaining said rail at a predetermined spacing from said doorjamb.

**4,295,939**

## METHOD AND DEVICE FOR DETECTING A GASEOUS ANHYDRIDE IN AN OXYGEN BEARING GAS

**Marc Poirier, Chomedey; Michel Gauthier, Laprairie, and Andre Belanger, Ste-Julie, all of Canada, assignors to Hydro-Quebec, Montreal, Canada**

**Filed Nov. 30, 1979, Ser. No. 98,978**

**Claims priority, application Canada, Mar. 30, 1979, 324693**

**Int. Cl.³ G01N** *27/58*

**U.S. Cl. 204—1 T** **31 Claims**

1. A device for detecting a gaseous anhydride and measuring

its concentration in an oxygen-bearing gas, said device comprising:

a first solid-electrolyte element containing oxyanions of the anhydride to be detected;

a first reference electrode in contact with said first electrolyte element;

means for fixing a constant potential near this first reference electrode;

a second, $O^{--}$ ion-conducting, solid-electrolyte element, said solid-electrolyte element being spaced from said first reference electrode and in direct contact with said first electrolyte element so as to create an electrolytic junction;

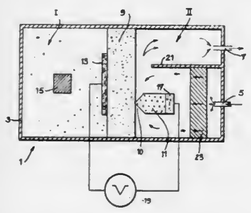
a second reference electrode in contact with said second electrolyte element, said second reference electrode being spaced from said electrolytic junction;

means for fixing a constant potential near this second reference electrode;

means for bringing the gas containing the gaseous anhydride to be detected into contact with the electrolytic junction formed by the first and second electrolyte elements so as to form a triple junction, means for preventing contact of said gas and said first reference electrode;

a potentiometer connected to said reference electrodes to measure the difference of potential existing between said reference electrodes when the gas containing the gaseous anhydride to be detected is in contact with the electrolytic junction formed by the first and second electrolyte elments, and

means for heating said triple junction to a temperature at which a logarithmic variation in the concentration of the



anhydride to be detected produces a proportional, virtually linear variation in the measured difference of potential, provided that said temperature is lower than the melting temperatures of said first and second electrolyte elements.

22. A method for detecting a gaseous anhydride and measuring its concentration in an oxygenbearing gas by measurement of a difference of potential, characterized in that it comprises the following steps:

forming an electrolytic junction by contact between a first solid-electrolyte element containing oxyanions of the anhydride to be detected and a second, solid-electrolyte element containing $O^{--}$ ions;

bringing the gas containing the gaseous anhydride to be detected into contact with said electrolytic junction formed by the first and second electrolyte elements to form a triple junction;

creating in this triple junction a difference of potential measurable by means of two reference electrodes in contact with said first and second electrolyte elements respectively, by fixing a constant potential in the vicinity of each of said reference electrodes, said reference electrodes being both spaced from the triple junction, the reference electrode in contact with said first electrolyte element being out of contact with the anhydride containing gas;

heating said triple junction to a temperature at which a logarithmic variation in the concentration of the anhydride to be detected produces a proportional, virtually linear variation in the difference of potential in said triple junction, said temperature being lower than the melting temperatures of said first and second electrolyte elements, and

measuring said difference of potential with a potentiometer connected to said reference electrodes so as to obtain a measurement of the concentration of the anhydride to be detected.

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**4,295,940**

## METHOD FOR BATTERY PLATE

**Brajendra P. Varma, Levittown, Pa., assignor to Eltra Corporation**

**Division of Ser. No. 64,650, Aug. 7, 1979, Pat. No. 4,230,779. This application Aug. 29, 1980, Ser. No. 182,346**

**Int. Cl.³ H01M *10/44***

**U.S. Cl. 204—2.1** **2 Claims**

1. A method of forming a positive plate for a lead acid battery, said method comprising the steps of immersing a lead or lead alloy grid pasted with a lead oxide composition in an electrolyte containing from 10 to 5000 parts per million of at least one element selected from the group consisting of manganese and chromium, and applying an electric current to said grid and said electrolyte thereby introducing from 0.1 to 0.4 percent based upon the weight of said plate of said element into said plate.

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**4,295,941**

## METHOD OF MANUFACTURING A METAL CERAMIC DENTAL RESTORATION

**Stewart J. Lustgarten, Holliston, Mass., assignor to Healthco Inc., Boston, Mass.**

**Filed Dec. 7, 1979, Ser. No. 101,203**

**Int. Cl.³ A61C *5/08***

**U.S. Cl. 204—35 R** **5 Claims**

1. A method of manufacturing a fixed prosthodontic metal ceramic dental restoration comprising casting a metal framework from a metal composition comprising an alloy of nickel and chromium having at least 4% nickel, electroplating a thin film deposit of gold between about 0.4 to 1 mil in thickness over a predetermined surface area of said framework with said gold deposit being in intimate contact with the nickel chromium alloy; distributing finely divided particles containing a major proportion of gold which vary in size between 1 to no more than about 20 microns over said electroplated gold surface and firing successive layers of porcelain over said predetermined surface area in a firing temperature range of between about 1600° F. to 1900° F. whereby the firing of said porcelain layers simultaneously causes said finely divided particles to form beads of substantially globular shape.

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**4,295,942**

## PROCESS FOR PREPARING MANGANESE OXIDE

**Konrad Koziol, Rothenbach, and Erich Wenk, Nuremberg, both of Fed. Rep. of Germany, assignors to Conradty GmbH & Co. Metallelektroden KG, Pegnitz, Fed. Rep. of Germany**

**Continuation of Ser. No. 23,346, Mar. 23, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 122,060**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853820**

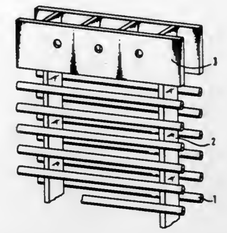
**Int. Cl.³ C25B *1/18***

**U.S. Cl. 204—96** **12 Claims**

1. The process for the electrolytic preparation of maganese oxides using an anode having a core of valve metal, the working surface of which has an electrically conductive, corrosion-resistant, mechanically solid coating which impedes the passivation of the core, wherein the working surface of the anode



comprises the surfaces of a plurality of rods which are mounted in parallel, and the rods are connected by conductive



supports, wherein the desired electrolysis product is a solid and not a gas.

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**4,295,943**

## PROCESS FOR THE ELECTROLYTIC PRODUCTION OF MANGANESE DIOXIDE

**Nenad R. Tomov, and Geoffrey M. Roberts, both of Geneva, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland**

**Filed Apr. 17, 1980, Ser. No. 141,199**

**Int. Cl.³ C25B *1/18***

**U.S. Cl. 204—96** **8 Claims**

1. A process for the electrolytic production of manganese dioxide comprising electrolyzing an aqueous manganese containing electrolyte between a flexible anode and a cathode to deposit manganese dioxide on the anode, flexing the anode to fracture and remove the manganese dioxide deposit and recovering the manganese dioxide without removing the anode from the cell.

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**4,295,944**

## ELECTROLYSIS OF AQUEOUS SOLUTION OF ALKALI METAL CHLORIDE

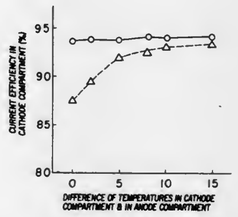
**Takao Satoh, and Toru Seita, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan**

**Filed Jul. 8, 1980, Ser. No. 166,787**

**Claims priority, application Japan, Sep. 11, 1979, 54-115659**

**Int. Cl.³ C25B *1/34***

**U.S. Cl. 204—98** **9 Claims**




3. The method of claim 2, wherein said temperature range is a difference of from 4° C. to 8° C.

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**4,295,945**

## PROCESS FOR THE PRODUCTION OF LIQUID CHLORINE

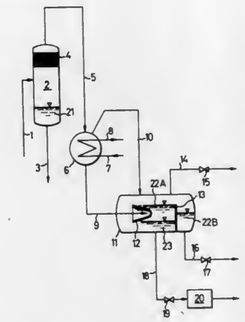
**Dieter Bergner; Kurt Hannesen, both of Kelkheim; Wolfgang Müller, Bad Soden am Taunus, and Wilfried Schulte, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed May 2, 1980, Ser. No. 146,020**

**Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917974**

**Int. Cl.³ C25B *1/26***

**U.S. Cl. 204—128** **10 Claims**




1. A process for the production of liquid chlorine comprising the steps of

electrolyzing an aqueous alkali metal chloride solution in an electrolytic cell under an operational pressure of at least 8 bars and at an anolyte temperature above the boiling point of chlorine at the operational pressure;

obtaining from the electrolysis a mixture of anolyte and steam-saturated gaseous chlorine in an anode space of the electrolytic cell;

separating the anolyte from the steam-saturated gaseous chlorine;

liquefying the steam-saturated gaseous chlorine under a pressure of at least 8 bars to a condensate after the steam-saturated chlorine passes out of the electrolytic cell by cooling the steam-saturated gaseous chlorine, said cooling comprising maintaining a temperature of at least 28° C. of the condensate which includes a liquid water-saturated chlorine phase and a liquid chlorine-saturated water phase; and

separating the water phase from the chlorine phase which has a heavier specific weight than the water phase.

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**4,295,946**

## METHOD AND APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

**Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vyacheslav T. Efimov, ulitsa Sumskaya, 59, Kv. 2; Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91a, kv. 30, and Ljudmila F. Shamsha, ulitsa Dinamovskaya, 3, kv. 23, all of Kharkov, U.S.S.R.**

**Filed Aug. 8, 1980, Ser. No. 176,334**

**Int. Cl.³ C02F *1/46***

**U.S. Cl. 204—149** **3 Claims**

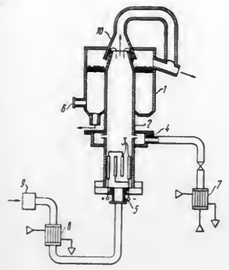
1. A method of electrochemical purification of contaminated liquids, comprising:

heating a contaminated liquid to a temperature at least in the order of 40° C.;

cooling an electrolyte to at least in the order of 25° C.;

passing said cooled electrolyte through a region having energized soluble electrodes provided within an electrocoagulation chamber;

mixing said heated contaminated liquid within said electrocoagulation chamber above said soluble electrodes with an ascending flow of said cooled electrolyte containing products of dissolution of said soluble electrodes;



separating formed foam and sludge from the mixture of contaminated liquid and electrolyte within a settling chamber.

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**4,295,947**

## PHOTO-CURABLE COATING COMPOSITIONS FOR BUILDING MATERIALS

**Eiichi Ohtani; Kengo Kobayashi; Asao Isobe, and Shigeyoshi Tanaka, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan**

**Filed Sep. 12, 1979, Ser. No. 74,660**
**Claims priority, application Japan, Sep. 18, 1978, 53-114371**
**Int. Cl.³ C08F *2/50*; B32B *27/16***
**U.S. Cl. 204—159.15** **2 Claims**

1. A photo-curable coating composition for building materials which comprises

(a) an isocyanate-modified epoxy ester obtained by the reaction of an acrylic or methacrylic ester of an epoxy compound having not less than two epoxy groups in the molecule with a polyisocyanate;

(b) a photopolymerizable monomer being copolymerizable with the epoxy ester (a);

(c) a ketone resin formed by condensation of a ketone with an aldehyde;

(d) a photo-sensitizer; and

(e) a sensitizing auxiliary,

the amounts of the constituents (a) to (e) being as follows:

| | | | |
|---|---|---|---|
| 0/100 | $\leqq (b)/(a)+(b) \leqq$ | 70/100 | (weight ratio) |
| 1/100 | $\leqq (c)/(a)+(b) \leqq$ | 50/100 | (weight ratio) |
| 0.5/100 | $\leqq (d)+(e)/(a)+(b) \leqq$ | 15/100 | (weight ratio) |
| 0/1 | $\leqq (e)/(d) \leqq$ | 3/1 | (molar ratio) |

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**4,295,948**

## PHOTOCURABLE ADHESIVE FROM ACRYLIC ACID, ACRYLAMIDE, DIMETHYLAMINOETHYL METHACRYLATE, BENZOPHENONE AND METHYL ETHYL KETONE

**Alain Roman, Bossey; Pierre Chevreux, St. Jean de Gonvillo, both of France; Manfred Wüst, Dardagny, and Jacques Ehretsmann, Conches, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland**

**Division of Ser. No. 605,055, Aug. 15, 1975, abandoned. This application Sep. 20, 1979, Ser. No. 77,472**
**Claims priority, application Switzerland, Aug. 16, 1974, 11220/74; Aug. 16, 1974, 11221/74; Aug. 16, 1974, 11222/74**
**Int. Cl.³ C08F *220/56, 220/70, 226/10*; B32B *17/10***
**U.S. Cl. 204—159.23** **2 Claims**

1. The photopolymerizable adhesive which consists of:

| | |
|---|---|
| acrylic acid: | 15% to 88.5% by weight |
| benzophenone: | 0.5% to 10% by weight |
| methyl-ethyl-ketone: | 1% to 60% by weight |
| dimethylamino-ethyl-methacrylate: | 5% to 35% by weight and |
| acrylic amide: | 5% to 35% by weight. |

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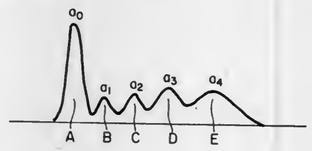
**4,295,949**

## METHOD FOR DETERMINING BOUNDARY POINTS IN ELECTROPHORESIS

**Toshihide Fujiwara, Fuchu, and Ryo Fujimori, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed May 21, 1980, Ser. No. 151,889**
**Claims priority, application Japan, May 25, 1979, 54-64814**
**Int. Cl.³ G01N *27/26***
**U.S. Cl. 204—180 G** **5 Claims**




1. A method for determining boundary points in electrophoresis comprising a step to determine points on the abscissa corresponding to peak tops on a densitogram traced based on electrophoresis and select said points as standard positions, a step to locate said standard positions on a densitogram of an unknown sample traced based on electrophoresis of an unknown sample, a step to count number of points having minimum values existing between each pair of the neighboring standard positions on the densitogram of the unknown sample and a step to select the point having the minimum value as the normal boundary point when a single point is counted or the one corresponding to the lowest concentration as the normal boundary point when 2 or more points are counted.

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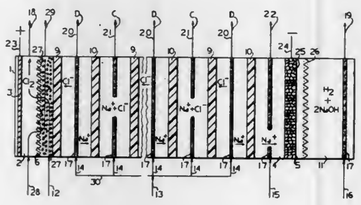
**4,295,950**

## DESALINATION WITH IMPROVED CHLOR-ALKALI PRODUCTION BY ELECTROLYTICDIALYSIS

**Marc Cole, 1057 C Argyll Cir., Lakewood, N.J. 08701**

**Continuation-in-part of Ser. No. 71,991, Sep. 4, 1979, abandoned. This application Jun. 5, 1980, Ser. No. 156,735**
**Int. Cl.³ B01D *13/02*; C25B *1/34, 1/46***
**U.S. Cl. 204—180 P** **19 Claims**




8. In a process, conducted in an electrolyticdialysis cell, for the electrolytic decomposition of a first part of the alkali metal halide solute of a separately maintained aqueous brine to produce substantially pure chlorine and substantially pure caustic soda in concentrated solution and hydrogen, and for the concomitant electrodialysis in said cell of the solute of a further part of said separately maintained aqueous brine to form at least partly desalinated water and salt enriched water, the improvement consisting, in combination, of the electrical discharge of the cations of said first part of said solute to atoms at an immobilized liquid metal amalgam filling the interconnected micro-pores of novel cathode immersed in a separately maintained sea water catholyte, and subsequent reaction of said atoms with water of dilute caustic soda solution in a denuding chamber abutting said novel cathode to form said substantially pure concentrated caustic soda solution and hydrogen, and further consisting, in said combination, of the electrical discharge of the anions of said first part of said solute at an anode immersed in a separately maintained substantially saturated metal chloride solution as anolyte, to form substantially pure chlorine, an electric current being passed between said anode and the amalgam of said novel cathode.



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**4,295,951**

## FILM-COATED CATHODES FOR HALATE CELLS

**Tilak V. Bommaraju, Grand Island; Theodore H. Dexter, Lewiston, and Charles G. Rader, Grand Island, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.**

**Filed May 14, 1980, Ser. No. 149,814**
**Int. Cl.³ C25B *9/00, 11/03, 11/10***
**U.S. Cl. 204—242** **11 Claims**

11. In an electrolytic halate cell comprising a cell container, an anode, a cathode, and an alkali metal halate solution, the improvement comprising eliminating the presence of chromium ions in the solution by utilizing, as said cathode, a film-coated cathode comprising a conductive substrate coated with an adherent, porous film of a substantially nonconductive, chemically inert material, said film having an average thickness of from about $10^{-4}$ microns to about $10^{3}$ microns, an average porosity of from about 1% to about 85%, and an average pore size of from about 0.1 microns to about 30 microns.

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**4,295,952**

## NOVEL CATIONIC MEMBRANES

**Oronzio de Nora; Luigi Giuffre, and Giovanni Modica, all of Milan, Italy, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy**

**Division of Ser. No. 138,290, Feb. 22, 1979, Pat. No. 4,246,090. This application Mar. 24, 1980, Ser. No. 133,521**
**Claims priority, application Italy, Jan. 17, 1979, 19354 A/79**
**Int. Cl.³ C25B *13/08***
**U.S. Cl. 204—252** **7 Claims**

1. A membrane electrochemical cell comprising a cell housing containing at least one anode in an anode compartment and at least one cathode in a cathode compartment forming an interelectrodic gap with a cation exchange membrane separating the anode and cathode compartments with the sulfonated polymer facing the anodic side.

5. A fluid impermeable cation exchange membrane comprising a first layer of a water wettable and water insoluble sulfonated polymer of styrene and about 8 to 20 molar percent of divinylbenzene and a second layer of an unsulfonated polymer of divinylbenzene and at least one monomer selected from the group consisting of 2-vinylpyridine and 4-vinylpyridine in a molar ratio of styrene to vinylpyridine of about 1:8 to 1:1.

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**4,295,953**

## FILTER PRESS TYPE ION EXCHANGE MEMBRANE-METHOD ELECTROLYSIS CELL

**Shigeaki Fuseya, Gifu, and Teruo Ichisaka, Tamano, both of Japan, assignors to Chlorine Engineers Corp., Ltd., Tokyo, Japan**

**Filed Jan. 2, 1980, Ser. No. 109,029**
**Int. Cl.³ C25B *9/00, 15/08***
**U.S. Cl. 204—257** **2 Claims**

1. A filter-press type ion exchange membrane-method electrolysis cell comprising

(a) an anode structure which comprises a rectangular anode frame including a top element, a bottom element and two side elements and anode plates welded to the anode frame,

(b) a cathode structure which comprises a rectangular cathode frame including a top element, a bottom element and two side elements and cathode plates welded to the cathode frame, and

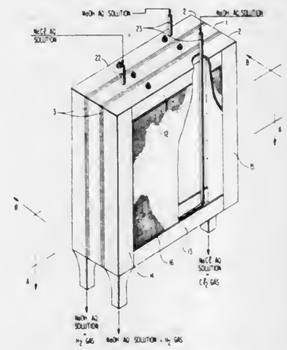
(c) an ion exchange membrane interposed between the anode structure and the cathode structure;

wherein

the two side elements of the anode frame and the two side elements of the cathode frame have a tubular structure with a rectangular cross section,

the top and bottom elements of the anode frame and the top and bottom elements of the cathode frame have a ]-shaped cross section, and are secured such that their open portions face the inside of an anode compartment and a cathode compartment, respectively, and

at least one end of the top element of the anode frame communicates with the top end of the side element of the anode frame and at least one end of the top element of the



cathode frame communicates with the top end of the side element of the cathode frame so that the side element communicating with the top element of the anode frame, and the side element communicating with the top element of the cathode frame form conduits for withdrawing gas and solution flowing from the anode compartment and the cathode compartment, respectively,

(d) a current disperser surrounding an anode lead bar welded to anode plates within the anode structure and a current disperser surrounding a cathode lead bar welded to cathode plates within the cathode structure, whereby a region not permitting passage of gas is formed between the periphery of the anode lead bar and the inside of the current disperser welded to the anode plates and between the periphery of the cathode lead bar and the inside of the current disperser welded to the cathode plates, thus serving as a passage for a downwardly moving stream of electrolytic solution, and

(e) a pipe for supplying an anolyte solution disposed within the anode compartment and a pipe for supplying a catholyte solution disposed within the cathode compartment.

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**4,295,954**

## COAL CONVERSION CATALYSTS

**Thomas O. Mitchell, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Oct. 18, 1979, Ser. No. 86,212**
**Int. Cl.³ C10G *1/06***
**U.S. Cl. 208—10** **5 Claims**

1. In a solvent extraction process for coal conversion wherein coal is slurried in an organic solvent and heated to a temperature sufficient to dissolve or liquefy most of the coal, the resulting coal liquefaction product is upgraded by catalytic

hydrogenation, and a process-derived recycle solvent is hydrogenated and returned to the initial dissolution stage; the improvement which comprises contacting a coal/solvent slurry, with a catalyst selected from the groups consisting of:

(1) spent hydrogenation catalyst from processes for the hydrogenation of hydrocarbons selected from the group consisting of petroleum, petroleum-derived liquids, Fischer-Tropsch liquids, and shale oils;

(2) spent adsorbent from guard chambers used to demetallize said hydrocarbons; and

(3) mixtures thereof.

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**4,295,955**

## ATTENUATION OF METAL CONTAMINANTS ON CRACKING CATALYST WITH A BORON COMPOUND

**Hosheng Tu, Shorewood, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Mar. 10, 1980, Ser. No. 129,003**
**Int. Cl.³ C10G *11/04***
**U.S. Cl. 208—120** **7 Claims**

1. A process for attenuating a metal on fluidized cracking catalyst which has been contaminated with said metal, said catalyst being used in a fluidized cracking system wherein said catalyst is cycled between a cracking zone, in which said catalyst is contacted at cracking temperature with a hydrocarbon feedstock, and a regeneration zone, in which carbonaceous residual material is oxidized and thereby removed from said catalyst, the source of said metal contaminant being said feedstock or residual metals resulting from the synthesis of said catalyst, which process comprises withdrawing a portion of said catalyst being transferred from said regeneration zone to said cracking zone as a slip stream, passing said slip stream to an independent attenuation zone, wherein said withdrawn portion of said catalyst is cooled to a temperature less than about 100° C. and thereafter is contacted with an aqueous solution of a boron compound to impregnate said boron compound upon said catalyst, drying said impregnated catalyst to remove water resultant from said aqueous solution, calcining said dried impregnated catalyst at a temperature of from about 425° C. to about 815° C. and adding said dried and calcined impregnated catalyst from said attenuation zone to the remaining portion of the catalyst being transferred from said regeneration zone to said cracking zone.

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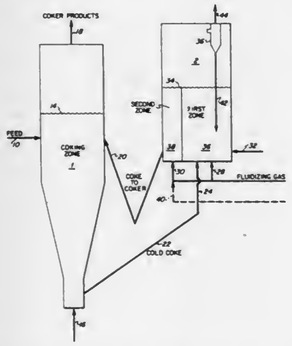
**4,295,956**

## FLUID COKING PROCESS

**William J. Metrailer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Mar. 3, 1980, Ser. No. 126,400**
**Int. Cl.³ C10G *9/32***
**U.S. Cl. 208—127** **11 Claims**




1. In a coking process comprising the steps of:

(a) contacting a carbonaceous chargestock under fluid coking conditions in a coking zone comprising a first bed of fluidized solids to produce a vapor phase product, including normally liquid hydrocarbons, and coke, said coke depositing on said fluidized solids;

(b) passing a portion of said solids with a coke deposit thereon to a vessel comprising a second bed of fluidized solids, and

(c) passing a portion of solids from said second vessel to said coking zone, the improvement which comprises: said fluid bed in said second vessel being divided into two zones, introducing a fluidizing gas into the first of said zones in an amount sufficient to provide a superficial gas velocity at least sufficient to maintain said solids fluidized and introducing a fluidizing gas into the second of said zones in an amount sufficient to provide in said second zone a superficial gas velocity ranging from about 1.5 to about 5 times the superficial gas velocity of said first zone, said superficial velocity of said second zone being at least two feet per second, to entrain solid fines out of said second zone, and passing a portion of solids from said second zone to said coking zone.

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**4,295,957**

## REFORMING WITH MULTIMETALLIC CATALYSTS

**Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 34,596, Apr. 30, 1979, Pat. No. 4,251,392. This application Jul. 14, 1980, Ser. No. 168,491**
**Int. Cl.³ C10G *35/09***
**U.S. Cl. 208—138** **15 Claims**

1. A process for reforming a hydrocarbon feed at reforming conditions which comprises palladium and platinum in total concentration ranging from about 0.2 to about 0.6 percent, with from about 15 to about 50 mol. percent of the composition being platinum, as contrasted with the amount of palladium contained in the composition, from about 0.1 to about 2 percent rhenium, and from about 0.01 to about 0.1 percent copper, composited with an inorganic oxide support.

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**4,295,958**

## REFORMING WITH MULTIMETALLIC CATALYSTS

**Charles H. Mauldin, and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 29,675, Apr. 13, 1979, Pat. No. 4,251,391. This application Jul. 14, 1980, Ser. No. 168,492**
**Int. Cl.³ C10G *35/09***
**U.S. Cl. 208—138** **23 Claims**

1. A process for reforming a hydrocarbon feed at reforming conditions which comprises contacting said feed with a catalyst which consists essentially of from about 0.1 to about 2 percent platinum, from about 0.1 to about 2 percent rhenium, and from about 0.01 to about 0.1 percent copper composited with an inorganic oxide support.

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**4,295,959**

## HYDROCARBON DEHYDROCYCLIZATION WITH AN ATTENTUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

**George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 48,957, Jun. 15, 1979, Pat. No. 4,229,319, which is a division of Ser. No. 954,684, Oct. 25, 1978, Pat. No. 4,206,040, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Oct. 20, 1980, Ser. No. 198,733**
**Int. Cl.³ C07C *15/8*; B01J *27/08*; C10G *35/09***
**U.S. Cl. 208—138** **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing catalytically effective amounts of a halogen component, a silver component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.



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**4,295,960**

## HYDROCARBON DEHYDROCYCLIZATION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

**George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 36,120, May 4, 1979, Pat. No. 4,231,897, which is a division of Ser. No. 947,906, Oct. 2, 1978, Pat. No. 4,193,863, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, now Pat. No. 4,165,276. This application Nov. 3, 1980, Ser. No. 203,018**
**1980, Ser. No. 203,018**
**Int. Cl.³ C07C *15/08*; C10G *35/09*; B01J *27/08***
**U.S. Cl. 208—139** **25 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalyst composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing catalytically effective amounts of a halogen component, a cadmium component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic state.

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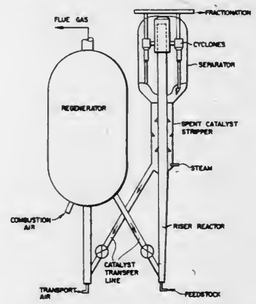
**4,295,961**

## METHOD AND APPARATUS FOR IMPROVED FLUID CATALYTIC RISER REACTOR CRACKING OF HYDROCARBON FEEDSTOCKS

**Robert J. Fahrig, Lansing, and Lansing M. Hinrichs, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Nov. 23, 1979, Ser. No. 96,939**
**Int. Cl.³ C10G *11/18***
**U.S. Cl. 208—161** **4 Claims**




1. In a method for the fluid catalytic cracking of hydrocarbon feedstocks wherein an ascending cocurrent stream of vaporous hydrocarbons and entrained catalyst particulates whose upward flow is at a rate substantially less than the flow rate of said hydrocarbons is effected in an elongated conduit reaction zone, the improvement which comprises:

(1) altering the direction of flow of said stream of hydrocarbons and catalyst particulates to a downward direction by conducting said stream into a flow reversal means which discharges into a downwardly directed flow reversal conduit;

(2) accelerating the rate of downward flow of said catalyst particulates by gravitational force augmenting fluid flow drag forces to impart downward momentum thereto;

(3) withdrawing cracked hydrocarbon products laterally from the downwardly flowing catalyst particulates and passing said products directly into cyclone separator means thereby effecting rapid disengagement of said cracked hydrocarbon products from said catalyst particulates; and

(4) contacting the downwardly flowing catalyst particulates with an ascending flow of inert stripping gas after substantial withdrawal of said cracked hydrocarbon products, the downward momentum of said catalyst particulates preventing their passage laterally with the cracked hydrocarbon products and permitting their passage countercurrent to the upward flow of inert stripping gas.

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**4,295,962**

## RECOVERING COPPER BY FLOTATION USING N-MERCAPTOALKYL AMIDE DEPRESSANT

**Robert M. Parlman, and Ralph P. Williams, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Apr. 30, 1980, Ser. No. 145,093**
**Int. Cl.³ B03D *1/06***
**U.S. Cl. 209—167** **6 Claims**

1. A process for recovering copper-bearing mineral sulfides from a metallurgical concentrate, said process comprising in a froth flotation process admixing (1) froth floated metallurgical concentrate containing copper-bearing sulfides with (2) an amount of N-mercaptoalkyl amide sufficient to depress the flotation of said copper-bearing mineral sulfide and recovering the non-floated copper-bearing mineral sulfides.

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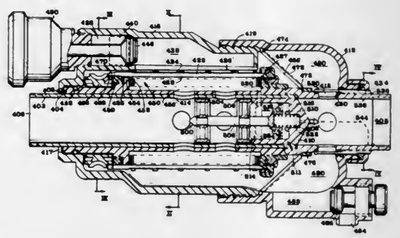
**4,295,963**

## BACKWASHABLE FLUID FILTER

**Mordeki Drori, 89 Zahal St., Kiron, Israel**

**Filed Feb. 7, 1980, Ser. No. 119,388**
**Claims priority, application Israel, Feb. 15, 1979, 56682**
**Int. Cl.³ B01D *29/38***
**U.S. Cl. 210—108** **15 Claims**



1. A backwashable filtering device including a housing having an inlet connectable to an upstream fluid pipe and an outlet connectable to a downstream fluid pipe, a filter body having an upstream surface communicating with the housing inlet to intercept dirt particles in the fluid flowing in the foreward direction from the housing inlet to the housing outlet, a backwash nozzle within the housing and having a nozzle inlet disposed adjacent to the upstream surface of the filter body, means for effecting relative movement between the filter body and the backwash nozzle, and means for connecting the backwash nozzle to the atmosphere for backwashing the filter body; characterized in that the device further includes a valve assembly movable to open or close a passage between the filter body and the housing outlet, spring means tending to move the valve assembly to close said passage, and pressure means for applying to the valve assembly the pressure at a point upstream

of the valve assembly tending to move same to open said passage, whereby under low pressure conditions the valve assembly closes or restricts said passage to the outlet and thereby maintains the pressure for backwashing the filter body via the nozzle.

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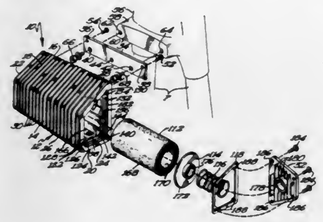
**4,295,964**

## MOTORCYLE APPARATUS

**James M. Preisler, Bloomington, Minn., assignor to Thomas H. Rudd, Wayzata, Minn.**

**Filed Feb. 4, 1980, Ser. No. 118,021**
**Int. Cl.³ B01D** *27/10*
**U.S. Cl. 210—130** **19 Claims**



1. Device for filtering and cooling oil for attachment to a motorcycle comprising, in combination: an oil filter having a shape and an oil flow passageway including at least one opening; a casing having an outside surface and an inside surface; internal heat dissipating members extending from the inside surface of the casing for retarding oil flow therearound and for receiving and transferring heat from the oil to the casing; external heat dissipating members extending from the outside surface of the casing for receiving and transferring heat from the casing to the atmosphere, with the internal heat dissipating members terminating in and defining an oil filter capturing cavity of a shape and size for receiving the oil filter; an oil filter seat member located within the oil filter capturing cavity of the casing for seating with the opening of the oil filter; first means for allowing oil flow into the oil flow passageway of the oil filter; second means for allowing oil flow out of the casing; and third means for biasing the oil filter toward the oil filter seat member and for allowing the oil to bypass the oil filter when the oil pressure inside the oil filter overcomes the biasing means thus causing the oil filter to unseat from the seat member and allow oil to escape from the opening in the oil filter, wherein the casing includes a front, a back, a top, a bottom, a first side, and a second side, wherein the first and second means are located in the bottom, wherein the internal heat dissipating members comprise, in combination: a first shoulder located in the corner between the front and the top; a second shoulder located in the corner between the front and the bottom; a third shoulder located in the corner between the bottom and the back; a fourth shoulder located in the corner between the top and the back, and wherein a longitudinal cross section of the casing through the front, back, top, and bottom is an isosceles trapezoid.

8. Apparatus for mounting an accessory to a motorcycle frame, with the accessory including a back, comprising, in combination: at least a first member securable to the motorcycle frame, with the securable member including an elongated portion having an enlarged end; a mounting plate having a shape and a thickness, with the mounting plate including at least a first aperture having a size allowing the elongated portion of the securable member to pass therethrough but preventing the enlarged end of the securable member from passing therethrough; at least a first aperture formed in the back of the accessory and having a shape and size complementary to and for receiving the enlarged end of the securable member; means for securing the mounting plate to the back of the accessory with the securable member outstanding from the mounting plate and extending through the mounting plate aperture and with the enlarged end captured within the accessory aperture by the mounting plate; two abutting members located on opposite sides of the accessory aperture for providing a three point connection with the securable member for preventing the accessory from turning or twisting about the securable member.

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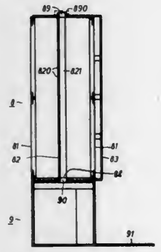
**4,295,965**

## MULTI-FILTER CHAMBER AQUARIUM FILTER

**Siegfried Köster, Paulsdorfer Strasse 2, D-8000 München 2, Fed. Rep. of Germany**

**PCT No. PCT/DE79/00006, § 371 Date Aug. 2, 1979, § 102(e) Date Aug. 2, 1979**
**PCT Filed Jan. 20, 1979, Ser. No. 63,115**
**Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802908**
**Int. Cl.³ E04H** *3/20*
**U.S. Cl. 210—169** **10 Claims**



1. Aquarium filter for combination with and connection to a suction device (**107–109**) having

an essentially box-like filter cassette (**6, 8**) of elongated, essentially rectangular cross section adapted for vertically positioning in an aquarium, with a narrow dimension of the cassette facing the bottom of the aquarium,

in which the cassette is formed to define two filter chambers (**65, 67, 85, 86**) spaced from each other, and a clear-water chamber (**66, 84**) positioned between the filter chamber and in fluid communication with the suction device, said clear-water chamber being separated from said filter chambers by an apertured vertical partitioning wall;

and wherein, in accordance with the invention,

the walls of the cassette separating said filter chambers from the aquarium comprise

removable cover plates (**61, 62, 81**) extending parallel to the partitioning wall, and formed with openings (**610, 620, 810**) therein to permit aquarium water to pass therethrough and into the filter chambers, while permitting individual removal of filter material from the filter chambers;

the cassette is formed with a lower opening (**88**) in communication with the clear-water chamber (**66, 84**);

and the suction box (**1, 3, 9**) is essentially of rectangular or square cross section fitting against said narrow dimension of the cassette and positioned beneath the cassette, said suction box being formed with means (**70, 90**) communicating with the lower opening in the cassette and hence with the clear-water chamber (**66, 84**) at the side of the box in engagement with the cassette.

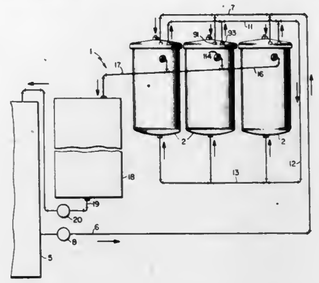


**4,295,966**

## APPARATUS FOR REMOVING CONTAMINANTS FROM LUBRICATING OIL

**Ralph W. LeBlanc, and Robert M. Bingham, both of P.O. Box 52734, New Orleans, La. 70152**

**Filed Jul. 17, 1980, Ser. No. 169,893**
**Int. Cl.³ B01D** *35/18*
**U.S. Cl. 210—180** **11 Claims**



1. A refiner for removing contaminants from lubricating oil comprising:

(a) a fluid containment vessel having a top and a generally vertical axis.

(b) a plate removably secured in said vessel and dividing said vessel into an upper chamber and a lower chamber; said plate having an upper surface; said surface having a domed shape with a generally smooth arcuate configuration and being raised in a center portion thereof above the remainder thereof; said plate also having a plurality of passageways extending from a lower side of said plate whereat said passageways communicate with said lower chamber to said surface near said center portion thereof;

(c) filter media located in said vessel lower chamber;

(d) first conducting means for delivering the oil to said vessel and communicating with said vessel lower chamber such that oil entering said vessel passes through said filter media, then through said passageways, and then flows over said surface;

(e) second conducting means for removing the oil from said vessel after the oil has passed over said dispersion plate; and

(f) venting means for exhausting said vessel upper chamber;

(g) whereby solid contaminents in the oil are substantially removed by said filter media and whereby volatile contaminents in the oil are substantially removed by evaporation while the oil is on said surface in a thin uniform manner even when said vessel axis is canted from vertical and the evaporated volatile contaminants are exhausted from said vessel upper chamber by said venting means.

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**4,295,967**

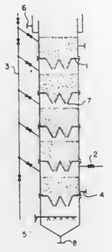
## FLUIDIZED BED CONTACT APPARATUS

**Akinori Kurima; Yasuhiro Iwase, and Tadao Kimiwada, all of Yokohama, Japan, assignors to Chiyoda Kako Kensetsu Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 952,639, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 625,777, Oct. 24, 1975, abandoned. This application May 23, 1980, Ser. No. 62,049**
**Claims priority, application Japan, Oct. 26, 1974, 49-123028**
**Int. Cl.³ B01D** *15/02*
**U.S. Cl. 210—189** **3 Claims**

1. An apparatus adapted for contact between divergent materials, and capable of forming a fluidized bed condition, comprising:

a plurality of trays, each of said plurality of trays being structured so as to have thereon a multiplicty of inverted frustum-shaped depressions adjacent to each other, each of said inverted frustum-shaped depressions being shaped so as to have a widened upper opening and inner lateral faces which incline inwardly from said upper opening to a narrowed lower opening at the bottom of said inverted frustum-shaped depressions, said trays being positioned vertically over each other so as to form a tower, said trays being positioned in such a manner that the lower narrowed opening of each of said inverted frustum-shaped depressions is vertically skewed with respect to each of the lower narrowed openings in each of the inverted



frustum-shaped depressions in the next vertically positioned tray, in said tower;

a housing surrounding said trays so as to form a support for said tower;

a particulate feeding means provided on said tower with respect to each of said trays;

a particulate material withdrawing means located on said tower;

a liquid feeding means located on said tower; and

a liquid discharge means located on said tower.

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**4,295,968**

## SEPARATING MATERIALS FOR THIN LAYER CHROMATOGRAPHY AND THEIR PREPARATION

**Herbert Halpaap, Jugenhein, and Karl-Friedrich Krebs, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany**

**Filed Mar. 20, 1978, Ser. No. 888,595**
**Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712113**
**Int. Cl.³ B01D** *15/08*
**U.S. Cl. 210—198.3** **12 Claims**

1. In a separating material for thin-layer chromatography, comprising a substrate material having a coating thereon which coating comprises a thin sorbent layer, the improvement wherein the sorbent layer has a surface modified by reacting the sorbent layer with a silanizing agent without the exclusion of moisture.

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**4,295,969**

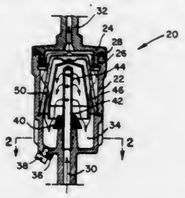
## MAGNETIC FUEL PURIFIER WITH ROTATING PRE-PURIFIER

**Gideon Hagberg, Halmstad, Sweden, assignor to Gunner Berg, Glumslov and Sven-Olle Strömberg, Helsingborg, both of, Sweden**

**Filed Oct. 1, 1979, Ser. No. 80,304**
**Claims priority, application Sweden, Oct. 2, 1978, 7810289**
**Int. Cl.³ B01D** *35/06*
**U.S. Cl. 210—223** **5 Claims**

1. Magnetic fuel purifier with rotating pre-purifier for liquid fuel and the like with separation of contaminations, partly by centrifugalizing and partly by magnetic action, comprising a conical pre-purifier (**46**); a tubular, non-magnetic center shaft (**42**) for supporting the pre-purifier, the center shaft being an inlet for the fuel and having a plurality of through-going ducts

(44) for the passage of fuel, said pre-purifier having pitching longitudinal wing blades (48) rotated by the fuel pressure, whereby the fuel is thrown against conical outer walls of the pre-purifier and thereafter falls downwards; a conical magnet (40) surrounding and firmly applied to the center shaft below the pre-purifier in such manner that the falling fuel strikes the magnet; a collecting container (34) positioned below the magnet; a conical filter (50) surrounding the pre-purifier in sucn manner that fuel flows from the collecting container through the conical filter out of the purifier, the conical filter being made from sintered bronze ball material; an outer case (22) for holding the pre-purifier, conical magnet, and conical filter and for forming the collecting container; and a lid (24) connected to the outer case, the outer case and lid being made from non-magnetic, transparent material; said blades (48) of said




pre-purifier (46) extending inwardly from the outer walls towards the center shaft (42), said pre-purifier (46) having a closed top with a portion of its upper surface shaped to mate with a portion of the conical filter (50) to thereby center said pre-purifier (46) in said outer case (22), said outer case (22) having a through duct (30) formed in a lower portion thereof communicating with the interior of said center shaft (42) for introducing fuel into said purifier, and said lid (24) having a through duct (32) for passage of purified fuel out of said purifier, said outer walls of said pre-purifier (46) being spaced from and at least partially encompassed by said conical filter (50) so that a fluid flow path is defined therebetween, fuel flowing upwardly from said collecting container (34) into said fluid flow path and through said conical filter (50) into said duct (32) of said lid (24).

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**4,295,970**

**FILTER CONVEYING DEVICE FOR FILTER PRESSES**

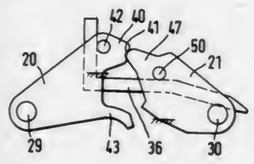
**Max Oelbermann, Remscheid, and Karl-August Rademacher, Wuppertal, both of Fed. Rep. of Germany, assignors to Rittershaus & Blecher GmbH, Wuppertal, Fed. Rep. of Germany**

**Filed Jun. 6, 1980, Ser. No. 157,154**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923864**

**Int. Cl.³ B01D** *25/00*

**U.S. Cl. 210—230** **15 Claims**




1. A device for conveying respective filter plates from a filter plate pack of a filter press, the device including a carriage means adapted to move along the filter press, drive means for selectively moving the carriage means in a forward and reverse direction, means for automatically reversing a direction of the carriage means upon the carriage means encountering a predetermined resistance to movement, characterized in that a pawl means is swingably mounted on the carriage means for engaging behind a foremost filter plate of the filter plate pack during a movement of the carriage means in a first direction of movement, a drop lever means is swingably mounted on the carriage means for engaging a forward portion of the foremost filter plate during a movement of the carriage means in a direction opposite said first direction of movement, said pawl means and said drop lever means being configured such that when they are swung upward into a stop position out of contact with the filter plates they cooperate with one another to hold themselves in said stop position whereby they may travel past the filter plates without contacting said filter plates, and wherein means are provided at a first end of the filter press for swinging the pawl means and drop lever means into the upward stop position so as to enable the pawl means and drop lever means to travel past the filter plates without contact, and in that means are provided on an opposite end of the filter press for swinging the pawl means into a release position so as to release the drop lever means from the stop position.

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**4,295,971**

**METHOD FOR CLARIFYING SLIMES**

**Sanaa E. Khalafalla, Minneapolis, and George W. Reimers, Burnsville, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Aug. 14, 1980, Ser. No. 177,975**

**Int. Cl.³ C02B** *9/02*

**U.S. Cl. 210—695** **11 Claims**

1. A method for clarifying slimes from the group consisting of iron oxide slimes, oxidized taconite slimes, scrubber water from iron-making furnaces, and kaolin slimes, said method comprising the steps of

(a) treating the slime with a stabilized aqueous-base magnetic colloid comprising (1) colloidal magnetic particles and (2) at least one surfactant that bridges the slime particles electrostatically to said magnetic particles and that stabilizes said magnetic particles, said surfactant being present in an amount sufficient to perform the bridging and stabilization functions; said magnetic colloid becoming unstable and said magnetic particles thereof irreversibly flocculating when said magnetic colloid is sufficiently diluted, and said magnetic colloid being used in an amount sufficient to provide for particle-to-particle titration between said slime particles and said magnetic particles,

whereby said magnetic particles form floccules with said slime particles; and

(b) separating the clarified slime from the aggregated floc- cules.

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**4,295,972**

**METHOD FOR TREATING WATER CONTAINING WASTES**

**Takeji Kamei, Fuji, Japan, assignor to Nihon Automatic Machinery Mfg. Co., Ltd., Japan**

**Division of Ser. No. 35,201, Apr. 30, 1979, Pat. No. 4,226,712. This application May 7, 1980, Ser. No. 147,381**

**Claims priority, application Japan, Apr. 28, 1978, 53-51916; Apr. 29, 1978, 53-51195**

**The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.**

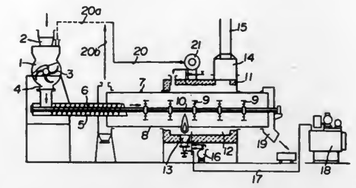
**Int. Cl.³ C02F** *11/14*

**U.S. Cl. 210—710** **1 Claim**

1. A method of treating water containing organic waste comprising the steps of: mixing 100 parts by weight of the organic waste containing 50% to 99.8% by weight of water with from 5 to 40 parts by weight of calcium oxide to produce an exothermic reaction mixture of the calcium oxide and the water containing the waste; heating the reaction mixture using the heat from the exothermic reaction mixture to obtain a preliminary dried mixture; transferring the preliminarily dried mixture to a drying kiln; further drying the preliminarily dried mixture and granulating it in the drying kiln by continuously agitating and heating the preliminarily dried mixture to a temperature of between 100° C. and 300° C. to yield a granulated



product, collecting stinking exhaust gases produced by said mixing of the waste with calcium oxide; channeling the exhaust




gases to a furnace; and burning the exhaust gases in the furnace to produce substantially odorless gases.

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**4,295,973**

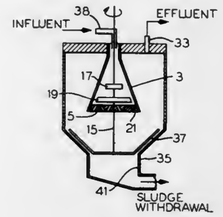
**PROCESS FOR SEPARATING SOLIDS FROM SUSPENSIONS OF INFLUENT**

**Kamlesh K. Jain, Phoenixville, Pa., assignor to Fram Industrial Filter Corp., Tulsa, Okla.**

**Division of Ser. No. 21,276, Mar. 16, 1979, Pat. No. 4,224,157. This application Apr. 28, 1980, Ser. No. 144,721**

**Int. Cl.³ C02F** *1/52*

**U.S. Cl. 210—738** **3 Claims**




1. A process for separating solids from suspensions wherein influent is mixed in an inner mixing compartment of a separator unit, and wherein said influent is transferred to an outer settling compartment from which clarified liquids and settled suspensions are withdrawn, wherein the improvement comprises separating said mixing compartment from said settling compartment with a hydrodynamic changing means, minimizing convective momentum of said influent with said hydrodynamic changing means while transferring said influent from said mixing compartment to said settling compartment, by which said agglomerated solids are prevented from breaking up and are caused to settle without interference from said influent, and continuously decreasing said momentum of said influent flowing through said mixing and settling compartments to cause said solids of increasingly smaller sizes to separate and settle, said step of minimizing said momentum further comprising directing said influent through perforations in said plate which perforations are orientated to eliminate or minimize tangential components of velocity and minimize axial components of said velocity, by which said momentum in said settling compartment is minimized, whereby to maximize a rate of said settling.

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**4,295,974**

**BLOOD SAMPLE COLLECTION AND PHASE SEPARATION DEVICE**

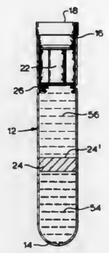
**William D. Cornell, Ballwin, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.**

**Filed May 5, 1980, Ser. No. 146,845**

**Int. Cl.³ B01D** *21/26*

**U.S. Cl. 210—789** **19 Claims**

19. The method of collecting a sample of whole blood, and separating and partitioning it into its relatively high and low density phases comprising the steps of providing an evacuated container having a closed bottom end and an open upper end, a phase partitioning device in the container near the upper end of the container which has a main portion spaced from the inner sidewall of the container, a quantity of thixotropic gel-like blood phase partitioning material in an initial location between and in contact with said main portion and inner sidewall of the container, restricted orifice means communicating between the gel-like material and the interior of the container below the partitioning device, and a stopper in the open end of




the container, introducing a sample of whole blood into the interior of the container by piercing the stopper with a needle cannula connected to a source of whole blood, centrifuging the container to centrifugally separate the whole blood sample into its low and high density phases, and moving the gel-like material from its initial location through said restricted orifice means and into the interior of the container below the partitioning device under the influence of centrifugal forces during centrifugation at a flow rate requiring that the barrier formed by the gel-like material takes at least 1 minute to become completely formed.

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**4,295,975**

**OIL COLLECTING METHOD**

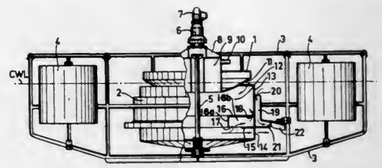
**Gösta Walin, L. Montörsgatan 3, Västra Frölunda, Sweden S-421 68**

**Division of Ser. No. 898,079, Apr. 20, 1978, Pat. No. 4,186,095. This application Jan. 29, 1980, Ser. No. 116,647**

**Claims priority, application Sweden, Apr. 27, 1977, 7704814**

**Int. Cl.³ E02B** *15/04*

**U.S. Cl. 210—800** **8 Claims**




1. A method of separating and collecting oil floating on the surface of a body of oil-polluted water comprising the steps of:

fixedly positioning a stator on the water, said stator being substantially symmetrical about a generally vertical axis and having a downwardly opening central oil-collecting cavity, and a lower oil-contacting and diverting surface which slopes downwardly and inwardly from the periphery of said stator through the surface of the water to the submerged opening of said cavity;

rotating a submerged hollow rotor about said vertical axis directly beneath said stator, the rotor having a sidewall defining therewithin a rotor interior, the interior of said rotor communicating with the surrounding body of water through an upper inlet near the surface of the water which

surrounds the lower surface of said stator, and a lower outlet spaced below said inlet in the lower portion of said rotor, said rotation establishing a vortex of liquid in the interior of said rotor which draws a surface layer of oil and water into the upper portion of said rotor through said outlet, and causes the rotating oil to contact the lower surface of said stator to be slowed thereby and diverted inward to said oil-collecting cavity.

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**4,295,976**

## FLUORINATED ANTI-STAIN AND SOIL RELEASE FINISHES

**Andre L. Dessaint, Nogent sur Oise Creil, and Jean Perronin, Chantilly, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France**

**Filed Sep. 28, 1976, Ser. No. 727,497**

**Claims priority, application France, Oct. 17, 1975, 75 31794**

**Int. Cl.**[3] **C14C** *9/00;* **C07C** *149/20, 149/40;* **C09K** *15/10*

**U.S. Cl. 252—8.9** **32 Claims**

**1.** A fluorinated telomerization product consisting of the reaction product of:

(a) one mole of an ester of one or more polyols with one or more acids of the general formula:

$$HS—A(COOH)_n \quad (I)$$

wherein A represents an aliphatic or cyclic hydrocarbon radical and n is a whole number from 1 to 4, and

(b) 1 to 5 moles of one or more compounds possessing at least one ethylene bond, at least one of these compounds corresponding to the general formula:

$$Rf—B—\underset{\displaystyle R}{\underset{|}{C}}=CH—R \quad (II)$$

wherein Rf represents a perfluorinated chain, straight or branched, containing 1 to 20 carbon atoms,

one of the sybmols R is hydrogen and the other is hydrogen or alkyl containing 1 to 4 carbon atoms; and

Rf—B—is a residue selected from the group consisting of the residues of following formulae:

$Rf—(CH_2)_x—SO_2—N(R')—(CXX')_y—\underset{\displaystyle R'''}{\underset{|}{\overset{\displaystyle R''}{\overset{|}{C}}}}—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—(OC_2H_2XX')_z—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—O—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—S—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—S—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—(CXX')_x—SO_2—(CXX')_y—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—SO_2—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—CH=CH—CH_2—(OC_2H_2XX')_z—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

-continued

$Rf—CH=CH—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—CF=CH—CH=CH—(OC_2H_2XX')_2—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—SO_2—N(R')—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—SO_2—N(R')—(CXX')_x—\underset{\displaystyle R'''}{\underset{|}{\overset{\displaystyle R''}{\overset{|}{C}}}}—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—CO_2—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—CO—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—CO—N(R')—(CXX')_x—O—\overset{\displaystyle O}{\overset{\|}{C}}—$

$Rf—SO_2—(CXX')_x—$

$Rf—O—$

$Rf—CO_2—(CXX')_x—$

$Rf—(CH_2)_x—N(R')—CO—$

$Rf—SO_2—N(R')—CO—$

$Rf—CO—N(R')—CO—$

$Rf—CO—N(R')—(CXX')_x—N(R'')—CO—$ and

$Rf—CO—N(R')—$

wherein

x is a whole number between 1 and 20;

y is a whole number from 1 to 4;

z is a whole number from 1 to 10;

R' is hydrogen, alkyl with 1 to 10 carbon atoms, cycloalkyl with 5 to 12 carbon atoms or hydroxyalkyl with 2 to 4 carbon atoms;

R'', R''', X and X' are the same or different and each represents hydrogen or alkyl with 1 to 4 carbon atoms.

**12.** A composition for treating a textile to render said textile resistant to soiling comprising an effective amount of a fluorinated product as defined in claim **1** in a solvent medium.

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**4,295,977**

## NONIONIC TEXTILE SOFTENER COMPOSITION

**Edwin C. Sherburne, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 123,874, Feb. 22, 1980, abandoned. This application May 12, 1980, Ser. No. 148,063**

**Int. Cl.**[3] **D06M** *13/02, 13/18*

**U.S. Cl. 252—8.9** **10 Claims**

**1.** A nonionic textile softening composition comprising:

(1) from about 70% to about 80% by weight of a blend of (i) a mixture of linear and branched $C_{18}$ to $C_{32}$ monohydric alcohols and (ii) a mixture of $C_{24}$ to $C_{40}$ hydrocarbons, said blend of alcohols and hydrocarbons having a melting point between 110° F. and about 122° F.;

(2) from about 15% to about 25% by weight of the etherification reaction product of ethylene oxide and blend (1) where from about 30 to about 50 mols of ethylene oxide are reacted with each mol of hydroxyl groups in blend (1); and

(3) from about 3% to about 10% by weight of polyoxyethylene ether of oxo decyl alcohol wherein the mol ratio of oxyethylene groups to oxo decyl alcohol groups is from about 5 to about 10.



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**4,295,978**

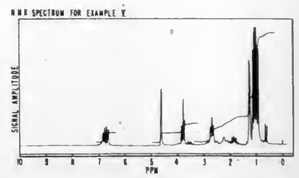
## USE OF ISOCHROMAN MUSK COMPOUNDS IN AUGMENTING OR ENHANCING THE AROMA OF DRYER-ADDED FABRIC SOFTENER ARTICLES

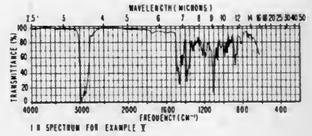
**Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright; Hugh Watkins, Lincroft; Manfred H. Vock, Locust, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

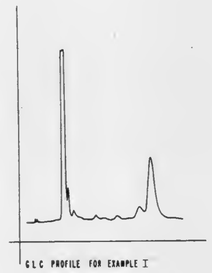
**Division of Ser. No. 63,374, Aug. 3, 1979, Pat. No. 4,250,200. This application Nov. 13, 1980, Ser. No. 206,651**

**Int. Cl.**[3] **D06M** *13/18, 13/16, 15/00*

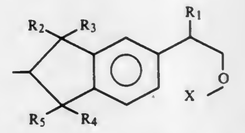
**U.S. Cl. 252—8.9** **3 Claims**



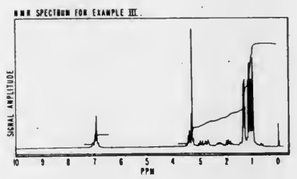



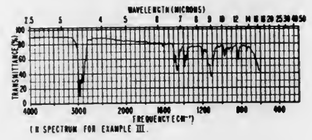



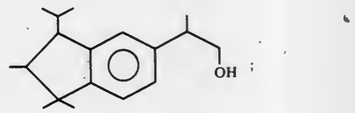

**1.** A dryer-added fabric softening article comprising a substrate, a substrate coating, and an outer coating, said outer coating coated on said substrate coating and said substrate coating coated on said substrate, said substrate comprising a water dissolvable paper and said outer coating comprising from 0.05% up to 5% by weight of said dryer-added fabric softener article of an indane alkanol or tricyclic isochroman having the structure:

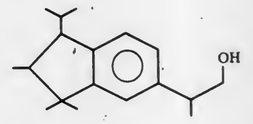



wherein X is hydrogen, methyl or $—CH_2—$; the dashed line is either a carbon-carbon single bond or no bond; $R_1$ is hydrogen or methyl; $R_2$, $R_3$, $R_4$ and $R_5$ represent hydrogen, methyl or isopropyl; with the proviso that $R_2$ and $R_3$ are methyl when $R_4$ is hydrogen and $R_5$ is isopropyl or $R_4$ and $R_5$ represent methyl when $R_2$ is hydrogen and $R_3$ is isopropyl; and with the further proviso that the dashed line is a carbon-carbon single bond when X is $—CH_2—$ and the dashed line is no bond when X is hydrogen or $CH_3$, said indane alkanol or tricyclic isochroman having a structure selected from the group consisting of:



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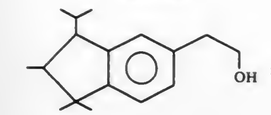
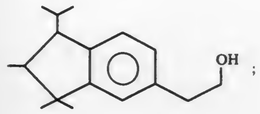
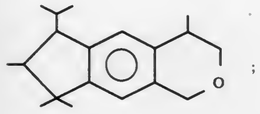
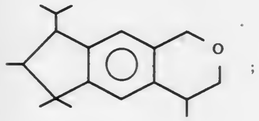
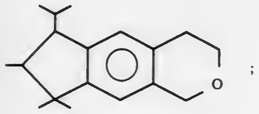
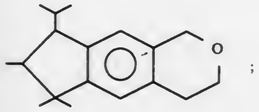


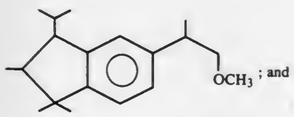




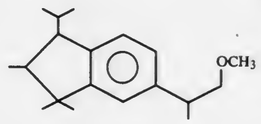








; and



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**4,295,979**

**METHOD AND COMPOSITION FOR INHIBITING CORROSION IN HIGH TEMPERATURE, HIGH PRESSURE GAS WELLS**

**Shelby P. Sharp, Tulsa, Okla., and Lyman Yarborough, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed May 29, 1979, Ser. No. 43,521**

**The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.**

**Int. Cl.³ C23F *11/00***

**U.S. Cl. 252—8.55 E** **5 Claims**

**1.** A method for inhibiting corrosion in a high temperature, high pressure gas well, characterized in that an aqueous or brine phase is present, but no petroleum condensate phase exists at bottomhole conditions, comprising the steps of:

(a) adding up to about 27 parts by weight of an alkyl amine per 100 parts per weight of a dialkyl disulfide producing an amine activated dialkyl disulfide solvent.

(b) adding to said activated dialkyl disulfide solvent at least about 40 parts by weight by elemental sulfur per 100 parts by weight alkyl disulfide oil producing a corrosion inhibitor carrier capable of existing in a liquid phase at bottomhole conditions at said high temperature, high pressure gas well,

(c) injecting said corrosion inhibitor carrier into said gas well to inhibit corrosion.

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**4,295,980**

**WATERFLOOD METHOD**

**Kaye L. Motz, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.**

**Continuation-in-part of Ser. No. 910,243, May 30, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,642**

**Int. Cl.³ E21B *43/22***

**U.S. Cl. 252—8.55 D** **13 Claims**

**1.** An improvement in the method of recovering hydrocarbons from a petroliferous subterranean formation, said method including the step of injecting into said formation an aqueous saline mixture containing an alkali metal hydrocarbon sulfonate and a solubilizing agent, said improvement comprising injecting into said formation an aqueous saline mixture containing an effective amount of

(a) about 0.5 to about 25 weight percent of an alkali metal linear alkane sulfonate wherein the alkane moiety contains 20 to 24 carbon atoms,

(b) about 1 to about 25 weight percent of a water-soluble solubilizing agent, and

(c) about 0.5 to about 3 weight percent of a salinity agent which is an alkali metal salt,

said method being characterized further in that the water-soluble solubilizing agent is a water-soluble $C_1$–$C_5$ alcohol.

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**4,295,981**

**PRODUCTION OF OVERBASED MAGNESIUM DETERGENT ADDITIVES**

**Victor C. Burnop, Church Croft, West Challow, Wantage, Oxfordshire, England**

**Filed Jul. 21, 1980, Ser. No. 169,513**

**Claims priority, application United Kingdom, Jul. 27, 1979, 26211/79**

**Int. Cl.³ C10M *1/40, 1/20, 3/34, 3/14***

**U.S. Cl. 252—33.4** **7 Claims**

**1.** A process comprising the following steps:

(i) forming a reaction mixture comprising:

(a) a non-volatile diluent oil

(b) magnesium alkoxyalkoxide as a solution in the alkoxyalcohol from which it is derived

(c) one or more hydrocarbyl-substituted phenols or metal phenates wherein the or each hydrocarbyl group contains no more than 60 carbon atoms or one or more sulphurised phenols having one or more hydrocarbyl group substituents each substituent containing no more than 60 carbon atoms or mixtures of said surfactants

(ii) adjusting the concentration of the free alkoxyalcohol to be less than 5%

(iii) adding at least one mole of water for every gram atom of the magnesium present in excess of the amount of magnesium required to neutralise the surfactant and hydrolysing the magnesium alkoxyalkoxide

(iv) introducing carbon dioxide into the reaction mixture whilst at a temperature not above 100° C.

(v) removing volatiles from the reaction mixture.

**3.** A process according to claim **1** in which sulphonate or a sulphonic acid is included in the reaction mixture.



**4,295,982**

**SULFURIZED AMINOGUANIDINE REACTION PRODUCT AND LUBRICANT COMPOSITIONS CONTAINING SAME**

**Gerassimos Frangatos, Haddonfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed May 12, 1980, Ser. No. 148,898**

**Int. Cl.³ C10M *1/38***

**U.S. Cl. 252—42** **10 Claims**

**1.** A product obtained by (1) reacting an aminoguanidine or an acid salt thereof with an unsaturated monocarboxylic acid at a temperature of from about 150° C. to about 275° C. and (2) reacting the product of (1) with sulfur at from about 150° C. to about 225° C.

**5.** A lubricant composition comprising a major proportion of a mineral lubricating oil, a synthetic lubricating oil or a grease from either of these and an anti-rust amount of the product of claim **1**.

**9.** The composition of claim **5** wherein the lubricant is a grease.

**10.** The composition of claim **9** wherein the thickener for said grease is a lithium hydroxystearate soap.

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**4,295,983**

**LUBRICATING OIL COMPOSITION CONTAINING BORONATED N-HYDROXYMETHYL SUCCINIMIDE FRICTION REDUCERS**

**Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Ethyl Corporation, Richmond, Va.**

**Filed Jun. 12, 1980, Ser. No. 158,715**

**Int. Cl.³ C10M *1/10***

**U.S. Cl. 252—49.6** **16 Claims**

**1.** A friction reducing lubricating oil additive comprising the reaction product of an N-hydroxymethyl aliphatic hydrocarbyl succinimide with an amount of a boronating agent sufficient to impart about 0.1 to 1.5 weight percent boron to said reaction product, said reaction product being made at about 50°–200° C., said N-hydroxymethyl aliphatic hydrocarbyl succinimide prepared by reacting $NH_3$ with an aliphatic $C_{12}$–$C_{36}$ hydrocarbyl succinic anhydride to form the corresponding succinimide and subsequently reacting the succinimide with formaldehyde to form said N-hydroxymethyl aliphatic hydrocarbyl succinimide.

**9.** Lubricating oil formulated for use in the crankcase of an internal combustion engine containing a friction-reducing amount of the reaction product of claim **1**.

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**4,295,984**

**PASTE-LIKE, VISCOUS DAMPING MEDIUM COMPRISING POLYGLYCOL ETHERS AND/OR ESTERS**

**Kaspar Lochner, Karlsburgstr. 7b, 8000 München, Fed. Rep. of Germany**

**Filed Oct. 3, 1979, Ser. No. 81,381**

**The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.**

**Int. Cl.³ C04B *43/00***

**U.S. Cl. 252—62** **24 Claims**

**1.** A paste-like, viscous damping medium dispersion for damping mechanical and acoustic vibrations, comprising polyglycol ethers and/or polyglycol esters having a viscosity of about 10 cSt to 1000 cSt at 50° C. and a relative average molecular weight of about 700 to 20000, 30 to 70% by weight of ground graphite having a particle size of less than 100μ, 0.1 to 8% by weight of a wetting agent and 0.1 to 10% by weight of finely ground aluminum silicate or amorphous silicon dioxide as a viscosity stabilizer, the % weight being based in each case on the total weight of the dispersion, the viscosity of the dispersion being about (1 to 4)$\times 10^6$ cP at 25° C.

**4,295,985**

**METHOD OF REMOVAL OF CHLORINE RETAINED BY HUMAN SKIN AND HAIR AFTER EXPOSURE TO CHLORINATED WATER, AND SOAP AND SHAMPOO COMPOSITIONS ADAPTED TO EFFECT SAID REMOVAL**

**Henry G. Petrow, 32 Garfield St., and Mark L. Weissman, 742 Belmont St., both of Watertown, Mass. 02172**

**Continuation-in-part of Ser. No. 88,144, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 900,601, Jun. 7, 1978, abandoned. This application May 1, 1980, Ser. No. 145,681**

**Int. Cl.³ C11D *7/32;* D06L *3/10***

**U.S. Cl. 252—105** **10 Claims**

**1.** A toilet soap composition for cleansing and removing retained chlorine from human skin and hair after immersion in chlorine containing waters, said composition consisting essentially of a chemically stable, uniform mixture of a toilet soap and a water soluble, non-toxic and harmless-to-the skin chlorine-reducing agent which is a mixture of from about 50 to about 30% by weight urea and from about 50 to about 70% by weight of an alkali metal thiosulfate, said agent being present in said mixture in amount between at least about 2% and less than about 15% by weight of said soap in said mixture and being compatible with said soap.

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**4,295,986**

**LOW TEMPERATURE CATALYTIC REDUCTION**

**Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138**

**Filed May 14, 1979, Ser. No. 38,898**

**Int. Cl.³ C07B *1/00;* C09K *3/00***

**U.S. Cl. 252—188** **15 Claims**

**1.** A process for reducing compounds having reducible electronegative functionality, said process comprising the step of carrying out said reduction in a reaction medium which comprises a reducing agent which is a hydride of an alkali metal, and a catalyst which is the borohydride of an alkali metal, and an ether solvent in which the borohydride catalyst is soluble.

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**4,295,987**

**CROSS-LINKED SODIUM POLYACRYLATE ABSORBENT**

**Lawrence R. Parks, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Dec. 26, 1979, Ser. No. 106,958**

**Int. Cl.³ B01J *20/04;* D21D *3/00;* B01J *20/10, 20/26***

**U.S. Cl. 252—194** **18 Claims**

**1.** An absorbent composition comprising a copolymer of acrylic acid cross-linked with a first cross-linking component comprising a monomer having at least two vinyl groups and a second cross-linking component comprising an ionic divalent cation.

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**4,295,988**

**MAGNETO-OPTIC $BI_1$ $LU_2$ $FE_5O_{12}$ CRYSTALS**

**Gary L. Nelson, Eagan, and William A. Harvey, Minneapolis, both of Minn., assignors to Sperry Corporation, New York, N.Y.**

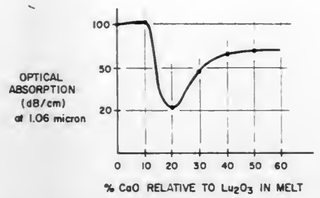
**Filed Jul. 18, 1979, Ser. No. 58,710**

**Int. Cl.³ C30B *29/28***

**U.S. Cl. 252—584** **2 Claims**

**1.** A mixture for growing a $Bi_1Lu_2Fe_5O_{12}$ garnet crystal on a $Gd_3Ga_5O_{12}$ garnet substrate in a liquid phase eptiaxial process, said mixture consisting essentially of PbO, $Bi_2O_3$, $Fe_2O_3$,

$Lu_2O_3$ and CaO in concentrations sufficient to grow said $Bi_1$-$Lu_2Fe_5O_{12}$ garnet crystal and the latter CaO in a concentration




such that the molar ratio of CaO to $Lu_2O_3$ is in the range of 0.05 to 0.40.

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**4,295,989**

## LUMINESCENT HAFNIA COMPOSITION

**Philipp H. Klein, Washington, D.C.; Arrigo Addamiano, and Roger Allen, both of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 23, 1980, Ser. No. 162,347**
**Int. Cl.³ C09K *11/463***
**U.S. Cl. 252—301.4 F** **11 Claims**

1. A blue-luminescing material of $3HfO_2$:$Y_2O_3$ with a $Ce^{3+}$ dopant in an amount of 0.1 to 1.0 weight percent exhibiting a cubic crystalline structure.

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**4,295,990**

## REAGENT FOR THE QUANTITATIVE DETERMINATION OF WATER

**Antonie E. Verbeek, and Jozef M. J. Mattheij, both of Deventer, Netherlands, assignors to J. T. Baker Chemicals B.V., Deventer, Netherlands**

**Filed Jun. 9, 1980, Ser. No. 157,440**
**Claims priority, application European Pat. Off., Jul. 26, 1979, 79102673.5**
**Int. Cl.³ G01N *31/00*; C09K *3/00***
**U.S. Cl. 252—408** **6 Claims**

1. A reagent for the quantitative determination of water in combination with a titration solution containing iodine, which reagent contains sulfur dioxide and an anhydrous alkali metal acetate in an anhydrous lower aliphatic alcohol as solvent, characterized in that the lower aliphatic alcohol is selected from the group consisting of 2-methoxy ethanol or a mixture of 2-methoxy ethanol and methanol in a volume ratio of at least 10:90.

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**4,295,991**

## TITANIUM TRICHLORIDE CATALYST COMPONENT AND THE PROCESS FOR THE PRODUCTION THEREOF

**Harry J. Wristers, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Sep. 26, 1978, Ser. No. 945,929**
**Int. Cl.² C08F *4/64***
**U.S. Cl. 252—429 B** **47 Claims**

1. A non-friable, highly active Ziegler-type $TiCl_3$ catalyst composition obtained by:

(1) contacting $TiCl_4$ with an organoaluminum compound at a temperature in the range of about −50° C. to about 30° C. to produce a $TiCl_3$ reduced solid product,

(2) contacting the reduced solid $TiCl_3$ product with a minor amount of an α-olefin having at least three carbon atoms under polymerization conditions to obtain a reduced $TiCl_3$ solid product containing about 1 to about 1,000 wt.% of prepolymerized α-olefin based on the weight of $TiCl_3$,

(3) treating said prepolymerized reduced solid with one of

(a) a chlorinated hydrocarbon having at least 2 carbon atoms and a Lewis base complexing agent or (b) $TiCl_4$ and a Lewis base complexing agent to convert the prepolymerized $TiCl_3$ reduced solid to a substantially non-friable highly active, crystalline prepolymerized $TiCl_3$ composition.

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**4,295,992**

## SUPPORT PREPARED FROM ORGANOMAGNESIUM COMPOUNDS AND SILICON HALIDES; AND CATALYSTS FOR POLYMERIZING OLEFINS

**Ronald L. Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 102,808, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 24,487, Mar. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,769, Jun. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 837,665, Sep. 29, 1977, abandoned. This application Jun. 17, 1980, Ser. No. 160,332**
**Int. Cl.³ C08F *4/02, 4/64, 10/02, 10/06***
**U.S. Cl. 252—429 C** **30 Claims**

1. A catalyst support which comprises the reaction product formed by reacting (1) a mixture of an organomagnesium compound represented by the formula $MgR_2$ and a silicon halide represented by the formula $R'_{4-n}SiX_n$, said mixture being in a non-polar solvent, with (2) an alcohol represented by the formula R″OH; wherein the organomagnesium compound is or can be rendered hydrocarbon soluble and wherein each R, R′ and R″ is independently an aliphatic hydrocarbon group having from 1 to about 20 carbon atoms, X is Cl, Br or I, n has a value of from 1 to 4 and wherein the molar ratio of R″OH:$MgR_2$ is at least 2:1 and the molar ratio of R″OH:$R'_{4-n}SiX_n$ is sufficient so as to provide at least one X group per OH group.

2. The catalyst support of claim 1 wherein R has from about 2 to about 8 carbon atoms, R′ has from about 1 to about 6 carbon atoms, R″ is an aliphatic group having from about 1 to about 6 carbon atoms, X is chlorine or bromine; wherein the ratio of R″OH:$R'_{4-n}SiX_n$ is sufficient so as to provide from 2 to about 3 X groups per OH group; and wherein said non-polar solvent has a hydrocarbon having from about 5 to about 10 carbon atoms.

9. A catalyst composition resulting from the addition of a reducing agent to a mixture of the support of claims 1, 2 or 3 suspended in an inert liquid hydrocarbon and a transition metal compound of Groups 4b, 5b, 6b, 7b, or 8 of Mendeleev's Periodic Table under conditions so as to produce a catalytically active product and in proportions such that the magnesium: transition metal atomic ratio is from about 0.1:1 to about 30:1 followed by washing the resultant solid catalyst product with an inert liquid hydrocarbon.

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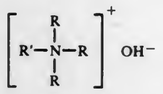
**4,295,993**

## CATALYTIC COMPOSITE, METHOD OF MANUFACTURE AND PROCESS FOR USE

**David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jan. 4, 1980, Ser. No. 109,934**
**The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.**
**Int. Cl.³ B01J *31/22***
**U.S. Cl. 252—430** **24 Claims**

1. A catalytic composite comprising a metal chelate, an alkali metal hydroxide, and a quaternary ammonium hydroxide disposed on a molecular sieve support, the quaternary ammonium hydroxide represented by the structural formula:





wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, and R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, said alkali metal hydroxide comprising at least about 10 wt. % of said catalytic composite.

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**4,295,994**

## CELLULOSE ACETATE BUTYRATE BOUND ZEOLITE ADSORBENTS

**Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 48,955, Jun. 15, 1979, Pat. No. 4,248,737. This application Apr. 11, 1980, Ser. No. 139,492**
**Int. Cl.³ B01J *29/08, 20/18***
**U.S. Cl. 252—430** **14 Claims**

1. An adsorbent comprising a zeolite crystalline aluminosilicate suitable for use in a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with said adsorbent, the silicon constituent of said adsorbent tending to dissolve in said solution resulting in the undesirable disintegration of said crystalline aluminosilicate, the adsorbent additionally containing a water permeable binder material comprising cellulose acetate butyrate which substantially reduces the extent of dissolution of said silicon constituent and the extent of said disintegration of said adsorbent.

3. The adsorbent of claim 2 further characterized in that said crystalline aluminosilicate contains cations at exchangeable cationic sites selected from the group consisting of alkali metals and alkali earth metals.

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**4,295,995**

## CATALYSTS HYDROCARBON TREATING PROCESSES

**Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation-in-part of Ser. No. 955,526, Oct. 30, 1978, which is a continuation-in-part of Ser. No. 847,898, Nov. 2, 1977, Pat. No. 4,134,825. This application Nov. 1, 1979, Ser. No. 90,415**
**Int. Cl.³ B01J *23/84, 23/85, 27/04, 31/12***
**U.S. Cl. 252—431 C** **20 Claims**

1. A catalyst comprising a composition comprising a metal component, carbon and hydrogen deposited on a support selected from the group consisting of solid metals and metal alloys of metals of Groups IB, II, III, IV, VB, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said support having a surface area of less than about 5 square meters per gram, and the metal constituent of said metal component of said composition being selected from the group consisting of metals of Groups II, III, IV, V, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said composition having a surface area of at least about 50 $m^2/g$, said catalyst having been prepared by the steps which comprise:

(a) dispersing in a hydrocarbon oil having a Conradson carbon content up to about 50 weight percent, (1) a thermally decomposable metal compound in an amount sufficient to provide a ratio of atoms of oil Conradson carbon to atom of metal constituent of said thermally decomposable compound of less than about 750 to 1, said metal constituent being selected from the group consisting of Group II, Group III, Group IV, Group V, Group VIB, Group VIIB, and Group VIII of the Periodic Table of Elements and mixtures thereof, and (2) said support;

(b) heating the resulting mixture in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and a gas comprising hydrogen and hydrogen sulfide, and

(c) recovering a supported catalyst.

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**4,295,996**

## CATALYSTS FOR HYDROCARBON TREATING PROCESSES

**Roby Bearden, Jr.; Clyde L. Aldridge, and Lloyd A. Pine, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Nov. 13, 1979, Ser. No. 93,698**
**Int. Cl.³ B01J *23/74, 27/04, 31/12***
**U.S. Cl. 252—431 C** **21 Claims**

1. A catalyst comprising a composition comprising a metal component, carbon and hydrogen deposited on a support, the metal constituent of said metal component of said composition being selected from the group consisting of metals of Groups II, III, IV, V, VIB, VIIB, VIII and mixtures thereof of the Periodic Table of Elements, said composition having a surface area of at least about 50 $m^2/g$ and said support being an aluminum alloy powder having a surface area of less than 5 square meters per gram, said alloy having been prepared by atomizing said aluminum alloy, in molten state, into a stream selected from the group consisting of water, a gas and mixtures thereof, said catalyst having been prepared by the steps which comprise:

(a) dispersing in a hydrocarbon oil having a Conradson carbon content up to about 50 weight percent, (1) a thermally decomposable metal compound in an amount sufficient to provide a ratio of atoms of oil Conradson carbon to atom of metal constituent of said thermally decomposable metal compound of less than about 750 to 1, said metal constituent being selected from the group consisting of Group II, Group III, Group IV, Group V, Group VIB, Group VIIB, and Group VIII of the Periodic Table of Elements and mixtures thereof, and (2) said support;

(b) heating the resulting mixture in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and a gas comprising hydrogen and hydrogen sulfide, and

(c) recovering a supported catalyst.

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**4,295,997**

## $SO_2$ ACTIVATION OF SUPPORTED CHROMIUM OXIDE CATALYSTS

**Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 2,633, Jan. 11, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,435**
**Int. Cl.³ B01J *27/02, 23/26, 21/08***
**U.S. Cl. 252—439** **8 Claims**

1. A method for producing an activated catalyst said method comprising:

(1) contacting a catalyst comprising chromium on a silica-containing support with a gaseous environment consisting essentially of sulfur dioxide and oxygen at a temperature within a temperature range and for a time sufficient to activate the catalyst and subsequently

(2) maintaining a temperature within the contact temperature range of step (1) while contacting said catalyst with a gaseous environment consisting essentially of oxygen and gases inert to reaction with the catalyst.

2. A method of claim 1 wherein the catalyst is contacted

with a gaseous environment consisting essentially of oxygen and gases inert to reaction with the catalyst while the temperature is being increased prior to contact with sulfur dioxide.

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**4,295,998**

## SELENIUM OR TELLURIUM TREATED SILICA

**Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 14, 1980, Ser. No. 130,632**
**Int. Cl.³ B01J** *21/06, 27/00*
**U.S. Cl. 252—439** **16 Claims**

1. A process comprising a first step wherein silica is contacted with a treating agent selected from at least one of selenium or tellurium under nonoxidizing conditions at a temperature of at least 370° C. and a subsequent second step wherein it is contacted with an oxidizing ambient at a temperature within the range of 370°-900° C.

2. A method according to claim 1 for producing a catalyst wherein said silica contains a chromium compound and is heated in the presence of oxygen prior to said treatment with said selenium or tellurium, said selenium or tellurium being in elemental form and being used in an amount within the range of 0.05 to 1 weight percent of the element based on the weight of the oxidized catalyst and wherein said oxidizing ambient comprises oxygen.

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**4,295,999**

## POLYMERIZATION CATALYST

**Lynn H. Slaugh, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Division of Ser. No. 86,013, Oct. 17, 1979, Pat. No. 4,239,872. This application May 21, 1980, Ser. No. 152,209**
**Int. Cl.³ B01J** *23/20, 23/24, 21/00*
**U.S. Cl. 252—455 R** **16 Claims**

1. A process for the preparation of a catalyst suitable for polymerization reactions which process comprises:
(a) impregnating a silica or alumina support with a transition metal salt decomposable upon calcination to the oxide wherein said metal salt is selected from the group consisting of vanadium, titanium, chromium or mixtures thereof;
(b) calcining the metal impregnated support at a temperature ranging from about 450° C. to about 1000° C.;
(c) impregnating the calcined support with a solution of aluminum hydride; and
(d) heating the hydride impregnated support in hydrogen at a temperature range from about 200° C. to about 600° C.

4. The process of claims 1, 2 or 3 wherein the support is silica.

7. The process of claims 1, 2 or 3 wherein the transition metal ranges from about 0.1 to about 20 percent by weight (measured as the metal) of the total catalyst and the aluminum added as aluminum hydride ranges from about 0.1 to about 25 percent by weight (measured as the metal) of the total catalyst.

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**4,296,000**

## ADSORBENTS FOR POLYOL PURIFICATION

**Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.**

**Continuation-in-part of Ser. No. 74,226, Sep. 10, 1979, which is a continuation of Ser. No. 869,347, Jun. 13, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,335**
**Int. Cl.³ B01J** *20/10, 20/08, 20/04*
**U.S. Cl. 252—455 R** **3 Claims**

1. A method of producing an adsorbent for polyol purification comprising a synthetic amorphous silica having at least 70% of the silica larger than 44 microns produced by the method comprising the steps of:
(a) subjecting an aqueous dispersion including finely divided silica and a sodium hydroxide to hydrothermal treatment at a temperature in the range from about 138 to 210 degrees Celsius and for a period of time of from about 2.5 to 4.5 hours and sufficient to react the silica and said sodium hydroxide to form a reaction mixture of partly polymerized sodium silicate, said aqueous dispersion having a silica/sodium oxide weight ratio of at least 1.8:1;
(b) spray-drying said reaction mixture at a temperature of at least 204 degrees Celsius to form minute hollow spheres of sodium polysilicate having a bulk density of about 0.4 g/cc;
(c) reacting the polysilicate with a 5 to 15% sulfuric acid solution to form a synthetic amorphous silica; and
(d) filtering, washing and drying the synthetic amorphous silica.

2. A method of producing an adsorbent according to claim 1 wherein a metal cation adduct selected from the group consisting of aluminum, magnesium, zinc and calcium is added to said synthetic silica until the silica contains up to 5% by weight of said metal cation adduct.

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**4,296,001**

## TITANIUM IMPREGNATED SILICA-CHROMIUM CATALYSTS

**Gil R. Hawley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Feb. 6, 1980, Ser. No. 118,838**
**Int. Cl.³ B01J** *21/06, 23/26*
**U.S. Cl. 252—458** **38 Claims**

1. A process for producing a chromium-containing catalyst comprising impregnating a dry silica xerogel, formed by drying a silica hydrogel, with an aqueous solution of a hydrolysis resistant titanium compound.

11. A process for preparing a chromium-containing catalyst comprising forming a silica hydrogel containing a hydrolysis resistant titanium compound, and drying said hydrogel to form a xerogel.

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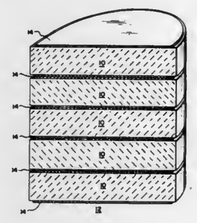
**4,296,002**

## METAL OXIDE VARISTOR MANUFACTURE

**Theodore O. Sokoly, Racine, and John Niedzialkowski, Milwaukee, both of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.**

**Filed Jun. 25, 1979, Ser. No. 51,872**
**Int. Cl.³ H01B** *1/06*
**U.S. Cl. 252—518** **6 Claims**



1. A method of making a metal oxide varistor, which comprises the steps of:
forming a powdered mixture comprised of at least one electrically conductive metal oxide powder, and a small percentage of at least one preselected powdered additive, said additive being selected from the group consisting of different metal oxides and metal florides;
forming of said powdered mixture, by pressing, a plurality of blocks, each having complementary top and bottom surfaces,
forming a stack of said plurality of blocks; (and)
sintering said stack of blocks, whereby said complementary abutting top and bottom surfaces of adjacent blocks are bonded together to form a varistor; and
applying metallic contacts only to the top and bottom surfaces of said varistor.

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**4,296,003**

## ATOMIZED DIELECTRIC FLUID COMPOSITION WITH HIGH ELECTRICAL STRENGTH

**Ronald T. Harrold, Murrysville, and Lawrence E. Ottenberg, East Huntingdon Township, Westmorland County, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed Jun. 27, 1980, Ser. No. 163,901**
**Int. Cl.³ H01B** *3/24*
**U.S. Cl. 252—570** **14 Claims**

1. A dielectric fluid composition consisting of a mixture of
(a) a first fluid selected from the group consisting of electronegative gases, electropositive gases, and mixtures thereof, and
(b) a second fluid including an atomized liquid selected from the group consisting of chlorinated liquids, fluorocarbon liquids, and mixtures thereof and having a droplet size of from about 0.1$\mu$ to about 25$\mu$ in diameter, and wherein the mixture has a pressure of from about 40 Torr to about 730 Torr.

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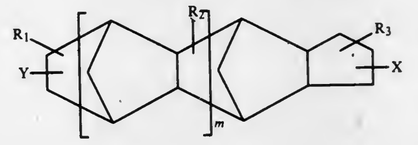
**4,296,004**

## POLYCYCLIC POLYAMINES

**Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.**

**Division of Ser. No. 74,368, Sep. 10, 1979, Pat. No. 4,229,376. This application May 23, 1980, Ser. No. 152,905**
**Int. Cl.³ C08G** *59/50*
**U.S. Cl. 260—18 EP** **12 Claims**

1. A process for curing a polyamine of the formula:



wherein the above formula m is equal to 0 or 1; x and y are selected from the group consisting of:
$-CH_2NH_2$; $-CH_2NH(CH_2CHR_4CH_2NH_2)$; and
$-CH_2N(CH_2CHR_4CH_2NH_2)_2$, and mixtures thereof,
wherein $R_1$, $R_2$, $R_3$, and $R_4$ are hydrogen or methyl and mixtures thereof, provided that both x and y may not be $CH_2NH_2$ comprising contacting the amine with an epoxy resin.

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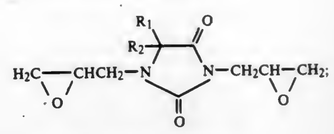
**4,296,005**

## ADDUCTS CONTAINING HYDROXYL GROUPS FROM MONONUCLEAR HYDANTOIN GLYCIDYL COMPOUNDS AND NON-AROMATIC DICARBOXYLIC ACIDS

**Marianne Di Benedetto, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

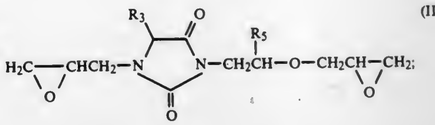
**Continuation-in-part of Ser. No. 107,234, Dec. 26, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,739**
**Int. Cl.³ C08G** *59/26, 63/46, 63/42, 12/42*
**U.S. Cl. 260—18 EP** **14 Claims**

1. An advanced addition product containing hydroxyl groups, which is obtained by heating a mixture comprising:
(a) one equivalent of a mononuclear hydantoin glycidyl compound selected from the group consisting of
(1) a compound of the formula I



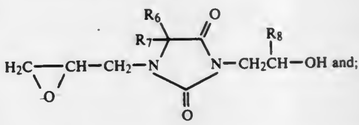
(I)

(2) a compound of the formula II



(II)

(3) a compound of the formula III



(III)

(4) any combination of compounds of the formulae I, II, or III,
wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_6$ and $R_7$ are independently alkyl of 1 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms or $R_1$ and $R_2$ together, $R_3$ and $R_4$ together and $R_6$ and $R_7$ together are tetramethylene or pentamethylene, and $R_5$ and $R_8$ independently are hydrogen or methyl;
(b) 0.7 to 2.0 equivalents of a non-aromatic dicarboxylic acid of 9 to 44 carbon atoms; and
(c) 0.0 to 0.5 equivalents of a monocarboxylic acid of 6 to 18 carbon atoms.

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**4,296,006**

## BINDER FOR COATING COMPOSITIONS AND ITS USE

**Volker Bugdahl; Gerhard Morlock; Werner Reidt, all of Hanau, and Emil Kerschner, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Feb. 19, 1980, Ser. No. 122,492**
**Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906844**
**Int. Cl.³ C09D** *3/58*
**U.S. Cl. 260—23 EP** **18 Claims**

1. A binder for coating compositions based on a mixture of an unsaturated $\beta$-hydroxy ester with copolymerizable monomers, said binder consisting essentially of, on a total weight basis
(A) 25 to 60 weight percent of an unsaturated $\beta$-hydroxy ester which is produced by reacting an epoxy resin based on bisphenol A and epichlorohydrin with a molecular weight between 800 and 3000 and an epoxide equivalent weight between 400 and 2500 with a mixture of
(a) 74 to 64 mole percent of methacrylic acid, acrylic acid, or a mixture of methacrylic acid and acrylic acid, and
(b) 26 to 36 mole percent of at least one saturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms or a mixture of at least one saturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms with up to 20 mole percent of an unsaturated aliphatic monocarboxylic acid having 8 to 20 carbon atoms, and
(B) 75 to 40 weight percent of a mixture based on the weight of component (B) of
(a) 70 to 95 weight methyl methacrylate,
(b) 30 to 5 weight percent of at least one monomer of the

formula $CH_2=CR_1-COOR_2$ where $R_1$ is hydrogen or a methyl group and $R_2$ is a straight chain alkyl group with 4 to 10 carbon atoms, a branched alkyl group with 6 to 12 carbon atoms, a hydroxy-alkyl group with 2 to 4 carbon atoms or a saturated hydrocarbon group interrupted by ether oxygen atoms containing 3 to 10 carbon atoms; and

(c) 0 to 3 weight percent of at least one crosslinking agent for acrylate or methacrylate resins.

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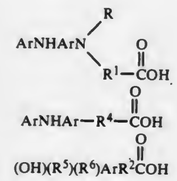
**4,296,007**

## NITRILE RUBBER CONTAINING CADMIUM ANTIOXIDANTS

**Roger E. Morris, Cuyahoga Falls, and August H. Jorgensen, Jr., Rocky River, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio**

**Filed Mar. 27, 1980, Ser. No. 134,591**
**Int. Cl.³ C08K** *5/18, 5/13*
**U.S. Cl. 260—23.7 N** **20 Claims**

1. Nitrile rubber, which is a polymer of a nitrile and more than 40% diene, containing an effective amount of one or more of the following anitoxidants in the form of cadmium salts:



where Ar is an aromatic group; R is hydrogen, alkyl group of 1 to 4 carbon atoms, or oxyalkylene group of 1 to 4 carbon atoms; $R^1$ is alkylene group of 1 to 20 carbon atoms,

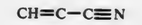
where $R^2$ is alkylene group of 1 to 20 carbon atoms,



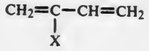
where $R^3$ is alkylene group of 1 to 8 carbon atoms, and n is a number of 1 to 20; $R^4$ is



or —$OR^2$— group; and $R^5$ and $R^6$ are same or different groups attached to the Ar group which are selected from hydrogen and alkyl radicals which individually contain 1 to 8 carbon atoms; the nitrile is defined by the formula

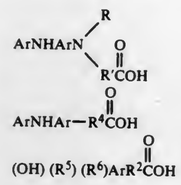


where R is selected from hydrogen, halogens, alkyl radicals of 1 to 8 carbon atoms, and aryl radicals; and the diene is defined by the formula



where X is selected from hydrogen, halogens, alkyl radicals of 1 to 5 carbon atoms, and aryl radicals.

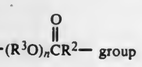
13. In the process for making finished synthetic nitrile rubber, the improvement comprising contacting nitrile rubber latex wherein the nitrile rubber is a polymer of a nitrile and more than 40% diene with cadmium coagulating agent and an effective amount of one or more of the antioxidants, in the form of alkali metal salts which are converted to cadmium salts upon contact with the cadmium coagulating agent, the antioxidants are represented by the following formulas:



where Ar is an aromatic group; R is hydrogen, alkyl group of 1 to 4 carbon atoms, or oxyalkylene group of 1 to 4 carbon atoms; R′ is alkylene group of 1 to 20 carbon atoms,



where $R^2$ is alkylene group of 1 to 20 carbon atoms,



where $R^3$ is alkylene group of 1 to 8 carbon atoms, and n is a number of 1 to 20; $R^4$ is



or —$OR^2$— group; and $R^5$ and $R^6$ are same or different groups attached to the Ar group which are selected from hydrogen and alkyl radicals which individually contain 1 to 8 carbon atoms.

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**4,296,008**

## SEALANT COMPOSITION

**David J. St. Clair, and Earle E. Ewins, Jr., both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Filed Apr. 21, 1980, Ser. No. 142,311**
**Int. Cl.³ C08L** *93/00;* **C08J** *3/00*
**U.S. Cl. 260—27 BB** **8 Claims**

1. A sealant composition possessing excellent oxidative and UV stability along with improved tack, reduced melt viscosity, and a cohesive failure mechanism in the 180° peel test comprises:

(a) 100 parts by weight of a selectively hydrogenated block copolymer component comprising an A′B′ block copolymer and a multiblock copolymer having at least two end blocks A and at least one mid block B wherein the A′ and A blocks are monoalkenyl arene polymer blocks and the B′ and B blocks are substantially completely hydrogenated conjugated diene polymer blocks, the number average molecular weight of the A′ and A blocks are between about 3,000 and about 7,000, and the monoalkenyl arene content of the multiblock copolymer is between about 7% and about 22% by weight, wherein the weight ratio between the A′ B′ block copolymer and the multiblock copolymer is 20:80 to about 60:40;



about 50 to about 350 parts by weight of a tackifying resin compatible with block B;

(c) about 0 to about 100 parts by weight of a plasticizer; and

(d) about 0.1 to about 10 parts by weight of a silane coupling agent.

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**4,296,009**

## WAX-CONTAINING UNSATURATED POLYESTER LAMINATING COMPOSITION WITH AROMATIC TERTIARY AMINE

**Edward J. Kerle, Granville, and Terry R. Beaver, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Jan. 7, 1980, Ser. No. 110,166**
**Int. Cl.³ C08L** *91/00*
**U.S. Cl. 260—28.5 R** **3 Claims**

1. In a laminating composition comprising (i) an ethylenically unsaturated polyester polymer, (ii) an ethylenically unsaturated curing agent comprising styrene, (iii) a free radical catalyst for the cure reaction of said polyester polymer and said curing agent and (iv) paraffin wax, the improvement for enhancing interlaminar adhesion in cured laminates prepared therefrom which comprises said composition (v) further comprising at least about 0.1 percent by weight of a tertiary monoamine having a single aromatic group and two alkyl or hydroxy alkyl groups joined to the amino nitrogen atom thereof and (vi) containing no more than about 10 percent by weight of non-reinforcing filler, where both percentages are based on the total weight of said polymer and said curing agent.

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**4,296,010**

## RESIN COMPOSITION FOR CATIONIC ELECTRODEPOSITING PAINTS

**Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Hyogo, Japan**

**Filed Jan. 30, 1980, Ser. No. 116,780**
**Claims priority, application Japan, Mar. 26, 1979, 54-34227**
**Int. Cl.³ C08L** *75/04*
**U.S. Cl. 260—29.2 TN** **14 Claims**

1. A resin composition for cationic electrodepositing paints which has a high throwing power and does not foul a top coated film and is particularly suitable for two-coat finishing, said resin composition comprising the reaction product of

[A] a basic polyamino resin containing amino groups and/or hydroxyl groups capable of reacting with isocyanate groups, with

[B] a polyisocyanate mixture composed of

(i) 40 to 95 mole% of a low-volatile partially blocked aromatic polyisocyanate containing at least two benzene rings having an isocyanate group directly bonded to a nuclear carbon atom, in which substantially all isocyanate groups except one are blocked with an alcohol,

(ii) 2.5 to 50 mole% of a low-volatile fully blocked aromatic polyisocyanate containing at least two benzene rings having an isocyanate group directly bonded to a nuclear carbon atom, and

(iii) 2.5 to 40 mole% of a difunctional polyisocyanate,

the mole percentages being based on the total amount of the polyisocyanates (i), (ii) and (iii).

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**4,296,011**

## EPOXY ESTER COPOLYMER AQUEOUS DISPERSIONS

**Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.**

**Division of Ser. No. 18,887, Mar. 9, 1979, Pat. No. 4,247,659, which is a continuation-in-part of Ser. No. 885,036, Mar. 9, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,128**
**Int. Cl.³ C08L** *61/06*
**U.S. Cl. 260—29.3** **13 Claims**

1. Epoxy ester copolymer soluble in water with the aid of an amine comprising the hydroxy functional epoxy ester of a polyepoxide having an average molecular weight of about 300 to about 1100 and a 1,2-epoxy equivalency of about 1.4 to about 2.0, esterified with an at least approximately stoichiometric proportion, based on epoxide functionality, of monocarboxylic acid selected from benzoic acid, $C_1$–$C_8$ alkyl substituted benzoic acid, and $C_6$–$C_{10}$ alkanoic acid, the esterification reaction being continued to provide an acid number of less than 20, said hydroxy functional epoxy ester being polyesterified with from 1.5–8%, based on the weight of the epoxy ester, of a monoethylenically unsaturated dicarboxylic acid which resists homopolymerization to an acid number of less than 20, and said polyester being copolymerized with from 15% to 70% of monoethylenic monomers, based on the copolymer, said monoethylenic monomers including carboxyl functional monomer providing an acid number of from 20–100 in the copolymer, said copolymer being dispersed in water in the form of a salt with an amine.

12. Epoxy ester copolymer as recited in claim 1 in which said copolymer is present in admixture with from 5–40%, based on total resin solids, of an aminoplast or phenoplast resin.

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**4,296,012**

## SIZING COMPOSITIONS INCORPORATING KETENE DIMER

**Toshiharu Okumichi; Osamu Oseto, both of Suita; Keizo Matsumoto, Hirakata; Shigenori Thuzimoto, and Hisanari Sanda, both of Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Japan**

**Filed Dec. 10, 1979, Ser. No. 101,768**
**Claims priority, application Japan, Dec. 28, 1978, 53-161560; Feb. 28, 1979, 54-23631**
**Int. Cl.³ C08L** *23/18, 25/06, 95/00*
**U.S. Cl. 260—29.6 XA** **7 Claims**

1. A sizing composition for cellulosic fiber sheets comprising water and finely divided solid particles dispersed in the water, said solid particles being a uniform mixture of about 40 to about 96% by weight of a ketene dimer and about 4 to about 60% by weight of a noncrystalline hydrocarbon resin formed by dissolving one in the other.

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**4,296,013**

## VINYLIDENE CHLORIDE POLYMER MICROGELS

**Dale S. Gibbs, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich.**

**Division of Ser. No. 942,515, Sep. 15, 1978. This application Dec. 13, 1979, Ser. No. 103,020**
**Int. Cl.³ C08L** *27/08*
**U.S. Cl. 260—29.6 TA** **4 Claims**

1. A coating latex containing discrete, cross-linked vinylidene chloride polymer microgels, said latex comprising the product obtained by emulsion polymerizing (a) about 88 to about 92 parts by weight of vinylidene chloride; (b) about 6 to about 12 parts by weight of methyl acrylate or methyl methacrylate; (c) about 1 to about 5 parts by weight of a copolymerizable crosslinking polyfunctional comonomer; and (d) about 1 to about 10 parts by weight of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and fumaric acid, said microgels having a particle size of about 0.1 to about 0.5 micron, a gel content of about 1 to about 50 percent, and a second order transition temperature less than about 30° C.

**4,296,014**

## AQUEOUS DISPERSION TYPE THERMOSETTING COATING COMPOSITION

**Masaaki Hayashi, Tokyo; Hiroharu Sasaki, Yamato, and Kazuyoshi Tsuneta, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Japan**

**Filed Dec. 17, 1979, Ser. No. 104,447**
**Claims priority, application Japan, Oct. 26, 1978, 53-132000; Dec. 19, 1978, 53-156653; Dec. 26, 1978, 53-164179**
**Int. Cl.³ C08L** *67/06*
**U.S. Cl. 260—29.6 NR** **13 Claims**

1. An aqueous dispersion type thermosetting coating composition comprising (A) fine thermosetting water-insoluble resin particles consisting essentially of (a) a preformed polyester-modified vinyl resin having a hydroxyl value of 30 to 200, which is formed by solution graft-polymerizing (i) an unsaturated polyester resin formed by reaction between an unsaturated dicarboxylic acid and a polyhydric alcohol, with (ii) at least one $\alpha,\beta$-monoethylenically unsaturated monomer, and optionally with (iii) a phosphoric acid group-containing $\alpha,\beta$-monoethylenically unsaturated monomer, and (b) a preformed cross-linkable copolymer resin derived from a monomer mixture comprising (iv) an N-alkoxymethylated monomer of an $\alpha,\beta$-monoethylenically unsaturated carboxylic acid amide and (ii) at least one $\alpha,\beta$-monoethylenically unsaturated monomer, (B) a surface active agent and/or a thickener, and (C) a necessary amount of water.

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**4,296,015**

## MOLDED ARTICLE OF HYDROUS POLYMER AND PROCESS FOR PRODUCING THE SAME

**Seiji Aotani, Yokohama, and Hisanori Kanayama, Machida, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan**

**Filed Jan. 24, 1980, Ser. No. 115,098**
**Claims priority, application Japan, Jan. 30, 1979, 54/8739**
**Int. Cl.³ C08K** *5/06*
**U.S. Cl. 260—29.6 ME** **22 Claims**

1. A molded article of hydrous polymer comprising a polymer latex or a macromolecular substance latex, an oily substance, and an additive selected from the group consisting of a polyether and a combination of a polyvalent metal compound and a polyether, said polymer latex or macromolecular substance latex containing anionic groups, having a polymer concentration of 20–70% by weight, and being selected from the group consisting of:

(a) polymer latexes prepared by emulsion polymerization process,

(b) polymer latexes obtained by re-emulsification process, and

(c) natural macromolecular substance latexes;

wherein said polyether is selected from the group consisting of polyoxypropylene, oxyethylene-oxypropylene copolymer and polyoxytetramethylene; and

wherein the amounts of the oily substance and the polyether are 10–200 parts by weight and 0.5–30 parts by weight, respectively, per 100 parts by weight of said polymer latex.

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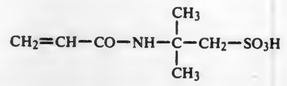
**4,296,016**

## METHOD OF PREPARING A POLYMERIC ELECTROLYTE PARTICULARLY FOR AN ELECTRO-OPTICAL DEVICE

**Jean-Paul Randin, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland**

**Filed Apr. 2, 1980, Ser. No. 136,466**
**Claims priority, application Switzerland, May 3, 1979, 133/79**
**Int. Cl.³ C08K** *3/00*
**U.S. Cl. 260—29.6 SQ** **5 Claims**

1. A method of preparing a proton polymeric electrolyte, particularly for an electro-optical device, which is a mixture of poly[2-acrylamido-methylpropanesulphonic acid] and water and containing pigment distributed substantially homogeneously, comprising forming a suspension of a said pigment in water, dissolving 5 to 50% by weight of a monomer of the formula



or a salt thereof in the suspension, adding a polymerisation initiator to the mixture, carrying out the polymerisation reaction with agitation, and evaporating part of the water until the water content is less than 52% of the weight of the dry polymer, the pigment being present in the amount of 2 to 25% by weight of the dry polymer.

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**4,296,017**

## GRAFT COPOLYMER PRESSURE-SENSITIVE ADHESIVES, THEIR MANUFACTURE AND USE

**Rudolf Weissgerber; Alois Stoll; Herbert Kandler; Hans-Herbert Nunner; Christine Eichelseder, and Helmut Pangeri, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

**Filed Jan. 18, 1980, Ser. No. 113,259**
**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903687**
**Int. Cl.³ C08F** *261/04, 263/02, 263/04;* **C08L** *39/06*
**U.S. Cl. 260—30.6 R** **8 Claims**

1. A graft copolymer for use as a polymeric pressure-sensitive adhesive consisting of

(I) from 5% to 30% by weight of a graft base soluble in the monomer component selected from the group consisting of

(i) a copolymer of 40% to 85% by weight of said copolymer of ethylene units, 15% to 60% by weight of said copolymer of vinyl acetate units and 0 to 10% by weight of said copolymer of monomer units copolymerizable with ethylene and vinyl acetate,

(ii) said copolymer with up to 10% by weight of said copolymer of vinyl alcohol units derived from vinyl acetate units, and

(iii) mixtures of 25% to 99.9% by weight of said copolymer with from 0.1% to 75% by weight of other graftable polymers soluble in the monomer component, and

(II) from 70% to 95% by weight of a monomer mixture grafted to said graft base consisting of

(a) from 30% to 80% by weight of said mixture of vinyl esters of alkanoic acids having 2 to 4 carbon atoms,

(b) from 20% to 70% by weight of said mixture of monomers selected from the group consisting of vinyl esters of alkanoic acids having 6 to 18 carbon atoms, esters of $\alpha,\beta$-alkenoic acids having 3 to 8 carbon atoms, with alkanols having 3 to 18 carbon atoms, esters of alkenedioic acids having 4 to 8 carbon atoms, with alkanols having 3 to 18 carbon atoms, and mixtures thereof,

(c) from 0.5% to 15% by weight of said mixture, of N-vinyl-2-pyrrolidone,

(d) from 0 to 20% by weight of other olefinically-unsaturated compounds copolymerizable with said components (a), (b) and (c), and

(e) from 0 to 25% by weight of a plasticizer.

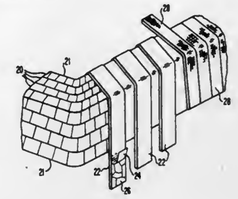


**4,296,018**

## CATECHOL OR PYROGALLOL CONTAINING FLEXIBLE INSULATING TAPE HAVING LOW GEL TIME

**James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 17, 1979, Ser. No. 39,918**
**Int. Cl.³ B32B** *19/02, 27/38;* **C08K** *5/07, 5/13*
**U.S. Cl. 260—32.8 EP** **8 Claims**



1. A composition comprising:

(A) semi-solid epoxide, a mixture of solid epoxide and liquid epoxide or a mixture of semi-solid epoxide and liquid epoxide, with a solvent for said epoxide selected from the group consisting of ketones, aromatic hydrocarbons, and mixtures thereof, where the weight ratio of total epoxide to total solvent is from about 85:15 to about 10:90;

(B) about 0.01 to about 5.0 phr of an organo-tin compound having the structural formula:

$(R)_3\,SnX$

where each R is independently selected from the group consisting of alkyl groups having from about 1 to 10 carbon atoms, aryl groups, Cl, Br, or $NO_2$ substituted aryl groups, alkaryl groups with the alkyl constituent having from 1 to 10 carbon atoms, Cl, Br, or $NO_2$ substituted alkaryl groups with the alkyl constituent having from about 1 to 10 carbon atoms, aralkyl groups with the alkyl constituent having from about 1 to 10 carbon atoms, cyclopentane, groups, cyclopentene groups, cyclopentadiene groups, cyclohexane groups, cyclohexene groups, cyclohexadiene groups, pyrrolidine groups, pyrrole groups, tetrahydrofuran groups, dioxane groups, pyridine groups and piperdine groups, and each X is selected from the group consisting of halide, hydroxide, acetate, butyrate, propionate, and dimethyl phosphate; and

(C) about 0.001 to about 1 phr of an activator selected from the group consisting of catechol, pyrogallol, and mixtures thereof.

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**4,296,019**

## SOLVENT BLENDS FOR ETHYLENE COPOLYMERS

**Alfred R. Nelson, Edenville, and Kenneth E. Johnsen, Midland, both of Mich., assignors to The Dow Chemical Co., Midland, Mich.**

**Filed Nov. 29, 1979, Ser. No. 98,465**
**The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.**
**Int. Cl.³ C08K** *5/05*
**U.S. Cl. 260—33.4 R** **9 Claims**

1. A solution comprising a solvent blend which comprises from about 5 to about 35 percent by weight of an acyclic alcohol selected from the group consisting of ethanol, propanol, isopropanol, n-butanol, isobutanol and t-butanol, based upon the total weight of said solvent blend, about 3 percent to about 90 percent by weight of a monocyclic aromatic hydrocarbon, based upon the total weight of said solvent blend, and from about 5 to about 92 percent by weight of a halogenated $C_2$ hydrocarbon, based upon the total weight of said solvent blend, and a copolymer of ethylene and ethylenically unsaturated carboxylic acid, or an ionic metal salt thereof, having from about 2.5 to about 30 percent by weight of said carboxylic acid, based on the total weight of said copolymer, characterized in that said copolymer remains dissolved at a temperature of at least 60° C.

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**4,296,020**

## POLYUREA THICKENED MOLDING COMPOSITIONS

**Juan J. Magrans, Jr., Newark, Del., assignor to ICI Americas Inc., Wilmington, Del.**

**Filed Oct. 29, 1979, Ser. No. 89,128**
**Int. Cl.³ C08L** *67/00, 75/02, 75/06*
**U.S. Cl. 260—37 N** **17 Claims**

1. A resin blend useful in preparing non-sticky molding compositions by the reaction therewith of polyisocyanate which comprises: an ethylenically unsaturated monomer containing dissolved therein 30–70% by weight of a resin selected from the group consisting of vinyl terminated polyester urethane resin, ethylenically unsaturated polyester resins, and ethylenically unsaturated polyisocyanurate resins, and 1.5–30% by weight of at least organic polyamine polyurea precursor free of ethylenic unsaturation selected from the group consisting of polyalkylene polyamines and cyanoalkylated polyoxyalkylene polyamines having a molecular weight of about 190–2000 having a general formula selected from the group consisting of:

$H_2NCH_2\text{-}CXH(OCH_2CX)_yNH_2$

wherein X is H or an alkyl group having 1–18 carbon atoms and where y is a number of about 2 to about 16,

A triamine of polyalkoxylated trimethylol propane having the general formula:

$CH_3CH_2C[CH_2(O\text{-}CH_2\text{-}CHX)_zNH_2]_3$

where z is an average of 1–11, and

A cyanoethylated polyoxyalkylated polyamines having the general formula:

$R[(OCH_2CHX)_nOCHYCHZNHA]_m$

where R is the nucleus of an oxylation-susceptible aliphatic polyhydric alcohol containing 2–12 carbon atoms and 2–8 hydroxyl groups, A is hydrogen or a cyano lower alkyl radical having 1 or 2 carbon atoms between the hydrogen and the cyano radical provided at least one A is a cyano-lower-alkyl radical, Z is an alkyl group containing 1–18 carbon atoms, X and Y are hydrogen or Z, n has an average value of 0–50 and m is 2–8, R saturated and consists of carbon and hydrogen wherein there is a reaction product of the polyisocyanate with the polyamine polyurea precursor.

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**4,296,021**

## REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED HIGH VOLTAGE BREAKDOWN RESISTANCE

**Allen D. Wambach, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Dec. 6, 1976, Ser. No. 747,634**
**Int. Cl.³ C08K** *3/34, 3/40*
**U.S. Cl. 260—40 R** **12 Claims**

1. A method of improving the high voltage dielectric breakdown characteristics of reinforced thermoplastic compositions comprising adding to a polybutylene therephthalate resin a reinforcing agent comprising (i) aluminum silicate, alone, or in combination with (ii) glass fibers, said reinforcing agent being present in an amount of up to 60% by weight of said reinforced thermoplastic composition and in an amount at least sufficient to reinforce the composition but in an amount not in excess of that which impairs the long term high voltage breakdown resistance of the composition in comparison with a corresponding unfilled composition or one wherein the filler consists essentially of glass fibers.

4,296,022

## POLYPROPYLENE BLEND COMPOSITIONS

Robert L. Hudson, Severna Park, Md., assignor to Chevron Research, San Francisco, Calif.

Filed Jun. 4, 1980, Ser. No. 156,521
Int. Cl.³ C08L 23/12
U.S. Cl. 260—42.46 5 Claims

1. A polypropylene resin blend, useful for melt-spinning fine denier yarns, which comprises, per 100 parts by weight of total polypropylene resin, about from 70–95 parts of a first polypropylene resin having a melt flow index about of from 30 to 38 and a swell index of about from 1.8 to 2.3; about from 5 to 30 parts of a second polypropylene resin having a melt flow index of about from 4 to 35 and a swell index of about from 5 to 7; and about 0.2 to 0.5 parts of a hindered phenol melt flow stabilizer for retarding polypropylene polymer degradation during melt extrusion.

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4,296,023

## VINYL CHLORIDE POLYMER COMPOSITIONS WITH REDUCED COMBUSTIBILITY AND REDUCED SMOKE FORMATION UNDER CONDITIONS OF FIRE

Hubertus J. Vroomans, Beek, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed May 30, 1980, Ser. No. 154,898
Claims priority, application Netherlands, Jun. 1, 1979, 7904369; Jun. 27, 1979, 7904991; Oct. 17, 1979, 7907651
Int. Cl.³ C08K 3/24
U.S. Cl. 260—45.75 F 8 Claims

1. A vinyl chloride polymer composition having an oxygen index according to ASTM D 2863 of at least 60 and reduced smoke formation under conditions of fire, said composition contains a zinc titanate,

which zinc titanate is composed to a large extent of by weight of spinel crystal structure,

present in an amount from 0.05 to 5 parts by weight per 100 parts by weight of said vinyl chloride polymer.

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4,296,024

## HUMAN IMMUNE SERUM GLOBULIN WITH HIGH HEPATITIS A ANTIBODY TITER

William J. McAleer, Ambler, and William J. Miller, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 813,566, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 610,499, Sep. 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 531,020, Dec. 9, 1974, abandoned. This application Jan. 5, 1979, Ser. No. 1,133
Int. Cl.³ C07G 7/00
U.S. Cl. 260—112 B 5 Claims

1. Human immune serum globulin having a hepatitis A antibody titer of at least about 75,000 IAHA units/ml.

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4,296,025

## PROCESS FOR PREPARING HUMAN INTERFERON

Kaname Sugimoto, Okayama, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed May 13, 1980, Ser. No. 149,533
Claims priority, application Japan, May 24, 1979, 54-63210
Int. Cl.³ C07G 7/00; A61K 45/02
U.S. Cl. 260—112 R 4 Claims

1. A process for preparing human interferon, comprising exposing human leukocyte suspension to both Type I and Type II interferon inducers to induce interferon, and purifying and collecting the induced interferon.

4,296,026

## PRODUCTION OF SOYBEAN PROTEIN ISOLATE OF IMPROVED PURITY

Donald B. Millar, Toronto, Canada, assignor to General Foods Inc., Toronto, Canada

Filed Sep. 22, 1980, Ser. No. 189,646
Int. Cl.³ A23J 1/14
U.S. Cl. 260—123.5 8 Claims

1. In a process for the formation of a soybean protein isolate by contacting soybeans with an aqueous sodium chloride solution of ionic strength of at least about 0.2 molar to solubilize the protein, diluting the protein solution to an ionic strength sufficient to form a protein dispersion of protein in the aqueous phase, and collecting the protein from the dispersion as an amorphous mass of soybean protein isolate, the improvement which comprises using calcium chloride in said aqueous sodium chloride solution in an amount effective to increase the purity of said soybean protein isolate.

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4,296,027

## PURE INTRAVENOUS HUMAN AND ANIMAL GAMMA GLOBULINS

Richard M. Condie, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 829,565, Aug. 31, 1977, Pat. No. 4,136,094. This application Jan. 22, 1979, Ser. No. 5,150
Int. Cl.³ C07G 7/00
U.S. Cl. 260—112 B 9 Claims

1. An isolated natural, unaltered, unfragmented, undenatured monomeric immune gamma globulin for intravenous administration characterized by 99% purity and containing less than 1% aggregates and less than 1% dissociated materials.

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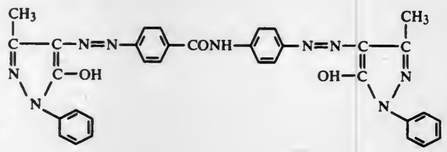
4,296,028

## PYRAZOLONYL SUBSTITUTED DISAZO PIGMENTS

Ugo Moiso, 5, Viale Rimembranze; Vincenzo Massabo, 10, Viale Rimembranze, and Danilo Domenis, 43, Via S. Giuseppe, all of Saronno (Varese), Italy

Division of Ser. No. 274,670, Jul. 24, 1972, abandoned. This application Sep. 30, 1977, Ser. No. 838,128
Claims priority, application Italy, Jul. 26, 1971, 7669 A/71; Dec. 29, 1971, 33062 A/71
Int. Cl.³ C09B 33/12, 33/13, 33/153; D06P 1/04
U.S. Cl. 260—160 1 Claim

1. A disazo pigment of the formula:



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4,296,029

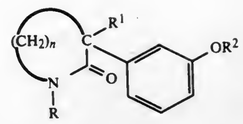
## PROCESS FOR PREPARING HEXAHYDROAZEPINE, PIPERIDINE AND PYRROLIDINE DERIVATIVES

Brian J. Bushell, Portsmouth; John F. Cavalla, Isleworth; Robin G. Shepherd, Burnham, and Alan C. White, Windsor, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Jun. 23, 1980, Ser. No. 161,992
Claims priority, application United Kingdom, Jul. 3, 1979, 23123/79
Int. Cl.³ C07D 223/10
U.S. Cl. 260—239.3 R 15 Claims

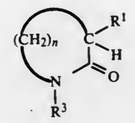
1. A method for preparing a 2-oxo-hexahydroazepine, 2-oxo-piperidine or 2-oxo-pyrrolidine of formula I



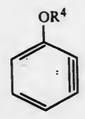


wherein n is 2, 3 or 4, R is selected from the group consisting of hydrogen, lower alkyl, phenyl(lower)alkyl, loweralkenylmethyl and cycloalkylmethyl of 3–4 carbons in the cycloalkyl moiety, $R^1$ is selected from the group consisting of hydrogen and lower alkyl and $R^2$ is selected from the group consisting of hydrogen, lower alkyl and phenyl (lower)alkyl which comprises reacting an anion of a lactam of formula III

(III)



where n and $R^1$ are as defined above and $R^3$ is lower alkyl, phenyl(lower)alkyl, trialkyl-, triaryl- or triarylalkylsilyl, loweralkenylmethyl or cycloalkylmethyl of 3-4 carbon atoms in the cycloalkyl moiety with a benzyne of formula IV



where $R^4$ is lower alkyl, phenyl(lower)alkyl, or trialkyl-, triaryl or triarylalkyl-silyl to give an anion of the compound of formula I where $R^1$ is lower alkyl or a dianion of the compound of formula I where $R^1$ is hydrogen and protonating the anion or dianion of the compound of formula I to give a compound of formula I.

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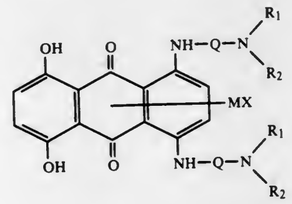
4,296,030

## METAL CHELATES OF 1,4-BIS(SUBSTITUTED-AMINO-5,8-DIHYDROXY-ANTHRAQUINONES

Stanley A. Lang, Jr., Stony Point, and Keith C. Murdock, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

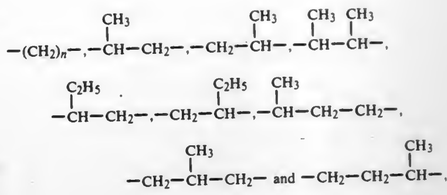
Filed Apr. 9, 1980, Ser. No. 138,620
Int. Cl.³ C07F 3/06, 15/02, 15/06
U.S. Cl. 260—239 A 9 Claims

1. A chelated compound selected from the group consisting of those of the formula:



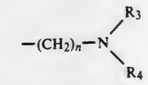
wherein Q is a divalent moiety selected from the group consisting of those of the formulae:

(I)



wherein n is an integer from 2 to 4 inclusive; $R_1$ and $R_2$ are each individually selected from the group consisting of hydrogen, alkyl($C_1$–$C_4$), monohydroxyalkyl($C_1$–$C_4$), with the proviso that the carbon atom alpha to the nitrogen atom does not bear an hydroxy group, dihydroxyalkyl($C_3$–$C_6$), with the proviso that the carbon atom alpha to the nitrogen atom does not bear a hydroxy group, formyl, alkanoyl($C_2$–$C_4$), trifluoroacetyl and moieties of the formulae:

$-(CH_2)_n-CN$, $-(CH_2)_n-O-R$ and



wherein n is an integer 2 to 4 inclusive, R is alkyl($C_1$–$C_4$) and $R_3$ and $R_4$ are each individually selected from the group consisting of hydrogen, alkyl($C_1$–$C_4$) and monohydroxyalkyl($C_2$–$C_4$), with the proviso that the carbon atom alpha to the nitrogen atom does not bear an hydroxy group and the group

is morpholino, thiomorpholino, piperazino, 4-methyl-1-piperazino or a moiety of the formula:

wherein m is an integer 2 to 6 inclusive; with the proviso that the ratio of the total number of carbon atoms to the sum of the total number of oxygen atoms plus the total number of nitrogen atoms in the side chains at the 1-position and the 4-position does not exceed 4 and with the further proviso that $R_1$ and $R_2$ are not both hydrogen or alkyl; M is selected from the group platinum, copper, iron, zirconium, cobalt, chromium and zinc; X is chloride, sulfate or nitrate and the pharmacologically acceptable acid-addition salts thereof.

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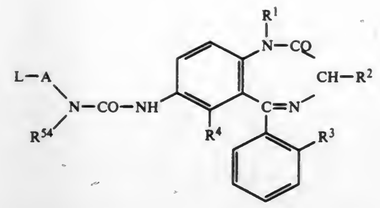
4,296,031

## BENZODIAZEPINE DERIVATIVES

Albert E. Fischli, and Andre Szente, both of Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 63,288, Aug. 2, 1979, Pat. No. 4,251,443. This application Sep. 11, 1980, Ser. No. 186,061
Claims priority, application Switzerland, Aug. 11, 1978, 8563/78; Jun. 6, 1979, 5270/79; Jul. 5, 1979, 6296/79
Int. Cl.³ C07D 243/24
U.S. Cl. 260—239.3 D 2 Claims

1. A compound of the formula



wherein $R^1$ is lower alkyl, $R^2$ is hydrogen or lower alkyl, $R^3$ is halogen and $R^4$ is hydrogen or halogen, A is a lower alkylene group, $R^{54}$ is hydrogen or lower alkyl and L is selected from the group consisting of halogen, tosyloxy, mesyloxy and trimethylammonium.

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**4,296,032**

## METHOD FOR THE PREPARATION OF PENICILLANIC-β-LACTAMASE INHIBITORS

**Paul M. Denerley, Horley, England, assignor to Beecham Group Limited, England**

**Filed Mar. 31, 1980, Ser. No. 135,316**

**Claims priority, application United Kingdom, Apr. 4, 1979, 11764/79**

**Int. Cl.³ C07D** *277/60*

**U.S. Cl. 260—245.2 R** **4 Claims**

1. A process for the preparation of an in-vivo hydrolysable ester of 6β-bromopenicillanic acid when substantially free from the corresponding in-vivo hydrolysable ester of 6α-bromopenicillanic acid which process comprises mixing isomeric in-vivo hydrolysable esters of 6α- and 6β-bromopenicillanic acids and thereafter chromatographically separating the mixture of isomers into fractions and recovering the in-vivo hydrolysable ester of 6β-bromopenicillanic acid from a fraction containing said in-vivo hydrolysable ester of 6β-bromopenicillanic acid substantially free from the in-vivo hydrolysable ester of a 6α-bromopenicillanic acid.

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**4,296,033**

## 4-AZIDO-1-MERCAPTOACYL PROLINE

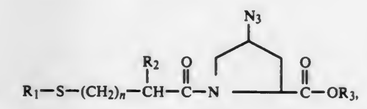
**Edward W. Petrillo, Jr., Pennington, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Jul. 23, 1980, Ser. No. 171,565**

**Int. Cl.³ A61K** *31/40, 31/445;* **C07D** *207/16, 211/34*

**U.S. Cl. 260—326.2** **8 Claims**

1. A compound having the formula



or a salt thereof, wherein,

$R_1$ is hydrogen, alkyl, aryl, arylalkyl, alkanoyl, or arylcarbonyl;

$R_2$ is hydrogen, alkyl, alkylthio or trifluoromethyl;

$R_3$ is hydrogen, alkyl or arylalkyl; and

n is 1 or 2;

wherein the asymmetric center indicated by the asterisk (*) is in the L-configuration and wherein the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, phenyl or trifluoromethyl groups.

**4,296,034**

## POLYFLUORINATED SULFONAMIDES

**Pierre Bouvet, Rouen, and Jean-Pierre Lalu, La Mulatiere, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France**

**Continuation of Ser. No. 466,051, May 1, 1974, abandoned, which is a continuation of Ser. No. 5,352, Jan. 23, 1970, abandoned. This application May 24, 1979, Ser. No. 41,926**

**Claims priority, application France, Jan. 22, 1969, 69 01059**

**Int. Cl.³ C07D** *295/22;* **C07C** *143/75, 143/74*

**U.S. Cl. 260—326.82** **2 Claims**

1. A polyfluorinated sulfonamide compound having the structure

$$C_nF_{2n+1}\text{-}(CH_2)_b\text{-}SO_2\text{—}NRR'$$

wherein

(a) $C_nF_{2n+1}$ corresponds to a straight or branched polyfluorinated carbon chain, n being a number of from 1 to 20;

(b) b is an integer of from 2 to 20;

(c) —NRR′ is selected from the group (d) or (e) below:

(d) N is nitrogen; R is hydrogen or an alkyl radical of from 1 to 10 carbon atoms; and R′ is hydrogen, an alkyl radical of from 1 to 10 carbon atoms, a cyclic alkyl radical of from 5 to 12 carbon atoms, or an aryl hydrocarbon radical of from 6 to 12 carbon atoms;

(e) —NRR′ is a pyrrolidine radical having the structure

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**4,296,035**

## TOTAL SYNTHESIS OF THE UTERO-EVACUANT SUBSTANCE D,L-ZOAPATANOL

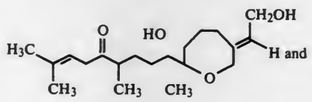
**Vinayak V. Kane, Princeton, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Division of Ser. No. 971,471, Dec. 20, 1979, Pat. No. 4,237,053. This application Mar. 17, 1980, Ser. No. 130,660**

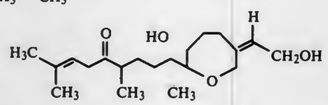
**Int. Cl.³ C07D** *313/04*

**U.S. Cl. 260—333** **3 Claims**

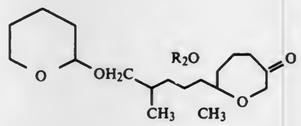
1. The process for the preparation of a compound selected from the group consisting of



and

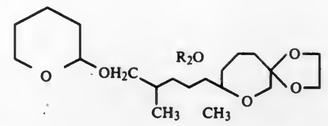


which comprises reacting a compound of the formula

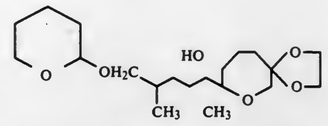


with ethylene glycol to form a ketal of the formula

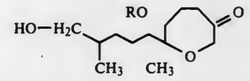




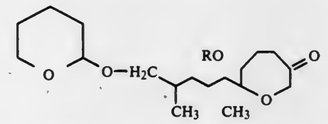
reacting the product formed with sodium in liquid ammonia to form an alcohol of the formula



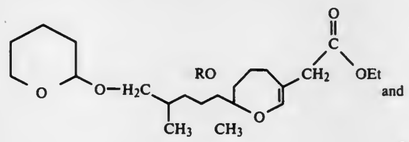
reacting the alcohol with t-butyldiphenylsilyl chloride in the presence of imidazole to form a compound of the formula



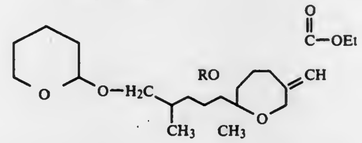
reacting the alcohol formed with dihydropyran and an acid selected from P-toluenesulfonic acid and camphorsulfonic acid to form a compound of the formula



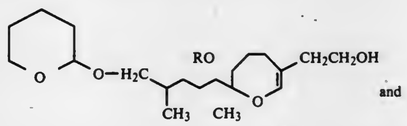
reacting the ketone with triethylphosphonoacetate to form a mixture of isomers having the formulas



and



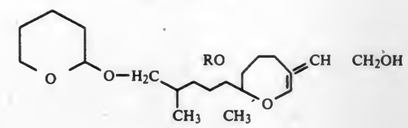
reacting the mixture with lithium aluminum hydride to form a mixture of alcohols having the formulas



and

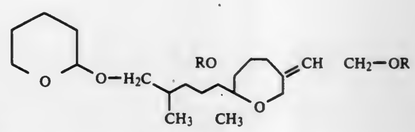
A

-continued

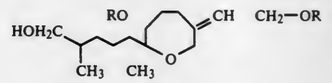


B

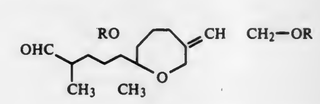
separating the alcohols, and reacting the alcohol B with t-butyldiphenylsilyl chloride to form a compound of the formula



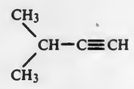
reacting the product with acetic acid to form an alcohol of the formula



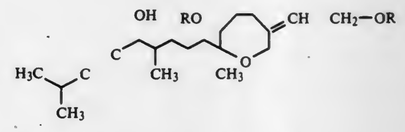
reacting the alcohol with chromium trioxide to form an aldehyde of the formula



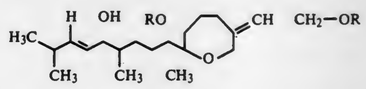
reacting the aldehyde with an acetylenic Grignard reagent prepared from



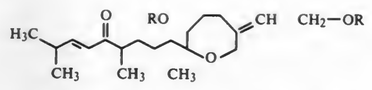
to form a compound of the formula



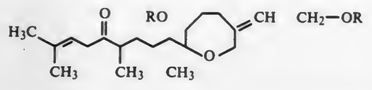
reacting the product with lithium aluminum hydride to form a compound of the formula



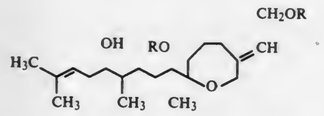
reacting the alcohol formed with an oxidizing agent selected from chromium trioxide and manganese dioxide to form a ketone of the formula



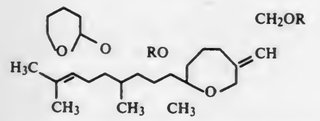
reacting the ketone with potassium t-butoxide followed by treatment with acetic acid to form a compound of the formula



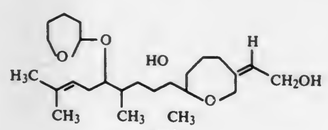
reacting the product with sodium borohydride to form a compound of the formula



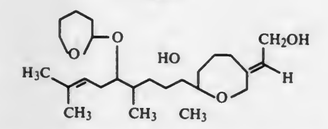
reacting the product formed with dihydropyran and an acid selected from P-toluenesulfonic acid and camphorsulfonic acid to form a compound of the formula



reacting the product formed with tetrabutylammonium fluoride to form a mixture of compounds of the formula

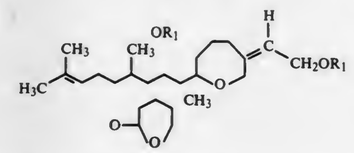


and

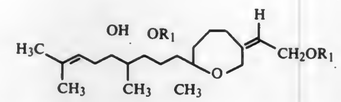


separating the compounds in the mixture, and then

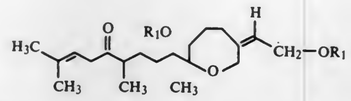
(a) reacting compound A with an esterifying agent selected from a lower alkyl anhydride or alkanoyl halide having 2–5 carbon atoms to form an ester of the formula



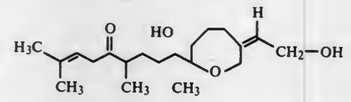
treating the product with an acid selected from acetic acid, P-toluenesulfonic acid and camphorsulfonic acid to form an alcohol of the formula



treating the alcohol formed with chromium trioxide to form a ketone of the formula



and reacting the product formed with tetrabutylammonium hydroxide to form a compound of the formula

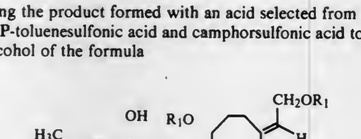


and

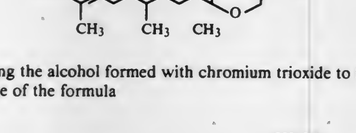
(b) reacting compound B with an esterifying agent selected from a lower alkyl anhydride or alkanoyl halide having 2–5 carbon atoms to form an ester of the formula



A



B



wherein R is a t-butyldiphenylsilyl group, $R_1$ is lower alkanoyl having 2–5 carbon atoms and $R_2$ is selected from the group consisting of benzyl, p-nitrobenzyl and p-methylbenzyl.



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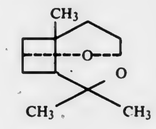
**4,296,036**

## SELECTIVE METHOD FOR THE PREPARATION OF INSECT PHEROMONE

**Kenji Mori, Tokyo, and Mitsuru Sasaki, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

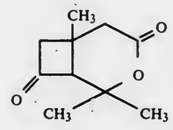
**Filed Mar. 31, 1980, Ser. No. 135,274**
**Claims priority, application Japan, Apr. 6, 1979, 54-42138**
**Int. Cl.³ C07D *319/04, 305/14***
**U.S. Cl. 260—340.7** **4 Claims**

1. A method for the preparation of 3,3,7-trimethyl-2,9-dioxatricyclo[3.3.1.$0^{4,7}$]nonane represented by the formula (I),



(I)

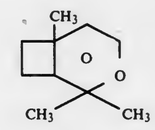
which comprises reacting a keto lactone represented by the formula (II),



(II)

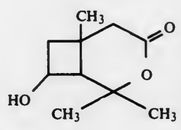
with diisobutylaluminum hydride and subsequently treating with an acid, wherein the reaction temperature is from −70° C. to +20° C., wherein the reaction time is from a moment up to one hour and wherein the molar ratio of the compound represented by the formula (II) to diisobutylaluminum hydride is 1:2-3.

2. A method for the preparation of a keto lactone represented by the formula (II),



(I)

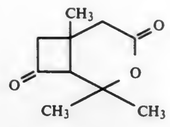
which comprises oxidizing a hydroxy lactone represented by the formula (III),



(III)

with a chromic acid at 0° to 20° C. from a moment up to two hours, wherein the molar ratio of the compound represented by the formula (III) to the chromic acid is 1:1-3 equivalents.

4. 1,5,5-trimethyl-4-oxabicyclo[4.2.0]octa-3,7-dione represented by the formula (II),



(II)

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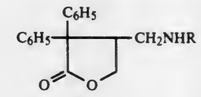
**4,296,037**

## 4,5-DIHYDRO-3,3-DIPHENYL-4-HYDROCARBYLAMINOMETHYLFURAN-2(3H) ONES

**Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.**

**Division of Ser. No. 615,951, Sep. 23, 1975, Pat. No. 4,119,637.**
**This application Jul. 24, 1978, Ser. No. 127,001**
**Int. Cl.³ C07D *307/26***
**U.S. Cl. 260—343.6** **6 Claims**

1. A compound selected from those having the formula



wherein R is selected from the group consisting of lower alkyl having one to six carbon atoms, lower cycloalkyl having four to eight carbon atoms, or phenyllower alkyl consisting of benzyl, phenethyl, phenpropyl and α-methylbenzyl.

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**4,296,038**

## PREPARATION OF (−)-DIHYDROCHRYSANTHEMOLACTONE

**T. L. Ho, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.**

**Filed Apr. 24, 1980, Ser. No. 143,299**
**Int. Cl.³ C07D *311/94***
**U.S. Cl. 260—343.21** **5 Claims**

1. A process for producing (−)-dihydrochrysanthemolactone from 2-caren-4-one comprising:

methylating said 2-caren-4-one with a methylating agent selected from methyl lithium and methyl magnesium halide to produce 4-methyl-2-caren-4-ol;

oxidizing said 4-methyl-2-caren-4-ol with ozone followed by cleaving at the double bond with removal of 2 carbon atoms to produce a tautomeric mixture of cis-2,2-dimethyl-3(2'-oxopropyl) cyclopropane-carboxylic acid and cis-2-oxo-3-oxa-4,7,7-trimethylbicyclo [4.1.0] heptan-4-ol;

methylating with a methylating agent selected from methyl lithium and methyl magnesium halide said tautomeric mixture to produce a single compound that upon acidification forms a hydroxy acid; and

lactonizing said hydroxy acid by dehydration to produce said (−)-dihydrochrysanthemolactone.

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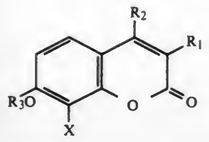
**4,296,039**

## SELECTED PROCESS FOR PRODUCING MONOHALOGENATED DERIVATIVES OF 7-HYDROXY-COUMARIN

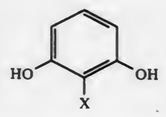
**Francesco Della Valle, Padua, Italy, assignor to Fidia S.p.A., Padua, Italy**

**Division of Ser. No. 952,460, Oct. 18, 1978, abandoned. This application Jan. 15, 1980, Ser. No. 112,223**
**Claims priority, application Italy, Nov. 17, 1977, 29765 A/77**
**Int. Cl.³ C07D *311/08, 413/06, 405/06***
**U.S. Cl. 260—343.45** **5 Claims**

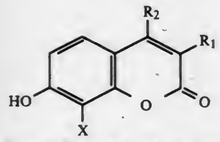
1. Process for the preparation of pure 7-hydroxycoumarin derivatives of the formula I:



wherein X represents a halogen atom, $R_1$ is selected from the group consisting of piperidino ethyl, morpholino ethyl, diethylamino ethyl and diethylamino propyl, $R_2$ is selected from the group consisting of methyl and phenyl, and $R_3$ is selected from the group consisting of ethoxy-carbonyl-methyl and ethoxy-carbonyl-ethyl, which process comprises (a) reacting a 2-halo-resorcinol of the formula V:



with a $\beta$-keto ester to obtain an intermediate of the formula



wherein $R_1$, $R_2$ and X are as hereinbefore indicated, and (b) subsequently reacting said intermediate VI with a compound of the formula $R_3$-Halogen, wherein $R_3$ is as before defined, in the presence of an acid-binding agent to obtain the desired compound I.

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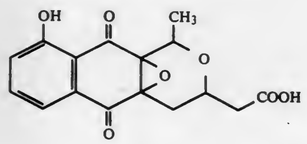
**4,296,040**

## ANTIBIOTIC NANAOMYCIN E AND A PROCESS FOR PRODUCING THE SAME

**Satoshi Omura, Tokyo; Haruo Tanaka, Machida; Itaru Takahashi, Kumamoto; Shinzo Ishii; Kazuyuki Mineura, both of Nagaizumi; Kunikatsu Shirahata, Machida, and Masaji Kasai, Fujisawa, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha and Kitasato Kenkyusho, both of Tokyo, Japan**

**Continuation of Ser. No. 17,314, Mar. 5, 1979, abandoned. This application Nov. 23, 1970, Ser. No. 97,001**
**Claims priority, application Japan, Mar. 7, 1978, 53-25041**
**Int. Cl.³ C07D *311/78***
**U.S. Cl. 260—345.2** **1 Claim**

1. A compound represented by the formula:



said compound having the following specific rotation $[\alpha]_D^{20} = +89.0°$ (c=0.95 in methanol).

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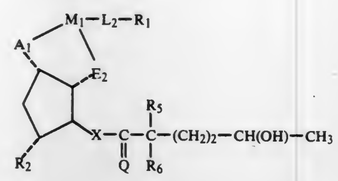
**4,296,041**

## 19-HYDROXY-7A-HOMO-PGI$_2$ COMPOUNDS

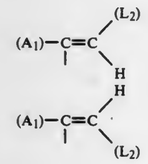
**John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508.**
**This application Mar. 3, 1980, Ser. No. 126,481**
**Int. Cl.³ C07D *311/94***
**U.S. Cl. 260—345.2** **7 Claims**

1. A prostacyclin-type compound of the formula



wherein $A_1$ is —O— (oxo) and $E_2$ is $—CH_2CH_2—$;
wherein $L_2$ is
(1) $—(CH_2)_j—$, wherein j is one to 4, inclusive,
(2) $—(CH_2)_q—CF_2—$, wherein q is one, 2, or 3, or
(3) —CH=CH—;
wherein $M_1$ is



wherein Q is oxo, $\alpha$-H:$\beta$-H, $\alpha$-OH:$\beta$-$R_4$, or $\alpha$-$R_4$:$\beta$-OH,
wherein $R_4$ is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein $R_1$ is
(1) $—COOR_3$,
(2) $—CH_2OH$,
(3) $—CH_2N(R_7)(R_8)$,
(4) $—CO—N(R_7)(R_8)$,
(5) $—CO—NH—SO_2—R_{15}$, or
(6) tetrazolyl,
wherein $R_3$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;
(g) $—(Ph)—CO—CH_3$,
(h) $—(p\text{-}Ph)—NH—CO—(p\text{-}Ph)—NH—CO—CH_3$,
(i) $—(p\text{-}Ph)—NH—CO—(p\text{-}Ph)$,
(j) $—(p\text{-}Ph)—NH—CO—CH_3$,
(k) $—(p\text{-}Ph)—NH—CO—NH_2$,
(l) $—(p\text{-}Ph)—CH=N—NH—CO—NH_2$,
(m) $\beta$-naphthyl,
(n) $—CH_2—CO—R_{16}$,
wherein —(Ph)— is inter-phenylene and —(p-Ph) is inter-para-phenylene or para-phenyl;
wherein $R_{16}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_7$ and $R_8$ are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein $R_{15}$ is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or



phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of 2 to 4 carbon atoms, inclusive,
wherein $R_2$ is hydrogen, hydroxyl, or hydroxymethyl,
wherein $R_5$ and $R_6$ are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of $R_5$ and $R_6$ is fluoro only when the other is hydrogen or fluoro, and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $—CH_2CH_2—$.

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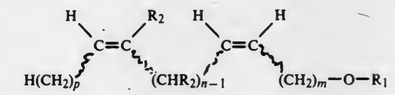
**4,296,042**

## PREPARATION OF UNSATURATED ALIPHATIC INSECT PHEROMONES USING CYCLIC PHOSPHONIUM YLIDS

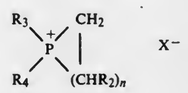
**Joseph M. Muchowski, Sunnyvale, and Michael C. Venuti, San Francisco, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

**Filed Jun. 18, 1980, Ser. No. 160,711**
**Int. Cl.³ C07D *309/06*; C07C *41/18*; C07F *7/04***
**U.S. Cl. 260—345.9 R** **14 Claims**

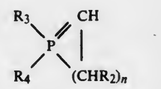
1. A process for the preparation of a compound of the formula:



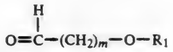
wherein
m is an integer from 1 to 11,
n is an integer from 1 to 9,
p is an integer from 1 to 6,
$R_1$ is selected from the group consisting of tetrahydropyranyl, benzyl, trimethylsilyl, t-butyldimethylsilyl and triphenylmethyl;
which process comprises:
(a) contacting a cyclic phosphonium halide of the formula:



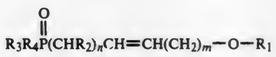
wherein
n is as set forth above,
$R_2$ is selected from the group consisting of hydrogen, and straight and branched chain lower alkyl groups,
$R_3$ and $R_4$ are independently selected from the group consisting of phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl, and halo substituted phenyl; and
X is a halogen selected from the group consisting of chlorine, bromine, and iodine;
with an alkali metal alkoxide to produce a ylid of the formula:



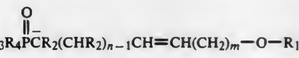
wherein n, $R_2$, $R_3$ and $R_4$ are as set forth above;
(b) treating said ylid with a protected hydroxy alkyl aldehyde of the formula



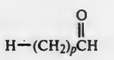
wherein $R_1$ and m are as set forth above, to produce a phosphine oxide of the formula:



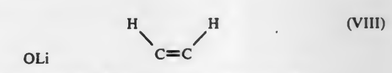
wherein m, n, $R_1$, $R_2$, $R_3$ and $R_4$ are as set forth above;
(c) contacting said phosphine oxide with an organo lithium compound in an aprotic solvent medium to produce a lithium salt of the formula:



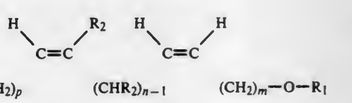
wherein m, n, $R_1$, $R_2$, $R_3$, and $R_4$ are as set forth above;
(d) treating said lithium salt with an aldehyde of the formula:



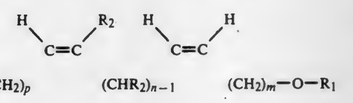
wherein p is as set forth above to produce an alcoholate of the formula:



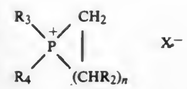
wherein m, n, p, $R_1$, $R_2$, $R_3$ and $R_4$ are as set forth above; and
(e) heating said alcoholate in an aprotic solvent medium to produce a diene of the formula:



wherein m, n, p, $R_1$, and $R_2$ are as set forth above.
2. A process for the preparation of a compound of the formula:

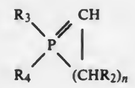


wherein
m is an integer from 1 to 11,
n is an integer from 1 to 9,
p is an integer from 1 to 6,
$R_1$ is selected from the group consisting of tetrahydropyranyl, benzyl, trimethylsilyl, t-butyldimethylsilyl and triphenylmethyl;
which process comprises:
(a) contacting a cyclic phosphonium halide of the formula:



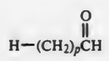
(I)

wherein
n is as set forth above,
$R_2$ is selected from the group consisting of hydrogen, and straight and branched chain lower alkyl groups,
$R_3$ and $R_4$ are independently selected from the group consisting of phenyl, lower alkyl-substituted phenyl, lower alkoxy-substituted phenyl, and halo substituted phenyl; and
X is a halogen selected from the group consisting of chlorine, bromine, and iodine;
with an alkali metal alkoxide to produce an ylid of the formula:



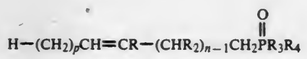
(II)

wherein n, $R_2$, $R_3$ and $R_4$ are as set forth above;
(b) treating said ylid with an aldehyde of the formula



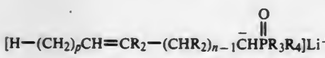
(VII)

wherein p is as set forth above, to produce a phosphine oxide of the formula:



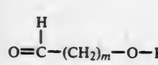
(XII)

wherein n, p, $R_2$, $R_3$ and $R_4$ are as set forth above;
(c) contacting said phosphine oxide with an organo lithium compound in an aprotic solvent medium to produce a lithium salt of the formula:



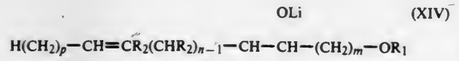
(XIII)

wherein n, p, $R_2$, $R_3$, and $R_4$ are as set forth above;
(d) treating said lithium salt with a protected hydroxy aldehyde of the formula:



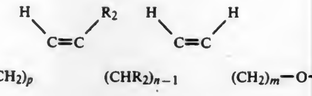
(III)

wherein m and $R_1$ are set forth above to produce an alcoholate of the formula:



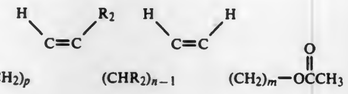
(XIV)

wherein m, n, p, $R_1$, $R_2$, $R_3$ and $R_4$ are as set forth above; and
(e) heating said alcoholate in an aprotic solvent medium to produce a diene of the formula:



(IX)

wherein m, n, p, $R_1$, and $R_2$ are as set forth above.
3. The process of claim 1 or 2 further including the step of converting said diene to its corresponding acetate.



(XI)

7. The process according to claim 1 or 2 wherein Compound IX is produced by replacement of Step (e) by treatment with a water solution in a dipolar aprotic solvent medium and treatment with an alkali or alkaline earth metal hydride.

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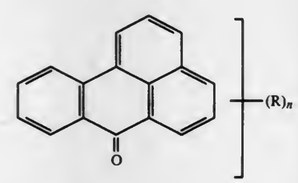
**4,296,043**

## PROCESS FOR THE PREPARATION OF BENZANTHRONES

**Josef Schroeder, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

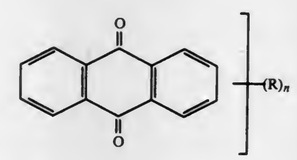
**Filed May 17, 1979, Ser. No. 39,790**
**Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823160**
**Int. Cl.³ C07C *50/22***
**U.S. Cl. 260—352** **8 Claims**

1. Process for the preparation of benzanthrone of the formula



(I)

in which
R designates alkyl or halogen and
n represents 0, 1, 2 or 3,
which comprises contacting an anthraquinone of the formula



(II)

in which
R and n have the meaning indicated above, with acrolein or a compound from which acrolein is formed under the reaction conditions, in the presence of phosphorus or a phosphorus compound having a reducing action, in relatively highly concentrated sulphuric acid at elevated temperature, and working up the reaction mixture to give the benzanthrone of the formula (I).



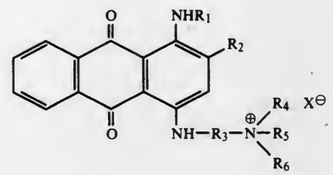
**4,296,044**

## PROCESS FOR THE PREPARATION OF CATIONIC ANTHRAQUINONE DYESTUFFS

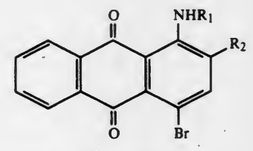
**Karl H. Duchardt, and Günter Gehrke, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 31, 1980, Ser. No. 117,170**
**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906132**
**Int. Cl.³ C07C *97/25***
**U.S. Cl. 260—381** **9 Claims**

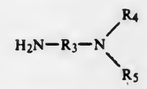
1. In the preparation of cationic anthraquinone dyestuffs of the formula



wherein
$R_1$ denotes hydrogen, alkyl or cycloalkyl,
$R_2$ denotes hydrogen, alkyl or bromine,
$R_3$ denotes alkylene,
$R_4$ and $R_5$ denote alkyl, aryl or aralkyl,
$R_6$ denotes alkyl or aralkyl and
$X^{\ominus}$ denotes an anion,
by reacting a 4-bromoanthraquinone of the formula



with amines of the formula



in the presence of proton acceptors and copper salts as a catalyst, and subsequently quaternising the product with compounds of the formula

$R_6$—X

without intermediate isolation, the improvement which comprises carrying out the reaction of the 4-bromoanthraquinone with the amine in a solvent mixture consisting of 50–90% of one or more aprotic, non-polar or slightly polar solvents and 10–50% of one or more protic or aprotic, polar solvents, and in the presence of a base which does not precipitate the catalyst so as to trap the acid formed during the reaction.

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**4,296,045**

## PROCESS FOR THE PREPARATION OF POLY-(-N-ALKYLIMINOALANES)

**Salvatore Cucinella; Alessandro Mazzei, both of San Donato Milanese, and Giovanni Dozzi, Milan, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy**

**Continuation of Ser. No. 601,209, Aug. 1, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,228**
**Claims priority, application Italy, Aug. 2, 1974, 25941 A/74; Jun. 24, 1975, 24706 A/75**
**Int. Cl.³ C07F *5/06***
**U.S. Cl. 260—448 R** **10 Claims**

1. In a process of preparing a poly-(-N-alkyliminoalane) having the composition $(HAlNR)_n$, wherein R represents a member of the group consisting of aliphatic, cycloaliphatic, aromatic and alkylaromatic radicals, and n is a number in the range of 3 to 50, the process comprising reacting metallic aluminum with a primary amine having the formula $H_2NR$, wherein R has the significance given above, in the presence of hydrogen at a pressure in the range of from 1 to 1000 kg/cm² and at least a stoichiometric quantity of said aluminum with respect to the amine, at a temperature in the range of from room temperature to the dissociation temperature of the end product, and in the presence of an initiator composition, the improvement which comprises said initiator composition being present in an amount less than about 5 mole percent with respect to said amine, said initiator composition being selected from the group of initiators consisting of alkaline or earth-alkaline metals and hydrides of aluminum and alkaline or earth-alkaline metals, poly-(-N-alkyliminoalanes) and alkyl aluminum derivatives.

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**4,296,046**

## PROCESS FOR THE MANUFACTURE OF ACRYLONITRILE

**Robert A. Innes, Monroeville, and William L. Kehl, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 972,933, Dec. 26, 1978, Pat. No. 4,222,899. This application Mar. 31, 1980, Ser. No. 135,523**
**Int. Cl.³ C07C *120/14***
**U.S. Cl. 260—465.3** **10 Claims**

1. A process for preparing acrylonitrile which comprises reacting propylene, ammonia and a gas containing molecular oxygen in contact with a catalyst wherein the atomic ratios of the components thereof are defined by the following empirical formula:

$$USb_aX_bY_cO_d,$$

wherein X is an element from Group IV B of the Periodic Table; Y is at least one element selected from the group consisting of molybdenum and vanadium; a is a number falling within the range of about 1.35 to about 2.75; b is a number falling within the range of about 0.25 to about 1.65; and c is a number falling within the range of about 0.05 to about 0.25; d is a number falling within the range of about 8 to about 12; and the sum of a+b is a number falling within the range of about 2.5 to about 3.80 at a temperature in the range of about 375° to about 525° C. and a pressure of about 0 to about 100 pounds per square inch gauge for at least about 0.01 second.

**4,296,047**

## CONTINUOUS PREPARATION OF PHOSPHORIC ACID ALKYL ESTER DICHLORIDES

**Karl-Julius Schmidt; Friedrich Schmidt, both of Wuppertal; Peter Siegle, Cologne, all of Fed. Rep. of Germany, and Gert Hansen, Sao Paulo, Brazil, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

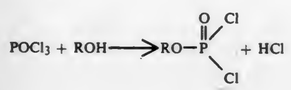
**Filed Mar. 12, 1980, Ser. No. 129,852**

**Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911700**

**Int. Cl.³ C07F *9/14***

**U.S. Cl. 260—974** **7 Claims**

1. In the preparation of a phosphoric acid alkyl ester dichloride by reacting phosphorus oxychloride with an aliphatic alcohol according to the equation



in which

R represents $C_1$–$C_5$-alkyl,

the improvement which comprises carrying out the reaction continuously at a temperature of about 10° to 50° C. using an excess of phosphorus oxychloride of about 5 to 400%.

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**4,296,048**

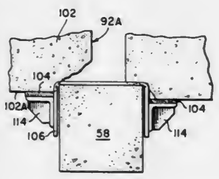
## SUPPORT BRACKET FOR DISTRIBUTION PANEL FOR COOLING TOWERS AND THE LIKE

**William J. Sim, 4068 Arjay Cir., Ellicott City, Md. 21043, and Ronald M. Marth, 5409 Lucy Dr., Waldorf, Md. 20601**

**Filed Apr. 1, 1980, Ser. No. 136,390**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—111** **19 Claims**




1. A support bracket for supporting a first beam on a second beam wherein relative movement of one beam with respect to the other beam may cause deterioration of a beam end, comprising a U-shaped strap passed over the underlying beam in inverted supported position thereon and proximate the supported beam, said strap having a supportive angle member with a flange portion being in operative supportive contact with the underside of said supported beam, the supportive engagement permitting a degree of relative movement of one said beam with respect to the other said beam.

16. A hyperbolic cross flow water cooling tower comprising an outer shell open at the top interior, a cooling ring base on said shell, a cool water basin therebelow, said cooling ring including a plurality of radially disposed superposed bent panels having upper beams thereon, a plurality of drip and water dispersing means formed as panels and supported from and suspended from at least some said bent panels, a precast concrete water distribution basin having a base comprised of curvilinear segments of double T-beams adjacently placed, with the bottoms of said T-beams supportedly resting on the said upper beam of the upper ones of said superposed bent panels, said bent panels and beams thereof being of precast concrete, said curvilinear segments having spaced ends supportedly in contact with the upper surface of said upper beam of said upper bent panel, the precast materials and environmental use causing relative movement between said T-beam bottoms and said upper beam, resulting in a wearing away of the ends of said T-beams, and a T-beam supportive bracket including an angle member having a horizontal and a vertical leg, inverted U-shaped straps placed over said said upper beam supporting said T-beams on each opposite side of said angle member, said vertical leg of said angle member being fixedly attached to depending legs of said strap, and integrated therewith, said horizontal leg of said angle member being operatively supportively disposed beneath said spaced ends and serving to permit relative movement of the precast members while limiting abrasive deterioration thereof.

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**4,296,049**

## DISTRIBUTOR FOR WASHING FLUID IN A SCRUBBER OR STRIPPER

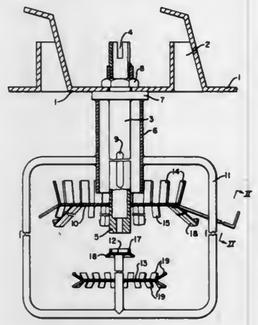
**Horst Ritter, Essen, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany**

**Filed Apr. 11, 1980, Ser. No. 139,504**

**Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916462**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—111** **8 Claims**



1. Apparatus to distribute a downward flow of washing fluid in a scrubber or a stripper for treating a countercurrent gaseous or vaporous stream, said apparatus including the combination of a plurality of distributing trays each having an aperture for the upward flow of said stream, said aperture terminating at an elevation above the level of washing fluid contained by the tray thereof, a spigot extending above a tray and having a liquid receiving opening between the tray and the aperture thereabove, each spigot extending downwardly from a tray and including a liquid discharge nozzle at a lower end thereof and at least one fluid discharge opening thereabove, means for securing said spigot to a tray, a casing surrounding each spigot in a concentrically-spaced relation, and two fluid distributing members, one disposed underneath said nozzle of a spigot and the other member disposed between the nozzle and said fluid discharge opening on a portion of the spigot to project beyond said casing.

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**4,296,050**

## PACKING ELEMENT FOR AN EXCHANGE COLUMN

**Werner Meier, Elgg, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland**

**Filed Oct. 26, 1977, Ser. No. 845,784**

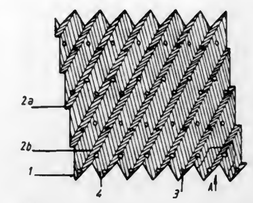
**Claims priority, application Switzerland, May 12, 1977, 5948/77**

**Int. Cl.³ B01F *3/04***

**U.S. Cl. 261—112** **11 Claims**

1. A packing element for an exchange column comprising a plurality of corrugated plates of foil-like material disposed in parallel relation, each said plate having corrugations disposed at an angle and in criss-crossing relation to the corrugations of an adjacent plate, each said plate having a plurality of apertures distributed therein, and each said corrugation of each plate having a laterally extending fine fluting therein whereby said apertures and said fine fluting effect a uniform distribution of a downwardly flowing liquid under capillary action.



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**4,296,051**

## METHOD OF PRODUCING GRANULAR SODIUM DICHLOROISOCYANURATE

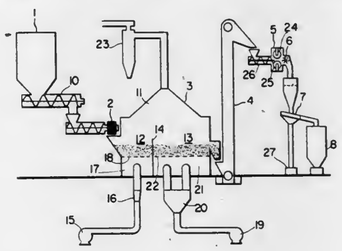
**Tadao Shimamura, and Tadayoshi Kojima, both of Tokushima, Japan, assignors to Shikoku Kasei Kogyo Co., Ltd., Marugame, Japan**

**Filed Oct. 22, 1979, Ser. No. 87,160**

**Claims priority, application Japan, Oct. 23, 1978, 53-130724**

**Int. Cl.³ B02C *4/00***

**U.S. Cl. 264—118** **10 Claims**




1. A method of producing granular sodium dichloroisocyanurate comprising the steps of extruding wet sodium dichloroisocyanurate having a moisture content of about 15–30% through a screen with a plurality of openings to form columnar pellets, passing said pellets through a fluidized bed heating chamber to dry said pellets until they contain substantially no free water, compacting said dried pellets to increase their bulk density, crushing said compacted pellets, and screening the crushed pellets to obtain the granular sodium dichloroisocyanurate product.

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**4,296,052**

## METHOD OF FABRICATING HELIUM-TIGHT TUBESHEET FOR HOLLOW FIBER TYPE BATTERY CELLS

**Joginder N. Anand, Clayton; Timothy T. Revak, Concord, and Floris Y. Tsang, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 12,637, Feb. 16, 1979, Pat. No. 4,219,613. This application Feb. 14, 1980, Ser. No. 121,357**

**Int. Cl.³ H05B *1/00***

**U.S. Cl. 264—25** **6 Claims**

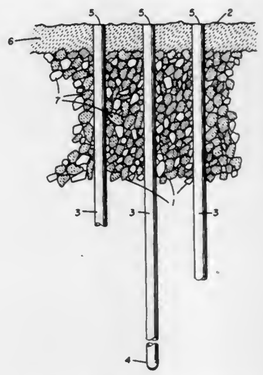
1. A process for making a helium-tight, tubesheet/hollow fiber assembly comprising a ceramic tubesheet which has first and second generally opposed faces and is pierced by a plurality of inorganic hollow fibers having closed-ended sections extending from said first face and open ends terminating in or beyond said second face,

the portion of said tubesheet subjacent to and defining said second face being non-porous and sealingly engaged with the fibers,

the remainder of the tubesheet being contiguous with said portion but not itself sealingly engaged with the fibers, and consisting essentially of sintered, ceramic particles having the same chemical composition as said portion;

said process comprising:

(a) providing a self-supporting, sintered, ceramic particle mass which has two generally opposed surfaces and is pierced by and adhered to said fibers, the closed-ended sections of which extend from one of said surfaces and the open ends of which terminate in or beyond said other surface,




the particles constituting said mass consisting of a material which

(1) has a coefficient of thermal expansion not differing from the coefficient for the fiber material by more than $20\times10^{-7}$ per °C.,

(2) is fusible, at a temperature below the softening point of the fibers, to a melt capable of bonding with them, and

(3) has a sufficiently low thermal conductivity so that the portion of said mass subjacent to and defining said other surface can be locally heated to said temperature and melted without causing the rest of said mass to lose its sintered, particulate structure,

(b) so heating to said temperature said portion of said mass, and

(c) cooling the so-heated mass to solidify the resulting layer of molten ceramic,

thereby forming said helium-tight assembly.

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**4,296,053**

## METHOD OF MAKING FOAMED PLASTISOL INSOLES FOR SHOES

**Daniel M. Doerer, Chesterfield, and Lloyd E. Brunkhorst, Florissant, both of Mo., assignors to Brown Group, Inc., St. Louis, Mo.**

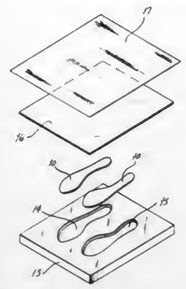
**Filed May 24, 1979, Ser. No. 42,197**

**Int. Cl.³ B29D *27/04***

**U.S. Cl. 264—26** **8 Claims**

1. A process for molding insoles for footwear comprising: forming a mold cavity having a predetermined shape and surface texture; metering and depositing a foamable liquid vinyl material into the mold cavity; freely floating a stabilizing ply on the liquid vinyl material in the mold cavity; closing the mold cavity with a pressure applying head; placing gas release means between the foamable liquid vinyl material in the cavity and the head to release gaseous media and to prevent adhesion of the vinyl material to the head; applying a high frequency reversing AC field for agitating the foamable liquid vinyl

material into fusing and expanding to fill the mold cavity; and providing a reservoir for air and gas passing through the release means such that the mold cavity is vented during the agitating of the foamable liquid vinyl material.



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**4,296,054**

## METHOD FOR PRODUCTION OF POLYURETHANE CUSHION MATERIAL

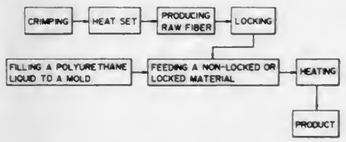
**Sadaaki Takagi, 39, Mikage-cho, Okazaki-shi, Aichi-ken, Japan**

**Division of Ser. No. 893,277, Apr. 5, 1978, abandoned, which is a continuation of Ser. No. 742,568, Nov. 17, 1976, abandoned. This application Dec. 31, 1979, Ser. No. 108,556**

**Claims priority, application Japan, Nov. 18, 1975, 50-138520**

**Int. Cl.³ B29D** *27/04*

**U.S. Cl. 264—45.3** **9 Claims**




1. A method for production of a polyurethane cushion material comprising crimping a strand of large denier of a fiber filament by twisting the strand in a single twist and then further twisting it in the same direction to yield a double-twisted strand, setting it while double-twisted by wet heating, loosening the double-twisted, heat-set strand, and cutting it into staple lengths, and opening the cut staple lengths to form a three-oriented, crimped fiber filament, filling a mold with a mass of staple fiber thus formed together with polyurethane foam-forming components, foaming the polyurethane components, and post-curing the foam to complete polycondensation.

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**4,296,055**

## METHOD OF INJECTION MOLDING THERMOPLASTIC RESINOUS PRODUCTS SUBSTANTIALLY FREE FROM SINK MARKS, SWIRLS AND RELATED BLEMISHES

**Wilford D. Harris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 839,055, Oct. 3, 1977, abandoned, which is a continuation of Ser. No. 679,638, Apr. 22, 1976, abandoned. This application Feb. 7, 1979, Ser. No. 10,188**

**Int. Cl.³ B29D** *27/00*

**U.S. Cl. 264—45.5** **5 Claims**

1. In a method for the injection molding of synthetic resinous thermoplastic injection moldable compositions, the method comprising providing a heat-plastified synthetic resinous composition, injecting the heat-plastified composition into a mold cavity to fill the cavity, the mold cavity having walls below the thermoplastic temperature of the composition, cooling the composition within the mold configuration until it is at least self-supporting and removing the compositions from the mold, the improvement which comprises modifying said heat-plastified resinous composition by incorporating within the composition and in intimate admixture therewith a volatile fluid foaming agent, a particulate thermally decomposable blowing agent, the foaming agent being present in quantity sufficient to provide cell formation in the molded part and sufficient to compensate for shrinkage during cooling, a finely divided nucleating or cell inducing agent and providing a gas under pressure within the mold cavity sufficient to prevent foaming of the composition until the cavity is filled with the resinous composition, injecting said modified heat-plastified composition into said cavity, under said gas pressurized conditions which prevent foaming of the composition until the cavity is filled with the resinous composition whereby a molding substantially free from sink marks, swirls and related blemishes is obtained.

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**4,296,056**

## METHOD FOR PREPARING A FILTER MEDIUM

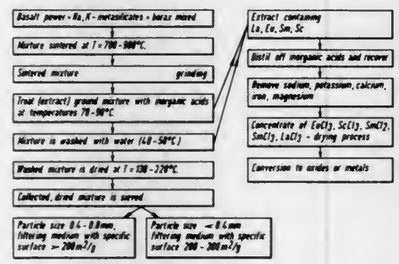
**Alois J. Bumbalek, Hanover-Kleefeld, Fed. Rep. of Germany, assignor to Hermann Wegener Schiffgraben, Fed. Rep. of Germany**

**Filed Mar. 26, 1979, Ser. No. 23,832**

**Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817176**

**Int. Cl.³ B29H** *7/20*

**U.S. Cl. 264—49** **8 Claims**




1. A method for making a particulate filtering medium which comprises

(a) admixing a powder having a particle size not exceeding 70 microns, selected from the group consisting of basalt and lava, with borax and a metasilicate selected from the group consisting of sodium metasilicate and potassium metasilicate,

(b) sintering the mixture at a temperature between 700° and 900° C.,

(c) grinding the sintered product,

(d) treating the ground product with an inorganic acid,

(e) washing the acid-treated product with water, to increase the specific surface area thereof and

(f) drying the washed product to produce a particulate filter medium having a specific surface area in excess of 200 $m^2/g$.

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**4,296,057**

## METHOD OF MAKING ALUMINA FIBERS

**William C. Ziegenhain, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.**

**Division of Ser. No. 142,587, Apr. 21, 1980. This application Sep. 2, 1980, Ser. No. 182,878**

**Int. Cl.³ C04B** *35/64*

**U.S. Cl. 264—63** **3 Claims**

1. A method for preparing alumina fibers comprising

(a) reacting aluminum alkoxides containing from 2 to about 30 carbon atoms with methanol at a temperature of from about 130° F. to about 450° F. to form solid aluminum methoxide and alcohols.

(b) recovering solid aluminum methoxide from the reaction mixture of (a), washing with methanol to remove higher alcohols, then

(c) reacting the aluminum methoxide with aqueous HCl containing from about 5 to about 15% by weight hydrochloric acid at relux temperature of the solution for a time sufficient to convert substantially all aluminum methoxide to aluminum chlorohydrate in aqueous solution with methanol, then

(d) concentrating the aluminum chlorohydrate solution by removing methanol and sufficient water to a viscosity suitable for drawing fibers, then

(e) drawing fibers from the concentrated solution.

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**4,296,058**

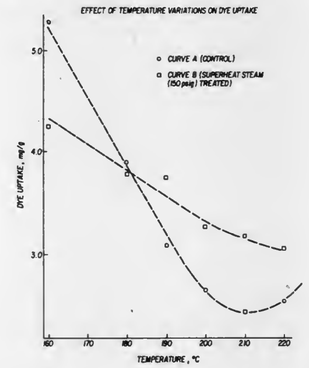
## PROCESS FOR ENHANCING THE UNIFORMITY OF DYE UPTAKE OF FALSE TWIST TEXTURIZED POLYETHYLENE TEREPHTHALATE FIBROUS MATERIALS

**John C. Chen, North Plainfield, and Herbert L. Davis, Convent Station, both of N.J., assignors to Celanese Corporation, New York, N.Y.**

**Filed Oct. 23, 1978, Ser. No. 953,662**

**Int. Cl.³ D01F** *1/04*

**U.S. Cl. 264—78** **18 Claims**




1. In a process for providing a dyed, false twist texturized fibrous material comprising at least 85 mole percent polyethylene terephthalate which is subject to variations in dye uptake induced by a false twist texturizing treatment conducted on said fibrous material prior to or concurrently with a dyeing process, the improvement which comprises enhancing the uniformity of dye uptake of said fibrous material by:

(a) providing a fibrous material comprising at least 85 mole percent polyethylene terephthalate having a birefringence of at least 0.1 prior to said false twist texturizing treatment; and,

(b) annealing said fibrous material of (a) at a temperature of about 120° to about 160° C. while controlling the length thereof in a manner sufficient to prevent a longitudinal shrinkage greater than about 10% and a longitudinal extension greater than about 5% based on the original length of the fibrous material prior to annealing, for a period of about 0.01 to about 1 second.

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**4,296,059**

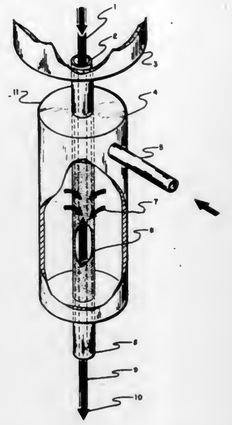
## PRESSURE SEALING PROCESS

**Francesco DeMaria, Gulf Breeze, Fla., assignor to American Cyanamid Company, Stamford, Conn.**

**Continuation-in-part of Ser. No. 938,203, Aug. 30, 1978, abandoned. This application Jul. 20, 1979, Ser. No. 59,928**

**Int. Cl.³ B29H** *21/04*

**U.S. Cl. 264—130** **3 Claims**



1. A process for transferring a moving fiber tow bundle from a high pressure zone to a low pressure zone which comprises:

(a) passing said fiber tow bundle through a passageway contained in a sealing zone which provides liquid water under pressure thereto, said sealing zone being located between said high pressure zone and said low pressure zone, said passageway being confined and elongated and having a continuous longitudinal surface adapted to receive a coating of liquid water under pressure thereon by diffusion therethrough of liquid water under pressure from said sealing zone, and said passing being conducted while said coating of liquid water is continuously diffused onto said passageway surface so that said water coating and said fiber tow bundle cooperate to produce an effective pressure seal within the length and confines of said passageway and said water coating prevents contact of said fiber tow bundle with said passageway surface; and

(b) receiving said fiber tow bundle in said low pressure zone.

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**4,296,060**

## METHOD OF PRODUCING A PULTRUDED, FIBER REINFORCED ROD

**Charles W. Killmeyer, deceased, late of Braddock Hills, Pa.; by Elizabeth A. Killmeyer, administrator, Pittsburgh, Pa.; James E. Lane, Henrietta, N.C.; Leslie L. Taylor, Jr., Forest City, N.C., and Joe T. Pearson, Lawndale, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

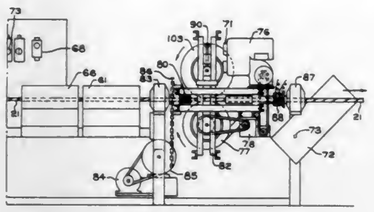
**Division of Ser. No. 101,990, Dec. 7, 1979. This application Jul. 7, 1980, Ser. No. 166,522**

**Int. Cl.³ B29D** *1/00*

**U.S. Cl. 264—137** **7 Claims**

1. An improved method of producing a pultruded, fiber reinforced, resinous rod comprising coating glass fiber continuous strands with resin, pulling the resin-coated continuous glass fiber strands through a shaping zone to provide a rod structure having at least one protrusion on the surface containing resin-coated continuous glass fiber strands, at least partially curing the resin-coated continuous glass fiber strands, passing the at least partially-cured rod through a second zone, rotating the at least partially-cured rod in said second zone relative to said first zone to form a solid rod in which at least a portion of

the continuous glass fiber strands follow the contour of at least one protrusion of the rod through the two zones and completely curing the rod; wherein the improvement comprises pulling the rod by rotating opposed surfaces against the rod



surface to move the rod through said second zone and simultaneously moving the opposed surface around the axis of the rod continuously to impart twist thereto as the surfaces are exerting pulling forces on the rod.

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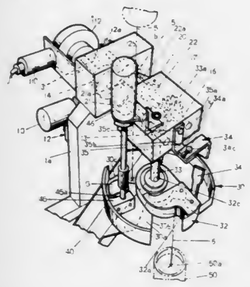
**4,296,061**

## THERMOPLASTIC GOB FEEDING AND TRANSFER METHOD AND APPARATUS

**James W. Buckingham, Pemberville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Mar. 19, 1980, Ser. No. 131,712**
**Int. Cl.³ B29B *5/06***
**U.S. Cl. 264—138** **9 Claims**



2. The method of feeding successive free falling gobs of heated thermoplastic material to successive molding cavities, comprising the steps of:

(1) intercepting the free fall of each gob with a continuously horizontally moving transfer surface:

(2) moving each gob solely by the movement of the transfer surface to a position horizontally spaced from its free fall path, and

(3) deflecting each successive gob from the moving transfer surface into a molding cavity positioned below the transfer surface.

5. A gob feeding mechanism for converting a continuously extruded rod-like formation of heated thermoplastic material into a series of identical weight gobs and delivering the gobs respectively to molding members, comprising, in combination, shearing means periodically contacting the thermoplastic formation to shear freely falling gobs therefrom, a transfer plate mounted beneath the shear members, means mounting said transfer plate for continuous horizontal movement intersecting the free fall path of the gobs so that a portion of the transfer plate will periodically receive a falling gob thereon, a plurality of molding members each having an open top molding cavity, means for moving said molding members successively beneath the path of movement of said transfer plate and in timed relationship to the movement thereof, and means for deflecting each gob on said transfer plate to fall into the open top molding cavity of a molding member passing beneath the transfer plate.

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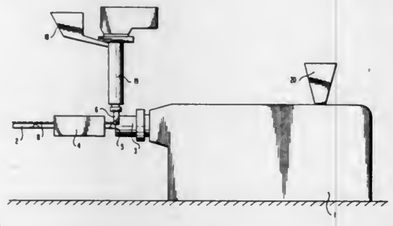
**4,296,062**

## PROCESS FOR THE EXTRUSION OF COATED SKEIN-SHAPED PROFILES, PREFERABLY OF THERMOPLASTIC SYNTHETIC RESINS

**Peter Gauchel, Alzenbach, and Waldemar Wissinger, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany**

**Division of Ser. No. 399,982, Sep. 24, 1973, Pat. No. 4,204,821. This application Jul. 26, 1978, Ser. No. 927,985**
**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246679**
**Int. Cl.³ B29F *3/10***
**U.S. Cl. 264—173** **12 Claims**



1. A continuous process for the extrusion and sizing of an elongated multi-surfaced profile member for use as a structural component in the building industry having at least one hollow chamber formed therein, which comprises extruding a hard polyvinyl chloride to form an elongated multi-surfaced profile member having at least one hollow chamber formed therein, extruding a homopolymer or a copolymer of methyl methacrylate simultaneously and continuously with the extrusion of the elongated profile member to provide a continuous coating of the homopolymer or copolymer onto at least one partial circumferential portion of said member while said member is still within the plastic temperature range to provide a partially coated member having an exposed circumferential portion that is formed of said hard polyvinyl chloride and subsequently immediately after extrusion sizing the resulting partially coated member to provide the final precise profile configuration to said partially coated member.

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**4,296,063**

## METHOD OF PRODUCING BRACKET AND GEAR BOX OF ELECTRIC MOTOR WITH GEAR BOX AND METAL MOLD USED WITH THE SAME

**Masaaki Sendo, and Kinzo Suzuki, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 12, 1979, Ser. No. 75,209**
**Int. Cl.³ B29F *1/10***
**U.S. Cl. 264—273** **10 Claims**

1. A method for producing an integral unit including a metal bracket having attached thereto a gear box formed of synthetic resinous material, said unit being of the type to be used in an electric motor, said method comprising:

providing a plate metal bracket;

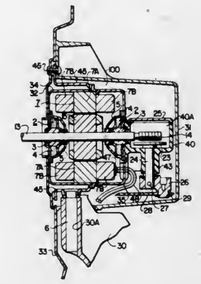
providing a composite metal mold including a stationary mold member, a first movable mold member and a second movable mold member;

moving said first and second movable mold members relative to each other and to said stationary mold member to a mold open position providing an open space between said first movable mold member and said second movable mold member;



positioning said plate metal bracket on one of said movable mold members within said open space;

moving said first movable mold member in a first direction toward said stationary mold member while guiding said first movable mold member along a first guide means extending in said first direction, and moving said second movable mold member, in a second direction inclined to said first direction, toward both said first movable mold member and said stationary mold member while guiding said second movable mold member along a second guide means extending in said second direction and along a third guide means extending transverse to said first direction, to



thereby move said movable mold members to a mold closed position closing said open space and providing predetermined spacings between said plate metal bracket and said mold members;

introducing synthetic resinous material into said predetermined spacings, and thereby forming a gear box integrally connected to said plate metal bracket as a unit;

moving said movable mold members in directions opposite to said first and second directions to said mold open position; and

removing said integral unit of said gear box and said plate metal bracket from said mold.

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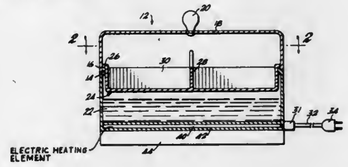
**4,296,064**

## METHOD AND STRUCTURE FOR RECYCLING SOAP CHIPS

**Angel T. Satcher, 164 NE. 82 Ter., Miami, Fla. 33138**

**Filed Jul. 3, 1980, Ser. No. 165,604**
**Int. Cl.³ B29C *1/00***
**U.S. Cl. 264—322** **1 Claim**




1. A method of recycling soap chips wherein a container is utilized which comprises, an inwardly offset upper rim, the container including a floor, a space between the floor and the rim adapted to receive a charge of water therein, electrical heating means adjacent the container floor for heating the water in the container space, and separate rack including two septums perpendicular to one another, dividing the rack into four compartments; the rack compatibly mating with and suspended by the offset upper rim a predetermined distance above the water, the method comprising:

gathering chips of soap;

placing chips of soap into each of the compartments;

activating electrical heating means for heating water in container space;

melting the soap chips;

deactivating the heating means;

cooling the rack;

removing the rack from the container; and turning the rack over, emptying formed soap bars.

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**4,296,065**

## METHOD OF PRODUCING HIGHLY DENSIFIED CERAMIC ARTICLES

**Takashi Ishii, Tokyo; Katsutoshi Nishida, Yokohama; Michiyasu Komatsu, Yokohama, and Akihiko Tsuge, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan**

**Filed May 13, 1976, Ser. No. 685,980**
**Claims priority, application Japan, May 14, 1975, 50-55954**
**Int. Cl.³ C04B *35/58***
**U.S. Cl. 264—325** **3 Claims**

1. A method of producing ceramic articles of complicated shape having a density substantially equal to the theoretical density, said articles having a surface roughness Rmax of from 3μ to 7μ and substantially no deformed portion, which method comprises:

forming a preliminary molding by injection molding a powdered ceramic material selected from the group consisting of carbides, oxides and nitrides of W, Zr, Si, Al, Ta, Nb, B, V, Hf, Mo, Cr and mixtures thereof, said preliminary molding having a porosity of 30 to 70% with a uniform pore distrubition;

heating said preliminary molding at a temperature of from 1550° C. to 1900° C. to obtain a preliminarily sintered molding of a porosity below 30 percent;

embedding said preliminarily sintered molding in a pressure transmitting powder which is nonreactive and nonfusible under the conditions of the subsequent sintering; and

applying pressure to the pressure transmitting powder at a sintering temperature so as to compress uniformly the preliminarily sintered molding and remove the pores present in the molding.

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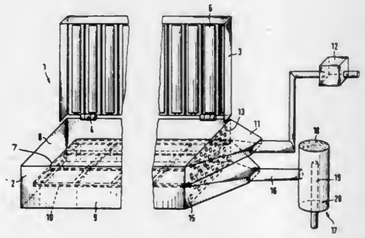
**4,296,066**

## MULTICHAMBER PHOTOREACTOR

**Günther Schenck, Bismarckstrasse 31, 4330 Mülheim-Ruhr, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 923,710, Jul. 11, 1978, Pat. No. 4,255,383. This application Jan. 28, 1980, Ser. No. 115,657**
**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904242**
**Int. Cl.³ A61L *2/10, 2/16, 2/24***
**U.S. Cl. 422—24** **49 Claims**



19. A process for purifying a fluid medium with a predetermined minimum radiation dose of ultraviolet radiation wherein, at a given location, a number n, less than four, of series connected flow paths to be passed consecutively by said medium are provided in juxtaposition to each other and the incident ultraviolet radiation is first introduced into one of said

paths and permitted to escape from said path into other of said paths, in which process the relationship between the irradiation intensities effective in each one of said flow paths and the total rate of flow of the medium through all said flow paths is established so that the sum of the fractional doses applied to the medium being passed through each one of said series connected flow paths equals said predetermined minimum radiation dose applied to the medium when it has passed consecutively through all said flow paths, said process being characterized by:

two of the flow paths provided in juxtaposition to each other having a depth ratio in the range of about 0.34 to about 0.47, said depth ratio being defined by the depth of the smaller one of said two flow paths divided by the sum of the depths of said two flow paths, and

the relationship between the irradiation intensity, the character of the medium and the sum of the depths of the medium in said two flow paths being established so that the total radiation absorbed by the medium in both said two flow paths does not exceed 90 percent of the incident radiation.

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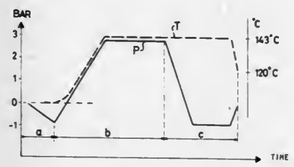
**4,296,067**

## METHOD OF STERILIZING MATERIAL, ESPECIALLY BANDAGE AND SURGICAL INSTRUMENTS, IN AN AUTOCLAVE OPERATING WITH VACUUM AND STEAM

**John O. Näsman, Rapphönsvägen 15,, 122 39 Enskede, and Carl-Erik Högfeldt, Tideliusgatan 56, 116 69 Stockholm, both of Sweden**

**Filed Jan. 30, 1980, Ser. No. 116,843**
**Claims priority, application Sweden, Jan. 30, 1979, 7900813**
**Int. Cl.³ A61L *2/06***
**U.S. Cl. 422—26** **3 Claims**



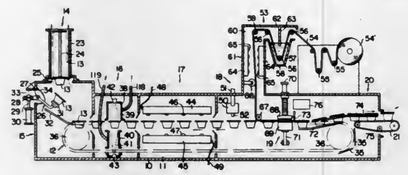

1. A method of sterilizing material in an autoclave operating with vacuum and steam, consisting of the steps in sequence of creating vacuum in the autoclave chamber by connecting a vacuum source thereto until a predetermined pre-vacuum has been obtained, supplying steam to the autoclave chamber so that the pressure and the temperature rise to desired values during the sterilization period, interrupting the steam supply and creating an after-vacuum in the autoclave chamber, characterized in that during substantially the entire after-vacuum period the sterilization temperature prevailing in the autoclave chamber at the beginning of the after-vacuum period is maintained substantially constant by supplying dry heat in the chamber from a separate dry heat source and at the termination of the after-vacuum period, and as the vacuum is permitted to terminate, lowering the temperature slightly.

**4,296,068**

## APPARATUS FOR STERILIZING A SUCCESSION OF FOOD CONTAINERS OR THE LIKE

**Masaru Hoshino, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 15, 1980, Ser. No. 121,730**
**Claims priority, application Japan, Feb. 19, 1979, 54-17987; Jul. 31, 1979, 54-105847[U]; Aug. 8, 1979, 54-101036; Sep. 21, 1979, 54-121675**
**Int. Cl.³ B08B *3/12, 7/04***
**U.S. Cl. 422—62** **26 Claims**



21. A sterilizing apparatus for sterilizing successive articles being fed along a predetermined path, comprising:

means for feeding the articles along the predetermined path at least in one row;

means defining two opposed sterilizing chambers on the opposite sides of the predetermined path;

means for supplying a sterilized liquid as a fine spray into the sterilizing chambers, whereby the successive articles traveling between the sterilizing chambers are sterilized;

means for heating the sterilizing chambers and the supplying means;

a light source for emitting a beam of light across at least one of the two opposing sterilizing chambers;

means for receiving the light beam and generating electrical output representative of the density of the droplets of the sterilizing liquid in the sterilizing chambers;

integrator means for integrating the output from the receiving and generating means during each of the successive prescribed period of time; and

comparative means for comparing the output from the integrator means with a predetermined reference representative of the intergral, during one of the prescribed periods of time, of the output from the receiving and generating means in the case where a desired amount of the finely sprayed sterilizing liquid is supplied into the sterilizing chamber.

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**4,296,069**

## APPARATUS FOR PROCESSING AN ANALYSIS SLIDE

**Michael R. Smith, and Anthony P. DiFulvio, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 16, 1980, Ser. No. 159,562**
**Int. Cl.³ G01N *35/04***
**U.S. Cl. 422—64** **6 Claims**

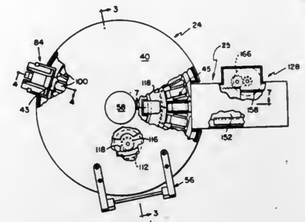
1. Apparatus for use in a chemical analyzer of the type which is adapted to measure a characteristic of a sample fluid deposited on an analysis slide, said apparatus comprising:

incubator means including a temperature-controlled chamber having a transfer location at which an analysis slide may be transferred into or out of said chamber and conveyor means for supporting a plurality of slides in said chamber and selectively moving each of the analysis slides to and from said transfer location;

means defining a read station wherein said characteristic can be measured; and

slide transfer means for moving an analysis slide along a slide path extending between said incubator means and said read station, said slide transfer means including diverter means selectively conditionable in (1) a first condition wherein an analysis slide can be freely moved by said slide transfer means along said slide path and (2) a second condition wherein an analysis a slide being moved along said slide path by said slide transfer means is diverted from said slide path.





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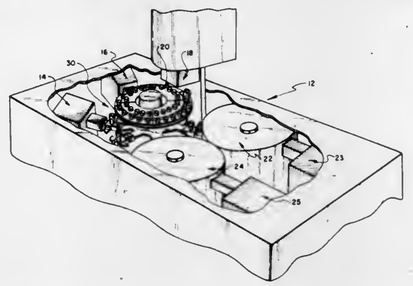
**4,296,070**

## SLIDE DISTRIBUTOR FOR A CHEMICAL ANALYZER

**Michael S. Montalto; Douglass L. Blanding, and Michael R. Smith, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 16, 1980, Ser. No. 159,564**
**Int. Cl.³ G01N *35/04***
**U.S. Cl. 422—65** **14 Claims**



1. Apparatus for use in measuring a characteristic of a sample fluid wherein the fluid is deposited on an analysis slide which is analyzed after an appropriate period of time, said apparatus comprising:

a plurality of apparatus elements, said elements being arranged in a preselected sequence along a path traveled by said slide in said apparatus, said elements including slide supply means, metering means for depositing a predetermined quantity of sample on a slide supported in a metering position, and incubator means;

slide transfer means for moving a slide from said slide supply means along said slide path and for delivering a slide to a selected one of said elements;

drive means for moving said slide transfer means through a series of slide advance cycles; and

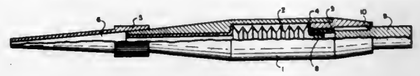
locating means engageable with said slide transfer means for precisely positioning said slide transfer means and a slide therein relative to each of said elements after each advance cycle to facilitate the processing of the slides and the transfer of slides between said elements and said transfer means.

**4,296,071**

## PIPETTE WITH ELASTIC BELLOWS

**Erich Weiss, Mannheim-Sandhofen, and Dieter Ungermann, Mannheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim, Mannheim-Waldhop, Fed. Rep. of Germany**

**Filed Nov. 14, 1979, Ser. No. 94,134**
**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851532**
**Int. Cl.³ B01L *3/02*; G01N *1/14*; A61M *1/00***
**U.S. Cl. 73—864.11** **8 Claims**



1. A pipette comprising: an elongated casing; an elastic bellows disposed in the casing with one end thereof fixed to the casing; and means mounting the other end of the bellows for longitudinal movement relative to the casing from a rest position to a predetermined compressed position and wherein the bellows is prestressed over the entire range of travel between the rest and compressed positions and has sufficient elasticity to return to the rest position unaided, the mounting means comprising stop means forming two separate stops limiting movement of the other end of the bellows wherein one stop defines the rest position and the other stop defines the compressed position.

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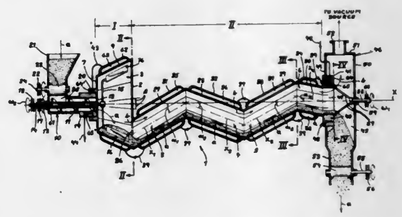
**4,296,072**

## APPARATUS FOR THE TREATMENT OF WET SOLIDS, ESPECIALLY PULPY MATERIALS, BY HEATING OR COOLING

**Istvan Takacs; Zoltan Banos; Janos Illes; Endre Vereczkey; Peter Rudolf, and György Kerey, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar, Budapest, Hungary**

**Filed Mar. 19, 1980, Ser. No. 131,825**
**Claims priority, application Hungary, Mar. 21, 1979, RI 702**
**Int. Cl.³ B01D *1/14, 9/02, 9/04, 11/00***
**U.S. Cl. 422—254** **10 Claims**



1. An apparatus for treatment of wet solids, especially pulpy organic materials comprising:

a hollow treating body rotatable about a horizontal axis;

means for feeding the material to be treated into said treating body;

means for discharging the treated material from said treating body; and

means for controlling the temperature of said treating body, said treating body comprising:

a treating drum centered on said horizontal axis and communicating thereat with said feeding means, said drum having a polygonal cross section defined by an axially flared peripheral wall formed by a plurality of planar panels, each having a pair of nonparallel opposing edges, said peripheral wall being flanked by first and second polygonal end walls of different size centered on said horizontal

axis and perpendicular thereto, said first and second end walls being connected at corresponding edges to said peripheral wall,

a first duct having a polygonal cross section communicating with said drum at a location wholly offset from said horizontal axis and having a first longitudinal axis forming an angle therewith,

a second duct having a polygonal cross section communicating with said first duct at said horizontal axis and having a secong longitudinal axis forming an angle therewith, said first and second longitudinal axes intersecting on said horizontal axis,

a third duct having a polygonal cross section communicating with said second duct at a location wholly offset from said horizontal axis and having a third longitudinal axis forming an angle therewith, and

a fourth duct having a polygonal cross section communicating with said third duct at said horizontal axis and having a fourth longitudinal axis forming an angle therewith, said third and fourth longitudinal axes intersecting at a location offset from said horizontal axis, said fourth duct having an outlet centered on said horizontal axis and communicating with the discharge means, said first, second, third and fourth ducts having substantially the same cross sectional area.

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**4,296,073**

## HIGH TEMPERATURE ATTACK OF ORES BY MEANS OF A LIQUOR ESSENTIALLY CONTAINING A SOLUBLE BICARBONATE

**Pierre Maurel; Francois Nicolas, both of Aix-en-Provence, and Bernard Bosca, Gardanne, all of France, assignors to Aluminum Pechiney, Lyons, France**

**Filed Jan. 31, 1979, Ser. No. 7,920**
**Claims priority, application France, Sep. 2, 1978, 78 04468**
**Int. Cl.³ C01G *43/00***
**U.S. Cl. 423—3** **13 Claims**

1. In a process for the oxidizing attack at high temperature of ores containing at least one metal from the group formed by uranium, vanadium and molybdenum, by means of an aqueous liquor containing sodium bicarbonate and sodium carbonate in the presence of free oxygen blown into the reaction medium, the separation of the sterile fractions and the liquor emanating from the attack containing the dissolved metal or metals, the improvement comprising treating the ore with an aqueous liquor containing a majority of sodium bicarbonate and a minority of sodium carbonate in which the ratio by weight of sodium bicarbonate ($NaHCO_3$) to sodium carbonate ($Na_2CO_3$) is at least 1.5, injecting the free oxygen into the reaction medium while in a reaction vessel to provide a pressure of oxygen in the reaction vessel of at least 5 bars and maintaining the temperature of the reaction medium between 160° C. and 300° C. for a period of at most 6 hours.

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**4,296,074**

## METHOD OF DECLADDING

**Samuel J. Yosim, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

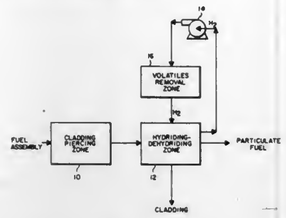
**Filed Apr. 10, 1978, Ser. No. 894,678**
**Int. Cl.³ G21C *19/34***
**U.S. Cl. 423—4** **6 Claims**

1. A method of decladding an assembly comprising an element selected from the group consisting of uranium, thorium and mixtures thereof, clad in stainless steel, zirconium or a zirconium alloy consisting essentially of zirconium and containing minor amounts of nickel, chromium, tin, iron and combinations thereof; said method comprising:

perforating the cladding material to expose the selected element;

reacting said selected element with hydrogen at a temperature of from 450° C. to 680° C. and a hydrogen pressure of from 360 to 1400 torr for a time sufficient to form a hydride of substantially all of the selected element;

increasing the temperature to a range of from about 700° C. to 900° C. to dehydride the selected element to reduce it back to its elemental form;




separating the cladding material from the selected element; and

recovering the selected element in a friable particulate readily comminutable form.

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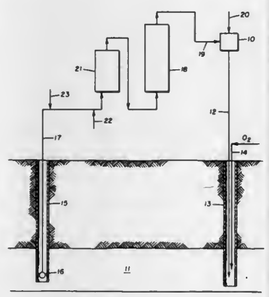
**4,296,075**

## METHOD FOR PROTECTING AN ION-EXCHANGE RESIN FROM CHEMICAL POISONING

**Tsoung-yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Nov. 24, 1978, Ser. No. 963,661**
**Int. Cl.³ C01G *43/00***
**U.S. Cl. 423—7** **7 Claims**



1. A method for protecting an ion-exchange resin used for adsorbing uranium and/or related values from a leach solution from poisoning caused by polythionates in the leach solution, the method comprising:

passing the leach solution through a catalytic material before passing the leach solution through said resin, said catalytic material converting said polythionates in the leach solution into non-poisoning thiosulfates, sulfites, and water.

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**4,296,076**

## CHROMIC OXIDE PRODUCTION

**Danvers A. Swales, and Michael A. Marshall, both of Darlington, England, assignors to British Chrome & Chemicals Ltd., Stockton-on Tees, England**

**Continuation-in-part of Ser. No. 3,333, Jan. 15, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,713**
**Int. Cl.³ C01G *37/033***
**U.S. Cl. 423—53** **18 Claims**

1. A process for the preparation of chromic oxide having a water insoluble sulphur content of below about 40 ppm, which comprises calcining a solid product feed material at a temperature ranging from above 1100° to 1600° C. for a time period of from about 10 minutes to 10 hours, said solid product containing at least 60 ppm water insoluble sulphur and from 0.1 to 50% by weight of water soluble material (based on chromic oxide), and optionally containing materials that will volatise during calcining, and selected from the group consisting of

(a) impure chromic oxide, and

(b) a heat decomposable product that will decompose during calcining to form the said solid product feed material.



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**4,296,077**

## RECOVERY OF MOLYBDENUM VALUES FROM LEACH MUDS

**Steven R. Heuer, Arvada, and Zdenka Zbranek, Littleton, both of Colo., assignors to Engelhard Min. & Chem. Corp., Iselin, N.J.**

**Filed Nov. 10, 1980, Ser. No. 205,843**
**Int. Cl.³ C01G *39/00***
**U.S. Cl. 423—53** **4 Claims**

1. In a process for the recovery of molybdenum values from molybdenite concentrates wherein the molybdenite concentrate is roasted in the presence of air to convert molybdenum sulfide to molybdenum trioxide and the resulting concentrate containing molybdenum trioxide leached with an aqueous alkaline solution whereby soluble molybdenum salts are extracted therefrom and dissolved in the leach solution and the insoluble solid leach mud separated from the leach solution, the improvement which comprises repulping the leach mud with an aqueous ammonia solution under pressure with an oxygen-containing gas, at a temperature in the range of about 50° to 150° C. for at least about 2 hours, separating residual undissolved solids from said aqueous ammonia solution, repulping said undissolved solids with an aqueous caustic leach solution at a temperature in the range of about 50° to 150° C. for at least about 2 hours, separating solid residue from said caustic leach solution, and recovering said leach solutions containing dissolved molybdenum salts.

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**4,296,078**

## SEPARATION OF HYDROGEN CHLORIDE FROM GASEOUS MIXTURES

**Cyril B. Tellis, 818 Beaumont Rd., Charleston, W. Va. 25314**

**Filed Oct. 7, 1980, Ser. No. 194,775**
**Int. Cl.³ B01D *53/34***
**U.S. Cl. 423—240** **3 Claims**

1. The method for the selective separation of hydrogen chloride from a gaseous mixture containing hydrogen chloride, carbon dioxide and other gaseous impurities which comprises contacting said gaseous mixture with a cross-linked, water-insoluble polymer of N-glycidylpiperazine at a temperature between about −10° and 100° C.

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**4,296,079**

## METHOD OF MANUFACTURING ALUMINUM SULFATE FROM FLUE GAS

**H. William Hauser, Marietta, Ga., assignor to Vinings Chemical Company, Atlanta, Ga.**

**Continuation of Ser. No. 877,038, Feb. 10, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,772**
**Int. Cl.³ C01B *17/00***
**U.S. Cl. 423—242** **9 Claims**

1. A continuous process for removing sulfur dioxide from sulfur dioxide containing flue gas which comprises:

(a) Continuously contacting an aqueous solution, at a temperature of from 40° to 70° C., containing from 1 to 15 percent by weight sodium aluminate and having a pH between 2 and 10 with a sulfur dioxide containing flue gas at a ratio of between 0.20 and 2 mols of sodium aluminate per mol of sulfur dioxide in a gas-liquid contacting device so that at least a substantial portion of the sulfur dioxide in the flue gas is absorbed into the aqueous solution where it reacts with sodium aluminate to produce sodium sulfite and aluminum hydroxy sulfite;

(b) Transporting the aqueous solution of sodium sulfite and aluminum hydroxy sulfite to a solid-liquid separator and adjusting the pH and temperature of the solution until the aluminum hydroxy sulfite forms an insoluble precipitate, which is then separated from the solution by suitable separating means; and

(c) Transporting the aluminum hydroxy sulfite precipitate to an oxidizing reactor where water is added to form a slurry which is maintained at a temperature of from 60° to 90° C. and an oxidizing agent is used to oxidize the aluminum hydroxy sulfite to aluminum sulfate which is then separated from the slurry by suitable separating means.

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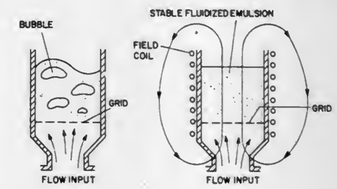
**4,296,080**

## PROCESS FOR THE REMOVAL OF PARTICULATES ENTRAINED IN A FLUID USING A MAGNETICALLY STABILIZED FLUIDIZED BED

**Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Division of Ser. No. 786,613, Apr. 11, 1977, Pat. No. 4,115,927, which is a continuation-in-part of Ser. No. 610,071, Sep. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,003, Oct. 11, 1974, abandoned. This application Aug. 21, 1978, Ser. No. 935,566**
**Int. Cl.² C01B *17/60***
**U.S. Cl. 423—244** **20 Claims**




1. A process for the removal of contaminant particulates entrained in a fluid stream containing the same, which process comprises:

(a) removing said particulates by passing said fluid stream through at least one controllably moving particulate capture bed comprising magnetizable particles within a scrubber vessel, said bed being expanded and levitated by said stream and controllably moving said bed in response to a pressure differential in said bed, wherein at least a portion of said bed is subjected to an applied magnetic field having a substantial component along the direction of said external force field at a strength such that gross solids backmixing and fluid by-passing in said bed are suppressed but less than that which impairs the fluid-like properties of the bed; and (b) removing the retained particulates from said bed, wherein the product of the magnetic moment of the particulates in said fluid and the magnetic moment of the magnetizable particles is less than about $50(emu/gr)^2$.

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**4,296,081**

## PROCESS FOR PURIFYING GASEOUS EFFLUENTS

**Michel Nomine, and Gerard Chelu, both of Verneuil-en-Halatte, France, assignors to Charbonnages de France, France**

**Filed Feb. 1, 1980, Ser. No. 117,674**
**Claims priority, application France, Feb. 8, 1979, 79 03249**
**Int. Cl.³ B01D *53/34***
**U.S. Cl. 423—245** **10 Claims**

1. A process for purifying aldehyde-containing air comprising submitting the air to the simultaneous action of small quantities of sulphurous anhydride ($SO_2$) and ammonia, followed by washing with water.

**4,296,082**

## PURIFICATION OF WET PROCESS PHOSPHORIC ACID

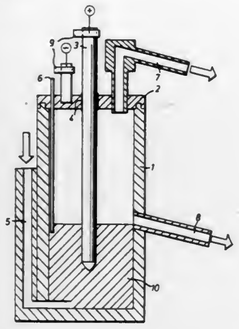
**Edward J. Lowe, Stourbridge; Michael W. Minshall, Wombourne, and Arthur Wilson, Stourbridge, all of England, assignors to Albright & Wilson Limited, Warley, England**

**Continuation-in-part of Ser. No. 899,896, Apr. 26, 1978, Pat. No. 4,215,098. This application Apr. 10, 1979, Ser. No. 28,680**

**The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.**

**Int. Cl.³ C01B *25/40, 25/16;* B01D *1/00***

**U.S. Cl. 423—305** **39 Claims**



1. A method for the production of purified phosphoric acid or phosphatic derivatives of wet process phosphoric acid which comprises heating wet process phosphoric acid in an evaporator vessel having carbon walls which are electrically conducting and which are stable to the concentrated phosphoric acid at the evaporation temperatures, to evaporate water therefrom to leave a concentrated acid by direct electrical resistance heating by passing an alternating current through said wet process acid until the concentration of said acid is at least 76% by weight $P_2O_5$, precipitating solid impurities in said concentrated acid and separating solid impurities from the purified phosphoric acid or phosphatic derivative.

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**4,296,083**

## ZEOLITE SYNTHESIS

**Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 925,015, Jul. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,901, Apr. 22, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 93,958**

**Int. Cl.³ C01B *33/28***

**U.S. Cl. 423—329** **14 Claims**

1. A method for synthesizing zeolites, said zeolites characterized by an alumina to silica mole ratio of not greater than 0.083 and a constraint index within the approximate range of 1 to 12, which comprises forming a reaction mixture containing one or more sources of alkali metal oxide, organic nitrogen-containing cations provided by an amine, hydrogen ions, an oxide of silicon, water and, optionally, an oxide of aluminum, in which the composition, in terms of mole ratios of oxides, is as follows:

$Al_2O_3/SiO_2$=0–0.083
$OH^-/SiO_2$=0
$H_2O/SiO_2$=5–200
$M/SiO_2$=0.01–5.0
$R/SiO_2$=0.01–3.0
$H^+$(additional)/$SiO_2$=0–1.0

wherein R is an organic nitrogen-containing cation source, M is an alkali metal ion, and wherein the pH of said reaction mixture is at least about 7 and maintaining the reaction mixture at a temperature and pressure for a time necessary to crystallize therefrom said zeolite.

**4,296,084**

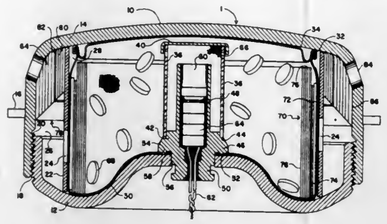
## METHOD OF AND APPARATUS FOR GAS GENERATION

**Gary V. Adams, Brigham City, and Fred E. Schneiter, Ogden, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.**

**Filed Oct. 29, 1979, Ser. No. 88,992**

**Int. Cl.³ C01B *21/02***

**U.S. Cl. 423—351** **26 Claims**



1. A method of generating clean nitrogen gas in which most of the combustion residue product has been removed comprising

a. providing a combustible composition essentially 60–80% sodium azide, 2–26% ferric oxide, 2–26% molybdenum disulfide and 0–6% sulfur,

b. placing said combustible composition in a combustion chamber having gas discharge orifices,

c. raising the temperature of said combustible composition sufficiently to ignite it, and

d. providing filtering means and cooling means between said combustible composition and said gas discharge orifices, said filtering means being selected for its compatibility with the combustion process and for its characteristic property at the combustion temperature of said composition of becoming less porous for a short interval during an early stage of the combustion function time thereby, during such interval, to increase the restrictive effect thereof and to retard the flow of combustion products out of said gas discharge orifices to allow such combustion products to be cooled by and condensed on said cooling means.

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**4,296,085**

## PROCESS FOR THE PRODUCTION OF AMMONIA AND THE CORRESPONDING SYNTHESIS GAS

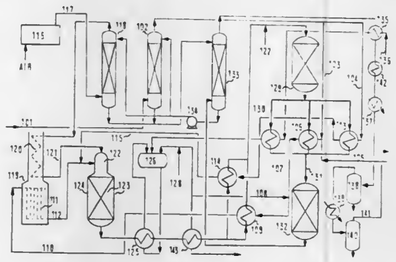
**David L. Banquy, 39 Rue St-Placide, Paris, France (75006)**

**Filed Mar. 19, 1980, Ser. No. 131,837**

**Claims priority, application France, Jan. 7, 1980, 80 00196**

**Int. Cl.³ C01B *2/02, 2/30;* C01C *1/04***

**U.S. Cl. 423—359** **9 Claims**



6. A process for producing ammonia synthesis gas from a desulfurized hydrocarbon containing feedstock available at a pressure of at least 30 bars, comprising:



(a) dividing said feedstock into two fractions, the first fraction representing 5 to 70 percent of the total feedstock,

(b) subjecting only the first fraction from (a) to a primary steam reforming reaction, by mixing said fraction with steam, and heating the mixture thereof by indirect heat exchange, in the presence of a reforming catalyst, to form a gaseous effluent including hydrogen at a temperature between 680° and 820° C.,

(c) combining the gaseous effluent from (b) with the second fraction from (a), to obtain a gas mixture at a minimum temperature of 550° C. and containing at least 5 mole percent hydrogen and at least 25 percent methane equivalent, on a dry gas basis,

(d) reacting in a single step the gas mixture from (c) with compressed air in a secondary reforming reactor operating under essentially adiabatic conditions and comprising a gas mixing zone and a reaction zone, the amount of air injected into said mixing zone being sufficient to initiate therein the partial oxidation reaction, and said reaction zone containing a single bed of catalyst or catalysts, thus producing a raw synthesis gas at a temperature between 850° and 1100° C. containing an amount of nitrogen appreciably larger than that required to convert to ammonia all the potential hydrogen contained therein, and a molal methane percentage of less than one-tenth of the percent methane equivalent contained in the gas mixture from (c),

(e) shift converting to carbon dioxide carbon monoxide contained in the gas effluent from (d), by reacting said gas effluent with steam in the presence of at least one shift conversion catalyst,

(f) removing essentially all the carbon dioxide contained in the gas effluent from (e), by scrubbing with a solvent,

(g) methanating the residual carbon oxides contained in the gas effluent from (f), by reaction with part of the hydrogen therein, in the presence of a methanation catalyst, thus producing a synthesis gas having a molal $H_2/N_2$ ratio less than 2.4,

(h) removing the excess nitrogen contained in the gas effluent from (g) by partial condensation and subsequent distillation of said gas effluent at a temperature between −175° and −190° C., thereby producing a final synthesis gas having essentially the stoichiometric composition for ammonia synthesis, and a liquid containing said excess nitrogen, all the refrigeration requirements of said removal being supplied by the expansion of at least part of said liquid to a pressure below 6 bars absolute.

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**4,296,086**

## MONITORING PROCESS AND APPARATUS

**Paul Whitehead, Binfield Heath, England, assignor to Johnson, Matthey & Co., Limited, London, England**

**Filed Dec. 10, 1979, Ser. No. 101,857**

**Claims priority, application United Kingdom, Dec. 15, 1978, 48663/78**

**Int. Cl.³ G01N *21/78;* C01B *21/06***

**U.S. Cl. 423—392** **16 Claims**

1. A process of monitoring the ammonia oxidation conversion efficiency in a nitric acid plant which comprises taking samples of the reactant mixture and of the reaction product, and measuring both the ammonia content in the sample of reactant mixture and the nitrogen oxide content in the sample of reaction product by ultraviolet spectrophotometry using ultraviolet light of wavelength 200–220 nm, the nitrogen oxide content in the sample of reaction product being measured after converting any nitric oxide in said sample to nitrogen dioxide at elevated temperature and pressure.

**4,296,087**

## METHOD FOR PRODUCING CARBON BLACK

**Robert J. Lewis, Eden Prairie, Minn., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 946,654, Oct. 2, 1978, Pat. No. 4,237,092. This application May 15, 1980, Ser. No. 150,124**

**Int. Cl.³ C01B *31/02;* C09C *1/48***

**U.S. Cl. 423—449** **13 Claims**

1. In a method for producing carbon black comprising the steps of:

contacting hot combustion gases and a carbonaceous feed in a reaction zone to thereby produce carbon black and gas;

separating said carbon black from said gas; and

utilizing at least a part of the thus separated gas as a recycle gas to supply at least a part of said hot combustion gases;

the improvement comprising the step of:

maintaining the ratio of the volume of said hot combustion gases to the volume of said carbonaceous feed substantially constant at a desired temperature for said hot combustion gases.

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**4,296,088**

## HEAT EXCHANGE TECHNIQUES FOR THE CATALYTIC OXIDATION OF GASEOUS SULFUR COMPOUNDS TO SULFUR TRIOXIDE

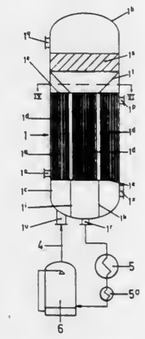
**Adolf Staüffer, Pulheim, Fed. Rep. of Germany, assignor to International Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Continuation of Ser. No. 888,597, Mar. 20, 1978, abandoned. This application Nov. 20, 1979, Ser. No. 96,127**

**Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711897**

**Int. Cl.³ C01B *17/76, 17/80***

**U.S. Cl. 423—533** **13 Claims**



1. In a process for the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide comprising passing said gaseous sulfur compounds through a plurality of serially connected spatially separate zones, each zone being either a catalytic reaction zone which, optionally is in contact with a heat exchange medium or, an uncatalyzed heat exchange zone, and there being at least one catalytic zone in indirect contact with the heat exchange medium and one said heat exchange zone, the improvement which comprises using a liquid heat exchange medium and for each of said catalytic reaction zones which is in contact with said heat exchange medium and for said spatially separate heat exchange zones, the heat exchange is accomplished by circulating said liquid heat exchange medium in indirect heat exchange relationship therewith and with a heat consumer or heat source; the circulation rate being high enough and the amount of the medium being such that the liquid heat exchange medium exchanges heat in said heat exchange zones, said heat exchanged catalytic reaction zones and said heat consumer or source and has a temperature differential of no more than 5 centigrade degrees throughout the circula-

tion path of said heat exchange medium, thereby controlling the temperature of said heat exchange zones; said liquid heat exchange medium remaining liquid throughout the circulation thereof.

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**4,296,089**

## INORGANIC FIBERS

**Alois Aignesberger, Trostberg, Fed. Rep. of Germany; Walter Lukas, Innsbruck, Austria, and Ekkehard Weinberg, Trostberg, Fed. Rep. of Germany, assignors to Suddeutsche Kalkstickstoff-Werke, Trostberg, Fed. Rep. of Germany**

**Division of Ser. No. 792,081, Apr. 28, 1977. This application Feb. 28, 1979, Ser. No. 16,054**

**Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621611**

**Int. Cl.**[3] **C01F** *11/46;* **C04B** *11/00*

**U.S. Cl. 423—555** **8 Claims**

1. Method for the preparation of calcium sulfate dihydrate fibers or their dehydration products having a ratio of average length to diameter of more than 100:1 and a length of at least 0.2 mm, which method comprises

reacting a dilute aqueous solution of at least one calcium salt at elevated temperature with a dilute aqueous solution of the stoichiometric amount of a water-soluble sulfate at pH values between 8 and 13,

the reaction mixture obtained to stand until the desired fiber length is achieved, and

separating the fibers formed from the solution after achieving the desired length.

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**4,296,090**

## ANTI-D TEST AND REAGENT

**Henry A. Graham, Jr.; David J. Olekna, both of Annandale; Johnna B. Hawk, Rocky Hill, and Diane M. Barrett, Somerville, all of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.**

**Continuation-in-part of Ser. No. 57,481, Jul. 13, 1979, abandoned. This application Oct. 5, 1979, Ser. No. 82,199**

**Int. Cl.**[3] **G01N** *33/80*

**U.S. Cl. 424—11** **14 Claims**

1. A method for rapidly determining the presence or absence of D antigen on the red blood cells of a given individual which comprises the steps of:

(a) obtaining a sample of red blood cells to be tested;

(b) adding to and mixing with said sample an antibody reagent to form a mixture; and

(c) without incubation observing said mixture to determine whether agglutination does or does not occur;

wherein said antibody reagent comprises reduced and S-alkylated anti-D IgG which has an average titer of at least 32 for Dce cells in the slide test or rapid tube test.

7. A method for preparing an antibody reagent useful for rapidly determining the presence or absence of D antigen on red blood cells, which antibody reagent has an average titer of at least 32 for Dce cells in the slide test or the rapid tube test, which comprises the steps of:

(a) obtaining a substantially lipid-free anti-D human antiserum;

(b) adjusting the pH of said antiserum to about 8.6 by addition of an effective buffering amount of a compatible buffer;

(c) reducing said buffered antiserum with a reducing agent;

(d) S-alkylating said reduced buffered antiserum with an S-alkylating agent;

(e) dialyzing said S-alkylated reduced antiserum at a pH between 7.5 and 8.3; and

(f) adjusting the total protein concentration to about 6–10% by weight by addition of a nonspecific protein.

**4,296,091**

## NOVEL SYNERGISTIC INSECTICIDES

**Robert Joly, Montmorency; Charles Pavan, Nogent-sur-Marn, and Pierre R. Carle, Rognonas, all of France, assignors to Roussel Uclaf, Paris, France**

**Filed Mar. 10, 1980, Ser. No. 128,461**

**Claims priority, application France, Mar. 16, 1979, 79 06712**

**Int. Cl.**[3] **A01N** *25/00, 37/00, 37/08, 25/06*

**U.S. Cl. 424—18** **17 Claims**

1. An insecticidal composition comprising as the active ingredient an insecticidally effective amount of a synergistic mixture of 80 to 70% by weight of (S) 1-oxo-2-allyl-3-methyl-cyclopent-2-en-4-yl d trans chrysanthemate and 20 to 30% by weight of (R) 1-oxo-2-allyl-3-methyl-cyclopent-2-en-4-yl d trans chrysanthemate.

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**4,296,092**

## MUCOLYTIC BENZENE AND THIOPHENE-CARBOTHIOIC ACID 2-AMINOALKYL ESTER ACID SALTS

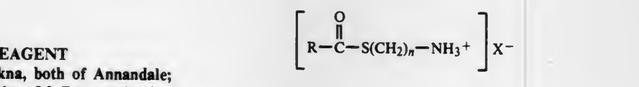
**Harry R. Munson, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.**

**Continuation-in-part of Ser. No. 932,747, Aug. 10, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,761**

**Int. Cl.**[3] **A61K** *9/00, 31/38, 31/265*

**U.S. Cl. 424—43** **18 Claims**

1. A method of combatting mucus build-up in an animal body for the purpose of alleviating lung congestion in an animal suffering therefrom which comprises administering to said animal an effective amount of a compound having the formula:



wherein;

R is 2-thiophene, benzene and benzene substituted by one to 3 radicals which may be the same or different, selected from halogen, lower-alkyl, lower-alkoxy, carboxy, trifluoromethyl;

$X^-$ is a chlorine or bromine radical, and

n is 2 or 3.

18. 2-thiophenecarbothioic acid, 2-aminoethyl ester monohydrochloride.

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**4,296,093**

## CYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

**David G. Rowsell, Staines; John M. Gascoyne, Southall, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, England**

**Division of Ser. No. 351,356, Apr. 16, 1973, abandoned. This application Feb. 4, 1980, Ser. No. 118,205**

**Int. Cl.**[3] **A61K** *9/68, 31/16*

**U.S. Cl. 424—45** **12 Claims**

1. In a manufactured consumer product for application to or consumption by the human body and being:

(a) a personal care product comprising a topically or orally administrable base medium containing a flavourant, colourant, perfume, surface active agent or antiseptic agent;

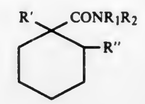
(b) an ingestible preparation comprising an edible or potable base containing a flavourant or colourant.

(c) a pharmaceutical preparation comprising a topically or orally administrable pharmaceutically acceptable carrier and an active pharmaceutical ingredient; or

(d) a tobacco containing consumer product, said consumer product also containing an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body when brought into contact therewith by application or consumption of the said product, the



improvement which comprises using as said cold receptor stimulating ingredient an effective amount of a cyclic carboxamide of the formula



wherein

R′ is $C_1$–$C_5$ alkyl and R″ is hydrogen or $C_1$–$C_5$ alkyl, with the proviso that R′ and R″ together provide a total of from 1–8 carbon atoms; and

$R_1$ and $R_2$ are each hydrogen, $C_1$–$C_5$ alkyl or $C_1$–$C_8$ hydroxyalkyl and together provide a total of 0 to 8 carbon atoms, with the proviso that when $R_1$ is H then $R_2$ may also be alkylcarboxyalkyl of up to 6 carbon atoms.

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**4,296,094**

## DENTAL CLEANING COMPOSITION AND METHOD

**Yoshio Matsushima; Teruhiko Kumura; Isamu Kawamura, all of Takamatsu, and Terushige Kawata, Tokushima, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan**

**Filed Jun. 2, 1980, Ser. No. 155,165**

**Int. Cl.**[3] **A61K** *7/16, 7/18*

**U.S. Cl. 424—49** **12 Claims**

1. A dental cleaning composition comprising about 0.01 to about 30% by weight, based on the composition, of a hydrotalcite compound of the following formula

$$Mg_{1-x}Al_x(OH)_{2+x-ny}A_y^{n-}.mH_2O$$

wherein

$A^{n-}$ represents an anion having a valence of n,

x is a positive number represented by $O<x<0.5$,

y is a positive number represented by $O<y\leqq 0.5$, and

m is a positive number represented by $O<m<2$, and at least one dentally acceptable carrier or diluent selected from the group consisting of polishing agents, moisture-retaining agents, binders, and foaming agents.

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**4,296,095**

## DENTAL AND MOUTH CARE PREPARATIONS

**Udo Hoppe, Hamburg; Gerhard Sauermann, Wiemersdorf; Julius Curts, Hamburg, all of Fed. Rep. of Germany; Per-Olof Glantz, Lund, Sweden; Bo Krasse, Askim, Sweden; Kare Larsson, Hovas, Sweden; Börje Noren, Upsala, Sweden; Göran Odham, Södra Sandby, Sweden, and Jan Olsson, Hovas, Sweden, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany**

**Filed Sep. 20, 1978, Ser. No. 944,195**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742411**

**Int. Cl.**[3] **C07C** *101/24;* **A61K** *7/22*

**U.S. Cl. 424—52** **10 Claims**

1. A method for preventing the formation of dental plaque and tartar on teeth comprising applying to said teeth an effective amount of a composition comprising from 0.1 to 20% by weight, based on the total weight of the composition, of a compound of the formula

$$H_2N.CH_2(CH_2)_3.CH(NH_2).COOR.X_n$$

wherein R is selected from the group consisting of straight chain alkyl, branched chain alkyl and alkenyl all having 14 to 18 carbon atoms, X is a group which renders said compound a salt and n has a value of 0, 1 or 2, and a carrier suitable for application to said teeth, and the inside of the mouth.

**4,296,096**

## HIGH VISCOSITY DENTIFRICE

**Robert C. Pierce, Plainsboro, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.**

**Continuation-in-part of Ser. No. 54,779, Jul. 5, 1979, abandoned. This application Mar. 25, 1980, Ser. No. 133,706**

**Int. Cl.**[3] **A61K** *7/16, 7/18*

**U.S. Cl. 424—52** **9 Claims**

1. A dentifrice toothpaste or gel having a viscosity of about 50,000 to 420,000 cps (measured at 10 rpm with #7 spindle on Brookfield Viscometer Model RBF at 22° C.), said viscosity being sufficiently high so that said dentifrice is not liquid and runny and not so high that it is difficult to extrude from a dentifrice containing a normally water-insoluble dentally acceptable polishing agent, up to about 89.5% by weight of water and requiring added humectant and gelling agents, said dentifrice containing, as its sole essential humectant and gelling agent, a water-absorbent anionic polyelectrolyte polymer which provides and imparts both gelling and humectant characteristics to said dentifrice, said anionic polyelectrolyte polymer consisting essentially of a polyacrylic acid ionically complexed with a polyvalent metal cation selected from the group consisting of aluminum, zirconium, iron and zinc at a pH between 2.0 and 8.5 which pH is below the pH of reversibility of the ionic complex of said polyvalent cation and said water absorbent anionic polyelectrolyte, said ionically complexed polyelectrolyte polymer having a particle size such that at least about 90% of the particles are larger than 2 microns, each of said particles having a linkage density at the particle surface greater than the linkage density in the particle interior, the linkages at the particle surface comprising at least in part ionic complexing of said anionic polyelectrolyte polymer by said polyvalent metal cations, said anionic polyelectrolyte polymer being provided in said dentifrice in an amount of about 0.5–20% by weight, said dentifrice containing a humectant and gelling agent selected from the group consisting of: (a) said anionic polyelectrolyte polymer as the sole humectant and gelling agent; (b) said anionic polyelectrolyte polymer as the sole gelling agent and up to about 20% by weight of an additional humectant; (c) said anionic polyelectrolyte polymer as the sole humectant and up to about half the amount of said anionic polyelectrolyte polymer of an additional gelling agent; and (d) said anionic polyelectrolyte polymer with up to about 20% by weight of an additional humectant and up to about half the amount of said anionic polyelectrolyte polymer of an additional gelling agent; wherein said additional humectant and said additional gelling agent provide rheological modifications in the character of said dentifrice.

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**4,296,097**

## SUPPRESSION OF REAGINIC ANTIBODIES TO DRUGS EMPLOYING POLYVINYL ALCOHOL AS CARRIER THEREFOR

**Weng Y. Lee, 99 Silver Ridge Rise NW., Calgary, Alberta, Canada (T3B 4P6), and Alec Sehon, 695 Academy Rd., Winnipeg, Manitoba, Canada (R3N 0E8)**

**Filed Feb. 27, 1979, Ser. No. 15,864**

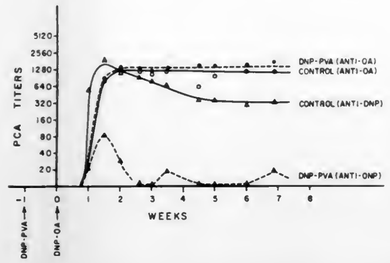
**Int. Cl.**[3] **A61K** *31/74, 31/43*

**U.S. Cl. 424—78** **9 Claims**

1. A process for the suppression of the formation of anti-BPO (benzylpenicilloyl) antibodies in a person sensitive to penicillin which comprises administering to said person a suppressing effective amount of a conjugate that is prepared by the reaction of penicillin with an amino derivative of water-soluble, nonimmunogenic polyvinylalcohol polymers, said reaction being carried out in the presence of a suitable salt and at an alkaline pH.

9. A process for the suppression of IgE antibodies which are responsible for allergies to a wide spectrum of drugs which comprises administering a suppressing effective amount of a

conjugate that is prepared by the reaction of the potentially allergenic drug with an amino derivative of water-soluble,




nonimmunogenic polyvinylalcohol polymers in the presence of a suitable salt and at an alkaline pH.

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**4,296,098**

**COMPOSITIONS AND METHODS FOR THE TREATMENT OF ATHLETE'S FOOT**

**Masataro Sato, 2-chome, No. 28-26 Fukuokamachi, Takamasatu City, Japan**

**Continuation of Ser. No. 882,790, Mar. 2, 1978, abandoned, which is a division of Ser. No. 759,492, Jan. 14, 1977, Pat. No. 4,108,984. This application May 31, 1979, Ser. No. 44,305**

**The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.**

**Int. Cl.**[2] **A61K** *37/48*

**U.S. Cl. 424—94** **1 Claim**

1. A composition for the treatment of wet athlete's foot, comprising a dry mixture of finely powdered montmorillonite and pyroligneous acid in a weight ratio of about 4:1, and a small quantity of papain enzyme present in an amount of about 1/5000 by weight of the mixture.

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**4,296,099**

**PROCESS FOR EXTRACTING EMBRYONIC CALF SKIN AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME**

**Claudine Berrebi, and Georges Manoussos, both of Paris, France, assignors to L'Oreal, Paris, France**

**Continuation of Ser. No. 746,018, Nov. 30, 1976, abandoned. This application May 13, 1980, Ser. No. 149,561**

**Int. Cl.**[2] **A61K** *35/48, 7/42*

**U.S. Cl. 424—105** **10 Claims**

1. A process for preparing an embryonic calf skin extract having improved cicatrisive activity from calf skin taken between the second month of gestation and birth comprising the steps of (i) grinding said embryonic calf skin, (ii) extracting the resulting ground embryonic calf skin in an aqueous medium at a pH of 4 obtained by the addition thereto of an organic acid selected from the group consisting of acetic acid, citric acid, trichloroacetic acid, succinic acid, ascorbic acid and lactic acid, the ratio of calf skin, kg/liter of said aqueous extraction medium being between 1:1 to 1:4 and at a temperature between 60° C. and 75° C. for 15 hours, (iii) separating the resulting extract from the insolubles, and (iv) lyophilizing the said separated extract.

2. An extract of embryonic calf skin having improved cicatrisive activity obtained in accordance with the process of claim 1.

**4,296,100**

**METHOD OF TREATING THE HEART FOR MYOCARDIAL INFARCTION**

**Wayne P. Franco, 79 Two Stone Dr., Wethersfield, Conn. 06109**

**Filed Jun. 30, 1980, Ser. No. 164,074**

**Int. Cl.**[3] **A61K** *35/55*

**U.S. Cl. 424—108** **13 Claims**

1. A method of treating an area in the heart of a patient subjected to ischemic heart disease, to maintain viability in that area for a sustained time period to salvage said area,

said method comprising applying an effective dose of FGF to the heart.

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**4,296,101**

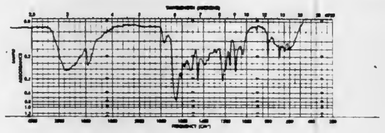
**ANTIBIOTIC KRISTENIN**

**Frank L. Weisenborn, Titusville; William E. Brown, Princeton, and Edward Meyers, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Feb. 13, 1978, Ser. No. 877,199**

**Int. Cl.**[3] **A61K** *35/00;* **C12P** *13/00, 1/04;* **C12R** *1/125*

**U.S. Cl. 424—119** **4 Claims**



1. The antibiotic kristenin having the infrared spectrum in KBr 3350, 2950, 1660, 1620, 1525, 1455, 1225, 1160, 1110, 805 and 690 $cm^{-1}$ shown in the FIGURE, the ultraviolet spectrum in methanol λmax 210 nm (27100), 247 nm (6090), 314 nm (4200), $[\alpha]_D^{methanol} - 81.9°$, and the approximate elemental analysis C, 56.58, H, 6.90, and N, 9.92.

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**4,296,102**

**METHOD OF COMBATING AMEBIASIS IN HUMANS**

**Felipe Laso, Montecito 59, Mexico City, Mexico**

**Filed Jun. 12, 1980, Ser. No. 158,649**

**Int. Cl.**[3] **A61K** *33/40, 33/22, 33/20*

**U.S. Cl. 424—130** **4 Claims**

1. The method of combating amebiasis in a human suffering from amebiasis, comprising orally administering to said human, an amount effective to combat said amebiasis, of a perborate stabilized aqueous solution of chlorine oxides formed by adding to 1000 cc of water the following:

80–120 grams sodium chlorite

90–130 grams sodium hypochlorite (13% aqueous solution)

5–7.5 cc of 37.7% hydrochloric acid

2–4.5 cc of 98.15% sulfuric acid

4–12 grams of an inorganic perborate selected from the group consisting of sodium perborate and potassium perborate, and

8–15 grams of sodium peroxide or an equivalent amount of potassium peroxide, hydrogen peroxide, potassium percarbonate, or sodium percarbonate.

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**4,296,103**

**STABILIZED SOLUTION OF CHLORINE OXIDES**

**Felipe Laso, Montecito 59, Mexico City DF, Mexico**

**Filed Aug. 8, 1980, Ser. No. 176,278**

**Int. Cl.**[3] **A61K** *33/40, 33/22, 33/20, 33/02*

**U.S. Cl. 424—130** **7 Claims**

1. A stabilized orally administrable aqueous therapeutic solution of chlorine oxides containing boron prepared by the addition to 1000 parts by weight of water the following:

80–120 parts by weight of sodium chlorite;

90–130 parts by weight of a 13% aqueous solution of sodium hypochlorite;



5–10 cc of 37.7% hydrochloric acid;

2–4.5 cc of 98.15% sulfuric acid;

4–15 parts by weight of an inorganic perborate selected from sodium perborate or potassium perborate; and

8–15 parts by weight of sodium peroxide.

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**4,296,104**

**THERAPEUTIC DIMETHYL SULFOXIDE COMPOSITION AND METHODS OF USE**

**Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607**

**Filed Aug. 30, 1979, Ser. No. 71,072**

**Int. Cl.**[3] **A61K** *31/10, 31/17, 33/14*

**U.S. Cl. 424—153** **8 Claims**

1. In a method for administrating dimethyl sulfoxide to a host, the improvement comprising reducing the side effects of malodorous breath and skin reactions normally associated with such dimethyl sulfoxide administration, comprising the step of:

administrating to said host a composition comprising dimethyl sulfoxide and a side-effect reducing agent taken from the group consisting of urea, or ethanol or mixtures thereof in an amount which is effective for said purpose.

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**4,296,105**

**DERIVATIVES OF DOXORUBICINE, THEIR PREPARATION AND USE**

**Roger M. Baurain, Kraainem, and Andre B. L. Trouet, Winksele, both of Belgium, assignors to Institut International de Pathologie Cellulaire et Moleculaire, Brussels, Belgium**

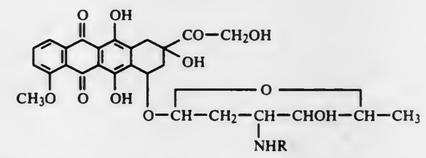
**Filed Jul. 5, 1979, Ser. No. 55,291**

**Claims priority, application Belgium, Aug. 3, 1978, 869485**

**Int. Cl.**[3] **A61K** *31/71;* **C07H** *15/24*

**U.S. Cl. 424—180** **7 Claims**

1. Derivatives of doxorubicine selected from the group consisting of a compound of the formula



wherein R is D—, L— and DL-leucyl and the acid addition salts thereof.

5. A veterinary composition, which contains an antitumoral effective amount of N-leucyl-doxorubicine or an acid addition salt thereof together with one or more compatible and pharmaceutically acceptable diluents or additives.

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**4,296,106**

**ISTAMYCINS AND PRODUCTION THEREOF**

**Hamao Umezawa; Yoshiro Okami, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan**

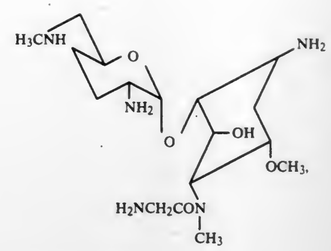
**Filed Apr. 18, 1980, Ser. No. 141,492**

**Claims priority, application Japan, May 1, 1979, 54/52517; Sep. 17, 1979, 54/117912**

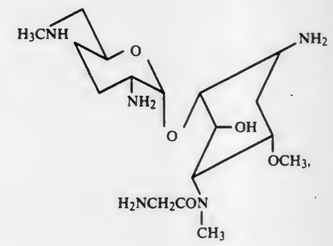
**Int. Cl.**[3] **A61K** *31/71;* **C07H** *15/22*

**U.S. Cl. 424—181** **7 Claims**

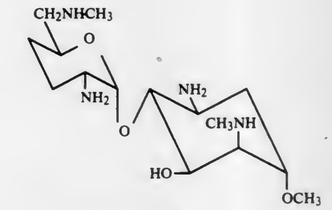
1. The new compound, istamycin, which is selected from istamycin A of the formula



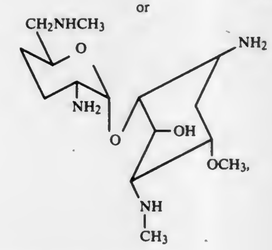
istamycin B of the formula



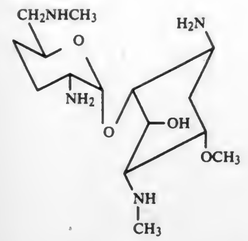
istamycin $A_o$ of the formula



or



and istamycin $B_o$ of the formula



and mixtures thereof, or a nontoxic pharmaceutically acceptable acid-addition salt thereof.

7. A method for inhibiting bacterial growth in an animal susceptible to said bacterial growth which comprises administering to said animal an antibacterially effective amount of at least one of istamycin A, istamycin B and nontoxic pharmaceutically acceptable acid-addition salts thereof.

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**4,296,107**

## MILDIOMYCIN ANALOGS AND A METHOD OF PRODUCTION

**Takashi Suzuki, Takatsuki; Hidekazu Sawada, Neyagawa, and Kazuyoshi Katamoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

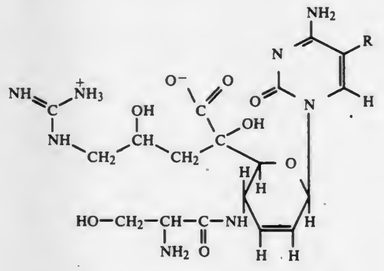
**Filed Aug. 19, 1980, Ser. No. 179,555**

**Claims priority, application Japan, Aug. 24, 1979, 54-108330**

**Int. Cl.³ A61K** *31/70;* **C07H** *17/00*

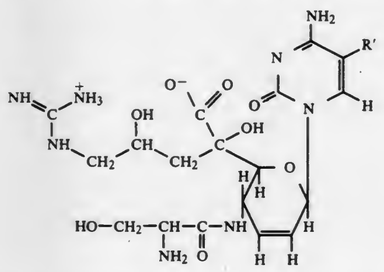
**U.S. Cl. 424—180** **10 Claims**

1. A compound of the formula:

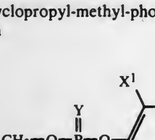


wherein R is hydrogen, a halogen atom or a lower alkyl group, or an acid salt thereof.

8. A process for producing a compound of the formula:

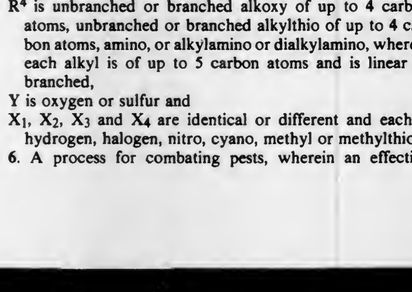


wherein R′ is hydrogen, a halogen atom, a lower alkyl group or a hydroxymethyl group, or an acid salt thereof, which comprises cultivating a mildiomycin-microorganism belonging to the genus Streptoverticillium in a culture medium containing a compound of the formula:



wherein R′ has the same meaning as above, or an acid salt thereof to have said compound elaborated and accumulated in the culture broth.

10. A plant fungicidal and acaricidal composition which comprises a fungicidally or acaricidally effective amount of a compound of the formula



wherein R is hydrogen, a halogen atom or a lower alkyl group, or an acid salt thereof and a carrier therefor.

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**4,296,108**

## 2,2-DICHLOROCYCLOPROPYL-METHYL-PHOSPHORIC ACID DERIVATIVES

**Rainer Bürstinghaus, Weinheim-Lützelsachsen; Karl Kiehs, Lampertheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

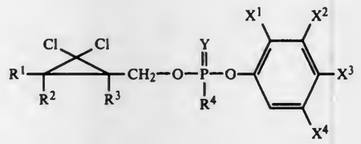
**Filed Jul. 7, 1980, Ser. No. 166,573**

**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934229**

**Int. Cl.³ C07F** *9/09, 9/165;* **C01N** *57/04*

**U.S. Cl. 424—210** **6 Claims**

1. 2,2-Dichlorocyclopropyl-methyl-phosphoric acid derivatives of the formula



(I),

where

$R^1$, $R^2$ and $R^3$ are identical or different and are hydrogen or methyl,

$R^4$ is unbranched or branched alkoxy of up to 4 carbon atoms, unbranched or branched alkylthio of up to 4 carbon atoms, amino, or alkylamino or dialkylamino, wherein each alkyl is of up to 5 carbon atoms and is linear or branched,

Y is oxygen or sulfur and

$X_1$, $X_2$, $X_3$ and $X_4$ are identical or different and each is hydrogen, halogen, nitro, cyano, methyl or methylthio.

6. A process for combating pests, wherein an effective amount of a 2,2-dichlorocyclopropyl-methyl-phosphoric acid derivative of the formula I as claimed in claim 1 is allowed to act on the pests or their habitat.

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**4,296,109**

## CORTICOID 21-SULFOPROPIONATES AND THE SALTS THEREOF, A PROCESS FOR THE PRODUCTION THEREOF AND PHARMACEUTICAL PREPARATIONS THEREOF

**Henry Laurent; Peter Esperling; Joachim-Friedrich Kapp, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

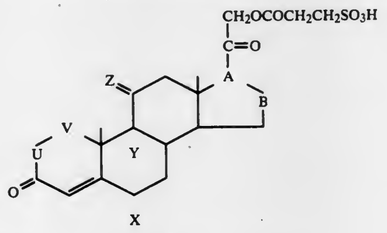
**Filed Oct. 9, 1979, Ser. No. 81,947**

**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843690; Aug. 6, 1979, 2032166**

**Int. Cl.³ A61K** *31/56*

**U.S. Cl. 424—241** **28 Claims**

1. A corticoid 21-sulfopropionate of the formula



X

wherein

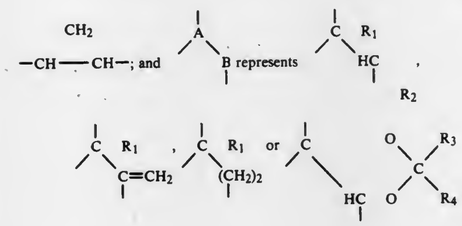
represents a single of double bond;

X is hydrogen, chlorine, fluorine or methyl;

Y is hydrogen, fluorine or chlorine;

Z is oxo, or hydrogen in the α-position and hydroxy in the β-position;

—U—V represents —$CH_2$—$CH_2$—, —CH=CH— or



wherein $R_1$ is hydrogen, hydroxy or acyloxy, wherein the acyl group is derived from a $C_{1-8}$ hydrocarbon carboxylic acid; $R_2$ is hydrogen or methyl; and $R_3$ and $R_4$ are independently each alkyl of 1–4 carbon atoms; and the salts thereof with physiologically acceptable bases.

28. A method of treating shock which comprises administering to a patient suffering from shock an amount of a compound of claim 1 effective for treatment of shock.

**4,296,110**

## ANTIHYPERTENSIVE I-SUBSTITUTED CYCLIC LACTAM-2-CARBOXYLIC ACIDS

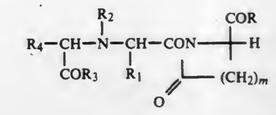
**Alexander L. Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Oct. 28, 1980, Ser. No. 201,471**

**Int. Cl.³ A61K ; C07D ; A61K**

**U.S. Cl. 424—244** **11 Claims**

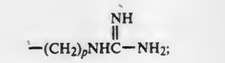
1. A compound of the formula:



where

R and $R_3$ are independently OH, $C_1$–$C_4$ alkoxy or benzyloxy;

$R_1$ is H, $CH_3$, $C_2H_5$, $CF_3$, isobutyl, isoamyl, —$(CH_2)_n$$NHR_5$ or



$R_2$ is H or $CH_3$;

$R_4$ is $C_1$–$C_{10}$ alkyl, —$(CH_2)_q$$C_6H_5$ or —$(CH_2)_r$$NH_2$;

$R_5$ is H or $C_1$–$C_4$ alkyl;

m is 2, 3 or 4;

n is an integer from 1–6;

p is an integer from 1–6;

q is an integer from 0–6; and

r is an integer from 1–6;

and pharmaceutically acceptable salts thereof.

11. A method of treating hypertension in mammals which comprises administering to the mammal an effective hypertensive amount of a compound of claims 1 to 9.

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**4,296,111**

## 7-SUBSTITUTED METHYL CEPHALOSPORINS DERIVATIVES AND ANALOGUES THEREOF

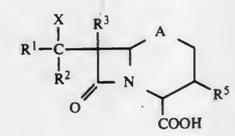
**Thomas R. Beattie; Burton G. Christensen, both of Scotch Plains, and Frank P. Dininno, Old Bridge, all of N.J., assignors to Merck & Co. Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 815,475, Jul. 14, 1977, abandoned, which is a continuation of Ser. No. 634,082, Nov. 21, 1975, abandoned. This application Jun. 14, 1979, Ser. No. 48,551**

**Int. Cl.³ C07D** *501/00*

**U.S. Cl. 424—246** **3 Claims**

1. A compound having the structural formula:



and the non-toxic, pharmaceutically acceptable salts thereof; wherein:

the dotted line indicates provision for both $\Delta^2$ and $\Delta^3$ embodiments:

A is S and SO;

$R^3$ is hydrogen, methoxyl, and lower alkylthio;

X is OH, SH, $NH_2$, =O and =NH;

$R^1$ and $R^2$ are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, phenethyl, 2-thienylmethyl, and phenyl;

$R^5$ is hydrogen, chloro, lower alkoxy, formyl and —$(CH_2)_n$Y wherein n is an integer from 1–6 and Y is

hydrogen, hydroxy, halogen, lower alkanoyloxy, lower alkanoylthio, lower alkoxy, phenoxy, benzyloxy, azido, amino, N-lower alkylamino, N,N-dilower alkylamino, N-lower alkanoylamino, N,N-dilower alkanoylamino, carbamoyl or thiocarbamoyl and the N-lower alkyl or N,N-dilower alkyl derivatives thereof, pyridinium, 3-methylpyridinium, 4-methylpyridinium, 3-chloropyridinium, 3-bromopyridinium, 3-iodopyridinium, 4-carbamoylpyridinium, 4-(N-hydroxymethylcarbamoyl)-pyridinium, 4-(N-carbomethoxycarbamoyl)pyridinium, 4-(N-cyanocarbamoyl)pyridinium, 4-(carboxymethyl)-pyridinium, 4-(hydroxymethyl)pyridinium, 4-(trifluoromethyl)pyridinium, quinolinium, and luthidinium; with the proviso that, when X is =O or =NH, one of $R^1$ and $R^2$ is absent, and that not all of $R^1$, $R^2$, $R^3$ and $R^5$ are hydrogen at the same time.

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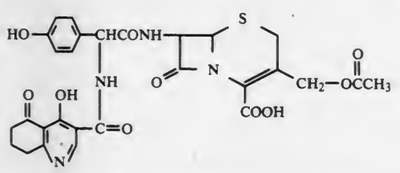
**4,296,112**

## CEPHALOSPORINS

**Akira Matsubara, Yokohama; Hideaki Sakai, Fujisawa; Makoto Odate, Yokohama; Toshio Suganuma, Mobara, and Takuo Nakano, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Filed Dec. 17, 1979, Ser. No. 104,292**
**Claims priority, application Japan, Apr. 19, 1979, 54/47275**
**Int. Cl.³ C07D** *501/20*
**U.S. Cl. 424—246** **6 Claims**

1. A cephalosporanic acid of the formula



and pharmaceutically acceptable salts and esters thereof.

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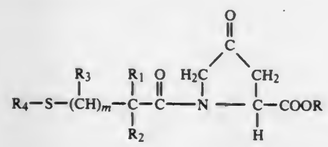
**4,296,113**

## MERCAPTOACYL DERIVATIVES OF KETO SUBSTITUTED PROLINE AND PIPECOLIC ACID

**Miguel A. Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

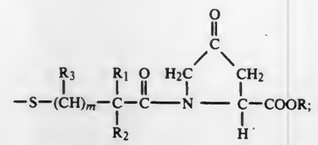
**Filed Jan. 14, 1980, Ser. No. 112,004**
**Int. Cl.³ A61K** *31/40, 31/44;* **C07D** *207/16, 401/12*
**U.S. Cl. 424—246** **20 Claims**

1. A compound of the formula

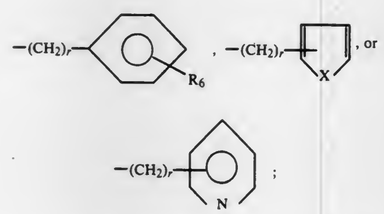


or a physiologically acceptable salt thereof, wherein
R is hydrogen or lower alkyl;
$R_1$ and $R_3$ are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $-(CH_2)_n-SH$, and halo substituted lower alkyl;
$R_2$ is hydrogen or lower alkyl provided that $R_2$ is lower alkyl only when $R_1$ is lower alkyl;
m is zero, one or two;
n is one, two, or three;
$R_4$ is hydrogen,

p-methoxybenzyl, trityl, or provided that neither $R_1$ nor $R_3$ is $-(CH_2)_n-SH$

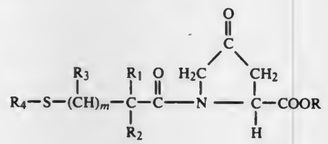


$R_5$ is lower alkyl, chloro, bromo or fluoro substituted lower alkyl, $-(CH_2)_r-$cycloalkyl wherein the cycloalkyl group is a saturated ring of 3 to 7 carbons,



r is zero, one, two, or three;
$R_6$ is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy; and
X is oxygen or sulfur.

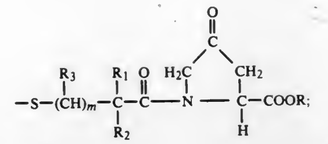
16. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of one or more hypotensive agents or physiologically acceptable salts thereof of the formula



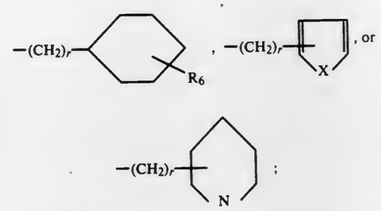
wherein
R is hydrogen or lower alkyl;
$R_1$ and $R_3$ are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $-(CH_2)_n-SH$, and halo substituted lower alkyl;
$R_2$ is hydrogen or lower alkyl provided that $R_2$ is lower alkyl only when $R_1$ is lower alkyl;
m is zero, one, or two;
n is one, two, or three;
$R_4$ is hydrogen,

or provided that neither $R_1$ nor $R_3$ is $-(CH_2)_n-SH$





$R_5$ is lower alkyl, chloro, bromo, or fluoro substituted lower alkyl, $-(CH_2)_r-$cycloalkyl wherein the cycloalkyl group is a saturated ring of 3 to 7 carbons,



r is zero, one, two, or three;
$R_6$ is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy; and
X is oxygen or sulfur.

20. The method of alleviating hypertension which comprises administering an effective amount of the composition of claim 16.

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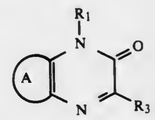
**4,296,114**

## 3,4-DIHYDRO-3-OXOPYRIDO[2,3-B]-PYRAZINES, COMPOSITIONS AND USE THEREOF

**Richard A. Appleton, and David Johnston, both of Loughborough, England, assignors to Fisons Limited, London, England**

**Filed Aug. 2, 1979, Ser. No. 63,357**
**Claims priority, application United Kingdom, Aug. 15, 1978, 33431/78; Dec. 13, 1978, 48438/78**
**Int. Cl.³ A61K** *31/495, 31/535;* **C07D** *471/08*
**U.S. Cl. 424—248.52** **10 Claims**

1. A compound of formula I,



I

in which $R_1$ is phenyl substituted by halogen, alkoxy, alkyl, carboxy-alkyl, $-NR_4R_5$, carboxy or alkoxy carbonyl,
$R_3$ is hydrogen, alkyl, mono- or di-carboxy alkyl, halo, alkoxy, phenyl, halo-phenyl, hydroxy, phenoxy, thiol, thioalkoxy, thiophenoxy, $-NR_4R_5$, cyano, —COOH, carboxyureido, $-CF_3$, $-COR_6$, hydroxyalkyl, aminoalkyl, or alkoxy substituted by $NR_4R_5$,
ring A is a pyridine ring which optionally carries up to 4 substituents $R_3$, which may be the same or different,
$R_4$ and $R_5$, which may be the same or different, each represent hydrogen, phenyl, halophenyl or alkyl, the alkyl optionally being substituted by alkoxy or by a mono- or di-alkyl or unsubstituted amino group; or $R_4$ and $R_5$, together with the nitrogen atom to which they are attached, form a piperidine, morpholine or an optionally alkyl substituted piperazine ring, and
$R_6$ is hydrogen or alkyl,
each of $R_3$ and any substituent on ring A or on the $R_1$ phenyl group, when they contain carbon, containing up to and including 10 carbon atoms,
provided that when $R_1$ is phenyl substituted by methoxy, $R_3$ is not phenyl,
or a pharmaceutically acceptable salt, ester or amide thereof.

9. A pharmaceutical composition for treatment of an inflammatory condition comprising an effective amount of a compound according to claim 1, as active ingredient, in admixture with a pharmaceutically acceptable adjuvant, diluent or carrier.

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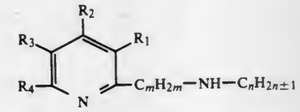
**4,296,115**

## PYRIDYLALKYLAMINES

**Leslie J. Browne, Morristown, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed May 1, 1980, Ser. No. 145,533**
**Int. Cl.³ C07D** *213/36;* **A61K** *31/44*
**U.S. Cl. 424—263** **8 Claims**

1. A secondary hydroxypyridylalkylamine of the formula



wherein one of $R_1$, $R_2$ and $R_4$ is hydroxy, and the others, as well as $R_3$, are hydrogen or lower alkyl; m is an integer from 2 to 4; and n is an integer from 1 to 7; or a pharmaceutically acceptable acid addition salt thereof.

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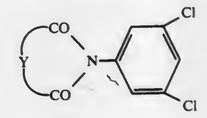
**4,296,116**

## FUNGICIDAL AGENTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE FOR COMBATING FUNGI

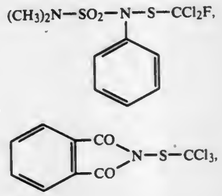
**Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Oct. 26, 1979, Ser. No. 88,688**
**Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849695; Jul. 31, 1979, 2931034**
**Int. Cl.³ A01N** *43/76, 41/06, 43/80, 43/50*
**U.S. Cl. 424—272** **9 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of (1) at least one carboximide of the formula



in which
Y represents a bifunctional group linking the two carbonyl groups with formation of an optionally substituted 5-membered heterocyclic ring with a total of 1 or 2 hetero-atoms (O and N),
and (2),



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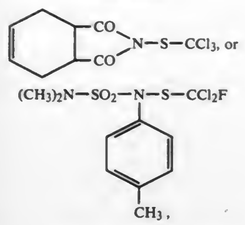

the weight ratio of component (1) to component (2) ranging from about 1:1 to 1:4.

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**4,296,117**

**1-ARYLOXY-2-HYDROXY-3-[(BENZIMIDAZOLINONE-SUBSTITUTED ALKYL)-AMINO]PROPANES AND SALTS THEREOF**

**Herbert Köppe, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Gojko Muacevic, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany**

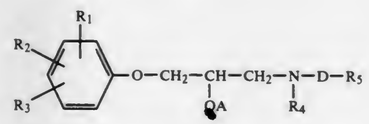
**Division of Ser. No. 4,279, Jan. 17, 1979, Pat. No. 4,256,756, which is a continuation-in-part of Ser. No. 838,450, Oct. 3, 1977, abandoned. This application Jan. 16, 1980, Ser. No. 112,640**

**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644833**

**Int. Cl.**[3] **A61K** *31/415;* **C07D** *235/26*

**U.S. Cl. 424—273 B** **7 Claims**

1. A compound of the formula



wherein

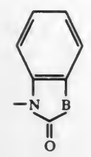
$R_1$ is hydrogen; halogen; trifluoromethyl; nitro; alkyl of 1 to 8 carbon atoms; alkoxy of 1 to 4 carbon atoms; alkoxyalkyl of 2 to 8 carbon atoms; alkenyl of 2 to 5 carbon atoms; alkynyl of 2 to 5 carbon atoms; alkenyloxy of 3 to 6 carbon atoms; alkynyloxy of 3 to 6 carbon atoms; $-(CH_2)_x-A'$, where x is 1, 2 or 3 and A' is cyano, amino, carboxamido or hydroxyl; phenoxy; benzyloxy; or $-CH_2-SO_2-CH_3$;

$R_2$ is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; aralkoxy of 7 to 14 carbon atoms; alkenyl of 2 to 4 carbon atoms; nitro; or, together with $R_3$, —CH=CH—CH=CH—, which is attached to carbon atoms of the phenyl ring in o-position with respect to each other;

$R_3$ is hydrogen; halogen; alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms; or aralkoxy of 7 to 14 carbon atoms;

$R_4$ is hydrogen; alkyl of 1 to 5 carbon atoms; or aralkyl of 7 to 14 carbon atoms;

$R_5$ is



where B is

where $R_{12}$ is aryl;

D is alkylene of 1 to 12 carbon atoms; and

A is lower alkanoyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of blocking the $\alpha$- and $\beta$-adrenergic receptors in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim **1**.

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**4,296,118**

**FUNGICIDAL 3-[N-(PYRAZOL-1-YL-ACETYL)-N-(SUBSTITUTED PHENYL)]-AMINO-TETRAHYDRO-2-FURANONES**

**Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Adolf Hubele, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

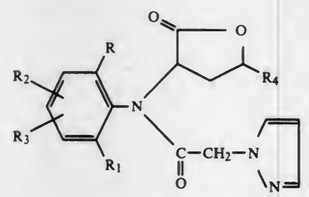
**Division of Ser. No. 2,490, Jan. 11, 1979, abandoned, which is a division of Ser. No. 873,585, Jan. 30, 1978, Pat. No. 4,147,792. This application Aug. 22, 1980, Ser. No. 180,266**

**Claims priority, application Switzerland, Feb. 4, 1977, 1381/77; Mar. 28, 1977, 3884/77**

**Int. Cl.**[3] **A01N** *43/56, 43/08;* **C07D** *405/12*

**U.S. Cl. 424—273 P** **4 Claims**

1. A compound of the formula I



wherein

R represents $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy or halogen,

$R_1$ represents $C_1$–$C_3$-alkyl, $C_1$–$C_4$-alkoxy or halogen,

$R_2$ represents hydrogen, $C_1$–$C_3$-alkyl, $C_1$–$C_4$-alkoxy or halogen,

$R_3$ represents hydrogen or methyl, with the total number of C atoms of the substituents R, $R_1$, $R_2$ and $R_3$ in the phenyl ring not exceeding the number 8, and

$R_4$ represents hydrogen or methyl,

4. A fungicidal composition containing as active substance a fungicidally effective amount of a compound according to claim **1** or **2**, together with a suitable inert carrier therefor.



**4,296,119**

**PROCESS AND COMPOSITION FOR REDUCING BLOOD PRESSURE IN ANIMALS**

**Richard J. Wurtman, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 898,740, Apr. 24, 1978, abandoned. This application Nov. 27, 1978, Ser. No. 963,857**

**Int. Cl.**[3] **A61K** *31/40*

**U.S. Cl. 424—274** **2 Claims**

1. The process for reducing blood pressure in an animal afflicted with high blood pressure which comprises administering to said animal tryptophan to the animal in an amount effective to reduce blood pressure of at least about 5 mg/kg body weight.

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**4,296,120**

**(CARBOXY-OXO-PYRROLIDINO)PHENYLALKENAMIDES AND ESTERS THEREOF AS SRS-A ANTAGONISTS**

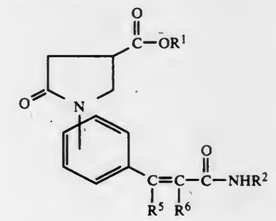
**Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Filed Aug. 28, 1980, Ser. No. 182,162**

**Int. Cl.**[3] **A61K** *31/40;* **C07D** *207/277*

**U.S. Cl. 424—274** **21 Claims**

1. An alkenamide compound of the formula



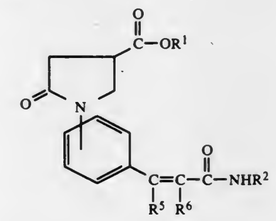
and a pharmaceutically-acceptable salt thereof;

wherein $R^1$ is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons and $-CH_2-CH_2-NR^3R^4$, wherein $R^3$ and $R^4$ are each alkyl having 1 to 3 carbons;

$R^2$ is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;

and $R^5$ and $R^6$ are selected from the group consisting of hydrogen and methyl.

11. A method for antagonizing the effect of slow-reacting substance of anaphylaxis in a human subject, which comprises administering to said subject a slow-reacting substance of anaphylaxis antagonizing amount of an alkenamide compound of the formula



or a pharmaceutically-acceptable salt thereof;

wherein $R^1$ is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons and $-CH_2-CH_2-NR^3R^4$, wherein $R^3$ and $R^4$ are each alkyl having 1 to 3 carbons;

$R^2$ is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons; and $R^5$ and $R^6$ are selected from the group consisting of hydrogen and methyl.

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**4,296,121**

**NOVEL PROSTAGLANDIN DERIVATIVES OF THE $\Delta 2$-$PGF_2$ AND $\Delta 2$-$PGE_2$ SERIES AND PROCESS FOR THEIR MANUFACTURE**

**Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main; Ulrich Lerch, Hofheim am Taunus, and Elmar Konz, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

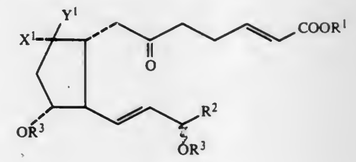
**Filed Aug. 2, 1979, Ser. No. 62,937**

**Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834248**

**Int. Cl.**[3] **C07D** *333/24;* **A61K** *31/557;* **C07D** *307/54;* **C07C** *177/00*

**U.S. Cl. 424—275** **7 Claims**

1. A compound of the formula



wherein:

$X^1$ and $Y^1$ taken alone are different and are hydrogen or hydroxy, or taken together are oxygen;

$R^1$ is

(a) hydrogen or linear or branched, saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon having up to 10 carbon atoms, or is

(b) a physiologically acceptable metal ion, an $NH_4^+$ ion, or an ammonium ion derived from a primary, secondary, or tertiary amine;

$R^2$ is linear or branched alkyl having 1 to 7 carbon atoms substituted with

(a) $\alpha$- or $\beta$-thienyl or furyl, which thienyl or furyl in turn may be mono-, di-, or tri-substituted in the nucleus with at least one member selected from the group consisting of halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, and alkoxy having 1 to 6 carbon atoms, or

(b) $\alpha$- or $\beta$-thienyloxy or such thienyloxy mono-, di-, or tri-substituted in the nucleus with at least one member selected from the group consisting of halogen, trifluoromethyl, alkyl having 1 to 6 carbon atoms, and alkoxy having 1 to 6 carbon atoms; and

$R^3$ is hydrogen, 1-ethoxyethyl, tetrahydropyran-2-yl, or tetrahydrofuran-2-yl, or is such tetrahydropyranyl or tetrahydrofuranyl mono- or poly-substituted by alkyl.

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**4,296,122**

**2,3-DIHYDRO-6,7-DISUBSTITUTED-5-(ACYL)BENZOFURAN-2-CARBOXYLIC ACIDS**

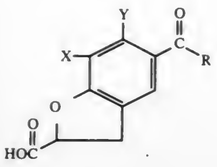
**Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,087,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1975, abandoned. This application Jan. 27, 1978, Ser. No. 873,024**

**Int. Cl.**[3] **A61K** *31/34;* **C07D** *307/77*

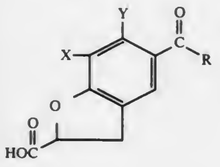
**U.S. Cl. 424—285** **13 Claims**

1. A compound having the formula:



wherein
X is halo, methyl or hydrogen;
Y is halo or methyl and
X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;
R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; and
the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof.

**8**. A pharmaceutical composition useful in the treatment of edema associated with hypertension comprising a therapeutically effective amount of a compound of the formula of



wherein
X is halo, methyl or hydrogen;
Y is halo or methyl,
X and Y can be combined to form a hydrocarbylene radical of from 3 or 4 carbon atoms,
R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy and
the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof and a pharmaceutically acceptable carrier.

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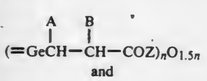
**4,296,123**
**GERMANIUM-CONTAINING ORGANIC POLYMER AND ITS USE IN THE TREATMENT OF OPTHALMOLOGICAL DISORDERS**

**Akira Ishikawa, Tokyo; Yukihito Ishida, Fujisawa; Shiro Ikegami, Funabashi; Hiroshi Satoh, Tokyo, all of Japan; Ryuichi Sato, 2310, Kamikoizumi, Oizumicho, Ora-gun, Gunma-ken, Japan; Setsuo Tomisawa, Tokyo, Japan, and Shigeru Toyoshima, Funabashi, Japan, assignors to Ryuichi Sato, Gunma, Japan**

**Division of Ser. No. 12,151, Feb. 14, 1979. This application Feb. 29, 1980, Ser. No. 125,948**
**Claims priority, application Japan, Mar. 1, 1978, 53-1992; Mar. 1, 1978, 53-21993**
**Int. Cl.**[3] **A61K** *31/28*
**U.S. Cl. 424—287** **1 Claim**

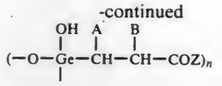
**1**. A method of treating an animal suffering from eye cataracts, which comprises; administering to said animal an effective amount to relieve said suffering, of a polymer selected from those of the formulae:



(III)

and

-continued



(IV)

wherein A represents one of a hydrogen atom, an alkyl having 1 to 3 carbon atoms, —COOH, —COOR (wherein R is alkyl having 1 to 3 carbon atoms), B represents one of a hydrogen atom or an alkyl having 1 to 3 carbon atoms; Z represents one of a hydroxy, an alkoxy group having 1 to 3 carbon atoms or an alkyl having 1 to 3 carbon atoms; and n is an integer greater than 3, inclusive.

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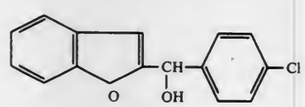
**4,296,124**
**PHARMACEUTICAL METHODS**

**Mario Ghelardoni; Vittorio Pestellini; Piero Del Soldato; Giovanna Volterra, and Alberto Meli, all of Florence, Italy, assignors to A. Menarini S.A.S., Italy**

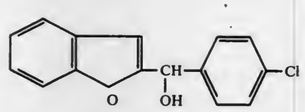
**Filed Aug. 11, 1980, Ser. No. 176,867**
**Claims priority, application Italy, Aug. 10, 1979, 9513 A/79**
**Int. Cl.**[3] **A61K** *31/34*
**U.S. Cl. 424—285** **4 Claims**

**1**. A method of causing normolipidemia in mammals by administering a normolipidemic amount of the compound (2-benzofuryl)-(p-chlorophenyl)-carbinol of formula I:



(I)

**2**. A method of decreasing platelet binding in mammals by administering an effective amount of the compound (2-benzofuryl)-(p-chlorophenyl)-carbinol of formula I:



(I)

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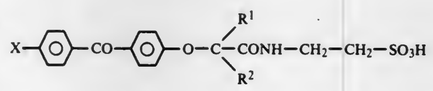
**4,296,125**
**DERIVATIVES OF BENZOYLPHENOXYALKANOIC ACIDS HAVING NORMOLIPEMIZING ACTIVITY**

**Valerio Borzatta; Manlio Cristofori; Mauro Morotti, all of Bologna, and Giuseppe Mascellani, Calderino di M.S. Pietro, all of Italy, assignors to Alpha Farmaceutici S.p.A., Italy**

**Continuation of Ser. No. 29,006, Apr. 11, 1979, abandoned. This application Feb. 21, 1980, Ser. No. 123,454**
**Claims priority, application Italy, May 9, 1978, 3426 A/78; Dec. 21, 1978, 3630 A/78**
**Int. Cl.**[3] **A61K** *31/185;* **C07D** *143/53*
**U.S. Cl. 424—315** **5 Claims**

**1**. A compound of the formula:



wherein:
X represents an atom of chlorine, bromine, iodine, or an alkyl group having 1 to 4 carbon atoms; and
$R^1$ and $R^2$, equal or different from each other, represent a hydrogen atom or an alkyl group or a hydroxyalkyl



group, said groups having 1 to 6 carbon atoms; or a pharmaceutically acceptable salt of said compound.

**5**. A pharmaceuitcal preparation useful in the therapy of hyperlipaemia or of hypercholesterolemia, characterized in that it contains a hypolipaemic or hypocholesterolemic effective dose of at least one of the compounds of claim **1** associated or combined with one or more usual excipients or solvents.

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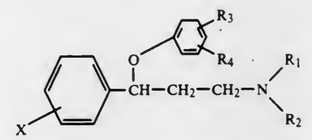
**4,296,126**
**3-ARYLOXY-3-ARYL-PROPANEAMINES AND THEIR METHOD OF USE**

**Lucien Nedelec, Le Raincy; Daniel Frechet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France**

**Filed Feb. 22, 1979, Ser. No. 13,831**
**Claims priority, application France, Feb. 24, 1978, 78 05335**
**Int. Cl.**[3] **A01N** *37/30;* **A61K** *31/135;* **C07C** *93/02*
**U.S. Cl. 424—316** **22 Claims**

**1**. A compound selected from the group consisting of benzene-propanamines of the formula



wherein X is selected from the group consisting of hydrogen, chlorine, fluorine and bromine, $R_1$ is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, $R_2$ is alkyl of 1 to 5 carbon atoms, $R_3$ is selected from the group consisting of hydrogen, chlorine, bromine, $—CF_3$, methyl and methoxy and $R_4$ is nitro and their non-toxic, pharmaceutically acceptable acid addition salts.

**14**. A method of curbing the appetite of warm-blooded animals comprising administering to warm-blooded animals an anorexigically effective amount of at least one compound of claim **1**.

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**4,296,127**
**MIXED SALTS OF ESSENTIAL OR SEMI-ESSENTIAL AMINO ACIDS AND NITROGEN-FREE ANALOGS THEREOF**

**Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.**

**Filed Apr. 18, 1979, Ser. No. 31,274**
**Int. Cl.**[3] **A01N** *37/12;* **C07C** *101/30, 101/08*
**U.S. Cl. 424—319** **13 Claims**

**1**. Compound of the formula:

$$AN.xH_2O$$

wherein A is selected from the group consisting of essential amino acids and semi-essential amino acids, N is selected from the group consisting of alpha-keto and alpha-hydroxy analogs of essential or semi-essential amino acids, but when A is L-ornithine or L-arginine, N is not an alpha-keto analog of a branched chain essential amino acid, and x may be zero or a positive number which need not be an integer.

**10**. A composition useful for providing essential and/or semi-essential amino acids to the body, comprising a mixture of two or more compounds of the formula of claim **1**, at least one of said compounds being other than the reaction product of the semi-essential amino acid L-ornithine or L-arginine with an alpha-keto analog of a branched chain essential amino acid.

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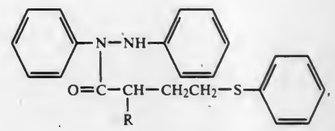
**4,296,128**
**CARBOXYLIC ACID HYDRAZIDES AND PROCESSES FOR THEIR MANUFACTURE**

**Alfred Sallmann, and Richard Göschke, both of Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed May 7, 1980, Ser. No. 147,458**
**Claims priority, application Switzerland, May 11, 1979, 4416/79**
**Int. Cl.**[3] **C07C** *149/43;* **A61K** *31/24, 31/195*
**U.S. Cl. 424—309** **3 Claims**

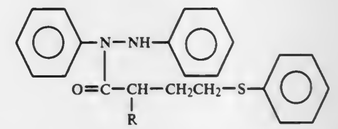
**1**. A new carboxylic acid hydrazide of the formula



(I)

in which
R represents carboxy, or a pharmaceutically acceptable salt of the compound of the formula I.

**3**. A pharmaceutical preparation containing an antithrombotically effective amount of a carboxylic acid hydrazide of the formula



wherein R represents carboxy or a pharmaceutically acceptable salt thereof, lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, together with one or more pharmaceutically acceptable carriers.

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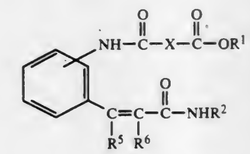
**4,296,129**
**(CARBOXYACYLAMINO)PHENYLALKENAMIDES AND ESTERS THEREOF AS SRS-A ANTAGONISTS**

**Saul B. Kadin, New London, Conn., assignor to Pfizer, Inc., New York, N.Y.**

**Filed Oct. 29, 1980, Ser. No. 201,894**
**Int. Cl.**[3] **A61K** *31/24;* **C07C** *101/447, 101/453*
**U.S. Cl. 424—309** **27 Claims**

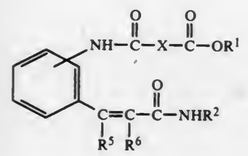
**1**. An alkenamide compound of the formula



and the pharmaceutically-acceptable salts thereof;
wherein $R^1$ is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein $R^3$ and $R^4$ are each alkyl having 1 to 3 carbons;
$R^2$ is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;
$R^5$ and $R^6$ are selected from the group consisting of hydrogen and methyl;
and X is selected from the group consisting of cis-vinylene, ethylene and

wherein $R^7$ and $R^8$ are each selected from the group consisting of hydrogen and methyl.

**26**. The method of antagonizing the effect of slow-reacting substance of anaphylaxis in a human subject, which comprises administering thereto a slow-reacting substance of anaphylaxis antagonizing amount of an alkenamide compound of the formula



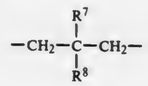
or a pharmaceutically-acceptable salt thereof;

wherein $R^1$ is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein $R^3$ and $R^4$ are each alkyl having 1 to 3 carbons;

$R^2$ is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;

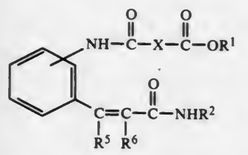
$R^5$ and $R^6$ are selected from the group consisting of hydrogen and methyl;

and X is selected from the group consisting of cis-vinylene, ethylene and



wherein $R^7$ and $R^8$ are each selected from the group consisting of hydrogen and methyl.

**27**. A pharmaceutical composition, which comprises a pharmaceutically-acceptable carrier and an alkenamide compound of the formula



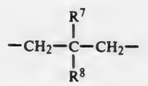
or a pharmaceutically-acceptable salt thereof;

wherein $R^1$ is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbons, and $-CH_2-CH_2-NR^3R^4$, wherein $R^3$ and $R^4$ are each alkyl having 1 to 3 carbons;

$R^2$ is selected from the group consisting of alkyl having 8 to 15 carbons and cycloalkyl having from 6 to 12 carbons;

$R^5$ and $R^6$ are selected from the group consisting of hydrogen and methyl;

and X is selected from the group consisting of cis-vinylene, ethylene and



wherein $R^7$ and $R^8$ are each selected from the group consisting of hydrogen and methyl;

and wherein the ratio of the pharmaceutically-acceptable carrier to the alkenamide compound is in the range from 1:6 to 6:1 by weight.

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**4,296,130**

## METHYLSULFONYLMETHANE AND METHODS OF USE

**Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607**

**Filed Aug. 30, 1979, Ser. No. 71,068**
**Int. Cl.³ A61K** *31/10*
**U.S. Cl. 424—337** **2 Claims**

**1**. A method of extending the blood supply of a warm blooded animal which method comprises:

intravenously introducing into the blood of said warm blooded animal requiring such treatment a blood diluent comprising an aqueous solution of methylsulfonylmethane, present in an amount of about 0.1–50 weight percent.

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**4,296,131**

## PHARMACEUTICAL COMPOSITIONS AND THEIR USE IN THE PROPHYLAXIS AND/OR TREATMENT OF CERTAIN DISEASES

**Cornelis A. Ladage, De Meern; Douwe J. Van Linge, Eemnes, and Huibert A. Van Riessen, Lunteren, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands**

**Division of Ser. No. 3,968, Jan. 16, 1979, Pat. No. 4,250,089.**
**This application Aug. 10, 1979, Ser. No. 65,627**
**Claims priority, application Netherlands, Jan. 20, 1978, 7800762**
**Int. Cl.² A61K** *31/055, 47/00*
**U.S. Cl. 424—347** **8 Claims**

**1**. A pharmaceutical composition for the treatment of distomatosis, comprising an amount, effective against distomatosis, of a member selected from the group consisting of 4,4'-dichloro-6,6'-dinitro-o,o'-bisphenol; 4,4',6,6'-tetrabromo-o,o'-bisphenol; 4,6'-dichloro-4,6'-dinitro-2,2'-methylenediphenol; and 6-bromo-4'-fluoro-4,6'-dinitro-2,2'-methylenediphenol, dissolved in a solvent vehicle comprising 5 to 50 w/v percent of dimethylsulfoxide (DMSO) in combination with a symmetric or unsymmetric ester of adipic acid wherein both alkyl groups together contain six to twelve carbon atoms and wherein the smaller alkyl group present if said ester is unsymmetric contains at least two carbon atoms.

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**4,296,132**

## DOG FOOD OF IMPROVED ACCEPTABILITY

**Charles R. Lazarus, Ossining; Howard D. Stahl, Hartsdale, both of N.Y., and Gerhard J. Haas, Woodcliff Lake, N.J., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Mar. 13, 1980, Ser. No. 129,875**
**Int. Cl.³ A23K** *1/00, 1/18*
**U.S. Cl. 426—2** **9 Claims**

**1**. An improved, nutritionally-balanced dog food comprising fat, protein, carbohydrates, vitamins and minerals wherein the improvement consists of magnesium oleate in admixture with at least a portion of the fat, the magnesium oleate being present in an amount effective to improve the palatability of the dog food for dogs.

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**4,296,133**

## METHOD FOR PRODUCING BREAD

**Kenji Tanaka, Kawagoe, and Shigeru Endo, Tokyo, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan**

**Filed Aug. 24, 1979, Ser. No. 70,321**
**Int. Cl.³ A21D** *2/08, 8/02*
**U.S. Cl. 426—23** **13 Claims**

**1**. A method for producing bread which comprises kneading a dough together with (a) 3 to 30 ppm of an additive selected from the group consisting of L-ascorbic acid, dehydroascorbic acid and salts thereof, and (b) 5 to 60 ppm of an additive selected from the group consisting of malic acid, α-ketoglutaric acid, tartaric acid, asparagic acid, glutamic acid, hydroxy-oxalic acid, oxo-succinic acid, diamino-succinic acid, γ-hydroxy-glutamic acid and salts thereof; or 5 to 80 ppm of methionine; or 10 to 60 ppm of an alum; or 5 to 70 ppm of a nicotinic acid, wherein all amounts are based on the weight of wheat flour, allowing the thus kneaded dough to ferment, and then baking the thus fermented dough.



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**4,296,134**

## LIQUID EGG BLEND

**Wayne A. Boldt, S. 66 W20230 Tans Dr., Muskego, Wis. 53150**

**Continuation of Ser. No. 569,607, Apr. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 469,476, May 13, 1974, abandoned. This application Mar. 8, 1977, Ser. No. 786,301**
**Int. Cl.³ A23L** *1/32*
**U.S. Cl. 426—250** **30 Claims**

**1**. A substantially fat-, oil,- cholesterol- and yolk-free fresh egg product with a maximum of 80 calories per 100 grams, a protein concentration of from 7.5 to 19 percent by weight and a maximum water content of about 1.3 times that found in fresh egg whites and which comprises from 60 to 96 parts by weight of liquid natural egg whites, zero to 18 parts by weight of added water, 2.0 to 10.5 parts by weight of egg-yolk-protein replacement, whereby said protein replacement with said natural egg whites provide combined protein-containing essential amino acids in approximately the same respective proportions as they occur in fresh whole eggs, 0.2 to 0.95 part by weight of stabilizer, 0.1 to 2.5 parts by weight of flavoring and 0.01 to 0.20 part by weight of coloring, which blend is useful, without reconstitution, for preparing scrambled eggs or omelets in the same manner as employed for whole fresh eggs and wherein said egg product, after doubler-boiler cooking, has a syneresis value of less than about 4 percent.

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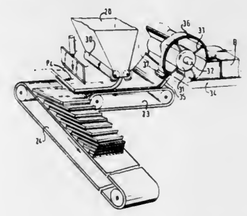
**4,296,135**

## METHOD OF FORMING A LAYER OF PRE-DETERMINED THICKNESS FROM A FEEDSTOCK OF BUTTER OR MARGARINE

**Jacques P. Rutten, Tilburg, Netherlands, assignor to Machinefabriek C. Rijkaart B.V., Asperen, Netherlands**

**Filed Jun. 6, 1979, Ser. No. 45,999**
**Int. Cl.³ A21D** *13/00;* **A23C** *15/00*
**U.S. Cl. 426—275** **7 Claims**



**1**. A method of forming a layer of a desired thickness of a substance which is butter or margarine, from a feedstock of said substance of any shape characterized by repeatedly scraping off an amount from said feedstock and by subsequently severing a portion of the desired thickness from said amount, after which the portions are joined in order of succession to form the desired layer.

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**4,296,136**

## COCONUT POWDER

**Salvatore F. Ziccarelli, Downers Grove; Rey C. Ramos, and Robert M. Brown, both of Chicago, all of Ill., assignors to Beatrice Foods Company, Chicago, Ill.**

**Filed Feb. 1, 1980, Ser. No. 117,797**
**Int. Cl.³ A23L** *1/221*
**U.S. Cl. 426—533** **23 Claims**

**1**. A process for producing reconstitutable natural coconut flavor comprising:

(1) grinding coconut meat to an average particle size of 2000 microns or less and until a pulp containing coconut flavor liquor is obtained;

(2) separating the coconut flavor liquor from the coconut meat fiber wherein the separated liquor has no more than 2% fiber therein;

(3) deactivating enzymes in the flavor liquor by heating the flavor liquor at a temperature and for a time within enzyme deactivation conditions, whereby enzymes in the liquor are deactivated; and

(4) concentrating the deactivated liquor to a concentrated form by at least one step selected from (a) condensing the liquor to more than 25% solids, or (b) spray-drying the liquor to a free-flowing powder;

whereby a concentrated coconut flavor is obtained.

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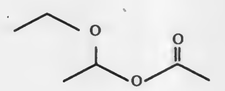
**4,296,137**

## FLAVORING WITH 1-ETHOXY-1-ETHANOL ACETATE

**Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.**

**Filed Aug. 7, 1980, Ser. No. 176,111**
**Int. Cl.³ A23L** *1/226, 1/235*
**U.S. Cl. 426—534** **3 Claims**

**1**. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuff and chewing gum, comprising the step of adding to said consumable material from 0.05 p.p.m. up to about 500 p.p.m. of 1-ethoxy-1-ethanol acetate having the structure:



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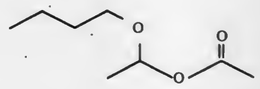
**4,296,138**

## FLAVORING WITH 1-N-BUTOXY-1-ETHANOL ACETATE

**Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 176,111, Aug. 7, 1980. This application Dec. 18, 1980, Ser. No. 217,810**
**Int. Cl.³ A23L** *1/226*
**U.S. Cl. 426—534** **3 Claims**

**1**. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of foodstuff and chewing gum, comprising the step of adding to said consumable material from 0.05 p.p.m. up to about 500 p.p.m. of 1-n-butoxy-1-ethanol acetate having the structure:



**4,296,139**

## BITTERING AGENTS

**Riaz A. Khan, Sonning, and Michael R. Jenner, Pangbourne, both of England, assignors to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles**

**Filed Oct. 17, 1979, Ser. No. 85,402**

**Claims priority, application United Kingdom, Oct. 18, 1978, 41115/78**

**Int. Cl.³ A23L** *1/226, 2/00, 2/02*

**U.S. Cl. 426—536** **8 Claims**

1. In a method of bittering a substance by incorporating therein an effective amount of a bittering agent, the improvement which comprises employing 2,6,1',6'-tetrachloro-2,6,1',6'-tetradeoxymannosucrose as said bittering agent.

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**4,296,140**

## MOLDED GELLED PIMIENTO BODY

**Jack B. Jaquith, Modesto, and Allen R. Church, Madera, both of Calif., assignors to Tri/Valley Growers, San Francisco, Calif.**

**Continuation-in-part of Ser. No. 775,556, Mar. 8, 1977, abandoned, and Ser. No. 946,115, Sep. 27, 1978, abandoned. This application May 27, 1980, Ser. No. 153,220**

**Int. Cl.³ A23L** *1/04*

**U.S. Cl. 426—575** **10 Claims**

1. A molded gelled body produced by gelling a composition in calcium chloride, the composition comprising a mixture of macerated pimiento flesh, a water soluble alginate, at least one of the substances starch and a vegetable gum, and an acid, said pimiento flesh constituting the major ingredient by weight, the alginate being present in quantity such that upon cooling and subjecting said mixture to contact with the aqueous calcium chloride solution it will quickly gel the mixture, the starch or gum being present in quantity sufficient to result in a gel which can be manipulated without structural damage and the acid being present in quantity sufficient to provide a pH not exceeding about 4.5, and wherein the molded gelled body is characterized by dimensional stability such that after storage for two days in a brine containing 7% sodium chloride, 0.5% lactic acid and 500 to 1000 ppm calcium chloride it exhibits substantially no change in shape and dimensions.

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**4,296,141**

## CONCHLESS HIGH PROTEIN CHOCOLATE FLAVORED COMPOSITION AND METHOD OF MAKING SAME

**Potito U. de Paolis, 131 Groverton Pl., Los Angeles, Calif. 90024**

**Filed Aug. 27, 1979, Ser. No. 69,857**

**Int. Cl.³ A23G** *1/00;* **A23D** *5/00*

**U.S. Cl. 426—613** **8 Claims**

1. A method of making a conchless chocolate composition which comprises:

initially admixing at least the following ingredients:

(a) 5–40 parts, by weight, edible fats;

(b) 40–70 parts, by weight, sweetener selected from the group consisting of a sugar and a sugar substitute;

(c) 2–60 parts, by weight, flavoring selected from the group consisting of cocoa powder and carob powder; and

(d) 3–40 parts, by weight, of soya protein isolate;

to form a viscous paste;

admixing with said viscous paste additional edible fats to form a liquified admixture having a total fat content of between 10–65 parts, by weight;

heating said liquid admixture to a temperature of between about 110° F. and 140° F. for a period of time of between about 10 and 30 minutes, under agitation; and

cooling said heated liquified admixture to form said conchless chocolate product wherein said soya protein isolate acts as essentially the sole emulsifying agent for the said conchless chocolate composition.

**4,296,142**

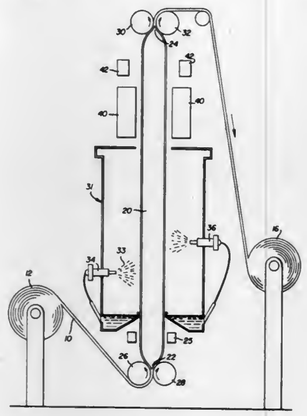
## METHOD FOR COATING A TUBULAR FOOD CASING

**Ganapathy Vasudevan, Bolingbrook, and Stanley Lustig, Park Forest, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.**

**Continuation of Ser. No. 919,067, Jun. 26, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,434**

**Int. Cl.³ B05D** *1/06*

**U.S. Cl. 427—28** **17 Claims**



1. A continuous process for forming a pin-hole free layer on the exterior surface of a flexible tubular cellulosic food casing, comprising the steps of:

establishing a path for processing said food casing;

providing two sets of pinch rollers at spaced apart locations along said path so that said food casing can move through said set of pinch rollers continuously while being maintained in a pinched state;

maintaining an inflated section of said food casing in tension between said sets of pinch rollers;

electrostatically coating a portion of said food casing section with dry particles of a resinous polymeric material having an average particle size of less than 125 microns to establish a coating having a thickness of at least about 0.5 mil;

moving said food casing along said path so that the coated portion of said food casing moves to a location for sintering between said sets of pinch rollers; and

sintering said coated portion to form said layer.

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**4,296,143**

## METHOD OF PRODUCING MICROLENSES

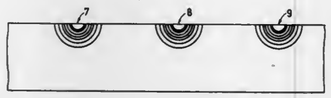
**Adrianus J. J. Franken; Giok D. Khoe, both of Eindhoven, Netherlands, and Dieter Küppers, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 5, 1979, Ser. No. 82,394**

**Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913843**

**Int. Cl.³ G02B** *1/10, 3/00;* **C03C** *17/02*

**U.S. Cl. 427—38** **6 Claims**



1. A method of producing microlenses embedded in a glass plate, characterized in that rotation-symmetrical recesses are produced in a glass plate, whereafter vitreous layers are deposited on the plate by means of a vapour deposition process until the recesses are fully filled up, whereafter the thickness of the coated glass plate is reduced to the original value or to a lower value.



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**4,296,144**

## ION IMPLANTED STYLUS

**Edward W. Maby, Plainsboro; Hirohisa Kawamoto, Princeton, and Pierre V. Valembois, Cranbury, all of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Apr. 23, 1980, Ser. No. 142,982**

**Int. Cl.³ C23C** *11/00*

**U.S. Cl. 427—38** **8 Claims**

1. In a method for fabricating a playback stylus which comprises a diamond dielectric support element for use with a capacitive information system including a high density information conductive disc which comprises the steps of forming a bottom surface for contacting the disc and preparing a conductive layer adjacent to the bottom surface by ion implanting a portion of the diamond dielectric support element;

the improvement comprising the additional step of annealing the ion implanted diamond at from about 850° to about 1500° C.

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**4,296,145**

## METHOD FOR COATING ONE SIDE ONLY OF STEEL STRIP WITH MOLTEN COATING METAL

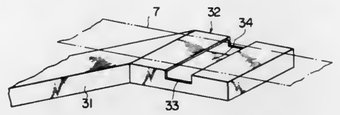
**Seizun Higuchi, Kitakyushu; Kazuhiro Tano, Nakama; Minoru Kamada, and Susumu Okamoto, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Dec. 28, 1979, Ser. No. 108,154**

**Claims priority, application Japan, Dec. 30, 1978, 53/165280**

**Int. Cl.³ B05C** *3/18;* **C23C** *1/02*

**U.S. Cl. 427—47** **11 Claims**



1. In a method of continuously coating one side only of a steel strip with a molten coating metal including the steps of:

(1) passing the steel strip to be coated substantially horizontally above a bath of the molten coating metal, with guide rolls imposing longitudinal tension thereon, through a chamber containing a molten metal coating bath, the chamber being filled with a nonoxidizing atmosphere,

(2) forcing the molten coating metal via an electromagnetic pump up from a submerged inlet of an adjacent molten metal guide to an outlet opening positioned above the molten coating metal bath surface forming a rising stream of the coating metal on the exit side of the outlet, and

(3) contacting the rising metal stream with the bottom surface of the substantially flat steel strip to be coated,

the improvement comprising positively flowing the molten coating metal toward both edges of the substantially horizontal flat strip by passing the molten metal through the metal guide outlet offering less flow resistance to the rising molten metal stream on the exit side of the guide outlet along the width thereof and offering greater flow resistance to the rising molten metal along the length thereof with respect to the running strip, thus positively forcing the flow of molten metal out to both edges of the substantially horizontal, flat strip; and thereby forming a uniform layer of the coating metal on the bottom side of the strip thus contacted with the metal while preventing the coating metal from flowing over to the opposite non-coated side of the steel strip.

**4,296,146**

## METHOD FOR REMOVING RESIST LAYER FROM SUBSTRATE WITH COMBUSTIBLE GAS BURNOFF

**Thomas C. Penn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 2, 1977, Ser. No. 856,900**

**Int. Cl.³ B05D** *5/12*

**U.S. Cl. 427—58** **16 Claims**

1. In the fabrication of an electronic structure including a layer of semiconductor material and at least one electronic device formed thereon, wherein a patterned layer of resist material is disposed on a surface of different material than the resist material, a method of removing the patterned layer of resist material from the surface of different material, said method comprising:

decomposing resist material via chemical reaction from said layer of resist material by exposing said layer of resist material to the flame of a combustible gas, wherein the flame contains resist-attacking reactive products;

retaining the structure including the surface of different material in a condition, which is essentially unaltered physically and chemically with respect to its condition prior to the exposure of the layer of resist material to the flame of the combustible gas, during the decomposition of resist material; and

discontinuing the exposure of the structure to the flame of the combustible gas when only said layer of resist material has been removed by decomposition of the resist material thereof while the structure including the surface of different material remains in its unaltered condition.

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**4,296,147**

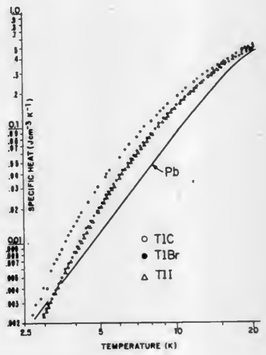
## THALLOUS HALIDE MATERIALS FOR USE IN CRYOGENIC APPLICATIONS

**William N. Lawless, 518 Illinois Ct., Westerville, Ohio 43081, assignor to William Nicholas Lawless, Westerville, Ohio**

**Filed May 21, 1979, Ser. No. 41,039**

**Int. Cl.³ D02G** *3/00*

**U.S. Cl. 427—120** **6 Claims**




1. A structured, ceramic, dielectric, heat exchange material for use in cryogenic applications having a specific heat equal to or greater than that of lead at temperatures below about 20° K. comprising a mixture of components X and Y,

where X is selected from the group consisting of thallous fluoride, thallous chloride, thallous bromide, and thallous iodide, and

where Y is selected from the group consisting of thallous fluoride; thallous chloride; thallous bromide; thallous iodide; epoxy resin; $AB_2O_4$, where A is a Group IIB metal ion with or without other divalent metal ions and B is chromium ion with or without other trivalent metal ions; $AB_2O_6$, where A is manganese or nickel ion or both, with

or without other divalent metal ions and B is niobium, tantalum, or both; and $A_2BCO_6$, where A is lead ion with or without other divalent metal ions, B is gadolinium or manganese with or without other trivalent metal ions, and C is niobium, tantalum, or both, with the proviso that X and Y cannot be the same compound.

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**4,296,148**

## METHOD TO APPLY MULTIPLE LAYERS, INCLUDING AN ELECTRODE LAYER, ON A SINTERED OR PRE-SINTERED ION CONDUCTIVE SOLID ELECTROLYTE BODY

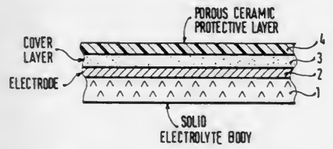
**Karl-Hermann Friese, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Nov. 29, 1979, Ser. No. 98,602**

**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852647**

**Int. Cl.³ B05D** *5/12*

**U.S. Cl. 427—125** **24 Claims**




1. Method of making a solid electrolyte ion conductive gas sensing element having

a solid ion conductive electrolyte body (1) having two surface portions, one of which is adapted for exposure to the gas to be sensed

a layer of electrode material (2) on one surface portion of the body;

a layer of electrode material on the second surface portion of the body;

a cover layer of porous ceramic material on the layer of electrode material on said one surface portion of the body; and

a cover layer of porous ceramic material on the layer of electrode material on said second surface portion of the body,

comprising the steps of

providing a pre-sintered ion conductive solid electrolyte body having said two surface portions,

applying a layer of the electrode material on one surface portion of said body;

applying a layer of the electrode material on the second surface portion of said body;

applying a cover layer of ceramic material which, when sintered, becomes porous, on the layer of electrode material on one surface portion of said body;

applying a cover layer of ceramic material which, when sintered, becomes porous on the layer of electrode material on the second surface portion of said body; and

then in one step, sintering the electrode layers and the cover layers, by heating the body with the electrode layers and the cover layers applied thereon to a temperature in which the sintering process of the electrode layers at least commences and the ion conductive body and the cover layer are completely sintered.

**4,296,149**

## MANUFACTURE OF ACICULAR COBALT-CONTAINING MAGNETIC IRON OXIDE

**Peter Rudolf, Neuhofen; Werner Steck, Mutterstadt; Helmut Jakusch, Frankenthal; Guenter Vaeth, Limburgerhof, and Christof Jaeckh, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jan. 29, 1980, Ser. No. 116,552**

**Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905351**

**Int. Cl.³ C01G** *49/06*

**U.S. Cl. 427—130** **1 Claim**

1. A process for the manufacture of acicular, magnetic iron oxide consisting of a core of gamma-iron(III) oxide surrounded by a ferrite shell which contains, based on the amount of magnetic material, from 0.2 to 12 percent by weight of cobalt(II) ions and from 0.1 to 15 percent by weight of iron(II) ions, which process comprises: suspending acicular gamma-iron(III) oxide in water, adding to said suspension an aqueous solution containing cobalt(II) ions, followed by the addition of an aqueous base to bring the pH to not less than 10, both additions being made at room temperature, thereafter introducing an aqueous solution containing iron(II) ions under an inert gas atmosphere, with continued stirring, and after the cobalt(II) hydroxide and iron(II) hydroxide has precipitated under the inert gas atmosphere, the solid product is filtered off, washed neutral with water and heated at from 100° to 200° C. for from one to seven hours, the steps of stirring, precipitating and filtering all taking place at room temperature.

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**4,296,150**

## TRANSPARENT IMAGE MARKING SHEET FOR PROJECTION SYSTEMS

**Norbert Mecke; Franz U. Schmitt; Karl-Heinz Schrader, and Heinke Blutschkau, all of Hanover, Fed. Rep. of Germany, assignors to Pelikan A.G., Hanover, Fed. Rep. of Germany**

**Filed Apr. 1, 1980, Ser. No. 136,397**

**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911798**

**Int. Cl.³ B05D** *3/10, 5/06;* **G02B** *1/10*

**U.S. Cl. 427—164** **12 Claims**

1. A transparent image sheet carrier for overhead-projection systems based upon a dark-tone colored field with image markings in bright-tone contrasting colors, comprising a sheet bearing a layer containing at least one acid-resistant dye for imparting said dark-tone color to said field, said dye being dischargeable in the locale of said image markings by discharge means with a simultaneous appearance in said image locale of said bright-tone contrasting color.

9. A method of preparing acid-resistant transparent image bearing sheets for overhead projection systems based upon bright-colored images upon a contrasting dark-tone colored field, which comprises the steps of:

providing a transparent substrate sheet bearing a dark-tone color field layer, said color being based upon a dischargeable transparent dark tone dye, and

forming localized images on said field by the application to said image locale of a discharge agent to locally discharge said field dye with the simultaneous appearance in said discharged image locale of the bright-colored contrasting image.

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**4,296,151**

## FLUORINATED POLYMERIC SURFACES

**Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Division of Ser. No. 968,713, Dec. 12, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,768**

**Int. Cl.³ B05D** *3/00, 3/12*

**U.S. Cl. 427—255.1** **10 Claims**

1. A process for treating a polymeric surface formed from (1) normally solid polymers of aliphatic mono-1-olefins and (2) elastomeric and resinous copolymers of conjugated dienes and vinyl-substituted aromatic compounds which comprises contacting said surface with a fluorine-containing gas under conditions and for a period of time sufficient to render said surface water-wettable and receptive to adherence of a second material selected from adhesives, coatings, paints, inks, decorations, and the like, and then contacting said surface with said second material under conditions which cause said second material to adhere to said fluorinated surface.



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**4,296,152**

## METHOD AND COMPOSITION FOR TREATING WOOD WITH PENTACHLOROPHENOL

**Roy P. Kirchner, Tallahassee, Fla., assignor to Idacon, Inc., Houston, Tex.**

**Filed May 8, 1980, Ser. No. 135,992**

**Int. Cl.³ C09D** *5/16, 5/18;* **B05D** *1/18, 3/00*

**U.S. Cl. 427—440** **2 Claims**

1. A method of impregnating wood with pentachlorophenol comprising the steps of preparing a solution of about 25 to 55 percent by weight of pentachlorophenol in an organic solvent comprising a petroleum fraction at least 50% of which will distill above 485° F., preparing a finely divided dispersion of the solution in water in which the pentachlorophenol content is from 0.1 to 10 percent by weight, and impregnating wood with the dispersion.

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**4,296,153**

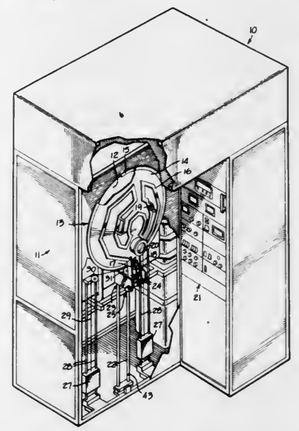
## VACUUM CHAMBER DOOR ASSEMBLY AND METHOD

**Gunard O. B. Mahl, San Francisco, Calif., assignor to CHA Industries, Menlo Park, Calif.**

**Filed May 15, 1978, Ser. No. 906,025**

**Int. Cl.³ B05D** *3/00*

**U.S. Cl. 427—444** **30 Claims**



1. An apparatus comprising a cabinet defining a vacuum chamber therein, and a door assembly movably mounted on said cabinet to normally close an opening to said vacuum chamber, the improvement comprising mounting means mounting said door assembly on said cabinet (1) for initial pivotal movement between a closed position normally closing the opening to said vacuum chamber and an open position pivoted outwardly away from said vacuum chamber for fully exposing said opening, and (2) for further movement, following and independent of said pivotal movement, to a position remote from said opening.

22. A method for loading and unloading a vacuum chamber defined in an apparatus with at least one article to be processed comprising the steps of

movably mounting a door assembly on said apparatus for movement between closed and opened positions relative to said chamber,

pivoting said door assembly away from said chamber,

moving said door assembly vertically downwardly to a remote, lowered position vertically below said chamber,

placing an article to be processed in said chamber,

moving said door assembly vertically upwardly to a raised position, and

pivoting said door assembly inwardly into closed and sealed relationship with respect to said chamber.

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**4,296,154**

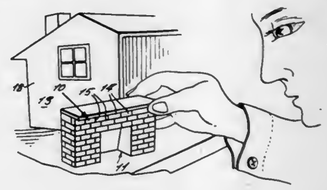
## STRIP BRICK FACING MATERIAL

**Robert B. Ibberson, Gingerbread Hill, Arlington, Vt. 05250**

**Filed Feb. 8, 1980, Ser. No. 120,004**

**Int. Cl.³ B44F** *9/04*

**U.S. Cl. 428—15** **3 Claims**



1. A simulated brick facing for application to a supporting member including individual strips, each simulating a layer of brick, at least one longitudinal groove along at least one side of each strip simulating the horizontal, recessed mortar layer between layers of brick, transverse grooves simulating vertical, recessed mortar bonds between side-by-side bricks, said grooves defining raised lands simulating the visible faces of individual bricks, side walls of both said longitudinal and transverse grooves being entirely substantially perpendicular to the lands and the groove bottoms and being entirely free of any undercuts therein into the body of the simulated bricks, said individual strips having planar undersurfaces adapted to be applied one above the other to the supporting member to represent a brick structure.

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**4,296,155**

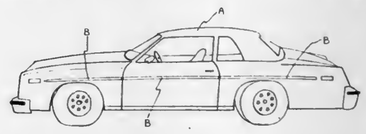
## OVERCOATED DECORATIVE MOULDING

**Ciro N. Madonia, 1390 Beaufort Dr., Burlington, Ontario; Christopher Hatzikelis, R.R. 1, Palgrave, Ontario, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, all of Canada**

**Filed Oct. 16, 1979, Ser. No. 85,276**

**Int. Cl.³ B32B** *3/02, 31/30*

**U.S. Cl. 428—31** **6 Claims**



1. An elongated decorative moulding for protecting vehicle bodies from minor impacts, said decorative moulding comprising:

(a) an extruded strip of pliable material having a symmetrical lens shaped cross section with substantially flat first surface and an impact-absorbing outwardly convex second-surface spanning said first surface;

(b) adhesive means carried by said first surface and adapted to fasten said first surface to a vehicle body;

(c) a decorative strip having two major surfaces and two

minor edge surfaces, one major surface being attached to said impact-absorbing second surface, the other major surface having a decorative material thereon, said decorative material being susceptible to weathering at least at the edge surfaces of said decorative strip; and

(d) a transparent weather-resistant acrylic monomer coating overlying at least the edge surfaces and the portion of said decorative strip immediately adjacent each edge surface thereof in sealing relation therewith and connected in sealing relation with the portion of said extruded strip immediately adjacent said decorative strip.

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**4,296,156**

## MULTILAYER FILM INCLUDING A POLYURETHANE

**Stanley Lustig, Park Forest, and Stephen J. Vicik, Darien, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 106,501**
**Int. Cl.³ B32B** *27/40;* **C08G** *18/42;* **B65D** *81/34*
**U.S. Cl. 428—35** **16 Claims**

**1**. A flexible puncture resistant biaxially oriented coextruded multilayer film having a thickness of from about 2.0 to about 3.5 mils comprising at least one layer having a thickness of at least about 0.5 mil and consisting essentially of an aromatic polyurethane elastomer, said film having been subjected to a biaxial stretching in the range of from about 12 to about 18.

**7**. The multilayer film of claim **1**, wherein said film has a first outer layer of a heat sealable polymer; a first core layer connected to said first outer layer and serving as an oxygen barrier; a second core layer of said aromatic polyurethane connected to said first core layer; and a second outer layer connected to said second core layer of a biaxially orientable polymer which adheres to said aromatic polyurethane.

**10**. A flexible puncture resistant biaxially oriented coextruded multilayer film having a thickness of from about 2.0 to about 3.5 mils, comprising:

a first outer layer of ethylene vinyl acetate copolymer having a vinyl acetate content of from about 5% to about 18% by weight and having a melt flow of from about 0.2 to about 1.0 decigram per minute;

a first core layer of polyvinylidene chloride copolymer having at least about 50% by weight of a polymerized vinylidene chloride and containing a maximum of about 5% by weight of a plasticizer;

a second core layer of aromatic polyurethane elastomer having a thickness of at least about 0.5 mil; and

a second outer layer of ethylene vinyl acetate copolymer having a vinyl acetate content of from about 5% to about 18% by weight and a melt flow of from about 0.2 to about 1.0 decigrams per minute;

said film having been subjected to a biaxial stretching in the range of from about 12 to about 18.

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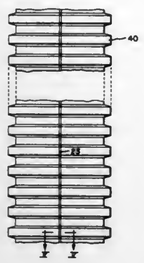
**4,296,157**

## TUBE WITH WEAKENED SIDE WALL SEGMENT

**Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125**

**Continuation-in-part of Ser. No. 966,678, Dec. 5, 1978, Pat. No. 4,202,530. This application Mar. 22, 1979, Ser. No. 22,671**
**Int. Cl.³ D03D** *21/00, 49/24*
**U.S. Cl. 428—36** **2 Claims**

**1**. A tubular apparatus to protect a cable from damage comprising an open-ended elongated hollow tube having a side wall with a continuous internal surface of a first thermoplastic material and of substantially uniform thickness throughout except for a narrow arcuate web segment of reduced thickness along substantially the entire length of the tube to create a line of weakness for access to the interior of said tube along a parting line defined by fracturing the arcuate web segment under an applied force, and a coextruded insert of a second thermoplastic material dissimilar to said first thermoplastic




material adhered to the exterior wall surface of said arcuate web segment to maintain said line of weakness.

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**4,296,158**

## INFORMATION CARRYING DISCS

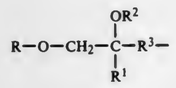
**Terry W. Lewis, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 1, 1980, Ser. No. 117,466**
**Int. Cl.³ B32B** *3/02*
**U.S. Cl. 428—65** **10 Claims**

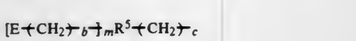
**1**. An information-carrying element comprising a substrate having adhered to at least one surface thereof a separate layer having a maximum thickness of from 1.0 to 100 μm and a circular or spiral pattern of grooves with or without modulations, depressions, protuberances, said separate layer comprising a polymer layer derived from 15 to 100% by weight of at least one polyacryloyl-containing heterocyclic wherein said heterocyclic is selected from the formulae:

$$A^1—Z—A^2 \quad (1)$$

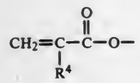
wherein $A^1$ and $A^2$ independently are alkoxyalkyl groups having terminal ethylenic unsaturation and having the formula



wherein R—O— is a monovalent residue of an aliphatic terminally unsaturated primary alcohol, ROH, formed by the removal of the active hydrogen from the primary —OH group, R having the formula:



wherein E is



c is an integer of from 1 to 6,

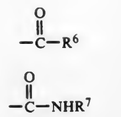
$R^1$ and $R^4$ are independently selected from hydrogen and methyl,

$R^5$ is an aliphatic group having from 1 to 15 carbon atoms, and no more than two catenary oxygen or carboxy groups, a valence of m+1.

m is an integer of from 1 to 5,

$R^2$ is selected from hydrogen and groups of the formula





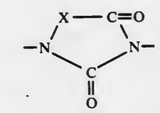
wherein

$R^6$ is selected from alkyl and alkenyl groups

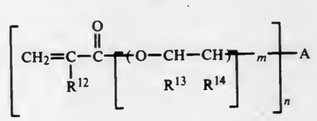
$R^7$ is an aliphatic or aromatic group of up to eight carbon atoms,

$R^3$ is an alkylene group of from 1 to 6 carbon atoms with up to one catenary oxygen atom, and

Z is a heterocyclic group of the formula



wherein X is a divalent group which is required to complete a 5- or 6-membered heterocyclic ring, or



(2)

wherein

$R^{12}$ and $R^{13}$ independently represent hydrogen or methyl,

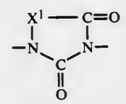
$R^{14}$ represents hydrogen, an alkyl group, or a phenyl group,

$R^{13}$ and $R^{14}$ together may represent trimethylene or tetramethylene group,

m represents a number of from 1 to 30,

n is 2 or 3, and

A represents a group of the formula



wherein $X^1$ represents the divalent radical necessary to complete a 5- or 6-membered heterocyclic ring group, said process comprising exposing said composition to radiation while the composition is in the presence of an atomosphere of at least 2% by volume of oxygen to polymerize said components having formula (1) or (2).

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**4,296,159**

## POLYURETHANE BACKED CARPET

**Randall C. Jenkines; Clyde G. Taylor; Robert B. Turner, and Donald H. Ridgway, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Sep. 29, 1980, Ser. No. 191,590**
**Int. Cl.³ B32B** *3/00, 3/26*
**U.S. Cl. 428—95** **40 Claims**

**15**. A carpet comprising (I) a primary backing; (II) a yarn tufted or woven through said primary backing thereby creating a yarn bundle on the underside of the resultant tufted or woven textile article and (III) a polyurethane composition applied to the underside thereby encapsulating the yarn bundles and adhering the yarn bundles to the primary backing; said polyurethane composition comprising the catalyzed reaction product of a mixture comprising

(A) a relatively high molecular weight polyether polyol having an average of from 2 to about 8 hydroxyl groups per molecule and an average hydroxyl equivalent weight of from about 500 to about 2200 or a mixture of such polyols;

(B) a relatively low molecular weight polyol having an average of from about 2 to about 8 hydroxyl groups per molecule and an average equivalent weight of from about 31 to about 230 or a mixture of such polyols;

(C) an organic polyisocyanate or polyisothiocyanate having an average of from about 2 to about 4 NCX (each X being independently O or S) groups per molecule or a mixture of such isocyanates or isothiocyanates; and

(D) an inorganic filler component; wherein:

(1) components (A) and (B) are present in quantities such that the ratio of the number of hydroxyl equivalents contributed by component (B) to the number of hydroxyl equivalents contributed by component (A) is from about 0.8:1 to about 5.5:1;

(2) components (A), (B) and (C) are present in quantities so as to provide an NCX/OH ratio of from about 0.95/1 to about 1.5/1; with the proviso that the NCX:OH ratio is sufficient to provide a tuft lock value of at least about 12 pounds and the edge curl value is not greater than about 4.1 centimeters at the particular ratio at which components (A) and (B) are employed and the particular equivalent weights at which components (A) and (B) are employed; and

(B 3) component (D) is present in quantities of from about 50 parts to about 300 parts per 100 parts by weight of liquid reactants; and

wherein (a) said carpet has a tuft lock of at least about 12 pounds (5.44 kg) and an edge curl of not greater than about 4.1 centimeters and (b) the time required for the catalyzed, filled, unfrothed polyurethane forming mixture to reach a Brookfield viscosity of 20,000 centipoise is greater than about 70 seconds measured from the time the catalyst is added to a mixture of the other components, said catalyst being added when the temperature of the uncatalyzed mixture is about 93° F., ±1° F.

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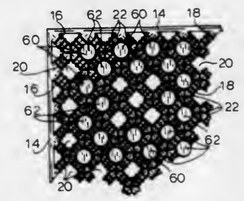
**4,296,160**

## METHOD OF ZONING GRATE SURFACES

**Nicholas G. Forlenza, Utica, N.Y., assignor to Mateflex/Mele Corporation, Utica, N.Y.**

**Filed Jan. 7, 1980, Ser. No. 110,132**
**Int. Cl.³ B32B** *3/12*
**U.S. Cl. 428—117** **3 Claims**




**1**. A method of delineating a zone on a surface of a thermoplastic grating, said grating comprising a molded thermoplastic sheet of a first color having an upper surface and a lower surface, a plurality of support legs on the lower surface and a plurality of square openings in the sheet communicating between upper and lower surfaces, the sheet portions between said square holes being bars defining the edges of adjacent holes, which comprises; inserting in those openings within said zone a removable closure member adapted to interlock with the grating and close the openings, said member having a second color which is visually distinguishable from the first color, said member comprising a cylinder having a first closed end and a second end, and expanded flange portions on each of said first and second ends, said flange portions flaring toward the mid-section of the cylinder shaped member, said interlocking occurring when the flanges frictionally engage the bars.

**4,296,161**

## DRY-FORMED NONWOVEN FABRIC

**Paul H. Kaiser, Glenolden; Rudolf Neuenschwander, Swarthmore, both of Pa., and Henry J. Norton, Wilmington, Del., assignors to Scott Paper Company, Philadelphia, Pa.**

**Continuation of Ser. No. 93,526, Nov. 13, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,235**

**Int. Cl.³ B32B** *5/14*

**U.S. Cl. 428—171** **13 Claims**

1. A dry-formed nonwoven fibrous web including a fiber composition which is at least 50%, by weight, wood pulp fibers less than about 0.635 cm (¼ inch) in length with 25% or more of the fiber composition in the web, by weight, being kraft wood pulp fibers, and under 50%, by weight, reinforcing fibers intermixed with the wood pulp fibers throughout the web structure; an embossment in the web providing a plurality of compressed, densified valley regions and less-dense high loft regions, said web including no more than about 5.1 g/m² (3.0 lbs per ream of 2,880 ft.²) of a binder and having a cross machine direction wet tensile strength of at least about 0.107 Kg/cm (0.6 lbs./inch).

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**4,296,162**

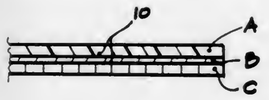
## WALLCOVERINGS

**Raymond W. Jean, 90 LaSalle St., New York, N.Y. 10027**

**Continuation-in-part of Ser. No. 886,512, Mar. 14, 1978, Pat. No. 4,205,110. This application Dec. 13, 1979, Ser. No. 103,211**

**Int. Cl.³ B32B** *7/00, 15/04, 15/20*

**U.S. Cl. 428—213** **3 Claims**




1. Flexible, unitary, multi-layer surface wallcovering material consisting of an outer layer of opaque vinyl having a thickness of 3 to 5 mils, a second layer of aluminum foil having a thickness of 0.00025 to 0.005 inches, a backing layer of material selected from the group consisting of paper, fabric, confill and scrim, and an adhesive layer between said first and second layers and said second and backing layers, wherein said adhesive is continuous and co-extensive with each adjacent layer such that said layers are laminated together to form a unitary composite structure.

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**4,296,163**

## FIBROUS COMPOSITE HAVING ELASTICITY

**Shingo Emi, and Noritsugu Saiki, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan**

**Filed Jul. 20, 1979, Ser. No. 59,238**

**Claims priority, application Japan, Aug. 1, 1978, 53-93094; Jan. 16, 1979, 54-2165**

**Int. Cl.³ B32B** *7/02*

**U.S. Cl. 428—212** **10 Claims**

1. A fibrous composite comprising a coalesced assembly of

(A) a sheet-like mesh structure composed of fibers of a synthetic elastomeric polymer, the individual fibers being interconnected in irregular spaced-apart relationships thereby forming a number of meshes of different shapes and sizes, said mesh structure having

(1) a recovery ratio after 10% stretch of at least 70% in two arbitrarily selected, mutually perpendicular directions on the plane of said mesh structure;

(2) a weight of 10 to 100 g/m²; and

(3) a fiber density (Fd) of 3 to 100, in which the fiber density (Fd) is calculated in accordance with the following equation:

$$Fd=\tfrac{1}{2}(a+b) \quad (1)$$

wherein a is the number of fibers which cross a straight line formed by connecting two arbitrary points 2 mm apart from each other on the plane of the sheet-like mesh structure (A), and b is the number of fibers which cross a straight line formed by connecting two arbitrary points 2 mm apart from each other on a straight line at right angles to the straight line referred to above with regard to the number of fibers (a); and

(B) a mat-, web- or sheet-like fibrous structure composed of short or long fibers, said fibrous structure having a recovery ratio after 10% stretch of less than 50% in at least one arbitrarily selected direction.

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**4,296,164**

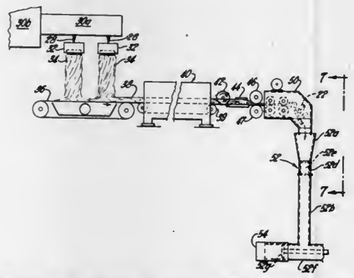
## FIBROUS GLASS BLOWING INSULATION AND PROCESS

**Richard S. Bemis, Granville, and Daniel A. McCartan, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Continuation of Ser. No. 52,518, Jun. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 930,946, Aug. 4, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,954**

**Int. Cl.³ B32B** *17/00*

**U.S. Cl. 428—219** **21 Claims**



1. Blowing insulation comprising fibrous glass prisms, approximate cubes, and flakes of various thicknesses, formed by delamination of columns at random upon handling, the columns having been cut from a generally laminated blanket of bonded glass fibers in such a manner that a maximum dimension of each column initially extends in the direction of a minimum dimension or thickness of the blanket, and the blowing insulation having a product of conductivity (k) and density (d) of less than 0.27 in a blown condition, where (k) is measured in terms of British thermal units/(hour)(square foot)(degree Fahrenheit/inch) at 75 degrees Fahrenheit mean temperature and (d) is measured in terms of pounds per cubic foot (less than 5.37 in a blown condition, where (k) is measured in terms of calories/(hour)(square centimeter)(degree Celsius/centimeter) at 24 degrees Celsius mean temperature and (d) is measured in terms of kilograms per cubic meter).

18. A continuous process of making blowing insulation comprising continuously forming glass fibers from molten glass, spraying the fibers with a thermosetting resin, continuously collecting the sprayed fibers on a moving conveyor to form a continuous generally laminated fibrous glass blanket, conveying the blanket through an oven to cure the binder, cutting the blanket longitudinally into a plurality of strips and cutting the strips generally transversely of but at an angle other than a right angle to their longitudinal edges into columns in such a manner that a maximum dimension of each column initially extends in the direction of a minimum dimension or thickness of the blanket and the maximum dimension of each column is several times greater than either of two other dimensions measured at right angles to the maximum dimension, and delaminating the columns by subjecting them to further handling to effect the breaking up thereof at random into smaller prisms, approximate cubes, and flakes of various thicknesses.



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**4,296,165**

## ANTISTATIC NATURAL AND SYNTHETIC TEXTILE MATERIALS WHICH HAVE BEEN TREATED WITH SALTS OF ORTHOPHOSPHORIC OR POLYPHOSPHORIC ACID

**Sarwan K. Kakar, Flat Rock; Frank R. Kappler, Wyandotte, and John J. Cramer, Grosse Ile, all of Mich., assignors to The Diversey Corporation, Northbrook, Ill.**

**Continuation of Ser. No. 899,130, Apr. 24, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 53,824**

**Int. Cl.³ D06M** *3/16, 5/00, 11/08*

**U.S. Cl. 428—264** **11 Claims**

1. An antistatic synthetic textile material or blend of natural and synthetic textile materials impregnated with an antistatic amount of an antistatic agent consisting essentially of at least one of

(A) a neutral, ionically-bonded ammonium salt of an orthophosphoric acid,

(B) a neutral, ionically-bonded ammonium salt of a polyphosphoric acid,

(C) a neutral, ionically-bonded mixed ammonium and alkanolamine salt of orthophosphoric acid in which the alkanolamine is a 2 or 3 carbon atom alkanolamine or a mixture thereof and

(D) a neutral, ionically-bonded mixed ammonium and alkanolamine salt of polyphosphoric acid in which the alkanolamine is a 2 or 3 carbon atom alkanolamine or a mixture thereof.

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**4,296,166**

## AIR FILTER OF POLYURETHANE MESH CONTAINING CARBON ADSORBENT

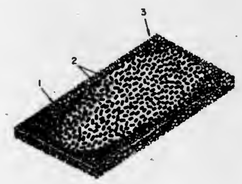
**Fumiichi Ogino, Kawanishi, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Sep. 25, 1979, Ser. No. 78,717**

**Claims priority, application Japan, Oct. 9, 1978, 53-124411**

**Int. Cl.³ B32B** *5/16*

**U.S. Cl. 428—283** **7 Claims**




1. Air cleaning filter element which comprises at least two sheets of three dimensional mesh-structured elastic-flexible webs prepared by selective hydrolysis of a polyurethane foam having 3 mm to 10 mm thickness as superimposed, said webs containing 9 to 31 air spaces per 25 linear millimeters, and an activated carbon adsorbent having a BET specific surface area of 500 to 2000 m²/g and a grain size of 1 to 5 mm in diameter, said adsorbent being deposited in an amount between 200 and 2500 grams per square meter and bonded to and between the webs with an amount of adhesive agent.

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**4,296,167**

## COMPOSITIONS FOR USE IN SEAL COATS

**Marcel Ceintrey, Anse de Kerjegu, 29120 Combrit, France**

**Continuation-in-part of Ser. No. 64,742, Aug. 8, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,750**

**Claims priority, application France, Aug. 18, 1978, 78 24231**

**Int. Cl.³ B32B** *7/00*

**U.S. Cl. 428—284** **11 Claims**

1. Seal coat for a structure comprising: (a) a binding layer deposited on said structure; and (b) a reinforcement layer comprising a non-woven material of synthetic fibres impregnated with a binder comprising a complex of a modified epoxy resin and a polyureide, which is the reaction product of a first component comprising a liquid epoxy resin and a blocked polyisocyanate prepolymer, with a second component comprising an aliphatic or cycloaliphatic polyamine, said binder covering the surface of said seal coat.

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**4,296,168**

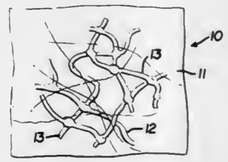
## PADDING SHEET FORMED OF A MIXTURE OF FIBERS BONDED AT THEIR INTERSECTIONS

**Jere B. Ambrose, 5645 Lakeshore, Holland, Mich. 48423**

**Filed Feb. 19, 1980, Ser. No. 122,134**

**Int. Cl.³ D04H** *1/58*

**U.S. Cl. 428—288** **1 Claim**




1. In a relatively thick, dense, non-woven fiber matted padding formed of a mixture of hair-like fibers bonded together at their intersections, the improvement comprising:

said fibers including cotton or other synthetic fibers and a minor proportion of a relatively low heat softening point thermo-plastic material which is shredded to provide fine fibers of thermo-plastic material, said fine fibers of thermo-plastic material randomly mixed within the over all mixture, said thermo-plastic fibers being formed of polypropylene, said polypropylene fibers being about 20–22 percent by weight compared with the total of the other fibers in the mixture;

said thermo-plastic material fibers each being randomly oriented within the mixture and being bonded by moving the mixture through an elongated furnace at about 450°–525° F. for heat softening the thermo-plastic material fibers to the other fibers upon which they form overlapping contact, to thereby randomly bond the fiberous mixture together without a separate bonding additive, wherein the padding is substantially free of conventional bonding resins.

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**4,296,169**

## WALLBOARD HAVING IMPROVED DRYING RATE DUE TO PLURAL CONTACTING FIBER NETWORKS

**Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Feb. 4, 1980, Ser. No. 118,332**

**Int. Cl.³ B32B** *5/08, 5/12, 5/26, 13/02*

**U.S. Cl. 428—298** **6 Claims**

1. A board comprising: two sheets of paper spaced apart and bonded to a core of inorganic cementitious material, said core having a network of dispersed glass monofilaments jack-strawed into a three-dimensional water transmitting network extending between its surfaces, and at least one of said layers of paper having a network of dispersed glass monofilaments jack-strawed into a water transmitting network that extends

between its major surfaces with said network in said paper being in water transmitting contact with said network of said core.

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**4,296,170**

## FIREPROOF LAMINATES

**Takashi Ohashi, Iruma; Toru Okoyama, Sagamihara, and Katsuhiko Arai, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

**Filed Mar. 6, 1980, Ser. No. 127,669**
**Claims priority, application Japan, Mar. 6, 1979, 54/26042**
**Int. Cl.³ B32B** *5/20*
**U.S. Cl. 428—313** **11 Claims**

1. A fireproof laminate comprising a urethane modified polyisocyanurate foam as a core material produced by reacting an organic polyisocyanate with a polyol in the presence of an isocyanate trimerization catalyst, a blowing agent and other additives, and a surface material piled on at least front surface of said core material, which comprises:

(1) using an aluminum foil with a thickness of not less than 0.015 mm as a front surface material for said core material, said front surface material being united with said core material by self-adhesion of said foam;

(2) using, as said polyol for the formation of said urethane modified polyisocyanurate foam, at least one low molecular weight diol (hereinafter referred to as A-group diol) selected from the group consisting of (a) compounds having the general formula

$$HO\text{-}(CH_2CH_2O)_n\text{-}H,$$

wherein n is 2, 3 or 4, (b) compounds having the general formula

$$HO\text{-}(CH_2CHO)_n\text{-}H,$$
$$\quad\quad\quad

alloy coating formed on a surface of said substrate by a process of depositing small particles on said substrate, said metal alloy consisting of 78–97.5% by weight of chromium, at least two elements selected from the group consisting of molybdenum, nickel and cobalt in the combined proportion of 2–20% by weight, and 0.5–2% by weight of a scavenger element.

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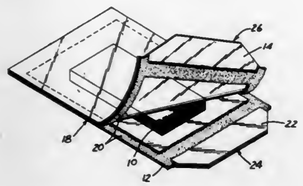
**4,296,179**

## FRANGIBLE BONDING USING BLUSH LACQUER

**Charles R. Wardwell, 559 Oak St., Winnetka, Ill. 60093**

**Division of Ser. No. 482,436, Jun. 24, 1974, Pat. No. 3,938,659.**
**This application Oct. 24, 1975, Ser. No. 625,506**
**Int. Cl.³ B32B** *9/06;* **C09J** *7/02;* **A61B** *17/06*
**U.S. Cl. 428—498** **3 Claims**




1. A product with frangible bonding including the combination of a paper substrate having internal bonds bonding it together internally, and a frangible bonding system, said frangible bonding system comprising a bonding agent in the form of a dried blush lacquer bonded to said substrate by interlayer bonds, and heat seal material for bonding said blush lacquer to a surface, said heat seal material having internal bonds bonding it together internally and being bonded to said blush lacquer by interlayer bonds, said dried blush lacquer being formed of film-forming resin containing voids, the film-forming resin forming cohesive internal bonds of said blush lacquer, said voids making said cohesive internal bonds of said blush lacquer weaker than the internal bonds of said substrate and said heat seal material and the interlayer bonds between said blush lacquer and said substrate and between said blush lacquer and said heat seal material.

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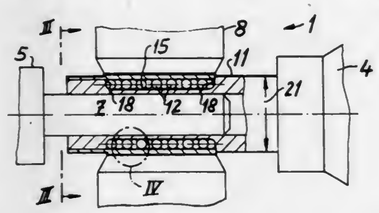
**4,296,180**

## PROCESS FOR THE PRODUCTION OF METALLIC FORMED MEMBERS

**Siegfried Rhau, Nuremberg, and Adolf Weber, Neunkirchen, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany**

**Filed Nov. 19, 1979, Ser. No. 95,545**
**Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852657**
**Int. Cl.³ B21B** *00/00;* **F42B** *13/48*
**U.S. Cl. 428—558** **14 Claims**




1. In a process for the production of a formed member, including discrete particles embedded in a metallic matrix, the improvement comprising: arranging said particles intermediate a metallic basic support member and a metallic outer casing; embedding said particles in said basic support member and said outer casing through round cold forging of said outer casing, and having forging wedges which extend along and over all of said particles concurrently work over the full length of said outer casing in conformance with the length of the particle arrangement along the axial direction of said formed member during rotation of said formed member.

2. A formed member comprising discrete particles embedded in a metallic matrix including a metallic basic support member and a metallic outer casing, with said particles being embedded in said basic support member and in said outer casing.

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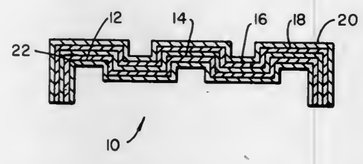
**4,296,181**

## PLATING METHOD AND STRUCTURE

**Samuel A. Nehra, 12 Lake Shore La., Grosse Pointe Shores, Mich. 48236**

**Filed Jan. 16, 1980, Ser. No. 112,468**
**Int. Cl.³ C23C** *7/00*
**U.S. Cl. 428—626** **4 Claims**




1. A plated article having a reactive surface constructed of one of plastic, resin, aluminum, steel and zinc, comprising a cleaned article surface, a flame sprayed tin zinc metal coating which is over 50% tin by weight and four or more mils thick adhering to the cleaned article surface and chrome metal plating over the sprayed metal surface including copper cyanide, bright copper, semi-bright nickel, bright nickel and chrome layers.

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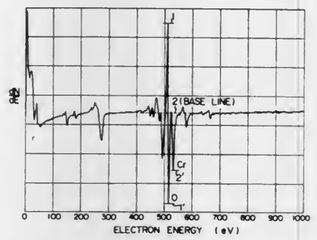
**4,296,182**

## CAN COMPOSED OF ELECTROLYTICALLY CHROMATED STEEL

**Hiroshi Matsubayashi, Kamakura; Michiko Tsurumaru, Tokyo; Makoto Horiguchi, Fujisawa; Hiroshi Ueno, Yokosuka, and Yoichi Kitamura, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan**

**Filed May 1, 1979, Ser. No. 35,333**
**Claims priority, application Japan, May 8, 1978, 53-53819; Dec. 13, 1978, 53-153202**
**Int. Cl.³ B65D** *7/00;* **C25D** *11/38;* **C23C** *17/00;* **B32B** *15/08*
**U.S. Cl. 428—629** **4 Claims**




1. A can at least a part of which is made of an electrolytically chromated steel sheet having a chromium-containing surface layer consisting of a layer of metallic chromium and a layer of chromium oxide, the thickness of the metallic chromium layer being from 20 to 300 mg/m² and the thickness of the chromium oxide layer being 5 to 50 mg/m² based on the amount of chromium, said steel sheet having a surface such that when it is degreased in acetone for 1 minute and analyzed by an Auger electron spectrometer at an incident electron accelerating voltage of 3 KeV, a modulation voltage of 3 V, a modulation frequency of 12 to 20 KHz and a degree of vacuum of at least $6\times10^{-8}$ torr, the ratio of the peak-peak distance ($O_{P\text{-}P}$) of $KL_{2,3}L_{2,3}$ of oxygen to the base-peak distance ($Cr_{B\text{-}P}$) of $L_3M_{2,3}M_{4,5}$ of chromium in the resulting Auger electron spectrum satisfies the following relation:

$$6.5 \geqq (O_{P\text{-}P})/(Cr_{B\text{-}P}) \geqq 1.5.$$



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**4,296,183**

## AL-SN BASE BEARING ALLOY AND COMPOSITE

**Keiiti Iwahana; Yoshimi Mathuda, and Kenichiro Futamura, all of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan**

**Filed Apr. 2, 1980, Ser. No. 136,638**
**Int. Cl.³ B32B** *15/04*
**U.S. Cl. 428—653** **6 Claims**

1. An Al-Sn base bearing alloy consisting essentially of 3:5 to 25 wt.% of Sn; 0.1 to 1.0 wt.% of Cr; 0.5 to 9 wt.% in total of one or more members selected from the group consisting of Pb, Bi, In and Cd; and the remainder is Al.

3. A bearing material which is made by applying said bearing alloy as claimed in claim 1 to a backing steel sheet by pressure welding.

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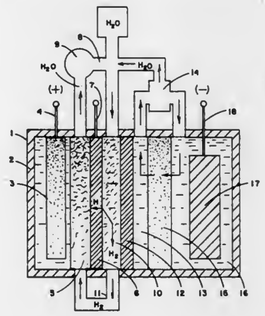
**4,296,184**

## ELECTROCHEMICAL CELL

**John Z. O. Stachurski, 220 Kaymar Dr., Amherst, N.Y. 14150**

**Filed Jan. 3, 1980, Ser. No. 109,241**
**Int. Cl.³ H01M** *12/04*
**U.S. Cl. 429—14** **3 Claims**




1. A method of operating an electrochemical cell as a galvanic cell or as an electrolytic cell, said cell comprising

a housing, a semipermeable membrane dividing the housing into two chambers, first and second, said first chamber containing protogenous ion-conducting liquid and a positive electrode, said second compartment containing an aprotic, ion-conducting liquid and also containing a negative electrode which corrodes when exposed to the protogenous liquid, said protogenous liquid being partly soluble in the aprotic liquid;

said method preventing the corrosive protogenous liquid from reaching said negative electrode, comprising the steps of

subdividing the second chamber by means of a porous partition into two compartments, one adjacent to said membrane, and the other containing the negative electrode;

flowing the aprotic liquid, free of the protogenous liquid, into the compartment containing the negative electrode;

flowing the aprotic liquid across the porous partition away from the negative electrode to prevent the protogenous liquid present in the aprotic liquid from reaching the negative electrode;

flowing said aprotic liquid from the porous partition and between it and the semipermeable membrane and into the drying means, in order to remove the protogenous substance which gets into the aprotic liquid while it is in contact with the semipermeable membrane,

flowing aprotic liquid back to the negative electrode compartment.

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**4,296,185**

## COATING FOR LITHIUM ANODE, THIONYL CHLORIDE ACTIVE CATHODE ELECTROCHEMICAL CELL

**Vincent O. Catanzarite, 7044 Mira Vista, Las Vegas, Nev. 89120**

**Continuation-in-part of Ser. No. 53,988, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 840,521, Oct. 11, 1977, Pat. No. 4,170,693. This application Apr. 25, 1980, Ser. No. 143,719**
**The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.**
**Int. Cl.³ H01M** *6/14*
**U.S. Cl. 429—48** **16 Claims**

1. An electrochemical cell comprising:

(a) a cathode current collector;

(b) an anode mechanically spaced from said cathode current collector;

(c) an ionically conductive electrolyte in physical contact with said anode and cathode current collector, said electrolyte consisting of a solute dissolved in a solvent that also performs the function of an active cathode depolarizer;

(d) a coating contiguous to said anode, said coating consisting of a compound in the cyanoacrylate family.

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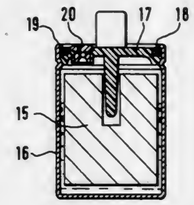
**4,296,186**

## TWO PART PRESSURE RELIEF VALVE

**Franz J. Wolf, Bad Soden-Salmunster, Fed. Rep. of Germany**

**Continuation of Ser. No. 715,463, Aug. 18, 1976, abandoned. This application Jul. 13, 1979, Ser. No. 57,358**
**Int. Cl.³ B65D** *51/16;* **F16K** *15/14;* **H01M** *2/12*
**U.S. Cl. 429—54** **7 Claims**




1. In combination, a sealing lid of plastic, a container subject to super-atmospheric internal pressure such as a capacitor or battery, said lid having a peripheral groove with elastomeric sealing material therein engaged by the container, said lid having a transverse opening therethrough, and a pressure relief valve molded directly in said opening comprising:

(a) a one piece valve housing of the same material as said sealing material, with the inner surface of the opening fitting firmly around the housing, the valve housing having an axial length substantially equal to the axial length of the opening, means defining a chamber in said housing including an annular valve seat, an axially opening conically upwardly flaring inlet communicating with said valve seat, an axially oriented outlet communicating with said chamber remote from said valve seat, and being eccentric relative to the axis of said valve seat, said chamber defining means comprising means defining a chamber surface conically outwardly flaring from said valve seat

and means defining wall means being formed in one piece with said means defining said flaring chamber surface and generally parallel to the plane of said valve seat and spaced therefrom,

(b) a spherical valve body in said valve chamber engaging an imperforate portion of said wall means and being partially embedded in said wall means, and engaging said valve seat when said valve is closed,

(c) said wall means being elastically strained when said valve is closed and forcing said valve body against said valve seat, and

(d) means for preventing axial shifting of said valve housing relative to said lid comprising an inwardly directed collar intermediate the ends of said opening engaging an annular recess in the housing, the surface of the opening and collar fitting firmly around the housing.

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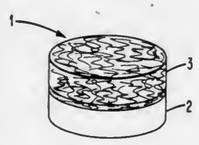
**4,296,187**

## INTEGRATED CARBON/INSULATOR STRUCTURE AND METHOD FOR FABRICATING SAME

**John E. Barnes, Wakefield; Franz Goebel, Sudbury, and William T. McHugh, Westwood, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jun. 13, 1980, Ser. No. 159,266**
**Int. Cl.³ H01M** *6/14*
**U.S. Cl. 429—105** **11 Claims**




1. An integrated carbon/insulator structure for an electrochemical cell, comprising:

a porous substrate of an electrically-nonconductive material and having a predetermined thickness; and

a porous layer of a carbon material supported by the porous substrate, said layer of carbon material having a predetermined thickness and further having a portion thereof at its interface with the porous substrate permanently diffused into and interlocking with a portion of the porous substrate thereby to form an integrated structure with the porous substrate.

7. An electrochemical cell comprising:

a metal housing;

an electrochemical system within the metal housing and including an electrolytic solution and a battery stack exposed to said electrolytic solution, said battery stack comprising:

an anode; and

an integrated carbon/insulator structure adjacent to the anode, said integrated carbon/insulator structure comprising:

a porous substrate of an electrically-non-conductive material adjacent to the anode and having a predetermined thickness; and

a porous layer of a carbon material supported by the porous substrate, said layer of carbon material having a predetermined thickness and further having a portion thereof at its interface with the porous substrate permanently diffused into and interlocking with a portion of the porous substrate thereby to form an integrated structure with the porous substrate.

**4,296,188**

## CD(SE,TE) ALLOY PHOTOVOLTAIC MATERIALS

**Gary Hodes; David Cahen, and Joost Manassen, all of Rehovot, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel**

**Filed Mar. 27, 1980, Ser. No. 134,665**
**Claims priority, application Israel, Jul. 7, 1979, 57908**
**Int. Cl.³ H01M** *6/36*
**U.S. Cl. 429—111** **8 Claims**

2. A photoelectrochemical cell comprising a photoelectrode, an electrolyte, and a counterelectrode, said photoelectrode comprising a Cd(Se,Te) alloy comprising about 30 mole % to about 90% mole % CdSe and wherein said electrolyte comprises a $S/S^{=}$ redox couple.

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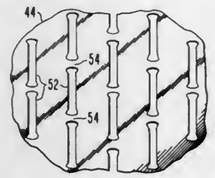
**4,296,189**

## COLOR PICTURE TUBE HAVING IMPROVED SLIT TYPE SHADOW MASK AND METHOD OF MAKING SAME

**Henry W. Kuzminski, Ephrata, Pa., assignor to RCA Corporation, New York, N.Y.**

**Division of Ser. No. 41,998, May 24, 1979. This application Nov. 17, 1980, Ser. No. 207,781**
**Int. Cl.³ G03C** *5/00*
**U.S. Cl. 430—5** **2 Claims**




1. In a method of making a color picture tube having a slit type apertured mask, wherein the slit apertures are arranged in columns and the apertures in each column are separated by webs, said mask being formed by coating a metal sheet with a photosensitive material, exposing the photosensitive material through a photomaster having an apertured pattern thereon and thereafter etching the metal sheet to form apertures therein, the improvement comprising

exposing said metal sheet through a photomaster having aperture images thereon which have greater width at the ends thereof than at the central portions of the aperture images,

whereby upon etching said metal sheet apertures are generated therein which are more nearly rectangular than are apertures formed in a mask which was exposed by a photomaster having rectangular aperture images.

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**4,296,190**

## PHOTOSENSITIVE MATERIAL FOR USE IN ELECTROPHOTOGRAPHY WITH A RADIATION CURED BINDER RESIN

**Haruo Hasegawa; Hiroyoshi Taniguchi, and Takao Igawa, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 809,795, Jun. 24, 1977, abandoned, which is a continuation of Ser. No. 627,544, Oct. 31, 1975, abandoned. This application Jun. 11, 1979, Ser. No. 47,229**
**Int. Cl.³ G03G** *5/04*
**U.S. Cl. 430—57** **14 Claims**

1. An electrophotographic plate, comprising:

an electrically conductive substrate;

a first photoconductive layer coated over said substrate and having a thickness of from 0.1$\mu$ to 10$\mu$, said first photoconductive layer consisting essentially of a mixture of an inorganic or organic first photoconductor and a resin that has been cured by ionizing radiation, said first photoconductive layer having been prepared by applying onto said substrate a liquid dispersion or solution of said first photoconductor and from 0.2 to 50 percent by weight, based on the weight of said first photoconductor, of a radiation-curable resin selected from the group consisting of non-modified maleic anhydride-type unsaturated polyester, silicone-modified, urethane-modified or acrylic urethane-modified maleic anhydride-type unsaturated polyester, polyester having maleyl group therein, acrylic polymer having maleyl group therein, epoxide resin having maleyl group therein, acrylic polymer having acryloyl group as a side chain thereof, telomerized polyester acrylate, telomerized polyamide acrylate, epoxyacrylate, urethane acrylate, silicone acrylate, and reactive allyl group-containing resin, and then applying ionizing radiation to said first photoconductive layer, in a solvent-free state, until said radiation-curable resin has been cured; and

a second photoconductive layer coated over said first photoconductive layer and having a thickness of from 3$\mu$ to 50$\mu$, said second photoconductive layer consisting essentially of an organic second photoconductor and a resin binder therefor, said second photoconductive layer having been prepared by applying a liquid dispersion or solution of said organic second photoconductor and said resin binder in an organic solvent onto said first photoconductive layer having said cured resin therein and then evaporating the solvent.



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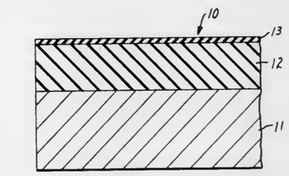
**4,296,191**

## TWO-LAYERED PHOTORECEPTOR CONTAINING A SELENIUM-TELLURIUM LAYER AND AN ARSENIC-SELENIUM OVER LAYER

**Richard L. Jacobson, Roseville, and Timothy T. Lin, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jun. 16, 1980, Ser. No. 159,878**
**Int. Cl.³ G03G** *5/082*
**U.S. Cl. 430—57** **14 Claims**




1. A composite photoreceptor member including a support layer and only two layers of photoconductive materials, said two layers including:

a. a first layer of a vitreous selenium and tellurium composition carried on the support layer,

b. and a second layer comprising vitreous arsenic-selenium composition overlaying said layer of vitreous selenium-tellurium composition wherein said layer of selenium-tellurium composition is about 40 to 80 microns in thickness and said layer of arsenic-selenium composition is about 0.5 to 5.0 microns in thickness.

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**4,296,192**

## ELECTROSTATOGRAPHIC TONER COMPOSITION

**Robert J. Gruber, Pittsford; Steven B. Bolte, Webster; John F. Knapp, Fairport; Dale R. Ims, Webster, and Richard B. Lewis, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jul. 2, 1979, Ser. No. 54,203**
**Int. Cl.³ G03G** *9/00*
**U.S. Cl. 430—109** **6 Claims**

1. An improved electrostatographic toner composition comprised of a resin, and a colorant, the resin consisting essentially of a polyether polymer resulting from the reaction product of 50 mol percent of a dihydric phenol, containing about 10 to 25 mol percent of a polyalkylene ether glycol selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol, di-1,2-polylene glycol, tri-1,2-propylene glycol, and tetra 1,2-propylene glycol, and about 40 mol percent to about 25 mol percent of epichlorohydrin.

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**4,296,193**

## PHOTOSENSITIVE POSITIVE DIAZO MATERIAL WITH COPOLYMER OF ACRYLAMIDE AND DIACETONEACRYLAMIDE AND A PROCESS FOR DEVELOPING TO FORM COLOR RELIEF IMAGE

**Takeo Moriya, Kawagoe, and Toshio Yamagata, Urawa, both of Japan, assignors to Kimoto & Co., Ltd., Tokyo, Japan**

**Filed Jun. 20, 1980, Ser. No. 161,513**
**Claims priority, application Japan, Jan. 16, 1980, 55-3407**
**Int. Cl.³ G03C** *1/60, 1/71, 1/74, 5/34*
**U.S. Cl. 430—149** **7 Claims**

1. A photosensitive material comprising a base material and a layer of a positive image forming, alkali developable photosensitive composition wherein, after exposure to light, the light exposed areas are removable by washing, and said layer is formed on said base material, said photosensitive composition comprising (A), 100 parts by weight of a water soluble resin binder containing at least 60 weight % of acrylamide-diacetoneacrylamide copolymer, the copolymerization of acrylamide to diacetoneacrylamide being 8:2–5:5 and the average polymerization degree being 300–1500, and (B), 5–20 parts by weight of a water-soluble, photosensitive diazonium salt.

4. A process for forming a color-developed positive relief image comprising: forming on a base material, a layer of a positive-image forming, alkali developable photosensitive composition comprising (A), 100 parts by weight of a water soluble resin binder containing at least 60 weight % of acrylamidediacetoneacrylamide copolymer, the polymerization ratio of acrylamide and diacetoneacrylamide being 8:2–5:5 and average polymerization degree being 300–1500, and (B), 5–20 parts by weight of a water-soluble, photosensitive diazonium salt;

exposing said photosensitive material to form an image thereon; and

developing said exposed photosensitive material by contact with an alkali developer.

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**4,296,194**

## POSITIVE-WORKING LIGHT SENSITIVE DIAZO MATERIALS WITH AZO DYE

**Terence Harper, Leeds, and Allen P. Gates, Knaresborough, both of Great Britain, assignors to Vickers Limited, London, England**

**Continuation of Ser. No. 895,070, Apr. 10, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,190**
**Claims priority, application United Kingdom, Apr. 12, 1977, 15144/77**
**Int. Cl.³ G03C** *1/60, 1/54*
**U.S. Cl. 430—176** **10 Claims**

1. A positive working light-sensitive composition which exhibits a colour change upon exposure to light, which composition comprises in admixture (a) a first component which is an azo dye formed by reacting a p-aminobenzene diazonium salt and a compound selected from 3-hydroxy-2-naphthoic acid and acid derivatives thereof and (b) a second component which includes a non-light sensitive polymer and and o-quinone diazide and/or a diazonium compound and which, on exposure to light, produces an acidic light decomposition product which is capable of reacting with the azo dye to produce a material having a colour different to that of the azo dye.

**4,296,195**

## TWO-SHEET DIFFUSION TRANSFER ASSEMBLAGES AND PHOTOGRAPHIC ELEMENTS

**John F. Bishop, and Wayne A. Bowman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 1, 1980, Ser. No. 174,420**
**Int. Cl.³ G03L** *5/54, 7/00, 1/76*
**U.S. Cl. 430—215** **23 Claims**

**1.** In a photographic element comprising a support having thereon, in order, a polymeric acid layer, a timing layer and at least one unexposed photosensitive silver halide emulsion layer having associated therewith a dye image-providing material,

the improvement wherein a primer layer is located between said polymeric acid layer and said timing layer, said primer layer comprising:

(a) a mixture of gelatin and cellulose nitrate; or

(b) a mixture of an acrylic acid copolymer and an acrylic acid terpolymer, said acrylic acid copolymer comprising 60 to 90 weight percent of recurring units derived from acrylic acid and 10 to 40 weight percent of recurring units derived from an alkyl acrylate or alkyl methacrylate, wherein said alkyl group has 1 to about 10 carbon atoms, said acrylic acid terpolymer comprising 5 to 40 weight percent of recurring units derived from acrylic acid, 10 to 40 weight percent of recurring units derived from acrylonitrile and 20 to 85 weight percent of recurring units derived from vinylidene chloride, said acrylic acid copolymer comprising from about 40 to about 90 weight percent of said mixture; or

(c) an acrylic acid copolymer comprising 5 to 30 weight percent of recurring units derived from acrylic acid and 70 to 95 weight percent of recurring units derived from an alkyl acrylate or alkyl methacrylate, wherein said alkyl group has 1 to about 10 carbon atoms.

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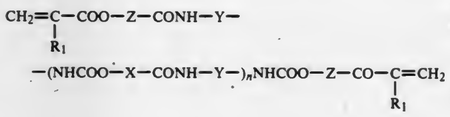
**4,296,196**

## PHOTOPOLYMERIZABLE MIXTURE IN A TRANSFER ELEMENT

**Raimund J. Faust, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

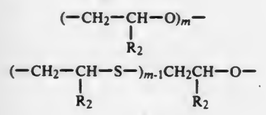
**Division of Ser. No. 41,741, May 23, 1979, Pat. No. 4,250,248. This application Jun. 27, 1980, Ser. No. 163,597**
**Int. Cl.³ G03C** *5/00, 1/68*
**U.S. Cl. 430—271** **12 Claims**

**1.** A light-sensitive transfer material, comprising a flexible temporary support and a thermoplastic photopolymerizable layer which layer comprises a polymeric, thermoplastic binder which is soluble or at least swellable in aqueous-alkaline solutions, a polyurethane with two terminal acrylic acid or methacrylic acid ester groups which is capable of addition polymerization, and a photoinitiator, said polyurethane corresponding to Formula I



wherein

—X— is one of the groups

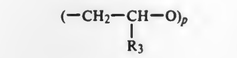


—$C_kH_{2k}$—O— and

—$C_rH_{2r-2}$—O—

Y is a saturated aliphatic or cycloaliphatic group with 2 to 12 carbon atoms, and

Z is



and wherein

$R_1$, $R_2$, and $R_3$ are hydrogen atoms or methyl groups,

n is a whole number from 2 to 15,

m is a whole number from 2 to 4,

p is a whole number from 1 to 4,

k is a whole number from 2 to 12, and

r is a whole number from 4 to 12.

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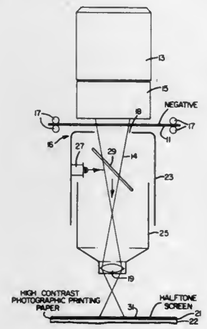
**4,296,197**

## HALFTONE PRINTING SYSTEM

**Robert W. Stevie, Ft. Thomas, Ky., assignor to Innovative Photograhic Enterprises, Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 803,256, Jun. 3, 1977, abandoned. This application Nov. 1, 1979, Ser. No. 90,475**
**Int. Cl.³ G03F** *5/00;* **G03C** *5/00*
**U.S. Cl. 430—300** **5 Claims**




**1.** A method of making a printing plate comprising focusing light into a gray scale image onto photographic printing paper through a halftone screen and irradiating said paper through said screen with light in addition to the light focused into said gray scale image, said printing paper being selected to have a sufficiently high contrast rating to produce dots which are uniformly black with no shades of gray over the area of each dot in the resulting halftone image produced on said printing paper, assembling said halftone print with cold type to make up a page, making a negative of the assembly of said cold type and said halftone print, and making a printing plate from said negative.

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**4,296,198**

## PHOTOGRAPHIC PROCESS USING A THIN FLEXUOUS LAYER AND REFLECTIVE LAYER

**Franz Trautweiler, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**Filed Jul. 2, 1979, Ser. No. 54,044**
**Claims priority, application Switzerland, Jul. 7, 1978, 7421/78**
**Int. Cl.³ G03C** *1/84, 11/14*
**U.S. Cl. 430—403** **18 Claims**

**1.** In a process for the production of a photographic print including the steps of providing a composite photographic material comprising a transparent support layer carrying photosensitive material, forming the print image including at least the steps of exposing the photosensitive material and developing the exposed photosensitive material, and then adhering the image-bearing composite material to a main support with the developed photosensitive material disposed between said support layer and said main support, the improvement comprising providing said support layer as a flexuous layer having a thick-

ness of from about 5μ to 50μ and having a light reflective layer adhered to said main support with said developed photosensitive layer being in contact with said light reflective layer.

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**4,296,199**

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jun. 19, 1980, Ser. No. 161,237**
**Claims priority, application Japan, Jun. 19, 1979, 54-77152**
**Int. Cl.³ G03C** *1/40*
**U.S. Cl. 430—551** **22 Claims**

**1.** A silver halide photographic light-sensitive material containing a colorless photographic cyan color-forming coupler having, in a position for coupling with an oxidation product of an aromatic primary amine developing agent, a coupling-off group represented by the formula (I)

$$—O—(R_1S)_x(R_2S)_yR_3 \quad (I)$$

wherein $R_1$ and $R_2$ each represents an unsubstituted straight or branched chain alkylene group; $R_3$ represents a substituted or unsubstituted alkyl group, a cycloalkyl group, an aryl group, or a heterocyclic group; x represents a positive integer; and y represents 0 or a positive integer.

**16.** A light-sensitive material as in claim **1**, wherein said coupler is present in a layer containing a p-substituted phenol derivative or in a layer adjacent to a layer containing a p-substituted phenol derivative.

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**4,296,200**

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

**Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Aug. 12, 1980, Ser. No. 177,337**
**Claims priority, application Japan, Aug. 13, 1979, 54-102963**
**Int. Cl.³ G03C** *1/40*
**U.S. Cl. 430—551** **18 Claims**

**1.** A silver halide photographic light-sensitive material containing a colorless photographic cyan color forming coupler having, in a position for coupling with an oxidation product of an aromatic primary amine developing agent, a coupling-off group represented by the formula (I):

$$—O—R—S—R_1 \quad (I)$$

wherein R represents a substituted alkylene group containing from 1 to 18 carbon atoms or an unsubstituted or substituted alkenylene group, and said alkylene group or alkenylene group may be straight or branched chain; and $R_1$ represents a substituted or unsubstituted alkyl group, an alkenyl group, an aralkyl group, an aralkenyl group, a cycloalkyl group, or a heterocyclic group and said alkyl group, alkenyl group, aralkyl group and aralkenyl group may be straight chain or branched chain; and said heterocyclic group being connected with a thio group at the position of a carbon atom of the heterocyclic group.

**15.** A light-sensitive material as in claim **1**, wherein said coupler is present in a layer adjacent to a layer containing a p-substituted phenol derivative or in a layer containing a p-substituted phenol derivative.

**4,296,201**

## METHODS FOR THE DETECTION OF ANTIMITOCHONDRIAL AND ANTINUCLEAR ANTIBODIES

**Wolfgang Ax, Marburg an der Lahn; Hartwig W. Bauer, Munich, and Hans-Harald Sedlacek, Marburgh an der Lahn, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany**

**Filed Aug. 16, 1979, Ser. No. 67,003**
**Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 2836362**
**Int. Cl.³ G01N** *33/54*
**U.S. Cl. 435—7** **2 Claims**

**1.** A method for testing for the presence of anti-mitochondrial antibodies which comprises coating air-dried unfixed hypernephroma cells with an isotonic salt solution of the antibody to be tested, incubating the coated cells for 10 minutes to 2 hours in a moist chamber, then washing the cells with an isotonic salt solution and coating them with a fluorescently-labeled antibody directed against antigen-determinants of the antibody sought for, incubating the cells for 10 minutes to 2 hours in a moist chamber, washing at least once with demineralized water, and examining the cells by immunofluorescence microscopy, whereby fluorescence of the mitochondria of the hypernephroma cells is considered a positive finding of said anti-mitochondrial antibodies.

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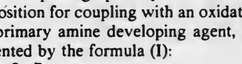
**4,296,202**

## DIAGNOSTIC COMPOSITION FOR THE DETECTION OF LEUKOCYTES AND CHROMOGENS USEFUL THEREIN

**Dieter Berger, Viernheim; Franz Braun, Rimbach; Günter Frey, Ludwigshafen; Werner Güthlein, Mannheim-Neckarau, and Manfred Kuhr, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Fed. Rep. of Germany**

**Filed Aug. 2, 1979, Ser. No. 63,211**
**Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836644**
**Int. Cl.³ C12Q** *1/29*
**U.S. Cl. 435—29** **36 Claims**

**1.** Diagnostic composition for the detection of leukocytes in body fluids, comprising an absorbent carrier impregnated with a buffer substance and a chromogen, wherein the chromogen is an azo dyestuff ester of the formula



wherein

A is a five- or six-membered heterocyclic radical of up to 2 hetero ring atoms selected from nitrogen, sulfur and oxygen, and wherein the heterocyclic ring may be substituted with at least one member of the group selected from halogen, lower alkyl and lower alkoxy; or

A is phenyl substituted by at least one member of the group selected from lower alkyl, lower alkoxy, nitro, sulphanato and acylamino;

B is benzene, naphthalene or quinoline, optionally substituted with one or two radicals selected from sulphanato, lower alkoxy and lower alkoxypoly-alkyleneoxy;

R is a carboxylic acid residue or an amino acid or peptide residue having a nitrogen protective group; and

n is 1 or 2.

**4,296,203**

## XANTHOMONAS BIPOLYMER FOR USE IN DISPLACEMENT OF OIL FROM PARTIALLY DEPLETED RESERVOIRS

**William C. Wernau, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.**

**Filed Nov. 15, 1977, Ser. No. 851,757**
**Int. Cl.³ C12P *19/06*; C12N *15/00, 1/20*; C12R *1/64***
**U.S. Cl. 435—104** **9 Claims**

1. A process for preparing a pyruvate-free xanthan-containing fermentation broth suitable for the preparation of mobility control solutions used in oil recovery which comprises aerobically fermenting a pyruvate-free xanthan producing strain of *Xanthomonas campestris* in an aqueous nutrient medium whose ingredients comprise a carbohydrate, a source of assimilable nitrogen and trace elements and continuing the fermentation until at least about 100 ppm of pyruvate-free xanthan is present in the broth.

7. A process for preparing deacetylated pyruvate-free xanthan suitable for use in the recovery of oil from an oil-bearing subterranean formation by injecting a mobility control solution containing said deacetylated pyruvate-free xanthan into said formation which comprises

(a) fermenting by aerobic propagation a pyruvate-free xanthan producing strain of *Xanthomonas campestris* in an aqueous nutrient medium whose ingredients comprise a carbohydrate, a source of assimilable nitrogen and trace elements until at least about 100 ppm of pyruvate-free xanthan is present in the broth,

(b) adjusting the pH of the whole or filtered broth to about 9, allowing the resultant broth to stand at room temperature for at least 10 minutes and optionally neutralizing, and

(c) adding sufficient water miscible precipitating agent to cause precipitation of said deacetylated pyruvate-free xanthan and separating said precipitated deacetylated pyruvate-free xanthan therefrom.

9. A biologically pure culture of the microorganism *Xanthomonas campestris*, having the identifying characteristics of ATCC 31313, said culture being capable of producing pyruvate-free xanthan in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

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**4,296,204**

## USE OF MOTIONLESS MIXER AS CELL CULTURE PROPAGATOR

**Roy Grabner, Blue Bell, Pa., and Edward L. Paul, Chatham Township, Union County, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 872,289, Jan. 25, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,641**
**Int. Cl.³ C12M *7/00***
**U.S. Cl. 435—235** **2 Claims**

1. A process for propagating cells comprising attaching cells to the surfaces of a motionless mixer element disposed within a housing, the motionless mixer element comprising an assembly of parallel sheets shaped to provide a plurality of channels which converge and diverge to form a plurality of mixing cells, each cell being formed and bounded by the juncture of two inlet channels which converge toward each other at about right angles in one plane, and two outlet channels which diverge from each other at about right angles in another plane, the planes being rotated about 90° with respect to each other, supplying nutrients into the mixer and

maintaining the cells under conditions which permit cell growth and division,

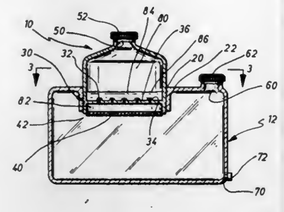
and harvesting the cells.

**4,296,205**

## CELL CULTURE AND CONTINUOUS DIALYSIS FLASK AND METHOD

**Dharmvir S. Verma, 5831 Rutherglen, Houston, Tex. 77096**

**Filed Feb. 22, 1980, Ser. No. 123,552**
**Int. Cl.³ C12M *3/04*; C12N *5/00***
**U.S. Cl. 435—240** **12 Claims**




1. In a flask for the growth of cells or the preparation of conditioned media comprising a tissue culture chamber, a dialysis chamber and a dialysis or millipore membrane separating said chambers, the improvement comprising a tissue culture shelf separating the tissue culture chamber into a tissue culture compartment and a dialysis compartment, said shelf having one or more perforations, wherein the edges of said tissue culture shelf surrounding said perforations are upraised to form tray-like areas so that cells cultured on said shelf do not pass over said edges and through said perforations.

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**4,296,206**

## IRREVERSIBLE ANTI-GLUCOCORTICOIDS

**S. Stoney Simons, Jr., Bethesda, Md., assignor to United States of America, Washington, D.C.**

**Filed Apr. 30, 1980, Ser. No. 145,350**
**Int. Cl.³ C12N *5/00***
**U.S. Cl. 435—240** **5 Claims**

1. In a method for inhibiting glucocorticoid action, the improvement which comprises the use as the inhibitor of a compound selected from the group consisting of cortisol-21-mesylate and dexamethasone-21-mesylate.

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**4,296,207**

## ANTIFREEZE PROTECTION OF ROADS

**Werner Siegmund, Mannheim, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany**

**Filed Jun. 5, 1980, Ser. No. 156,747**
**Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923939; Oct. 24, 1979, 2943447; Nov. 16, 1979, 2946823**
**Int. Cl.³ C08G *18/14***
**U.S. Cl. 521—53** **15 Claims**

1. An admixture for the surface layer of a road, comprising:

a first and primary component thereof, being a granular, inorganic material, grains thereof being porous, in which the pore volume is at least 30 degrees, the pores containing a first antifreeze substance;

a second and secondary component, being a granular, organic materal, the grains thereof also being porous and having a pore volume in excess of 30 degrees, the pores containing a second antifreeze substance;

at least one of the components being made hydrophobic through the addition of a silicon-organic compound; and

the grains of said first and second component being embedded in a bituminous, or asphalt, binder.

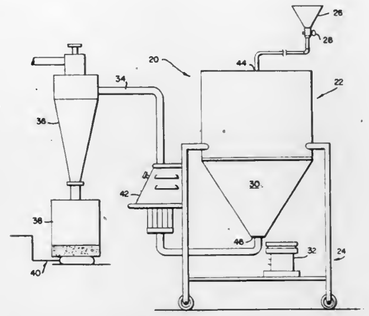


**4,296,208**

## METHODS OF PREPARING POLYIMIDES AND POLYIMIDE PRECURSORS

**John Gagliani, and Usman A. K. Sorathia, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.**

**Filed Sep. 12, 1980, Ser. No. 186,670**
**Int. Cl.³ C08J *9/00*; C08G *18/16***
**U.S. Cl. 521—77** **18 Claims**




1. A method of preparing a dry, foamable, particulate precursor which can be converted into a polyimide by heating it, said method comprising the steps of: forming a primary diamine, 3,3',4,4'-benzophenonetetracarboxylic acid ester solution by dissolving one or more such diamines and the aforesaid acid or an anhydride thereof in a lower alkyl alcohol, atomizing said solution, and drying the droplets obtained by atomizing the diamine, ester solution with a heated gas.

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**4,296,209**

## MATERIAL AS SPONGIOSACEMENT WITH EFFERVESCENT REABSORPTIVE EFFECT

**Dobrivoje Tomic, Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 961,346, Nov. 17, 1978, abandoned. This application Mar. 26, 1980, Ser. No. 133,973**
**Int. Cl.³ C08K *3/10, 3/24, 5/11*; C08L *33/12***
**U.S. Cl. 521—85** **2 Claims**

1. A cement mixture for use in surgical and therapeutic procedures in animals, comprising

(a) approximately 70% by weight polymethylmethacrylate as a cementitious substance,

(b) approximately 20% $CaCO_3$ as effervescent medium,

(c) approximately 10% $Na_2HPO_4.12H_2O$ as reabsorptive substance, and,

(d) phosphoric acid as an agent for activating said medium to cause said medium to effervesce whereby when said cement is mixed and applied to an animal bone, solid tissue and the like the effervescent effect and reabsorptive substance will produce voids in said cement prior to the curing of said cement in situ.

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**4,296,210**

## OPEN-CELL SHAPED ARTICLE MADE OF ACETALIZED POLYVINYL ALCOHOL AND PROCESS FOR ITS MANUFACTURE

**Wolfgang Zimmermann, Kelkheim; Hermann Schindler, Hofheim am Taunus, and Günther Pospich, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 26, 1980, Ser. No. 211,332**
**Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948508**
**Int. Cl.³ C08V *9/30***
**U.S. Cl. 521—85** **9 Claims**

1. An open-cell shaped article made of acetalized polyvinyl alcohol which is characterized in that the shaped article (a) consists of acetalized polyvinyl alcohol which, prior to acetalization, has an ester number of 50 to 270 mg of KOH/g and the 4% by weight aqueous solution of which has a viscosity of 4 to 50 mPa·s at 20° C., (b) has cells with diameters in the range of from 0.5 to 5 mm in uniform distribution and (c) contains a nucleic acid.

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**4,296,211**

## PROCESS FOR THE PRODUCTION OF POLY (POLYISOCYANATE-POLYOL-ALKALI METAL SILICATE) SOLID OR FOAMED PRODUCTS

**David H. Blount, 5450 Lea St., San Deigo, Calif. 92105**

**Division of Ser. No. 146,474, May 5, 1980, which is a continuation-in-part of Ser. No. 36,350, May 7, 1979, which is a continuation-in-part of Ser. No. 889,932, Mar. 27, 1978, which is a continuation-in-part of Ser. No. 663,924, Mar. 4, 1976, which is a continuation-in-part of Ser. No. 599,000, Jul. 7, 1975, Pat. No. 4,072,637, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Jan. 26, 1981, Ser. No. 228,083**
**Int. Cl.³ C08G *77/00***
**U.S. Cl. 521—154** **26 Claims**

1. The improved process for the production of poly(-polyisocyanate-polyol-alkali metal silicate) foamed products by mixing and reacting the following components:

(a) the improvement comprises of producing an emulsion of a polyol and alkali metal silicate, which contains only water molecules that are attached to the alkali metal silicate,

(b) an organic polyisocyanate or polyisothiocyanate.

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**4,296,212**

## ELASTOMERIC POLYURETHANE-POLYUREA POLYMER PREPARED FROM AN ORGANIC POLYISOCYANATE A POLYOL AND AN AROMATIC DIAMINE HAVING AT LEAST ONE OF THE ORTHO POSITIONS TO EACH AMINE LOWER ALKYL

**James H. Ewen, and Thomas R. McClellan, both of Seabrook, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Filed Aug. 27, 1980, Ser. No. 181,720**
**Int. Cl.³ C08G *18/14***
**U.S. Cl. 521—163** **11 Claims**

1. In an elastomeric polyurethane-polyurea polymer prepared by the catalyzed reaction of an organic polyisocyanate, a polyol and an extender mixture comprising an aromatic polyamine and a low molecular weight diol the improvement which comprises employing in said reaction, with said organic polyisocyanate

A. a polyol having a primary hydroxyl functionality of from about 2 to about 4 and a molecular weight of from about 1500 to about 12,000, and

B. an extender mixture comprising,

(i) an aromatic diamine wherein at least one of the positions ortho to each amine group of said diamine is substituted by a lower alkyl group, and

(ii) a low molecular weight diol provided that said aromatic diamine comprises from about 5 to about 45 percent by weight of said extender mixture with the balance of from about 55 to about 95 percent by weight comprising the diol extender, and

wherein the equivalent proportions of said polyol (A) to said extender mixture (B) is within the range of about 1:4 to about 1:50, and the ratio of isocyanate equivalents to the total active hydrogen equivalents of said polyol, said aromatic diamine, and said diol is from about 0.85 to about 1.35.

**4,296,213**

## POLYURETHANE FOAMS USING A POLYUREA POLYMER POLYOL

**Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 86,365, Oct. 17, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 202,892**

**Int. Cl.³ C08G** *18/14, 18/50, 18/32*

**U.S. Cl. 521—166** **11 Claims**

1. A polyurea polymer polyol made by the reaction of a hydroxyl-containing amine, a polyether polyol of about 3000 to 8000 molecular weight and an organic polyisocyanate wherein the ratio of moles of hydroxyl containing amine to moles of polyether polyol ranges from about 0.5 to 3.5 and the ratio of moles of active hydrogens to moles of isocyanate groups ranges from about 1.4 to 3.5.

6. A method for producing a polyurethane which comprises first making a polyurea polymer polyol by reacting a hydroxyl-containing amine, a polyether polyol and an organic polyisocyanate wherein the ratio of moles of hydroxyl containing amine to moles of polyether polyol ranges from about 0.5 to 3.5 and the ratio of moles of active hydrogens to moles of isocyanate groups ranges from about 1.4 to 3.5 and then reacting said polyurea polymer polyol with an organic polyisocyanate.

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**4,296,214**

## METHACRYLIC RESIN HAVING A HIGH SOLAR RADIANT ENERGY ABSORBING PROPERTY AND PROCESS FOR PRODUCING THE SAME

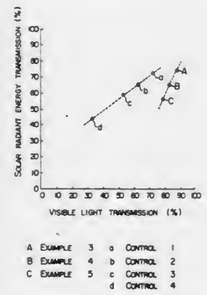
**Kazumasa Kamada; Yoshio Nakai, and Kazunori Abe, all of Ootake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan**

**Filed Apr. 11, 1980, Ser. No. 139,441**

**Claims priority, application Japan, Apr. 20, 1979, 54-49240**

**Int. Cl.³ C08K** *5/09, 5/52*

**U.S. Cl. 525—2** **22 Claims**




1. A methacrylic resin having a high solar radiant energy absorbing property wherein an organic compound (A) containing cupric ion in an amount of 0.01 to 5 parts by weight calculated as cupric ion and a compound (B) having at least one P—O—H bond in a molecule in an amount to be 0.1 to 10 mols per mol of the above mentioned organic compound (A) are contained per 100 parts by weight of a methacrylic resin selected from homopolymer of methyl methacrylate or copolymers of polymerizable unsaturated monomer mixture containing at least 50% by weight of a methyl methacrylate.

**4,296,215**

## METHOD TO THICKEN DISSOLVED THERMOSET RESINS

**Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.**

**Continuation of Ser. No. 928,691, Jul. 27, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,896**

**Int. Cl.³ C08L** *75/06, 67/06, 63/02*

**U.S. Cl. 525—28** **28 Claims**

1. A method of increasing the viscosity of a uniformly dispersed or solubilized composition comprising (A) at least 10 percent by weight of a polymerizable resin selected from the class consisting of a vinyl urethane resin and an unsaturated polyester resin which resin is curable to a thermoset resin and has a molecular weight of at least 500, and (B) up to 90% by weight of an ethylenically unsaturated monomer, which method comprises mixing into the composition an amount of at least 2% by weight of the composition of a polyisocyanate and a catalytic amount of a trimerization catalyst selected from the class consisting of quaternary ammonium hydroxides, quaternary ammonium acetates, quaternary ammonium formates, alkali metal acetates and alkali metal formates, and trimerizing the polyisocyanate in the composition.

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**4,296,216**

## THERMOPLASTIC RESIN COMPOSITION

**Hajime Sakano, Hirakata; Mikio Kodama, Takatsuki; Koichi Nakayama; Isao Yoshida, both of Amagasaki, and Atsunori Inoue, Takatsuki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan**

**Filed Mar. 5, 1980, Ser. No. 127,287**

**Int. Cl.³ C08L** *55/02, 77/00, 59/02, 59/04*

**U.S. Cl. 525—66** **1 Claim**

1. A thermoplastic resin composition consisting essentially of (A) at least one of polyamide resins and polyacetal resins, (B) at least one of aromatic monovinyl compound/vinyl cyanide copolymers comprising units of aromatic monovinyl compounds and units of vinyl cyanides in a weight ratio of 60:40 to 80:20 and having an intrinsic viscosity of 0.3 to 1.1 and (C) at least one of conjugated diene rubber/vinyl cyanide graft copolymers comprising units of conjugated diene rubbers in an amount of 5 to 45% by weight based on the weight of the graft copolymers in a weight proportion of the components (A), (B) and (C) being respectively 0.1–10:5–90:5–94.9.

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**4,296,217**

## AROMATIC POLYETHERSULPHONES HAVING —$OCH_2COR$ END GROUPS

**John Stuart-Webb, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Feb. 22, 1979, Ser. No. 14,249**

**Claims priority, application United Kingdom, Feb. 28, 1978, 7865/78**

**Int. Cl.³ C08G** *65/48*

**U.S. Cl. 525—390** **6 Claims**

1. An aromatic polyethersulphone containing repeat units of the general formula

—E—O—E′—O—

or, where E is the same as E′,

—E—O—

in which E is the residuum obtained by the removal of the halogen atoms of a dihalobenzenoid compound in which each halogen atom is activated by an —$SO_2$— group ortho or para thereto, and E′ is the residuum obtained by removal of the hydroxyl groups from a bisphenol; or where E is the same as E′, it is the residuum obtained by the removal of the halogen atom and the hydroxyl group from a halophenol in which the halogen atom is activated by an —$SO_2$— group ortho or para thereto, said polyethersulphone having from 3 to 20 end



groups of the formula —$OCH_2COR$ where R is alkyl or alkoxy, per 100 repeat units.

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**4,296,218**

## HEAT-CURABLE AND SOLVENT-SOLUBLE ESTER GROUP-CONTAINING POLYMER COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

**Shigeyoshi Hara, and Tateyoshi Yamada, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan**

**Division of Ser. No. 894,006, Apr. 6, 1978, Pat. No. 4,251,649, which is a division of Ser. No. 593,644, Jul. 7, 1975, Pat. No. 4,137,221. This application Apr. 23, 1980, Ser. No. 143,161**

**Claims priority, application Japan, Jul. 11, 1974, 49-78672; Sep. 30, 1974, 49-111649**

**Int. Cl.³ C08L** *67/02;* **C08J** *3/00*

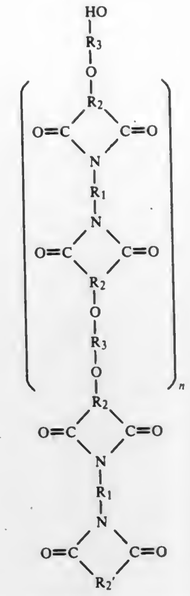
**U.S. Cl. 525—439** **16 Claims**

1. A process for producing a heat-curable and solvent soluble ester group containing polymer composition which comprises:

(1) reacting a highly polymerized linear aromatic polyester having an intrinsic viscosity ($\eta$), measured on an o-chlorophenol solvent at 35° C., of above 0.3 (component 1) with 10 to 70 mole percent, based on the total amount, in moles of dibasic acid contained in the polyester, of a diaryl carbonate (component 2) in the presence of a compound (component 3) containing at least two functional groups selected from the group consisting of (a) a carboxyl group or its functional derivatives, (b) a cyclic carboxylic anhydride group or its precursors, (c) a primary or secondary amino group, (d) an isocyanate group or its stabilized group or precursors, (e) an iminoacetic acid group or its functional derivatives, and (f) an hydroxyl group, to depolymerize the polyester and form a modified solvent-soluble low molecular weight polyester (component A′) in which at least 30 mole percent of the entire terminal groups are aryl carboxylate groups,

(2) mixing a monomeric or solvent soluble low molecular weight polymeric condensation product of at least two species of component 3 (component C) in which the main chain includes at least one linkage selected from the group consisting of amide, imide, hydantoin and ester linkages and at least 50 mole percent of the entire terminal groups and carboxyl groups or functional derivatives thereof, with component A′ to form a mixture (D), and

(3) (i) mixing or (ii) partially reacting the mixture (D) with a monomeric or polymeric solvent-soluble polyfunctional compound (component B) containing at least two reactive groups selected from the group consisting of hydroxyl, primary amino and secondary amino.



wherein $R_1$ is a group containing at least two carbon atoms, the nitrogen atoms of the imide rings being directly connected to different carbon atoms of the group $R_1$, $R_2$ is a group containing at least two carbon atoms, the carbonyl groups of the imide rings being directly connected to different carbon atoms of the group $R_2$, $R'_2$ is a group containing at least two carbon atoms and a carbon-carbon double bond, $R_3$ is an aromatic group, the oxygen atoms between the groups $R_2$ and $R_3$ being directly connected to different carbon atoms of the aromatic nucleus of the group $R_3$, and n is an integer of zero, 1 or larger than 1, the bisimide ether compound being soluble in an organic solvent having a boiling point not higher than 130° C. at normal temperature and under normal pressure.

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**4,296,219**

## BISMIDE-ETHER COMPOUNDS, COMPOSITIONS THEREOF, AND METHOD OF PRODUCING SAME

**Akio Takahashi; Yutaka Itoh; Motoyo Wajima; Hirosada Morishita, and Akio Nishikawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan**

**Filed Jan. 22, 1979, Ser. No. 5,233**

**Claims priority, application Japan, Mar. 31, 1978, 53-36592; Jun. 7, 1978, 53-67712**

**Int. Cl.³ C08G** *73/12*

**U.S. Cl. 525—488** **40 Claims**

1. A bisimide-ether compound having the general formula:

**4,296,220**

## METHOD FOR PREPARING VINYL ESTER RESINS

**Harold O. Seeburger; Ralph G. Beattie, and Violete L. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jun. 2, 1980, Ser. No. 155,882**

**Int. Cl.³ C08G** *8/32;* **C07C** *57/00, 69/54*

**U.S. Cl. 525—507** **11 Claims**

1. A process for preparing vinyl ester resins wherein a hydroxy phenolic compound is reacted in the presence of a basic catalyst with tertiary alkyl glycidyl ether and the resulting reaction product is dealkylated and esterified with an ethylenically unsaturated carboxylic acid.

**4,296,221**

## PROCESS AND APPARATUS FOR INTERMITTENT POLYMERIZATION AT ELEVATED PRESSURE

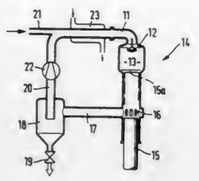
**Helmut Bauer, Basel, Switzerland, assignor to Maschinenfabrik Burckhardt AG, Basel, Switzerland**

**Filed Mar. 28, 1980, Ser. No. 135,122**

**Claims priority, application Switzerland, Apr. 26, 1979, 3960/79**

**Int. Cl.³ C08F** *2/34, 10/02*

**U.S. Cl. 526—87** **15 Claims**




1. A process for an intermittent polymerization comprising the steps of

supplying a substance to be polymerized in gaseous form in timed relation to a working zone of a pump or compressor volumetrically operable between two pressure stages;

thereafter compressing the substance in the working zone to a predetermined pressure and temperature; and

adding a polymerization catalyst to the working zone at the latest in an initial range of expansion of the substance in the working zone to effect polymerization.

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**4,296,222**

## MANUFACTURE OF POLY-α-OLEFINS

**Gerhard Staiger, Bobenheim-Roxheim, and Klaus Bronstert, Carlsberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Mar. 24, 1977, Ser. No. 780,764**

**Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616260**

**Int. Cl.³ C08F** *4/66, 10/06*

**U.S. Cl. 526—119** **8 Claims**

1. In a process for the manufacture of an α-olefin polymer by polymerizing one or more α-olefins at from 0° to 150° C. and from 1 to 100 atmospheres absolute by means of a catalyst system comprising (1) a titanium-containing component obtained from (1.1) a compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ having a maximum particle diameter of 2 mm and (1.2) an organic electron donor, containing one or more phosphorus, nitrogen and/or oxygen atoms, which has been milled with the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to form a complex compound, and (2) an aluminum-containing component consisting of a compound of the formula $Al(C_nH_{2n+1})_3$ or $Al(C_nH_{2n+1})_2Cl$ or a mixture of such compounds, n being, in each case, an integer from 2 to 6, with the provisos that the molar ratio of titanium contained in the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to the electron donor (1.2) is from 10:5 to 10:1 and the molar ratio of titanium contained in the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) to the aluminum-containing component (2) is from 10:5 to 10:300, the catalyst system employed being a system in the preparation of which the milling of the compound of the formula $TiCl_3.\frac{1}{3}AlCl_3$ (1.1) with the electron donor (1.2) has been carried out without assistants or additives in a vibratory ball mill with steel balls of from 6 to 60 mm diameter under a milling acceleration of from 30 to 70 $m.sec^{-2}$ for a period of from 10 to 70 hours at a temperature which is from 4° to 10° C. below the temperature at which the particles of the material being ground begin to agglomerate, the improvement wherein the titanium-containing catalyst component (1) of the catalyst system used is one which has been treated with from 0.2 to 2.0 parts by weight of (i) titanium tetrachloride per part by weight of the untreated catalyst component (1) and (ii) from 0.15 to 1.5 parts by weight of an ether and/or ester per part by weight of the untreated catalyst component (1) after milling and before the polymerization.

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**4,296,223**

## POLYMERIZATION OF OLEFINS

**Eugene Berger, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium**

**Continuation of Ser. No. 658,682, Feb. 17, 1976, abandoned, which is a continuation of Ser. No. 372,073, Jun. 21, 1973, abandoned. This application Oct. 8, 1980, Ser. No. 195,093**

**Claims priority, application Luxembourg, Jun. 22, 1972, 65587**

**Int. Cl.³ C08F** *4/02, 10/02*

**U.S. Cl. 526—125** **17 Claims**

1. A solid catalytic complex comprising the solid reaction product formed by reacting together

(A) at least one reagent selected from magnesium dichloride and magnesium dichloride hydrate; with

(B) at least one reagent which is a halogen-free titanium alkoxide containing $C_1$–$C_{20}$ organic radicals bonded to the metal via oxygen; and with

(C) at least one reagent which is an alkyl aluminium chloride having the general formula $AlR'_nX_{3-n}$ in which R' is a hydrocarbon radical containing 1 to 20 carbon atoms, X is a chloride and n is any number such that $1 \leqq n \leqq 2$.

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**4,296,224**

## PERFLUOROALKYL-ACR[METHACR]YLATE, HYDROXY-CHLOROPROPYL-ACRYLATE POLYMER

**Shosin Fukui, Shinsenrihigashi, and Tadashi Akazawa, Osaka, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan**

**Filed Sep. 26, 1979, Ser. No. 79,217**

**Claims priority, application Japan, Sep. 28, 1978, 53-119694**

**Int. Cl.³ C08F** *220/38, 220/30*

**U.S. Cl. 526—243** **6 Claims**

1. A water and oil repellent consisting essentially of a copolymer comprising units of (a) at least 25% by weight of at least one of perfluoroalkyl group-containing acrylates and methacrylates and of (b) from 0.1 to 10% by weight of at least one of 2-hydroxy-3-chloropropyl acrylate and methacrylate of the formula:

$$CH_2{=}CRCOOCH_2CH(OH)CH_2Cl$$

wherein R is hydrogen or methyl.

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**4,296,225**

## STABLE VINYL ACETATE AND AMINE MONOMER COPOLYMER EMULSIONS

**David Rhum, Old Lyme, Conn., assignor to Celanese Corporation, New York, N.Y.**

**Filed Jan. 4, 1980, Ser. No. 109,574**

**Int. Cl.³ C08F** *2/30, 2/24, 20/34*

**U.S. Cl. 526—260** **2 Claims**

1. A process for preparing a stable aqueous emulsion composition adapted for application as a wet abrasion-resistant paper coating binder which comprises simultaneously adding to an aqueous medium containing a vinyl polymerization catalyst a combination of copolymerizable monomer components comprising (1) between about 70–95 weight percent of vinyl acetate; (2) an aqueous solution of between about 0.5–10 weight percent of vinyl monomer containing an aliphatic amine-acid salt group; and (3) 0.5–20 weight percent of at least one other vinyl monomer, all based on total monomer weight; wherein the aqueous solution of amino-containing vinyl monomer is added as a separate feedstream.



**4,296,226**

## VINYL POLYMER WITH ACETYLACETOXY GROUPS, PROCESS FOR ITS MANUFACTURE AND AN AGENT OBTAINED THEREOF

**Helmut Braun, Kriftel; Helmut Rinno, Hofheim am Taunus, and Karl J. Rauterkus, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

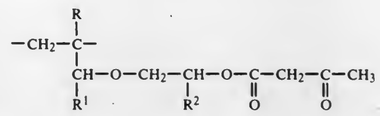
**Filed Jul. 9, 1980, Ser. No. 167,052**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927932**

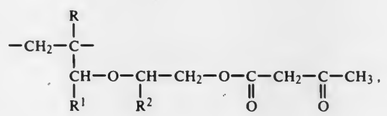
**Int. Cl.³ C08F** *16/38, 216/38*

**U.S. Cl. 526—316** **5 Claims**

1. A vinyl copolymer having acetylacetoxy groups, which contains units of formula (I)



and/or of formula (II)



in which R is a hydrogen atom or a methyl group, $R^1$ is a hydrogen atom or an alkyl group having 1, 2 or 3 carbon atoms, and $R^2$ is a hydrogen atom or a hydrocarbon radical having from 1 to 8 carbon atoms and optionally containing one or several oxygen atoms or a halogen atom.

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**4,296,227**

## CURABLE POLYETHER RESINS

**Harold O. Seeburger; George J. Atchison, and Violete L. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jan. 31, 1980, Ser. No. 117,154**

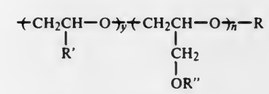
**Int. Cl.³ C08G** *65/32*

**U.S. Cl. 526—320** **9 Claims**

1. A curable polyether compound of theoretical molecular weight less than 60,000 of the formula $XA_m$ wherein:

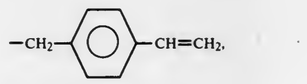
X is the residue left by the removal of m active hydrogen atoms from an initiator compound $XH_m$; and

a is a moiety of the formula



where:

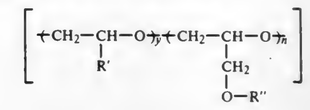
R is independently each occurrence selected from



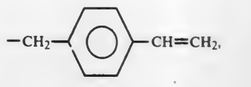
$-CH_2-CH{=}CH_2$ and hydrogen;

R' is independently each occurrence selected from hydrogen, halogen $C_{1-4}$ alkyl or haloalkyl and phenyl;

R'' is independently each occurrence a chain-terminating moiety selected from R, tertiary butyl, hydrogen, and a saturated or unsaturated ester functionality, or a chain-propagating moiety of the formula



and y and n are numbers from zero to 500 provided that in at least one occurrence of A n is at least one, and further provided that in at least one occurrence of A, R or R'' is



or $-CH_2-CH{=}CH_2$.

7. A curable mixture comprising Component (a) a compound of claim 1, and Component (b) an unsaturated reactive compound capable of curing with the compound of claim 1.

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**4,296,228**

## ROOM TEMPERATURE CURABLE COMPOSITIONS

**Ernst Innertsberger; Oswin Sommer; Erhard Bosch; Johann Müller, all of Burghausen, and Aügust Schiller, Marktl, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,230**

**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911301**

**Int. Cl.³ C08G** *77/04*

**U.S. Cl. 528—33** **10 Claims**

1. A curable composition which is stable under anhydrous conditions but when exposed to moisture at room temperature, cures to an elastomer comprising a diorganopolysiloxane having terminal condensable groups and a silicon compound containing acetoxy, tert-butoxy and SiC-bonded alkyl groups, in which at least a portion of the silicon compound containing acetoxy, tert-butoxy and SiC-bonded alkyl groups is obtained from the reaction of an alkyltriacetoxysilane with tert-butanol in the presence of aqueous acetic acid.

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**4,296,229**

## HOT-MELT POLYESTERIMIDE-POLYISOCYANATE ELECTRICAL COATING COMPOSITIONS

**Denis R. Pauze, Scotia, and Otto S. Zamek, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed May 30, 1980, Ser. No. 154,838**

**Int. Cl.³ C08G** *18/80, 18/42;* **C08F** *283/04*

**U.S. Cl. 528—45** **6 Claims**

1. A composition for hot-melt electrical wire coating comprising:

a high solids content resinous polyester-imide-polyisocyanate reaction product obtained by heating ingredients comprising

(a) an aromatic diamine;

(b) an aromatic carboxylic anhydride containing at least one additional carboxylic group;

(c) terephthalic acid or a reactive derivative thereof;

(d) a polyhydric alcohol having at least three hydroxyl groups;

(e) an alkylene glycol; and a small amount of

(f)(i) an alkylene glycol monoether or monoester;

(ii) a polyalkylene glycol monoether or monoester; or

(iii) a mixture of (i) and (ii),

until an acid number of lower than 6 to 7 is attained, and adding to the hot reaction product a blocked polyisocyanate in an

amount of 1 to 40 parts by weight per 100 parts by weight of the polyesterimide and blocked polyisocyanate.

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**4,296,230**

## POLYURETHANE COATINGS PRODUCED FROM (1) A POLYISOCYANATE MIXTURE OF POLYISOCYANATES FROM THE DIPHENOL METHANE SERIES AND A POLYHYDROXY POLYETHER CONTAINING AT LEAST ONE TERTIARY AMINE NITROGEN WITH (2) A POLYOL IN A TWO COMPONENT COATING SYSTEM

**Jōsef Pedain, Cologne; Walter Uerdingen, Bergisch-Gladbach, and Hans-Jürgen Müller, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 747,568, Dec. 6, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,165**

**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555535**

**Int. Cl.³ C08G** *18/76*

**U.S. Cl. 528—67** **15 Claims**

1. A process for the production of coatings by coating substrates of any type with a coating composition of which the binder consists essentially of a mixture of:

(a) a polyisocyanate component and

(b) at least one organic polyhydroxyl compound, wherein the polyisocyanate component (a) is a reaction product obtained from:

(i) a polyisocyanate mixture which, in addition to from about 20 to 80%, by weight, of 2,4'-diisocyanato diphenyl methane, contains a total of from about 80 to 20%, by weight of 2,2'-diisocyanato diphenyl methane, 4,4'-diisocyanato diphenyl methane, and optionally, higher nuclear polyisocyanates of the diphenyl methane series, and

(ii) a polyhydroxy polyether containing at least one tertiary amine nitrogen atom and having an average molecular weight of from about 500 to 10,000 or a polyhydroxy polyether mixture containing at least one such polyhydroxy polyether and having an average molecular weight of from about 500 to 10,000, components (i) and (ii) having been reacted in an NCO:OH equivalent ratio of from about 300:1 to 10:1 to form a reaction product containing free isocyanate groups and urethane groups.

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**4,296,231**

## CURABLE EPOXIDE RESIN MIXTURES

**Ferdinand Gutekunst, Riehen, and Rolf Schmid, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

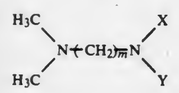
**Filed May 1, 1980, Ser. No. 145,406**

**Claims priority, application Switzerland, May 8, 1979, 4307/79**

**Int. Cl.³ C08G** *59/64*

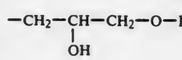
**U.S. Cl. 528—93** **10 Claims**

1. A curable mixture comprising a polyepoxide compound having on average more than one epoxide group in the molecule, and optionally a polycarboxylic acid, an anhydride or a polyhydric phenol as the curing agent, the said mixture additionally containing a compound of the formula I



(I)

in which m is a number from 3 to 10, X is a group of the formula



in which R is an alkyl having 4 to 10 C atoms or a phenyl which is unsubstituted or substituted by chlorine, bromine or alkyl or alkoxy each having 1 to 3 C atoms, and Y is a hydrogen atom or has the meaning defined for X, as the curing catalyst or as the curing accelerator for curing the epoxide compound with di- or poly-carboxylic acids or anhydrides of di- or poly-carboxylic acids or with polyhydric phenols.

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**4,296,232**

## PROCESS FOR PREPARING POLYARYLATES IN THE PRESENCE OF A DIPHENYL ETHER COMPOUND AND A CATALYST

**Louis M. Maresca, Belle Mead; Peter J. Gill, North Brunswick, and Mitchell H. Berger, Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

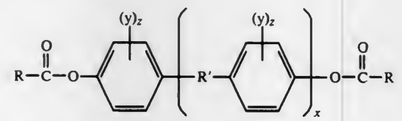
**Filed Aug. 27, 1979, Ser. No. 70,039**

**Int. Cl.³ C08G** *63/18, 63/28, 63/30, 63/66*

**U.S. Cl. 528—179** **19 Claims**

1. A process for preparing a polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/gm, which process comprises reacting:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene, or cycloalkylidene radical having up to and including 9 carbon atoms, O S, SO, $SO_2$, CO, x is 0 or 1; with

(b) at lease one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of a diphenyl ether compound, at a temperature of from about 260° to about 350° C. and in the presence of a catalytically effective amount of a magnesium catalyst.

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**4,296,233**

## CONJUGATE OF AMINO SUGAR-STEROID HORMONE

**Satoru Enomoto, Fujisawa; Kiro Asano, Kukizaki, and Hiromitsu Tanaka, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

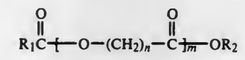
**Filed Mar. 29, 1979, Ser. No. 25,073**

**Claims priority, application Japan, Apr. 14, 1978, 53-44034**

**Int. Cl.³ C07J** *17/00*

**U.S. Cl. 536—5** **5 Claims**

1. A conjugate of an amino sugar and a steroid hormone having the formula:



wherein $R_1C$ is a radical of a carboxyl group containing amino sugar selected from the group consisting of 2-amino-2-deoxy-glucuronic acid, 2-amino-2-deoxy-3-O-(1-carboxyethyl) D-glucose and 2-amino-2-deoxy-3-O-β-D-glucopyranurosyl-D-galactose; $R_2$ is a radical of a steroid hormone selected from the group consisting of 17β-hydroxy-4-androsten-3-one; 3β-hydroxy-5-androsten-17-one; 1,3,5 (10)-estratriene-3,17 β-diol; 5β-pregnane-3α, 20α-diol; 4-pregnene-3, 20-dione; 11β, 17α, 21-trihydroxy-4-pregnene-3, 20-dione; 11β, 21-dihydroxy-4-pregnene-3,20-dione; prednisone; desoxymethasone, mestanolone; androstanolone; unsodeoxycholic acid methanedienone; β-sitosterol and Alphaxalone, the bonding between said amino sugar radical and said steroid hormone radical occurring only at the 3 or 17 position of said steroid radical; m is 0 or 1 and n is 1 or 2.



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**4,296,234**

## ABSORBENT MATERIALS

**Lothar F. O. Mindt, deceased, late of Upper Dean, England; by Peter R. Payne, administrator, and George R. Sanderson, both of Bedford, England, assignors to Lever Brothers Company, New York, N.Y.**

**Continuation of Ser. No. 960,423, Nov. 13, 1978, abandoned, and a continuation of Ser. No. 766,524, Feb. 7, 1977, abandoned. This application Apr. 23, 1980, Ser. No. 142,908**

**Claims priority, application United Kingdom, Dec. 19, 1973, 58917/73; Dec. 19, 1973, 58918/73; Jul. 17, 1974, 31672/74**

**Int. Cl.³ A61L** *15/00;* **C08B** *31/00*

**U.S. Cl. 536—47** **43 Claims**

1. A highly absorbent material which is substantially dry and non-sticky to the touch in the swollen state being a substantially water-insoluble cross-linked gelatinised starch, in which the degree of substitution of the cross-linking groups is 0.001 to 0.02, which is substituted by ionic groups which are attached to the starch by ether linkages and which groups are associated with counterions selected from mono- and divalent counterions, and which has a urine retention value of at least 8 g/g.

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**4,296,235**

## PROCESS FOR THE REMOVAL OF ALKALI METAL HALIDES FROM CELLULOSE ETHERS SOLUBLE IN COLD WATER AND USE OF THE PURIFIED PRODUCTS IN WASHING AND CLEANSING AGENT COMPOSITIONS

**Horst Ziche, Dusseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,901**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912486**

**Int. Cl.³ C08B** *11/20, 11/22*

**U.S. Cl. 536—85** **5 Claims**

1. A process for the purification of cold-water soluble cellulose ethers containing alkali metal halides consisting essentially of suspending a cold-water-soluble cellulose ether crude reaction product containing 25% by weight or more of alkali metal halides, based on the dry weight, where said cellulose ethers are selected from the group consisting of methyl cellulose, ethyl cellulose, mixed methyl/ethyl cellulose, mixed ethyl/hydroxyethyl cellulose, mixed ethyl/hydroxypropyl cellulose and mixed ethyl/dihydroxypropyl cellulose, in an aqueous solution containing from 4% to about 25% by weight of one or more water-soluble salts selected from the group consisting of alkali metal sulfates, alkali metal phosphates, alkali metal silicates and alkali metal carbonates, with agitation at a temperature of from 10° C. to 50° C., separating the purified cellulose ether solids and repeating the suspending and separating steps zero, one or more times.

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**4,296,236**

## 7-(OR 6-) SUBSTITUTED-7-(OR 6-)ACYLIMINO CEPHALOSPORIN (OR PENICILLIN) COMPOUNDS

**Burton G. Christensen, Scotch Plains; David B. R. Johnston, Warren, and Raymond A. Firestone, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

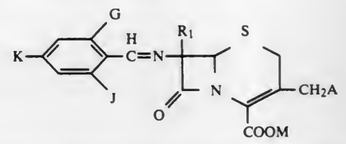
**Division of Ser. No. 243,057, Apr. 11, 1972, Pat. No. 3,875,146. This application Jan. 9, 1975, Ser. No. 539,881**

**Claims priority, application United Kingdom, Apr. 30, 1971, 13008/71; Sep. 1, 1971, 40813/71; Sep. 1, 1971, 40814/71; Nov. 29, 1971, 55232/71**

**Int. Cl.³ C07D** *499/02, 501/14*

**U.S. Cl. 542—420** **7 Claims**

1. The compound having the formula:



wherein M is benzyl, benzhydryl, trichloroethyl, methoxybenzyl; A is hydrogen, acetoxy, or pyridinium; each of G, K and J are hydrogen, halo, or nitro; and $R_1$ is loweralkylthio.

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**4,296,237**

## 4-(PYRIDYL, PIPERAZINYL AND THIAZOLYL SUBSTITUTED THIAZOLYL)-3-HYDROXY-3-PYRROLINE-2,5-DIONES

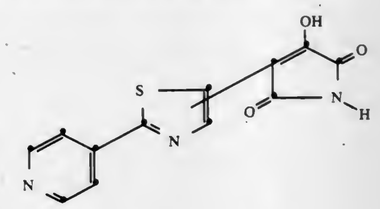
**Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worchester, both of Pa., assignor to Merck & Co., Inc., Rahway, N.J.**

**Filed Sep. 11, 1979, Ser. No. 74,466**

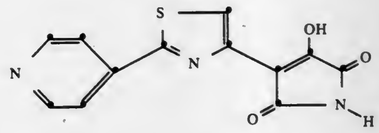
**Int. Cl.³ C07D** *417/14;* **A61K** *31/425, 31/44, 31/495*

**U.S. Cl. 544—405** **5 Claims**

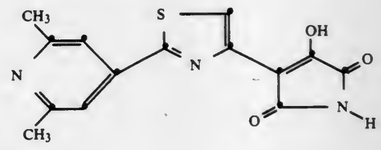
1. The compounds having the structure:



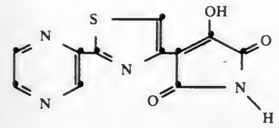
2. The compound having the structure:



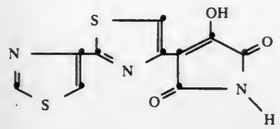
3. The compound having the structure:



4. The compound having the structure:



5. The compound having the structure:



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**4,296,238**

**2,6-METHANO-3-BENZAZOCINES**

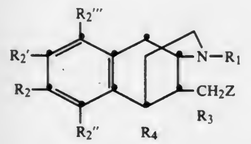
**William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

**Division of Ser. No. 9,594, Feb. 5, 1979, Pat. No. 4,255,579, which is a continuation-in-part of Ser. No. 877,166, Feb. 13, 1978, Pat. No. 4,180,667, which is a continuation-in-part of Ser. No. 741,227, Nov. 12, 1976, Pat. No. 4,100,164, which is a continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,313, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,571, May 20, 1975, Pat. No. 3,932,422. This application May 7, 1980, Ser. No. 147,084**

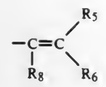
**Int. Cl.³ C07D *221/26***

**U.S. Cl. 546—97** **21 Claims**

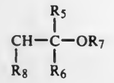
1. A compound having the formula



where $R_1$ is hydrogen, lower-alkyl, lower-alkanoyl (only when $R_4$ is hydrogen), lower-alkenyl, lower-alkynyl, halo-lower-alkenyl, cyclo-lower-alkyl, cyclo-lower-alkyl-lower-alkyl, 2- or 3-furylmethyl, or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups, phenyl-lower-alkyl, or phenyl-lower-alkyl substituted in the phenyl ring by from one or two members of the group consisting of halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, amino, lower-alkanoylamino or a single methylenedioxy attached to adjacent carbon atoms; $R_2$, $R_2'$, $R_2''$ and $R_2'''$ are each hydrogen, or three of them are hydrogen and the fourth is halogen, lower-alkyl, hydroxy, loweralkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkoxycarbonylamino or phenyl, or two of the adjacent such groups together are methylenedioxy; $R_3$ is hydrogen or lower-alkyl; $R_4$ is hydrogen, lower-alkyl, lower-alkoxy-lower-alkyl, hydroxy-lower-alkyl, lower-alkylthio-lower-alkyl, lower-alkylsulfinyl-lower-alkyl, phenylthio-lower-alkyl, phenylsulfinyl-lower-alkyl, lower-alkenyl or halo-lower-alkyl, or $R_3$ and $R_4$ together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Z is the group



where either $R_5$ and $R_6$ are both lower-alkyl or one is hydrogen and the other is lower-alkyl, or a group of the formula



where $R_5$ and $R_6$ are the same or different hydrogen, lower-alkyl, cyclo-lower-alkyl-lower-alkyl, phenyl or phenyl-lower-alkyl; $R_7$ is hydrogen, lower-alkanoyl, benzoyl or benzoyl substituted by from one to three members of the group consisting of lower-alkyl, lower-alkoxy, hydroxy, halo or trifluoromethyl; and $R_8$ is hydrogen or lower-alkyl; or an acid-addition salt thereof.

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**4,296,239**

**AMINO-4H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPINES**

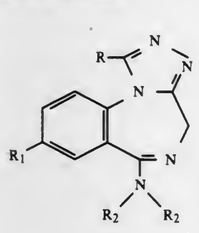
**Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 804,627, Jun. 8, 1977, Pat. No. 4,180,668. This application Jul. 30, 1979, Ser. No. 61,976**

**Int. Cl.³ C07D *211/68***

**U.S. Cl. 546—271** **3 Claims**

1. A compound of the formula



wherein

R is hydrogen, $C_1$ to $C_3$-alkyl or hydroxymethyl;

$R_1$ is hydrogen or a halogen having an atomic number of from 9 to 35; and the two $R_2$ moieties are taken together with the nitrogen to which they are bonded to complete a 3,6-dihydro-1(2H)-pyridyl nitrogen ring moiety or a pharmacologically acceptable salt thereof.

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**4,296,240**

**SILACYCLOALKANE AMIDES**

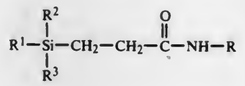
**Robert E. Damon, II, Randolph, N.J., assignor to Sandoz, Inc., East Hanover, N.J.**

**Filed Apr. 24, 1980, Ser. No. 143,262**

**Int. Cl.³ C07F *7/10*; C07D *209/10***

**U.S. Cl. 556—406** **14 Claims**

1. A compound of the formula:

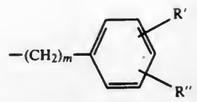


wherein $R^1$ is either

(a) alkyl having from 1 to 22 carbon atoms; or

(b) of the formula



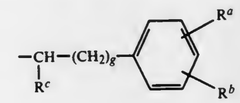


in which

m is 0, 1 or 2, and each of R′ and R″ is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127;

$R^2$ and $R^3$ are joined to form an acyclic hydrocarbon radical which together with the silicon atom forms a ring having from 3 to 20 ring members and having no more than 25 carbon atoms; and

R is of type (a) an aralkyl-type radical of the structure



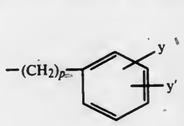
(a)

wherein g is 0, 1 or 2;

$R^a$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

$R^b$ is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

$R^c$ is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



(ii)

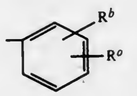
in which p is 0, 1 or 2, and

y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or

subtype (iii) alkyl having from 1 to 8 carbon atoms; or

R is of type (b) a phenyl-type radical of the structure



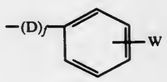
(b)

in which

$R^b$ is as defined above, and

$R^o$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or

$R^o$ is a radical of the structure R/:



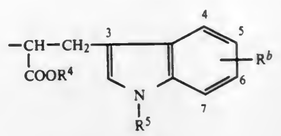
in which

D is $-CH_2-$ or $-O-$;

f is 0 or 1; and

W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or

R is of type (c) an indolyl radical of the structure:



(c)

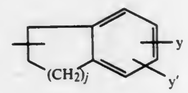
wherein

$R^b$ is as defined above;

$R^4$ is alkyl having from 1 to 8 carbon atoms or benzyl; and

$R^5$ is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or

R is (d) a benzocycloalkyl nucleus of the structure:



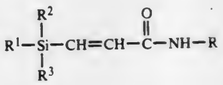
(d)

wherein

y and Y′ are as defined above; and

j is a whole integer of from 1 to 4.

**14**. A compound of the formula:

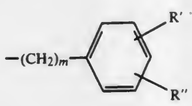


wherein

$R^1$ is either

(a) alkyl having from 1 to 22 carbon atoms; or

(b) of the formula

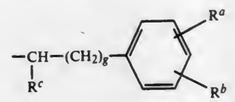


in which

m is 0, 1 or 2, and each of R′ and R″ is independently a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127;

$R^2$ and $R^3$ are joined to form an acyclic hydrocarbon radical which together with the silicon atom form a ring having from 3 to 20 ring members and having no more than 25 carbon atoms; and

R is of type (a) an aralkyl-type radical of the stucture



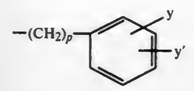
(a)

wherein

g is 0, 1 or 2;

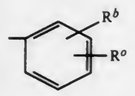
$R^a$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

$R^b$ is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and
$R^c$ is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure



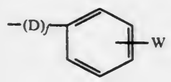
(ii)

in which
p is 0, 1 or 2, and
y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and
y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or
subtype (iii) alkly having from 1 to 8 carbon atoms; or
R is of type (b) a phenyl-type radical of the structure

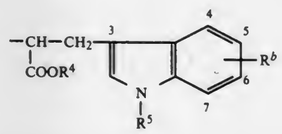


(b)

in which
$R^b$ is as defined above, and
$R^o$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or
$R^o$ is a radical of the structure $R^f$:

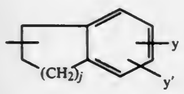


in which
D is $-CH_2-$ or $-O-$;
f is 0 or 1; and
W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or
R is of type (c) an indolyl radical of the structure:



(c)

wherein
$R^b$ is as defined above;
$R^4$ is alkyl having from 1 to 8 carbon atoms or benzyl; and
$R^5$ is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl; or
R is (d) a benzocycloalkyl nucleus of the structure:



(d)

wherein
y and y′ are as defined above; and
j is a whole integer of from 1 to 4.

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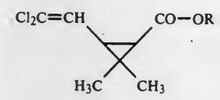
**4,296,241**

## PREPARATION OF 3-(2,2-DICHLOROVINYL)-2,2-DIMETHYL-CYCLOPROPANE-1-CARBOXYLIC ACID DERIVATIVES

**Hellmut Hoffmann; Fritz Maurer, both of Wuppertal; Uwe Priesnitz, Unna-Massen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

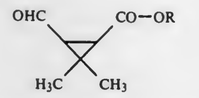
**Filed Jul. 2, 1980, Ser. No. 165,871**
**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929725; Mar. 11, 1980, 3009242**
**Int. Cl.³ C07C *69/743***
**U.S. Cl. 560—124** **9 Claims**

1. A process for the preparation of a 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid or derivative of the formula

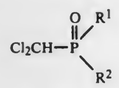


in which R is hydrogen, sodium, potassium or alkyl with 1 to 4 carbon atoms,

comprising reacting a 3-formyl-2,2-dimethyl-cyclopropane-1-carboxylic acid or a derivative of the formula



with a dichloromethane derivative of the formula



in which $R^1$ and $R^2$ each independently is alkyl, phenyl, alkoxy or phenoxy, or together are alkanediyl or alkanedioxy,

in the presence of a base at a temperature between about −50° and +50° C.

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**4,296,242**

## PROCESS FOR THE PREPARATION OF CHIRAL 3-AMINO-2-HYDROXYPROPIONIC ACID AND N-BLOCKED DERIVATIVES THEREOF

**Tattanahalli L. Nagabhushan, Parsippany, and Alan Cooper, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Filed Jun. 6, 1979, Ser. No. 46,076**
**Int. Cl.³ C07C *101/30***
**U.S. Cl. 560—160** **7 Claims**

1. The process of preparing chiral 3-amino-2-hydroxypropionic acid which comprises subjecting a glycamine in an aqueous lower alkanol medium to the successive steps of
(a) cyclic 1,2-N,O-carbonylation with alkoxycarbonyl chloride, phenoxycarbonyl chloride, or p-nitrophenoxycarbonyl chloride to produce the corresponding chiral 1,2-N,O-carbonyl glycamine,
(b) periodic cleavage, and (c) permanganate oxidation to produce chiral 2,3-N,O-carbonylisoserine,



(d) acid hydrolysis to produce an acid addition salt of chiral isoserine, followed by
(e) treatment with base to neutralize the acid addition salt to produce chiral isoserine.

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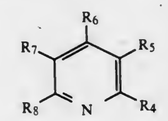
**4,296,243**

## PROCESS FOR PRODUCING SORBIC ACID OR ITS DERIVATIVES

**Kazuo Sato, Arai, Japan, assignor to Daicel Ltd., Osaka, Japan**

**Filed Jul. 27, 1979, Ser. No. 61,780**
**Claims priority, application Japan, Aug. 3, 1978, 53-95186**
**Int. Cl.³ C07C *51/09, 57/10, 67/08, 69/587***
**U.S. Cl. 560—210** **7 Claims**

1. In a process for producing sorbic acid and its alkali salts and ester derivatives by reacting crotonaldehyde with ketene in the presence of a catalyst to form a polyester and heat-decomposing or hydrolyzing the resulting polyester addition product, the improvement wherein the catalyst in the polyester synthesizing step comprises a zinc salt of an aliphatic carboxylic acid and only one of a phosphine or a pyridine, wherein said carboxylic acid is a saturated or unsaturated carboxylic acid having at least 2 carbon atoms, said phosphine is represented by the formula $R_1R_2R_3P$ in which each of $R_1$, $R_2$ and $R_3$ represents an alkyl or aryl group, and said pyridine is represented by the formula:



in which each of $R_4$, $R_5$, $R_6$, $R_7$ and $R_8$ represents a hydrogen atom or a lower alkyl group and wherein the amount of the zinc salt of the aliphatic carboxylic acid is about 0.1 to 5.0% by weight based on the crotonaldehyde, the amount of the phosphine is about 0.3 to 1.0 mol per mol of the zinc salt of the aliphatic carboxylic acid and the amount of the pyridine is about 0.5 to 3.0 mols per mol of the zinc salt of the aliphatic carboxylic acid.

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**4,296,244**

## (3-TRIFLUOROMETHYLPHENYL)-ALPHA-HYDROXYACETIC ACID AND PROCESS FOR PREPARATION

**David Y. Tang, Eggertsville, and Arthur M. Foster, Snyder, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.**

**Filed Nov. 7, 1979, Ser. No. 92,118**
**Int. Cl.³ C07C *59/84***
**U.S. Cl. 562—470** **6 Claims**

1. (3-trifluoromethylphenyl)-alpha-hydroxyacetic acid.

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**4,296,245**

## METHOD FOR THE PREPARATION OF A PURE ALKALI METAL BENZOATE AND BENZYL ALCOHOL

**Cornelis Jongsma, Oirsbeek; Leon H. B. Frijns, Valkenburg, and Paula A. M. Raven-Donners, Sittard, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands**

**Filed May 16, 1980, Ser. No. 150,690**
**Claims priority, application Netherlands, May 17, 1979, 7903878**
**Int. Cl.³ C07C *51/42, 27/04***
**U.S. Cl. 562—494** **26 Claims**

1. A method for the preparation of a food-grade pure alkali metal benzoate from crude benzyl benzoate, obtained by the oxidation of an alkylbenzene compound with a gas containing molecular oxygen, wherein said crude material is subjected to treatment with a reducing substance,
selected from the class of (a) hydrogen or (b) the metals with reducing properties in groups IA, IIA, IIB, IIIA, IVA, VIIB, and VIII of the periodic system in the presence of water, to convert impurities therein to alkaline-aqueous soluble components without substantial conversion of any benzyl benzoate, and subsequently saponifying said benzoate to obtain said food-grade pure alkali metal benzoate.

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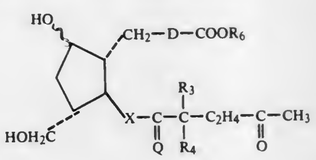
**4,296,246**

## 13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_1$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,970**
**Int. Cl.³ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3—(CH_2)_g—CH_2—$, or
(2) $(CH_2)_3—(CH_2)_g—CF_2—$;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-$R_5$ or α-$R_5$:β-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) β-naphthyl,
(n) $—CH_2—CO—R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

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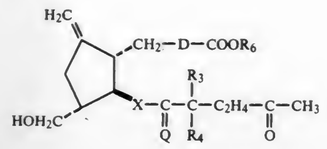
**4,296,247**

## 13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,008**
**Int. Cl.³ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) $\beta$-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —$CH_2CH_2$—.

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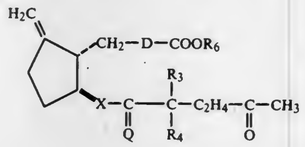
**4,296,249**
**13,14-DIHYDRO-11-DEOXY-9-DEOXY-9-METHYLENE-19-OXO-PGE$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,029**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) $\beta$-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ or $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —$CH_2CH_2$—.

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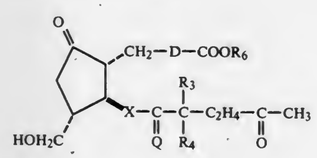
**4,296,248**
**13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,009**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula

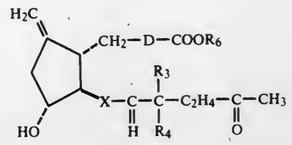


wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—$CH_3$,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—$CH_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—$CH_3$,
(k) —(p—Ph)—NH—CO—$NH_2$,
(l) —(p—Ph)—CH=N—NH—CO—$NH_2$,
(m) $\beta$-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ *L is fluoro only when the other is hydrogen or fluoro; and*
wherein X is —$CH_2CH_2$—.



**4,296,250**
**13,14-DIHYDRO-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS**
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**
**Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,039**
**Int. Cl.$^3$ C07C *177/00***
**U.S. Cl. 562—503** **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—$CH_2$—, or
(2) $(CH_2)_3$—$(CH_2)_g$—$CF_2$—;
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_6$ is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—$CH_3$,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—$CH_3$,
(k) —(p-Ph)—NH—CO—$NH_2$,
(l) —(p-Ph)—CH=N—NH—CO—$NH_2$,
(m) $\beta$-naphthyl,
(n) —$CH_2$—CO—$R_{28}$,
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein $R_{28}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein X is —$CH_2CH_2$—.

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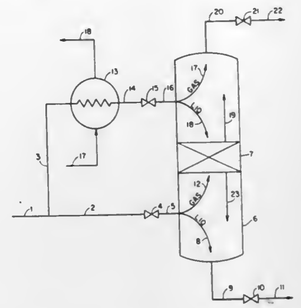
**4,296,251**
**SYNTHESIS OF (+)-CIS-HOMOCARONIC ACID**
**T. L. Ho; Zia U. Din, and Carlos G. Cardenas, all of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.**
**Filed May 15, 1980, Ser. No. 150,197**
**Int. Cl.$^3$ C07C *51/34***
**U.S. Cl. 562—506** **7 Claims**

1. A process for producing (+)-cis-homocaronic acid from 2-caren-4-ol, 2-caren-4-one, 3-caren-2-ol, or mixtures thereof comprising the steps of:
ozonizing the reactants,
treating the ozonides produced with, hydrogen peroxide and recovering (+)-cis-homocaronic acid.

**4,296,252**
**UREA SYNTHESIS PROCESS**
**Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021**
**Filed May 23, 1980, Ser. No. 152,534**
**Int. Cl.$^3$ C07C *126/02***
**U.S. Cl. 564—70** **3 Claims**



1. In a cyclic process for producing urea comprising
reacting $CO_2$ and $NH_3$ in the presence of an aqueous ammoniacal solution of at least one compound selected from the group consisting of ammonium carbonate and/or ammonium carbamate in a urea synthesis reactor at an elevated temperature of about 330° F. to about 400° F. and at a pressure from about 1,800 PSIG to about 6,000 PSIG, to form a urea synthesis reactor effluent fluid at high pressure,
lowering the pressure of said reactor effluent fluid to flash off gaseous $NH_3$, $CO_2$ and $H_2O$ phase to obtain a residual reactor effluent solution comprising ammonium carbamate, ammonia, water and urea,
recycling at least part of said flashed off gaseous $NH_3$, $CO_2$ and $H_2O$ phase to the urea reactor,
passing said residual reactor effluent solution to a carbamate decomposer wherein it is heated and wherein the ammonia and water vapor contained in said effluent solution is taken off in a gaseous product and wherein the ammonium carbamate is decomposed to form gaseous ammonia and gaseous carbon dioxide which is also taken off in the gaseous product,
at least part of said gaseous product from said carbamate decomposer is recycled to said urea synthesis reactor, and
a liquid product solution is withdrawn from said carbamate decomposer containing urea,
the improvment comprising splitting said urea synthesis reactor effluent fluid stream into a minor stream containing from about 5% to about 35% by weight of the total urea synthesis reactor effluent fluid stream, and a major stream containing the balance of said urea reactor effluent fluid stream,
passing said major stream through a pressure release valve to lower the pressure to the range from about 30 PSIG to about 800 PSIG and then passing said major stream at said lower pressure to the lower section of a liquid gas separator having a midsection provided with a liquid gas contact means above said lower section and an upper section above said midsection, said major stream at said lower pressure comprising (i) a gaseous phase containing $NH_3$, $CO_2$ and $H_2O$ which rises into and through said midsection of said separator into said upper section, and is removed therefrom with the other gaseous contents thereof, and (ii) a liquid phase containing urea and unconverted ammonium carbamate which passes downthrough the lower section of said separator and is withdrawn as a liquid part of the liquid product from the separator which is passed to an ammonium carbamate decomposer,
passing said minor stream through a heat exchanger wherein

its temperature is lowered between about 40° and 80° F., and then passing said cooled minor stream through a pressure release valve to lower the pressure to substantially the pressure of the major stream as it enters said liquid gas separator and passing said minor stream having said lowered pressure to the upper section of said liquid gas separator wherein it is separated into (a) a gaseous phase containing $NH_3$, $CO_2$ and $H_2O$ which is removed therefrom with the other gaseous contents of said upper section of said separator and recycled to said urea synthesis reactor and (b) a liquid phase which is passed downwardly through said midsection of said separator wherein it contacts the gaseous phase (i) passing upward through said midsection and absorbs carbon dioxide and water vapor from said gaseous phase (i) and said liquid phase (b) then passes downwardly through the lower section of said separator and is withdrawn as part of the liquid product from the separator which is passed to said ammonium carbamate decomposer,

whereby the combined gaseous phase from said liquid separator which is recycled to said urea synthesis reactor has a lower $CO_2$ and $H_2O$ content than said gaseous phase (i) flashed off from said major stream and rising into and through said midsection of said separator,

and the combined liquid product withdrawn from the lower section of said separator containing ammonium carbamate which is passed to said carbamate decomposer, has a larger content of $CO_2$ and $H_2O$ than the liquid phase (ii) of said major stream after reduction in pressure and before passing through the lower section of said separator and mixing with the liquid phase (b) of said minor stream passed downwardly through said midsection of said separator.

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**4,296,253**

## 2,5-INTER-O-PHENYLENE-3,4-DINOR-PGF$_2$ AMIDES

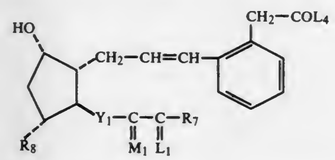
**Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,596**

**Int. Cl.$^3$ C07C *103/24***

**U.S. Cl. 564—153** **1 Claim**

1. A prostacyclin intermediate of formula VII



wherein $R_8$ is hydrogen, hydroxy, or hydroxymethyl;
wherein $Y_1$ is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —$CH_2CH_2$—, or
(4) —C≡C—,
wherein $M_1$ is $\alpha$-$R_5$:$\beta$-OH or $\alpha$-OH:$\beta$-$R_5$, wherein $R_5$ is hydrogen or alkyl with one to 4 carbon atoms, inclusive;
wherein $L_1$ is $\alpha$-$R_3$:$\beta$-$R_4$, $\alpha$-$R_4$:$\beta$-$R_3$, or a mixture of $\alpha$-$R_3$:$\beta$-$R_4$ and $\alpha$-$R_4$:$\beta$-$R_3$, wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro;
wherein $R_7$ is
(1) —$(CH_2)_m$—$CH_3$, wherein m is an integer from one to 5, inclusive;
(2) phenoxy;
(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(4) phenyl;
(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;
(6) phenylmethyl, phenylethyl, or phenylpropyl; or
(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 **1 carbon atoms, inclusive, or alkoxy of one to** 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that $R_7$ is phenoxy or substituted phenoxy, only when $R_3$ and $R_4$ are hydrogen or methyl, being the same or different;
wherein $L_4$ is
(1) amino of the formula —$NR_{21}R_{22}$, wherein $R_{21}$ and $R_{22}$ are
(a) hydrogen;
(b) alkyl or one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or nitro;
(g) carbamoylalkyl of 2 to 5 carbon atoms, inclusive;
(h) acetylalkyl of 3 to 6 carbon atoms, inclusive;
(i) benzoylalkyl of 7 to 11 carbon atoms, inclusive;
(j) benzoylalkyl substituted by one, 2 or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, or nitro;
(k) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(l) dihydroxyalkyl of one to 4 carbon atoms, inclusive, or
(m) trihydroxyalkyl of one to 4 carbon atoms, inclusive;
with the further proviso that not more than one of $R_{21}$ and $R_{22}$ is other than hydrogen or alkyl; or
(2) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein $R_{23}$ is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and $R_{21}$ is other than hydrogen, but otherwise as defined above.

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**4,296,254**

## TRANSETHERIFICATION IN AMIDES

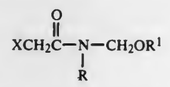
**Robert E. Middlebrook, Coral Gables; George R. Harvey, Miami, both of Fla., and John P. Chupp, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Mar. 25, 1980, Ser. No. 133,752**

**Int. Cl.$^3$ C07C *102/00***

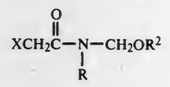
**U.S. Cl. 564—214** **19 Claims**

1. Process for the preparation of N-methylene ether-substituted 2-haloacetamides having the formula



I

which comprises transetherification of N-methylene ether-2-haloacetamides of the formula



II

with a compound of the formula

$R^1OH$ III

wherein the above formulae



X is chloro, bromo or iodo,
R is a phenyl or cycloalkenyl radical or a phenyl or cycloalkenyl radical substituted with lower alkyl, alkoxy, polyalkoxy or alkoxymethyl having up to 6 carbon atoms, halogen, $NO_2$, —$CF_3$ or a tetrahydrofurfuryloxy radical containing up to 6 carbon atoms and
$R^1$ and $R^2$ are different $C_{1-6}$ alkyl, haloalkyl, alkenyl, haloalkenyl, alkynyl, haloalkynyl, alkoxyalkyl, cycloalkyl, cyanoalkyl or lower alkoxycarboalkyl radicals or 1,3-dioxolanylmethyl which may be substituted with lower alkyl groups, said transetherification being conducted in an inert solvent at elevated temperature and in the presence of an acid catalyst.

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**4,296,255**

## ACYCLIC CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

**David G. Roswell, Staines; David J. Spring, Datchet, and Roger Hems, Maidenhead, all of England, assignors to Wilkinson Sword Limited, London, England**

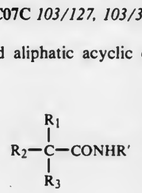
**Division of Ser. No. 36,662, May 7, 1979, Pat. No. 4,230,688, which is a continuation of Ser. No. 768,219, Feb. 14, 1977, Pat. No. 4,153,679, which is a division of Ser. No. 351,357, Apr. 16, 1973, abandoned. This application Apr. 25, 1980, Ser. No. 143,948**

**Claims priority, application United Kingdom, Apr. 18, 1972, 17914/72**

**Int. Cl.$^3$ C07C *103/127, 103/38, 101/30***

**U.S. Cl. 564—215** **5 Claims**

1. Monosubstituted aliphatic acyclic carboxamides of the formula



where
$R_1$, $R_2$ and $R_3$ are each $C_1$–$C_5$ straight or branched chain alkyl and together provide a total of at least 5 carbon atoms; and
R′ is selected from $C_1$–$C_5$ alkyl, $C_1$–$C_8$ hydroxyalkyl and alkylcarboxyalkyl of up to 6 carbon atoms.

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**4,296,256**

## 2-DECARBOXY-2-HYDROXYMETHYL-19-KETO-PG COMPOUNDS

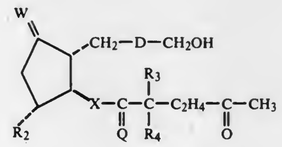
**John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 25,879, Apr. 2, 1980. This application Mar. 20, 1980, Ser. No. 132,349**

**Int. Cl.$^3$ C07C *177/00***

**U.S. Cl. 568—330** **262 Claims**

1. A compound of the formula



wherein D is
(1) cis-CH=CH-$CH_2$-$(CH_2)_g$-$CH_2$-,
(2) cis-CH=CH-$CH_2$-$(CH_2)_g$-$CF_2$-,
(3) cis-$CH_2$-CH=CH-$CH_2$-$CH_2$-,
(4) trans-$(CH_2)_3$-CH=CH-,
(5) -$(CH_2)_3$-$(CH_2)_g$-$CH_2$-,
(6) -$(CH_2)_3$-$CH_2$-$CF_2$-,
(7) -$(CH_2)_3$-O-$CH_2$-,
(8) -$(CH_2)$-O-$(CH_2)_2$-,
(9) -$CH_2$-O-$(CH_2)_3$-,
(10) -(m-Ph)-$(CH_2)_2$-, or
(11) -(m-Ph)-O-$CH_2$-,
wherein -(m-Ph)- is inter-meta-phenylene and
wherein g is zero, one, two, or three;
wherein Q is $\alpha$-OH:$\beta$-$R_5$ or $\alpha$-$R_5$:$\beta$-OH, wherein $R_5$ is hydrogen or methyl;
wherein $R_2$ is hydrogen, hydroxyl, or hydroxymethyl,
wherein $R_3$ and $R_4$ are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of $R_3$ and $R_4$ is fluoro only when the other is hydrogen or fluoro; and
wherein W is oxo, methylene, $\alpha$-OH:$\beta$-H, or $\alpha$-H:$\beta$-OH; and
wherein X is cis- or trans-CH=CH-, -C≡C- or -$CH_2CH$-.

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**4,296,257**

## PROCESS FOR PRODUCING DIHYDROCARVONE GEOMETRIC ISOMERS

**Carlos G. Cardenas, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.**

**Filed Jan. 7, 1980, Ser. No. 109,989**

**Int. Cl.$^3$ C07C *45/51, 45/58***

**U.S. Cl. 568—361** **8 Claims**

1. A process for producing a single dihydrocarvone isomer from mixed liquid phase cis- and trans-limonene oxide isomers under limonene oxide rearrangement conditions and to the substantial exclusion of the other dihydrocarvone isomer, which comprises:
(A) separating said limonene oxide isomers by either:
(a) rearranging substantially selectively cis-limonene oxide at a temperature of from 50° C. to 95° C. in the presence of an acid catalyst to the trans-dihydrocarvone isomer and terminating this rearrangement before substantial rearrangement of the trans-limonene oxide occurs to form a reaction mixture or
(b) first fractionally distilling said limonene oxide isomers to isolate the cis-limonene oxide isomer from the trans-limonene oxide isomer as separate distillate fractions and then rearranging one of the thus-separated limonene isomer distillate fractions in the presence of from 0.1% to 10% by weight of said separated limonene oxide isomer of an acid catalyst, at a temperature of from 50° C. to 95° C., until the corresponding dihydrocarvone isomer is formed in the reaction mixture to the substantial exclusion of the other dihydrocarvone isomer,
(B) neutralizing the acid catalyst in said reaction mixture with a base, and
(C) recovering the resulting dihydrocarvone isomer from the reaction mixture.

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**4,296,258**

## PROCESS FOR THE PREPARATION OF MACROCYCLIC KETONES

**Charles Fehr, Geneva; Günther Ohloff, Bernex, both of Switzerland, and Georges H. Büchi, Cambridge, Mass., assignors to Firmenich SA, Geneva, Switzerland**

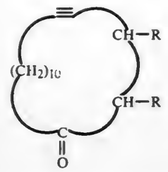
**Filed Dec. 28, 1979, Ser. No. 107,847**

**Claims priority, application Switzerland, Jan. 26, 1979, 796/79**

**Int. Cl.$^3$ C07C *45/00***

**U.S. Cl. 568—364** **7 Claims**

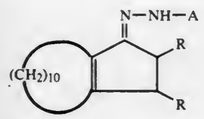
1. A process for the preparation of acetylenic macrocyclic ketones of formula



(I)

wherein one of symbols R represents a lower alkyl radical containing 1 to 3 carbon atoms and the other a hydrogen atom, which comprises

a. treating a hydrazone of formula



(II)

wherein symbols R are defined as above and A designates a sulphonyl radical of formula

$$R^1SO_2-$$ (III)

wherein $R^1$ stands for an aryl radical, with a halogenating reagent selected from the group consisting of

a. bromine,
b. chlorine,
c. iodine,
d. 1,3-dibromo-5,5-dimethyl-hydantoin,
e. N-bromosuccinimide,
f. N-iodosuccinimide and
g. N-chlorosuccinimide

in the presence of a lower aliphatic alcohol and at a temperature of from about −25° to about +25° C.;

b. reducing the excess of halogenating reagent by addition of reducing agent, and

c. heating the reaction mixture in an aqueous medium at a temperature of from about 20° to about 60° C.

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**4,296,259**

**PREPARATION OF A 1,4-PENTADIEN-3-OL**

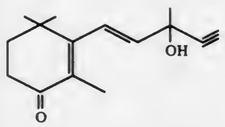
**Urs Hengartner, Roseland, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

**Division of Ser. No. 24,296, Mar. 27, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,574**

**Int. Cl.³ C07C *49/743***

**U.S. Cl. 568—378** **1 Claim**

1. A compound of the formula:



**4,296,260**

**PROCESS FOR THE PREPARATION OF PHLOROGLUCINOL**

**Rainer Zielke, Erlenbach, and Helmut Maegerlein, Obernburg, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.**

**Filed Aug. 8, 1979, Ser. No. 64,691**

**Claims priority, application Fed. Rep. of Germany, Sep. 18, 1978, 2840597**

**Int. Cl.³ C07C *39/10, 37/01***

**U.S. Cl. 568—763** **8 Claims**

1. A process for the preparation of phloroglucinol comprising reacting hexachlorobenzene with sodium propylate in a molar ratio of hexachlorobenzene:sodium propylate of from about 1:3 to about 1:20, in an aprotic solvent, and at a temperature from about 50° to about 250° C. to form trichlorophloroglucinol tripropylether, dechlorinating the trichlorophloroglucinol tripropylether with metallic sodium to form phloroglucinol tripropylether, and hydrolyzing the phloroglucinol tripropylether to form phloroglucinol.

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**4,296,261**

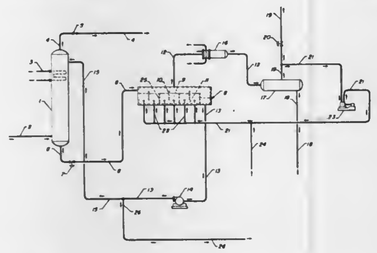
**PROCESS FOR THE MANUFACTURE OF ETHANOL FROM ETHYLENE**

**Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jun. 9, 1980, Ser. No. 157,773**

**Int. Cl.³ C07C *29/12***

**U.S. Cl. 568—890** **9 Claims**



1. A process for the manufacture of a $C_2$–$C_5$ alcohol which comprises the steps of:

(a) treating a $C_2$–$C_5$ olefin in an absorption zone in admixture with a $C_2$–$C_5$ alkyl hydrogen sulfate at conditions to form a $C_2$–$C_5$ dialkyl sulfate;

(b) treating said dialkyl sulfate in a hydrolyzing zone in admixture with a measured amount of water at conditions effecting the partial hydrolysis of said dialkyl sulfate and the formulation of a $C_2$–$C_5$ alkyl hydrogen sulfate and a $C_2$–$C_5$ alcohol;

(c) separating said alcohol; and,

(d) recycling the alkyl hydrogen sulfate to said absorption zone and treating said $C_2$–$C_5$ olefin in admixture therewith in accordance with step (a).

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**4,296,262**

**MANUFACTURE OF TERTIARY BUTYL ALCOHOL**

**Henry R. Grane, Springfield; John C. Jubin, Jr., Wallingford, and G. Richard Worrell, Media, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 45,365, Jun. 4, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,404**

**Int. Cl.³ C07C *29/50***

**U.S. Cl. 568—910** **1 Claim**

1. The method of preparing tertiary butyl alcohol (TBA) which includes the steps of:

maintaining in an oxidation reaction zone a liquid reaction mixture comprising TBA, tertiary butyl hydroperoxide (TBHP), and (TBHP) isobutane at conditions favoring the oxidation of isobutane to a mixture of TBA and TBHP, said conditions comprising a temperature within the range from about 240° F. to about 340° F., a pressure maintaining most of the isobutane in said oxidation reaction zone in the liquid phase, said pressure being within the range from about 100 psig to about 1000 psig, a residence time within the range from about 1 to about 10 hours, and a concentration of soluble molybdenum catalyst corresponding to about 1 to about 500 ppm of the weight of isobutane in said liquid;

refluxing back into said reaction mixture a significant portion of any TBHP or other components boiling above TBA, while withdrawing from the oxidation reaction zone an overhead vapor stream comprising nitrogen, carbon monoxide, carbon dioxide, isobutane, acetone, methanol, water, and TBA;

selectively condensing from said overhead vapor stream a condensed TBA stream comprising acetone, methanol, water and TBA;

selectively condensing isobutane from the TBA depleted overhead vapor stream and recycling such condensed isobutane to the oxidation reaction zone;

withdrawing an isobutane-depleted overhead vapor stream comprising nitrogen, carbon monoxide, carbon dioxide from said overhead vapor stream;

directing at a controlled rate a slip stream of liquid rection mixture from the oxidation reaction zone to a debutanizing zone in which the isobutane is selectively separated and recycled to the oxidation reaction zone, said slip stream being controlled to be sufficient to maintain in the liquid oxidate in the reaction zone a concentration of high-boiling byproducts from about 1% to about 10%, said high-boiling byproducts being those, other than TBHP and TBA, which are not completely codistilled with the TBA;

directing the debutanized slip stream to a decomposition zone maintained at a temperature from about 200° to 350° F. at a pressure from about 40 to about 100 psig for a residence time of from about 1 to about 6 hours to decompose a portion of the TBHP and to increase the TBA concentration;

directing the liquid effluent stream from the decomposition zone to a distillation zone to provide a distillate stream comprising acetone, methanol, and TBA, and to provide a residual liquid having a unit weight ratio of tertiary butyl alcohol to tertiary butyl hydroperoxide greater than one, byproducts which are not completely codistilled with tertiary butyl alcohol, and molybdenum catalyst;

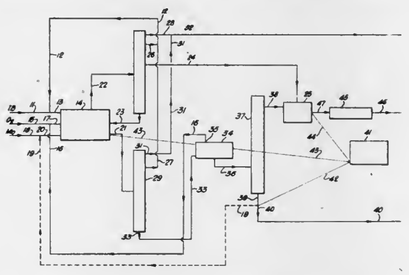
withdrawing at least a portion of said residual liquid stream;

directing a stream containing TBA to a cleanup zone maintained at 375°–475° F. for from 1 to 10 minutes under pressure to decompose any TBHP residues;

directing to a gasoline-blending zone a stream comprising TBA derived from the effluent stream from said cleanup zone; and

merging a debutanized distillate from the reactor overhead stream with a debutanized distillate derived from the slip stream to provide a stream containing TBA at some stage prior to the directing of a TBA containing stream to said cleanup zone.





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**4,296,263**

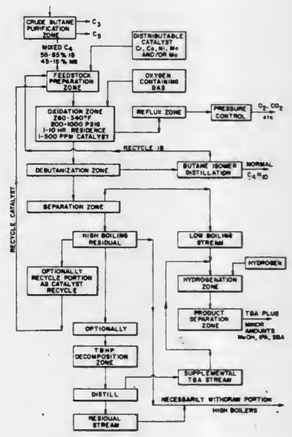
**TERTIARY BUTYL ALCOHOL PRODUCTION**

**G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Sep. 19, 1980, Ser. No. 188,653**

**Int. Cl.³ C07C *27/12***

**U.S. Cl. 568—910** **1 Claim**



1. A method of preparing tertiary butyl alcohol which includes the steps of:

separating most $C_3$ hydrocarbons and most $C_5$ hydrocarbons from a mixed $C_4$ hydrocarbon stream in a crude butane purification zone to provide a stream of purified mixed $C_4$ hydrocarbons consisting essentially of from about 51 to about 85% isobutane and from about 49 to about 15% normal butane;

mixing said stream of purified mixed $C_4$ hydrocarbons with a stream of recycle $C_4$ hydrocarbons and with a catalyst stream in a feedstream preparation zone to provide a feedstream of mixed $C_4$ hydrocarbons, said catalyst being distributable in said mixed $C_4$ hydrocarbons, and said catalyst comprising a multivalent metal selected from the group consisting of chromium, cobalt, nickel, manganese, molybdenum, and mixtures thereof in a concentration of from about 1 to about 500 parts per million parts of isobutane, said catalyst stream optionally including a recycled stream derived from a high boiling stream;

maintaining in an oxidation zone, a pressurized liquid reaction mixture, said $C_4$ hydrocarbons derived from the feedstream being the most abundant component of said liquid reaction mixture;

directing said feedstream into said oxidation zone at a feedstream rate controlled to maintain said predominance of $C_4$ hydrocarbons in said liquid reaction mixture in said oxidation zone while maintaining an isobutane flow rate corresponding to a preselected residence time for the $C_4$ hydrocarbons;

injecting an oxygen containing gas into said oxidation zone at a normal rate stoichiometrically effective for converting to tertiary butyl alcohol at least one-sixth but less than half of said isobutane flow rate in said feedstream;

withdrawing from said oxidation zone a stream of liquid reaction mixture at a rate stoichiometrically equal, as regards $C_4$ components, to said feedstream rate and controlled to maintain the residence time of $C_4$ hydrocarbons in said oxidation zone at a predetermined residence time within a range from about 1 to about 10 hours;

maintaining the pressure in said oxidation zone at a predetermined pressure within a range from about 200 to about 1000 psig;

directing a portion of the vapors from said oxidation zone into a reflux zone and withdrawing gaseous products from said reflux zone at a rate adapted to maintain said predetermined pressure, said withdrawn gaseous products comprising oxygen and carbon dioxide;

maintaining the temperature in said oxidation zone substantially at a predetermined temperature within the range from 260° to 340° F., the combination of controlled temperature, pressure, catalyst concentration, high boiler concentration, and residence time providing a conversion of isobutane within the range from 15% to 45%;

subjecting the liquid effluent from the oxidation zone to a debutanizing distillation zone and separating and withdrawing overhead from said debutanizing zone an intermediate mixed butanes stream and separating and withdrawing a residual liquid stream of oxygenated organic liquid from said debutanizing zone;

subjecting said intermediate mixed butanes stream to distillation in a butane isomer distillation zone to prepare a residual normal butane stream containing less than 45% isobutane and an overhead isobutane stream which in isobutane and containing less than 45% impurities comprising normal butane and withdrawing from the process said residual normal butane stream, and directing to said feedstream preparation zone said isobutane stream as a stream of recycle isobutane,

subjecting said liquid stream of oxygenated organic liquid from the debutanizing zone to a distillation separation zone for the separation of at least one low boiling stream comprising overhead components selected from the group consisting of acetone, methanol, tertiary butyl alcohol, methyl ethyl ketone, methyl formate, ethyl formate, isopropyl formate, methyl acetate, ethyl acetate, and related compounds boiling below about 194° F., and for the separation of a residual high boiling stream comprising components selected from the group consisting of water, formic acid, secondary butyl alcohol, normal butyl alcohol, tertiary butyl hydroperoxide, acetic acid, high boiling esters, and related compounds boiling above about 194° F.;

subjecting a stream comprising said low boiling stream to hydrogenation in a hydrogenation zone at mild conditions favoring minimized hydrogenation of tertiary butyl alcohol to isobutane and significant conversion of methyl ethyl ketone to secondary butyl alcohol, and acetone to isopropanol, the liquid effluent from the hydrogenation zone being directed to a product separation zone;

optionally subjecting at least a portion of said residual high boiling stream to a tertiary butyl hydroperoxide decomposition zone, the effluent from which is distilled in a post-decomposition distillation zone for separating overhead a supplemental tertiary butyl alcohol stream from a residual effluent stream and directing said supplemental tertiary butyl alcohol stream to said hydrogenation zone, said tertiary butyl hydroperoxide decomposition zone being maintained at a temperature within the range from about 200° to about 350° F. for a residence time of about 1 to about 6 hours;

withdrawing from the process at least a portion of streams selected from the group consisting of said high boiling stream from the separation zone, said residual effluent stream from the post-decomposition distillation zone, and mixtures thereof;

optionally recycling to said feedstream preparation zone a portion of streams selected from the group consisting of said high boiling stream from the separation zone, said residual effluent stream from the post-decomposition zone, and mixtures thereof, as a catalyst recycle stream;

and withdrawing in a product separation zone as the most valuable product of the process a liquid product stream containing minor amounts of isopropanol and methanol, said liquid product stream containing tertiary butyl alcohol as the principal component.

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**4,296,264**

## ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

**Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.**

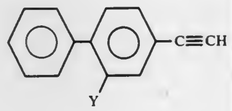
**Continuation of Ser. No. 753,273, Dec. 22, 1976, which is a division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Oct. 19, 1977, Ser. No. 843,695**

**The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.**

**Int. Cl.³ C07C *25/06***

**U.S. Cl. 570—128** **2 Claims**

1. A compound of the formula



wherein Y is halo.

2. A compound according to claim 1 which is 3-fluoro-4-phenylethynylbenzene.

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**4,296,265**

## PROCESS FOR PREPARING HEXAFLUOROPROPENE OLIGOMERS

**Yohnosuke Ohsaka, Takatsuki, and Takashi Tohzuka, Settsu, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan**

**Filed Jul. 18, 1980, Ser. No. 170,151**

**Claims priority, application Japan, Jul. 19, 1979, 54-91849; Aug. 15, 1979, 54-103713**

**Int. Cl.³ C07C *17/26***

**U.S. Cl. 570—138** **5 Claims**

1. A process for preparing hexafluoropropene oligomers which comprises contacting gaseous hexafluoropropene with a catalyst comprising an alkali metal fluoride supported on activated charcoal or nickel oxide.



**4,296,266**

## PROCESS FOR THE MANUFACTURE OF LOWER OLEFINS FROM METHANOL/WATER MIXTURES

**Friedrich Wunder, Flörsheim am Main; Ernst I. Leupold, Neu-Anspach; Horst Hachenberg, Walluf, and Hans-Joachim Schmidt, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Jul. 16, 1980, Ser. No. 169,629**

**Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928922**

**Int. Cl.³ C07C *1/00, 1/24***

**U.S. Cl. 585—640** **6 Claims**

1. Process for the manufacture of $C_2$–$C_4$-olefins from methanol and/or dimethyl ether in the presence of water, on an aluminum silicate catalyst containing manganese, which comprises washing the catalyst with a solution of ethylenediaminetetraacetic acid or tartaric acid with a pH of 3 to 7.

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**4,296,267**

**Patent Not Issued For This Number**

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**4,296,268**

**Patent Not Issued For This Number**

**4,296,269**

## CONTROL OF ELECTRICAL ARC FURNACES

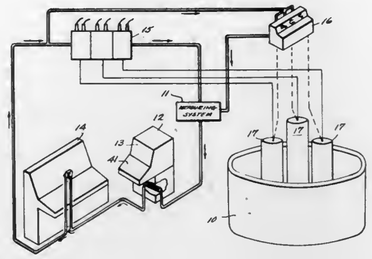
**Alistair B. Stewart, and Ian J. Barker, both of Randburg, South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa**

**Filed Jun. 13, 1978, Ser. No. 915,194**

**Claims priority, application South Africa, Jun. 29, 1977, 77/3923; Jan. 20, 1978, 78/0375**

**Int. Cl.³ H05B** *7/18*

**U.S. Cl. 13—12** **21 Claims**




1. A method for controlling operating conditions of a multiphase arc furnace, said furnace including a furnace bath, a transformer system defining a primary circuit and a secondary circuit, furnace control means, and electrodes operatively connected to the furnace control means and electrically connected to said secondary circuits, each of said electrodes, in conjunction with said furnace bath, having a reactance the method comprising the steps of:

measuring currents and voltages on at least one of said primary circuit and secondary circuit, excluding secondary phase voltages measured with respect to the furnace bath, and producing measurement signals related to said secondary circuit currents and voltages;

generating condition signals related to said operating conditions from said measurement signals on the basis that each said reactance is related to each other said reactance by an assumed relationship;

comparing the condition signals with predetermined signals; and

operating the furnace control means in accordance with any deviation of said condition signals from said predetermined signals to cause the conditioned signals to approach said predetermined signals.

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**4,296,270**

## ARRAY OF SOLAR CELLS

**Kranz Köhler, Unterhaching, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH**

**Filed Apr. 29, 1980, Ser. No. 144,954**

**Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919041**

**Int. Cl.³ H01L** *31/04*

**U.S. Cl. 136—244** **6 Claims**

1. An improved array of solar cells of the type having a plurality of solar cells having N-type and P-type conducting zones, a plurality of contacting connectors electrically interconnecting the N-type with the P-type conducting zone of adjacent cells, each contacting connector extending outwardly from the periphery of a respective cell, the improvement wherein each of the contacting connectors comprises a foil-type ribbon having a corrugated portion extending from each solar cell; and the connectors of adjacent solar cells being overlapped and connected to each other at the corrugated portions for electrical connection but without coming into contact with adjacent solar cells.

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**4,296,271**

## GAS INSULATED HIGH VOLTAGE LINE AND METHOD OF ASSEMBLING SAME

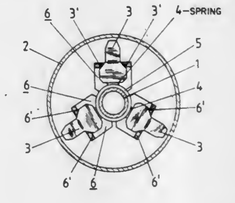
**Carl D. Floessel, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

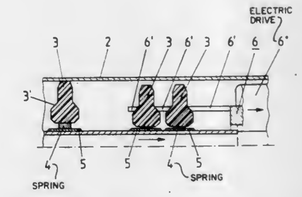
**Filed Apr. 1, 1980, Ser. No. 136,350**

**Claims priority, application Switzerland, Apr. 9, 1979, 3355/79**

**Int. Cl.³ H01B** *9/04, 13/20;* **H02G** *5/06*

**U.S. Cl. 174—28** **6 Claims**




1. A gas insulated, high-voltage electric line, comprising:

a pipe jacket having an inner surface;

a conductor centrally arranged within the pipe jacket;

a plurality of insulators arranged about the periphery of said conductor; and

spring means, arranged between said insulators and said conductor, for urging each of said insulators radially outwardly toward, and into contact with, said inner surface of said pipe jacket, said spring means including

at least one carrier ring encircling said conductor, on which carrier ring said insulators are mounted, an inner diameter of which carrier ring is at least as large as an outer diameter of said conductor; and

a plurality of resilient, spring-like elements, each of which elements is interposed between said conductor and one of said insulators; and

said insulators being movable relative to said pipe jacket along a longitudinal axis of said pipe jacket.

6. A method for assembling a gas insulated, high-voltage electric line, comprising the steps of:

mounting at least first and second sets of radially directed insulators onto a conductor, each of said insulators includ-

ing a resilient member interposed between the conductor and the insulator;

simultaneously urging all of the insulators mounted on the conductor radially downwardly toward said conductor to produce a clearance between an outer end of each of said insulators and an inner surface of a pipe jacket;

moving said conductor and said at least first and second sets of insulators into an interior of said pipe jacket;

releasing all of the insulators when the first set of insulators has been moved to a first location to permit the resilient members interposed between the conductor and the first set of insulators to urge the first set of insulators radially outwardly into engagement with the inner surface of said pipe jacket;

simultaneously engaging and urging all of the insulators of the second set of insulators radially downwardly toward said conductor to produce a clearance between an outer end of each of said second set of insulators and the inner surface of said pipe jacket;

moving said conductor and said second set of insulators further into the interior of said pipe jacket; and

releasing all of the insulators of the second set of insulators when the second set of insulators has been moved to a second location to permit the resilient members interposed between the conductor and the second set of insulators to urge the second set of insulators radially outwardly into engagement with the inner surface of said pipe jacket.

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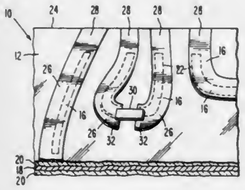
**4,296,272**

## COMPOSITE SUBSTRATE

**Robert L. Schelhorn, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 30, 1979, Ser. No. 98,927**
**Int. Cl.³ H05K** *1/03*
**U.S. Cl. 174—68.5** **7 Claims**




1. An improved thick film composite substrate of the type having a plurality of patterned conductive layers interleaved with a plurality of electrically insulating ceramic layers and having a patterned electrically conductive layer of a refractory material on an exposed surface thereof, said original patterned conductive layer of refractory material having been shrunk during fabrication of said substrate and being substantially incapable of being functionally interconnected with means of fixed spacing, said improved substrate comprising:

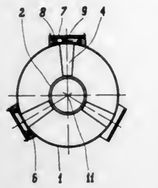
a patterned electrically conductive compensation layer generally following said original patterned conductive layer of refractory material entirely covering and extending beyond said shrunken patterned refractory material by an amount about equal to the degree of shrinkage of said original pattern whereby said patterned conductive compensation layer is functionally interconnectable with said means of fixed spacing.

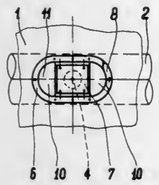
**4,296,273**

## SUPPORT ASSEMBLY FOR HIGH CURRENT BUS BARS

**Zygmunt Hologa; Krystyn Madeyski, and Adam Kurowski, all of Katowice, Poland, assignors to Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa", Katowice, Poland**

**Filed Mar. 3, 1980, Ser. No. 126,742**
**Int. Cl.³ H02G** *5/06*
**U.S. Cl. 174—99 B** **2 Claims**




1. In a support assembly for high current bus bars, including an elongated tubular enclosure having a generally circular cross-section, a plurality of insulators arranged in groups of three and being radially inwardly directed with respect to said enclosure, and spaced circumferentially 120° from each other, and means for adjustably mounting said insulators relative to said enclosure and providing access to the interior of said enclosure, the improvements being characterized in that said insulator mounting and access means comprises a series of longitudinally extending oval-shaped openings in said tubular enclosure, an integral oval-shaped flange defining each said opening, a cuboid-shaped bracket means mounted across each oval flange between opposite elongated sides thereof, each said bracket means including a square base extending radially inwardly toward the center of said enclosure, said insulator being secured to said bracket base, said cuboid-shaped bracket mounted over said oval-shaped opening defining a pair of semicircular spaces providing access for inspection to the interior of said enclosure, and located at longitudinally spaced opposite sides of said bracket means, and an oval-shaped cover releasably secured to each said oval-shaped flange and overlying said bracket means.

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**4,296,274**

## HIGH VOLTAGE BUSHING HAVING WEATHERSHED AND SURROUNDING STRESS RELIEF COLLAR

**Alan H. Cookson, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jul. 11, 1980, Ser. No. 167,501**
**Int. Cl.³ H01B** *17/26, 17/42*
**U.S. Cl. 174—142** **12 Claims**

1. A high voltage bushing comprising:

a hollow weathershed having an outside surface and a first end;

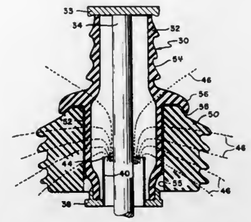
a high voltage conductor disposed within said weathershed exerting a region of high electric field stress concentration on the outside surface of said weathershed;

means contacting the electric field for outwardly directing the concentration of high electric field stress to a predetermined portion of the outside surface of said weathershed; and

a dielectric collar surrounding said predetermined portion of said weathershed, said collar having adjacent the region of high electric field stress concentration, a thickness substantially greater than the thickness of said weathershed, said collar further having an outside surface which forms a portion of the outside surface of said bushing; and

means, separate from said collar, for supporting said weathershed, whereby the electric field stress concentration on the outside surface of said bushing is relieved.



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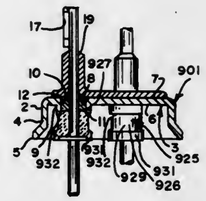
**4,296,275**

## HERMETIC REFRIGERATION TERMINAL

**Benjamin Bowsky, Maineville, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Jun. 9, 1980, Ser. No. 157,411**
**Int. Cl.³ H01B** *17/26*
**U.S. Cl. 174—152 GM** **13 Claims**




1. In a hermetic refrigeration terminal having a cup-shaped body with a generally flat bottom and at least one opening in said bottom defined by an annular sealing lip, a current conducting pin extending through said opening and beyond said lip on both ends thereof, the inner end of said pin being on the dish side and the outer end being on the outer side of said body, and a seal bonding said pin to an inside surface of said lip, the improvement comprising a flange extending generally radially from said pin and located axially between said lip and said inner end of said pin, and a sleeve surrounding said pin and extending axially between said flange and said lip, said sleeve being at least in part larger in diameter than said opening, said sleeve being bonded at its end opposite the flange to said seal.

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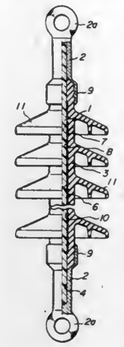
**4,296,276**

## ROD-TYPE SYNTHETIC RESIN INSULATOR WITH OVERCOAT AND METAL FITTINGS

**Takeshi Ishihara, Toyoake; Daisaku Goto, Konan, and Hitoshi Sugiura, Toyohashi, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan**

**Filed Mar. 4, 1980, Ser. No. 127,038**
**Claims priority, application Japan, Nov. 17, 1979, 54-149317**
**Int. Cl.³ H01B** *17/02*
**U.S. Cl. 174—179** **6 Claims**

1. A synthetic resin insulator comprising a fiber-reinforced plastic rod, metal fittings which hold both ends of the fiber-reinforced plastic rod, and a seamless unitary overcoat which consists of an elastic insulating material, covers the total surface of the fiber-reinforced plastic rod located between the metal fittings and is provided at its outside with a plurality of sheds, said metal fittings having metal sleeves gastightly fixed thereto and being operative to receive both ends of the overcoat, both ends of said overcoat being sandwiched between the metal sleeve and the fiber-reinforced plastic rod and fixed and sealed in the metal sleeve by pressing the sleeve in the radial direction so as to isolate gastightly the interface between the overcoat and the fiber-reinforced plastic rod from the external atmosphere, and wherein the elongation of the outer surface of the overcoat resulting from assembly with said fiber-reinforced plastic rod and pressing of said sleeves is not higher than 2%.

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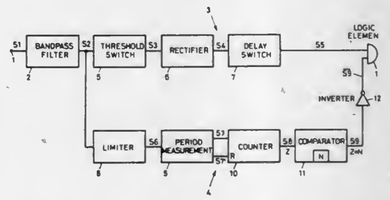
**4,296,277**

## ELECTRONIC VOICE DETECTOR

**Hansruedi Daneffel, Uerikon, Switzerland, assignor to Feller AG, Horgen, Switzerland**

**Filed Sep. 26, 1979, Ser. No. 79,186**
**Claims priority, application Switzerland, Sep. 26, 1978, 10033/78**
**Int. Cl.³ H04M** *1/64*
**U.S. Cl. 179—1 VC** **10 Claims**




1. An electronic voice detector for use in an automatic telephone answering apparatus, said voice detector having input means for receiving audio signals from a telephone line, and output means for supplying a control signal indicating the presence of an incoming voice signal, wherein between said input means and said output means a first signal channel and a second signal channel are disposed in parallel configuration, said signal channels being commonly connected to said input means and said signal channels being connected to said output means through a logic means, said first signal channel comprising signal threshold means for generating an output signal if the signal from the input means has an amplitude exceeding a predetermined level, and signal delay means connected to the output of said threshold means for generating an output signal if said output signal from said threshold means has a duration exceeding a predetermined time interval, said second signal

channel comprising period measuring means for measuring the period of each cycle of the signal from said input means and for generating a first output signal at a first output if the period of the cycle is within a predetermined range, and a second output signal at a second output if the period of the cycle is outside said predetermined range, and counting means having a counting input, a reset input and an output, said counting and reset inputs being connected to said first and second outputs, respectively, of said period measuring means, said counting means generating an output signal for a predetermined number of consecutive output signals from said first output of said period measuring means, and being reset by an output signal from said second output of said period measuring means, said output of said delay means being connected to a first input of said logic means and said output of said counting means being connected to a second input of said logic means, said logic means being adapted to supply the control signal to said output means with the presence of an output signal from said delay means and with the simultaneous absence of an output signal from said counting means.

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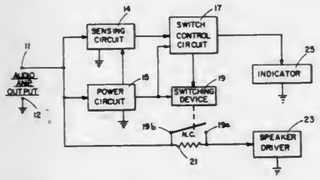
**4,296,278**

## LOUDSPEAKER OVERLOAD PROTECTION CIRCUIT

**Steven B. Cullison, Garden Grove, and Charles B. Slack, Costa Mesa, both of Calif., assignors to Altec Corporation, Anaheim, Calif.**

**Filed Jan. 5, 1979, Ser. No. 1,307**
**Int. Cl.[2] H04R *3/00*; H03K *5/08***
**U.S. Cl. 179—1 VL** **10 Claims**




1. A circuit for protecting a loudspeaker from overload by the power output of an amplifier fed thereto comprising:
sensing circuit means forming a first channel for detecting the amplifier power output and generating a control signal when said power output exceeds a predetermined level,
control circuit means for generating a switching signal in response to said control signal,
a current limiting device,
switch means for placing said current limiting device in circuit with the loudspeaker in response to said switching signal so as to limit the power fed thereto, and
power circuit means forming a second channel separate and apart from said first channel which receives the output of said power amplifier for generating a predetermined reference signal for the sensing circuit means and for providing power for the sensing circuit means and the switch means.

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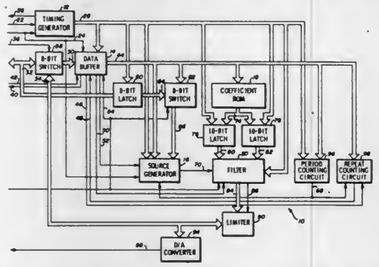
**4,296,279**

## SPEECH SYNTHESIZER

**John E. Stork, Malibu, Calif., assignor to Speech Technology Corporation, Santa Monica, Calif.**

**Filed Jan. 31, 1980, Ser. No. 117,075**
**Int. Cl.[3] G10L *1/00***
**U.S. Cl. 179—1 SM** **10 Claims**

1. A speech synthesizer for developing a signal representing voiced and fricative sounds from signals representing blocks of sound describing data, the synthesizer comprising in combination:
a timing generator including means for generating a signal delineating a series of predetermined sample intervals and means for generating a signal delineating a plurality of major periods within each of said sample intervals including a first period;
double buffering means connected to said timing generator, said double buffering means including first data block storing means for asynchronously receiving the signals representing members of a block of the data, second data block storing means for developing signals representing a previously received one of said blocks of said data and means for updating said second data block storing means from said first data block storing means;
period counting means connected to said timing generator and said double buffering means, said period counting means for developing a signal delineating a series of pitch periods each having a duration specified by said previous data signals;
source generating means connected to said timing generator and said period counting means and coupled to said double buffering means, said source generating means for periodically developing an excitation signal having an amplitude specified by said previous data signals, said source generating means including means for varying the sign of said excitation signal in a quasi-random fashion,




said excitation signal being developed once during each of said pitch periods for voiced signals, said excitation signal being developed once during each of said first periods with said quasi-randomly varying sign for fricative sounds;
filter coefficient generating means connected to said timing generator and said double buffering means, said filter coefficient generating means for generating signals representing filter coefficients from said previous data signals;
a time multiplexed digital filter connected to said timing generator, said source generating means and said filter coefficient generating means, said filter being configurable as a two-pole filter and as a pair of cascaded single pole filters responsive to said previous data signals, said filter having filter characteristics defined by said filter coefficient signals, said filter including an output and an input connected to said source generating means during each of said first periods for receiving said excitation signal and being connected to said filter output otherwise; and
output means coupled to said filter output during each of said first periods said output coupling means for developing the sound signal.

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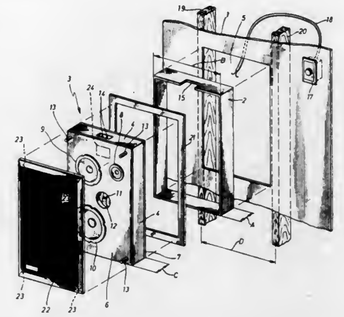
**4,296,280**

## WALL MOUNTED SPEAKER SYSTEM

**Ronald A. Richie, 5527 S. Braeswood, Houston, Tex. 77096**

**Filed Mar. 17, 1980, Ser. No. 131,264**
**Int. Cl.[3] H04R *1/02***
**U.S. Cl. 179—1 E** **12 Claims**

1. A high-fidelity speaker arrangement suitable for mounting in a wall structure comprising:
(a) a bass reflex speaker enclosure having,
(i) a plurality of speakers of varying frequency response characteristics to produce the high-fidelity sound,
(ii) a cross-over network for band pass filtering the audio electrical signal to the speakers whereby each speaker of given frequency response substantially receives only those frequencies of the signal that are within its response range, the depth dimension of said enclosure no greater than the nominal width of a standard wall stud, and
(iii) an acoustic sound absorber positioned to the rear of said speakers, for reducing the amount of sound reflected from the rear of said enclosure;
(b) a removable cover grille for covering the said speaker enclosure;



(c) a mounting assembly adapted for mounting between adjacent wall studs and secured to at least one of the wall studs, for receiving said speaker enclosure therein, said assembly having a depth dimension substantially equal to the depth of said speaker enclosure and a width dimension substantially equal to the nominal inside spacing between the adjacent wall studs for a standard stud spacing; and
(d) a trim frame mounted to the exterior surface of the wall, for covering said mounting assembly, said removable cover grille fitting inside said frame thereby making the exterior surface of the wall mounted speaker arrangement appear to be a part of the surface of the wall.

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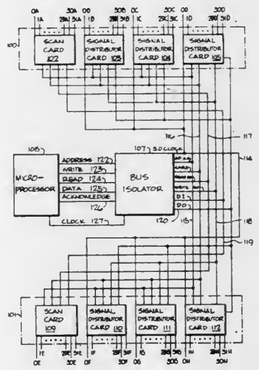
**4,296,281**

## STATIC, SOLID STATE ORIGINATING REGISTER COMPATIBLE WITH AN ELECTROMECHANICAL TELEPHONE CROSS-BAR SWITCHING SYSTEM

**Rajasekaran Udayasekaran, Mississauga, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Jan. 28, 1980, Ser. No. 115,906**
**Int. Cl.[3] H04Q *3/54***
**U.S. Cl. 179—18 EB** **9 Claims**




1. A static, solid-state originating register apparatus for use with an electromechanical telephone cross-bar switching system, said originating register apparatus comprising:
a plurality of static, solid-state scan networks responsive to an equal plurality of scan points, in a one-to-one relationship, for monitoring the status of said scan points;
a plurality of static, solid-state signal distributor networks for activating associated equipment in said switching system;
a microprocessor for controlling the operation of both said scan networks and said signal distributor networks; and
an isolator means for interfacing said microprocessor with both said scan networks and said signal distributor networks wherein said isolator means comprises:
means for changing the voltage levels of at least some address signals, originating from said microprocessor, to voltage levels suitable for use with both said signal distributor networks and said scan networks;
logic means, for providing command signals to read and to write, based both upon the logic states of a predetermined portion of the address signals, and upon the read and write signals generated by said microprocessor;
delay means, responsive to output signals of said logic means, for selectively delaying the occurrence of a read signal, a write signal and a signal distributor clock signal so as to provide a proper timing sequence for appropriate operations;
means, for changing the voltage levels of signals eminated from said delay means, to voltage levels suitable for use with both said scan networks and said signal distributor networks; and
a data link interface means for interfacing bi-directional data transmitted to or from said microprocessor, on a bi-directional data link, both with the data received from said scan networks, on a uni-directional data link, and with the data transmitted to said signal distributor networks, on a uni-directional data link.

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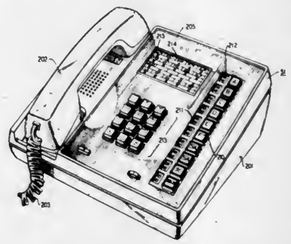
**4,296,282**

## INCOMING CALL IDENTIFICATION ARRANGEMENT

**Joseph T. O'Neil, Middletown; Thomas M. Quinn, Little Silver, and Tse L. Wang, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jun. 30, 1980, Ser. No. 164,358**
**Int. Cl.[3] H04Q *5/20***
**U.S. Cl. 179—99 LS** **3 Claims**



1. In a communication system having a plurality of multibutton stations each having capability of communicating with other stations over communication lines internal to the system wherein each button of each multibutton station is nonlocking and operable to establish communication connections to said station, said system comprising
means (**16-1**; FIG. **8**; FIG. **12**, SADT-**1**, SL-LSO) for providing visual signals at each communication control button of each station (**S1**, **S2**, **S3**) as an indication that a calling connection is incoming to the line controlled by said button at said station,
one of said buttons (**210B**) at a first station (**S3**) designated as a call coverage button operable to enable a communica-

tion connection between said first station (S3) and a first line on which a calling connection is being directed to a second station (S2),

a visual display field (214; FIGS. 3, 4 and 5; FIG. 14, RNG-CAL) at said first station operable when a call is directed to said first station for indicating the identity of the calling station (S1), said system characterized in that there is also provided determining means (FIGS. 3, 2, 7, 18 and 29, FIG. 10) for use on each incoming call to said first station (S3) to identify calls directed to said call coverage button (210B), and

means (FIG. 7; FIG. 9; FIG. 14; SL-ILJ) responsive to an identified call directed to said call coverage button (210B) for inhibiting said visual indication of said calling station (S1) and for substituting therefor on said visual display field an indication of the original called station (S2).

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**4,296,283**

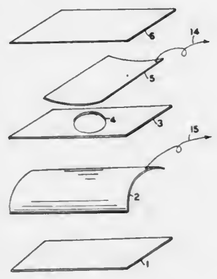
## NORMALLY CLOSED WAFER SWITCH

**Robert H. Koenig, Huntington Hills, and Victor D'Angelo, Port Washington, both of N.Y., assignors to Tapeswitch Corporation of America, Farmingdale, N.Y.**

**Filed May 17, 1979, Ser. No. 39,807**

**Int. Cl.³ H01H** *1/14*

**U.S. Cl. 200—16 D** **4 Claims**



1. A wafer switch which is normally closed in relaxed position but which opens when squeezed comprising:

a lower stiff plate,

a first curved conductive contact member having a longitudinal axis of curvature and mounted on the lower plate with the curvature extending in the upward direction,

an insulating plate mounted on the first curved conductive contact member, the insulating plate having a central aperture,

a second curved conductive contact member having a longitudinal axis of curvature and mounted on the insulating plate and having its curvature extending in the downward direction, said longitudinal axes of the first and second curved contact members being at right angles to each other,

the first and second conductive contact members being in contact through the aperture when they are in relaxed position,

an upper stiff plate mounted on the second curved contact member whereby when the upper and lower stiff plates are squeezed together the contact is broken.

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**4,296,284**

## FLEXIBLE SHIELD FOR HIGH VOLTAGE DISCONNECT SWITCH

**Donald L. Lott, Portland, Oreg., assignor to Siemens-Allis, Inc., Atlanta, Ga.**

**Filed Dec. 26, 1979, Ser. No. 106,720**

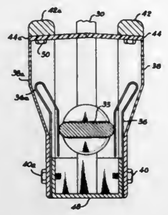
**Int. Cl.³ H01H** *31/00, 9/00*

**U.S. Cl. 200—48 R** **10 Claims**

1. Ice shielding means for an outdoor, high voltage disconnect switch assembly having interengaging moveable and stationary members, comprising:

rigid support means coupled to the stationary portion of the switch and extending generally vertically therefrom;

flexible shielding means having one side thereof fixedly coupled to said support means and aside opposite said one side free and unsupported so as to extend above the stationary portion of the switch and in the path of the moveable portion thereof;



whereby movement of the moveable portion of the switch pursuant to disengagement of the switch members temporary elastically deforms the shielding means.

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**4,296,285**

## HIGH-VOLTAGE, BLAST-ACTUATED POWER SWITCH HAVING FIELD ELECTRODES

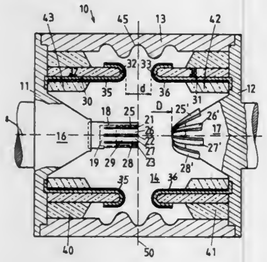
**Ernst Lang, Würenlingen, and Lutz Niemeyer, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Jan. 9, 1980, Ser. No. 110,793**

**Claims priority, application Switzerland, Jan. 11, 1979, 243/79**

**Int. Cl.³ H01H** *39/00*

**U.S. Cl. 200—61.08** **8 Claims**



1. A high voltage, blast-actuated power switch having a hollow switch casing and having first and second external electrical connections, said first and second external connections being electrically insulated from each other, said switch comprising:

bridge conductor means included within said switch casing for electrically connecting said first external connection to said second external connection, said bridge conductor means having first and second bridge conductor elements electrically connected to said first and second external connections, respectively, and said first and second bridge conductor elements being separatably connected to each other;

means for physically separating said first bridge conductor element from said second bridge conductor element by a first distance so as to electrically disconnect said first external connection from said second external connection; and

first and second field electrodes included within said switch casing, said first and second field electrodes being electrically connected to said first and second external connections, respectively, and said first and second field electrodes being separated by a second distance;

wherein said second distance is less than said first distance.



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**4,296,286**

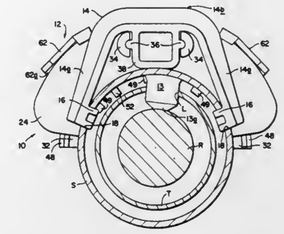
## SELF-REFERENCING POSITION SWITCH

**Warren N. Richardson, Mashpee, Mass., assignor to TRW Inc., Cleveland, Ohio**

**Filed Nov. 16, 1979, Ser. No. 95,042**

**Int. Cl.³ H01H** *9/00*

**U.S. Cl. 200—61.54** **19 Claims**



1. A self-referencing position switch adapted to be responsive to the position of a movable member relative to a second member, the movable member being movable over a course between a location at one end of the course and a selected location along the course, said switch comprising

A. a switch housing,

B. a switch actuator projecting from the housing for engagement by one of said members and movable by that member relative to the housing along a track to selectively open or close the switch when positioned at a determined location along the track from one end thereof,

C. means for mounting the housing to the other of said members so that the track extends in the same general direction as the course,

D. means for movably connecting the housing to the mounting means so that the two can move relative to one another along a path which extends in the same general direction as said course, and

E. means for adjustably maintaining the relative positions of the housing and mounting means along said path so that if the determined location is positioned beyond the selected location from said one course end, by moving said one member to said one course end, said switch actuator will be moved to said one track end and shift the housing relative to the mounting means by the amount required to align said determined track location with the selected course location.

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**4,296,287**

## WEATHERPROOFED CONDITION RESPONSIVE SWITCH

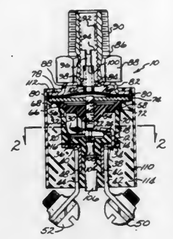
**Henry J. Boulanger, Cumberland, R.I.; Victor Lowell, North Attleboro, and Elliot Whipple, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 23, 1979, Ser. No. 97,018**

**Int. Cl.³ H01H** *35/34*

**U.S. Cl. 200—83 P** **13 Claims**

11. Condition responsive appartus comprising a generally cup shaped base having a bottom wall and a side wall depending therefrom, and forming a chamber therein, the side wall terminating at an open end, a motion transfer pin guide having a bore therethrough received at the open end of the base, a diaphragm assembly comprising a metallic annular diaphragm support plate disposed on the guide, a metallic diaphragm disposed on top of the support plate and a cup shaped metallic housing disposed on top of the diaphragm, the diaphragm support, diaphragm and housing welded together along a common, continuous outer peripheral margin, a motion transfer pin slidingly received in the guide and having two opposite ends, one end adapted to engage the diaphragm, a stationary electrical contact mounted in the base, a movable contact arm mounted in the base and adapted to move into and out of engagement with the stationary contact, the other end of the motion transfer pin adapted to engage the movable contact



arm, terminal receiving apertures formed in a wall of the base, electrical terminal means received in the apertures and connected to the stationary contact and movable contact arm, an orifice extending through the bottom wall of the base and pressure equalization means received in and occupying essentially all of the cross sectional area of the orifice whereby changes in pressure in an ambient in which the apparatus is disposed and the pressure within the chamber are able to equalize.

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**4,296,288**

## GAS INSULATED DISCONNECTING SWITCHES

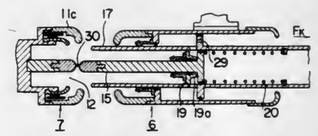
**Satoru Yanabu, Machida; Hitoshi Mizoguchi, and Naoaki Simogawara, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan**

**Filed Oct. 24, 1979, Ser. No. 87,655**

**Claims priority, application Japan, Oct. 30, 1978, 53-132593**

**Int. Cl.³ H01H** *33/12, 33/88*

**U.S. Cl. 200—146 R** **3 Claims**



1. A gas insulated disconnecting switch comprising:

(A) a stationary contact assembly including:

a substantially rod-shaped stationary arc electrode, and

a stationary conductive contact, and

(B) a movable contact assembly provided to confront said stationary contact assembly and including:

a stationary cylinder having an annular end plate extending inwardly from said stationary cylinder,

a cylindrical movable conductive contact coaxial with said stationary cylinder and having a piston extending outwardly from said movable conductive contact at a position farther from said stationary contact assembly than said end plate of said stationary cylinder, said piston slidably and gastightly engaging the inner surface of said stationary cylinder,

said end plate of said stationary cylinder slidably and gas-tightly engaging the outer surface of said movable conductive contact to form a compression chamber between said end plate and said piston and between said

stationary cylinder and said movable conductive contact, and

said movable conductive contact further having an annular stopper extending inwardly from said movable conductive contact,

a substantially rod-shaped movable arc electrode coaxial with said stationary cylinder and having a piston extending outwardly from said movable arc electrode at a position farther from said stationary contact assembly than said stopper of said movable conductive contact, said piston of said movable arc electrode slidably and gas-tightly engaging the inner surface of said movable conductive contact,

said stopper of said movable conductive contact slidably and gas-tightly engaging the outer surface of said movable arc electrode to form a damping chamber between said stopper and said piston of said movable arc electrode and between said movable conductive contact and said movable arc electrode, and

said movable conductive contact being provided with a perforation providing communication between said compression chamber and said damping chamber, said perforation being so positioned and sized that it extends, when said movable conductive contact is in engagement with said stationary conductive contact, over both sides of said end plate to provide communication between the two chambers and the exterior of the chambers, and,

a spring engaging at one end with said movable conductive contact and at the other end with said movable arc electrode in such a manner that when said movable conductive contact is moved toward said stationary conductive contact said spring urges said movable arc electrode toward the stationary arc electrode,

said stopper having a projection projecting toward said piston of said movable arc electrode to engage with and push said piston of said movable arc electrode when said movable conductive contact is separated from said stationary conductive contact.

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**4,296,289**

## ELECTRIC GAS-BLAST SWITCH

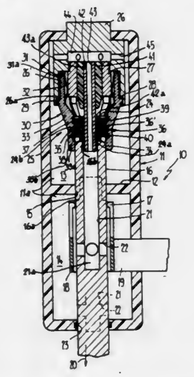
**Hans-Rudolf Wüthrich, Oberentfelden; Peter Krebs, Hirschtal; Hubert Spiegel, Oberentfelden, and Franz Eicher, Aarau, all of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland**

**Filed Mar. 26, 1979, Ser. No. 24,465**

**Claims priority, application Switzerland, Apr. 19, 1978, 4176/78**

**Int. Cl.³ H01H** *33/70*

**U.S. Cl. 200—148 R** **12 Claims**



1. An electrical gas-blast switch comprising:

a fixed set of contacts;

a movable, substantially tubular-shaped contact element which can be brought into and out of engagement with said fixed set of contacts;

said fixed set of contacts comprising:

a rim of rated current contacts which in a cut-on position of the switch engages about said movable contact element;

a burn-off rim electrically connected with the rated current contacts;

an intermediate electrode surrounded by said rim of rated current contacts but electrically insulated from the latter;

said rim of rated current contacts having contact surfaces cooperating with said movable contact element;

said burn-off rim being arranged within said rim of rated current contacts and rearwardly offset with respect to the contact surfaces of said rated current contacts which cooperate with said movable contact element;

a substantially tubular-shaped burn-off tip mounted at an end region of the movable contact element;

said burn-off rim, in the cut-on position of the switch, surrounds said burn-off tip and said burn-off tip engages with said intermediate electrode.

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**4,296,290**

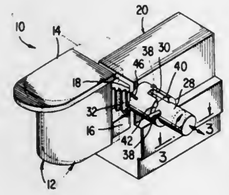
## SAFETY LOCK-ON MOTOR CONTROL

**David G. Peot, Easley, S.C., assignor to The Singer Company, Stamford, Conn.**

**Filed Jan. 16, 1980, Ser. No. 112,681**

**Int. Cl.³ H01H** *9/20*

**U.S. Cl. 200—325** **7 Claims**



1. In a trigger control for motor tools, or the like, incorporating a lock-on button on the side thereof; blocking means for blocking the lock-on button in a first rotational position of said button preventing an inadvertent depression but which enables the lock-on button to be rotated to a second rotational position and then depressed to provide a lock-on mode of operation which is easy to effectuate intentionally and having biasing means for automatically rotating said button when released from said second rotational position to said first rotational position so that such lock-on action is yet difficult to effectuate accidentally.

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**4,296,291**

## ELEVATOR CONTROL ADAPTOR FOR HANDICAPPED USERS

**Lester E. Johnson, Rte. #2, Box 40, Glyndon, Minn. 56547**

**Filed Jan. 25, 1980, Ser. No. 115,487**

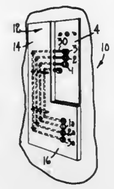
**Int. Cl.³ H01H** *3/20*

**U.S. Cl. 200—331** **16 Claims**

1. A method of making both the floor buttons and the car control buttons of a pre-installed self-service elevator system usable by persons unable to easily reach them, which comprises:

(a) establishing generally adjacent to each set of pre-installed floor and car control buttons an array of auxiliary buttons equal in number to the buttons in the adjacent set, wherein the auxiliary buttons in each array are located at a height which is easily reached by the persons who are unable to easily reach the floor and car control buttons;

(b) operatively connecting each of the auxiliary buttons in each array to a corresponding one of the buttons in the adjacent set by mechanically linking the auxiliary buttons to the corresponding buttons in the adjacent set such that



an inward actuating movement on one of the auxiliary buttons translates through the mechanical linkage to an inwardly actuating movement to its corresponding button in the adjacent set; and

(c) allowing all of the pre-installed floor and car control buttons to be individually operable in a normal manner by other persons who can easily reach these buttons.



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**4,296,292**

## VARIABLE ELECTROMECHANICAL DEVICE

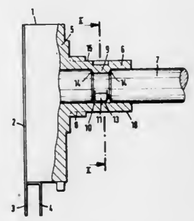
**Christian Schuberth, Bad Neustadt, and Rudolf Hartmann, Salz, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany**

**Filed Nov. 16, 1979, Ser. No. 94,891**

**Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850835**

**Int. Cl.³ H01H** *3/08;* **H01C** *10/00*

**U.S. Cl. 200—336** **7 Claims**



1. A variable electromechanical device, comprising

(a) a housing having a bore;

(b) an actuation shaft rotatably mounted in the bore and having an annular groove;

(c) a portion of the housing being displaced by stamping to extend into the annular groove of the shaft for preventing axial movement of the shaft within the bore;

(d) at least one projection formed on the shaft within the annular groove to cooperate with said displaced portion for limiting the rotation of the shaft relative to the housing;

(e) a high-viscosity liquid filling said annular groove, and

(f) liquid passage means associated with said projection to allow said liquid to pass from one side of the projection to the other side thereof when the shaft is rotated.

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**4,296,293**

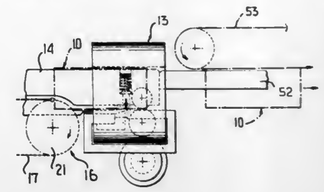
## PROGRESSIVE WELDING AND FORGING OF OVERLAPPED SEAMS IN TUBULAR BODIES

**Howard L. Gerber, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.**

**Filed Feb. 25, 1980, Ser. No. 124,414**

**Int. Cl.³ B23K** *13/02;* **H05B** *6/40*

**U.S. Cl. 219—8.5** **30 Claims**



1. A method of forming a tubular body with a welded longitudinal seam, said method comprising the steps of providing an unseamed tubular body, axially advancing the tubular body while guiding free edges of the body into overlapped relation, introducing electrical energy into the tubular body to heat the overlapped body free edges to a bonding temperature, lightly urging the heated free edges into bonding contact substantially without deformation of the free edges, and then forging the bonded still heated overlapped edges to effect a complete welding of the overlapped edges and materially reducing the thickness of a joint between the overlapped edges.

18. Apparatus for forming a welded side seam in a sheet metal tubular member, said apparatus comprising means for moving a rounded tubular member along a predetermined path with edge portions of the members in circumferentially overlapped relation, heating means disposed along said path for heating the edge portions to a welding temperature, pressing means disposed along said path adjacent said heating means for lightly urging the heated edge portions into bonded engagement, and forge means downstream of said pressing means for forging the bonded overlapped edge portions to effect a complete welding of the overlapped edge portions while materially reducing the thickness thereof.

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**4,296,294**

## METHOD AND APPARATUS FOR DRYING AND SETTING THE ADHESIVE ON BOOKS BY VAPORIZATION OF WATER USING RF ENERGY

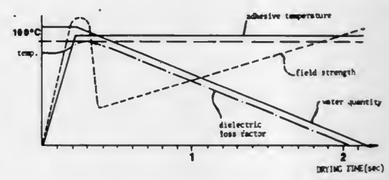
**Alexander Beckert, Wien-Osterreich, Austria, and Karl-Heinz Knobbe, Ellerbeck, Fed. Rep. of Germany, assignors to Reinhard Mohn GmbH, Gutersloh, Fed. Rep. of Germany**

**Continuation of Ser. No. 728,576, Oct. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,616, May 29, 1975, Pat. No. 4,014,732. This application Nov. 13, 1978, Ser. No. 960,269**

**Claims priority, application Fed. Rep. of Germany, Jun. 1, 1974, 2426704; Nov. 29, 1975, 2553816**

**Int. Cl.³ H05B** *6/54;* **B32B** *19/02*

**U.S. Cl. 219—10.41** **7 Claims**




1. An improved method for drying and setting an adhesive layer applied to the backs of book blocks by passing the book blocks by means of clamps along a travel path through a high

frequency leakage field to vaporize the water in the adhesive, the improvement comprising the steps of:
subjecting the adhesive layer on the back of said book blocks to a high frequency leakage field of high strength to heat the adhesive layer to a desired vaporization and drying temperature;
maintaining said desired temperature until said adhesive layer is completely dried and set by varying the strength of said high frequency leakage field along said travel path, said field strength initially being substantially reduced following heating of said adhesive layer to said desired temperature and thereafter continuously increased in inverse proportion to the dielectric loss factor of said adhesive layer, said high energy leakage field being produced by a plurality of RF electrodes spaced-apart along one side of the travel path of said book blocks in an oblique manner relative to said travel path and wherein said step of subjecting and maintaining comprises varying the spacing between said electrodes along said travel path, said electrodes being spaced relatively close together at the beginning and end of said travel path and being spaced further apart in the center range of said travel path, with the spacing between said electrodes decreasing from said center range to the end of said travel path, and wherein adjacent electrodes are fed with 180° phase displaced voltages so that the voltage difference between adjacent electrodes is larger than between an electrode and a clamp.

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**4,296,295**
**INDUCTION HEATING COIL**
**Mitsuyuki Kiuchi, Minoo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**
**Filed Mar. 25, 1980, Ser. No. 133,685**
**Claims priority, application Japan, Apr. 4, 1979, 54/44205[U]**
**Int. Cl.³ H05B** *5/04*
**U.S. Cl. 219—10.49 R** **4 Claims**

1. A flat spiral wound induction heating coil of inner and outer pitch for a cooking appliance of the induction heating type which comprises a coil winding of litz wire having inner and outer turns, the outer turns being directly adjacent with each other and having a substantially uniform pitch, and a strip of electrically insulating material which is wound along between and adjacent to only said inner turns of said coil winding of litz wire so as to provide a comparatively larger, substantially uniform winding pitch for said inner turns of litz wire than the pitch of said outer turns thereof and thereby providing a uniform temperature distribution across the bottom of the cooking appliance.

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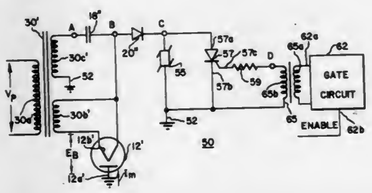
**4,296,296**
**CONTROLLABLE-DUTY-CYCLE POWER SUPPLY FOR MICROWAVE OVEN MAGNETRON AND THE LIKE**
**Charles W. Eichelberger; Rudolph A. Dehn, both of Schenectady, and Robert J. Wojnarowski, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**
**Filed Aug. 13, 1979, Ser. No. 66,300**
**Int. Cl.³ H05B** *6/66*
**U.S. Cl. 219—10.55 B** **9 Claims**




1. A controllable-duty-cycle power supply for connection between a sinusoidal power source and a load consuming appreciable amounts of power only if a minimum voltage applied thereto is exceeded, comprising:
a power transformer having a primary winding connected to said source and a high-voltage secondary winding having first and second ends;
a capacitance element connected in electrical series connection with said secondary winding first end and said load;
means connected to the junction between said capacitance element and said load for allowing unidirectional flow of current in only one of the directions toward and from said junction;
a non-linear resistance element in electrical series connection with said unidirectional means across said load; said non-linear resistance element providing a relatively high resistance for all voltages thereacross less than a predetermined breakdown voltage which is less than said minimum voltage and sufficiently large to prevent application of said minimum voltage to said load, and providing a relatively low resistance when the voltage thereacross exceeds said breakdown voltage;
a gateable element in electrical parallel connection with said non-linear resistance element, said gateable element having a breakdown voltage greater than said non-linear resistance element and less than said minimum voltage and being controllable to conductive and nonconductive conditions respectively to cause the voltage across said load to be respectively at least said minimum voltage and less than said minimum voltage and said load to be respectively power-consuming and non-power-consuming responsive respectively to first and second amplitudes of a controlling signal; and
means for providing said controlling signal of said first amplitude at a frequency at least two orders of magnitude higher than the frequency, at all phase angle relationships of each cycle, of said sinusoidal power source and with a controllable ratio of the time interval during which said relatively high frequency control signal is present to the entire time interval between successive intervals of control signal.

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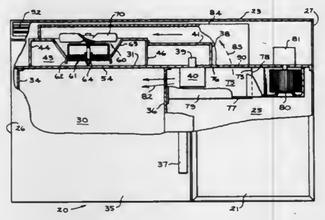
**4,296,297**
**DRIVE ARRANGEMENT FOR MICROWAVE OVEN MODE STIRRER**
**Matthew S. Miller, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**
**Filed Dec. 26, 1979, Ser. No. 106,649**
**Int. Cl.³ H05B** *6/74*
**U.S. Cl. 219—10.55 F** **6 Claims**



1. A microwave energy stirrer assembly for a microwave oven, said stirrer including stirrer blades mounted for rotational movement in the path of microwave energy into said oven, a vertical mounting shaft, said blades mounted adjacent the lower end of said shaft, a drive fan carried by said shaft adjacent the end remote from said stirrer blades, said stirrer blades adapted when rotated to change the microwave energy field pattern in said oven, air channeling means for directing a flow of air into contact with said drive fan to rotate said fan and consequently said shaft and mode stirrer blades, and a cylindrical bearing for supporting said assembly, said drive fan comprising a plurality of blades having surfaces facing said flow of air, said surfaces being shaped to lift said assembly axially from said bearing during rotation.



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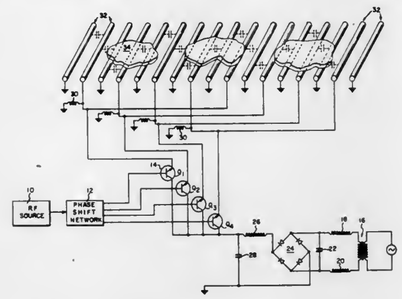
**4,296,298**
**DIELECTRIC COOKING APPARATUS**
**George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.**
**Continuation of Ser. No. 914,694, Jun. 12, 1978, abandoned.**
**This application Nov. 5, 1979, Ser. No. 91,004**
**Int. Cl.³ H05B** *6/54*
**U.S. Cl. 219—10.81** **3 Claims**




1. A dielectric heating oven comprising:
an enclosure;
a source of RF energy;
means for substantially terminating both ends of electric fields in a plane, said terminating means comprising a plurality of at least four elongated parallel electrodes positioned in said plane in said enclosure and spaced apart substantially less than a free space wavelength of said energy;
means for electrically grounding alternate electrodes of said plurality;
means for coupling said RF energy from said source to the remaining ungrounded electrodes of said plurality for cooking food positioned adjacent to said plane, said coupling means comprising means for selecting between deep or shallow cooking effects in said food, said selecting means including means for selectively varying the phase difference between the phase of energy coupled to one of said ungrounded electrodes and the phase of energy coupled to a second of said ungrounded electrodes; and
said phase difference is selectable between approximately 90°, 180° and 270° out of phase.

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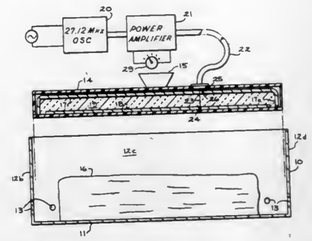
**4,296,299**
**APPARATUS FOR THAWING FROZEN FOOD IN A REFRIGERATION APPLIANCE**
**Richard L. Stottmann, Louisville, and Peter H. Smith, Anchorage, both of Ky., assignors to General Electric Company, Louisville, Ky.**
**Filed Dec. 31, 1979, Ser. No. 108,755**
**Int. Cl.³ H05B** *6/46*
**U.S. Cl. 219—10.81** **5 Claims**

1. For use in a refrigeration appliance, apparatus for thawing a frozen food load comprising:
a food thawing enclosure including top, bottom and side walls comprised of electromagnetic radiation shielding material and adapted to be positioned within and in good thermal communication with the low temperature atmosphere of the refrigeration appliance, said enclosure including first and second electrodes defining a food thawing zone therebetween;
means for moving at least one of said electrodes to permit removable placement of the food load in the thawing zone with both electrodes in close physical proximity to the food loads during the thawing process;
and means for supplying high frequency electromagnetic energy to said electrodes to thaw the food,




whereby the food load can be thawed and subsequently maintained at the food preservation temperature of the refrigeration appliance.

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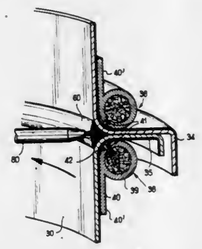
**4,296,300**
**METHOD AND DEVICE FOR WELDING PROTECTED METAL PARTS**
**Augusto Bottiglia, Milan, Italy, assignor to Sio-Societa per l'Industria Dell'Ossigenc e di Altri Gas, Milan, Italy**
**Filed Dec. 19, 1978, Ser. No. 971,105**
**Claims priority, application Italy, Dec. 23, 1977, 31263 A/77**
**Int. Cl.³ B23K** *9/23*
**U.S. Cl. 219—61.7** **9 Claims**

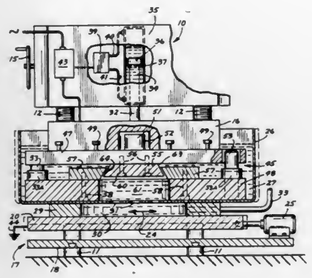



1. A method for welding metal protected by a coating of a material which volatilizes at a temperature less than the welding or brazing temperature of the metal, the method comprising, in combination:
forming a weld on the metal through the use of an electric arc;
cooling a selected localized portion of the coating in the immediate vicinity of the weld by applying a cryogenic cooling fluid to the coating, to maintain said coating at a temperature below its volatization temperature during the formation of the weld;
detecting the temperature of the coating portion during the formation of the weld; and
adjusting the cooling effect of the cryogenic fluid in accordance with the detected temperature.

## 4,296,301
## DIE FORMING METHOD AND MACHINE

Romain H. Johnson, 925 - 6th St. SE., Minneapolis, Minn. 55414

Continuation of Ser. No. 772,433, Feb. 28, 1977, abandoned. This application Sep. 12, 1978, Ser. No. 941,385
Int. Cl.³ B23P 1/00
U.S. Cl. 219—69 M 15 Claims



1. The method of forming a complete die from a blank and a die set having an upper shoe, a lower shoe, and guide means mounting the upper shoe on the lower shoe whereby the upper shoe can be moved toward and away from the lower shoe in a linear direction comprising the steps of:

severing a single blank to form a rough-cut female die block having an opening therethrough whereby the portion of the blank defined within the opening forms a rough-cut male die punch block complementary thereto and peripherally spaced from the female block when centered therein,

said severing forming adjacent rough-cut side walls on said female die block opening and said male punch block that are substantially parallel at any point therearound and tapered convergingly in the direction of intended die draft to define respectively smaller and larger openings on said female block and end surfaces on said male block on either side thereof with the larger end surface of said male block greater in size than the smaller opening of the female block, said taper of the rough-cut walls being greater than the taper of the intended die draft,

securing said male block to an upper die set shoe with the larger end surface of the block spaced downwardly therefrom, securing said female die block to a lower die set shoe with the smaller block opening spaced upwardly therefrom and said female block in surrounding relation to said male block,

aligning said die set shoes with said guide means for vertical relative movement in said linear direction so as to center the male block within the female block opening and with said male and female block walls in laterally spaced relation,

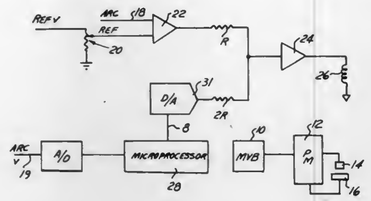
securing said upper die set shoe to an extractor, securing said lower die shoe to a bed, and,

moving the male punch block and female die block relative to each other in a direction in opposition to the taper of the side walls of the punch block and die opening while simultaneously effecting material-removing erosion between the male die punch block and the female die block to generate preselected die clearance and die draft.

## 4,296,302
## ADAPTIVE CONTROL OF GAP VOLTAGE AND POWER TO CONTROL SERVO OPERATION OF AN ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Aug. 21, 1979, Ser. No. 68,329
Int. Cl.³ B23P 1/02
U.S. Cl. 219—69 G 7 Claims




1. In an electrical discharge machining apparatus, an adaptive control system for providing relative movement between an electrode and a workpiece defining a machining gap including a servo feed motor and an electrically operated element for controlling said motor, comprising:

a first servo feed circuit including a gap voltage sensing network and a reference voltage network operably connected to said element for operating it responsive to the difference of voltage therebetween;

a second servo feed circuit including a second network for sensing gap voltage;

means for converting the output of said second network for sensing gap voltage to a first digital value;

means for comparing such first digital value to a predetermined and prestored digital value; and representative of optimum machining level;

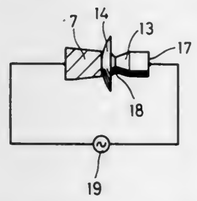
means for providing an analog output responsive to difference between said digital values and providing a second control output to modify the operation of said element and thus of said servo feed motor; and

a summing network operatively connected to the outputs of said first and second servo feed circuits for combining them before passing them to said electrically operated element.

## 4,296,303
## METHOD FOR MAKING INTERCELL CONNECTIONS IN MULTI-CELL STORAGE BATTERY

Kensaku Tsuchida, Kamakura, and Shinji Karasawa, Chigasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 26, 1979, Ser. No. 60,873
Claims priority, application Japan, Oct. 6, 1977, 52-120576
Int. Cl.³ B23K 11/14
U.S. Cl. 219—78.13 14 Claims




1. In a method for making an intercell connection in a multicell storage battery including, in each unit cell separated by at least a partition wall having an opening for said intercell connection, a pair of connectors integral with straps electrically conductive to electrode assemblies of one polarity and of the other polarity, wherein one of the connectors has a projection formed integral therewith and extending therefrom passing through said opening, and the other of the connectors has an aperture with an axis extending in the longitudinal direction of said projection to accept said projection extending through said opening, the method comprising the steps of:

(a) positioning said one and the other connectors of neighboring unit cells in contact with opposite sides of said partition wall so that said projection passes through said opening into said aperture to form a fit joint inbetween,

(b) causing said fit joint to be fused together by supplying said fit joint with heat sufficient for welding said projection with said aperture by applying an outside heating electrode to said fit joint with a back face of said other of the connectors being pressed by said heating electrode toward said connector and causing a heating current to flow between said projection and said heat electrode while pressing said connectors against said partition wall by a pair of pressing members, and

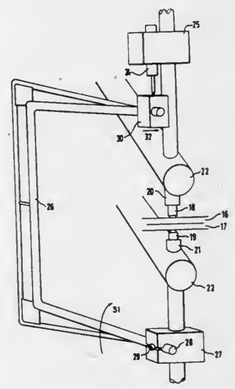
(c) continuing said pressing condition for a predetermined period of time after a completion of said heating operation.



## 4,296,304
## ELECTRODE DISPLACEMENT MONITORING IN RESISTANCE WELDING

Jacques Defourny, Herstal, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Sep. 19, 1978, Ser. No. 943,798
Claims priority, application Luxembourg, Sep. 20, 1977, 78152
Int. Cl.³ B23K 11/10
U.S. Cl. 219—86.41 3 Claims




1. In combination with a resistance welding machine comprising a main welding machine frame structure supporting a pair of first and second electrodes having a common alignment axis, apparatus for monitoring the operation of the welding machine, the apparatus comprising:

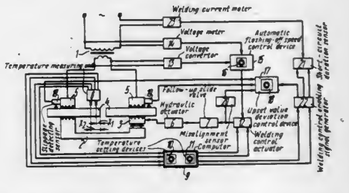
a single sensor for measuring displacement of the electrodes relative to each other during welding, the sensor having an axis along which the said displacement is measured, the said axis of the sensor and said common alignment axis of the electrodes being mutually parallel, the distance between the said axes being sufficiently small to render negligible any inadvertent small variation in parallelism between said sensor axis and said common alignment axis, wherein said single sensor is fixed to the first electrode,

the apparatus further comprising a second frame member, separate from said main frame structure and having two transverse elements, which are substantially perpendicular to the said alignment axis, and a longitudinal element interconnecting the transverse elements, one of the transverse elements being fixed to the second electrode, the other of the transverse elements being connected to the sensor, the longitudinal element being spaced from the electrodes by a distance which is only slightly less than the spacing between the electrodes and the main welding machine frame.

## 4,296,305
## MACHINE FOR CONTINUOUS FLASH BUTT WELDING

Viktor S. Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Vadim P. Krivonos, Krasnoarmeiskaya ulitsa, 45, kv. 92, Kiev; Nikolai V. Podola, ulitsa Pushkinskaya, 8, kv. 12, Kiev; Boris L. Grabchev, ulitsa Tupoleva, 5, kv. 4, Kiev; Vladimir R. Andrianov, proezd Zarevoi, 3, kv. 19, Moscow, and Rifkhat M. Shakirov, ulitsa Khudaiberdina, 1, kv. 16, Ufa, all of U.S.S.R.

Filed Apr. 10, 1979, Ser. No. 28,876
Int. Cl.³ B23K 11/04
U.S. Cl. 219—101 5 Claims




1. A machine for continuous flash butt welding of parts, comprising:

a welding transformer with a primary winding and a secondary winding;

a frame;

a movable clamping jaw and a stationary clamping jaw mounted on said frame for clamping workpieces mounted thereon;

a follow-up slide valve including a valve body and a rod;

hydraulic actuator means for displacing said movable clamping jaw and governed by said follow-up slide valve;

an automatic flashing-off speed control device;

a computer having an output, and including an automatic beginning-of-upset control device and an automatic upset value control device having an input, said computer, said automatic beginning-of-upset control device and said automatic upset value control device being incorporated in one unit;

a welding current meter forming one element of a welding circuit, and having an input connected to said primary winding of the welding transformer, and having an output;

first sensor means connected to the output of said welding current meter for detecting a short-circuit duration in the welding circuit;

control means having an output for controlling an upset value deviation, and provided with second sensor means for detecting slippage of said workpieces mounted on and welded in said clamping jaws;

third sensor means mounted on said follow-up slide valve for indicating misalignment of said rod of said follow-up slide valve relative to said valve body, and having an input and an output, said output of the third sensor means being connected to the input of said control means;

a welding control enabling signal generator having an input and outputs, said input of the welding control enabling signal generator being connected to the output of said computer, said outputs of the welding control enabling

signal generator being connected to said first sensor means for detecting short-circuit duration in the welding circuit and to said control means; and

actuators of said automatic flashing-off speed, beginning-of-upset and upset value control devices for controlling the flashing-off speed, beginning of upset operation, and upset value, respectively, being combined in a further single unit.

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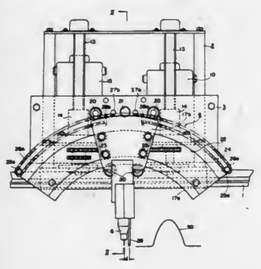
**4,296,306**

## METHOD OF WELDING CORRUGATED METALLIC MATERIALS

**Hirokazu Nomura, and Tadashi Fujioka, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 12, 1979, Ser. No. 75,165**
**Claims priority, application Japan, Sep. 29, 1978, 53-119264**
**Int. Cl.³ B23K** *9/12*
**U.S. Cl. 219—124.34** **1 Claim**



1. A method for welding corrugated metallic materials wherein a lifting block is vertically movably mounted on a welding apparatus proper which is movable in a horizontal direction on a track extending along a weld line and a rotating block carrying a welding torch is mounted on said lifting block, comprising the steps of:

mounting said welding torch to said rotating block by way of an arc length controlling drive block; comparing a change in an arc voltage with an arc length setting voltage; controlling an arc length control motor mounted on said arc length controlling drive block in response to a difference signal resulting from said comparison so as to maintain the arc length constant; controlling a lifting block drive motor in accordance with the rotational angle of said arc length control motor so as to bring the tip position of said welding torch into coincidence with the center of rotation of said rotating block; controlling a rotating block drive motor in response to signals from an obliquity detector disposed integrally with said torch and ahead thereof with respect to the direction of welding so as to maintain said torch at an angle corresponding to the oblique angle of the material to be welded; and controlling a welding apparatus proper traversing motor in response to a signal corresponding to said torch angle so as to maintain the welding speed constant.

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**4,296,307**

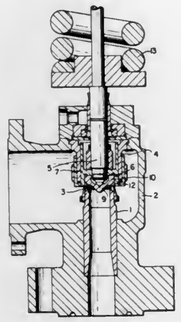
## MANUFACTURING METHOD OF THE VALVE DISK OF SPRING LOADED SAFETY VALVES

**Noboru Hagihara, Nishinomiya, Japan, assignor to TOA Valve Co. Ltd., Toribayashi Amagasaki, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,909**
**Claims priority, application Japan, Oct. 9, 1978, 53-124440**
**Int. Cl.³ B23K** *15/00*
**U.S. Cl. 219—121 ED** **4 Claims**

1. A method of manufacturing a valve disk for a spring-loaded safety valve, said valve disk comprising a cup-shaped center portion and a cylinder portion annularly fitted thereto, said center portion having a central longitudinal axis, a lower end, an outer periphery, a stepped annular recess about said lower end, and an annular protrusion axially-extending from said lower end and spaced radially inward of said stepped recess, said cylinder portion having an upper end, a lower end, an inner periphery and a radially inward extending annular valve-lip flange, said annular flange being made of continuous metal fibers and being formed by bending said lower end radially inwards, said upper end of said cylinder portion being fitted in said stepped recess, thereby forming a first contacting surface in a radial plane, said method comprising

forming at least one annular stage portion on said center portion radially inwardly of said stepped recess and radially outwardly of said annular protrusion;



forming at least one matching annular stage portion on said inner periphery of said cylinder portion;

fitting said cylinder portion to said center portion contacting said at least one annular stage portion to said at least one matching annular stage portion thereby forming a second contacting surface while establishing a uniform spacing between said annular protrusion and said annular flange; and

welding said cylinder portion to said centering portion by electronic beam at said first contacting surface whereby said second contacting surface takes up any heat distortion generated by the welding so that said uniform spacing is maintained constant.

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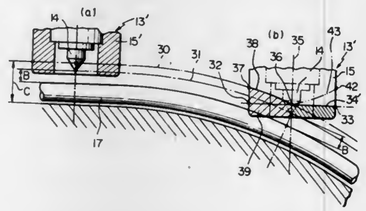
**4,296,308**

## APPARATUS FOR WELDING IMPELLER

**Syuhei Nakahama, and Etsu Yamashita, both of Chiba, Japan, assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Sep. 6, 1979, Ser. No. 72,843**
**Claims priority, application Japan, Sep. 6, 1978, 53/109274**
**Int. Cl.³ B23K** *9/225*
**U.S. Cl. 219—136** **10 Claims**



1. An apparatus for welding an impeller blade to a supporting plate of an impeller in which the impeller is held in a position to define between the impeller blade and the plate a V-shaped channel having an apex constituting a weld line including a straight horizontal portion and further including a curved portion extending continuously from the straight horizontal portion and within a plane inclined with respect to a horizontal plane, said apparatus comprising:

a welding torch assembly having a tungsten electrode, a nozzle surrounding said electrode and in which said electrode is mounted and having a passage for an inert gas, said nozzle having an exterior shape with the opposite sides thereof shaped for contacting the inner surfaces of said V-shaped channel for maintaining a substantially fixed distance between the tip of said electrode and the straight horizontal portion of the apex of said V-shaped channel, a torch rod having said torch nozzle mounted on one end thereof and a gas pipe for supplying the inert gas to said nozzle; and

a translating mechanism on which the other end of said torch rod is mounted for universal pivoting movement relative to said head, said translating mechanism being movable for moving said torch head along and above the weld line with said nozzle engaging the inner surfaces of said V-shaped channel under the effect of gravity;

the size of the lower portion of said nozzle from the center line thereof to at least one end of the nozzle facing in the direction of the length of the apex line being reduced sufficiently to give the nozzle a shape for keeping the space between said electrode and the apex of the channel substantially the same as the spacing in the straight horizontal portion of the apex during movement of said nozzle along the curved portion of the apex by avoiding interference of the nozzle with the inner surface of the V-shaped channel during movement along the curved portion of the apex.



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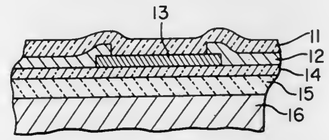
**4,296,309**

## THERMAL HEAD

**Akira Shinmi, Kawasaki; Masahisa Fukui, Yokohama; Toshitami Hara, Tokyo; Yoshiaki Shirato, Yokohama, and Yoshioki Hajimoto, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 15, 1978, Ser. No. 906,359**
**Claims priority, application Japan, May 19, 1977, 52-57936; Aug. 30, 1977, 52-103975; Sep. 7, 1977, 52-107522; Sep. 16, 1977, 52-111329; Oct. 13, 1977, 52-122622; Oct. 13, 1977, 52-122623; Oct. 13, 1977, 52-122624; Oct. 13, 1977, 52-122625; Oct. 28, 1977, 52-129482; Oct. 28, 1977, 52-129483; Oct. 28, 1977, 52-129484; Oct. 28, 1977, 52-129485; Oct. 28, 1977, 52-129486; Oct. 31, 1977, 52-131260; Oct. 31, 1977, 52-131261; Oct. 31, 1977, 52-131262; Dec. 28, 1977, 52-160137; Dec. 28, 1977, 52-160138; Dec. 28, 1977, 52-160139; Dec. 28, 1977, 52-160140; Dec. 28, 1977, 52-160143; Dec. 28, 1977, 52-160144; Dec. 28, 1977, 52-160145; Dec. 28, 1977, 52-160146; Dec. 28, 1977, 52-160147; Dec. 28, 1977, 52-160148; Dec. 28, 1977, 52-160149; Jan. 9, 1978, 53-1033; Jan. 9, 1978, 53-1034; Jan. 9, 1978, 53-1035; Jan. 11, 1978, 53-1806; Feb. 10, 1978, 53-14282; Feb. 10, 1978, 53-14283**
**Int. Cl.³ H05B** *1/00*
**U.S. Cl. 219—216** **36 Claims**



1. A thermal head comprising means for producing a pattern on a recording medium in accordance with information to be recorded, said means including a substrate, a thin film resistive heater element overlying the substrate, and electrically conductive members overlying the resistive heater element for supplying the resistive heater element with electric power, wherein the resistive heater element comprises a metal boride

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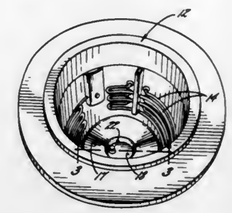
**4,296,310**

## COOKING DEVICE WITH WATER DETECTING MEANS

**Clement J. Luebke, Beloit, Wis.; John A. Mitchell, and Lowell W. Daniels, both of Rockford, Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.**

**Filed Aug. 20, 1979, Ser. No. 68,108**
**Int. Cl.³ F27D** *11/02*
**U.S. Cl. 219—440** **7 Claims**



1. A pressure fryer comprising a vessel adapted to hold a food product and cooking oil, a removable cover for establishing a pressure-tight condition within said vessel, means for heating said vessel and the contents thereof, an electrical circuit for controlling said heating means, means in the lower portion of said vessel for detecting the presence of water in the lower portion of said vessel and for producing an electrical signal when more than a predetermined quantity of water is present in said vessel, and means in said circuit for automatically disabling said heating means when said signal is produced.

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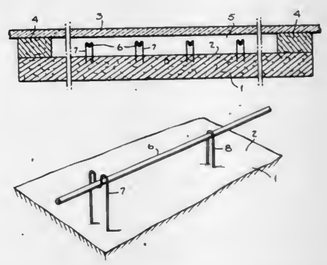
**4,296,311**

## ELECTRIC HOT PLATE

**Erik H. M. Hagglund, New Canaan, and Roger R. Giler, Wilton, both of Conn., assignors to The Kanthal Corporation, Bethel, Conn.**

**Filed Aug. 15, 1979, Ser. No. 66,684**
**Int. Cl.³ H05B** *3/74*
**U.S. Cl. 219—464** **1 Claim**



1. An electric cooking stove assembly comprising a glass plate, a convoluted molybdenum disilicide electric resistance heating wire forming a layer of interspaced convolutions substantially parallel with and spaced below said plate and having ends for connection with electric power, a refractory fibrous pad positioned below and completely free from contact with said layer and having a flat top surface substantially parallel with said layer, and means for supporting said layer so that when hot it radiates heat upwardly both directly and by reflection from said fibrous pad, the molybdenum disilicide wire of said element having a diameter and length which causes the wire to heat to temperatures substantially above 2000° F. when electrically powered at its rated voltage and at least the pad's said top surface having a substantially white color causing

appreciable diffused reflection of thermal energy having wave lengths inherent to said temperatures, said means comprising interspaced support wires having lower ends stuck in said fibrous pad, said support wires extending straight upwardly from the pad's said top surface, said wires having upper portions spaced above said pad and forming loops in which said molybdenum disilicide wire is positioned and thereby supported, said support wires having diameters no greater than said diameter of said molybdenum disilicide and made of metal alloy of the Fe-Cr-Al type and having an oxide coating protecting against reaction with said element.

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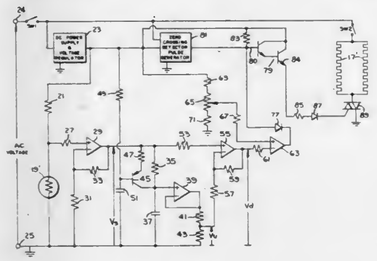
**4,296,312**

## ELECTRONIC TEMPERATURE SENSING SYSTEM FOR TOASTER APPLIANCES

**Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.**

**Continuation of Ser. No. 802,422, Jun. 1, 1979, abandoned. This application Nov. 19, 1979, Ser. No. 95,867**
**Int. Cl.³ H05B *1/02***
**U.S. Cl. 219—501** **31 Claims**



1. A temperature sensing system for sensing the heat applied to bread or other food article when loaded within the toast compartment of a toaster appliance so as to provide a consistent toast color for a given toast color setting for each toasting operation irrespective of starting conditions, comprising:
(a) first means, including a single temperature sensor to be positioned within the toast compartment of a toaster applicance and having an electrical characteristic which varies as a function of temperature, for providing a first electrical signal that is a function of the temperature of bread or a food article loaded within said toast compartment,
(b) second means to be positioned remote from the toast compartment for providing a second electrical signal that is a function of the ambient temperature in the vicinity of the loaded bread or other food article, said second signal being a function of the integral of said first electrical signal,
(c) third means for providing a third electrical signal that is a function of the difference between said first and second signals,
(d) fourth means for providing a fourth electrical signal that is invariant with respect to a given toast color as determined by the toast color setting, and
(e) fifth means responsive to the third and fourth signals for providing a fifth electrical signal for terminating the toasting operation upon said loaded bread or other food article having reached said given toast color.

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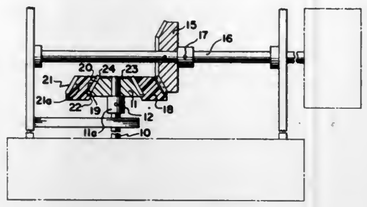
**4,296,313**

## GEAR SYSTEM AND METHOD OF ASSEMBLY

**John A. Horner, 211 Grove St., Kawkawlin, Mich. 48631, and Dale W. Wright, Saginaw, Mich., assignors to John A. Horner, Kawkawlin, Mich.**

**Filed Dec. 26, 1979, Ser. No. 106,913**
**Int. Cl.³ G06C *25/00***
**U.S. Cl. 235—61 L** **12 Claims**

1. An adapter bevel gear for interposition between a driving first bevel gear and a driven second bevel gear normally in mesh with said first gear so as to be driven by the latter at a predetermined speed ratio relative thereto, said adapter gear comprising a body formed of resilient material and having an internal, frustoconical cavity of such size as snugly to accommodate one of said first and second gears, said cavity having tooth-accommodating recesses therein for the snug accommo-



dation of each of the gear teeth of said one of said gears, said adapter gear having a frustoconical exterior provided with teeth of such size as to mesh with those of the other of said first and second gears, the number of said external teeth being greater than the number of tooth accommodating recesses in said cavity, thereby to change said ratio.

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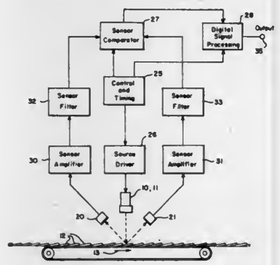
**4,296,314**

## NON-CONTACT COUNTER

**Kenneth W. Dabisch, and John S. Richards, both of Bolingbrook, Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.**

**Filed Nov. 26, 1979, Ser. No. 97,472**
**Int. Cl.³ G06M *7/00***
**U.S. Cl. 235—92 SB** **2 Claims**



1. Apparatus for counting newspapers moving in overlapped relationship in a continuous stream comprising:
(a) a source of pulsed radiant energy disposed to direct a stream of energy against the overlapped papers in a direction substantially normal to the direction in which the papers are moving;
(b) an energy sensor on each side of said radiant energy source to receive nonrefracted omnidirectional energy that is reflected from the stream of moving papers;
(c) sensor comparator means connected to each of said energy sensors;
(d) digital signal processing means connected to said sensor comparator means and responsive to the occurrence of a preselected number of consecutive validated pulses to deliver a count pulse indicating the passage of a paper past the energy source; and
(e) control and timing connected to (i) said source of radiant energy, (ii) to said sensor comparator means and (iii) to said digital signal processing means to pulse said source of radiant energy and to provide a clock pulse to said digital processing means.

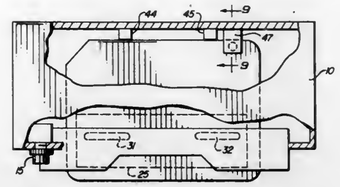


**4,296,315**

## CARD READER SECURITY SYSTEM

**Dan G. Weimer, Scottsdale, and Bradford O. Van Ness, Paradise Valley, both of Ariz., assignors to Engineered Systems, Inc., Tempe, Ariz.**

**Filed Apr. 16, 1979, Ser. No. 30,308**
**Int. Cl.³ G06K *7/08, 7/10, 19/06***
**U.S. Cl. 235—460** **6 Claims**



1. A security system for a card reader for reading data encoded on cards having a magnetic shield area located on the cards and covering at least two spaced points therein, said security system including in combination;
a card entry throat in the card reader having a slot therein to accommodate cards to be inserted into the reader;
two spaced-apart magnetically actuated switch means located on one side of the slot in said card entry throat;
two corresponding spaced-apart permanent magnet means located on the other side of the slot in said card entry throat opposite different ones of said two spaced-apart magnetically actuated switch means respectively, each of said magnet means having a field of sufficient strength to operate the corresponding switch means located opposite such magnet means, the relative locations of said switch means and said permanent magnet means being such that the shield area of an inserted card breaks the field from the permanent magnet means operating on the corresponding one of said switch means;
card insertion sensing switch means operated from a first state of operation to a second state of operation only when a card is fully inserted into the card reader for reading thereby; and
electrical control circuit means connected with each of said two spaced-apart magnetically actuated switch means and said card insertion switch means and operated thereby only when a card having a magnetic shield area covering said at least two spaced points thereon in the proper area thereof is fully inserted into the card reader for reading thereby.

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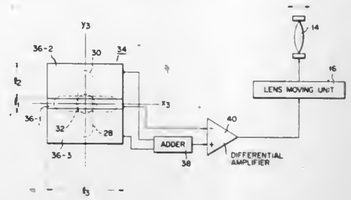
**4,296,316**

## OPTICAL FOCUSING DEVICE

**Shigeo Tsuji, Fujisawa, and Takahisa Aikawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,803**
**Claims priority, application Japan, Dec. 25, 1978, 53-158529**
**Int. Cl.³ G01J *1/36***
**U.S. Cl. 250—204** **4 Claims**

1. An optical focusing device for an optical information read-out system comprising:
an object lens for focusing a light beam onto the surface of a data carrier, thereby forming a projected image on the surface of the data carrier;
means for moving said objective lens along the optical axis of said objective lens;
light beams orienting means positioned in the light beam path between said objective lens and said light source for orienting the light beam toward said objective lens to change the position of the projected image of the light beam on the surface of the data carrier;
optical guiding means for guiding part of the light beams reflecting from or transmitted through the surface of the data carrier onto an observation plane;
photodetecting means disposed on said observation plane which detects a shape of the projected image of the light beam guided by said optical guiding means and is comprised of a first narrow photoelectric surface extending in the direction of movement of the projected image of the light beam which is effected by said light beam orienting




means, and second and third photoelectric surface closely disposed to the first photoelectric surface;
means for summing the signals detected by said second and third surface; and
electrical means for comparing the output signal from said summing means with the detectes signal from said first photoelectric surface to provide a signal to said lens moving means, thereby moving said objective lens to a predetermined position.

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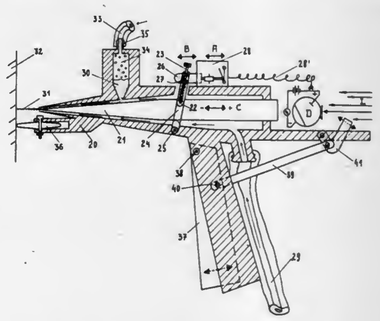
**4,296,317**

## PAINT APPLICATION METHOD AND MACHINE

**Roland Kraus, Mainlände 7, 8702 Veitshöchheim, Fed. Rep. of Germany**

**Filed Jan. 8, 1979, Ser. No. 1,437**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 250—215** **26 Claims**



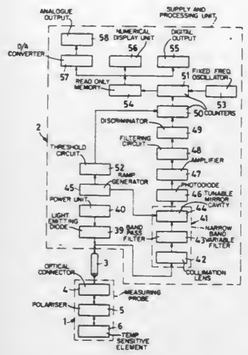
1. A paint application method comprising the steps of: guiding the spray opening of a spray gun at a constant distance from the working surface in the zone of picture reproduction; forcing paint into an air flow by pressure; controlling an amount of sprayed paint by the intensity of a light beam striking a photocell and controlled by a picture pattern; and moving photocell and the picture pattern synchronously with guide movement of the spray gun.

**4,296,318**

## OPTO-ELECTRONIC INSTRUMENT FOR REMOTE TEMPERATURE MEASUREMENT

**Sergio Mezzetti, Rho; Pierluigi Pizzolati, Cernusco Sul Naviglio, and Francesco Svelto, Rome, all of Italy, assignors to C.I.S.E. Centro Informazioni Studi Esperienze S.p.A., Italy**

**Filed Sep. 24, 1979, Ser. No. 78,322**
**Claims priority, application Italy, Sep. 22, 1978, 28012 A/78**
**Int. Cl.³ G02F *1/01***
**U.S. Cl. 250—225** **7 Claims**




1. An opto-electronic instrument for remote temperature measurement, comprising a measuring probe and a remote supply and processing unit connected together by at least one optical fibre, said supply and processing unit includng a luminous signal generator for said optical fibre, said measuring probe including at least one polariser, and a temperature-sensitive element constituted by a square cross-section parallelepiped crystal of uniaxial double refraction material disposed with its optical axis at 45° to the plane of polarisation of said polariser, to receive the luminous signal transmitted through said optical fibre and to retransmit it to the same optical fibre in the form of a luminous signal the intensity of which varies sinusoidally with the wavelength, and in which the peaks are spaced apart by a distance dependent on the sensed temperature, said supply and processing unit including a variable frequency filter controlled by a ramp generator for transforming said retransmitted luminous signal into a luminous signal the intensity of which varies sinusoidally with time, an opto-electrical transducer able to convert this latter luminous signal into a corresponding electrical signal of sinusoidal oscillation, and means for calculating the period of oscillation of said electrical signal.

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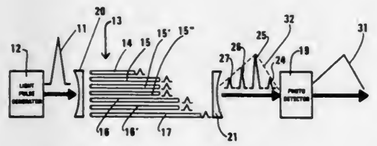
**4,296,319**

## WAVEFORM SYNTHESIZER

**Larry A. Franks, and Melvin A. Nelson, both of Santa Barbara, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Dec. 7, 1979, Ser. No. 101,369**
**Int. Cl.³ G02B *5/14***
**U.S. Cl. 250—227** **10 Claims**




1. A method of transforming a readily available preselected optical input pulse of one shape into a preselected output waveform of an arbitrary but defined different shape comprising:

(a) Providing an array of a plurality of fiber optic waveguides having lengths preselected so that the illumination of one end of the array with said preselected optical input pulse will produce at the other end of said array a chain of optical pulses spaced apart in time in accordance with said preselected lengths, whereby the summation of said chain of pulses will approximate the preselected output waveform,

(b) Illuminating said one end of the array with said optical input pulse, and

(c) Combining the outputs of said waveguides at the other end of said array to form a synthesized optical pulse output approximating the preselected shape.

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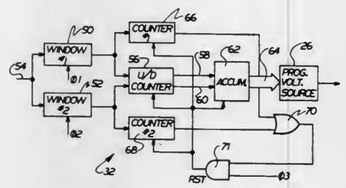
**4,296,320**

## AUTOMATIC GAIN CONTROL FOR RADIATION ANALYZER

**Samuel Miller, South Euclid, Ohio, assignor to Victoreen, Inc., Cleveland, Ohio**

**Filed Apr. 8, 1980, Ser. No. 138,652**
**Int. Cl.³ G01D *18/00***
**U.S. Cl. 250—252** **9 Claims**




8. A method of regulating the system gain of a radiation detecting system comprising the steps of:

providing a known radiation source having a known peak in its energy spectrum;

detecting radiation particles given off by said known radiation source and providing an electrical pulse in response to the detection of each said particle, said pulses each having an amplitude directly related to the energy of the corresponding detected particle;

setting the gain of said pulses in accordance with a stored gain indication;

counting the difference between the numbers of particles producing pulses having amplitudes falling within amplitude ranges above and below a preselected amplitude which is desired to correspond to the particle energy at which said known peak is located in said energy spectrum;

adjusting said stored indication whenever said difference count exceeds a preselected limit; and,

resetting said difference count to an initial value whenever more than a selected number of electrical pulses in a predetermined amplitude range have occurred since the previous reset.

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**4,296,321**

## BIT PRESSURE GAUGE FOR WELL DRILLING

**Donald W. Blincow, Claremont; Kevin H. Cassedy, Laguna Beach, and Samuel C. Dominey, Jr., Glendora, all of Calif., assignors to Tyco Laboratories, Exeter, N.H.**

**Filed May 5, 1980, Ser. No. 146,207**
**Int. Cl.³ G01V *5/00***
**U.S. Cl. 250—254** **6 Claims**

1. Apparatus for measuring the pressure on a well drilling bit connected to a drilling platform by a string of drill pipe, including in combination:

first and second sections of drill pipe having telescoping



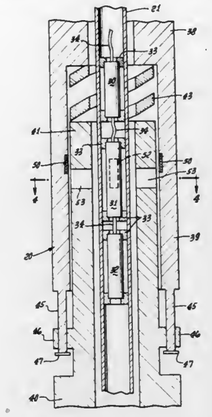
ends with said first section end sliding in said second section end;

a spring positioned between said first and second sections urging said second section away from said first section;

a probe positioned within said sections of drill pipe;

radioactive source means mounted on said second section end;

radiation detector means mounted in said probe, with said



first section end including window means providing a radiation path between said source and detector means; and

circuit means having said detector means connected as an input and providing as an output a signal varying as a function of radiation intensity at said detector means and hence of the position of said first section relative to said second section, the compression of said spring, and the pressure on said bit.

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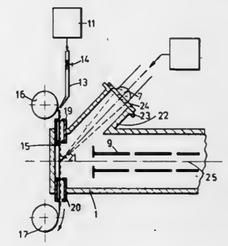
**4,296,322**

## METHOD FOR ANALYZING ORGANIC SUBSTANCES

**Reiner Wechsung, Cologne, Fed. Rep. of Germany, assignor to Leybold-Heraeus Gesellschaft mit beschränkter Haftung, Cologne, Fed. Rep. of Germany**

**Filed Aug. 27, 1979, Ser. No. 70,333**
**Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837715**
**Int. Cl.³ B01D *59/44***
**U.S. Cl. 250—282** **4 Claims**



1. A method for analyzing high molecular weight organic substances exiting from a chromatograph comprising subjecting such substance to laser radiation to produce negative ions therefrom, and subjecting those negative ions to time-of-flight mass spectroscopy.

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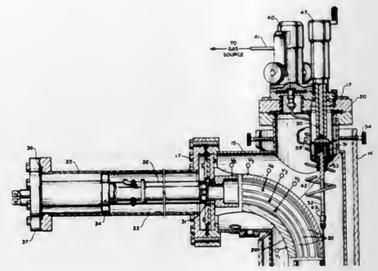
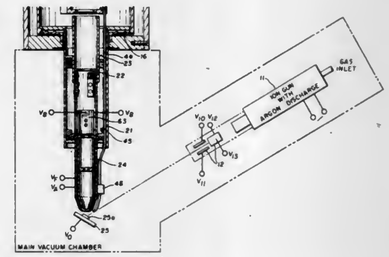
**4,296,323**

## SECONDARY EMISSION MASS SPECTROMETER MECHANISM TO BE USED WITH OTHER INSTRUMENTATION

**Robert L. Gerlach, Minnetonka, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed Mar. 10, 1980, Ser. No. 128,932**
**Int. Cl.³ B01D *59/44***
**U.S. Cl. 250—289** **11 Claims**






9. In a high definition spectroanalysis mechanism having capabilities of performing a plurality of analysis including a secondary ion mass spectrometry analysis of a preselected surface area, the mechanism comprising:

(a) a main vacuum chamber having an opening therein; said main vacuum chamber having means therein for producing secondary ions from said preselected surface area;

(b) a secondary vacuum chamber communicating with said main chamber through said opening therein;

(c) a flexible vacuum seal having an opening therein, said seal communicating with said main and secondary vacuum chambers permitting relative movement between said two vacuum chambers;

(d) means for imparting a limited movement of said secondary chamber with respect to said main chamber;

(e) a longitudinal extraction lens mechanism disposed adjacent the sample to be tested and extending between said main and secondary vacuum chambers and through said vacuum seal;

(f) a linear movement device connected to said longitudinal extraction lens mechanism to focus and withdraw said extraction lens with respect to said preselected surface area to be tested; and

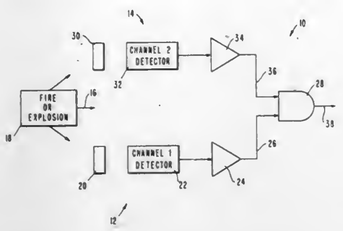
(g) means, within said secondary vacuum chamber, for analyzing said secondary ions from said preselected surface area.

**4,296,324**

## DUAL SPECTRUM INFRARED FIRE SENSOR

**Mark T. Kern, Goleta, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.**

**Filed Nov. 2, 1979, Ser. No. 90,701**
**Int. Cl.³ G01J *1/00***
**U.S. Cl. 250—339** **11 Claims**




1. An electrical detection system responsive to a fire or explosion for generating an output signal, including in combination:

(a) long wavelength channel means responsive to radiant energy in a predetermined spectral band greater than about 4 μm of electromagnetic radiation and received from a fire or explosion for generating a first logic signal;

(b) short wavelength channel means responsive to radiant energy in a predetermined spectral band less than about 3.5 μm of electromagnetic radiation and received from said fire or explosion for generating a second logic signal; and

(c) output gate means coupled to receive both said first and second logic signals and responsive thereto to generate said output control signal which may be further processed to control the suppression of said fire or explosion, with the proviso that at least one of said channel means is responsive to an atmospheric absorption wavelength associated with at least one combustion product of said fire or explosion.

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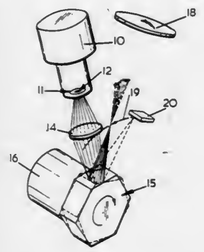
**4,296,325**

## SCANNING MIRROR POSITION SYSTEM

**Peter J. Berry, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland**

**Filed Mar. 10, 1980, Ser. No. 128,551**
**Int. Cl.³ G01J *1/00***
**U.S. Cl. 250—347** **2 Claims**



1. A radiation scanning system including a radiation detector, a radiation-imaging means for forming an image of radiation from a field of view, a scan member and a relay lens arranged to scan an image of the detector across the radiation image, and an arrangement for applying a characteristic radiation feature to the detector at a selected part of the detector image locus lying outside the normal scanned field of the system, wherein the radiation detector forms part of an assembly maintained at a temperature substantially below ambient, and said means for applying a characteristic radiation feature to the detector includes a mirror located on the scan locus of the detector image of the system and arranged to reflect radiation from the cooled assembly onto the detector.

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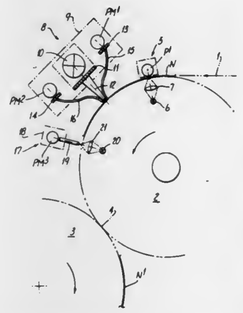
**4,296,326**

## WATERMARK DETECTION

**John M. Haslop, Woodley; Reginald G. Knapman, Overton, and Michael A. West, London, all of England, assignors to Thomas De La Rue & Company Limited, London, England**

**Filed Mar. 5, 1980, Ser. No. 127,789**
**Claims priority, application United Kingdom, Mar. 6, 1979, 07936/79**
**Int. Cl.³ G01J *1/42*; G01N *21/38*; B42D *15/00*; G06K *9/74***
**U.S. Cl. 250—372** **19 Claims**



1. A method of rejecting sheets which do not have a mould watermark (as herein defined), comprising the steps of:

measuring for each sheet, in an area in which a watermark is expected to be present, the absorption of ultraviolet radiation by the sheet;

measuring for each sheet, in the area in which a watermark is expected to be present, the transmittance of visible light by the sheet;

and rejecting sheets for which the said absorption measurement does not show a substantially constant value and also sheets for which the said transmittance measurement shows a substantially constant transmittance of visible light over the said area.

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**4,296,327**

## MULTI-STAGE COLLECTIVE FIELD CHARGED PARTICLE ACCELERATOR

**John L. Adamski, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jun. 2, 1980, Ser. No. 155,461**
**Int. Cl.³ H01J *27/00***
**U.S. Cl. 250—423 R** **10 Claims**

1. A multi-stage collective field charged particle accelerator, comprising:

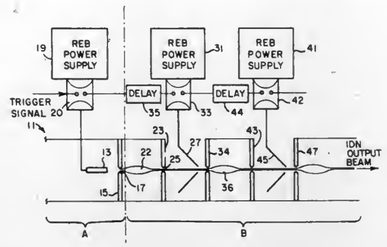
means forming a charged particle accelerator chamber;

a source of particles which in operation generates a particle plasma for said accelerator chamber;

first electron beam means, including a cathode source of electrons, power supply means for energizing said cathode, and an anode, having an opening therethrough, to which the electrons emitted from said cathode are discharged, the electron beam produced by said first electron beam means being characterized by a high current which exceeds the space charge limiting current, so that the electron beam stops downstream of the anode, thereby creating a space charge region which greatly accelerates a portion of the particles in the particle plasma, said portion forming a high energy particle bunch;

at least one successive electron beam means, positioned downstream of said first electron beam means, for further accelerating the particle bunch by creating another space charge region after it leaves said first electron beam means.



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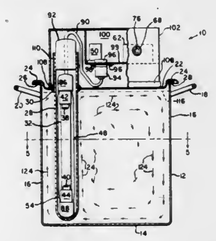
**4,296,328**

## APPARATUS FOR PRODUCING HIGH PURITY WATER

**Michael D. Regan, 40 Maple St., Medway, Mass. 02053**

**Filed Feb. 11, 1980, Ser. No. 120,725**
**Int. Cl.³ G01N *21/00***
**U.S. Cl. 250—436** **8 Claims**



1. An apparatus for photochemically removing organic material from water comprising a container forming a non-continuously inflowing and outflowing type single chamber water reservoir for holding a batch of said water in said single chamber reservoir, means for producing electromagnetic radiation in the 185 nanometer wavelength range including a source of said radiation positioned in said container to effect a gentle steady state circulation of the water in said batch about said source of radiation, and means for venting to the atmosphere from said container gasses produced in said container by said radiation.

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**4,296,329**

## ALIGNMENT DEVICE FOR COMPUTERIZED TOMOGRAPHY PHANTOMS

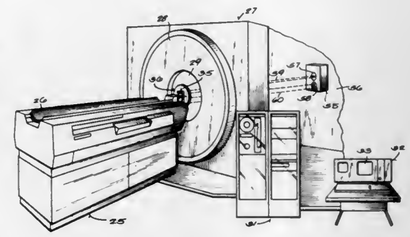
**Paul J. Mirabella, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 22, 1979, Ser. No. 87,595**
**Int. Cl.³ G01N *21/00***
**U.S. Cl. 250—491** **2 Claims**

1. Improved means for aligning the center of a calibration phantom with the isocenter of a computed tomography scanner apparatus, said scanner including an x-ray detector and an x-ray source for projecting an x-ray beam toward said detector while said source and detector are being orbited jointly about a longitudinal axis extending through said isocenter and constituting the center of an image reconstruction circle which lies between said source and detector in the x-ray beam path, said phantom comprising an x-ray transmissive cylinder having an end surface on which there are visible cross hairs which have a point of intersection coincident with the denter of the cylinder and which point it is desired to establish coincident with the isocenter for calibrating the scanner apparatus, and means for supporting said phantom is said beam path and for being shifted in any direction required to get said cross hair intersection and said longitudinal axis to coincide,

said improved aligning means comprising:

a laser light source means for being fixed in a predetermined location remotely from said phantom and generally in the direction in which said longitudinal axis extends, said laser light source being operative to project thin intersecting beams of coherent light which have the same angles between them as said cross hairs onto said phantom surface as luminous lines with the point of intersection of said beams being coincident with said isocenter and with the beams being simultaneously coincident with said cross hairs, said laser light source being adjustable to cause said beams to be coincident with the cross hairs of one of said phantoms after said one phantom has been shifted by means of its supporting means to a position where said center of the phantom cylinder coincides with said isocenter such that when any similar phantom is mounted for calibration purposes it will only be necessary to shift it until said intersecting laser light beams are coincident with its cross hairs to establish the similar phantom on the isocenter.



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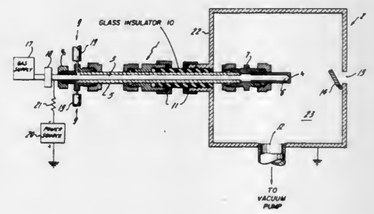
**4,296,330**

## FLOWING GAS DISCHARGE SOURCE OF VACUUM ULTRA-VIOLET LINE RADIATION SYSTEM

**George M. Thomson, Churchville, and Keith A. Jamison, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 16, 1980, Ser. No. 140,646**
**Int. Cl.³ G01J *1/00***
**U.S. Cl. 250—504 R** **4 Claims**




1. A vacuum ultraviolet line radiation system comprising:

(a) a gas supply;

(b) a tube means having an inlet operatively connected to

said gas supply, and an outlet end for carrying gas therethrough;
(c) a nozzle means fixedly mounted to the tube means at the outlet end of said tube means for sustaining an electrical discharge in an orifice positioned therein;
(d) a vacuum vessel circumambient said nozzle means having an outlet valve and outlet port axially aligned with said nozzle means and an evacuation port operatively positioned therein;
(e) a cooling jacket mounted longitudinally over said tube means;
(f) an insulator mounted upon said tube means between the inlet and outlet ends of said tube means, said insulator separating the tube means electrically from the vacuum vessel; and
(g) a power source for negatively biasing said source tube means with respect to said vacuum.

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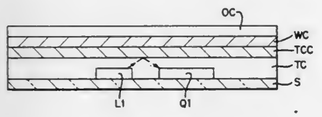
**4,296,331**
**OPTICALLY COUPLED ELECTRIC POWER RELAY**
**Edward T. Rodriguez, Winchester, Mass., assignor to Theta-Corporation, Woburn, Mass.**
**Filed Aug. 9, 1979, Ser. No. 65,072**
**Int. Cl.³ G02B *27/00***
**U.S. Cl. 250—551** **14 Claims**




1. Zero crossing a.c. power relay operable at several amperes and hundreds of volts, with optical isolation comprising, in a common plane,
at least one photosensitive SCR and at least one solid state junction light emitter optically coupled, from emitter face to SCR face,
the emitter and SCR being of planar form and housed in a common optical transmitting solid medium in substantially parallel and edge by edge relationship such that the emitter face does not directly oppose the SCR face,
the medium comprising a non-hemispherical surface dome over the emitter face and SCR face which is reflective,
control means for the SCR limiting its turn on to within 2 volts.

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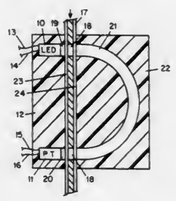
**4,296,332**
**SPROCKET HOLE SENSING DETECTOR FOR MOVING TRANSLUCENT PAPER SHEETS**
**Roy K. Hill, Bristol, Va., assignor to Sperry Corporation, New York, N.Y.**
**Filed Dec. 28, 1979, Ser. No. 108,099**
**Int. Cl.³ G06K *7/14***
**U.S. Cl. 250—570** **4 Claims**




1. An apparatus for sensing sprocket apertures in a translucent moving paper sheet in a reflective dust environment, the combination comprising,
a fixed source of light adapted to be directed in the path of a plurality of regularly spaced open sprocket apertures in said translucent moving paper sheet,
said light source having an intensity sufficient to continuously pass light through said translucent moving paper sheet and dust clogged apertures as well as the open sprocket apertures,
a light sensing device separated from and fixed relative to said light source and adapted to continuously sense rays from said light source,
encapsulating mounting means supporting said light source and said light sensing device at a predetermined number of regularly spaced sprocket apertures from each other, and
light ray directing means located on the opposite side of said translucent moving paper sheet from said light source and said sensing device,
said light ray directing means adapted for continuous receiving diffused light rays from said light source through said translucent moving paper sheet or dust clogged aperture in said moving sheet and for directing said diffused light rays through a different aperture in said same moving sheet to said light sensing device, whereby
said light sensing device is adapted to continuously sense the level of light intensity being received and to distinguish between the presence or the absence of at least two thicknesses of said translucent moving paper sheet by sensing the light to dark ratio.

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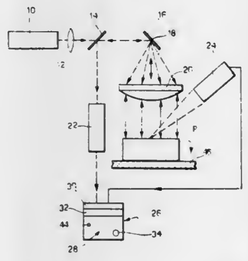
**4,296,333**
**METHOD AND APPARATUS FOR DETECTING SURFACE DEFECTS IN A WORKPIECE**
**Emilio Milana, Rivalta, and Franco Rasello, Gabiano, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy**
**Filed Sep. 10, 1979, Ser. No. 74,027**
**Claims priority, application Italy, Oct. 24, 1978, 69439 A/78**
**Int. Cl.³ G01N *21/48***
**U.S. Cl. 250—572** **7 Claims**



1. A method of detecting surface defects in a workpiece which has undergone a mechanical operation,
the method comprising the steps of:
directing a beam of coherent monochromatic light radiation onto the surface of the workpiece in a direction normal thereto;
moving the light radiation beam and workpiece relative to each other whereby to effectively scan an area of the workpiece surface with the light radiation beam;
directing the specular component of the radiation beam which is reflected perpendicular to the workpiece by each point of the scanned area of said surface to a first photomultiplier arranged to output an electrical signal indicative of the intensity of said specular component;
sampling the component of radiation beam scattered from each point of the scanned area of said surface via a second photomultiplier arranged to output an electrical signal indicative of the intensity of said scattered component;
processing the output signals from the first and second photomultipliers so as to obtain a resultant signal substantially free of signal noise due to the surface roughness of the workpiece; and
comparing said resultant signal with a reference threshold whereby to derive an indication of the presence of possible surface defects in the workpiece.



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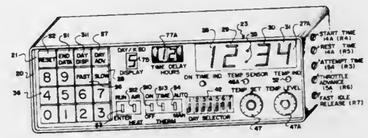
**4,296,334**
**PROGRAMMABLE ELECTRONIC STARTING DEVICE FOR AUTOS AND THE LIKE WITH MEANS SELECTABLE TO ACTUATE ACCESSORIES**
**Gim Wong, 1849 Gibbs Rd., Estevan, Saskatchewan, Canada**
**Filed Sep. 7, 1978, Ser. No. 940,357**
**Int. Cl.³ F02N *11/08***
**U.S. Cl. 290—37 R** **16 Claims**



1. A programmable electronic starter device for the engines of vehicles and the like which include a source of electric power, throttle linkage, a starter solenoid and other electrical auxiliary equipment, comprising in combination an electronic timer, a time display device operatively connected to said electronic timer, a time setting keyboard for producing pulses, a memory unit, means operatively connecting said memory unit to said time setting keyboard for injection "ON" time and "off time" within said memory unit, thereby controlling the duration time of the operation of the engine said means including an encoder to translate said pulse into electrical impulses, an address selector counter operatively connected to said keyboard, means whereby each pulse from said keyboard operates said address selector counter, said address counter being operatively connected to said memory unit, a comparator module operatively connected to said memory unit and to said address selector counter and a duration counter operatively connected to said comparator module, an alarm output module operatively connected to said alarm duration counter and timer means operatively connected between said alarm output module and said throttle linkage, said starter solenoid and said other auxiliary electrical equipment to operate same selectively.

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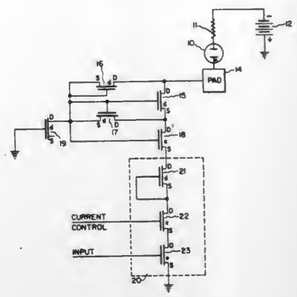
**4,296,335**
**HIGH VOLTAGE STANDOFF MOS DRIVER CIRCUITRY**
**Robert J. Simcoe, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.**
**Filed Jun. 29, 1979, Ser. No. 53,300**
**Int. Cl.³ H01L *00/00;* H02H *9/00***
**U.S. Cl. 307—200 B** **24 Claims**

1. A high voltage standoff circuit for driving high voltage low current display devices directly with constant current, said circuit being compatible with large scale integrated circuits, comprising:
first, second and third MOSFETs connected in a loop so as to form therein a junction of said first and second MOSFETs, a junction of said second and third MOSFETs, and a junction of said first and third MOSFETs, said first, second and third MOSFETs having their gates connected directly to each other in common with the junction of said second and third MOSFETs;
control means coupled to the junction of said first and second MOSFETs; and diode means coupled to said junction of said second and third MOSFETs, and circuit being




adapted to support high voltage applied to the junction of said first and third MOSFETs.

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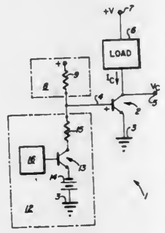
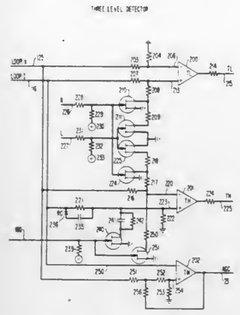
**4,296,336**
**SWITCHING CIRCUIT AND METHOD FOR AVOIDING SECONDARY BREAKDOWN**
**William R. Skanadore, Tempe, Ariz., assignor to General Semiconductor Co., Inc., Del.**
**Filed Jan. 22, 1979, Ser. No. 5,157**
**Int. Cl.³ H03K *17/10, 17/64;* H01L *29/72***
**U.S. Cl. 307—300** **1 Claim**




1. A method of operating a power transistor circuit to avoid secondary breakdown in a power transistor included in said power transistor circuit, said power transistor having base, collector, and emitter terminals, said power transistor having a secondary breakdown which is less than the $BV_{CBO}$ voltage of said power transistor, said power transistor circuit including a load element for supplying collector current to said collector terminal, said method comprising the steps of:
(a) turning said power transistor on by conducting a first current into said base terminal, said first current being sufficiently large to cause a collector current to flow in said collector terminal and to cause said power transistor to become saturated;
(b) turning said power transistor off by
(i) conducting a first base turn-off current out of said base terminal to remove charge stored in the base and collector regions of said power transistor, said first base turn-off current being substantially less than said collector current, and
(ii) conducting a second base turn-off current out of said base terminal, said second base turn-off current being at least equal to said collector current, said second base turn-off current being conducted out of said base terminal only after a substantial amount of said charge in said base and collector regions has been removed by said first base turn-off current.

**4,296,337**
**RESISTANCE DETECTOR WITH DELAYED HYSTERESIS**
**Dale E. Stone, Cedar Knolls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**
**Filed Oct. 15, 1979, Ser. No. 84,915**
**Int. Cl.³ H03K** *5/24*
**U.S. Cl. 307—356** **4 Claims**



1. A threshold detector characterized by
a differential amplifier having two inputs and an output,
means for applying a first signal across a voltage divider, a midpoint of which is connected to one of said inputs,
means for applying a second signal to the other of said inputs,
a first field effect transistor having its main electrodes connected across a portion of said voltage divider,
delay means responsive to signals at said output for applying control signals to the control electrode of said field effect transistor and
a second field effect transistor for connecting said voltage divider to ground potential.

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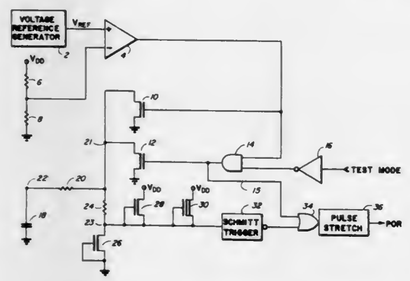
**4,296,338**
**POWER ON AND LOW VOLTAGE RESET CIRCUIT**
**James S. Thomas, Manor, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**
**Filed May 1, 1979, Ser. No. 35,044**
**Int. Cl.³ H03K** *5/153, 5/24, 17/687;* **H02J** *13/00*
**U.S. Cl. 307—362** **19 Claims**




1. An integrated circuit for generating a reset signal when a first voltage falls below a second voltage, said first and second voltages derived from a supply voltage, said integrated circuit having connection means for coupling an external capacitor thereto, comprising:
reset signal generating means;
first means for generating a first reset enabling signal when said first voltage falls below said second voltage, said first reset enabling signal coupled to an input of said reset signal generating means and terminating when said first voltage exceeds said second voltage; and
second means for generating a second reset enabling signal, said second means responsive to said first reset enabling signal and coupled to an input of said reset signal generating means, said second reset enabling signal terminating a predetermined length of time after said first voltage exceeds said second voltage, said predetermined length of time dependent upon the charging time of said capacitor.

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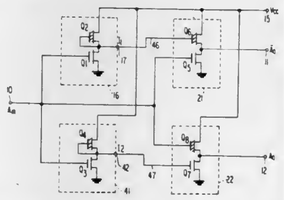
**4,296,339**
**LOGIC CIRCUIT COMPRISING CIRCUITS FOR PRODUCING A FASTER AND A SLOWER INVERTED SIGNAL**
**Tatsunori Murotani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**
**Filed Dec. 27, 1978, Ser. No. 973,776**
**Claims priority, application Japan, Dec. 27, 1977, 52-158839**
**Int. Cl.³ H03K** *19/094, 19/003, 19/20*
**U.S. Cl. 307—450** **9 Claims**



1. A logic circuit responsive to a variable input signal for producing a first and a second output signal that vary with phases opposite to and same as said input signal, respectively, said circuit comprising:
a first and a second inverter circuit responsive to said input signal for producing a first and a second inverted signal, respectively, one of said first and said second inverted signals varying with said input signal faster than the other of said first and said second inverted signals;
a first and a second buffer circuit;
first means for supplying said first inverted signal to said first buffer circuit; and
second means for supplying said second inverted signal to said second buffer circuit; and
third means for supplying said input signal to both of said first and said second buffer circuits;
whereby said first and said second buffer circuits produce said first and said second output signals, respectively.

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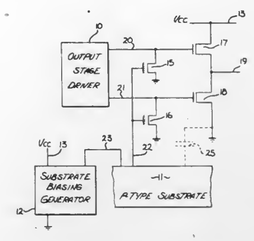
**4,296,340**
**INITIALIZING CIRCUIT FOR MOS INTEGRATED CIRCUITS**
**Douglas F. Horan, Los Gatos, Calif., assignor to Intel Corporation, Santa Clara, Calif.**
**Filed Aug. 27, 1979, Ser. No. 70,133**
**Int. Cl.³ H03K** *17/284, 17/22, 17/16, 5/08*
**U.S. Cl. 307—550** **10 Claims**

1. In an MOS integrated circuit employing a substrate biasing potential, a protection circuit for initially preventing the transmission of signals on a line in said integrated circuit when power is applied to said integrated circuit, comprising:
a transistor coupled to said line for preventing said transmission of said signals when said transistor is enabled, the gate of said transistor being coupled to receive said substrate biasing potential;
the threshold voltage of said transistor being selected such that said transistor is enabled in the absence of said substrate biasing potential and said transistor is disabled when said substrate biasing potential reaches a predetermined level;




whereby prior to and during the period when said integrated circuit is initially powered, said signals are prevented from being transmitted.

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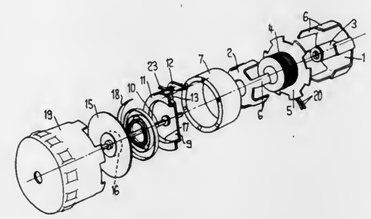
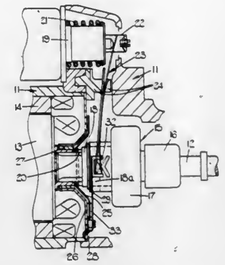
**4,296,341**
**SELF-STARTING SINGLE-PHASE SYNCHRONOUS MOTOR**
**Kurt Güttinger, Murten, Switzerland, assignor to Sodeco-SAIA SA, Geneva, Switzerland**
**Filed Jun. 27, 1978, Ser. No. 919,737**
**Claims priority, application Switzerland, Jul. 15, 1977, 8763/77**
**Int. Cl.³ H02K** *7/10*
**U.S. Cl. 310—41** **10 Claims**



1. A self-starting single-phase synchronous motor comprising:
a generally bell-shaped permanently magnetized rotor;
a stator having two parts each with distinct poles;
a coil located inwardly of the rotor and having a core which is connected at its end to said two stator parts, one said stator part being located between said coil and rotor and the other said stator part being located outwardly of said rotor, said rotor being rotatably mounted on a shaft with defined friction;
a resilient coupling element interposed between said rotor and shaft, said resilient coupling element engaging said rotor and shaft for resiliently transmitting torque from said rotor to said shaft; and
locking means mounted on said rotor and acting on said rotor for locking said rotor preventing rotation in an undesired direction and for permitting starting of said rotor in the opposite, desired direction of rotation, said locking means located in front of said resilient coupling element on the power transmission path.

**4,296,342**
**STARTER MOTOR**
**Donald A. Young, and Christopher P. Squires, both of Birmingham, England, assignors to Lucas Industries, Limited, Birmingham, England**
**Filed May 20, 1980, Ser. No. 151,755**
**Claims priority, application United Kingdom, May 25, 1979, 18384/79**
**Int. Cl.³ F16D** *55/22;* **F02N** *11/02*
**U.S. Cl. 310—77** **13 Claims**



1. A starter motor including an electric motor, a shaft rotatable by the motor, a pinion assembly carried by said shaft for rotation therewith, the pinion assembly being movable axially relative to the shaft between a rest position and an operative position, resilient means urging the pinion assembly to its rest position, and brake means operable to brake rotation of said driven shaft, said brake means comprising a brake disc mounted on said driven shaft for rotation therewith, a first friction member engageable with one face of the brake disc, a second friction member engageable with the opposite face of the disc, the first and second friction members being opposite one another, and a brake operating member movable in response to return movement of the pinion assembly to cause relative movement of the first and second friction member to grip the brake disc between them, so generating a braking action.

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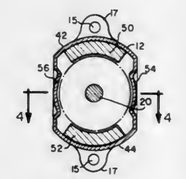
**4,296,343**
**ELECTRIC MOTOR HOUSING, OR THE LIKE, WITH INTEGRAL POLE AND METHODS FOR MAKING SAME**
**Bobby E. McMillen, Columbus, Miss., assignor to AMBAC Industries, Incorporated, Farmington, Conn.**
**Filed Oct. 5, 1979, Ser. No. 82,178**
**Int. Cl.³ H02K** *23/04*
**U.S. Cl. 310—154** **6 Claims**



1. An electric machine including an armature supported on a shaft for rotation within a housing, the housing comprising:
a section of tubular ferrous material;
at least two magnetic field pole pieces secured within the tubular ferrous material to provide alternate poles having curved surface areas spaced from and conforming generally to the curvature of the armature, and;
at least two intermediate induced field pole pieces provided by inwardly projecting sections of side walls of the tubu-

lar ferrous material and having arcuate face surfaces essentially equal in area to that of the magnetic pole pieces and spaced from the magnetic field pole pieces, said inwardly projecting pole pieces providing alternate intermediate poles for the machine by the induction effects generated from the magnetic field pole pieces in cooperation with the armature in the total magnetic flux path.

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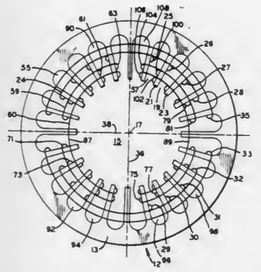
**4,296,344**

## MULTI-SPEED MOTOR

**Jerry R. Rabe, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.**

**Filed Mar. 13, 1979, Ser. No. 20,182**
**Int. Cl.³ H02K *3/00***
**U.S. Cl. 310—184** **11 Claims**



1. A stator assembly for a multi-speed motor operational in a plurality of different speed ranges including a core having an axially extending bore and axially extending slots communicating with the bore, and further including a main winding energizable in more than one speed range and at least two distinct auxiliary windings comprising a lower speed range auxilary winding and a higher speed range auxiliary winding, the lower speed range auxiliary winding being operable to start the motor for a lower speed range operation and the higher speed range auxiliary winding being operable to start the motor for higher speed range operation, the windings being accommodated within selected slots of the core with the main winding positioned radially outwardly of the lower speed range auxiliary winding relative to the bore and with the higher speed range auxiliary winding positioned radially inwardly of the lower speed range auxiliary winding relative to the bore; and said main winding comprising two pole groups selectively connectable to create four main poles for the lower speed range operation and to create two main poles for the higher speed range operation.

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**4,296,345**

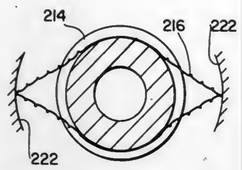
## FLEXIBLE LOOP SLIP RING BRUSH

**John B. Haberl, Dalton, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 14, 1980, Ser. No. 167,866**
**Int. Cl.³ H02K *13/00***
**U.S. Cl. 310—219** **20 Claims**

1. A brush for making electrical contact with peripheral portions of a slip ring rotatable within a housing comprising:

flexible wire means having opposite extremities anchored at locations diametrically opposite the slip ring, said wire means having helical formations therein and including opposed runs defining a loop when passed on opposite sides of the slip ring, said wire means being stretched so that compressive force is exerted by the wire means to resiliently contract the loop whereby the opposed runs are caused to embrace substantial arcuate peripheral portions on opposite sides of the slip ring defining a brush for sliding electrical contact therewith.

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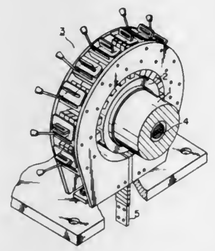
**4,296,346**

## BRUSH HOLDING APPARATUS FOR ROTARY ELECTRIC MACHINE

**Norihiro Ooki, Katsuta; Shoji Motegi, Hitachi; Yasuyuki Wachi, Takahagi; Yoshio Takikawa, Hitachi, and Norio Yamakawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan**

**Filed Nov. 20, 1979, Ser. No. 95,951**
**Claims priority, application Japan, Nov. 29, 1978, 53-146562**
**Int. Cl.³ H02K *13/00***
**U.S. Cl. 310—242** **9 Claims**



1. A brush holding apparatus for a rotary electric machine comprising:

a plurality of brushes disposed along the outer periphery of rotatable slip rings for making sliding engagement therewith;

a brush holder holding said brushes while pressing said brushes against the outer periphery of said slip rings at a predetermined pressure, said brush holder being provided on its head with an insulated handle;

retaining means fixedly mounted on a portion of said brush holder and shaped in the form of a wedge having its transverse width gradually narrowed toward said slip rings;

stationary means shaped to be engageable with said retaining means and spaced from said slip rings by a predetermined distance;

securing means for detachably securing said retaining means to said stationary means, said securing means including a retaining lug protruding from and fixed to a portion of said brush holder, and a lug-engaging cam supported in said stationary means so as to be engageable with said retaining lug; and

a manipulating lever pivotaliy coupled at one end thereof to a portion of said lug-engaging cam to cause angular rotation of said cam around its axis, said securing means being engaged with or disengaged from said retaining means in response to the manipulation of said manipulating lever whereby said brush holder can be mounted on or detached from said stationary means.

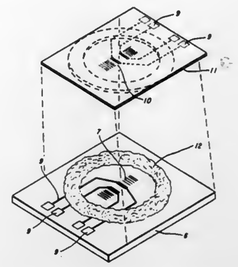


**4,296,347**

## SURFACE ACOUSTIC WAVE SENSOR

**Donald F. Weirauch, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 28, 1979, Ser. No. 79,735**
**Int. Cl.³ H01L *41/02*; H03H *9/05***
**U.S. Cl. 310—313 B** **10 Claims**



1. A surface acoustic wave sensor comprising a first member having a first relatively flat surface, a second member having a second relatively flat surface, a first surface acoustic wave array positioned upon said first surface, a second surface acoustic wave array positioned upon said second surface, first electrical connection means for making electrical connections to said first array, second electrical connection means for making electrical connections to said second array, said first surface acoustic wave array and said second surface acoustic wave array disposed in proximity one to the other so as to create a capacitive coupling effect between said arrays, and a fired glass frit bonding agent solely disposed between said first and second surfaces to form an enclosed chamber between said first and said second members while rigidly affixing said first and said second members each to the other, said chamber enclosing at least one of said first and said second arrays.

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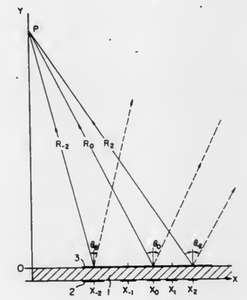
**4,296,348**

## INTERDIGITATED ELECTRODE ULTRASONIC TRANSDUCER

**Kohji Toda, Yokosuka, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan, a part interest**

**Filed Aug. 20, 1979, Ser. No. 68,273**
**Claims priority, application Japan, Aug. 21, 1978, 53/100929**
**The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.**
**Int. Cl.³ H01L *41/08***
**U.S. Cl. 310—334** **6 Claims**




1. An ultrasonic transducer characterized by comprising a piezoelectric substrate whose thickness is substantially smaller than wavelength (λ) of an ultrasonic wave in said substrate and an interdigital electrode means disposed on one side surface of said substrate, so that as AC voltages are applied to said interdigital electrode means while keeping the opposite side surface of said substrate in contact with a liquid medium ultrasonic waves are radiated toward said liquid medium.

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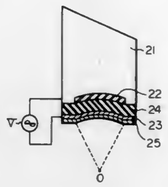
**4,296,349**

## ULTRASONIC TRANSDUCER

**Toshiharu Nakanishi, Kamakura; Miyo Suzuki, Fujisawa, and Hiroji Ohigashi, Zushi, all of Japan, assignors to Toray Industries, Inc., Japan**

**Filed Feb. 12, 1980, Ser. No. 120,782**
**Claims priority, application Japan, Feb. 13, 1979, 54-15177**
**Int. Cl.³ H01L *41/08***
**U.S. Cl. 310—335** **11 Claims**




1. An improved ultrasonic transducer, comprising: a piezoelectric film with associated electrodes and a reflective layer bonded to the said piezoelectric element,

said reflective layer having a thickness in a range from 1/32 λ to 3/16 λ,

and said λ being the wavelength of sound waves within said reflective layer at one half of free resonant frequency of the said piezoelectric film.

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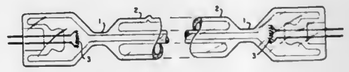
**4,296,350**

## GASEOUS FLUORESCENT DISCHARGE LAMP

**Jakob Maya, Boston, Mass., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Dec. 21, 1979, Ser. No. 106,297**
**Int. Cl.³ N01J *1/02***
**U.S. Cl. 313—26** **5 Claims**



1. An arc discharge device comprising a source of UV emission and a chamber external thereto containing a substance which, in vapor form, comprises gaseous molecules which absorb said UV emission and are raised to a highly excited state, from which the excited molecules relax to a lower intermediate energy state and then to a ground state, one of the two latter states being optically coupled to the immediate higher energy state so that the transition of said molecules from either the highly excited state to the intermediate state or from the intermediate state to the ground state results in the emission of visible radiation.

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**4,296,351**

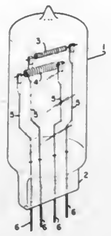
## TUNGSTEN HALOGEN LAMP HAVING LEAD-IN WIRE COMPRISING TANTALUM ALLOY

**Stephen F. Kimball, North Andover, and Peter R. Gagnon, Salem, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Oct. 17, 1979, Ser. No. 86,182**
**Int. Cl.³ H01K *1/28***
**U.S. Cl. 313—222** **10 Claims**

1. A tungsten halogen incandescent lamp comprising two

tungsten filaments supported on lead-in wires and disposed within a glass envelope, the glass envelope containing a fill of inert gas and halogen in elemental or compound form, the two tungsten filaments having different tungsten evaporation rates



during normal operation, the lead-in wires comprising an alloy including tantalum the purpose of which is to provide satisfactory lamp operation at the two different tungsten evaporation rates.

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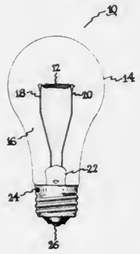
**4,296,352**

## INCANDESCENT LAMP

**Ivan Berlec, South Euclid, and Lewis V. McCarty, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 19, 1979, Ser. No. 105,329**
**Int. Cl.[3] H01K** *1/42, 7/08*
**U.S. Cl. 313—315** **16 Claims**



**1.** An incandescent lamp filament comprising a tungsten wire having an inner core of tungsten crystals doped with grain growth promoting additives selected from aluminum, silicon and potassium compounds to exhibit sag resistance and a surface layer of chemically vapor deposited undoped tungsten crystals imparting increased vibration damping and lower shear modulus value at elevated temperatures to the lamp filament.

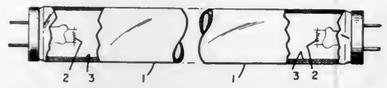
**10.** An incandescent lamp having a transparent envelope which contains a tungsten filament comprising a tungsten wire having an inner core of tungsten crystals doped with grain growth promoting additives selected from aluminum, silicon and potassium compounds to exhibit sag resistance and a surface layer of chemically deposited undoped tungsten crystals imparting increased vibration damping and a lower shear modulus value at elevated temperatures to improve the vibration resistance.

**4,296,353**

## FLUORESCENT LAMP HAVING HIGH COLOR RENDERING INDEX

**Wolfgang Walter, Brookline, Mass., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Oct. 29, 1979, Ser. No. 89,642**
**Int. Cl.[3] H01J** *1/62*
**U.S. Cl. 313—487** **9 Claims**



**1.** A fluorescent lamp having a high color rendering index and high efficacy comprising a glass envelope having electrodes at its ends and containing a fill including mercury and a starting gas, and a phosphor coating on the inner surface of the glass envelope, the phosphor coating comprising a blend of four narrow band emitting phosphors, the respective peak emissions of said four phosphors being in the regions of about 450–480 nm, 510–540 nm, 570–590 nm and 600–630 nm.

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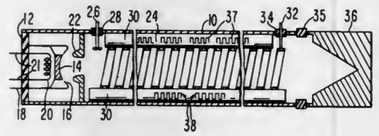
**4,296,354**

## TRAVELING WAVE TUBE WITH FREQUENCY VARIABLE SEVER LENGTH

**Michael L. Neubauer, Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Filed Nov. 28, 1979, Ser. No. 98,011**
**Int. Cl.[3] H01J** *25/34*
**U.S. Cl. 315—3.5** **25 Claims**



**1.** A traveling tube having internal gain compensation, comprising:

A helix-type interaction circuit for supporting interaction of an electron beam with microwave signals over an operable band of frequencies, said interaction tending to produce a gain varying with frequency, a first attenuator resonant at a first frequency within said operable band and coupled to said interaction circuit over a first length of said interaction circuit, and a second attenuator resonant at a second frequency within said band and coupled to said interaction circuit over a second length, said first and second frequencies being generally identified with frequencies in said operable band whose gain is sought to be compensated, whereby gain of said frequencies within said operable bandwidth is automatically compensated internally.

**20.** A traveling wave tube having noise-resistant internal gain compensation comprising:

a helix-type slow-wave circuit having an input end for microwave signals, said signals interacting with a linear electron beam over a selected band of frequencies, said interaction tending to produce a gain which varies with frequency,

a dielectric rod near said circuit extending in the direction of the axis of said slow-wave circuit; and

a first resistive conductor shaped to form a circuit resoanant at a first frequency within said tube, said conductor being attached to the surface of said rod so as to extend over a first length of said slow-wave circuit; and

a second resistive conductor shaped to form a circuit resident at a second frequency within said band, said conductor being attached to the surface of said rod so as to extend over a second length of said slow-wave circuit;

said conductors both being spaced away from said input end, said conductors providing respective different degrees of attenuation about said first and second frequencies to compensate said gain varying with frequency without degrading the anti-noise properties of said tube.



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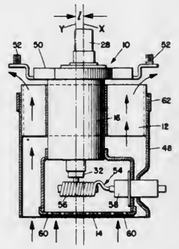
**4,296,355**

## MAGNETRON WITH COOLING MEANS

**Akihiro Fukatsu, and Isao Tada, both of Yokohama, Japan, assignors to Toshiba Corporation, Kawasaki, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,898**
**Claims priority, application Japan, Nov. 13, 1978, 53-155877[U]**
**Int. Cl.[3] H01J** *25/50*
**U.S. Cl. 315—39.51** **5 Claims**



**1.** An internal type magnetron comprising:

an anode having an anode axis;

a cathode disposed within said anode;

an antenna terminal disposed along an antenna axis which is offset from and substantially parallel to said anode axis; and

a cooling means surrounding said anode for cooling said anode, said cooling means having an outermost periphery, each point on the periphery lying at a substantially uniform radial distance from said antenna axis.

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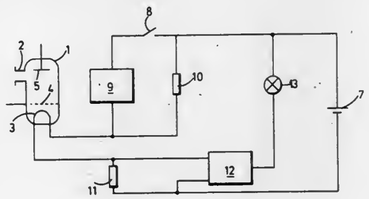
**4,296,356**

## IONIZATION VACUUM GAUGE CIRCUIT

**Karl Beinitz, Cologne, and Joachim Schubert, Wesseling, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Postfach, Fed. Rep. of Germany**

**Filed Dec. 11, 1979, Ser. No. 102,480**
**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853677**
**Int. Cl.[3] G08B** *21/00;* **H05B** *37/03*
**U.S. Cl. 315—135** **9 Claims**



**1.** In a circuit for an ionization vacuum gauge having a thermionic filament, a control circuit receptive of current for maintaining a constant current flow between the cathode and anode of the gauge and a switch for applying current to the control circuit, the improvement comprising: circuit means for indicating a filament interruption independent of the state of the switch including at least one resistor by-passing the switch to provide a continuous sensing current to the filament and means for detecting an interruption in the sensing current and for indicating such an interruption.

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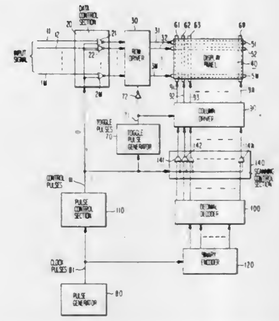
**4,296,357**

## PLASMA DISPLAY SYSTEM

**Tsutomu Hirayama, and Hiroshi Hada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 947,227, Sep. 29, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,718**
**Claims priority, application Japan, Sep. 29, 1977, 52-117622; Jul. 14, 1978, 53-86268; Aug. 8, 1978, 53-97079**
**Int. Cl.[3] H05B** *41/30*
**U.S. Cl. 315—169.4** **12 Claims**



**1.** An external electrode type plasma display apparatus comprising a group of first electrodes and a group of second electrodes disposed in an opposed relation to each other by the intermediary of a discharging gas to form cells therebetween, a dielectric coating covering the surface of the electrodes of at least one group exposed to said gas,

a first driver circuit applied to said first electrodes and having a plurality of input terminals,

a second driver circuit coupled to said second electrodes and having a plurality of input terminals,

a scanning control means for applying a first signal successively to said input terminals of said first driver circuit for a predetermined period at a predetermined interval,

said first driver circuit including means for producing a group of first voltage pulses in response to said first signal and means for applying said first voltage pulses successively to said first electrodes, said first voltage pulses having a predetermined first amplitude with a predetermined polarity, said first amplitude being smaller than a firing voltage of the cells,

a signal means for selectively applying a second signal to at least one of said input terminals of said second driver circuit for said predetermined period in synchronism with said first signal,

said second driver circuit including means for producing at least one second voltage pulse of an amplitude smaller than said firing voltage in response to said second signal and means for applying said second voltage pulse to said second electrode group so as to produce a first alternating voltage between the electrodes associated with a selected cell in combination with said first voltage pulses, said first alternating voltage having a second amplitude with one and opposite polarities, said second amplitude being larger than said firing voltage,

means for applying a third signal simultaneously to all of said input terminals of said first driver circuit, said first driver circuit further including means for producing a third

voltage pulse and means for applying said third voltage pulse to a plurality of said first electrodes, and

means for applying a fourth signal to all of said input terminals of said second driver circuit in synchronism with said third signal, said second driver circuit further including means for producing a fourth voltage pulse and means for applying said fourth voltage pulse to a plurality of said second electrodes so as to produce a second alternating voltage between said plurality of first electrodes and said plurality of second electrodes, said second alternating voltage having an amplitude larger than said firing voltage and a frequency lower than that of said first alternating voltage so that the number of discharging times due to said second alternating voltage is smaller than that due to said first alternating voltage.

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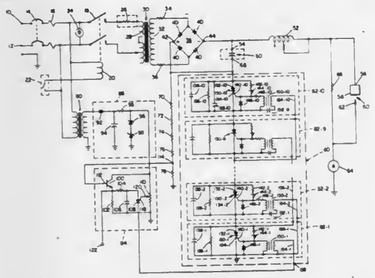
**4,296,358**

## HIGH-VOLTAGE SPARK SOURCE

**John A. Bernier, Lexington, Mass., assignor to Fisher Scientific Company, Pittsburgh, Pa.**

**Filed Jul. 30, 1979, Ser. No. 62,244**
**Int. Cl.³ H05B** *7/20*
**U.S. Cl. 315—241 R** **18 Claims**



1. A spark source for spectrochemical analysis comprising a spark gap for receiving a sample to be analyzed,

a storage capacitor,

a discharge circuit including reactive means connected in circuit between said capacitor and said spark gap,

discharge control means for discharging said capacitor through said spark gap, and

switching means for effectively removing said capacitor from said discharge circuit after a brief initial interval of current flow through said spark gap so that the current flow through said spark gap is essential unidirectional.

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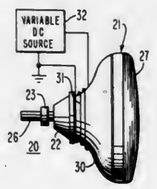
**4,296,359**

## TELEVISION DISPLAY ERROR CORRECTION

**Dennis L. Dodds, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Oct. 29, 1979, Ser. No. 88,657**
**Int. Cl.³ H01J** *29/56*
**U.S. Cl. 315—370** **5 Claims**




1. A method for correcting the effects on a display raster of an electron gun mount rotation error in a color kinescope having in-line electron guns and a display screen, comprising the steps of:

aligning the horizontal deflection axis of a deflection yoke mounted on said kinescope with the axis of alignment of said kinescope electron guns; and

generating, at a location adjacent to the exit end of said deflection yoke, an electron-influencing magnetic field extending in a direction orthogonal to the directions of the horizontal and vertical deflection fields produced by said deflection yoke and of a magnitude and polarity chosen to effect alignment of the horizontal axis of said display raster with the horizontal axis of the kinescope display screen.

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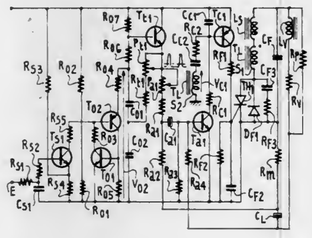
**4,296,360**

## SWITCHED-MODE FRAME-SCAN CONTROL CIRCUIT FOR A VIDEOFREQUENCY RECEIVER

**Gerard Rilly, Paris, France, assignor to Thomson-Brandt, Paris, France**

**Filed Jun. 4, 1980, Ser. No. 156,462**
**Claims priority, application France, Jun. 7, 1979, 79 14590**
**Int. Cl.³ H01J** *29/70, 29/72*
**U.S. Cl. 315—387** **8 Claims**



1. A switched-mode frame-scan control circuit comprising a circuit for generating a saw-tooth signal having an active switch monodirectional in voltage and bidirectional in current, connected to the terminals of a load comprising the vertical deflector in series with a measuring resistor and a connecting capacitor, wherein the active switch is controlled by a cyclic ratio control circuit connected, on the one hand, to a static servo-control circuit one input terminal of which is connected to the positive terminal of the connecting capacitor and the other input terminal to a reference DC voltage generator, so as to maintain a sufficiently high and stable voltage at the terminals of this capacitor for optimum operation of the active-switch circuit and, on the other hand, to a dynamic servo-control circuit one input terminal of which is connected to the measuring resistor and the other input terminal to a circuit for generating frame saw-teeth corrected into an S, so as to ensure conformity of the law of variation of the current in the deflector with respect to this corrected frame saw-tooth law; these two servo-control circuits taking effect on the moment when the active switch is triggered.

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**4,296,361**

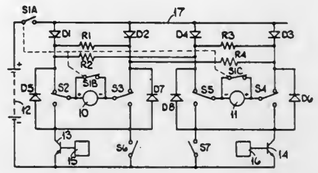
## CONTROL SYSTEMS

**Michael A. Archer, Hamburg, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jul. 24, 1979, Ser. No. 60,001**
**Claims priority, application United Kingdom, Aug. 15, 1978, 33341/78**
**Int. Cl.³ H02P** *1/54*
**U.S. Cl. 318—54** **5 Claims**

1. A control system for a pair of driving motors of a vehicle, the vehicle being of the kind in which road wheels on opposite sides of the vehicle are driven by the motors respectively, the steering of the vehicle being achieved by varying the electric current flow to the two motors whereby, in use, one motor can drive its associated road wheel more quickly than the other to achieve a steering action, the control system comprising first and second motor control circuits for the motors respectively, each motor control circuit comprising first and second changeover switches, the switches having common terminals connected to the supply terminals respectively of the associated motor and each switch having first and second changeover terminals, diodes respectively connecting the first changeover terminals of each changeover switch to one terminal of a source of supply, the second changeover terminals being connected to the other terminal of the source of supply whereby






when said switches are in a neutral position, the common terminals of the switches will be connected to said first changeover terminals and to the one terminal of the source of supply through said diodes, and in a drive position one of the common terminals of a switch will be connected to said second changeover terminal corresponding therewith and to the other terminal of the source of supply, the first and second changeover switches in each motor control circuit being operable to change the direction of current flow through the associated motor, characterized by a pair of resistors connected between the motor control circuits, said changeover switches when in said neutral position connecting the motors in series with each other and with said pair of resistors.

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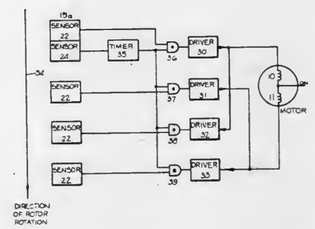
**4,296,362**

## MOTOR HAVING ELECTRONICALLY SWITCHED STATOR FIELD CURRENT AND INTEGRAL TORQUE CONTROL

**Denny D. Beasley, Cincinnati, Ohio, assignor to Beasley Electric Corporation, Georgetown, Ohio**

**Filed May 18, 1978, Ser. No. 907,120**
**Int. Cl.³ H02P** *6/02*
**U.S. Cl. 318—138** **12 Claims**




1. An electric motor comprising a stator, a rotor rotatably mounted on a shaft within said stator, a plurality of stator windings, and a circuit for switching stator field currents, said circuit comprising a positive current driver and a negative current driver for each stator winding, said positive current driver operating to permit current flow in one direction through said winding for part of the rotor rotation, said negative current driver operating to permit current flow in the opposite direction for a succeeding part of the rotor rotation, said circuit further comprising sensing means associated with each of said drivers to sense rotor position and produce outputs to cause said associated driver to permit said current flow, said sensing means including means for successively causing current flow through each of said stator windings in turn such that current flows in only one stator winding at a time, said sensing means comprising a plurality of spaced optical interrupters fixedly mounted with respect to the rotor shaft and at substantially equal radial distances therefrom, each of said interrupters having an optical source, an optical receiver and a space therebetween defining an optical path, said sensing means further including a substantially circular plate coaxial with the rotor shaft and adapted to rotate therewith, said plate containing a slot extending circumferentially along the outer edge of said plate of a length corresponding to said part of the rotor rotation that current flows through the windings, said plate being interposed within said optical paths such that a particular one of said optical receivers produces an output only when said slot is within the optical path associated with that receiver, one of said interrupters including a second optical source, optical receiver and space therebetween defining an optical path, and said plate contains a plurality of spaced apertures substantially radially equidistant from the center of said plate such that said second optical receiver produces an output each time one of said apertures traverses said second optical path.

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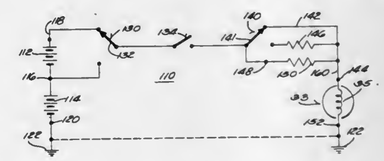
**4,296,363**

## SPEED SELECTION FOR A DIRECT CURRENT PERMANENT MAGNET MOTOR

**Charles H. Blake, Park City, and Donald H. Wood, Gurnee, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Continuation of Ser. No. 504,353, Sep. 9, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,690**
**Int. Cl.³ B63H** *21/26;* **H02B** *7/00*
**U.S. Cl. 318—349** **8 Claims**




1. A speed control circuit for a permanent magnet, direct current motor comprising a source of direct current, a permanent magnet motor including an armature winding having opposed terminals, and speed control means including a first resistor connected between one of said armature winding terminals and said direct current source, a second resistor connected to said one armature winding terminal, a shunt lead connected to said one armature winding terminal, and a switch connected to said direct current source and selectively operable between a first position connecting said direct current source to said shunt lead in parallel with said first resistor and disconnected from said second resistor, a second position connecting said direct current source to said second resistor in parallel with said first resistor and disconnected from said shunt lead, and a third position disconnected from both of said shunt lead and said second resistor, whereby current flow from said current source to said armature winding is solely through said first resistor.

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**4,296,364**

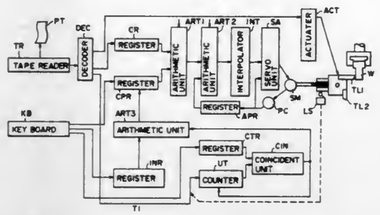
## TOOL COMPENSATION SYSTEM

**Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Japan**

**Filed Mar. 26, 1980, Ser. No. 134,120**
**Claims priority, application Japan, Sep. 27, 1978, 53-118840**
**Int. Cl.³ G05B** *19/25*
**U.S. Cl. 318—572** **11 Claims**

1. In a tool compensation system of the type which includes

a command value register for storing a movement command value, a compensation value register for storing a tool compensation value, and means for shifting a tool from a position represented by the movement command value to a position spaced apart therefrom a distance corresponding to the tool compensation value, the improvement comprising:




first means for counting the amount of use of the tool; and

second means responsive to said first means for correcting the content of the tool compensation value register by a preset value each time the count value of the first means has reached a predetermined value.

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**4,296,365**

## METHOD AND APPARATUS FOR CORRECTING ERRORS OF FEEDING OF ENDLESS BELT IN AUTOMATIC SCREEN PRINTING

**Takaharu Yoshikawa, Takatsuki, Japan, assignor to Toshin Kogyo Co. Ltd., Hyogo, Japan**

**Filed Sep. 13, 1979, Ser. No. 75,333**
**Claims priority, application Japan, Apr. 6, 1979, 54-41080**
**Int. Cl.³ G05D** *23/275*
**U.S. Cl. 318—632** **14 Claims**




1. In an automatic screen printing process comprising the steps of presetting the repeat length of an endless belt as a pulse number and intermittently driving an endless belt-driving roller based on the preset pulse number, a method for correcting feed errors including the steps of correcting feed errors owing to unevenness of thickness and elongation at individual positions of the endless belt by increasing or decreasing the pulse number prior to printing and feeding of the endless belt at every repetition for printing under control of said increased or decreased pulse number.

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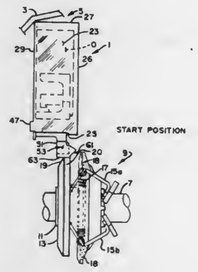
**4,296,366**

## MOTOR STARTING SWITCH

**Eugene F. Hildebrandt, and Thomas V. Ottersbach, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.**

**Filed Oct. 9, 1979, Ser. No. 82,769**
**Int. Cl.³ H02P** *5/30*
**U.S. Cl. 318—793** **4 Claims**

1. In a dynamoelectric machine, such as an electric motor, comprising a stator, a rotor and a shaft journalled with respect to the stator and supporting the rotor, said shaft having a longitudinal axis, said motor further including an auxiliary winding and a starting switch operable to de-energize said auxiliary winding upon the motor obtaining a predetermined speed during start up, said motor further including a centrifugal actuator mounted on said shaft and operatively connected to said starting switch for actuation of the latter in response to said rotor obtaining said predetermined speed, said centrifugal actuator having a portion thereof shiftable axially upon said shaft between a start position and a run position upon start up of the motor and upon said rotor obtaining said predetermined speed and being shiftable in reverse direction from its run to its start position upon slowing or stopping of the rotor thereby to reset said starting switch, the latter having a housing adapted to be secured in fixed position relative to said centrifugal actuator and having at least one switch contact therewithin movable in response to movement said centrifugal actuator between a start position in which said auxiliary winding is energized and a run position in which said auxiliary winding is de-energized, said housing having a wall, wherein the improvement com-




prises: an opening in said housing wall, said opening being offset to one side of said longitudinal axis of said shaft, a post secured to said housing and located within said opening, said post extending generally parallel to the longitudinal axis of said shaft, an actuator member journalled on said post, said actuator member having a cam follower extending from said post in generally transverse direction with respect to said longitudinal axis of said shaft and being cammingly engageable with said centrifugal actuator portion on the other side of said longitudinal axis from said post as said centrifugal actuator portion shifts axially between its run and start positions, said actuator member further having a movable contact lever disposed within said housing and cooperable with said movable switch contact, said actuator member being rotatable on said post in a generally radial direction with respect to said centrifugal actuator portion as the latter shifts axially between its start and run positions thereby to effect operation of said movable switch contact between its start and run positions.

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**4,296,367**

## SPEED CONTROL METHOD FOR AC MOTORS AND AN APPARATUS FOR THE CONTROL

**Akio Hirata, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Oct. 18, 1978, Ser. No. 952,385**
**Claims priority, application Japan, Oct. 18, 1977, 52-124887; Oct. 18, 1977, 52-124888**
**Int. Cl.³ H02P** *5/28, 3/18, 5/34, 5/36*
**U.S. Cl. 318—808** **7 Claims**

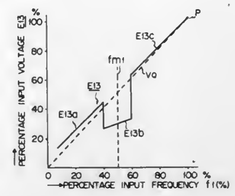
1. A speed control method for controlling the speed of an AC motor coupled with a load by supplying a variable voltage with a variable frequency to the AC motor comprising the steps of:

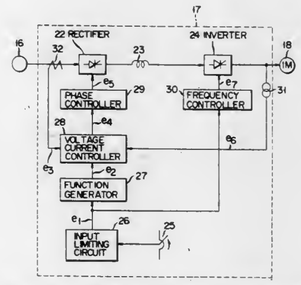
setting up at least two frequency regions for the variable frequency;

setting the ratio of a percentage input voltage expressed in terms of a percentage of the rated input voltage to the AC motor, to a corresponding percentage input frequency expressed in terms of a percentage of the rated input frequency



to the AC motor, less than unity within one of the frequency regions set in the first step, such that the high frequency torque ripple in said one of said set frequency regions is decreased; and




setting said ratio of percentage input voltage to percentage input frequency in at least a second frequency region to a ratio higher than that of said one of said frequency regions to increase motor torque in said second frequency region.

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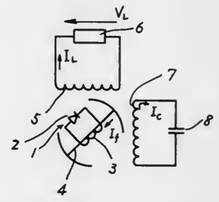
**4,296,368**

## INTERNAL COMBUSTION ENGINE DRIVEN GENERATOR

**Masaaki Kubo, Sunto, Japan, assignor to Kokusan Denki Co., Ltd., Japan**

**Filed Oct. 22, 1979, Ser. No. 86,634**
**Claims priority, application Japan, Oct. 26, 1978, 53-147388[U]**
**Int. Cl.³ H02P** *9/10*
**U.S. Cl. 322—75** **10 Claims**




1. An internal combustion engine driven generator in which a capacitor excitation type synchronous generator is driven by an internal combustion engine and has a parallel circuit of capacitor excitation winding means and capacitor means, said capacitor excitation winding means and said capacitor means providing sufficiently small ampere-turns of excitation so that, with a constant speed, the output voltage of the generator is decreased as the load current thereof decreases.

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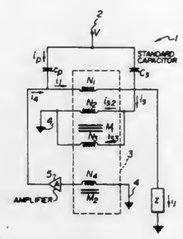
**4,296,369**

## ACTIVE QUADRATURE CURRENT REFERENCE SOURCE

**William J. M. Moore; Norbert L. Kusters, and Eddy So, all of Ottawa, Canada, assignors to Canadian Patents & Dev. Ltd., Ottawa, Canada**

**Filed Apr. 7, 1980, Ser. No. 138,179**
**Int. Cl.³ G05F** *1/00;* **H01F** *40/06*
**U.S. Cl. 323—218** **4 Claims**




1. A reference source comprising:

a reference capacitor $C_s$ of high stability and purity and low capacitance for coupling to a voltage source;

a power capacitor $C_p$ of high capacitance for coupling to the voltage source;

current comparator means coupled to the reference capacitor and the power capacitor for comparing currents through the capacitors $C_s$ and $C_p$ and for providing a difference signal; and

circuit means coupled to the current comparator means for generating a current in response to the difference signal and for adding the generated current to the current through the power capacitor to produce a combined output current having a waveform and phase identical to the current through the reference capacitor $C_s$.

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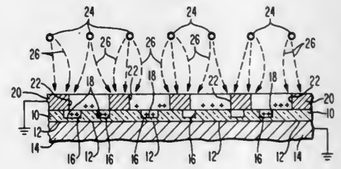
**4,296,370**

## METHOD OF DETECTING A THIN INSULATING FILM OVER A CONDUCTOR

**Robert B. Comizzoli, Belle Mead, and Robert D. Vibronek, Sayreville, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Oct. 11, 1979, Ser. No. 83,640**
**Int. Cl.³ G01R** *31/12, 31/26*
**U.S. Cl. 324—54** **8 Claims**




1. A method of detecting the presence of a thin insulating film having a thickness less than about 500 angstroms disposed over a surface of a conductor comprising the steps of:

positioning a conductive grid having openings therethrough adjacent the surface of said insulating film,

depositing through said openings in said grid ions of one type polarity adjacent said insulating film, said openings in said grid being sufficiently small to limit the surface charge voltage on said insulating film to less than the breakdown voltage of the thin insulating film, and

immersing said insulating film in a suspension of charged

particles having a polarity opposite to said one type, whereby the deposition of said charged particles adjacent said insulating film indicates the presence of said film.

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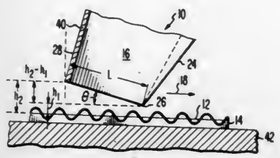
**4,296,371**

## SYSTEM FOR MEASURING STYLUS SHOE LENGTH

**Eugene O. Keizer, and Gerard A. Alphonse, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 17, 1980, Ser. No. 131,044**
**Int. Cl.³ G01R *27/26***
**U.S. Cl. 324—61 R** **23 Claims**



12. Apparatus for measuring shoe length of a stylus having a tip at one end thereof, said tip including a prow terminating at a base thereof and a stern remote from said prow, said tip adapted to track a path along a surface of an information record and to measure capacitive variations between said stylus and the surface of said record when relative motion is established between said stylus and said record, the shoe length being the distance between said base and said stern along a line tangent to said path at the tracking location, comprising:

means attached to said stylus for positioning the tip of said stylus adjacent the surface of a substrate to allow capacitive coupling, between said stylus and said substrate acting as capacitive electrodes, to produce an output signal at one capacitive electrode in response to an input signal at the other capacitive electrode,

means for changing the orientation of said stylus relative to said substrate an angle of $\theta$ degrees about an axis passing through the base of said prow in a direction parallel to the surface of said substrate and perpendicular to the direction of said shoe length, in order to change said orientation from a first position to a second position,

circuit means connected to the one capacitive electrode for measuring the amplitude of said output signal while said stylus and said substrate are oriented in said first and said second positions to obtain a first and a second signal respectively, and

means connected to said circuit means for comparing said first signal with said second signal to obtain a difference signal proportional to the shoe length of said stylus.

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**4,296,372**

## TECHNIQUES FOR IMPRESSING A VOLTAGE WITH AN ELECTRON BEAM

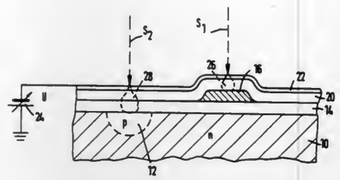
**Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed May 23, 1979, Ser. No. 41,613**
**Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824308**
**Int. Cl.³ G01N *27/00***
**U.S. Cl. 324—71 EB** **6 Claims**

1. In an electrical device of the type which includes an electrically conductive region which is covered with an insulating material, and the insulating material is covered with a passivating material, the improvement therein for non-destructive testing of the electrical integrity of the electrically conductive region, comprising:

a metal layer carried on the passivating material over the electrically conductive region for connection to a supply potential,

said metal layer and the insulating material and the passivating material permeable and responsive to electron radiation to form an electrical connection between the electrically conductive region and the metal layer, and thus carry the supply potential.



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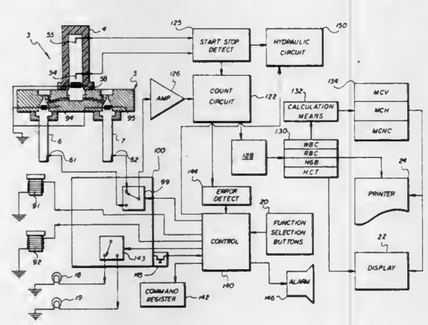
**4,296,373**

## HEMATOLOGY CELL COUNTING APPARATUS INCORPORATING MULTIPLE TRANSDUCERS FOR SEQUENTIAL OPERATION

**Henry R. Angel, Fairfield, and James W. Hennessy, Trumbull, both of Conn., assignors to Hycel, Inc., Houston, Tex.**

**Filed Jul. 12, 1979, Ser. No. 57,045**
**Int. Cl.³ G01N *27/00***
**U.S. Cl. 324—71 CP** **9 Claims**




1. In a particle counting apparatus of the impedance sensing type for counting particles passing in a liquid through an aperture by measuring the impedance between inner and outer electrodes on opposite sides of the aperture in the liquid path, including a transducer probe incorporating said aperture and a volumetric metering chamber for metering a predetermined volume of liquid in connection with counting particles, the improvement comprising a conduit system disposed between said transducer probe and said metering chamber in the fluid path, the cross section of the conduit system being of a dimension such that bubbles which can be formed therein are small with respect to the predetermined volume of liquid to be metered by said volumetric metering chamber, and wherein said inner electrode comprises a first impedance measuring inner electrode on that side of the conduit system proximate said transducer probe and a second impedance measuring inner electrode disposed on that side of the conduit system proximate said volumetric metering chamber, said first and second inner electrodes being connected in parallel.

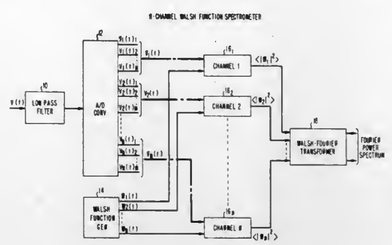


**4,296,374**

## WIDEBAND DIGITAL SPECTROMETER

**Paul S. Henry, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 11, 1979, Ser. No. 83,596**
**Int. Cl.³ G01R *23/16***
**U.S. Cl. 324—77 B** **5 Claims**




1. A wideband digital spectrometer comprising:

low-pass filtering means (**10**) for low-pass filtering an input signal;

means (**12**) connected to the output of said filtering means capable of converting an analog signal to a plurality of N digital signals, each digital signal having M bits of resolution;

Walsh function generating means (**14**) for generating a plurality of N Walsh functions, each Walsh function being either +1 or −1;

means (**18**) capable of performing an N×N Walsh-Fourier power transformation

characterized in that

the wideband digital spectrometer further comprises

power spectrum generating means (**16**) connected to both the output of the analog-to-digital converting means (**12**) and the output of the Walsh function generating means (**14**) and capable of generating as an output a signal representative of a Walsh power spectrum of said analog-to-digital converting means, the output of said power spectrum generating means being connected to the input of the Walsh-Fourier power transformation means.

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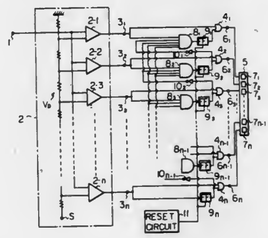
**4,296,375**

## LEVEL INDICATOR FOR INDICATION OF MAXIMUM VALUES

**Tsuneo Takezaki, Kadoma, Japan, assignor to Matsushita Electric Industrial Company, Kadoma, Japan**

**Filed Apr. 13, 1979, Ser. No. 29,714**
**Claims priority, application Japan, Apr. 14, 1978, 53/50086[U]**
**Int. Cl.³ G01R *19/04***
**U.S. Cl. 324—103 P** **15 Claims**




1. A level indicator system having a plurality of successively located luminous elements arranged to indicate the level of an input voltage by their respective location, comprising:

means for providing a plurality of graduated reference voltages;

a plurality of comparators each associated with a respective luminous element, each comparator having a reference input terminal biased at a respective reference voltage and a signal input terminal responsive to said input voltage, each comparator deriving an output signal in response to the voltage at the signal input terminal thereof exceeding the reference voltage at said reference input terminal; and

a plurality of storage circuits each associated with a respective luminous element and a respective comparator and responsive to a respective comparator output signal for delivering an output signal to the associated luminous element.

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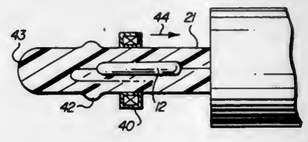
**4,296,376**

## PROBE FOR SENSING CHARACTERISTICS OF ELECTRICAL DEVICES UTILIZING A MAGNETIC SWITCH SENSOR BIASED BY AN ENCIRCLING MAGNETIC BIASING MEANS

**Robert J. Bartol, Jr., 931 E. Tenth Pl., Mesa, Ariz. 85203**

**Continuation of Ser. No. 889,838, Mar. 24, 1978, abandoned. This application Jan. 29, 1979, Ser. No. 7,472**
**Int. Cl.³ G01N *27/72*; G01R *33/12, 19/14***
**U.S. Cl. 324—235** **5 Claims**



1. A probe for sensing magnetic field characteristics generated by electric devices comprising in combination:

a non-magnetic housing,

a magnetizable switch forming a pair of contactable members mounted within said housing,

at least one of said members being movable in said housing relative to the other for engaging the other when in a magnetic field,

a lamp,

battery means having a pair of terminals,

a first means for connecting said lamp and said members in a series arrangement across the terminals of said battery means,

said members when exposed to a first magnetic field generated by an electric device deflecting relative to each other to engage to complete a circuit across said battery means to illuminate said lamp,

encapsulating means for said probe,

said encapsulating means comprising a first part forming a cylindrical configuration encasing said lamp and battery means and a second part forming an elongated constant diameter cylindrical projection of said first part and of a size reduced from said first part and containing said housing,

and

a magnetic means for mounting on and surrounding at least a part of said projection for producing a second constant magnetic field which passes substantially longitudinally through the axis of said switch to aid in closing said switch,

said magnetic means comprises a magnet in the shape of a toroid slidably mounted around and snugly fitting the periphery of said projection for increasing the sensitivity of said probe with the center of said magnet being substantially in longitudinal alignment with said members,

said magnet being movable along said projection and over said members to a given position causing engagement of said members and when moved from said position along said projection to another position opening said contacts.

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**4,296,377**

## MAGNETIC SIGNAL FIELD SENSOR THAT IS SUBSTANTIALLY IMMUNE TO ANGULAR DISPLACEMENT RELATIVE TO THE SIGNAL FIELD

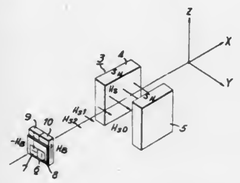
**Hiroyuki Ohkubo, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Mar. 23, 1979, Ser. No. 23,270**

**Claims priority, application Japan, Mar. 27, 1978, 53-34095; Mar. 27, 1978, 53-34096; Jun. 20, 1978, 53-83573[U]**

**Int. Cl.³ G01R** *33/06*

**U.S. Cl. 324—252** **16 Claims**




1. Apparatus for sensing an external magnetic field to produce an output signal whose magnitude corresponds to the strength of said external magnetic field and is substantially insensitive to deviations in the direction of said external magnetic field, comprising a magnetic field sensor have only two coplanar magnetoresistive elements, each magnetoresistive element having a main current conducting path and each magnetoresistive element having anisotropic resistance as a function of the direction of the resultant magnetic field applied thereto, and bias means for supplying first and second equal bias magnetic fields to said first and second magnetoresistive elements, respectively, the intensity of the bias fields being sufficient to saturate said first and second magnetoresistive elements, said first bias magnetic field being supplied at an angle with respect to the first main current conducting path which differs from the angle at which said second bias magnetic field is supplied with respect to the second main current conducting path, said first and second magnetoresistive elements being connected in series with each other; said apparatus further comprising means for supplying a d.c. current to said series-connected first and second magnetoresistive elements; and means coupled to the junction defined by said series-connected first and second magnetoresistive elements to produce an output signal representing the magnitude of an external magnetic field as supplied to said first and second magnetoresistive elements, whereby said output signal is substantially immune to angular displacements of said magnetic field sensor relative to said external magnetic field.

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**4,296,378**

## APPARATUS PROVIDING ENHANCED DETECTION OF SPECIMENS IN INHOMOGENEOUS FIELDS

**James D. King, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.**

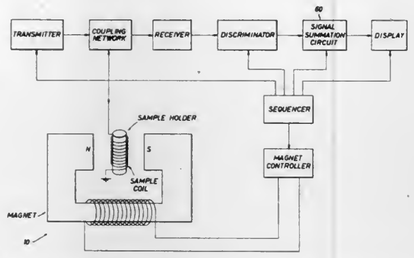
**Filed Apr. 5, 1979, Ser. No. 27,302**

**Int. Cl.³ G01N** *27/00*

**U.S. Cl. 324—313** **18 Claims**

1. Improvements in a nuclear magnetic or electron spin resonance detection apparatus which tests a sample for the presence and quantity of nuclei of interest which apparatus forms a magnetic field on the sample and wherein a magnetic field intensity of a specified value coacts with a transmitted RF pulse of a specified shape and frequency in the sample, which apparatus includes

(a) a magnet control means;
(b) an electromagnet operated by said control means;
(c) a pulsed RF transmitter operable to form an RF pulse of a specified pulse shape and frequency;
(d) a receiver positioned to receive an RF signal from the sample as a result of the transmitted RF pulse;
wherein the improvement comprises:
(1) first means for selectively operating the magnet control means to form different magnetic field strengths acting on the sample to expose multiple incremental portions of the sample to a magnetic field intensity within specified limits;




(2) timing means for controllably operating the transmitter to form repetitively transmitted pulses for the sample which pulses are transmitted into the sample synchronized with the operation of said first means; and
(3) summing means connected to the receiver for summing repetitively formed received signals from the sample, said summing means summing the received signals after synchronization thereof relative to the relative occurrence of the transmitted RF signals.

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**4,296,379**

## GROUND PROSPECTING METHOD UTILIZING ELECTRICAL RESISTIVITY MEASUREMENTS FOR MEASURING THE RESISTIVITY OF UNIT BLOCKS OF THE GROUND

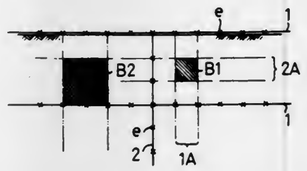
**Eizaburo Yoshizumi, 402 Manhegm Kamogawa, 14 Yoshida Kawara-machi, Sakyo-ku Kyoto-shi, Kyoto-fu, Japan**

**Filed Aug. 23, 1978, Ser. No. 936,057**

**Claims priority, application Japan, Aug. 25, 1977, 52-102040; Dec. 26, 1977, 52-156766; Dec. 27, 1977, 52-159646; Apr. 17, 1978, 53-44932**

**Int. Cl.³ G01V** *3/02*

**U.S. Cl. 324—357** **7 Claims**




1. A ground prospecting method, comprising dividing the entire region of the ground to be probed into a plurality of unit blocks in two-dimensional, areal, form or three-dimensional, volumetric, form, measuring by means of a plurality of sets of spaced current and voltage electrodes the apparent resistivity of each said unit block, and analytically determining the true resistivity of each said unit block from said measured apparent resistivity thereof to ascertain the condition of said ground region.



**4,296,380**

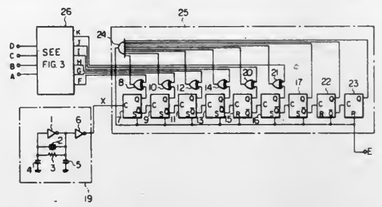
## PROGRAMMABLE DIGITAL FREQUENCY DIVIDER FOR SYNTHESIZING SIGNALS AT DESIRED FREQUENCY

**Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Osaka, Japan**

**Filed May 21, 1979, Ser. No. 40,618**

**Int. Cl.³ H03K** *21/34;* **H03L** *7/18*

**U.S. Cl. 328—48** **22 Claims**




1. A programmable digital frequency divider comprising:
a programmable binary counter respective of input pulses from a pulse source and having a plurality of control terminals for generating output pulses at a frequency variable in accordance with a set of binary states of said control terminals; and
a binary code converter comprising a plurality of input terminals to which is applied an M-bit input binary signal, a plurality of output terminals connected to said control terminals of said programmable counter, and a logic circuit connected between said input and output terminals for converting said M-bit input binary signal into an N-bit output binary signal for application to said output terminals, where N equals an integral multiple of M minus an error compensating number which causes the frequency of said output pulses to vary substantially linearly as a function of discrete variations of said input binary signal.

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**4,296,381**

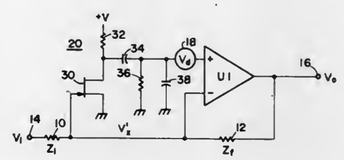
## DISTORTION REDUCTION CIRCUIT FOR AN INVERTING FEEDBACK AMPLIFIER

**Bruce E. Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Oct. 1, 1979, Ser. No. 80,711**

**Int. Cl.³ H03D** *1/00*

**U.S. Cl. 330—149** **3 Claims**




1. An amplifier circuit, comprising:
an inverting feedback amplifier having inverting and non-inverting inputs and an output, an input impedance element connected to said inverting input, and a feedback impedance element connected from said output to said inverting input; and
a distortion reduction amplifier comprising a field-effect transistor, the gate of which is directly connected to said inverting input of said feedback amplifier, and the drain of which is coupled to said non-inverting input of said feedback amplifier.

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**4,296,382**

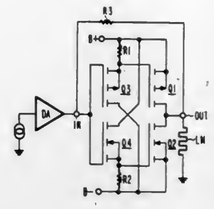
## CLASS AB PUSH-PULL FET AMPLIFIERS

**Merle V. Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Dec. 28, 1979, Ser. No. 108,027**

**Int. Cl.³ H03F** *3/30*

**U.S. Cl. 330—264** **21 Claims**

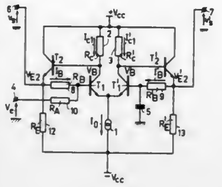



1. A Class AB quasi-linear push-pull amplifier comprising:
first and second supply terminals for receiving a relatively positive operating voltage and a relatively negative operating voltage respectively;
input and output signal terminals;
a p-channel, field-effect output transistor with a source electrode connected at said first supply terminal, with a drain electrode connected at said output signal terminal, and with a gate electrode;
an n-channel, field-effect output transistor with a source electrode connected at said second supply terminal, with a drain electrode connected at said output signal terminal, and with a gate electrode;
first potential translating means for maintaining a positive direct offset potential between said input signal terminal and the gate electrode of said p-channel output transistor during quiescent conditions and during positive excursions of input signal, which means includes a p-channel, field-effect source-follower transistor having the potential at said signal input terminal applied without translation to its gate electrode, and
a number N, at least one, of first forward-poled field-effect transistors having gate-source paths connected between the source electrode of said p-channel source-follower transistor and the gate electrode of said p-channel output transistor;
second potential translating means for maintaining a negative direct offset potential between said input signal terminal and the gate electrode of said n-channel output transistor during quiescent conditions and during negative excursions of input signal, which means includes an n-channel, field-effect source-follower transistor having the potential at said input signal terminal applied without translation to its gate electrode, and
a number N, of second forward-poled field-effect transistors having gate-source paths connected between the source electrode said n-channel source-follower transistor and the gate electrode of said n-channel output transistor;
means for maintaining the quiescent potential at said input signal terminal at a potential between said relatively positive and relatively negative operating voltages, which means includes:
a direct-coupled feedback connection from said output signal terminal to said input signal terminal;
pull-up means for pulling up the potential at the gate electrode of said p-channel output transistor during substantially positive excursions of input signal; and
pull-down means for pulling down the potential at the gate electrode of said n-channel output transistor during substantially negative excursions of input signal.

## 4,296,383
## BALANCING AMPLIFIER

**Jean-Louis Jeandot, Paris, and Emmanuel Lefort, L'Hay-les-Roses, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France**

**Filed Apr. 19, 1979, Ser. No. 31,648**
**Claims priority, application France, May 16, 1978, 78 14397**
**Int. Cl.³ H03F *3/45***
**U.S. Cl. 330—301** **20 Claims**



1. A balancing amplifier comprising a single input terminal for connection to a signal to be balanced, a pair of transistors connected as a differential amplifier with a control electrode of one transistor of the differential amplifier coupled to said input terminal via an input impedance element, each of the transistors hving a load circuit provided with a transistor arranged as a voltage follower for supplying, by means of a negative feedback network, a negative feedback voltage to the control electrode of the transistor of the differential amplifier to which the network is connected in response to a signal at the input terminal.

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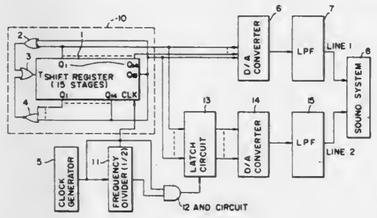
## 4,296,384
## NOISE GENERATOR

**Toshio Mishima, Kitamoto, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan**

**Filed Sep. 17, 1979, Ser. No. 76,083**
**Claims priority, application Japan, Sep. 20, 1978, 53-115393; Sep. 20, 1978, 53-115394**
**Int. Cl.³ H03B *29/00***
**U.S. Cl. 331—78** **2 Claims**




1. A band noise generator comprising:
a clock means producing a predetermined clock output,
a random pulse generator for generating random pulses in synchronism with said clock output and for separating multistage parallel outputs into integer and decimal bits for output;
a band width designating circuit for designating a predetermined noise band width and reading therefrom, by the integer bits, a frequency coefficient represented by an integer corresponding to the designated noise band width;
a memory circuit for storing a fundamental frequency coefficient represented by an integer;
an adder for adding together the frequency coefficient read from the band width designating circuit and the fundamental frequency coefficient from the memory circuit to output predetermined output bits;
an accumulator for adding the decimal bits from the random pulse generator to the output bits from the adder and accumulating them in synchronism with the clock to output predetermined high-order bits; and
a sine-wave table for reading therefrom a sine wave in accordance with the output content of the accumulator.

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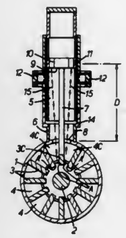
## 4,296,385
## X-RAY ASSISTED MULTIPACTOR DISCHARGE TUNED RESONANT CAVITY DEVICE

**Maurice Esterson, Chelmsford, and Michael B. C. Brady, Maldon, both of England, assignors to English Electric Valve Company, Chelmsford, England**

**Continuation of Ser. No. 12,725, Feb. 16, 1979, abandoned, which is a continuation of Ser. No. 734,882, Oct. 22, 1976, abandoned. This application Feb. 25, 1980, Ser. No. 124,126**
**Claims priority, application United Kingdom, Oct. 24, 1975, 43705/75**
**Int. Cl.³ H01P *1/14*; H03B *9/10***
**U.S. Cl. 331—90** **3 Claims**



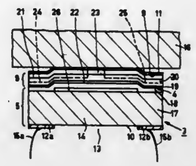
1. A multipactor tuned magnetron oscillator comprising an anode body having a generally cylindrical anode wall, a cathode disposed substantially concentrically within said anode wall, a plurality of vanes within said anode body and defining a plurality of resonant cavities therewithin, at least some of said vanes extending radially inwardly from said anode wall toward said cathode, said anode wall having an opening therein, an inner conductor extending substantially centrally through said opening and substantially radially into and out of said anode body so as to be coupled with at least one of said cavities, a cylindrical outer conductor connected to said anode wall and extending outwardly thereform in concentric relation to said inner conductor to form therewith a coaxial transmission line, a multipactor discharge device terminating said transmission line in outwardly spaced relation to said anode wall, said multipactor discharge device comprising a cylindrical inner electrode connected to and coaxial with said inner conductor and a cylindrical outer electrode concentric with said inner electrode and connected to said outer conductor, the inner and outer electrodes presenting mutually opposed and concentrically spaced surfaces which define a multipactor discharge gap, each of said vanes terminating in spaced relation to said cathode and defining a tip at which X-rays are generated during operation of the oscillator, and said opening having a diameter which is sufficiently large and said multipactor discharge gap surfaces being sufficiently spaced whereby generated X-rays pass in straight line fashion through said opening and into said discharge gap to directly irradiate at least one of said discharge gap surfaces sufficiently to cause emission of photoelectrons which enhance the starting of multipactor discharge between said gap surfaces.



## 4,296,386
## SEMICONDUCTOR INJECTION LASER HAVING A MOVABLE LASER BEAM

**Rudolf P. Tijburg; Peter J. de Waard, and Teunis van Dongen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 26, 1979, Ser. No. 6,606**
**Claims priority, application Netherlands, Feb. 2, 1978, 7801181**
**Int. Cl.³ H01S *3/19***
**U.S. Cl. 331—94.5 H** **20 Claims**



1. An injection laser which comprises:
a semiconductor body having two semiconductor regions of opposite type conductivities which form an injecting p-n junction in the semiconductor body, the semiconductor body having two oppositely-located side surfaces substantially perpendicular to said p-n junction which form an optical resonator therebetween and two oppositely-located major surfaces substantially parallel to said p-n junction;
a first contact region provided on one of said two major surfaces and a second contact region provided on the other of said major surfaces for passing a current across the p-n junction, one of said contact regions being divided into two sub-contact regions so that the current distribution across the p-n junction can be controlled by controlling the current distribution between said two sub-contact regions; and
means for forming an active zone at least partly adjoining said p-n junction which can be moved in a direction transverse to that of the laser beam by controlling the current distribution between said two sub-contact regions in a plane substantially parallel to that of the p-n junction, the two sub-contact regions being separated from each other by a gap which extends substantially in the same direction as the laser beam, said other contact region extending over its major surface across the area of the perpendicular projection of said gap onto the major surface of the other contact region, and the region of the semiconductor body between said sub-contact regions having a sufficiently high resistance such that a plurality of current paths are defined in said body from said two sub-contact regions and converging to said other contact region and which at least partly overlap each other at the area of said p-n junction.

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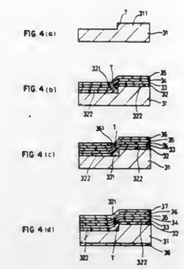
## 4,296,387
## SEMICONDUCTOR LASER

**Takashi Sugino, Takatsuki, and Kunio Itoh, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed May 18, 1979, Ser. No. 40,182**
**Claims priority, application Japan, May 22, 1978, 53-61205; Jun. 7, 1978, 53-69362; Jun. 7, 1978, 53-69363; Jun. 7, 1978, 53-69364; Jun. 8, 1978, 53-69572; Dec. 18, 1978, 53-156621**
**Int. Cl.³ H01S *3/19***
**U.S. Cl. 331—94.5 H** **10 Claims**

1. In a semiconductor laser of multi-layer heretostructure, an active layer epitaxially formed on a cladding layer on a substrate, a first ohmic contact electrode which is stripe shaped and disposed above said active layer, and a second ohmic contact electrode disposed under and contacting said substrate, said substrate having a terraced structure with a step part on its principle face, said active layer having a stripe shaped active region disposed oblique to said principle face between upper and lower parts which are horizontal to said principle face, with upper and lower bent parts disposed respectively between.



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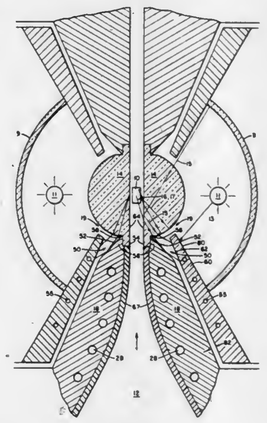
## 4,296,388
## THERMALLY IMPROVED DYE LASER FLOW CHANNEL

**Vaughn G. Draggoo, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.**

**Filed Oct. 29, 1979, Ser. No. 88,775**
**Int. Cl.³ H01S *3/08***
**U.S. Cl. 331—94.5 L** **16 Claims**



1. In a fluid laser comprising:
a channel having a flow therethrough of a laseable fluid;
a conduit for a flow of said fluid upstream of said channel;
an optically transparent window in optical communication with said laseable fluid and having a first interface therewith, said window having a second interface with an ambient atmosphere disposed externally of said channel;
means disposed externally of said channel and in optical communication with said window for exciting said laseable fluid in said channel by the transmission of light thereto through said window to cause laser radiation including fluorescent radiation to be produced in a region of said channel; and
at least one wall member partially defining said upstream

conduit for the flow of said fluid upstream of said channel, portions of said wall member being adjacent a perimeter of said window and being in sealing engagement therewith;

means for reducing heat absorbed by said wall member comprising:

a bevelled surface formed on said wall member externally of said conduit on said portions adjacent said perimeter of said window to provide a reduction in transverse thickness in said wall member portions adjacent said perimeter;

a highly reflective surface formed on said bevelled surface and facing away from said channel, said reflective surface being adapted to reflect away from said wall member said light and said fluorescent radiation directed theretoward and emanating from within said channel and said light directed theretoward and reflected from said first interface;

means in a confronting spaced relationship with said reflective surface for receiving and absorbing light energy reflected from said reflective surface.

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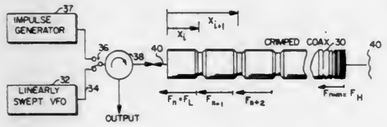
**4,296,389**

## CRIMPED COAX REFLECTIVE DISPERSIVE DELAY LINE

**Harrison W. Fuller, Lexington, Mass., and Chester E. Stromswold, Nashau, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.**

**Filed May 14, 1979, Ser. No. 39,229**
**Int. Cl.³ H01P** *1/202, 3/06, 9/00, 11/00*
**U.S. Cl. 333—160** **12 Claims**




1. A crimped coax reflective broad band dispersive delay line with precisely linear delay vs. frequency characteristics so that the output of said delay line will function as a pulse compression filter when the input to said delay line is linearly fm frequency swept in a manner is matched to the linear delay vs. frequency characteristic of said delay line.

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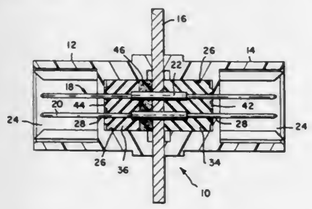
**4,296,390**

## SOLDERLESS FILTER MOUNTING FOR HEADER ASSEMBLIES

**Eric E. Vanderheyden, Hummelstown, and Albert Casciotti, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Apr. 21, 1980, Ser. No. 142,535**
**Int. Cl.³ H01R** *19/06, 19/10, 13/66;* **H03H** *7/01*
**U.S. Cl. 333—182** **11 Claims**




1. A filtered header or feedthrough connector comprising:

a ground plane;

a pair of hermaphroditic housing members of insulative material each having a planar first mating face and a profiled second mating face, a recess in each said planar face, said recesses together defining a cavity, and a plurality of terminal bores each extending from said second faces to said cavity, said housing members adapted to be mounted by their first mating faces on opposite sides of said ground plane;

a rubber block in each said cavity, each said block having a plurality of apertures therein, each aligned with a respective terminal bore in said housing members;

a conductive rubber gasket in one cavity held in compression between said first mating face and said ground plane and having a like plurality of apertures therein; and

a plurality of filtered terminal assemblies each including an elongated terminal with a filter sleeve secured intermediate the ends thereof and received in said blocks with the filter sleeve engaging said conductive gasket and the ends of the terminal projecting from said second mating faces to engage associated terminals, said conductive rubber gasket establishing electrical contact between said filter sleeve and said ground plane.

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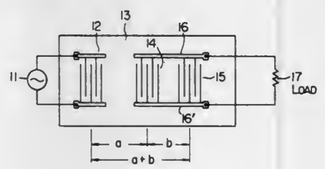
**4,296,391**

## SURFACE-ACOUSTIC-WAVE FILTER FOR CHANNEL SELECTION SYSTEM OF TELEVISION RECEIVER

**Katashi Hazama, Zushi, and Akitsuna Yuhara, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 24, 1978, Ser. No. 954,124**
**Claims priority, application Japan, Oct. 28, 1977, 52-128699; Oct. 28, 1977, 52-128700**
**Int. Cl.³ H03H** *9/64, 9/68*
**U.S. Cl. 333—193** **12 Claims**




1. A surface-acoustic-wave filter for a channel selection tuning system comprising:

a piezoelectric substrate;

a plurality of surface-acoustic-wave comb filter means provided integrally on a surface of said substrate and exhibiting as a whole a comb frequency characteristic which corresponds to a channel frequency distribution for a plurality of channel bands corresponding to different programs over a wide channel range, each surface-acoustic-wave comb filter means comprising:

an input transducer for converting a local oscillator output of a corresponding channel band into an acoustic surface wave;

first and second output transducers electrically connected and physically spaced for converting surface acoustic waves from the input transducer into electric signals, said first and second output transducers being located along a surface-acoustic-wave propagation path on the substrate with different distances from and on the same side of said input transducer, the respective spacings of said first and second output transducers from said input transducer being such that the reciprocal of a differential delay time between the output electrical signals from said first and second output transducers is equal to a divisor of a channel spacing in the corresponding channel band;

input and output terminal means coupled on the substrate for connecting at least two of said filter means in parallel, said output terminal means being directly coupled with said first and second output transducers to provide a sum of



outputs of the first and second output transducers as the output of the comb filter.

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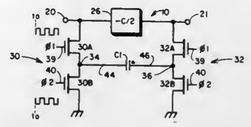
**4,296,392**

## SWITCHED CAPACITOR BILINEAR RESISTORS

**Man S. Lee, Belmont, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.**

**Filed Jun. 30, 1980, Ser. No. 164,394**
**Int. Cl.³ H03H** *11/46*
**U.S. Cl. 333—213** **24 Claims**




1. An integratable switched capacitor circuit for simulating a resistor comprising:

first and second nodes;

a capacitor having a pair of terminals;

first means for effectively establishing a negative capacitance between a pair of terminals thereof;

second means connecting associated ones of said terminals of said first means to said first and second nodes, respectively;

third means for periodically connecting one side of said capacitor to ground and to one of said nodes at a prescribed switching frequency so as to simulate a resistor across said nodes.

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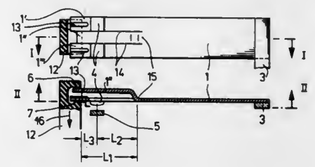
**4,296,393**

## CONTACT SPRING ARRANGEMENT FOR AN ELECTROMAGNETIC RELAY

**Hans Sauer, Fichtenstrasse 5, Deisenhofen, Fed. Rep. of Germany (D-8024); Wolf Steinbichler, Am Hoehenpark, Bad Feilnbach, Fed. Rep. of Germany (D-8201), and Sepp Antonitsch, Holzham 2d, Otterfing, Fed. Rep. of Germany (D-8156)**

**Filed Jan. 24, 1980, Ser. No. 115,093**
**Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902885**
**Int. Cl.³ H01H** *67/02*
**U.S. Cl. 335—125** **13 Claims**




1. A contact spring arrangement for an electromagnetic relay including

(a) a contact spring mounted on a terminal and having at least one portion serving as a movable contact cooperating with a fixed contact, and

(b) an actuator engaging the contact spring and having a first actuator portion for moving the movable contact towards the fixed contact and a second actuator portion for withdrawing the movable contact from the fixed contact,

(c) a first distance between the location at which the first actuator portion engages the contact spring and the contacting location of the movable and fixed contacts being greater than a second distance between the location at which the second actuator portion engages the contact spring and said contacting location.

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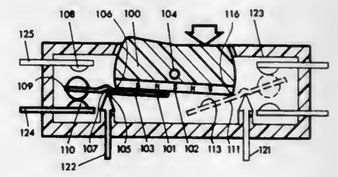
**4,296,394**

## MAGNETIC SWITCHING DEVICE FOR CONTACT-DEPENDENT AND CONTACTLESS SWITCHING

**A. Kadry Ragheb, 100 Francois, Montreal, Quebec, Canada**

**Filed Feb. 13, 1978, Ser. No. 870,846**
**Int. Cl.³ H01H** *36/00*
**U.S. Cl. 335—207** **72 Claims**




1. A magnetic switch comprising:

a. a switch mounting structure,

b. a first driver member comprising:

1. a first mounting portion by which said first member is moveably mounted relative to said switch structure,

2. a first magnetically attractive portion having a first magnetically attractive surface portion,

3. a first bearing portion,

c. mounting means, attached to said switch structure, providing support for the movement of said first member,

d. a second slave member comprising:

1. a second mounting portion by which said second member is moveably mounted relative to said switch structure,

2. a second magnetically attractive portion having a second magnetically attractive surface portion,

3. a second bearing portion,

e. first pivot means, attached to said switch structure, providing support for the movement of said second member,

f. first stop means, mounted to said switch structure, located in the path of travel of said second member,

g. said first and second members having a first position where the first and second magnetically attractive surface portions are located adjacent one another in a manner to cause said first and second members to be magnetically held in said first position, said first and second members also having a second position,

h. said first member being moveable by an applied force to said second position in a manner causing the said first bearing portion to engage the said second bearing portion, the resulting engaged movement further causing a corresponding movement of said second member to said second position wherein said second member makes contact with said first stop means, said engaged movement further causing said first and second magnetically attractive surface portions to become spaced from one another by an air gap,

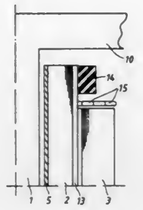
i. at least one of said first and second members being mounted for angular movement relative to said switch structure in a manner that said first and second members move angularly relative to one another.

**4,296,395**

## STRUCTURE FOR PREVENTING WINDING COLLAPSE

**Bertil Moritz, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden**

**Filed Nov. 2, 1979, Ser. No. 90,699**
**Claims priority, application Sweden, Nov. 9, 1978, 7811561; Feb. 28, 1979, 7901797**
**Int. Cl.³ H01F *27/08, 27/30***
**U.S. Cl. 336—60** **13 Claims**




1. A power transformer comprising at least two concentric, cylindrical windings, at least the innermost of which being wound from a conductor of tape or foil and having a circular cross-section, said innermost winding having an axial length greater than the axial length of an adjacent surrounding winding, an inner supporting cylinder made of metallic material for supporting said innermost winding, said inner supporting cylinder including a longitudinally extending, electrically insulating slot, and ring girders surrounding the ends of said innermost winding, said innermost winding being supported against said an adjacent surrounding winding and against said ring girders.

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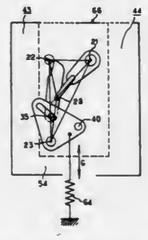
**4,296,396**

## MANUAL ELECTRIC SWITCH WITH THERMAL RELEASE

**Raymond A. Ingrain, Quetigny, and Jacques Cohen, Fontaine, both of France, assignors to La Telemecanique Electrique, France**

**Filed Jan. 29, 1980, Ser. No. 116,508**
**Claims priority, application France, Jan. 31, 1979, 79 02479**
**Int. Cl.³ H01H *71/16***
**U.S. Cl. 337—66** **6 Claims**




1. In a switch, with manual closing and opening and with thermal release, having a housing, an operating member in the housing and coupled to a control arm which is movable about a first fixed pivot and an end of which is coupled by a first articulation to a first end of a connecting rod to constitute a knee joint, a second end of said connecting rod being coupled by a second articulation to a loading lever, a first end of which loading lever is abutted on a latch displaced rotatably about a second fixed pivot, by the movement of overload bi-metallic strips, and a second end of which loading lever cooperates with a transmission lever which is associated with movable contacts, and which pivots about a third pivot, the improvement that:

(i) the first pivot and the second pivot are disposed in the proximity of an upper part of said housing near to said operating member,

(ii) said third pivot is fixed and disposed at the lower part,

(iii) said three pivots are placed substantially at the apices of a right-angled triangle, and

(iv) said second and third pivots are placed on a straight line substantially parallel to the direction of movement of said operating member and to the direction of movement of said movable contacts.

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**4,296,397**

## FUSE STRUCTURE FOR CORROSIVE ATMOSPHERE

**Donald C. Sedberry, Erdenheim, Pa., assignor to Welsbach Ozone Systems Corporation, Philadelphia, Pa.**

**Filed May 30, 1980, Ser. No. 155,799**
**Int. Cl.³ H01H *1/06***
**U.S. Cl. 337—199** **12 Claims**

1. A fuse structure for use with ozonators and corrosive atmosphere applications comprising:

a fine ozone corrosion resistant fuse wire;

conductive terminal means to which the fuse wire is conductively attached and which in turn enable fuse connection into a circuit;

rigid insulator spacing means engaging and spacing the terminal means so that the fuse wire is extended and so that the structure constitutes a unitary structure which may be handled as a unit; and

insulator shield means placed over the fuse wire over a substantial portion of its length and serving to shield the insulator spacing means from vaporized filament material when the fuse opens in order to avoid a conductive path being formed by vaporized fuse metal condensing on the insulator through which an alternate electrical path exists through the fuse.

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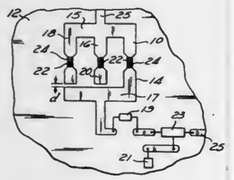
**4,296,398**

## PRINTED CIRCUIT FUSE ASSEMBLY

**James D. McGalliard, Santa Ana, Calif.**

**Filed Dec. 18, 1978, Ser. No. 970,632**
**Int. Cl.³ H01H *85/04***
**U.S. Cl. 337—297** **1 Claim**




1. A printed circuit, including multiple printed circuit fuse elements, comprising:

a circuit substrate;

a printed circuit formed on said substrate for interconnecting



circuit components, said printed circuit including a circuit bus;

a first printed circuit fuse element formed on said substrate, interconnected to limit the current in said printed circuit to protect said printed circuit from abnormally high currents, said first printed circuit fuse element having a predetermined current capacity which is lower than the current capacity of the conductors of said printed circuit which are connected to said first printed circuit fuse element; and

a second printed circuit fuse element on said substrate, having a solder land adjacent said circuit bus, said land separated from said bus sufficiently to electrically isolate said land from said bus, but spaced close enough to said bus to permit molten solder to be applied as a jumper from said land to said bus, said second printed fuse element, when solder is applied connecting said land to said bus, being in parallel circuit connection with said first printed circuit fuse element.

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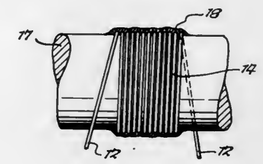
**4,296,399**

## MICROMINIATURE PALLADIUM OXIDE GAS DETECTOR AND METHOD OF MAKING SAME

**Frank T. John, Williamsville, N.Y., assignor to A-T-O Inc., Willoughby, Ohio**

**Division of Ser. No. 862,974, Dec. 21, 1977, Pat. No. 4,193,964.**
**This application Aug. 6, 1979, Ser. No. 64,020**
**Int. Cl.³ H01L *17/04, 7/00***
**U.S. Cl. 338—34** **2 Claims**




1. A method for making a miniature platinum or palladium wire coil comprising winding a wire having a diameter of from about 0.0001 cm to about 0.005 cm about a mandrel, said mandrel being made of a material which can be removed by oxidation without oxidizing said wire; coating the wire wound about said mandrel with a ceramic precursor; drying and curing the ceramic precursor to form a ceramic binder and removing said mandrel by oxidation, said precursor comprising aluminum phosphate, phosphoric acid, chromium phosphate, submicron aluminum oxide and water.

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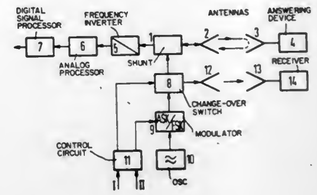
**4,296,400**

## INSTALLATION FOR CONTROL OF A TRAFFIC LIGHT SYSTEM BY VEHICLES HAVING AN AUTOMATIC LOCATION DETERMINATION

**Becker Friedbert; Johann Steinkamp, both of Munich, and Klaus Koenen, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 28, 1978, Ser. No. 964,431**
**Int. Cl.³ G08G *1/07***
**U.S. Cl. 340—32** **2 Claims**

1. In an installation for the control of a traffic light system from a vehicle, the combination of means carried by the vehicle for supplying information for automatic determination of position, i.e. bearing determination, a first directional antenna for transmission/reception, carried by the vehicle for transmission of such bearing information and having its transmission direction oriented essentially perpendicular to the direction of travel of the vehicle, a second directional antenna carried by the vehicle and oriented in the direction of travel of the vehicle for transmission of transfer messages or commands for the control of lights of such a traffic light system, means for producing carrier waves, means for modulating said carrier waves, said means for modulating is adapted to provide two types of modulated signals which are orthogonal to one another, one for the modulation of bearing information and the other for the modulation of transfer messages or commands, change-over switch means selectively connecting said means




for modulating to said first antenna over a shunt means or to said second antenna, and control means connected to said change-over switch means and said means for modulating for selectively controlling the type of modulation utilized and the antenna employed for a selected transmission.

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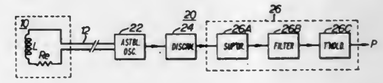
**4,296,401**

## INDUCTIVE VEHICLE DETECTOR

**Richard K. Duley, Romsey, England, assignor to Redland Automation Limited, Winchester, England**

**Filed Jan. 10, 1978, Ser. No. 868,240**
**Claims priority, application United Kingdom, Jan. 11, 1977, 1029/77**
**Int. Cl.³ G08G *1/01***
**U.S. Cl. 340—38 L** **14 Claims**




1. A vehicle detector circuit for use with an inductive detector loop for sensing the presence of a vehicle in the vicinity of the loop, comprising:

first means connectable to an inductive detector loop to impress on the loop a voltage of predetermined waveform including a discontinuity and produce therein a current whose relationship to the impressed voltage is essentially determined by the inductive time constant of the loop;

second means responsive to the current in the loop and having a non-resonant response to provide a signal having the waveform of the current in the loop;

comparator means responsive to said voltage waveform and to said current waveform signal to provide a signal dependent on the lag of the current waveform with respect to said discontinuity of the voltage waveform due to the inductive time constant of the loop circuit; and

analyzer means responsive to changes in said lag-dependent signal to provide an output signal indicative of the presence of a vehicle in the vicinity of the detector loop.

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**4,296,402**

## VEHICLE ANTI-THEFT DEVICE

**Slawomir Z. Szczepanski, 5455 N. Sheridan Rd., Chicago, Ill. 60640**

**Filed Apr. 2, 1980, Ser. No. 136,412**
**Int. Cl.³ B60R *25/04***
**U.S. Cl. 340—64** **15 Claims**

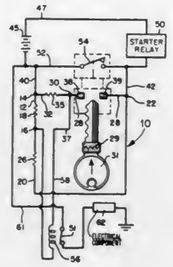
1. An anti-theft device for a motor vehicle having an electrical system including a starter relay, said device comprising:

a four-node electrical network including a first resistive segment having a predetermined resistance $R_1$ between a first interface node and a first intermediate node, a second

resistive segment having a predetermined resistance $R_2$ between the first intermediate node and a second interface node, a third resistive segment having a predetermined resistance $R_3$ between the second interface node and a second intermediate node, a fourth resistive segment having a predetermined resistance $R_4$ between the second intermediate node and the first interface node, said resistances $R_1$, $R_2$, $R_3$, and $R_4$ satisfying the equation

$$R_1R_3=R_2R_4$$

at least a part of said third resistive segment being removable, said first and second interface nodes being connected to the




electrical system of the motor vehicle such that a voltage differential is created between the first and the second interface nodes when the electrical system is activated;

means for detecting an imbalance in an electrical property between said first intermediate node and said second intermediate node whenever the resistance of the third resistive segment is different from $R_3$ and for generating in response thereto an output signal;

an electrical component; and

means for receiving the output signal and for disabling in response thereto said electrical component, said component selected such that means for receiving and disabling does not prevent normal operation of the starter relay but prevents operation of the engine.

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**4,296,403**

**METHOD AND CIRCUIT ARRANGEMENT FOR SWITCHING AND TRANSMITTING SIGNALS IN, OR FROM, A STORED PROGRAM CONTROLLED SWITCHING SYSTEM**

**Eckhart Haensel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 29, 1979, Ser. No. 98,387**

**Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853138**

**Int. Cl.³ H04Q** *3/00*

**U.S. Cl. 340—147 P** **3 Claims**

1. A circuit arrangement for switching and emitting signals in or from, respectively, a stored program controlled switching system having a plurality of addressable feeder channels supplying signals in the incoming transmission direction and a plurality of like-addressed receiving channels for feeding signals out in the outgoing direction, comprising:

a stored program controlled switching system connected to the plurality of feeder channels which supply signals in the incoming transmission direction and to the plurality of receiving channels which feed signals in the outgoing transmission direction;

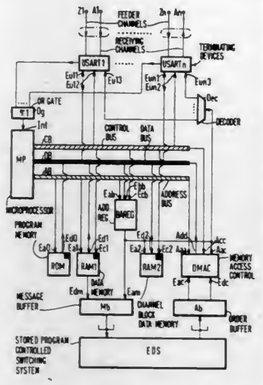
control means including programs stored therein for determining the processing steps to be executed;

said control means including a memory storing the processing programs;

an addressing device connected to said memory for receiving addresses and emitting a channel address designating a feeder channel and a receiving channel for the duration of the handling of the processing program relating thereto;

a control device including a control input, said control input connected to said addressing device for feeding addresses thereto;

a plurality of terminating devices connected to the feeder channels for receiving and recognizing the occurrence of




signals therein, said terminating devices connected to said control input of said control device and operable to cause said control device to feed channel addresses to said addressing device; and

means connected between said addressing device and said terminating devices and operable in response to addresses to condition the addressed terminating devices for transmission in both directions over the respective addressed channels.

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**4,296,404**

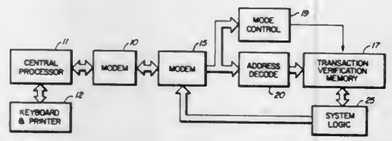
**REMOTE VERIFICATION LOCKOUT SYSTEM**

**James R. Sheldon, Phoenix, Ariz., assignor to Engineered Systems, Inc., Tempe, Ariz.**

**Filed Oct. 18, 1979, Ser. No. 85,895**

**Int. Cl.³ G06K** *5/00;* **H04Q** *3/02*

**U.S. Cl. 340—149 A** **5 Claims**




1. A system for providing a verification check of uniquely encoded multibit binary words at a plurality of remote locations, the system having a central station for supplying address signals and verification "valid/non-valid" control signals through a transmission link interconnecting said central station with each of said plurality of remote locations, each of said remote locations including in combination:

read/write memory means having a plurality of address locations therein, each address location storing a single binary bit indicative of the "valid/non-valid" status of the item represented by each such address location, said memory means further having a single output on which an output signal is produced corresponding to the binary bit stored at the address location selected in said memory means;

lockout utilization means coupled to the output of said memory means and operated in response to output signals appearing thereon;

address control means operated in response to addressing signals and coupled to said memory means for selecting particular address locations for the writing of bits into and the reading of bits from those address locations of said memory means;

read/write control means coupled to said memory means and further coupled with said transmission link and responsive to signals applied thereto from said central station over said transmission link for controlling the read/write mode of operation of said memory means and for supplying said verification control signals to said memory means to selectively change the "valid/non-valid" status of the binary bits stored in said memory means when said memory means is in the write mode of operation;

gating circuit means having a plurality of inputs and having outputs coupled with said address control means for supplying said addressing signals thereto;

address decoding means coupled to selected inputs of said gating circuit means and further coupled with said transmission link and responsive to address signals supplied thereto from said central station over said transmission link for supplying address input signals to said gating circuit means;

further circuit means coupled to others of the inputs of said gating circuit means for supplying input addressing signals thereto; and

selecting means coupled with said read/write control means and operated thereby and further coupled to said gating circuit means for causing the signals appearing on the outputs of said gating circuit means to be selected from the input signals from said address decoding means or the input signals from said further circuit means, thereby causing the signal on the output of said memory means to correspond to the binary bit stored at the address location selected by the addressing signals from said gating circuit means.

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**4,296,405**

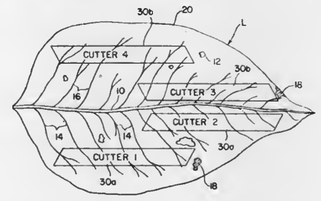
**DEVICE FOR CONVERTING ANALOG SIGNALS FROM A NATURAL LEAF SCANNER INTO DIGITAL SIGNALS AND METHOD OF OPERATING SAME**

**Leonard G. Rich, West Hartford, Conn., assignor to Gulf & Western Corporation, New York, N.Y.**

**Filed May 2, 1978, Ser. No. 902,253**

**Int. Cl.³ G06K** *9/00;* **A24C** *1/00*

**U.S. Cl. 340—146.3 AG** **9 Claims**




1. A device for converting a succession of analog voltage signals representative of the light intensity of light from and controlled by a corresponding succession of finite surface locations of a natural leaf into a white, black or gray digital signal for each given location, said device comprising: means for creating a white digital signal when an analog voltage signal at a given location exceeds a first threshold voltage corresponding to a given light intensity value; means for creating a black digital signal when an analog voltage signal at a given location is below a second threshold voltage; averaging means for creating said second threshold voltage by averaging at least a majority of previous analog signals of said succession of locations; means for excluding said analog signal for a given location from said averaging means when said analog signal creates said white digital signal; and, means for creating a gray digital signal in the absence of said white and black signals for a given location.

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**4,296,406**

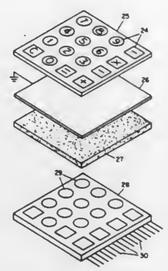
**PRESSURE SENSITIVE SWITCH STRUCTURE**

**Billy J. Pearson, Bluff City, Tenn., assignor to Sperry Corporation, New York, N.Y.**

**Filed Dec. 28, 1979, Ser. No. 107,970**

**Int. Cl.³ G08C** *21/00*

**U.S. Cl. 340—166 R** **6 Claims**



1. A pressure sensitive matrix switch device comprising:

an insulative base,

a first conductive pad means having a plurality of switch pads,

a second conductive pad means,

at least one of said pads being mounted on said base,

a pressure sensitive conductive-resistive material intermediate said conductive pad means,

said conductive-resistive material normally displaying a very high resistance therebetween when no pressure is applied,

said conductive-resistive material displaying a low resistance therebetween when a light pressure is applied,

means for applying pressure to said conductive pads to compress said conductive-resistive material and to change the resistance of said conductive-resistive material from a relatively high ohmic value to a relatively low ohmic value,

voltage source means connected to the said second conductive pad means,

said change of said conductive-resistive material from a relatively high ohmic value to a relatively low ohmic value for generating a voltage signal from one of said switch pads indicative of a particular switch device being operated, and

logic encoder means coupled to said voltage signal for generating binary coded signals indicative of one of said matrix switch devices being operated.

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**4,296,407**

**DIGITAL FREQUENCY SYNTHESIZER WITH FREQUENCY DIVIDER PROGRAMMABLE IN RESPONSE TO STORED DIGITAL CONTROL SIGNAL**

**Hiroshi Minakuchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Osaka, Japan**

**Filed May 14, 1979, Ser. No. 38,991**

**Int. Cl.³ H03L** *7/18;* **H03K** *13/20*

**U.S. Cl. 340—347 CC** **10 Claims**

1. A digital frequency synthesizer having a programmable frequency divider for dividing the frequency of a standard frequency signal by a variable integral multiple, comprising, means for generating a manually adjustable analog control signal, analog-to-digital converter means for converting said

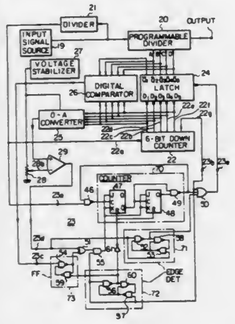
analog control signal into a digital signal, and a storage medium for storing said digital signal, the output of said storage medium representing said integral multiple;

wherein said analog-to-digital converter means comprises means for detecting the difference between said analog control signal and the stored digital signal to reset said storage medium to the digital signal generated at the instant said difference exceeds a predetermined value; and further

wherein said difference detecting means comprises:

a source of clock pulses;

a first binary counter receptive of said clock pulses to generate a digital signal varying stepwisely in response to each clock pulse, the output of said binary counter being connected to the input of said digital storage medium;




a digital comparator for generating an output signal in response to the occurrence of a coincidence between the input and output of said storage medium;

a digital-to-analog converter connected to the output of said binary counter to convert said digital signal into a corresponding analog signal;

an analog comparator for generating an output signal in response to the occurrence of a coincidence between said analog control signal and said analog signal delivered from said digital-to-analog converter; and

means for resetting said storage medium to store the instantaneous value of the digital signal generated by said first binary counter when the interval elapsed between the time of generation of an output signal of said digital comparator and the time of generation of an output signal of said analog comparator exceeds a predetermined value.

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**4,296,408**

**LOCATION TRANSMITTING SYSTEM**

**Jules K. Neuringer, Belle Harbor, N.Y., assignor to Portronix Communications Inc., Brooklyn, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 139,759**

**Int. Cl.³ G08B *1/08*; H04Q *7/00***

**U.S. Cl. 340—539** **4 Claims**

1. A location transmitting system comprising:

a mobile unit including power supply means having external terminals;

a plurality of encoder means at different predetermined locations for generating coded signals individually representative of said locations, each of said encoder means having external terminals for contacting said power supply terminals of said mobile unit;

a radio transmitter in said mobile unit for transmitting a radio signal from each of said encoder means locations;

each of said encoder means being energized and each of said encoder means being effective to modulate said transmitter to transmit an encoded radio signal representative of the location when said mobile unit is so positioned that

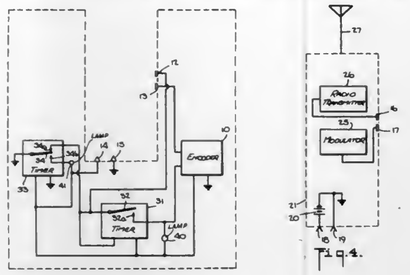


Fig. 4.

said power supply terminals thereof contact said external terminals of said encoder means.

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**4,296,409**

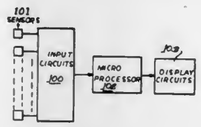
**COMBINE PERFORMANCE MONITOR**

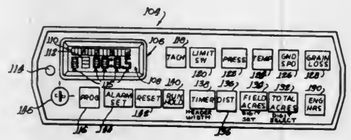
**Roger B. Whitaker, Crystal Lake, and Charles W. Blevins, Auburn, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.**

**Filed Mar. 12, 1979, Ser. No. 19,287**

**Int. Cl.³ A01D *41/00*; G06C *29/00*; G08B *19/00***

**U.S. Cl. 340—684** **18 Claims**




1. A combine performance monitor for a combine having a plurality of sensor means for detecting a plurality of different operating conditions of the combine and for providing sensor signals corresponding to said conditions, said combine performance monitor comprising: display means, operator accessible control and selection means and a programmable special purpose computer including means for storing a predetermined computer program, said computer being coupled to said sensor means, to said control and selection means and to said display means for calculating a plurality of values of predetermined combine functions related to combine performance in accordance with said sensor signals and with said predetermined program and for selectively energizing said display means to provide observable indications of said values, said operator accessible control and selection means and said special purpose computer including cooperating customizing means for selectively modifying said predetermined computer program in accordance with combine operating characteristics so as to customize said combine performance monitor for operation with any one of a plurality of combines having different operating characteristics.



**4,296,410**

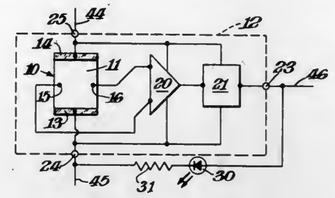
**TWO-STATE HALL ELEMENT PROXIMITY SENSOR DEVICE WITH LAMP INDICATOR**

**Jacob K. Higgs, Concord, and Grant D. Avery, Loudon, both of N.H., assignors to Sprague Electric Company, North Adams, Mass.**

**Filed Feb. 25, 1980, Ser. No. 124,389**

**Int. Cl.³ G08B *21/00*; H01H *36/00*; H01L *43/06***

**U.S. Cl. 340—686** **6 Claims**



1. A proximity sensor kit having two basic component parts capable of being mounted to a fixed and a movable member of a machine, respectively, for producing an electrical output signal and a visual indication when a portion of said movable member moves to within a predetermined distance with respect to a portion of said fixed member, said kit comprising the combination of said parts, namely:

(a) a two-state Hall element proximity sensor device, adapted to be mounted to said fixed member portion, comprising a Hall element and a voltage-threshold detector means being connected to the output of said Hall element for generating a particular electrical signal only when the magnetic field at said element exceeds a predetermined magnitude in a predetermined polarity; a housing containing said sensor device, the plane of said element being positioned parallel to and adjacent to an outer face of said housing; and an indicator lamp means for providing one state of illumination only when excited by said signal, said lamp means including a lamp that is connected to the output of said detector means and is attached to and protrudes from another face of said housing to be seen from many directions of viewing and to provide visual indication whether said particular electrical signal is present;

(b) a magnet adapted to be mounted to said movable member portion in such a position that when said fixed portion is within said predetermined distance, one of the poles of said magnet substantially faces said sensor, said magnet providing an ambient magnetic field at said Hall element of said predetermined polarity and of said predetermined magnitude.

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**4,296,411**

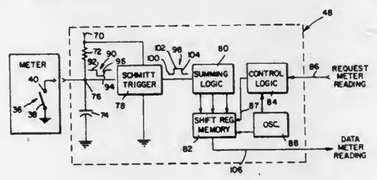
**ELECTRONIC REMOTE METER READING APPARATUS**

**Pat Romanelli, and Robert J. Romanelli, both of 224 Brook St., Harrington Park, N.J. 07640**

**Filed Sep. 25, 1978, Ser. No. 945,400**

**Int. Cl.³ G08C *19/00, 19/16***

**U.S. Cl. 340—870.02** **9 Claims**




1. Apparatus for converting a standard meter, having a plurality of rotatably driven dial elements indicating total units of a utility measured by said meter, into a meter capable of being read from a remote location,

said apparatus comprising magnetic means mounted on the single dial element of said meter which indicates the lowest whole unit of utility consumption measured, said magnetic means being mounted for rotation with said single dial element,

a single magnetic field sensitive element fixedly mounted on said meter in proximity to said single dial element and positioned to register intermittently with said magnetic means as said single dial element is rotated to produce an electrical signal in response to each field interception during rotation of said single dial element,

said magnetic means comprising at least one permanent magnet secured to said single dial element and positioned to produce one said electrical signal in response to the consumption of a single whole unit of utility consumed and indicated by said single dial element,

signal processing means for receiving said electrical signals to produce a unit pulse indicative of each field interception of said sensitive element by said magnetic means,

counting means for receiving and summing said pulses to indicate the total units of utility measured by said meter,

storage means for receiving said total units of information of utility measured and storing the same in a memory bank for future information, and

interrogator means for selectively interrogating said storage means for receiving and transmitting information as to the total units measured over a selected time period.

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**4,296,412**

**METHOD AND APPARATUS FOR SIGNAL TRANSMISSION**

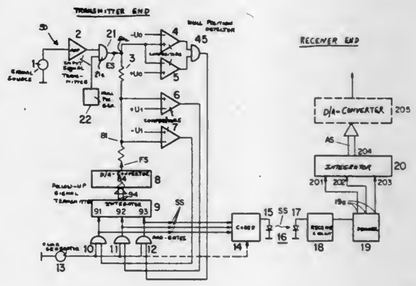
**Jiri Mastner, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Nov. 8, 1979, Ser. No. 92,520**

**Claims priority, application Switzerland, Dec. 1, 1978, 12295/78**

**Int. Cl.³ G08C *19/16, 25/00***

**U.S. Cl. 340—870.19** **15 Claims**




1. A method of transmitting signals between the transmitter end and receiver end of a transmission system, especially for transmitting current and voltage measurement signals by a potential bridging-transmission channel with pulse modulated electromagnetic waves, comprising the steps of:

comparing at the transmitter end an input signal with a follow-up signal which follows the input signal;

generating a control signal derived from the difference between the input signal and the follow-up signal;

forming as the control signal a multi-value control signal having different signal values;

correlating two signal values to both signs of the difference between the input signal and the follow-up signal;

correlating a third signal value to not exceeding a predeter-

mined threshold value of the magnitude of such difference;
transmitting the control signal to the receiver end;
utilizing the control signal at the receiver end for obtaining an output signal corresponding to the received signal by controlling an integrating element;
obtaining the output signal by timewise up-and-down integration at the first and second values and by fixedly holding the existing integrated value at the third value of the control signal;
triggering resetting of the follow-up signal to the value null as a function of the occurrence of null positions during the time course of the input signal;
transmitting a corresponding resetting signal to the receiver end; and
employing the resetting signal at the receiver end for resetting the output signal to null.

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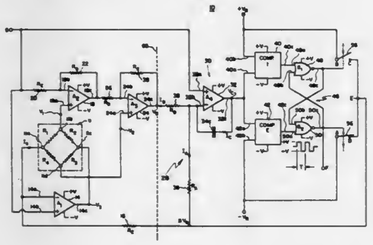
**4,296,413**

## RESISTANCE-BRIDGE TO FREQUENCY CONVERTER WITH AUTOMATIC OFFSET CORRECTION

**Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 28, 1979, Ser. No. 79,825**
**Int. Cl.³ G08C *19/04, 19/12***
**U.S. Cl. 340—870.38** **14 Claims**



1. A circuit for converting the magnitude of a sensed physical parameter to the periodic frequency of a waveform, comprising:
a sensor having first through fourth terminals and having an equivalent electrical resistance appearing between each pair of said terminals, which resistance varies proportional to the magnitude of the physical parameter to be sensed;
means connected to the first and second terminals of said sensor for providing a current flow of an essentially constant magnitude through the resistances of said sensor;
means connected to the third and fourth terminals of said sensor for generating a first voltage having a magnitude proportional to the magnitude of the physical parameter sensed by said sensor; and
means for converting said first voltage to said waveform having a frequency substantially proportionally to the magnitude of said sensed physical parameter, including first and second reference potential sources, having essentially identical magnitudes and opposite polarities;
means having first and second inputs respectively receiving said first voltage and a second voltage for integrating, with respective to time, the sum of the first and second voltages to provide an output voltage;
comparative means receiving said first and second reference potentials and said output voltage of said integrating means for providing first or second signals when the output voltage of said integrating means is equal to said first or second reference potentials, respectively; and
means for connecting said first or second reference potential to a common node, at which said second voltage appears with polarity selected to reverse the integration direction of said integrating means, responsive respectively to the generation of said comparing means first or second signal;
each of said first and second signals periodically alternating in polarity at a frequency substantially proportional to said first voltage; one of said first and second signals being said waveform.

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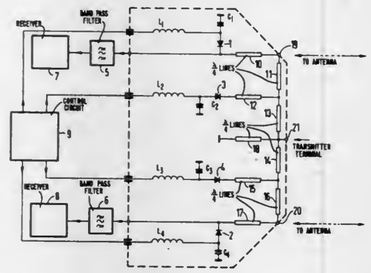
**4,296,414**

## P-I-N TYPE DIODE HIGH FREQUENCY SWITCH FOR SECONDARY RADAR INTERROGATION DEVICES AND TRANSPONDERS

**Franz Beyer, Munich, and Siegfried Sedlmair, Groebenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Nov. 29, 1979, Ser. No. 98,638**
**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855173**
**Int. Cl.³ G01S *13/02;* H01P *1/15***
**U.S. Cl. 343—5 SW** **8 Claims**



1. A P-I-N type diode high frequency switch provided in a secondary radar transponder which has an antenna diversity device equipped with two antennas, said P-I-N type diode high frequency switch being provided for supplying one of the two antennas with required pulses by means of two P-I-N type diodes operated by a control circuit either in the blocking state or in the short circuit state, one terminal of said P-I-N type diodes being respectively connected, via a T-element consisting of three quarter-wave length line pieces, to the transmitter terminal and to the terminal for one antenna or, respectively, to the terminal for the other antenna, as well as for relaying the reception signals existing at the two antenna terminals to two receivers of which each is associated with one antenna and which has connected at its input a band pass filter for blocking the transmission signal but allowing the reception signals to pass therethrough, characterized in that each of said two antenna terminals (**19, 20**) is directly connected to the associated band pass filter (**5, 6**) only through one line (**23, 24**); and the sum of the electrical length of the input impedance of one of the band pass filters (**5, 6**) and the electrical length of one of the lines (**23, 24**) which are between the band pass filter and the terminal of the antenna associated with this band pass filter is dimensioned such that a no-load condition occurs at the antenna terminal at the transmission frequency.

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**4,296,415**

## METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF SCINTILLATION AND REJECTION OF CLUTTER IN MONOPULSE RADARS

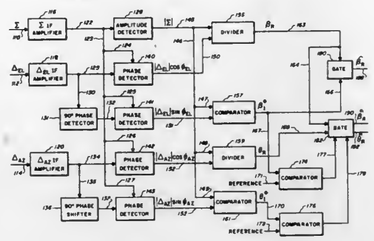
**Frank M. Pelton, Clarence, N.Y.; Clyde A. Miller, Falls Church, Va., and Thomas F. Leney, Elma, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.**

**Filed Feb. 6, 1974, Ser. No. 441,201**
**Int. Cl.³ G01S *13/44***
**U.S. Cl. 343—16 M** **5 Claims**

3. A circuit for processing radar return signals in a four horn monopulse radar system for reducing rain, sea and land clutter,



for reducing errors due to scintillation and for identifying tall, narrow structures having a much greater angular extent in the elevation plane than in the azimuth plane including:
means for processing radar return signals to obtain signals representing the real part of the complex angle of arrival;
means for applying threshold levels and for processing radar return signals to obtain thresholded signals indicative of the imaginary part of the complex angle of arrival;



means for processing the signals representing the real part of the complex angle of arrival in response to the thresholded signals indicative of the imaginary part of the complex angle of arrival whereby clutter and errors due to scintillation may be reduced and tall, narrow structures may be identified.

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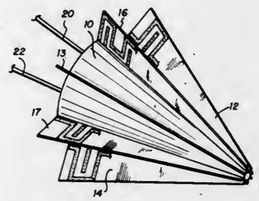
**4,296,416**

## DUAL MODE LOG PERIODIC MONOPOLE ARRAY

**Wayne R. Harader, Garland, Tex., assignor to E-Systems, Inc., Dallas, Tex.**

**Filed Oct. 26, 1979, Ser. No. 88,564**
**Int. Cl.³ H01Q *11/10***
**U.S. Cl. 343—792.5** **12 Claims**



1. A dual mode antenna, comprising:
a cone having a conducting surface,
a first plurality of log periodic monopole elements spaced about and attached to said conducting surface and extending radially therefrom, said first plurality of elements having a phase relationship for operating in a first mode, and
a second plurality of log periodic monopole elements interdigitated with said first plurality and spaced about and attached to said conducting surface and extending radially therefrom, said second plurality of elements having a phase relationship distinct from the phase relationship of said first plurality for operating in a second mode,
wherein said first plurality of monopole elements has a pattern to establish a progressive phase relationship around said cone.

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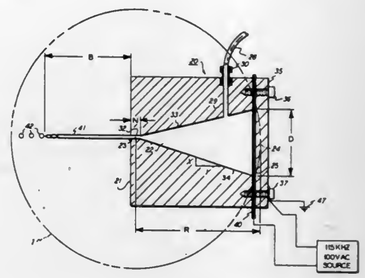
**4,296,417**

## INK JET METHOD AND APPARATUS USING A THIN FILM PIEZOELECTRIC EXCITOR FOR DROP GENERATION WITH SPHERICAL AND CYLINDRICAL FLUID CHAMBERS

**Roger G. Markham, Webster, and Doyle P. Skinner, Jr., Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 4, 1979, Ser. No. 45,044**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—75** **20 Claims**



1. Fluid drop generating apparatus comprising
a body including a fluid chamber, inlet means for coupling the chamber to a pressurized source of fluid and at least one nozzle means coupled to the chamber for emitting a continuous stream of fluid from which drops are formed and
piezoelectric film excitation means located within the chamber for stimulating pressure variations in a fluid within the chamber due to dimensional changes in the excitation means wherein
said chamber is substantially a cone formed as a conical section of a sphere with the nozzle means adjacent the apex of the cone and the excitation means located in close proximity to a rigid wall forming the base of said cone and opposite the apex.

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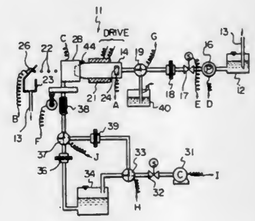
**4,296,418**

## INK JET PRINTING APPARATUS WITH REVERSE SOLVENT FLUSHING MEANS

**Hiroshi Yamazaki, and Takuro Isayama, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed May 23, 1980, Ser. No. 158,335**
**Claims priority, application Japan, May 26, 1979, 54-64603**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—75** **6 Claims**



1. An ink jet printing apparatus including nozzle means for ejecting a jet of ink and ink supply means for supplying ink to the nozzle means, characterized by comprising:
sensor means for sensing an ink clog in the nozzle means;
cap means for covering the nozzle means;

solvent supply means for supplying solvent to the cap means; and

control means for moving the cap means into covering engagement with the nozzle means and controlling the solvent supply means to supply solvent to the cap means in response to the sensor means sensing the ink clog.

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**4,296,419**

## MEMBER FOR RECORDING INFORMATION

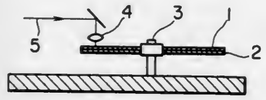
**Motoyasu Terao, Tokyo; Kazuo Shigematsu, Kawasaki; Masahiro Ojima, Kokubonji, and Seiji Yonezawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 17, 1979, Ser. No. 76,424**

**Claims priority, application Japan, Sep. 19, 1978, 53-127535[U]**

**Int. Cl.³ G01D** *15/34*

**U.S. Cl. 346—135.1** **20 Claims**




1. A member for recording information by forming apertures or recesses in a thin film owing to heat generated by projecting a recording beam onto the thin film, comprising a thin film on a substrate, wherein said thin film comprises an antimony-bismuth alloy having an antimony content lying within a range of from 1% to 15% inclusive in terms of percentage of an average number of atoms in a thickness direction of said thin film, whereby deterioration of the recording characteristic of the thin film with aging of the member is suppressed.

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**4,296,420**

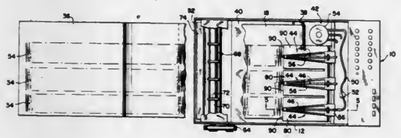
## CHART RECORDER HAVING PRESSURIZED INK SUPPLY AND Z FOLD PAPER FEED AND IMPROVED CHART RECORDING METHOD

**Thomas F. Dambach, Glendale, and James R. Ricketts, Milwaukee, both of Wis., assignors to Marquette Electronics, Inc., Milwaukee, Wis.**

**Filed Nov. 8, 1976, Ser. No. 740,003**

**Int. Cl.³ G01D** *15/16, 15/34*

**U.S. Cl. 346—140 R** **17 Claims**



1. A chart recorder for providing a graphic recording on a Z-folded recording medium strip having a path of movement through the recorder from a supply stack to a discharge, said recorder comprising:

a frame;

a writing platen mounted on said frame along the path of movement of the strip and presenting a flat, hard surface over which said strip passes;

a pressurized ink supply system having at least one pen positioned above said platen and having a tip urged into contact with said strip as it passes over said platen;

drive means positioned downstream of said writing platen for engaging the strip to draw it off the supply stack and over the writing platen; and

pressure means mounted on said frame, said pressure means including a flat pressure plate positioned over the surface of said platen and lying generally parallel thereto, said plate being positioned adjacent said pen tip immediately upstream thereof for pressing the strip flat onto the platen under said pressure plate and pen tip and for generating tension in the strip when it is moved by the drive means which further causes the strip to lie flat across the platen.

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**4,296,421**

## INK JET RECORDING DEVICE USING THERMAL PROPULSION AND MECHANICAL PRESSURE CHANGES

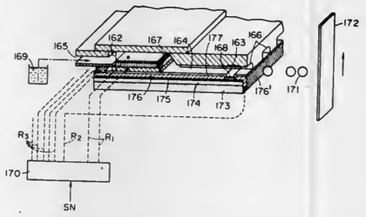
**Toshitami Hara, Tokyo; Yashushi Sato, Kawasaki; Yasushi Takatori, Machida, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 24, 1979, Ser. No. 87,801**

**Claims priority, application Japan, Oct. 26, 1978, 53-131860; Oct. 26, 1978, 53-131861; Oct. 30, 1978, 53-133376; Nov. 14, 1978, 53-140111; Nov. 14, 1978, 53-139978; Nov. 14, 1978, 53-139979; Dec. 4, 1978, 53-150377; Dec. 15, 1978, 53-156102; Dec. 20, 1978, 53-157148; Dec. 27, 1978, 53-165883**

**Int. Cl.³ G01D** *15/18*

**U.S. Cl. 346—140 R** **23 Claims**




1. A device for recording comprising ejecting a liquid recording medium by heat energy which comprises a recording head composed of

a discharging orifice for ejecting the liquid recording medium in a form of droplets,

an inlet for introducing the liquid recording medium,

a liquid chamber for holding the liquid recording medium, and

a heating element for applying heat energy to the liquid recording medium in the liquid chamber, and

a means for generating a mechanical pressure change in the liquid recording medium flowing into the liquid chamber, a means for synchronizing the application of heat energy to the liquid recording medium with the generation of the mechanical pressure change, and

a means for applying voltage pulse to control heating by the heating element, the distance between the surface of the heating element and the liquid recording medium being not more than 100 microns.

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**4,296,422**

## IMAGE RECORDING MATERIAL AND IMAGE RECORDING METHOD USING THE SAME

**Kazuhiro Kawaziri; Masato Fujiwara; Isamu Hatanaka; Masatoshi Tabei; Akio Higashi, and Mitsuharu Nirasawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jan. 24, 1979, Ser. No. 6,022**

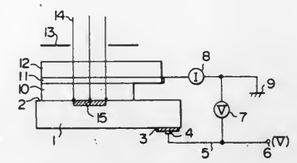
**Claims priority, application Japan, Feb. 8, 1978, 53-13300**

**Int. Cl.³ G01D** *15/14;* **G03G** *15/00*

**U.S. Cl. 346—160** **13 Claims**

7. A method of recording an image on an image recording member comprising (a) a recording medium including a support base, at least one surface of which is electrically conductive and a recording layer provided on the electrically conductive surface of said support base containing an oxidizable or reducible compound, and (b) a photoconductor disposed in contact with a surface of said recording layer of said recording medium, said photoconductor having a specific resistance of not more than $10^9$ Ωcm, where the boundary between the photoconductor and the recording layer is electrically rectifying, said method comprising the steps of






applying a reverse bias voltage across the said boundary and imagewise exposing the photoconductor while said bias voltage is being applied to the boundary.

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**4,296,423**

## DEVICE FOR ADJUSTING IMAGE DENSITY IN COMPOSITE INFORMATION RECORDING APPARATUS

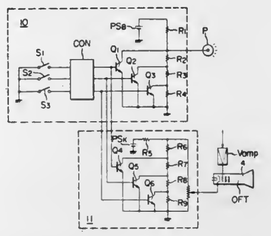
**Hiroya Nakamura, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 14, 1979, Ser. No. 66,423**

**Claims priority, application Japan, Aug. 18, 1978, 53-100017**

**Int. Cl.³ G01D** *15/40;* **G03G** *15/00, 15/00*

**U.S. Cl. 346—160** **2 Claims**




1. In a composite information recording apparatus including a photoconductive medium on which an electrostatic latent image is formable in accordance with a copying and/or a recording operation, a developing device having a developing electrode for developing the latent image on the photoconductive medium, means for supplying a bias voltage applied between the developing electrode and the photoconductive medium, and a signal reproducing device for use in the recording operation; an image density adjusting device, comprising:

switch means operable for selectively adjusting the bias voltage applied to the developing electrode in accordance with the density of an original to be copied;

means supplying a variable voltage to said signal reproducing device; and

further means operable by said switch means for controlling said variable voltage supply means to apply a variable voltage to said signal reproducing device in correspondence with the selectively adjusted bias voltage applied to the developing electrode, whereby image density of the recording operation is controlled in accordance with image density control of the copying operation.

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**4,296,424**

## COMPOUND SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR-CONVERTED CONDUCTIVE REGION

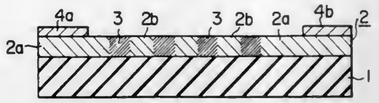
**Ichiro Shibasaki; Kaoru Ohmura, and Takeo Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 22, 1979, Ser. No. 22,916**

**Claims priority, application Japan, Mar. 27, 1978, 53-34062; Mar. 27, 1978, 53-34063; Aug. 9, 1978, 53-96114**

**Int. Cl.³ H01L** *27/24, 45/00, 23/48*

**U.S. Cl. 357—1** **20 Claims**




1. A compound semiconductor device comprising a functional portion of a compound semiconductor mainly comprising a group III-V compound semiconductor and an electrode portion connected to said semiconductor functional portion, wherein said electrode portion comprises a region of the compound semiconductor in which the material of said compound semiconductor is changed in the solid phase state to cause a change in its energy band structure and is thereby converted to a conductor in ohmic contact with the contiguous portion of the compound semiconductor.

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**4,296,425**

## LUMINESCENT DIODE HAVING MULTIPLE HETERO JUNCTIONS

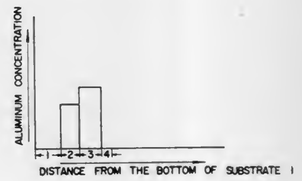
**Jun-ichi Nishizawa, Sendai, Japan, assignor to Handotai Kenkyu Shinkokai, Sendai, Japan**

**Continuation of Ser. No. 867,158, Jan. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 761,468, Jan. 21, 1977, abandoned, which is a continuation of Ser. No. 543,617, Jan. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 314,393, Dec. 12, 1972, abandoned. This application Sep. 18, 1979, Ser. No. 76,675**

**Claims priority, application Japan, Dec. 14, 1971, 46-100623**

**Int. Cl.³ H01L** *33/00, 29/203, 29/205*

**U.S. Cl. 357—17** **14 Claims**




2. A luminescent diode comprising:

A p+ type substrate;

at least one unit consisting of a p-type layer of a certain band gap and an n-type layer of a band gap wider than said certain band gap and epitaxially grown on said p-type layer to form a heterojunction at the interface between said p-type layer and said n-type layer, said unit being disposed in such a way that said p-type layer is located closer to said substrate than is said n-type layer, the and gap of said p-type layer increasing monotonically with distance from said substrate;

said substrate being capable of absorbing light entering there into from said p-type layer; and

a low resistivity contact disposed on an outermost surface of

said unit opposite to said substrate, said contact having an area contacting said outermost surface smaller than the area of said outermost surface for allowing a light output to be taken at said outermost surface.

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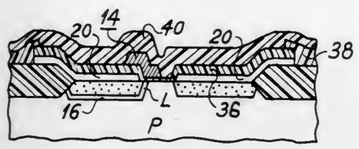
**4,296,426**

## PROCESS FOR PRODUCING AN MOS-TRANSISTOR AND A TRANSISTOR PRODUCED BY THIS PROCESS

**Jean Gilles, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Feb. 13, 1979, Ser. No. 11,923**
**Claims priority, application France, Feb. 17, 1978, 78 04528**
**Int. Cl.³ H01L *29/78***
**U.S. Cl. 357—23** **13 Claims**




1. A method for making an insulated gate field effect transistor of the type having a source region with a source contact electrode of polycrystalline silicon, a drain region with a drain contact electrode of polycrystalline silicon, and a channel region between the source and drain regions with an insulated control gate above the channel region, the method comprising the steps of:

providing a semiconductor substrate;

forming source and drain contact electrodes of polycrystalline silicon on the upper surface of the semiconductor substrate, each of said electrodes being doped with an impurity of a first type of conductivity and wherein at least one of the source and drain electrodes contains an impurity of the opposite type of conductivity to said first type and has a rate of diffusion greater than the rate of diffusion of the impurity of the first type of conductivity; and

heating the substrate so as to simultaneously form a source region and a drain region in the semiconductor substrate by diffusion of the impurity of the first type of conductivity from the electrodes into the substrate so as to produce a laterally diffused part of the channel adjacent to the source or drain region, said step of heating being effected at a predetermined temperature during a predetermined time to control the length of the laterally diffused part of the channel.

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**4,296,427**

## REVERSE CONDUCTING AMPLIFIED GATE THYRISTOR WITH PLATE-LIKE SEPARATOR SECTION

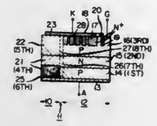
**Minami Takeuchi, Tokyo, and Minoru Kuriki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan**

**Continuation of Ser. No. 802,070, May 31, 1977, abandoned. This application Aug. 28, 1979, Ser. No. 70,655**
**Claims priority, application Japan, May 31, 1976, 51/63242**
**Int. Cl.³ H01L *29/747***
**U.S. Cl. 357—39** **1 Claim**

1. A reverse conducting thyristor comprising a thyristor section, diode section and a semiconductor separator section interposed between the thyristor and diode sections so as to prevent electrical interference between the thyristor and diode sections, said three sections being integrally formed into a cylindrical body,

said thyristor section including a first region of a first conductivity type formed on a first electrode; a second region of a second conductivity type formed on the first region, a third region of the first conductivity type formed on the third region, a cathode electrode a part of which is formed on the main emitter region, an auxiliary emitter region formed in the third region, an auxiliary gate electrode formed partly on the third region and partly on the auxiliary emitter region, and a main gate electrode formed on that surface portion of the third region which is adjacent to that lateral surface of the auxiliary emitter region which does not face the main emitter region;

said diode section including a fourth region of the second conductivity formed on the first electrode, a fifth region of the first conductivity type formed on the fourth region, and a part of said cathode electrode formed on the fifth region;



said semiconductor separator section including a sixth region of the first conductivity type formed on the first electrode, a seventh region of the second conductivity type formed on the sixth region, and an eighth region of the first conductivity type formed on the seventh region, said sixth, seventh and eighth regions being integrally formed into a flat plate;

said cathode electrode having a first portion disposed on a first part of said main emitter region and having a radius smaller than that of said first part of said main emitter region and a second portion disposed on said fifth region and on a remaining second part of said main emitter region and having a radius larger than that of said remaining second part of said main emitter region;

said auxiliary gate electrode surrounding the outer periphery of said first portion of said cathode electrode.

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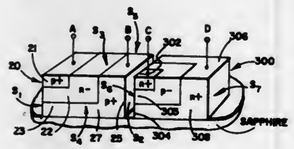
**4,296,428**

## MERGED FIELD EFFECT TRANSISTOR CIRCUIT AND FABRICATION PROCESS

**Tegzi P. Haraszti, Garden Grove, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jun. 28, 1979, Ser. No. 52,881**
**Int. Cl.³ H01L *27/02***
**U.S. Cl. 357—41** **48 Claims**




1. A semiconductor device comprising:

a first body of semiconductor material having first and second spaced apart surfaces, including a first surface zone of a first conductivity type and a first dopant concentration adjacent said first surface, a second surface zone of a second conductivity type and a second dopant concentration different from said first concentration adjacent said first surface and said first surface zone, and a third surface zone of said first conductivity type and said first dopant concentration adjacent said first surface and said second surface zone, said third surface zone being spaced apart from said first surface zone such that said second surface zone lies between said first and said third surface zones; said first and said second surface zones forming respectively first and second active regions of a first transistor device, and said second surface zone forming a control region of said first transistor device; a fourth surface zone of said first conductivity type and said first dopant concentration formed in said first body, said fourth surface zone being disposed adjacent said second surface, and directly connected with said third surface zone through a semiconductor body portion of said first body;

means for applying an electrical potential to said first and said third surface zones; and

control means disposed adjacent said second surface zone for controlling the flow of current through said second surface zone.



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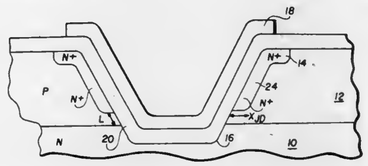
**4,296,429**

## VMOS TRANSISTOR AND METHOD OF FABRICATION

**James E. Schroeder, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Division of Ser. No. 932,232, Aug. 9, 1978. This application Nov. 26, 1979, Ser. No. 97,457**
**Int. Cl.³ H01L *29/06***
**U.S. Cl. 357—55** **8 Claims**




1. In a vertical insulated gate field effect transistor having a first layer of a first conductivity type, a second layer of a second conductivity type on said first layer, a horizontal surface region in said seconod layer of said first conductivity type, a groove extending from said horizontal surface region through said second layer and into said first layer, a layer of insulation in said groove and a gate material in said groove and on said layer of insulation, the portion of said second region adjacent said gate material being a vertical channel between said first layer and said horizontal surface region, the improvement comprising a vertical surface region in the lateral surface of said second layer adjacent said gate, contiguous to said horizontal surface region and terminating vertically within said second layer, said vertical channel being between the end of said vertical surface region and said first layer.

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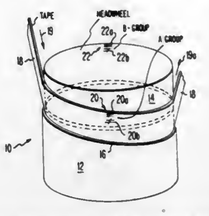
**4,296,430**

## MAGNETIC RECORDING WITH REDUCED CROSS-TALK AND INTERCHANNEL TIME DISPLACEMENT

**Henry R. Warren, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Oct. 12, 1979, Ser. No. 84,395**
**Int. Cl.³ H04N *5/78***
**U.S. Cl. 358—8** **4 Claims**

1. A magnetic head device for recording on magnetic tape, said device comprising a rotating drum, two pairs of magnetic heads, each pair comprising a wide width head for recording high frequency information and a narrow width head for recording low frequency information, each of said pairs having a gap between the heads comprising the pair, the order of the high and low frequency heads within one of said pairs being reversed with respect to the order of the high and low frequency heads of the remaining pair, said pairs being mounted on said drum to provide that the recording tracks laid down on




the tape by the low frequency heads have a guardband therebetween of the sum of the amounts by which the narrow heads differ in widths from the wide heads of the same pair respectively.

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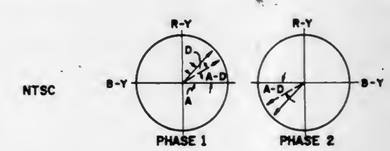
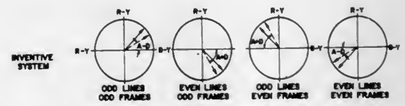
**4,296,431**

## HIGH-RESOLUTION TELEVISION SYSTEM

**Kenneth F. Holland, Canyon Country, Calif., assignor to Ygnacio Inc., Santa Barbara and Compact Video Systems Inc., Burbank, both of, Calif.**

**Filed Apr. 11, 1980, Ser. No. 139,475**
**Int. Cl.³ H04N *9/38***
**U.S. Cl. 358—12** **17 Claims**




1. A method for conveying color information in a television system, comprising the steps of:

(a) producing first and second color signals together containing said color information;

(b) using each of said color signals to separately modulate a carrier signal;

(c) reversing the phase of said carrier signal modulated by said first color signal at a first rate;

(d) reversing the phase of said carrier signal modulated by said second color signal at a second rate different from said first rate;

(e) combining said modulated carrier signals into a single modulated color subcarrier;

(f) transmitting said color subcarrier;

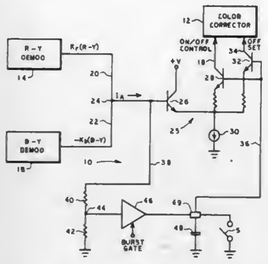
(g) demodulating said subcarrier upon receipt to obtain said first and second color signals.

**4,296,432**

## DYNAMIC ENABLING NETWORK FOR A COLOR CORRECTION CIRCUIT

**Christopher M. Engel, Arlington Heights, and Gopal K. Srivastava, Buffalo Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.**

**Filed Jul. 28, 1980, Ser. No. 172,903**
**Int. Cl.³ H04N 9/535**
**U.S. Cl. 358—28** **12 Claims**




1. In a television receiver which provides color-difference signals having A.C. components superimposed on a D.C. bias level, and in which a color correction circuit automatically operates on the color-difference signals to adjust their effective phase toward a fleshtone axis, a dynamic enabling and disabling network for the color correction circuit, comprising:

means for combining selected color-difference signals to generate a first control signal having a D.C. level corresponding to the D.C. bias level of the color-difference signals and having an A.C. component whose magnitude is near a maximum when the color-difference signals are representative of fleshtone hues;

means responsive to said selected color-difference signals for generating a second D.C. control signal whose amplitude is a function of the D.C. bias level of the selected color-difference signals;

a comparator receiving the first and second control signals for generating an enable output signal when the difference in amplitude between the first and second control signals is indicative of color-difference signals having a phase within a preselected range of fleshtone hues, and for generating a disable output signal when no such difference in amplitude exists; and

means for coupling the output signals of the comparator to the color correction circuit.

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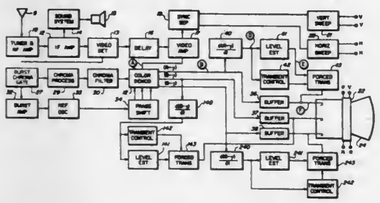
**4,296,433**

## COLOR TELEVISION RECEIVING SYSTEM WITH FORCED CHROMA TRANSIENTS

**Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation of America, Franklin Park, Ill.**

**Filed May 19, 1980, Ser. No. 151,360**
**Int. Cl.³ H04N 9/535**
**U.S. Cl. 358—37** **9 Claims**



1. In a television receiver including processing circuits producing signals for application to a picture tube, a system for improving transient response, including in combination:

sensing means coupled with the processing circuits of the television receiver for sensing changes in the level of a signal and providing an output indicative thereof;

second means coupled with the output of said sensing means for producing an output signal when a predetermined output signal level is obtained from said sensing means; and

control circuit means coupled with said sensing means and said second means for forcing the signal level applied to the picture tube to a predetermined signal level proprotional to the output of said sensing means irrespective of the level of the signal applied to the picture tube by the processing circuits.

2. The combination according to claim 1 wherein the television receiver is a color television receiver, the processing circuits produce demodulated color signals for application to a color picture tube, and said system is for improving color transient response; and wherein said control circuit means forces said predetermined signal level for a predetermined period of time.

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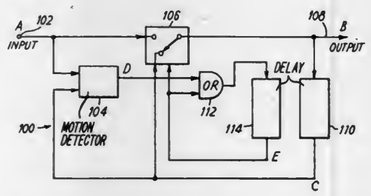
**4,296,434**

## METHOD OF AND APPARATUS FOR MOVEMENT PORTRAYAL WITH A RASTER E.G. TELEVISION, DISPLAY

**John O. Drewery, Coulsdon, and Richard Storey, Sutton, both of England, assignors to British Broadcasting Corporation, London, England**

**Filed May 29, 1979, Ser. No. 43,608**
**Claims priority, application United Kingdom, May 30, 1978, 23924/78**
**Int. Cl.³ H04M 5/30**
**U.S. Cl. 358—105** **22 Claims**




1. A method of portraying movement with a raster display, comprising the steps of:

storing a scan of the display;

comparing a subsequent input scan with the stored scan to detect differences therebetween which may represent motion of a displayed object;

retaining a continuing indication of the positions on the display of the differences thus detected;

retaining the portions of the input scan at positions for which a new difference is detected, and no difference has been detected previously; and

including in the output display the thus-retained portions.

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**4,296,435**

## LUMINANCE SIGNAL PROCESSING CIRCUIT

**Alain H. d'Hautecourt, Prospect Heights; Wayne E. Bretl, Schaumburg, and Ronald B. Lee, Skokie, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.**

**Filed Aug. 18, 1980, Ser. No. 179,142**
**Int. Cl.³ H04N 5/14**
**U.S. Cl. 358—166** **15 Claims**

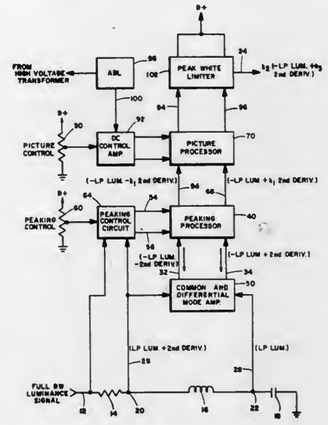
1. In a television receiver of the type having means developing a full bandwidth luminance signal including a low pass component and first and second derivative components of said low pass component, an improved luminance signal processing circuit comprising:

means responsive to said luminance signal for developing a first control voltage representing said low pass component and a second control voltage representing the combination of said low pass and second derivative components;

amplifier means responsive to said first and second control voltages for developing first and second current mode signals representing, respectively, in phase and 180° out of phase combinations of said low pass and second derivative components;

peaking signal processor means selectively operable for






controlling the levels of only the second derivative components of said first and second current mode signals for developing corresponding third and fourth current mode signals respectively;

picture processor means selectively operable for simultaneously controlling the levels of both the second derivative and low pass components of at least one of said third and fourth current mode signals for developing a corresponding output luminance voltage signal; and

a single source of DC potential coupled only to said picture processor means for supplying the bias energy from which said first, second, third and fourth current mode signals are derived.

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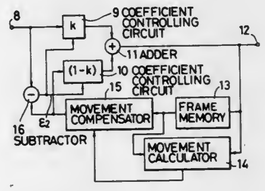
**4,296,436**

## NOISE REDUCING SYSTEM

**Masahiko Achiha, Iruma, Japan, assignor to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Aug. 21, 1979, Ser. No. 68,527**
**Claims priority, application Japan, Aug. 21, 1978, 53-100951**
**Int. Cl.³ H04N 5/21**
**U.S. Cl. 358—167** **5 Claims**




1. A noise reducing system comprising first circuit means for detecting a variation of a picture from an input picture signal and a past picture signal by mixing said signals with a selectively variable ratio; second circuit means for controlling the mixing ratio between the input picture signal and the past picture signal in response to an output signal of said first circuit means; and memory circuit means for delaying the output of said second circuit means a fixed time period to provide said past picture signal; said second means comprising movement detector circuit means for detecting displacement of the variation of the picture per frame from the output of said memory circuit means and the output of said first circuit means, and movement compensator circuit means coupled between said memory circuit means and said first circuit means and controlled by an output of said movement detector circuit means for generating and providing to the first circuit means a past picture signal which corresponds to the same area as the input picture signal.

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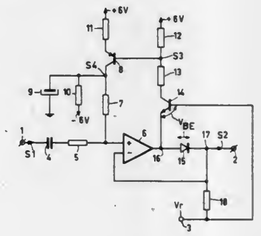
**4,296,437**

## CLAMPING CIRCUIT FOR A VIDEO SIGNAL

**Martinus F. A. M. Geurts, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 21, 1980, Ser. No. 113,885**
**Claims priority, application Netherlands, Mar. 5, 1979, 7901722**
**Int. Cl.³ H04N 5/16**
**U.S. Cl. 358—173** **5 Claims**




1. A clamping circuit for a video signal comprising an input and an output, a differential amplifier having a first and a second input and an output, a capacitor connected between said clamping circuit input and said differential amplifier first input, a capacitor charging and discharging circuit connected to said capacitor at said differential amplifier first input and to said differential amplifier output, a diode coupled between said differential amplifier output and said output of said clamping circuit, means for coupling said clamping circuit output to said differential amplifier second input, means for supplying a reference voltage, and a resistor for coupling said reference voltage to said differential amplifier second input.

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**4,296,438**

## PROJECTION AND SCANNING SYSTEM FOR PRODUCING VIDEO SIGNALS FROM MOTION PICTURE FILM AND CONTROL SYSTEM USED THEREIN

**Otto Stemme; Wolfgang Ruf, both of Munich, and Eduard Wagensonner, Aschheim, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Mar. 31, 1980, Ser. No. 136,114**
**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912667**
**Int. Cl.³ H04N 3/36**
**U.S. Cl. 358—214** **15 Claims**

1. A projection and scanning system designed to repeatedly project images from a motion picture film or from a still picture film onto a fixed horizontal line along which a charge-cou-

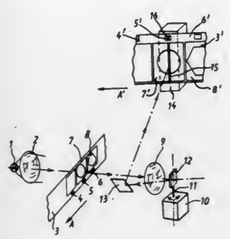
pled image sensor may be placed, in order to produce a flickerless video signal from a motion or still picture, comprising:

a projector which can be loaded with a motion or still picture film and which operates in a manner that images on the film are projected from the projector;

a movable mirror upon which images projected from the projector are directed;

a scanner connected to the mirror and cooperating with the projector in a manner that the mirror is moved to reflect successive horizontal lines of images projected by the projector onto a fixed horizontal line in sequence;

a synchronizer synchronizing operation of the scanner or the mirror movement with the movement of the motion picture film or with the position of each image of the motion



or still picture film being projected in still projection, so that the sequence runs in synchronism from a top horizontal line of each image being moved or unmoved during projection by the projector to a bottom horizontal line of each image projected by the projector;

a phase detecting element located in the plane of the charge-coupled image sensor in a fixed relationship which operates in a manner that the projector projects a phase signal from a phase mark of each image onto the phase detecting element; and

a phase detecting circuit being connected with said phase detecting element in which a phase error signal is produced when the phase of the vertical sync pulses of the video picture differs from the phase of the scanned moved or unmoved picture of the motion or still picture film.

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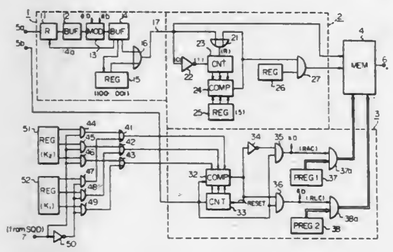
**4,296,439**

## DIGITAL SIGNAL CONTROL SYSTEM IN A FACSIMILE COMMUNICATION

**Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka; Yasushi Wakahara, Tokyo; Naohiko Hattori, Tokyo; Selichi Yamamoto, Tokyo, and Kouzo Nakao, Hoya, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 917,163, Jun. 20, 1978, abandoned. This application May 15, 1980, Ser. No. 150,100**
**Claims priority, application Japan, Jun. 20, 1977, 52-71995**
**Int. Cl.³ H04N** *7/12*
**U.S. Cl. 358—257** **5 Claims**



1. A method for controlling a facsimile system characterized in that the scanning lines of a picture signal are encoded so that (k) number of continuous scanning lines are encoded by a relative address encoding system and the next one scanning line is encoded by run length encoding system and that sequence is repeated, a pair of synchronization codes are defined for each encoding system, and each synchronization code is positioned at the head of each scanning line of a picture signal, each of the synchronization codes have $m_1$ and $m_2$ number of continuous 0's inserted between a pair of 1's, a facsimile transmission station interpolates "1" for each series of (MIN($m_i$)−1) number of continuous 0's of the picture signal in order to distinguish the picture signal from synchronization codes where MIN($m_i$) is the minimum value among $m_i$ and i is 1 or 2, and a receiving station eliminates the interpolated "1" to provide a clean output, wherein the value of (k) is switched according to the instantaneous quality of a communication line so that the value (k) when said quality is good is larger than that when said quality is bad.

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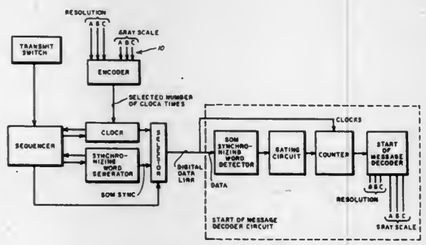
**4,296,440**

## START OF MESSAGE GENERATOR FOR A FACSIMILE SYSTEM

**Bernard Rosenheck, Dix Hills, N.Y., assignor to Litton Systems, Inc., Melville, N.Y.**

**Filed Dec. 20, 1976, Ser. No. 752,757**
**Int. Cl.³ H04M** *1/36*
**U.S. Cl. 358—257** **2 Claims**



1. A start of message generator including means for providing a substantial immunity to transmission line noise for a facsimile system comprising

means for selecting a specific mode of operation from any of a plurality of available modes, each of said modes having a discrete code,

means for encoding the selected mode with its respective code,

synchronizing word generator means for generating a start of message synchronizing word,

clock generator means for generating a selected number of clocks corresponding to the encoded selected mode,

sequencer means including

means for enabling said synchronizing word generator means for generating the start of message synchronizing word,

means for enabling said clock generator means immediately after said start of message synchronizing word has been generated for generating the selected number of clocks corresponding to the encoded selected mode,

means for enabling said synchronizing word generator means immediately after said selected number of clocks has been generated by said clock generator means for generating a second start of message synchronizing word, and

start of message decoder means including

start of message synchronizing word detector means for detecting the first and second start of message synchronizing words,

means for counting clocks,



means for enabling said counting means during the interval between the first and second start of message synchronizing words, and

means for decoding said number of counted clocks into one of said available modes.

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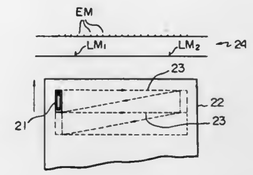
**4,296,441**

## PHOTOELECTRIC SCANNING APPARATUS

**Fumihiro Ogasawara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Dec. 3, 1979, Ser. No. 99,787**
**Claims priority, application Japan, Dec. 14, 1978, 53-153753**
**Int. Cl.³ H04N** *1/10*
**U.S. Cl. 358—293** **4 Claims**



1. A photoelectric scanning apparatus including a charge accumulation type photosensor array having a plurality of photosensor elements arranged in a row, the array being reciprocated for scanning perpendicular to the row, characterized by comprising:

pulse generator means for producing timing pulses in response to incremental movements of the array, the array producing data signals from outputs of all of the elements in response to each timing pulse;

sensor means for producing an enable signal when the array is within an effective scan area in which periods of timing pulses are constant; and

gate means for enabling transmission of the data signals only in response to the enable signal.

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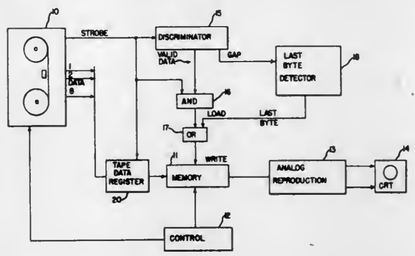
**4,296,442**

## ON-BOARD ANALOG REPRODUCER UNIT FOR OCEAN-BOTTOM SEISMOMETER

**Edgar A. Bowden, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 140,354**
**Int. Cl.³ G11B** *5/00*
**U.S. Cl. 360—6** **8 Claims**



1. In a marine exploration seismic exploration system wherein an ocean bottom seismometer unit deployed on the ocean bottom records digitized seismograms on a magnetic medium which is retrieved so that the recorded seismograms can be analyzed, an analog reproducer unit for installation on the exploration vessel which retrieves said magnetic medium comprising:

a magnetic reproducer unit for reproducing said digitized seismograms recorded on said magnetic medium;

a digital memory for storing digital samples reproduced from said medium;

digital to analog converter means for converting said digital samples into an analog signal;

an analog reproduction device for displaying said analog signal so that an operator can monitor said seismograms;

means for producing strobe pulses indicating the time of occurrence of the recording of a digital sample on said medium;

a discriminator for checking the repetition rate of said strobe pulses to discriminate valid strobe pulses from noise; and

gating means responsive to said discriminator and to said strobe pulses for storing said digital samples in said memory only when a valid detection of strobe pulses is obtained.

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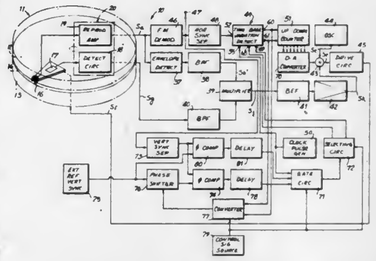
**4,296,443**

## MAGNETIC HEAD TRACKING CONTROL SYSTEM

**Hitoshi Sakamoto, Zama, and Yoshiaki Wakisaka, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Feb. 23, 1979, Ser. No. 14,764**
**Claims priority, application Japan, Feb. 23, 1978, 53-20332**
**Int. Cl.³ H04N** *5/78*
**U.S. Cl. 360—10** **62 Claims**



1. An apparatus for reproducing information signals recorded in successive parallel tracks on a record medium, with each of said tracks further containing a positional signal at a predetermined position therealong, comprising:

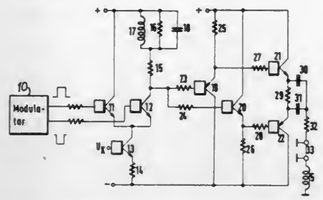
transducer means movable along each said track for reproducing the information and positional signals recorded therein; transducer deflecting means mounting said transducer means and being operative in response to the reception of an electrical drive signal for deflecting said transducer means in a direction which is transverse in respect to the direction along each of said tracks; means separating said positional signals from the signals reproduced by said transducer means; means receiving the separated positional signals for detecting a time base error of said positional signal reproduced from each of said tracks; and control circuit means for providing said electrical drive signal and including means for varying the latter in accordance with the detected time base error so as to control the deflection of said transducer means in said transverse direction at least in accordance with the detected time base error.

**4,296,444**

## INDUCTIVE SIGNAL TRANSDUCER SUPPLY CIRCUIT PARTICULARLY FOR VIDEO RECORDING USE

**Josef Sochor, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 929,938, Aug. 1, 1978, abandoned. This application Feb. 1, 1980, Ser. No. 117,432**
**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735498**
**Int. Cl.³ G11B** *5/45, 5/02*
**U.S. Cl. 360—65** **7 Claims**




1. Inductive signal transducer supply circuit, particularly for video recording use, to supply signals of essentially square wave pulse form to an inductive transducer to effect a recording in essentially square wave form with minimum wave shape degradation, as the frequency of applied pulse signals and hence the wave length thereof varies, said circuit comprising the combination of

a frequency-dependent compensating network (**4**) connected in advance of the inductive transducer (**5**), emphasizing high frequency components of the signal;

a current supply circuit (**11, 12, 13; 41**) supplying current to the compensating network in accordance with the applied signals;

and a current amplifier (**6; 19–29**) connected between the compensation network (**4**) and the inductive transducer (**5**) and supplying energizing current to said transducer; with

a connecting cable (**33**) between the output of the amplifier (**6; 19–29**) and the input to the transducer (**5**), said cable having a length which is substantially less than the minimum wave length of the supply signals being applied to the transducer, and presenting essentially only capacitative impedance;

and wherein the compensating network has a frequency component-output signal transfer characteristic which is the inverse of a series network comprising the amplifier and the connecting cable and the transducer.

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**4,296,445**

## PHASE SENSOR

**Lester F. Schowe, Jr., Morrison, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.**

**Filed Apr. 11, 1980, Ser. No. 139,257**
**Int. Cl.³ G11B** *5/45, 5/09*
**U.S. Cl. 360—65** **8 Claims**

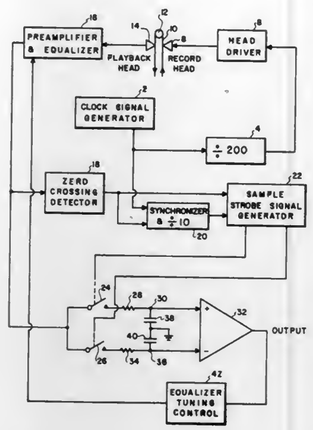
1. In a magnetic recording/playback system, a method of detecting phase shift errors in the playback portion of said system, said method comprising:

recording on a magnetic tape a square wave signal having a frequency of one-third of the bandedge frequency of the system;

playing back the recorded signal through said playback portion to produce a resultant signal having a waveform representing the first and third harmonics of said recorded signal, said waveform having a first and second peak in each positive half cycle;

extracting a time-averaged sample of the amplitude of each of said first and second peaks;

comparing the magnitude of the two time-averaged signals; and




producing a difference signal commensurate with and representative of said phase shift error.

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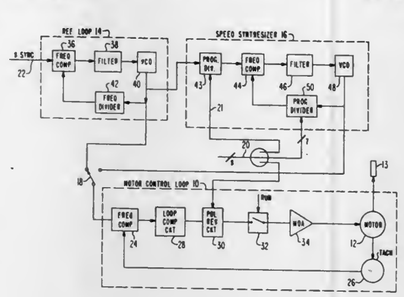
**4,296,446**

## MOTOR SPEED CONTROL CIRCUIT

**George S. Zorbalas, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 15, 1979, Ser. No. 94,690**
**Int. Cl.³ G11B** *15/46*
**U.S. Cl. 360—73** **6 Claims**




1. A circuit for controlling the speed of a motor, said circuit comprising:

a speed synthesizer having first input means for receiving a digital speed command signal, a second input means, and an output means for supplying a variable speed control signal;

a means for supplying a reference signal to said second input means;

a motor drive circuit having an input means for receiving said variable speed control signal and adapted to be coupled to said motor for speed control thereof; and

wherein said speed synthesizer comprises a frequency comparator having a first input coupled to said reference signal means, a second input, and an output;

a filter coupled to said comparator output;

a voltage controlled oscillator having a control input coupled to said filter and an output; and

a programmable divider having an input coupled to said oscillator output, a control input comprising said synthesizer first input means for receiving said digital speed



command signal, and an output coupled to said frequency comparator second input.

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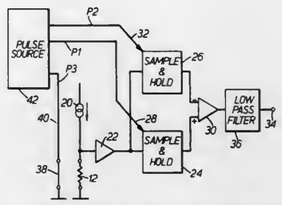
**4,296,447**

## MAGNETIC RECORDING AND REPRODUCTION

**John A. Lewis, Southampton, England, assignor to Racal Recorders, Ltd., Bracknell, England**

**Filed Dec. 11, 1979, Ser. No. 102,540**
**Claims priority, application United Kingdom, Dec. 11, 1978, 47983/78**
**Int. Cl.³ G11B** *5/30*
**U.S. Cl. 360—113** **9 Claims**




1. A system for reproducing signals stored magnetically on a magnetic storage medium, comprising

a magneto-resistive member having a predetermined input-/output characteristic curve relating changes in the magnetic field which is produced upon it by the stored signals, when it is mounted in juxtaposition to the magnetic storage medium, to the corresponding changes in its electrical resistance,

biasing means for alternately producing biasing magnetic fields acting in opposite directions but parallel to the magnetic field produced by the stored signals and thereby alternately biasing the magneto-resistive member to first and second predetermined operating points on its characteristic curve, whereby the magneto-resistive member produces a succession of first outputs which are dependent on the strength of the field produced by the stored signals in relation to the field represented by the first operating point and a succession of second outputs which alternate in time with the first outputs and are dependent on the strength of the field produced by the stored signals in relation to the field represented by the second operating point, and

output means for producing a composite output from the succession of first and second outputs,

the first and second operating points being selected such that the composite output is more linearly related to the strength of the stored signals than are either the first or the second outputs taken alone.

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**4,296,448**

## RECORDING CARTRIDGE HAVING A FLAT SMOOTHING PLANE WITH A RAISED PORTION

**Felix Garcia, Jr., Round Rock; Roger A. Hergert, Georgetown; Don C. Mann, Richardson, and Sheldon H. Brown, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 4, 1979, Ser. No. 45,378**
**Int. Cl.³ G11B** *5/82, 5/016, 17/32*
**U.S. Cl. 360—135** **13 Claims**

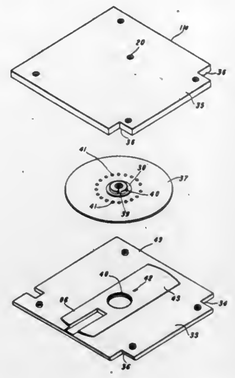
1. A cartridge comprising:

(a) a sheet of flexible information storage media having first and second opposite major surfaces, at least one of said major surfaces for storing information thereon; and

(b) a cartridge housing in the form of a rigid envelope having an internal chamber with first and second surfaces oppositely positioned, at least portions of said first and second surfaces being relatively flat, said media being retained within said chamber, said cartridge housing having:

(i) a first opening extending through a central region of one of said first and second surfaces for providing access to said media to impart rotational motion thereto;

(ii) a second opening extending through said first surface for receiving a magnetic head transducer for respectively reading and/or writing information on said media; and




(iii) said first surface including a raised portion having a curved surface in facing relationship with said media for causing said media to conform to the curvature of said curved surface as it passes over said raised portion, said second opening being substantially contained within said raised portion.

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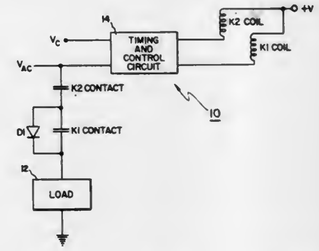
**4,296,449**

## RELAY SWITCHING APPARATUS

**Charles W. Eichelberger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 27, 1979, Ser. No. 69,618**
**Int. Cl.³ H02H** *3/033*
**U.S. Cl. 361—3** **17 Claims**




1. A switching circuit for selectively coupling a load to an A.C. power source, said switching circuit comprising:

(a) a master relay including a master relay contact and a master relay coil;

(b) a pilot relay including a pilot relay and a pilot relay coil, said master and pilot relay contacts being coupled in series with each other and being coupled between said load and said power source to cause said power source to be coupled to said load whenever both said master and pilot relay contacts are closed; and to cause said power source to be completely disconnected from said load whenever at least said pilot relay contact is open; said pilot relay contact being devoid of any additional conductive element thereacross;

(c) a single commutating diode coupled in parallel only with said master relay contact; and

(d) timing and control circuit means for performing a switching operation in which:

(1) said master relay contact is opened during a first half-cycle of the A.C. waveform of said power source during which said single commutating diode is forward-biased;

(2) the state of said pilot relay contact is changed during a second half-cycle of said A.C. waveform, said second half-cycle being that half-cycle of said A.C. waveform immediately following said first half-cycle, and during which said single commutating diode is reverse-biased.

(3) said master relay contact is closed during a third half-cycle of said A.C. waveform, said third half-cycle being that half-cycle of said A.C. waveform immediately following said second half-cycle.

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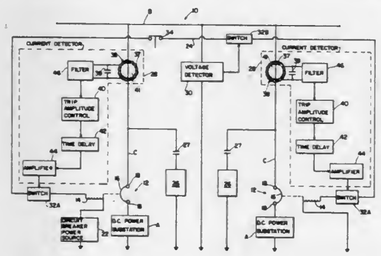
**4,296,450**

## DISCRIMINATING CIRCUIT BREAKER PROTECTION SYSTEM DIRECT CURRENT POWER DISTRIBUTION SYSTEMS

**Derek A. Paice, Murrysville, and Alan B. Shimp, Monroeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.**

**Filed Oct. 5, 1979, Ser. No. 82,383**
**Int. Cl.³ H02H 3/17**
**U.S. Cl. 361—50** **3 Claims**



1. A discriminating circuit breaker system for the protection of an electrically grounded power distribution system having a power supply and a transmission line, said circuit breaker system comprising:

an electrically controlled circuit breaker operable to be closed when energized and to open when de-energized, said breaker being connected between the power supply and the transmission line; and

a control circuit for controlling the operation of the circuit breaker, said control circuit comprising in combination:

means for producing an electric energizing signal for the circuit breaker;

a pilot wire through which said energizing signal must flow to energize the circuit breaker, said wire being mounted adjacent the transmission line;

means for producing and superimposing an alternating current signal on the grounded transmission line at a location adjacent the power supply;

current detecting means for detecting the level of the superimposed signal and producing a control signal when the current level from said alternating current signal exceeds a predetermined maximum level, which level corresponds to the presence of an illegitimate load on the power distribution system;

voltage detector means for detecting the voltage level of the superimposed signal above ground potential and producing a control signal when the voltage level of said alternating current signal in the transmission line falls below a predetermined minimum level, said level corresponding to the presence of an illegitimate load on the power distribution system; and

switch means responsive to the control signals produced by the voltage detecting means and current detecting means, said switch means being connected in series with the pilot wire whereby the circuit breaker may be opened by a control signal from the voltage or the current detecting means or by the cessation of current flow through the pilot wire.

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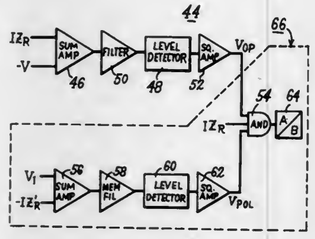
**4,296,451**

## ULTRA HIGH SPEED PROTECTIVE RELAY CIRCUIT

**Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.**

**Filed Dec. 31, 1979, Ser. No. 108,436**
**Claims priority, application United Kingdom, Oct. 11, 1979, 35313/79**
**Int. Cl.³ H02H 3/28**
**U.S. Cl. 361—80** **18 Claims**



1. In a protective relay for one or more transmission lines in a three-phase ac power system, the relay being of a phase comparator type and including phase coincidence detecting means responsive to at least two input signals supplied thereto, one input signal being an operating signal and a second input signal being a polarizing signal, and timer circuit means responsive to an output signal from said phase coincidence detecting means when the phase coincidence of the input signals is of a predetermined duration, an improvement wherein:

a. said operating signal comprises that portion of a first difference signal which exceeds a predetermined threshold value, the first difference signal being related to the difference between (1) the product of a signal proportional to transmission line current and a replica impedance of the transmission line and (2) a signal proportional to transmission line voltage; and

b. said polarizing signal comprises that portion of a second difference signal which exceeds a predetermined threshold value, the second difference signal being related to the difference between (1) a signal proportional to a voltage representative of the transmission line voltage and (2) the product of the signal proportional to transmission line current and the replica impedance of the transmission line multiplied by a predetermined constant.

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**4,296,452**

## MULTIPHASE FAULT PROTECTION CIRCUITRY WITH VARIABLE FUNCTIONAL LEVEL DETECTION

**Leif Eriksson, Sala, Sweden, and Salomon Liberman, Ra'anana, Israel, assignors to Asea Aktiebolag, Vesteras, Sweden**

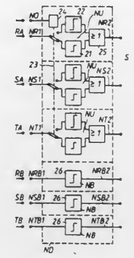
**Continuation-in-part of Ser. No. 964,202, Nov. 28, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,388**
**Claims priority, application Sweden, Nov. 28, 1977, 7713411**
**Int. Cl.³ H02H 7/26, 3/38**
**U.S. Cl. 361—82** **11 Claims**

1. Circuitry for generating tripping and blocking signals for the protection of electrical components in an electrical power supply network as a result of the occurrence of faults therein, comprising:

means for generation of respective tripping signals and blocking signals for each phase of the electrical power supply network in dependence on whether the fault lies ahead or behind the electrical component to be protected, respectively, in response to measurement of the voltage and current associated with transient waves generated by faults in each phase of the electrical power supply network;

detection means having a predetermined operating level, for determining the presence of a first tripping signal resulting





from the occurrence of a single phase fault and the presence of a second tripping signal resulting from the occurrence of a fault in another phase, and means for changing the operating level for detection of said second tripping signal upon detection of the first tripping signal; and

means responsive to said detection means for generating respective tripping and blocking outputs for each phase of said electrical power supply network, whereby double or triple pole tripping is prevented unless the presence of said second tripping signal is detected.

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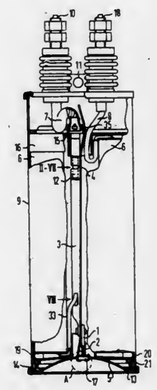
**4,296,453**

## WOUND ELECTRICAL CAPACITOR WITH EXCESSIVE PRESSURE PROTECTIVE DEVICE

**Karl Aigle; Udo Hieber, both of Heidenheim; Wilhelm Huebscher, Heidenfingen; Hans H. Rheindorf, Herbrechtingen, and Rolf Wiedemann, Nattheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed May 17, 1979, Ser. No. 39,877**
**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2825377**
**Int. Cl.³ H01G 1/11**
**U.S. Cl. 361—275** **7 Claims**



1. In a wound electrical capacitor, particularly a power capacitor, which is enclosed in a housing provided with an excess-pressure break-away structure, the combination of a hollow tubular electric conductor means mounted within the housing electrically connected to the capacitor and mechanically connected to the housing for the subjection of tension loads thereon in the presence of excessive pressure in the housing, said electrical conductor means having a localized cross-sectional reduction in material at a predetermined location which constitutes a rated break point, and reinforcing means at the break point to prevent accidental rupture of the break point except by said tension loads.

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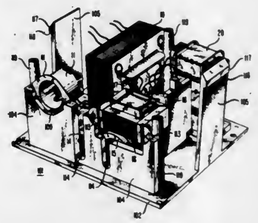
**4,296,454**

## MOLDED CIRCUIT RETAINING ENCLOSURE WITH A RECEPTACLE MEANS FOR SECURING INDIVIDUAL CIRCUIT COMPONENTS

**William H. Wong, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 22, 1979, Ser. No. 86,724**
**Int. Cl.³ H05K 7/12**
**U.S. Cl. 361—380** **4 Claims**



1. An enclosure-type circuit support structure to support electrical components of a circuit including resistive and reactive devices, the circuit support structure comprising:

a base chassis structure and a retaining chassis structure joined together by interlocking apparatus which locks the two chassis structures together in order to secure the electrical components in place, the base chassis structure including a plurality of drop-in receptacles each adapted dimensionally for receiving a specific electrical component of the circuit to be supported including at least a receptacle for a reactive device, the electrical components of the circuit being inserted into the receptacles;

the retaining chassis structure including retaining means for applying a constraining force to the electrical components in order to secure the electrical components into assigned drop-in receptacles; and

the retaining means comprising at least a clamp nodule applying clamping pressure to at least a selected reactive device of said electrical components, the clamp nodule comprising a projecting member set in an aperture in the retaining chassis structure which is aligned with a drop-in receptacle in which the selected electrical component is situated, the projecting member being connected as a cantilever-type beam to a periphery of the aperture and including a protuberance at a free end of the projecting member, the protuberance applying clamping pressure to the selected electrical component to hold it in its drop-in receptacle.

**4,296,455**

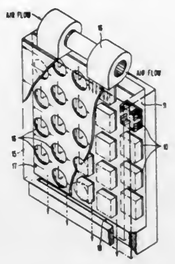
## SLOTTED HEAT SINKS FOR HIGH POWERED AIR COOLED MODULES

**Edgar C. Leaycraft, Woodstock; Sevgin Oktay, Poughkeepsie, and Carl D. Ostergren, Montgomery, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 23, 1979, Ser. No. 96,942**

**Int. Cl.³ H05K** *7/20*

**U.S. Cl. 361—383** **15 Claims**



1. An air cooling system for high density integrated circuit modules comprising:

a module containing integrated circuit chips and having a heat conductive covering surface;

a plurality of hollow heat sinks, each having a top opening at one end and the opposite end attached to said covering surface and each having a side opening therein extending from said covering surface and extending toward said top opening of each said hollow heat sink; and

means for impingement air flow substantially parallel to each said hollow heat sink which causes air flow through said top openings of each of said hollow heat sinks and out of said side opening in each said hollow heat sink as well as between said plurality of heat sinks whereby the heat is removed from said hollow heat sinks.

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**4,296,456**

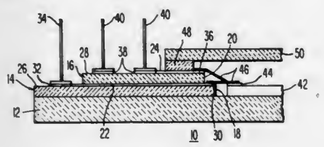
## ELECTRONIC PACKAGE FOR HIGH DENSITY INTEGRATED CIRCUITS

**Gilbert R. Reid, Norristown, Pa., assignor to Burroughs Corporation, Detroit, Mich.**

**Filed Jun. 2, 1980, Ser. No. 155,533**

**Int. Cl.³ H05K** *1/14*

**U.S. Cl. 361—403** **7 Claims**



1. An electronic package for an integrated circuit chip having a plurality of signal pads along its periphery comprising:

a base member and at least a first and a second circuit layer, said first circuit layer being mounted on said base member and said second circuit layer being mounted on said first circuit layer, each of said circuit layers being frame-like and having a central opening, a plurality of electrically conductive chip-connection tabs disposed on a planar surface of each of said circuit layers and situated adjacent the periphery of its central opening, respective pluralities of electrically conductive pin-mounting pads and metallized lines disposed on said planar surface of each of said circuit layers, each of said lines connecting a chip-connection tab to a pin-mounting pad on a common circuit layer;

the dimensions of the central opening of said second circuit layer being greater than those of the central opening of said first circuit layer, and the area of the planar surface of said second circuit layer being less than that of said first circuit layer, whereby the chip-mounting tabs and the pin-mounting pads of said first circuit layer remain uncovered in the presence of the mounted second circuit layer;

a plurality of input/output pins affixed respectively to the plurality of pin-mounting pads on each of said circuit layers;

the central openings of said circuit layers forming a well for receiving said chip, the latter being adapted to be mounted on said base member and to have said signal pads connected respectively to said chip-connection tabs on both said first and second circuit layers.

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**4,296,457**

## APPARATUS FOR ELECTRICALLY CONNECTING A PLURALITY OF CONTACTS

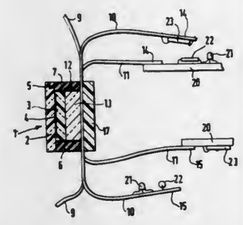
**Günter Hahlganss, Kriftel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Fed. Rep. of Germany**

**Filed Dec. 21, 1979, Ser. No. 106,082**

**Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901416**

**Int. Cl.³ H05K** *01/14*

**U.S. Cl. 361—413** **8 Claims**



1. Apparatus for electrically connecting a plurality of closely positioned contacts of a device, preferably a display device, with a plurality of spaced contacts of an electronic circuit controlling the device, comprising a plurality of flexible printed circuit boards each having a narrow mid-section and two outer end areas each of which is spaced from said mid-section and has a width greater than the width of said mid-section, and a plurality of conductor lines extending from said mid-section for connection with a portion of the closely positioned contacts of the device to said outer areas for connection with a portion of the spaced contacts of the electronic circuit, wherein the device has a width and a central axis passing transversely therethrough, said plurality of circuit boards including a first flexible printed circuit board having a configuration symmetrical about said axis, a second flexible printed circuit board having its mid-section disposed on one side of said axis and its end areas extending from its mid-section toward the opposite side of said axis, and a third flexible printed circuit board having its mid-section disposed on said opposite side of said axis and its end areas extending from its mid-section toward said one side of said axis, said end areas of said first, second and third flexible printed circuit boards each having the same width.



**4,296,458**

## ELECTROLYTE CAPACITORS WITH IMPROVED ANODE-TO-LEAD CONNECTION

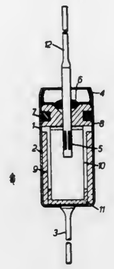
**Leslie Smith, Towcester; William Tew, Stoke Bruene, and Jack Woolley, Haversham, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland**

**Filed Nov. 20, 1978, Ser. No. 961,919**

**Claims priority, application United Kingdom, Nov. 24, 1977, 48885/77**

**Int. Cl.³ H01G** *9/00;* **B01J** *17/00*

**U.S. Cl. 361—433** **11 Claims**



1. A wet electrolyte capacitor comprising:

a can made from non-solderable valve metal,

an annular shaped cathode disposed within said can,

an anode made from non-solderable valve metal mounted substantially concentrically within said annular shaped cathode and separated therefrom by an electrolyte, contained within said can surrounding the cathode, the can being a hollow construction initially open at one end for insertion of the cathode and the anode,

an anode lead, the anode being provided with a recess for reception of said anode lead,

a seal for hermetically sealing the open end of the can, the seal including means for connecting the anode lead through the seal in electrical isolation from the can, and

a further seal within said can comprising a bung which is tightly fitted to surround the anode lead, said further seal being positioned between the anode and said seal and preventing the electrolyte from contacting the seal at least during the sealing operation,

said anode lead comprising a continuous piece of metal extending without jointing from the anode to the outside of the seal.

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**4,296,459**

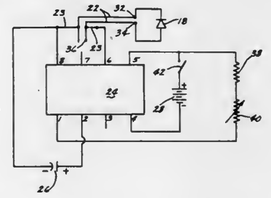
## LIGHT EMITTING ELECTRONIC JEWELRY

**Frederick P. DeLuca, 3520 Jewel Dr., Ames, Iowa 50010**

**Filed Aug. 6, 1979, Ser. No. 64,036**

**Int. Cl.³ F21L** *15/08*

**U.S. Cl. 362—104** **6 Claims**



1. A light emitting electronic earring comprising,

an earring post adapted for securement to a wearer's earlobe,

a light emitting diode operatively supported on said post,

a battery means, and

an electrical circuit,

said light emitting diode and battery means being electrically connected in said circuit such that said light emitting diode is illuminated at times by said battery means,

said electrical circuit comprising a mercury switch electrically connected between said light emitting diode and battery means so as to make and break the electrical connection therebetween in response to movements of the wearer's earlobe,

a casing,

said battery means and mercury switch being supported in said casing,

said electrical circuit including elongated conductor chains electrically connecting said light emitting diode to said mercury switch, said casing being suspended from said post by said conductor chains.

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**4,296,460**

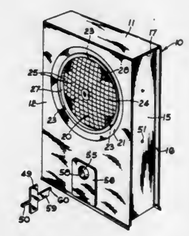
## LAMPS

**William E. Minoprio, Blackburn, and Arthur K. Horsfield, Preston, both of England, assignors to Dorman Smith Traffic Products Limited, Southport, England**

**Division of Ser. No. 833,098, Sep. 14, 1977. This application Dec. 10, 1979, Ser. No. 101,588**

**Int. Cl.³ F21L** *7/00*

**U.S. Cl. 362—200** **8 Claims**



1. A battery-powered lamp comprising a casing in the form of a box-like body part having a top and front and rear and side walls for housing at least one battery, at least the front wall having a depression which provides a generally planar depressed portion in which an opening is disposed; a light source supported in the casing; and a lens through which light from the light source can be transmitted, which lens has a peripheral rim which is a friction fit in said opening and has, on the peripheral rim, a plurality of ratchet-like teeth which are mutually spaced around the periphery of the lens and which make snap fits with and locate behind the material of the front wall bounding the opening to resist removal of the lens from its opening.

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**4,296,461**

## BATTERY PACKAGE WITH DC TO DC CONVERTER

**Henry R. Mallory, Greenwich, Conn., and Steven J. Nichols, North Tarrytown, N.Y., assignors to Duracell International Inc., Bethel, Conn.**

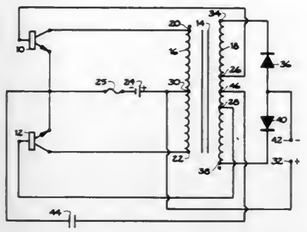
**Filed Jan. 29, 1979, Ser. No. 7,456**

**Int. Cl.³ H02M** *3/335;* **H01M** *2/34*

**U.S. Cl. 363—22** **10 Claims**

1. A battery package comprising a casing having therein one cell of a type which is subject to damage by cell reversal, said cell having an anode comprising lithium, a DC to DC converter circuit electrically connected to said cell, and means for electrically connecting the output of said converter circuit to a load, said converter circuit comprising means to substantially prevent current flow through said converter circuit unless a load is connected to the output of said converter circuit, whereby said cell discharges only when the load is connected

to said converter circuit, said converter circuit being adapted to provide a voltage output substantially in excess of the voltage of the one cell in said package, and said converter circuit including means to electrically prevent recharging of the cell.



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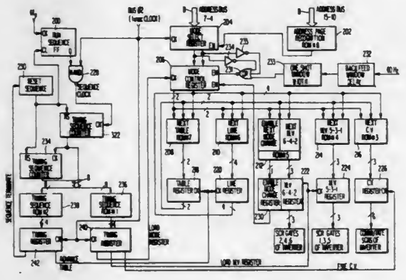
**4,296,462**

## INVERTER CONTROLLER

**George P. Gurr, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Atlanta, Ga.**

**Filed Jul. 2, 1979, Ser. No. 54,024**
**Int. Cl.³ H02M *7/515***
**U.S. Cl. 363—96** **25 Claims**



1. An inverter controller for controlling the firing time and sequence of gated conduction controlled rectifiers in an inverter used for generating a pulse code signal for injection upon electrical transmission lines, which comprises:

an address bus for providing address information;

means responsive to functional commands indicative of the desired mode of operation of said inverter for providing a portion of said address information on said address bus;

first memory means responsive to said address information on said address bus for generating next address information;

first register means for receiving said next address information from said first memory means and for delivering the other portion of said address information to said address bus;

second memory means responsive to said address information on said address bus for generating next gate control signals; and

second register means for receiving said next gate control signals from said second memory means for providing signals for the gate controlled rectifiers of said inverter.

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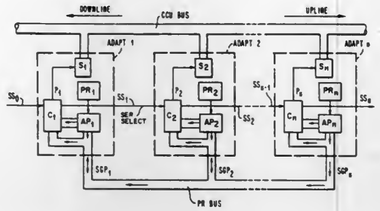
**4,296,463**

## SELECT SYSTEM FOR PRIORITY INTERFACE CIRCUITRY

**Gerard Dalboussiere, La Colle, Loup, France, and Wilburn D. Draper, Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed May 17, 1979, Ser. No. 39,714**
**Claims priority, application France, Jun. 7, 1978, 78 17709**
**Int. Cl.³ G06F *3/04***
**U.S. Cl. 364—200** **5 Claims**



1. A selection system for making the selection amongst interface circuits, each interface circuit interfacing a plurality of units making service requests at different priority levels, and a central unit, said selection being carried out according to said priorities, and said system being characterized in that it includes:

a central unit bus for connecting the interface circuits to the central unit,

a priority bus having an upline and down line extent and carrying priority level information,

a group of n interface circuits connected along said priority bus and each including a preselection means comprising:

a priority request register for registering the highest priority level received from the pending requests of the units connected to the interface circuit,

an adapter priority register connected to said priority request register for receiving the contents of the said priority request register at a predetermined time,

driving means connected to the priority bus for placing on the priority bus the priority level information from the adapter priority register,

receiving means connected to the priority bus and to the driving means and providing on its output the priority level information corresponding to the service requests pending in the interface circuits upline of the said interface circuit,

comparison means receiving on its first inputs the priority registered in the adapter priority register and on its second inputs the priority level provided by said receiving means and providing on its output a logic level "1" when the priority registered in the adapter priority register for that interface has a level higher than or equal to the priority level of the request having the highest priority among the requests pending in said interface circuits upline of the considered interface,

a serial select line interconnecting the n interface circuits of the group through one input connection and one output connection provided at each interface circuit,

means at each said interface circuit for propagating a serial selection informaion through the output connection of the serial select line, said means comprising an OR circuit having two inputs one receiving the logic level of the serial select line at the input connection and the other one receiving the logic level provided at the output of the comparison means and providing on its output the serial selection information to the output connection,

a select latch for enabling connection of said interface circuit to said central unit bus, and

logic means at each of the said interface circuits responsive to the results provided by the comparison means, the condition of the serial select line input and the presence of a select order from the central unit for setting the select latch of only one of the interface circuits and resetting the select latches of the other interface circuits whereby the said one interface circuit which has its select latch set is enabled for communication with the central unit over said central unit bus.

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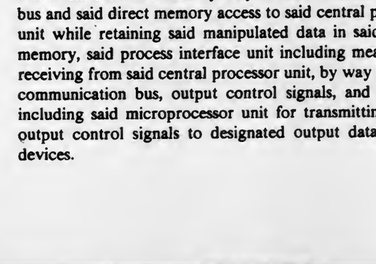
**4,296,464**

## PROCESS CONTROL SYSTEM WITH LOCAL MICROPROCESSOR CONTROL MEANS

**Rodney G. Woods, Glendale; Charles J. Clarke, Jr., and Robert C. Sodergren, both of Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 3, 1977, Ser. No. 773,913**
**Int. Cl.³ G06F *9/22***
**U.S. Cl. 364—200** **18 Claims**



1. A process control computer system comprising:

a central processor unit as a primary controller;

said central processor including a main computer memory and a control unit;

a two conductor communication bus;

an interface control unit including direct memory access with respect to said main computer memory, said interface control unit being interconnected between said central processor unit and said communication bus;

a plurality of process data point devices including input and output devices; and

a process interface unit connected to interface between said process data point devices and said communication bus;

said process interface unit including a microprocessor unit, local memory means operative under the control of said microprocessor unit, means further controlled by said microprocessor unit for continuously gathering data from said input data point devices, means including said microprocessor unit for manipulating said gathered data in accordance with selected instructions, means under the control of said microprocessor unit for storing said manipulated data in said local memory means, said manipulated data being compared within said process interface unit with predetermined criteria stored in said local memory means to detect extra-criteria data, means for storing said extra-criteria data in said local memory means, means including said microprocessor unit for transmitting said stored extra-criteria data by way of said communication bus and said direct memory access to said central process unit while retaining said manipulated data in said local memory, said process interface unit including means for receiving from said central processor unit, by way of said communication bus, output control signals, and means including said microprocessor unit for transmitting said output control signals to designated output data point devices.



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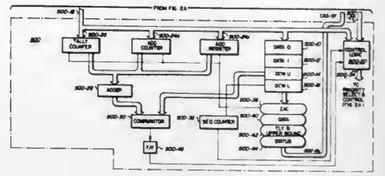
**4,296,465**

## DATA MOVER

**Nicholas S. Lemak, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Nov. 3, 1977, Ser. No. 848,172**
**Int. Cl.³ G06F *1/00***
**U.S. Cl. 364—200** **18 Claims**



1. A data mover comprising:

a data in bus;

a data out bus;

a control bus;

data register means connected to the data in bus for storing at least one data word;

control register means connected to the data in bus for storing at least one control word;

means connected to the data out bus for issuing memory read commands and memory write commands; and

control means connected to the control bus, to the data register means, and to the means for issuing memory commands for causing the means for issuing memory commands to issue a write command after issuing a read command on the data out bus only if a data word is stored in said data register means in response to a previously issued read command and to issue the data words stored in the data register means on the data out bus immediately following the issuing of write command.

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**4,296,466**

## DATA PROCESSING SYSTEM INCLUDING A SEPARATE INPUT/OUTPUT PROCESSOR WITH MICRO-INTERRUPT REQUEST APPARATUS

**James M. Guyer, Marlboro, and Joseph T. West, Boxborough, both of Mass., assignors to Data General Corporation, Westboro, Mass.**

**Filed Jan. 23, 1978, Ser. No. 871,689**
**Int. Cl.³ G06F *13/00, 15/16***
**U.S. Cl. 364—200** **13 Claims**

1. A data processing system comprising a host processor having a microprogram control store, a host processor memory, and a host memory management unit, the contents of which permit the conversion of logical addresses received by said host processor into physical addresses for said host memory, and further comprising

an input/output processor;

input/output bus means for providing communication between said input/output processor and said host processor, said host processor being capable of generating a specified coded signal in response to any interrupt request from said input/output processor;

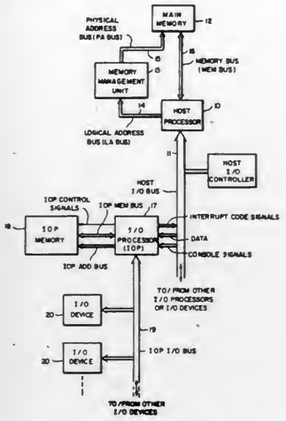
said input/output processor including

means for generating a micro-interrupt request signal for said host processor to request a re-allocation of a selected position of the contents of said memory management unit; and

micro-interrupt indentifying means responsive to said specified coded signal received from said host processor and to said micro-interrupt request signal of said input/output processor for providing a signal to said host processor for identifying said interrupt request as one requiring the re-allocation of said selected portion of the contents of said memory management unit, whereby said host proces-

sor can perform such re-allocation in accordance with a specified program in its micro-program control store;

said input/out processor thereby being capable of accessing said host memory and said memory management unit via said input/output bus means for the direct transfer of




logical addresses to said re-allocated selected portion of said memory management unit and for the direct transfer of data between said input/output processor and said host memory when said selected portion of said memory management unit has been re-allocated.

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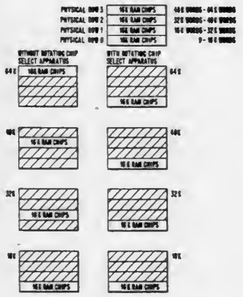
**4,296,467**

## ROTATING CHIP SELECTION TECHNIQUE AND APPARATUS

**Chester M. Nibby, Jr., Peabody, and William Panepinto, Jr., Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Jul. 3, 1978, Ser. No. 921,292**
**Int. Cl.³ G11C *13/00***
**U.S. Cl. 364—200** **33 Claims**




1. At least one memory module board included in a memory subsystem, said board including a control section and a memory section having from one up to a predetermined number of physical row locations of memory chips, each row location of memory chips providing a like increment of addressable memory space, said memory section including:

a number of addressable memory chips for providing a plurality of storage locations corresponding to said increment of memory space, said chips being positioned at a predetermined one of said row locations; and,

said control section including:

register means for receiving a portion of a plurality of address signals for accessing said storage locations within said increment of memory space, predetermined address bits of said portion of said address signals being coded to specify the physical row location of chips to be accessed;

rotating selection switch means for selectively generating signals coded to specify a desired starting physical row location of said memory chips of said memory section; and,

arithmetic means being coupled to receive said predetermined address bits of said portion and said coded signals from said rotating switch selection means, said arithmetic means being operative to generate logical row address signals by performing a predetermined arithmetic operation upon said predetermined address bits of said portion and said coded signals, said logical row address signals addressing said number of memory chips in said predetermined physical row location rather than a specified different physical row location when said increment of memory provided by said chips has been enabled by said portion for access.

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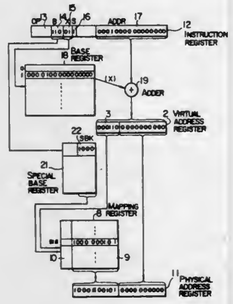
**4,296,468**

## ADDRESS CONVERSION UNIT FOR DATA PROCESSING SYSTEM

**Tadaaki Bandoh, and Yasushi Fukunaga, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 25, 1978, Ser. No. 945,396**
**Claims priority, application Japan, Sep. 26, 1977, 52/114629**
**Int. Cl.³ G06F *9/20***
**U.S. Cl. 364—200** **5 Claims**




1. An address conversion method for a data processing system in which a logical address is produced by processing an instruction which includes a first portion indicative of whether the instruction is a first or second kind of instruction, and in which a physical address representative of one of plural addressable storage locations in a physical memory space is produced by means of the logical address through mapping register means which store contents specifying pages of said physical memory space, said method comprising

producing the physical address by adding in the case of the first kind of instruction the contents of a first base register and the contents of an index register specified by respective second and third portions of the instruction to a fourth portion of the instruction comprising an address part of the instruction to form a logical address, addressing the mapping register means with an address corresponding to the juxtaposition of an upper bit portion of the logical address and a program status word, and then juxtapositioning the addressed contents of said mapping register means with a lower bit portion of the logical address; and

while in the case of the second kind of instruction producing



the physical address by adding the contents of the index register specified by the third portion of the instruction and the fourth portion of the instruction comprising the address part of the instruction to form a logical address, addressing a second base register with the second portion of the instruction, addressing the mapping register means with an address corresponding to the juxtaposition of an upper bit portion of the logical address and the addressed content of said second base register, and then juxtapositioning the addressed contents of said mapping register means with a lower bit portion of the logical address.

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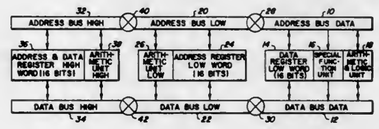
**4,296,469**

## EXECUTION UNIT FOR DATA PROCESSOR USING SEGMENTED BUS STRUCTURE

**Thomas G. Gunter; Harry L. Tredennick, both of Austin, and Doyle V. McAlister, Pflugerville, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 17, 1978, Ser. No. 961,798**
**Int. Cl.³ G06F *11/00***
**U.S. Cl. 364—200** **6 Claims**




1. A data processor comprising:

(a) first storage means for storing digital information of a predetermined bit length;

(b) first and second bus means coupled to said first storage means for carrying digital information, each of said first and second bus means being adapted to carry digital information of the predetermined bit length;

(c) second storage means for storing digital information of the predetermined bit length;

(d) third and fourth bus means coupled to said second storage means for carrying digital information, each of said third and fourth bus means being adapted to carry digital information of the predetermined bit length; and

(e) first and second switch means, said first switch means being coupled between said first and third bus means and being responsive to a first control signal for enabling transmission of digital information between said first and third bus means, and said second switch means being coupled between said second and fourth bus means and being responsive to a second control signal for enabling transmission of digital information between said second and fourth bus means, wherein each of said first, second, third and fourth bus means comprise pairs of differential signal conductors, each pair of differential signal conductors being adapted for carrying a true signal and a complement signal for each bit of the predetermined bit length.

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**4,296,470**

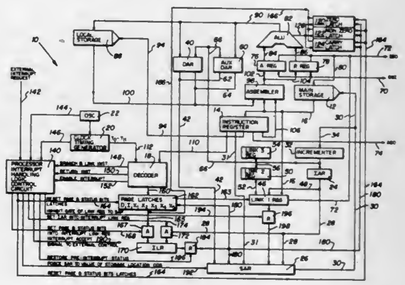
## LINK REGISTER STORAGE AND RESTORE SYSTEM FOR USE IN AN INSTRUCTION PRE-FETCH MICRO-PROCESSOR INTERRUPT SYSTEM

**Peter T. Fairchild, Woodstock, Ga., and Joel C. Leininger, Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Jun. 21, 1979, Ser. No. 50,570**
**Int. Cl.³ G06F *9/40***
**U.S. Cl. 364—200** **2 Claims**

1. In an interruptable stored-program data processing system which includes a storage unit for storing instructions, an instruction register for receiving stored instructions from the storage unit, a storage address register for addressing the storage unit, an instruction address register for normally providing to the storage address register the address of the instruction which follows the instruction held in the instruction register, a stack of link registers interconnected to form a last-in-first-out stack, circuitry responsive to a branch instruction in the instruction register for providing a branch address to the storage address register and for transferring the address in the instruction address register to the link register stack, circuitry responsive to a return instruction in the instruction register for transferring the last entered instruction address from the link register stack to the storage address register, and interrupt circuitry responsive to an interrupt request from a peripheral unit for switching the data processing system to an interrupt mode and forcing an interrupt routine starting address into the storage address register, an interrupt mode control mechanism for the link register stack comprising:

circuitry responsive to store link instructions in the instruction register during the initial phase of the interrupt routine for transferring the contents of the link register stack to a predetermined save area in the storage unit;



monitoring circuitry responsive to branch instructions and return instructions in the instruction register during the interrupt mode for monitoring the usage of the link register stack by the interrupt routine for producing a stack emply signal when no interrupt routine link addresses are pending in the stack;

circuitry responsive to load link instructions in the instruction register during the final phase of the interrupt routine for transferring the previously saved link register contents from the storage unit back to the link register stack;

and circuitry responsive to the stack empty signal and to a return instruction in the instruction register at the end of the interrupt routine for switching the data processing system back to the normal operating mode.

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**4,296,471**

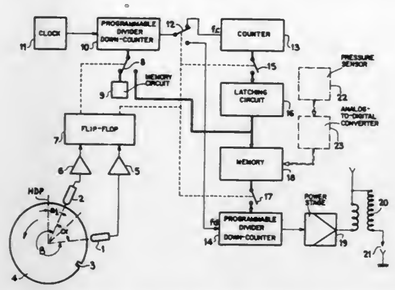
## DEVICE FOR INITIATING IN PARTICULAR THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

**Jacques Goux, Limours, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France**

**Filed Jun. 5, 1979, Ser. No. 45,770**
**Claims priority, application France, Jun. 8, 1978, 78 17157**
**Int. Cl.³ F02P *5/04***
**U.S. Cl. 364—424** **5 Claims**

1. Device for initiating, in particular the ignition of an internal combustion engine, said device comprising means for measuring the speed of rotation of the engine which comprise a disc for fixing to the shaft of the engine, a first sensor and a second sensor associated with the disc and offset from each other by a predetermined angle, a reference element carried by the disc and movable in front of the sensors, and means for initiating the ignition as a function of the measured speed of rotation, said means for measuring the speed of rotation further comprising a first programmable divider down-counter having an output and an input, a clock connected to said input for delivering thereto signals at a frequency $f_o$, a first counting

means connected to said output for counting the signals delivered by the programmable divider down-counter, the frequency $f_c$ of said signals delivered by the first programmable divider down-counter being equal to the frequency fo of the clock signals divided by the value of the angle $\beta$ equal to the difference between 360° and the angle $\alpha$ of the offset between the first sensor and the second sensor, a first memory containing different values of ignition advance angles having an output and an address input, the first counting means being connected to said address input, a second programmable divider down-counting means connected to said output of the first memory for counting down the signals stored in the first memory at a frequency corresponding to one signal per angular unit of rotation of the disc and, at the end of the count down, producing a signal actuating said ignition initiating means.

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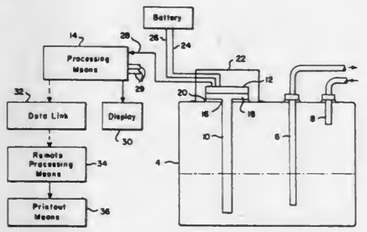
**4,296,472**

**NON-INTRUSIVE FLUID MEASURING SYSTEM**

**Barkhoudarian Sarkis, Madison Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.**

**Filed Oct. 1, 1979, Ser. No. 80,556**
**Int. Cl.³ G01F *23/26***
**U.S. Cl. 364—509** **34 Claims**




1. A fluid meter system with a fluid tank for use in fluid measurements such as consumed fluid, remained fluid, or flow rate comprising:

(a) a capacitive probe including first and second electrodes, means for securing said electrodes in a spaced-apart relationship and means for securing said electrodes in said fluid tank,

(b) circuit means electrically connected to said first and second electrodes for providing signal pulses representative of the capacitance of said probe,

(c) microprocessor means for receiving and processing said signal pulses including:

(i) program memory storage means,

(ii) data memory storage means,

(iii) a central processing unit operable in accordance with a program of said program memory storage means for calculating from said received signal pulses data signals corresponding to said fluid measurements, and

(iv) means for storing said fluid measurements in said data storage means, and

(d) means for outputting said stored data signals for providing an indication of same.

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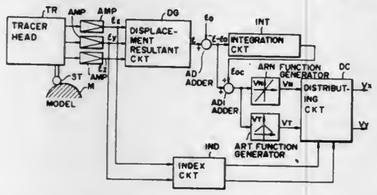
**4,296,473**

**PROFILE CONTROL SYSTEM**

**Ryoji Imazeki, and Etuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan**

**Filed Mar. 23, 1979, Ser. No. 23,459**
**Claims priority, application Japan, Mar. 23, 1978, 53-33397**
**Int. Cl.³ G06F *15/46***
**U.S. Cl. 364—520** **4 Claims**




1. In a profile control system in which an error signal, based on the difference between the displacement $\epsilon$ relative to a tracer head of a stylus tracing a model with friction therebetween, and a predetermined reference signal $\epsilon_0$, is applied to a command velocity function generator and a correcting velocity function generator to produce a command velocity signal and a correcting velocity signal, and in which a displacement direction signal from an index circuit and the command and correcting velocity signals are provided to a distributing circuit to derive therefrom respective axis command velocity signals for profile control, said axis command velocity signals having error as a result at least of said friction, the improvement comprising:

integrating means for integrating a difference signal $\epsilon$-$\epsilon_0$ between said displacement $\epsilon$ of the stylus and said reference signal $\epsilon_0$ to obtain an integrated value $\epsilon_{0c}$, and

means for applying a signal corresponding to the sum of the integrated value $\epsilon_{0c}$ and the difference signal $\epsilon$-$\epsilon_0$ as the error signal to said command and correcting velocity function generators for at least partially compensating for said error in said axis command velocity signals.

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**4,296,474**

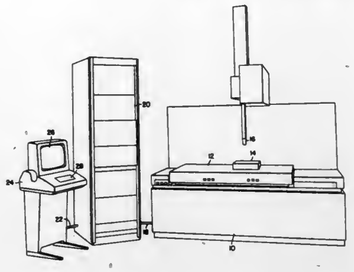
**INSPECTION SYSTEM AND APPARATUS THEREFOR**

**James J. Hurt, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.**

**Continuation of Ser. No. 830,412, Sep. 6, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 102,016**
**Int. Cl.³ G06F *15/46;* G05D *5/00***
**U.S. Cl. 364—560** **10 Claims**

1. An inspection system comprising: a coordinate measuring machine for providing actual data signals representative of actual feature coordinates on a part being inspected relative to an arbitrary coordinate system; data input means for providing nominal data signals representative of nominal feature coordinates on the part relative to a predetermined coordinate system; a data processor responsive to the nominal and actual data signals to process the actual data signals to provide true position data signals representative of the actual feature coordinates repositioned to most closely correspond to the nominal feature coordinates in the predetermined coordinate system;





and data output means responsive to the true position data signals to provide an output representative thereof.

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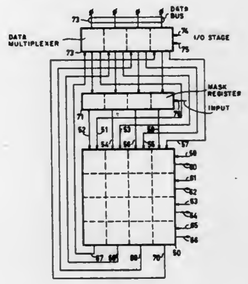
**4,296,475**

**WORD-ORGANIZED, CONTENT-ADDRESSABLE MEMORY**

**Leendert Nederlof, Eindhoven, Netherlands, and Roelof H. W. Salters, Sunnyvale, Calif., assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 19, 1978, Ser. No. 970,883**
**Int. Cl.³ G11C *15/04***
**U.S. Cl. 364—900** **9 Claims**




1. A content-addressable memory having a matrix of bit cells for accommodating a plurality of multibit words on an integrated circuit, said integrated circuit comprising:

a first input for inputting a key word, a second input for inputting a mask word for the selective deactivation of a part of the input key word by masking, and an output for outputting a data word stored in a word location;

first means for comparing a non-masked part of a key word with a corresponding part of a data word stored in a word location;

second means for indicating, for each word location, correspondence detected by said first means and for activating said output for outputting data from a word location for which correspondence occurs, wherein said second means comprise a validity indicator for each word location, having a state "valid" and a state "invalid", for selectively indicating the validity of the word stored at this location, and for each word a correspondence indicator, having a state "correspondence" and a state "non correspondence", said validity indicator acting as a bit position of the associated word location, so that when the memory is addressed as regards valid word location content, said state "invalid" blocks the associated correspondence indicator for the effective supply of a signal "correspondence", each validity indicator comprising a switch input for selectively setting the indicator, by an externally applied switch signal, to the one or to the other state;

third means for clearing a part of the memory and for switching, under the control of a correspondence signal from the correspondence indicator of one or more word locations, the validity indicator of said one or more word locations to the state "invalid";

a multiple match resolver for forming, in the case of simultaneous appearance of at least two active "correspondence" signals, a sequence for accessing the associated word locations, wherein for the writing of a data word in a word location, the bit position corresponding to the data of the validity indicator remains exclusively unmasked by the mask word in order to control, in the position "invalid", the associated correspondence indicator so as to form a position "correspondence", after which the multiple match resolver controls a write enable signal for a single word location thus provided with a correspondence signal;

fourth means for switching, under the control of a sequence signal from said multiple match resolver, the correspondence indicator for a word location indicated by said sequence signal to the position "non-correspondence" in order to apply, when a read command signal is received, the data of a word location to said output only once.

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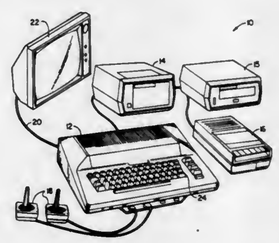
**4,296,476**

**DATA PROCESSING SYSTEM WITH PROGRAMMABLE GRAPHICS GENERATOR**

**Steven T. Mayer, Auburn; Jay G. Miner, Sunnyvale; Douglas G. Neubauer, Santa Clara, and Joseph C. Decuir, Mountain View, all of Calif., assignors to Atari, Inc., Sunnyvale, Calif.**

**Filed Jan. 8, 1979, Ser. No. 1,497**
**Int. Cl.³ G06F *3/153***
**U.S. Cl. 364—900** **18 Claims**



1. In a data processing system including a microprocessor, memory means having a plurality of addressable memory locations for storing microprocessor instructions, display instructions, and display graphics information, and a display unit of a type utilizing an image forming beam to form a raster of horizontal scan lines for displaying said graphics information to a user, said display instructions being stored in sequential ordered relation and including operation codes for defining first display characteristics of said graphics information and starting addresses indicative of the memory locations at which said graphics information is located, a graphics generator for executing said display instructions and, in response thereto, for selectively transferring portions of said display graphics information to said display unit for viewing, the generator comprising:

(a) first memory addressing means coupled to said memory means for sequentially accessing therefrom said display instructions;

(b) an instruction register coupled to said memory means for receiving and temporarily storing the operation code of each accessed instruction;

(c) second memory addressing means coupled to said memory means;

(d) control means coupled to said instruction register and responsive to the contents thereof for providing first control signals to cause transfer of said starting addresses from said memory means at memory locations designated by said first memory addressing means to said second addressing means and for causing said second memory addressing means to sequentially access said graphics information in synchronism with said image forming beam;

(e) transfer means coupled to said memory means and responsive to the contents of said instruction register for receiving and converting said display graphics information to video data of a format defined by said operation code, said transfer means including first buffer storage means for containing information indicative of a plurality of second display characteristics of said graphics information and selection means responsive to said video data for selecting a predetermined one of said plurality of second display characteristics, said buffer storage means being coupled to and addressable by said microprocessor for the transfer thereto of said display characteristic information.

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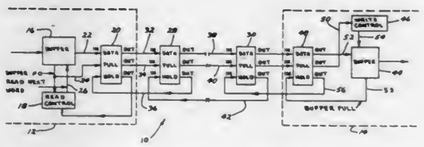
**4,296,477**

## REGISTER DEVICE FOR TRANSMISSION OF DATA HAVING TWO DATA RANKS ONE OF WHICH RECEIVES DATA ONLY WHEN THE OTHER IS FULL

**Maurice L. Hutson, Vadnais Heights, Minn., assignor to Control Data Corporation, Minneapolis, Minn.**

**Filed Nov. 19, 1979, Ser. No. 95,698**
**Int. Cl.³ G06F *13/00*; G11C *19/00***
**U.S. Cl. 364—900** **31 Claims**



6. A data transmission system consisting of a plurality of identical ripple register devices adapted to be connected serially between a sending device and a receiving device in which each of said ripple register devices has a data "in" port and a data "out" port, a Hold "in" port connected to a succeeding device and a Hold "out" port connected with a preceding device and a Full "out" port connected with a succeeding device and a Full "in" port connected with a preceding device wherein said Full "out" port transmits information that the particular ripple register device is prepared to transmit data and wherein said Hold "out" port transmits information that the particular ripple register device cannot receive data, wherein each particular ripple register device has at least two data registers so that data may be both received and transmitted simultaneously in response to independent signals at the Full "in" and Hold "in" ports.

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**4,296,478**

## READOUT OF ELECTROSTATICALLY STORED INFORMATION

**Helmut G. Kiess, Niedersteinmaur, and Bruno K. Binggeli, Arni, both of Switzerland, assignors to RCA Corporation, New York, N.Y.**

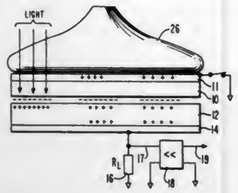
**Filed Oct. 12, 1979, Ser. No. 84,394**
**Int. Cl.³ G11C *11/23***
**U.S. Cl. 365—112** **6 Claims**

1. A method of producing an electrical signal representing a charge pattern on an insulating dielectric film, without destroying the charge pattern, comprising

placing a transparent electrode on the free top surface of said dielectric film,

placing the insulating dielectric film having the charge pattern in close contact with the free surface of an uncharged photoconductor having a back electrode connected through a signal output impedance to a point of reference potential,

scanning said photoconductor through said transparent



electrode and said dielectric film with a flying spot of light to produce a video electrical signal across said impedance during said scanning, and

removing the dielectric film from the photoconductor, whereby the original charge pattern on the dielectric film is retained.

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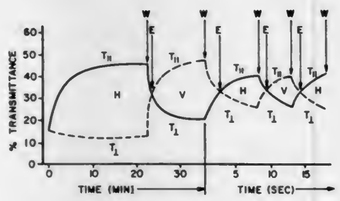
**4,296,479**

## METHOD FOR OPTICAL RECORDING IN PHOTO-DICHROIC GLASS SURFACES

**Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Nov. 15, 1979, Ser. No. 94,364**
**Int. Cl.³ G11C *13/04***
**U.S. Cl. 365—119** **6 Claims**



1. In a method for writing and erasing images in the surface of a photosensitive glass which demonstrates alterable photo-anisotropic effects wherein an image is written into the surface of said glass through exposure thereof to a beam of linearly-polarized red light having a wavelength between about 600–650 nm and said image is erased from the surface of said glass through exposure thereof to a beam of linearly-polarized red light having a wavelength between about 600–650 nm and having a different orientation of polarization, the improvement comprising erasing said image with a beam of linearly-polarized red light having a wavelength between about 600–650 nm but with about a 45° change in the direction of polarization from said writing beam.

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**4,296,480**

## REFRESH COUNTER

**Sargent S. Eaton, Jr., and Paul R. Schroeder, both of Colorado Springs, Colo., assignors to Mostek Corporation, Carrollton, Tex.**

**Filed Aug. 13, 1979, Ser. No. 66,149**
**Int. Cl.³ G11C *11/40***
**U.S. Cl. 365—222** **16 Claims**

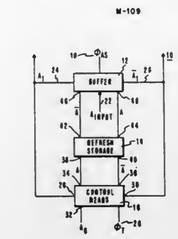
1. An n-bit address refresh counter comprising:

an address buffer for each address bit adapted to receive an address buffer strobe for inverting a pair of complementary input signals and placing the inverted signals onto a pair of output terminals;



a refresh address storage circuit for each address buffer connected to the address buffers for storing and providing the pair of complementary input signals; and

n−1 decoders for n−1 address buffers wherein the ith



decoder receives a transfer clock signal and at least i address bits, where i=1, 2 . . . , N−1 and controls the transfer of the inverted signals on the pair of output terminals of the ith address buffer to an input of its corresponding refresh storage circuit.

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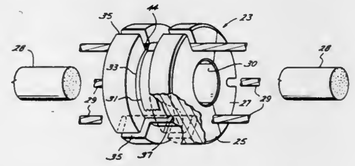
**4,296,481**

## STREAMER BULKHEAD

**Benjamin F. L. Weiss, Houston, Tex., assignor to Exploration Company, Houston, Tex.**

**Filed Dec. 17, 1979, Ser. No. 104,168**
**Int. Cl.³ G01V *1/38***
**U.S. Cl. 367—20** **9 Claims**



5. Bulkhead for a streamer section comprising

a two sector annulus adapted to receive an electrical conductor bundle adapted to extend therethrough, said annulus including a major sector of greater than 180 degrees arcuate extent and a correlative minor sector of less than 180 degrees arcuate extent,

said annulus having an annular groove in its outer periphery, said annular groove being adapted to receive a girth cinch to hold said sections together,

said annulus having a plurality of radial slots in its outer periphery adapted to receive tension lines adapted to extend therethrough,

each sector having planar sides disposed at an angle to each other,

said planar sides of one sector being engaged with the adjacent planar sides of the other sector.

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**4,296,482**

## PARAMETRIC ARRAY DOPPLER SONAR APPARATUS

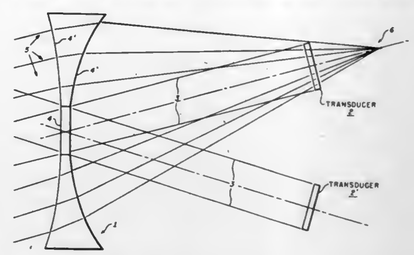
**Jacob A. Kritz, Westbury, N.Y., assignor to Sperry Corporation, New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 133,158**
**Int. Cl.³ G01S *15/60***
**U.S. Cl. 367—91** **12 Claims**

1. Parametric array Doppler sonar apparatus comprising a plurality of piston-type transducers, each being positioned to launch and receive acoustic energy along a different specified axis, means to energize each transducer during specified time intervals with a signal comprising a combination of first and second primary excitation frequencies,

a hybrid acoustic lens having a central disk shaped portion and an annular ray-converging portion surrounding said central portion,

each of said transducers having a diameter sufficiently large to launch a substantially collimated acoustic beam along



the axis of that transducer and being oriented to direct the collimated beam through the central portion of said lens,

each of said transducers being further positioned within the focal region of the converging portion of said lens so as to intercept substantially all of the acoustic energy reflected from a remote target and passing through the lens along the axis of that transducer.

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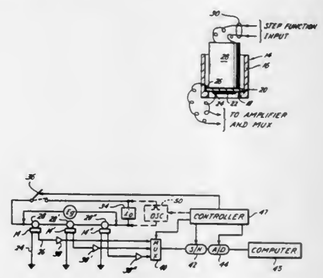
**4,296,483**

## METHOD AND MEANS FOR MEASURING GEOPHONE PARAMETERS

**Harry K. Haill, Houston, Tex., assignor to Litton Resources Systems, Inc., Houston, Tex.**

**Filed Jun. 30, 1980, Ser. No. 164,622**
**Int. Cl.³ G01V *13/00***
**U.S. Cl. 367—13** **8 Claims**



1. A device for substantially simultaneously testing the respective active elements of a plurality of electrically interconnected geophones that generate a signal output in response to a mechanical input and that will generate a mechanical output in response to a signal input, comprising:

means for applying a signal input in series to said active elements;

means for detecting the resultant mechanical force outputs of said geophones; and

means for sequentially determining selected characteristics of the individual active elements from the detected mechanical force outputs.

## 4,296,484
### DATA DISPLAY SYSTEM

Terry A. Miller, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,842
Int. Cl.[3] G01V *1/22, 1/34*
U.S. Cl. 367—71 23 Claims

19. Apparatus comprising:
a cathode ray tube screen;
means for supplying a sample of data from each of a plurality of data channels to said cathode ray tube screen to thereby display at least one sample of data from each of said plurality of data channels, on said cathode ray tube screen, in such a manner that all samples of data displayed on said cathode ray tube screen at any one time are displayed in an alternating sequence in a horizontal pattern across said cathode ray tube screen with no sample of data being displayed directly above or below another sample of data and in such a manner that each particular sample of data is displayed with respect to the data channel from which that particular sample of data was provided; and
means for controlling the display of data on said cathode ray tube screen so as to spread the display of said at least one sample of data from each of said plurality of data channels across substantially the entire screen of said cathode ray tube.

## 4,296,485
### TILT ALARM IN A SEISMIC EXPLORATION SYSTEM

Lawrence G. Clemens, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

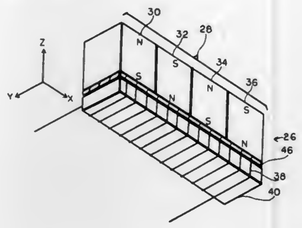
Filed Oct. 30, 1978, Ser. No. 955,904
Int. Cl.[3] G01V *1/22*
U.S. Cl. 367—77 8 Claims

5. A method for indicating that a remote geophone monitoring means has been tilted with respect to a desired position of said remote geophone monitoring means comprising the steps of:
sensing that said remote geophone monitoring means has been tilted with respect to a desired position of said remote geophone monitoring means and generating an enabling signal when said remote geophone monitoring means is tilted;
generating a tilt alarm signal in response to said enabling signal; and
automatically transmitting said tilt alarm signal from said remote geophone monitoring means to a central control station to thereby provide an indication that said remote geophone monitoring means has been tilted.

## 4,296,486
### SHIELDED ELECTROMAGNETIC ACOUSTIC TRANSDUCERS

Carmine F. Vasile, Huntington, N.Y., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 24, 1980, Ser. No. 114,862
Int. Cl.[3] H04R *15/00*
U.S. Cl. 367—140 13 Claims

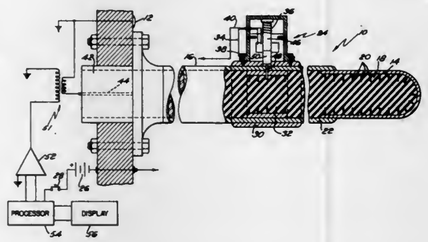


1. An electromagnetic acoustic transducer for use near a surface of an electrically conductive object, comprising:
a source of magnetic flux for establishing a static magnetic field in said object;
an electrical conductor disposed between said source of magnetic flux and said surface and proximate to said surface for conducting an alternating current in said static magnetic field; and
a thin, electrically conductive, nonmagnetic shield disposed between said source of magnetic flux and said conductor.

## 4,296,487
### PRESSURE SENSITIVE LINE TRANSDUCER

Milton Green, New London, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1979, Ser. No. 87,285
Int. Cl.[3] G01V *1/16, 1/38*
U.S. Cl. 367—169 4 Claims



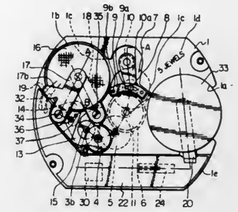

1. A line transducer for sensing pressure variations due to acoustic waves generated by an acoustic source comprising:
an elongated cable including a pressure sensitive electrical core element generating electrical signals in response to said acoustic waves of said acoustic source, said electrical core element of said elongated cable is an electrically conducting rubber that is insulated for preventing flow of electric current between said electrically conducting core element and a medium around said line transducer;
means for isolating said electrical signals from ambient noise including a solenoid for shorting an internal cladding of said elongated cable and an external cladding thereof; and
means for processing said electrical signals.



## 4,296,488
### WATCH MOVEMENT CONSTRUCTION

Yasuaki Nakayama, Hanno, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 918,010
Claims priority, application Japan, Jun. 28, 1977, 52/77029; Nov. 24, 1977, 52/141033; Dec. 21, 1977, 52/153715
Int. Cl.[3] G04B *19/04;* G04C *23/02*
U.S. Cl. 368—80 34 Claims

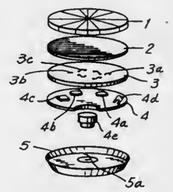


1. A movement construction for an electronic wristwatch driven by a stepping motor powered by a battery, comprising:
a base plate having a first cutout formed in close proximity to one portion of an outer periphery of said base plate to accommodate therein said battery, and a second cutout formed in close proximity to another portion of the outer periphery of said base plate;
a disk type driving coil forming part of said stepping motor and disposed in said second cutout of said base plate, said disk type driving coil having its upper and lower end surfaces substantially aligned on the same plane as upper and lower surfaces of said base plate;
a wheel train mounted on said base plate in an area between said battery and said driving coil in a manner to be concentric with said driving coil; and
a circuit board having an IC chip and a quartz crystal vibrator mounted in horizontal spaces, respectively, and supported by said base plate outside an area occupied by said driving coil, said battery and said wheel train which are aligned in a single plane.

## 4,296,489
### ELECTRONIC TIMEPIECE

Hiromitsu Mitsui, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 678,339, Apr. 19, 1976, abandoned. This application Apr. 25, 1979, Ser. No. 33,277
Claims priority, application Japan, Apr. 17, 1975, 50-46728
Int. Cl.[3] G04B *1/00*
U.S. Cl. 368—205 1 Claim

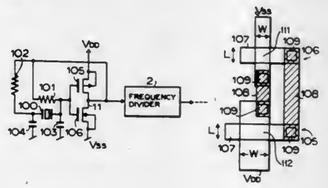


1. In an electronic timepiece including timekeeping circuitry having a solar battery for producing charging current in response to light being incident thereon, the improvement comprising said solar battery being formed of a plurality of solar cells, said solar cells being disposed on a surface of said timepiece, a circuit substrate including leads formed thereon for coupling said solar cells to said timepiece circuitry, and a conductive adhesive layer for physically securing said solar cells to said circuit substrate and for electrically coupling each of said solar cells to the leads on said circuit substrate, said conductive adhesive layer being conductive in a first predetermined direction perpendicular to the opposed surface thereof in contact with said solar cells and as an electrical insulator in the direction parallel to said opposed surface thereof.

## 4,296,490
### CRYSTAL OSCILLATION-TYPE ELECTRONIC TIMEPIECE

Yasuhiko Nishikubo, Iruma, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 757,025, Jan. 5, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,641
Claims priority, application Japan, Jan. 14, 1976, 51-2073; Oct. 21, 1976, 51-140664
Int. Cl.[3] G04C *19/00, 3/00, 5/00;* H03B *5/30*
U.S. Cl. 368—87 11 Claims




1. A crystal oscillation-type electronic timepiece comprising an oscillator having a crystal oscillator with an input and an output as a time base, means for dividing the frequency of the oscillator, display driving means connected to said frequency dividing means, time display means connected to said display driving means, said oscillator having a complementary metal oxide simiconductor logic circuit having an inverter with a gated N-channel transistor and a gated P-channel transistor, said gated N-channel transistor having a channel with a width-/length ratio of less than one, said gated P-channel transistor having a channel with a width/length ratio of less than two, an input capacitor with a given capacitance connected to the input of the crystal oscillator and an output capacitor having a capacitance less than the given capacitance of said input capacitor connected to the output of the crystal oscillator.

## 4,296,491
### INFORMATION CARRIER HAVING INTER-TRACK IDENTIFICATION CODE INFORMATION

Jonathan A. Jerome, Palo Alto, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 30, 1979, Ser. No. 61,794
Int. Cl.[3] G11B *7/00*
U.S. Cl. 369—59 8 Claims

1. Information-containing apparatus comprising:
(A) a substrate;
(B) a recording medium deposited on said substrate;
(C) a plurality of discrete signal data-containing tracks recorded in said medium;
(D) a discrete address code representative of each of said data-containing tracks recorded at a preselected position

in said medium and in line with said data-containing track with which the discrete address code is associated, said address codes all appearing within a predetermined region in said medium; and

(E) an index code recorded in said medium and disposed in a direction laterally of said data-containing tracks and between adjacent address codes, said index code being representative of the location on said medium at which it is recorded.

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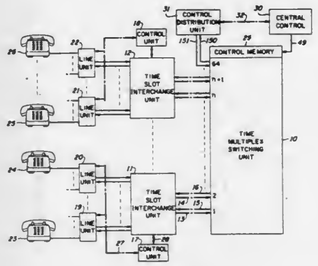
**4,296,492**

## CONTINUITY VERIFICATION ARRANGEMENT

**Edward H. Hafer, Winfield, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 26, 1979, Ser. No. 106,393**
**Int. Cl.³ H04J *3/12***
**U.S. Cl. 370—14** **11 Claims**




1. A continuity verification arrangement for verifying continuity of communication paths through a time division switching means comprising a first communication unit, a second communication unit, a time division switching means comprising means for generating communication path identity signals and means responsive to said communication path identity signals for completing a communication path between said first and said second communication units characterized in that

said time division switching means further comprises means for transmitting to said first and said second communication units said communication path identity signals;

said first communication unit comprises means responsive to said communication path identity signals for transmitting a unique character on said communication path; and

said second communication unit comprises receive means for receiving from said communication path said unique character transmitted by said originating unit, and continuity indicating means for generating continuity signals when said unique character is received on said communication path.

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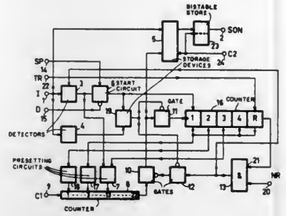
**4,296,493**

## METHOD OF AND ARRANGEMENT FOR REGENERATING START-STOP SIGNALS

**Robert Bodart, and Jean P. A. R. J. Werts, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 12, 1979, Ser. No. 75,049**
**Claims priority, application Netherlands, Sep. 13, 1978, 7809299**
**Int. Cl.³ H04L *5/24***
**U.S. Cl. 370—48** **2 Claims**

1. A method of regenerating start-stop signals having a stop polarity which is maintained for a certain period of time T after a start-stop transition, T being either greater than or equal to a minimum value, or greater than or equal to a minimum value and smaller than or equal to a maximum value, and of converting the regenerated signals into isochronous output signals, wherein the method includes taking signal samples of the start-stop signals at consecutive sampling instants by means of a regeneration process initiated by the start-stop transition, consecutively storing said signal samples in a storage device and reading out the stored signal samples at isochronous instants for forming the isochronous output signals, characterized in that the method comprises taking the signal samples at




sampling instants having unequal time intervals between them such that the $(n+1)^{st}$ signal sample, wherein $n \geqq 7$, is taken at more than 20-n msec. but less than 20-n+5 msec. after the start-stop transition.

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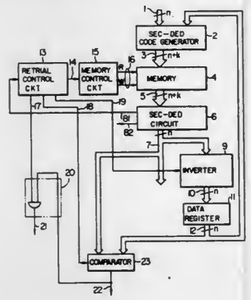
**4,296,494**

## ERROR CORRECTION AND DETECTION SYSTEMS

**Sakou Ishikawa; Yutaka Watanabe, and Katsuro Wakai, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 12, 1979, Ser. No. 84,452**
**Claims priority, application Japan, Feb. 7, 1979, 54-12275**
**Int. Cl.³ G06F *11/10***
**U.S. Cl. 371—13** **10 Claims**




1. An error correction and detection system for detecting and correcting, at most, an m-bit error and for detecting a greater than (m+1)-bit error where $m \geqq 1$, using a Hamming code comprising:

means for generating a Hamming code by adding a number of redundant bits to data bits;

a memory for storing said Hamming code;

error correcting and detecting means for checking the Hamming code read out from said memory, to thereby correct an error encompassing at most m bits, while detecting an error encompassing more than (m+1) bits;

means for inverting the corrected data bits output from said error correcting and detecting means in response to the detection of said at most m bit error by said error correcting and detecting means;

means for transferring said data bits, subsequent to said inversion, to said Hamming code generating means;

a data register for temporarily storing said inverted data bits as first data bits;

means for controlling said inverting means and said memory in response to the detection of said m-bit error in said error correcting and detecting means, to transfer the first data bits



to said Hamming code generating means, to obtain output data bits as second data bits from said error correcting and detecting means;

means for comparing said first data bits from said data register with said second data bits; and

means for indicating a miscorrection which has been made by said error correcting and detecting means in response to the result of the comparison by said comparing means.

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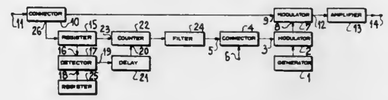
**4,296,495**

## DEVICE FOR MEASURING THE QUALITY OF A DIGITAL RADIO LINK

**Jacques Bursztejn, Paris, France, assignor to Thomson CSF, Paris, France**

**Filed Oct. 24, 1979, Ser. No. 88,098**
**Claims priority, application France, Oct. 31, 1978, 78 30848**
**Int. Cl.³ G06F *11/10***
**U.S. Cl. 371—22** **6 Claims**




1. A device for measuring the quality of a digital radio link comprising transmission means and reception means respectively for transmitting a digital information signal and for receiving said transmitted digital information signal, said transmission means comprising means for generating parity bits for sequences of n successive bits of information in said digital information signal; control means determining the beginning of said sequences and means for transmitting with said information signal at least part of said parity bits; said receiving means comprising detection means for detecting the transmitted parity bits, means for generating parity bits for sequences of n successive bits of information in said digital information signal received, control means determining the beginning of said sequences, and comparing means for comparing the transmitted parity bits and the generated parity bits; said control means in said receiving means comprising means for bit by bit recognition of any sequence of k predetermined bits forming a reference sequence, k being smaller than n, and supplying a control signal to said means for generating parity bits.

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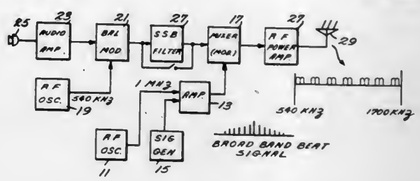
**4,296,496**

## EMERGENCY RADIO FREQUENCY WARNING DEVICE

**William S. Sadler, 2000 Fernwood Ave., St. Paul, Minn. 55113**

**Continuation of Ser. No. 674,727, Apr. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 485,761, Jul. 3, 1974, Pat. No. 3,949,300. This application Nov. 28, 1978, Ser. No. 964,152**
**Int. Cl.³ H04K *3/00*; H04B *1/02***
**U.S. Cl. 455—1** **9 Claims**




1. A radio frequency warning device for communicating with an AM radio receiver adapted to receive signals on any one of a plurality of AM broadcast carrier frequencies comprising:

means for generating a signal having components ranging across a broad frequency band;

means for generating an R-F signal;

means responsive to an audio frequency signal and said R-F signal for causing the generation of a suppressed carrier modulation signal;

means for modulating said suppressed carrier modulation signal and said broad band frequency signal to thereby generate a broad band AM radio interference signal having respective components at frequencies simulating sidebands to each of said plurality of AM broadcast carrier signals; and

means for transmitting said broad band interference signal, said broad band interference signal generating an intelligible audio signal when received by said AM radio receivers tuned to any of said plurality of carrier frequencies.

# DESIGN PATENTS

## GRANTED OCT. 20, 1981

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D32–058 | 261,350 |
| D34–033 | 261,377 |

261,320

**POCKET FOR JEANS OR THE LIKE**

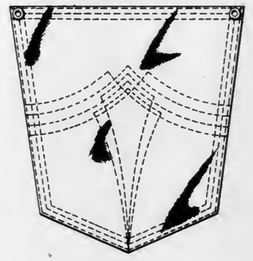
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.

Filed Jan. 29, 1980, Ser. No. 116,423

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—25



261,322

**POCKET FOR JEANS OR THE LIKE**

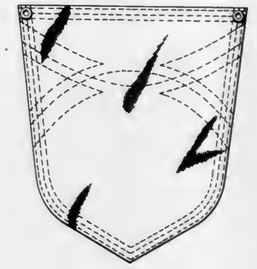
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.

Filed Jan. 29, 1980, Ser. No. 116,427

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—25



261,321

**POCKET FOR JEANS OR THE LIKE**

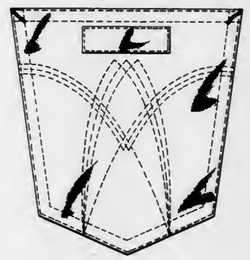
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.

Filed Jan. 29, 1980, Ser. No. 116,425

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—25



261,323

**JEANS OR THE LIKE**

George W. Catron, Sacramento, Calif., assignor to Leo R. LeSueur, Carmichael, Calif.

Filed Aug. 8, 1979, Ser. No. 64,856

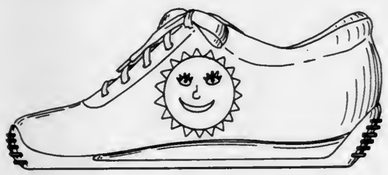
Term of patent 14 years

Int. Cl. D2—*02*

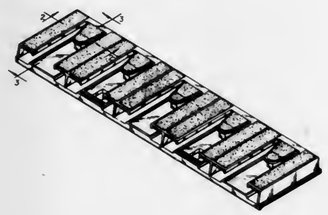
U.S. Cl. D2—28

261,324
JEANS OR THE LIKE
George W. Catron, Sacramento, Calif., assignor to Leo R. LeSueur, Carmichael, Calif.
Filed Aug. 8, 1979, Ser. No. 64,857
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

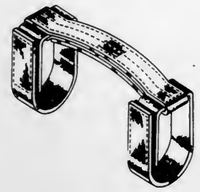
261,325
SHOE
Brian G. Niro, 1005 Arlington Heights Road, Arlington Heights, Ill. 60004
Filed Mar. 17, 1980, Ser. No. 131,217
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



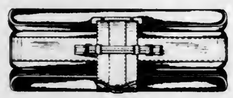
261,326
TAPE CASSETTE HOLDER FOR A SUNVISOR
Ted A. Bell, and Timothy S. Cooksey, both of Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Oct. 9, 1979, Ser. No. 82,828
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

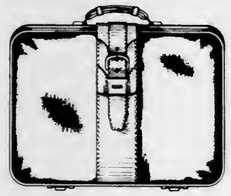


261,327
SKI CARRIER
Tommy D. Raye, 976 Welch Ct., Golden, Colo. 80401
Filed Aug. 1, 1977, Ser. No. 820,801
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36



261,328
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jul. 30, 1979, Ser. No. 61,816
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

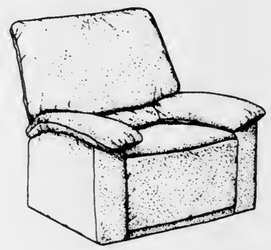




261,329
CHAIR
Robert L. Van Horn, 8165 University Blvd., Des Moines, Iowa 50311
Filed May 7, 1979, Ser. No. 36,408
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

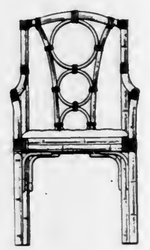
261,330
CHAIR
Louis M. Meier, Dubuque, Iowa, assignor to Flexsteel Industries, Inc., Dubuque, Iowa
Filed May 3, 1979, Ser. No. 35,500
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

261,331
ADJUSTABLE LOUNGE CHAIR OR SIMILAR ARTICLE
Rolf Benz, Haiterbacher Strasse 104, 7270 Nagold, Fed. Rep. of Germany
Filed Jul. 11, 1979, Ser. No. 56,712
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, MR 550-NA
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

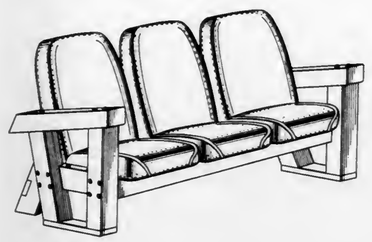


261,332
CHAIR
Eduard Rohr, Mägenwil, Switzerland, assignor to Wibe Treuhand AG, Sarmenstorf, Switzerland
Division of Ser. No. 675,302, Apr. 9, 1976.
Filed Feb. 9, 1978, Ser. No. 876,426
The portion of the term of this patent subsequent to Nov. 21, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—55

261,333
CHAIR OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Aug. 28, 1979, Ser. No. 70,443
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840125
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

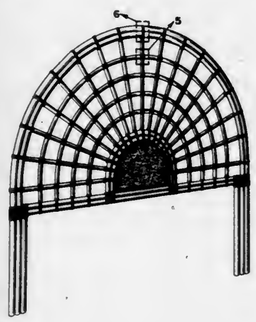


261,334
SEAT
Rex E. Light, 2836 Broadway, Fort Wayne, Ind. 46807
Filed May 19, 1978, Ser. No. 907,782
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—63

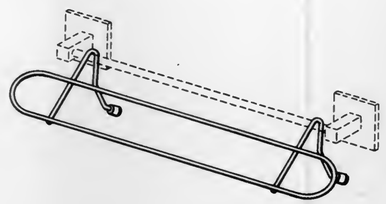


261,335
CHAIR
Marjorie M. Conner, New York, N.Y., assignor to Trigere, Inc., New York, N.Y.
Filed Aug. 14, 1979, Ser. No. 66,426
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

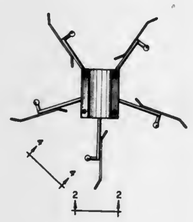
261,336
BED HEADBOARD
Robert Thorpe, 2400 W. Coast Hwy. #H, Newport Beach, Calif. 92663
Filed Mar. 6, 1980, Ser. No. 127,823
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79



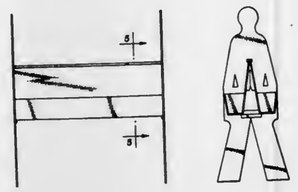

261,337
AUXILIARY TOWEL RACK
Raymond W. Fink, Maple Heights, Ohio, assignor to Tool Dynamics, Inc., Bedford Hts., Ohio
Filed Dec. 26, 1979, Ser. No. 106,756
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



261,338
ROTATABLE TIE RACK
Grover A. Miller, 6307 Everest Way, Sacramento, Calif. 95842
Filed Jun. 11, 1979, Ser. No. 47,365
Term of patent 14 years
Int. Cl. D6—*04*; D8—*08*
U.S. Cl. D6—113




261,339
DISPLAY STAND
Kenneth E. Johnson, Sr., Waco, Tex., assignor to T-Shirts Plus, Inc., Waco, Tex.
Filed Sep. 14, 1979, Ser. No. 75,726
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—152



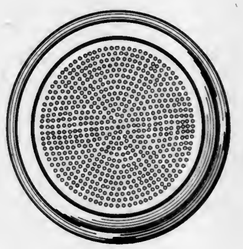



261,340
FURNITURE LEG AND RAIL CONNECTOR
Charles W. Clyburn, Reading, Ohio, assignor to James David Incorporated, Maryland Heights, Mo.
Filed Sep. 18, 1979, Ser. No. 76,789
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191

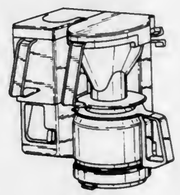
261,341
BASE FOR A TABLE OR THE LIKE
Gunter F. Eberle, Dallas, Tex., assignor to Vecta Contract, Inc., Grand Prairie, Tex.
Filed Jan. 24, 1979, Ser. No. 6,100
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

261,342
TABLE BASE
Stephen K. Frye, Fort Lauderdale, Fla., assignor to Lion in Frost Inc., Ft. Lauderdale, Fla.
Filed Feb. 26, 1979, Ser. No. 14,880
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

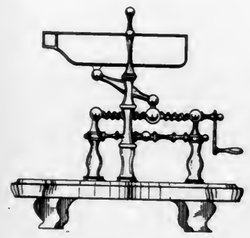
261,343
BASKET INSERT FOR A KITCHEN MACHINE
Oswald Gibiec, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Elektrowerke KG, Wuppertal, Fed. Rep. of Germany
Filed Mar. 27, 1979, Ser. No. 24,312
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 14145
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47

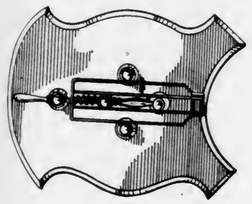


261,344
WALL-HUNG COFFEE MACHINE
Rudolf Maass, Solingen-Widdert, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Sep. 13, 1979, Ser. No. 74,997
Claims priority, application Fed. Rep. of Germany, May 5, 1979, 5MR8981
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



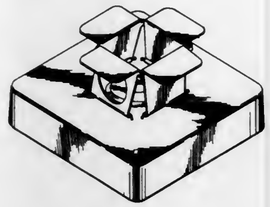
**261,345**
**DECANTING CRADLE**
Fritz Koeppel, 39 Tappan St., Everett, Mass. 02149, and Jean-Yves Loizance, 131 Commonwealth Ave., Boston, Mass. 02116
Filed Sep. 7, 1979, Ser. No. 73,278
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—70





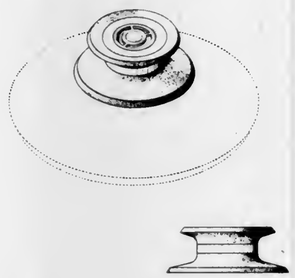
**261,346**
**CUP CAKE STAMPER**
Marjorie A. Thornley, c/o McCaleb, Lucas & Brugman, 230 W. Monroe St., Room 2040, Chicago, Ill. 60606
Filed Dec. 26, 1979, Ser. No. 106,384
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—101

**261,347**
**POT STAND ASSEMBLY FOR A PORTABLE CAMP STOVE**
William R. Lütz, Chamblee, Ga., assignor to Conceptual Factors, Inc., Atlanta, Ga.
Filed May 31, 1979, Ser. No. 44,201
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—130



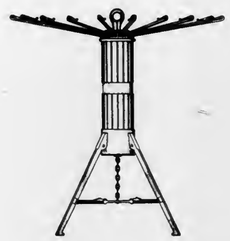
**261,348**
**RIBBED COFFEE URN LID**
Leo A. Groh; Douglas D. Ludwig, both of West Bend, Wis.; David L. Painter, Glenview, Ill., and John H. Free, Kalispell, Mont., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 4, 1980, Ser. No. 118,124
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—131

**261,349**
**POT COVER HANDLE**
Theophil Ryser, Beckenried, Switzerland, assignor to AMC International Alfa Metalcraft Corporation AG, Rotkreuz, Switzerland
Filed Aug. 1, 1979, Ser. No. 62,866
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—132



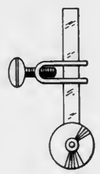


**261,350**
**CLOTHES DRYER RACK**
Taro Koshiyama, 46, 2-chome, Minamikinomoto, Yao-shi, Osaka-fu, Japan
Filed Oct. 24, 1978, Ser. No. 954,219
Claims priority, application Japan, Aug. 25, 1978, 53-16577
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—58

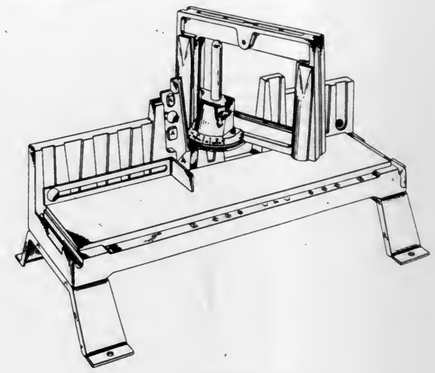


**261,351**
**SNOW SCOOP BODY**
William B. Carper, Harvard, Ill., assignor to Suntrak Industries, Inc., Harvard, Ill.
Filed Oct. 18, 1978, Ser. No. 952,574
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

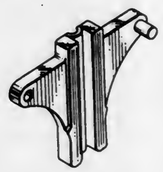
**261,352**
**GUIDE WHEEL FOR WELDING TORCHES**
Louis E. Miller, 409 E. 13th St., Odessa, Tex. 79761
Filed Aug. 28, 1979, Ser. No. 70,448
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



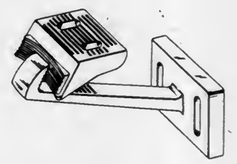
**261,353**
**MITRE BOX**
E. Curtis Ambler, Newington, and Sylvester W. Bies, Bloomfield, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed May 29, 1979, Ser. No. 42,864
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



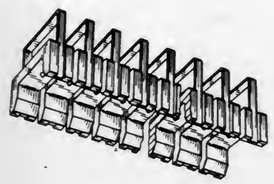
**261,354**
**CARD EJECTOR HANDLE FOR A PRINTED CIRCUIT BOARD OR SIMILAR ARTICLE**
Donald L. Clemens, The Colony, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.
Filed Feb. 11, 1980, Ser. No. 120,578
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—306



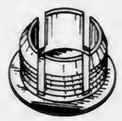
**261,355**
**CATCH ASSEMBLY FOR DRAWERS AND CUPBOARDS**
Alf Sundberg, Box 428, Sollentuna, Sweden
Filed May 17, 1979, Ser. No. 39,787
Claims priority, application Sweden, Nov. 17, 1978, 782667
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



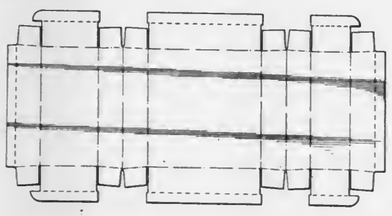
261,356
STRIP OF INSULATED CABLE CLIPS
Douglas Robinson, Preston, England, assignor to Ofrex Group Limited, London, England
Filed Mar. 3, 1978, Ser. No. 883,329
Claims priority, application United Kingdom, Sep. 7, 1977, 981432/77
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



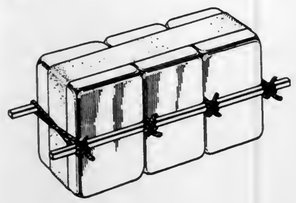
261,357
INSULATION INJECTION HOLE PLUG
R. Dean Doonan, 1001 Sunnyside Dr., Montezuma, Iowa 50171
Filed Jul. 28, 1978, Ser. No. 929,210
The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*99*; D9—*07*
U.S. Cl. D8—499



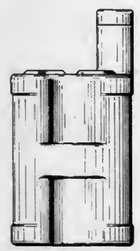
261,358
BLANK FOR THREE COMPARTMENT BOX
Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Jun. 4, 1979, Ser. No. 31,328
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—346



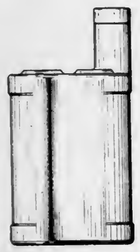
261,359
PACKAGE OF BLOCK-SHAPED ARTICLES
Henry E. Nass, 137 N. 4th St., Philadelphia, Pa. 19106
Filed Apr. 17, 1978, Ser. No. 896,782
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337



261,360
CONTAINER FOR LIQUIDS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,597
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375



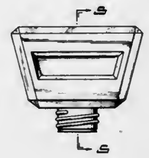
261,361
CONTAINER FOR LIQUID PRODUCTS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,598
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375



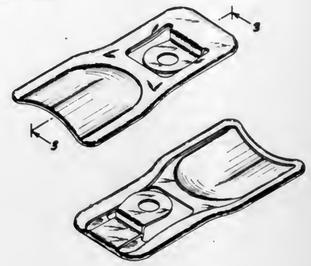


261,362
STACKABLE CONTAINER FOR LIQUIDS OR THE LIKE
Charles N. Epperson, Okmulgee, Okla., assignor to Invention Development Equity Assoc., Inc., Okmulgee, Okla.
Filed Aug. 10, 1979, Ser. No. 65,596
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

261,363
BOTTLE
Joseph Sandor, Reseda, Calif., assignor to California Sounds Ltd., Tarzana, Calif.
Filed Apr. 30, 1979, Ser. No. 34,770
Term of patent 14 years
Int. Cl. D09—*01*
U.S. Cl. D9—413

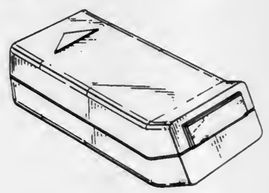


261,364
TAB FOR EASY OPENING CAN END
George F. Smyth, Los Angeles, Calif., assignor to Ermal C. Fraze, Dayton, Ohio
Filed Mar. 2, 1979, Ser. No. 17,157
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—438



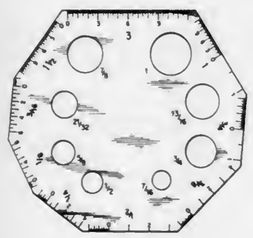
261,365
WATCH
Alain Carre, Paris, France, assignor to Waterman S.A., Paris, France
Continuation-in-part of Ser. No. 948,655, Oct. 3, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,275
Claims priority, application France, Apr. 7, 1979, 76 482
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

261,366
MICROWAVE DETECTOR
Yanta H. T. Lam, Kowloon, Hong Kong, assignor to Meyer Aluminium Limited, Kowloon, Hong Kong
Filed Jun. 25, 1979, Ser. No. 51,496
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—47

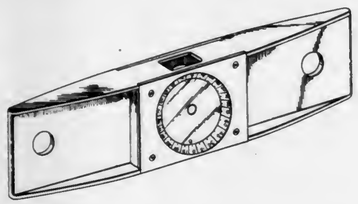


261,367
FRONT COVER FOR THERMOSTAT REGULATOR HOUSING
Mats Janson, Port, Switzerland, assignor to Tylo Sauna S.A., Biel-Bienne, Switzerland
Filed Apr. 6, 1979, Ser. No. 27,897
Claims priority, application Sweden, Oct. 16, 1978, 2389
Term ot patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—60

261,368
DRAWING INSTRUMENT
Joseph E. Barreca, Old Bridge Township, Mercer County, N.J., assignor to McGraw-Hill, Inc., New York, N.Y.
Filed Dec. 3, 1979, Ser. No. 99,562
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



261,369
COMBINED TORPEDO LEVEL AND PERIPHERAL ANGLE MEASURING DEVICE
James L. Smith, 17139 River Rd., Channelview, Tex. 77530
Filed Dec. 7, 1979, Ser. No. 102,109
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

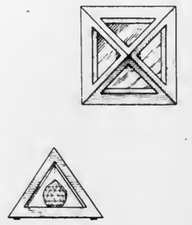


261,370
DIAL GAUGE
Yoshikazu Kikuchi, Tochigi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1979, Ser. No. 92,065
Claims priority, application Japan, Jun. 22, 1979, 54-26354
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

261,371
BURGLAR ALARM HOUSING
Kenneth T. Lewis, 300 N. Sixth, Longview, Tex. 75601
Filed Feb. 5, 1979, Ser. No. 9,437
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

261,372
EARRING
Leo A. Fried, Box 371, Poulsbo, Wash. 98370
Filed Jul. 23, 1979, Ser. No. 59,611
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—40

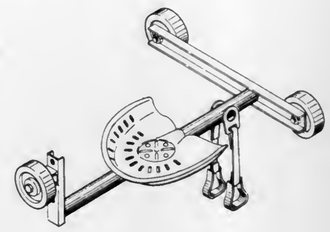
261,373
LIGHT-REFLECTING SCULPTURE
Stanley C. Fisher, 2434 Tocayo #158, San Diego, Calif. 92154
Filed Mar. 31, 1980, Ser. No. 135,263
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



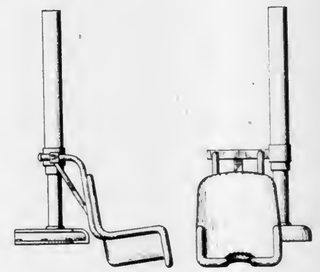
261,374
FIGURINE OF A DOLPHIN
Jesus A. Santa-Eulalia Carvajales, and Javier B. Santa-Eulalia Carvajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 22, 1978, Ser. No. 918,319
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,375
FIGURINE OF A OKAPI
Jesus A. Santa-Eulalia Carvajales, and Javier B. Santa-Eulalia Carvajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 22, 1978, Ser. No. 918,320
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

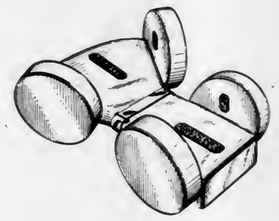
261,376
CONSTRUCTION TROLLEY
James A. Tipton, 1243 Browns Ferry Rd., Chattanooga, Tenn. 37419
Filed Jul. 2, 1979, Ser. No. 53,746
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—1



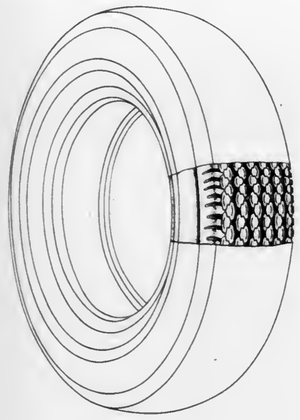
261,377
TUB MOUNTED BATH LIFT
Benton H. Grant, 126 Chestnut Hill Rd., Stamford, Conn. 06903
Filed May 3, 1979, Ser. No. 35,621
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—33



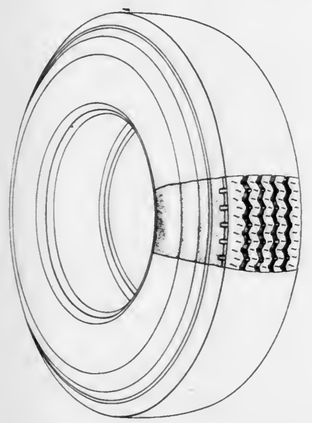
261,378
CHILD'S CRAWLER
Timothy J. Bergeron, Dolgeville, N.Y., assignor to J. A. Preston Corporation, New York, N.Y.
Filed Jun. 11, 1979, Ser. No. 47,383
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—128



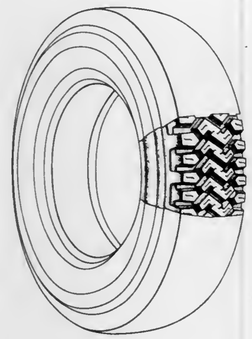
261,379
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Sep. 7, 1979, Ser. No. 73,267
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



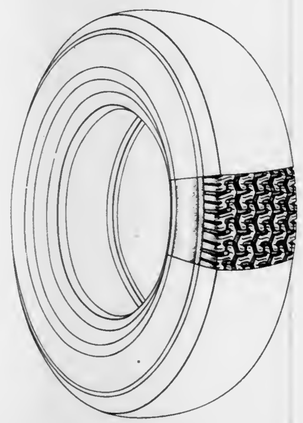
261,380
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Nov. 29, 1979, Ser. No. 98,558
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



261,381
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 25, 1979, Ser. No. 88,121
Claims priority, application France, Apr. 27, 1979, 599
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

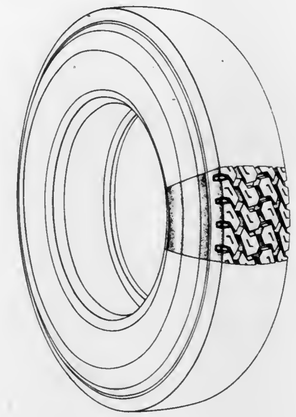


261,382
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Sep. 7, 1979, Ser. No. 73,268
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

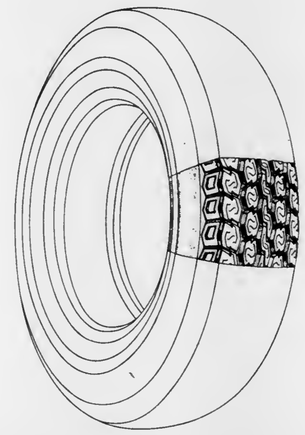




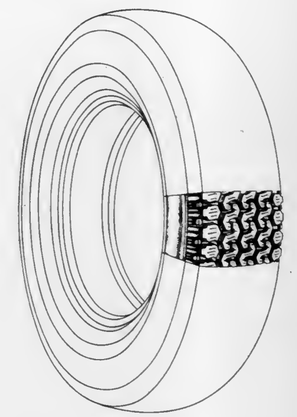
261,383
TIRE
Guy Amarger, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Nov. 29, 1979, Ser. No. 98,557
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



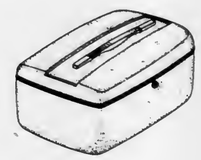
261,384
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 10, 1980, Ser. No. 110,922
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



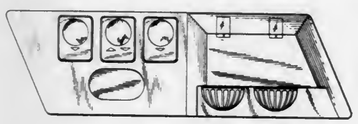
261,385
TIRE
Jean-Claude Peron, Greenville, S.C., assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jan. 24, 1980, Ser. No. 114,822
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



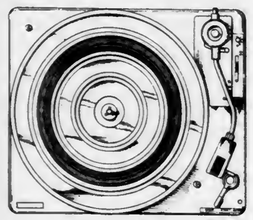
261,386
MOTORCYCLE TOTE BOX
Thomas S. Beaubien, Rancho Palos Verdes; Dennis C. Rich, Long Beach, and Robert E. Oehring, Norwalk, all of Calif., assignors to Bates Industries, Inc., Long Beach, Calif.
Filed Sep. 17, 1979, Ser. No. 77,164
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—158



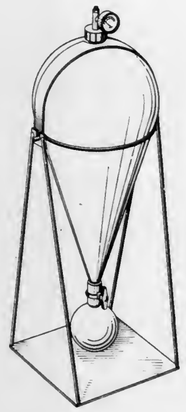
261,387
CONTROL PANEL FOR AIRCRAFT OR THE LIKE
Harry Weitz, New Hyde Park, and Diego M. Cacciatore, Farmingdale, both of N.Y., assignors to Instrument Systems Corporation, Jericho, N.Y.
Filed Apr. 20, 1979, Ser. No. 31,805
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—192



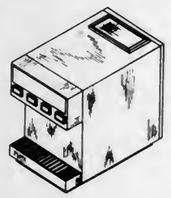
261,388
RECORD TURNTABLE
Raymond Vachus, Yzeure, France, assignor to Thomson-Brandt, Paris, France
Filed Jun. 4, 1979, Ser. No. 44,890
Claims priority, application France, Feb. 5, 1979, 77 277
The portion of the term of this patent subsequent to Sep. 15, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



261,389
FERMENTATION AND BEVERAGE STORAGE APPARATUS
Donald P. Pilla, 648 Cedar Ave., Burlington, Canada (L7T 2R5)
Filed Dec. 19, 1978, Ser. No. 971,067
Claims priority, application Canada, Oct. 31, 1978, 3110784
Term of patent 14 years
Int. Cl. D15—*08*; D23—*01*
U.S. Cl. D15—112

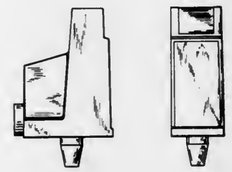


261,390
BEVERAGE DISPENSER
William A. Harvill, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga. and The Cornelius Company, Anoka, Minn.
Filed Jan. 29, 1980, Ser. No. 116,503
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

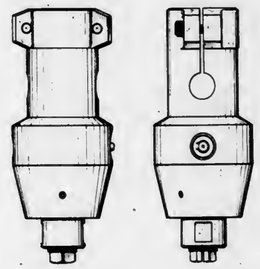




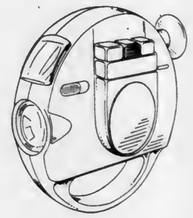
261,391
BEVERAGE DISPENSER VALVE
Walter E. Ranua, Blaine, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.
Filed Feb. 8, 1980, Ser. No. 119,735
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—120



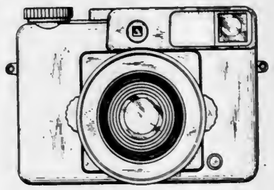
261,392
SPINDLECASE ATTACHMENT FOR TAPPING MACHINES TO CHANGE THE ROTATION OF THE TOOL
Eiji Miyakawa, Tokyo, Japan, assignor to Miyakawa Industry Company, Limited, Seki, Japan
Filed Jun. 12, 1979, Ser. No. 47,856
Claims priority, application Japan, Dec. 15, 1978, 53-53014
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



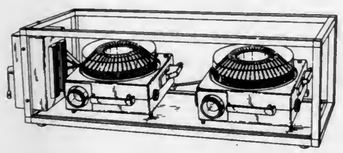
261,393
MOVIE CAMERA
Norbert Schlagheck, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Feb. 28, 1979, Ser. No. 15,781
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 15578
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—4



261,394
CAMERA
Udo M. Geissler, Munich, Fed. Rep. of Germany, assignor to Plaubel, Feinmechanik & Optik GmbH, Frankfurt am Main-Bergen-Enkheim, Fed. Rep. of Germany
Filed Jun. 7, 1978, Ser. No. 913,497
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 738671
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06

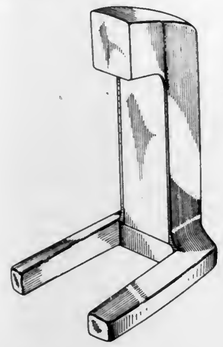


261,395
TARGET SLIDE PROJECTORS CONSOLE
Brain T. Brooksby, 156 Earlsbrook Rd., Redhill, Surrey; Harold J. Murray, 32 New Odiham Rd., Alton, Hampshire; Anthony Simpson, 65 South Hill, Godalming, Surrey, and Stuart M. Peterkin, 30 Leewood Way, Effingham, Surrey, all of England
Filed Feb. 21, 1979, Ser. No. 13,262
Claims priority, application United Kingdom, Aug. 24, 1978, 986059/78
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—11

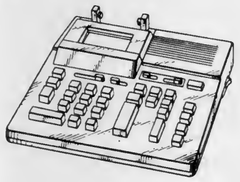


261,396
PHOTOGRAPHIC PRINT WASHER
Roger Wilken, R.F.D. 2-Bonnyvale Rd., Guilford, Vt. 05301
Filed Apr. 30, 1979, Ser. No. 34,837
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—35

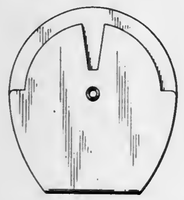
261,397
MICROSCOPE STAND OR SIMILAR ARTICLE
Edwin A. Speaker, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 30, 1979, Ser. No. 34,223
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—131



261,398
DESK TOP ELECTRONIC CALCULATOR
Takashi Hirata, and Hideo Fushimoto, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1979, Ser. No. 64,904
Claims priority, application Japan, Feb. 23, 1979, 54-6649
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



261,399
BLACK JACK SLIDE RULE
Robert G. Wagner, 1077 Wakefield Ave., St. Paul, Minn. 55106
Filed Oct. 15, 1979, Ser. No. 84,939
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D18—10

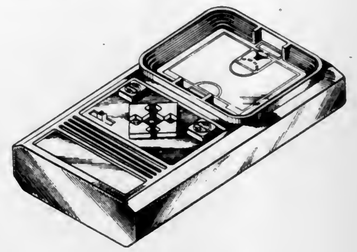




261,400
COMBINED ADHESIVE CONTAINER AND DISPENSER
Glenn L. Beall, Gurnee, Ill.; Lawrence Petersen, Mount Vernon, N.Y., and Richard J. Dauksys, Glastonbury, Conn., assignors to Loctite Puerto Rico, Sabana Grande, P.R.
Continuation of Ser. No. 921,620, Jul. 3, 1978, abandoned. This application Jan. 28, 1980, Ser. No. 116,350
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—66

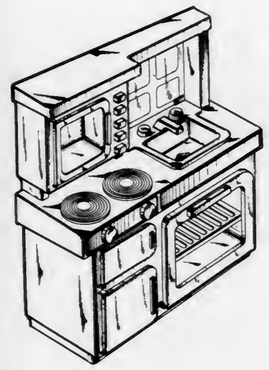
261,401
SIGN POST SUPPORT
Carroll E. Collis, 5640 Shull Street, Bell Gardens, Calif. 90201
Filed Dec. 7, 1979, Ser. No. 83,589
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—41

261,402
BASKETBALL GAME DISPLAY AND CONTROL PANEL OR SIMILAR ARTICLE
Robert B. Lovejoy, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Oct. 16, 1978, Ser. No. 951,903
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



261,403
TOY HOOP ROLLER
Joseph Pataki, 112 Graham Rd., Ithaca, N.Y. 14850
Filed Jun. 21, 1978, Ser. No. 917,688
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—101

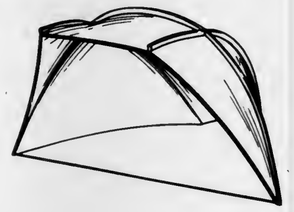
261,404
TOY KITCHEN
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Jan. 16, 1980, Ser. No. 112,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122



261,405
TOY RABBIT
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 15, 1980, Ser. No. 112,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—187

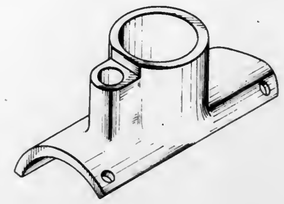
261,406
SKATE WHEEL
Gary L. Corbin, 11117 Klingerman St., El Monte, Calif. 91733
Filed Jul. 11, 1979, Ser. No. 56,546
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

261,407
SHELTER
Charles W. Moss, c/o Moss Tent Works, Mt. Battle St., Camden, Me. 04843
Filed Jun. 1, 1979, Ser. No. 44,592
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253





261,408
GAFF HOLDER FOR THE SPUR OF A GAMECOCK
John W. Bryan, 3501 Washington Dr., Falls Church, Va. 22042
Filed Mar. 14, 1980, Ser. No. 130,538
Term of patent 14 years
Int. Cl. D22—*02;* D30—*99*
U.S. Cl. D22—1



261,409
LONG BARREL HOLSTER
John E. Bianchi, 1601 Wilt Rd., and Richard D. E. Nichols, 813 Cozy Ct., both of Fallbrook, Calif. 92390
Filed Dec. 7, 1979, Ser. No. 101,200
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

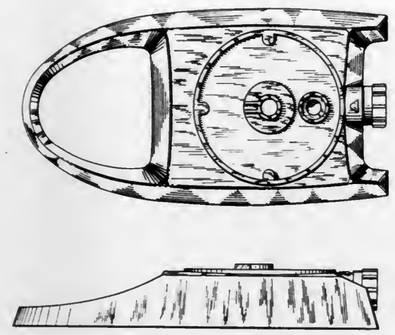
261,410
FISHING LURE
Dewey C. Mullins, Virginia Beach, Va., assignor to Mullins Lure Company, Virginia Beach, Va.
Filed Dec. 10, 1979, Ser. No. 101,670
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—29

261,411
FISHING ROD GRIP
Tetsuyuki Doi, and Takeshi Shohoji, both of Fukuyama, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Feb. 4, 1980, Ser. No. 118,236
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

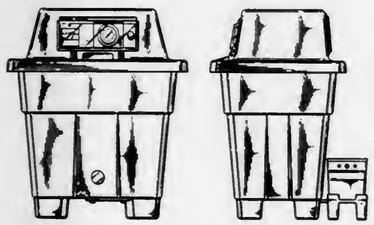
261,412
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan
Filed Oct. 10, 1979, Ser. No. 83,521
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

261,413
VACUUM FILTER
Roy T. Eddleman, 60916 Terminal Annex, Los Angeles, Calif. 90054
Filed Oct. 1, 1979, Ser. No. 80,437
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

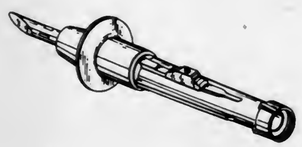
261,414
SPRINKLER BASE
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Mar. 8, 1979, Ser. No. 18,757
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



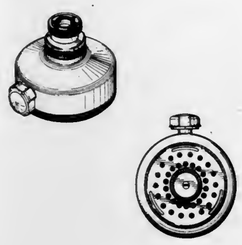
261,415
CHLORINE GENERATOR
Dow Yates, 2950 S. Shaver C-22, Pasadena, Tex. 77502
Filed Mar. 12, 1979, Ser. No. 19,850
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



261,416
CAN PIERCING SPRAYING TOOL
Larry O. Siefken, R.R. 1, Box 75, Palmer, Iowa 50571
Filed Aug. 2, 1978, Ser. No. 930,583
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

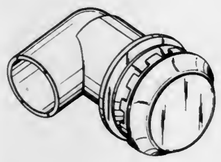


261,417
SHOWERHEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Aug. 27, 1979, Ser. No. 70,171
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, MR6936
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



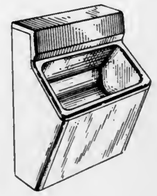
261,418
COMBINED STRAINER AND PLUG FOR A SINK OR THE LIKE
Edward Jackson, 26 McGahan St., Carina, Queensland, 4152, Australia
Filed Jun. 7, 1979, Ser. No. 46,546
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42

261,419
SAFETY SUCTION FITTING FOR HYDRO-THERAPY SPAS
Gerald W. Moreland, 11651 Pickett La., Garden Grove, Calif. 92640
Filed Nov. 5, 1979, Ser. No. 91,478
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42

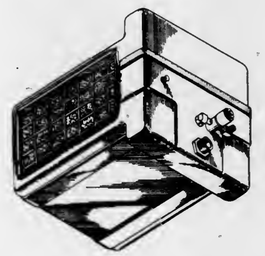




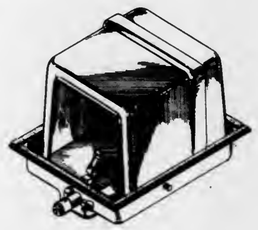
261,420
COMBINED PLUMBING FIXTURE BOWL AND CABINET
Lawrence E. Wolske, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 30, 1977, Ser. No. 866,174
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—59



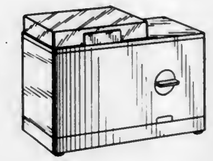
261,421
HUMIDIFIER FOR A HOT AIR FURNACE OR THE LIKE
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Aug. 24, 1979, Ser. No. 70,518
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



261,422
HUMIDIFIER FOR A HOT AIR FURNACE OR THE LIKE
William B. Morrow, Hillsville, Va., assignor to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Aug. 24, 1979, Ser. No. 70,519
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—147



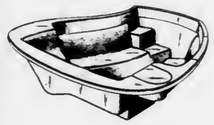
261,423
DENTURE CLEANER OR THE LIKE
Hans-Jürgen Geissler, Frankfurt, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Oct. 4, 1979, Ser. No. 81,945
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, MR 10180
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D24—10

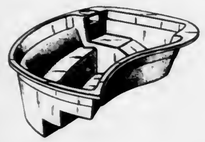


261,424
RACK FOR HOLDING DENTAL INSTRUMENTS
Robert A. Anson, 1423 Stony Brook Rd., Stony Brook, N.Y. 11790
Filed Mar. 9, 1978, Ser. No. 885,100
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—16

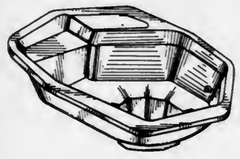
261,425
BONE CEMENT INJECTOR HANDPIECE
John A. Bruhn, New Paris, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.
Filed Feb. 11, 1980, Ser. No. 120,407
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

261,426
HYDROTHERAPY SPA
Richard G. Reineman, Newport Beach, Calif., assignor to Marlin Fiberglass, Inc., Huntington Beach, Calif.
Filed Aug. 27, 1979, Ser. No. 69,802
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02*
U.S. Cl. D24—38

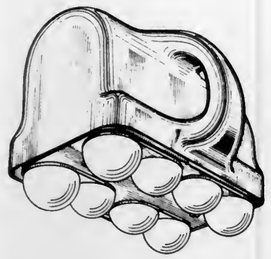




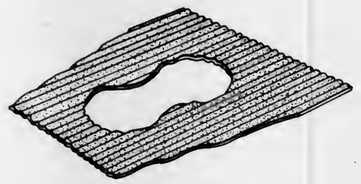
261,427
WHIRLPOOL BATHTUB
Philip I. Ogden, 1051 Boeing, Boise, Id. 83705
Filed Sep. 24, 1979, Ser. No. 78,097
Term of patent 14 years
Int. Cl. D24—*01;* D25—*99;* D23—*02*
U.S. Cl. D24—38



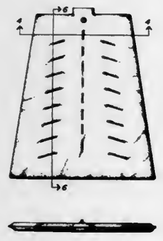
261,428
CHIROPRACTIC VIBRATOR
Edward D. Noble, 29 Havenbrook Blvd., Willowdale, Ontario, Canada (M2J 1A3)
Filed Nov. 20, 1978, Ser. No. 962,451
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



261,429
BED PAN SEAT LINER
Joan Hanna-Burns, 3630 S. Sepulveda 1-239, Los Angeles, Calif. 90034
Filed Aug. 31, 1979, Ser. No. 71,697
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51



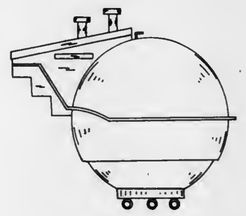
261,430
VACUUM SPLINT
Peter Baturin, Winnipeg, Canada, assignor to Medical Products Institute Incorporated, Winnipeg, Canada
Filed Oct. 10, 1978, Ser. No. 949,904
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



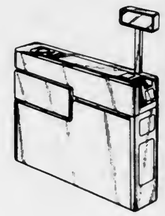


261,431
VENDING TRAILER
Shirley Barton, P.O. Box 2065, Sarasota, Fla. 33578
Filed Jan. 26, 1979, Ser. No. 6,631
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—10

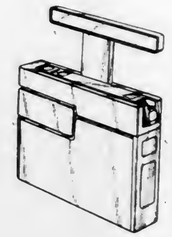
261,432
EMERGENCY SHELTER FOR UNDERGROUND INSTALLATION
James H. Ballard, 513 Bexar Ave., Hamilton, Ala. 35570
Filed Mar. 13, 1980, Ser. No. 130,076
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—36



261,433
AUTOMATIC TICKET GATE
Yoshihiko Sugano, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 4, 1980, Ser. No. 109,518
Claims priority, application Japan, Jul. 13, 1979, 54-28925
Term of patent 14 years
Int. Cl. D25—*02;* D20—*01*
U.S. Cl. D25—50



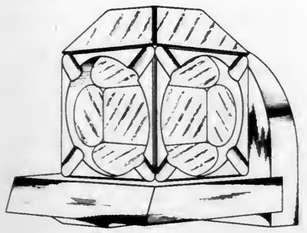
261,434
AUTOMATIC TICKET GATE
Yoshihiko Sugano, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Jan. 4, 1980, Ser. No. 109,518
Claims priority, application Japan, Jul. 13, 1979, 54-28924
Term of patent 14 years
Int. Cl. D20—*01;* D25—*02*
U.S. Cl. D25—50



261,435
ACOUSTICAL CEILING PANEL
Mark R. Weitzman, Toledo, Ohio; Jared R. Kies, Perrysburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sep. 27, 1979, Ser. No. 79,396
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—97

261,436
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Co., Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 35,995
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—80

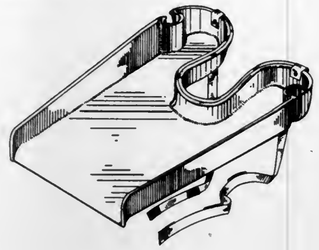
261,437
DECORATIVE WALL LAMP
Terry C. Stekelberg, R.R. #1, Pardeeville, Wis. 53954
Filed Nov. 27, 1978, Ser. No. 963,846
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—87



261,438
PIPE
S. Franklin Sher, 609 Lochmoor, Danville, Calif. 94526
Filed Jun. 2, 1980, Ser. No. 156,318
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

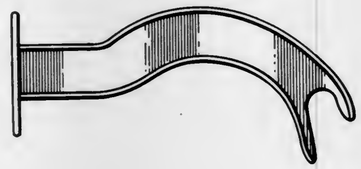
261,439
PIPE
S. Franklin Sher, 609 Lochmoor, Danville, Calif. 94526
Filed Jun. 2, 1980, Ser. No. 156,319
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

261,440
SHAMPOO DRAINAGE TRAY
Edward J. Pasquarello, 5 Silvermine Rd., Woburn, Mass. 01801
Filed Feb. 5, 1979, Ser. No. 9,111
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—20



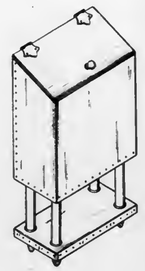
261,441
CURLING IRON
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Jun. 19, 1980, Ser. No. 158,840
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 73 MR 8842
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

261,442
OROPHARYNGEAL AIRWAY
Charles C. Anderson, 2827 W. Meadowwood Dr., Chesapeake, Va. 23321
Filed Apr. 17, 1979, Ser. No. 30,826
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D29—6

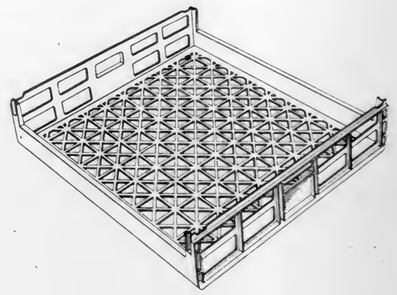




261,443
WALL-MOUNTED MAILBOX
William DeLange, 5826 Foxboro Trail, Springfield, Mo. 65804
Filed Jun. 4, 1979, Ser. No. 44,958
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—33



261,444
BAKERY TRAY
Emil L. Munch, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Nov. 30, 1978, Ser. No. 965,154
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D34—43



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1981

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Lowe, Edward J.; Minshall, Michael W.; and Wilson, Arthur, 4,296,082, Cl. 423-305.000.

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Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,296,310, Cl. 219-440.000.

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Long, E. David, 4,295,451, Cl. 123-438.000.

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Cullison, Steven B.; and Slack, Charles B., 4,296,278, Cl. 179-1.0VL.

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Carlson, Lawrence E., 4,295,316, Cl. 52-588.000.

Aluminum Pechiney: *See—*
Maurel, Pierre; Nicolas, Francois; and Bosca, Bernard, 4,296,073, Cl. 423-3.000.

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McMillen, Bobby E., 4,296,343, Cl. 310-154.000.

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DeMaria, Francesco, 4,296,059, Cl. 264-130.000.
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Lang, Stanley A., Jr.; and Murdock, Keith C., 4,296,030, Cl. 260-239.00A.

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Ammco Tools, Inc.: *See—*
Spainhour, Phillip A.; Morrison, Leonard A.; and Hampton, Robert S., Jr., 4,295,634, Cl. 254-10.500.

AMP Incorporated: *See—*
Vanderheyden, Eric E.; and Casciotti, Albert, 4,296,390, Cl. 333-182.000.
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Pomonik, George M., 4,295,237, Cl. 9-8.00P.
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Andersen, Alan J.: *See—*
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Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.
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Antos, George J., to UOP Inc. Hydrocarbon dehydrocyclization with an attenuated superactive multimetallic catalytic composite. 4,295,960, Cl. 208-139.000.
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Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,295,847, Cl. 8-189.000.
Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, 4,296,149, Cl. 427-130.000.
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Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, 4,295,879, Cl. 75-0.5AA.
Battan, Howard R.: *See—*
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
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Battelle Memorial Institute: *See—*
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, 4,295,948, Cl. 204-159.230.
Bauer, Hartwig W.: *See—*
Ax, Wolfgang; Bauer, Hartwig W.; and Sedlacek, Hans-Harald, 4,296,201, Cl. 435-7.000.
Bauer, Helmut, to Maschinenfabrik Burckhardt AG. Process and apparatus for intermittent polymerization at elevated pressure. 4,296,221, Cl. 526-87.000.
Baurain, Roger M.; and Trouet, Andre B. L., to Institut International de Pathologie Cellulaire et Moleculaire. Derivatives of doxorubicine, their preparation and use. 4,296,105, Cl. 424-180.000.
Baxter Travenol Laboratories, Inc.: *See—*
Kulin, Ralph; and Stauber, Ronald C., 4,295,619, Cl. 248-95.000.
Bayer Aktiengesellschaft: *See—*
Boehmke, Gunther, 4,295,859, Cl. 44-51.000.
Duchardt, Karl H.; and Gehrke, Gunter, 4,296,044, Cl. 260-381.000.
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,296,241, Cl. 560-124.000.
Kaspers, Helmut; and Brandes, Wilhelm, 4,296,116, Cl. 424-272.000.
Pedain, Josef; Uerdingen, Walter; and Muller, Hans-Jurgen, 4,296,230, Cl. 528-67.000.
Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, 4,296,047, Cl. 260-974.000.
Schroeder, Josef, 4,296,043, Cl. 260-352.000.
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.
Walz, Klaus; and Fiegel, Joachim, 4,295,852, Cl. 8-560.000.
BBC Brown, Boveri & Company Limited: *See—*
Floessel, Carl D., 4,296,271, Cl. 174-28.000.
Lang, Ernst; and Niemeyer, Lutz, 4,296,285, Cl. 200-61.080.
Mastner, Jiri, 4,296,412, Cl. 340-870.190.
Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research & Engineering Co. Catalysts hydrocarbon treating processes. 4,295,995, Cl. 252-431.00C.
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., to Exxon Research & Engineering Co. Catalysts for hydrocarbon treating processes. 4,295,996, Cl. 252-431.00C.
Beasley, Denny D., to Beasley Electric Corporation. Motor having electronically switched stator field current and integral torque control. 4,296,362, Cl. 318-138.000.
Beasley Electric Corporation: *See—*
Beasley, Denny D., 4,296,362, Cl. 318-138.000.
Beatrice Foods Company: *See—*
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.
Beattie, Ralph G.: *See—*
Seeburger, Harold O.; Beattie, Ralph G.; and Stevens, Violete L., 4,296,220, Cl. 525-507.000.
Beattie, Thomas R.; Christensen, Burton G.; and Dininno, Frank P., to Merck & Co. Inc. 7-Substituted methyl cephalosporins derivatives and analogues thereof. 4,296,111, Cl. 424-246.000.
Beaver, Bryan: *See—*
Fitzgerald, Stella; and Beaver, Bryan, 4,295,292, Cl. 46-201.000.
Beaver, Terry R.: *See—*
Kerle, Edward J.; and Beaver, Terry R., 4,296,009, Cl. 260-28.50R.
Beck, Gerhard: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.
Beck, Richard A.; and Presley, Glen T., to Parno Corporation. Auxiliary drive system. 4,295,539, Cl. 180-243.000.
Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, to Siemens Aktiengesellschaft. Installation for control of a traffic light system by vehicles having an automatic location determination. 4,296,400, Cl. 340-32.000.
Becker, James; and Neill, Daniel L., to Kelsey Hayes Company. Electric brake system. 4,295,687, Cl. 303-20.000.
Becker, Paul D.: *See—*
Rudolph, Paul; and Becker, Paul D., 4,295,864, Cl. 55-40.000.
Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, to Hoechst Aktiengesellschaft. Packaging sheath with contents. 4,295,563, Cl. 206-205.000.
Beckert, Alexander; and Knobbe, Karl-Heinz, to Reinhard Mohn GmbH. Method and apparatus for drying and setting the adhesive on books by vaporization of water using RF energy. 4,296,294, Cl. 219-10.410.
Beckman Instruments, Inc.: *See—*
Cowell, Mark J., 4,295,601, Cl. 233-26.000.
Becton, Dickinson and Company: *See—*
Christinger, Werner, 4 295,477, Cl. 128-766.000.
Percarpio, Edward P., 4,295,572, Cl. 215-247.000.
Quaas, Gary F., 4,295,476, Cl. 128-764.000.
Vincek, Robert C., 4,295,566, Cl. 206-457.000.
Beecham Group Limited: *See—*
Denerley, Paul M., 4,296,032, Cl. 260-245.20R.
Knudsen, Eric T., 4,295,567, Cl. 206-534.000.
Behr, R. Douglas: *See—*
Sutrina, Thomas A.; and Behr, R. Douglas, 4,295,919, Cl. 156-498.000.
Behringwerke Aktiengesellschaft: *See—*
Ax, Wolfgang; Bauer, Hartwig W.; and Sedlacek, Hans-Harald, 4,296,201, Cl. 435-7.000.
Beiersdorf Aktiengesellschaft: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Beinitz, Karl; and Schubert, Joachim, to Leybold-Heraeus GmbH. Ionization vacuum gauge circuit. 4,296,356, Cl. 315-135.000.
Belanger, Andre: *See—*
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.
Bell, Clinton C., to Ward Machinery Company, The. Stripping device for removing waste sheet board. 4,295,842, Cl. 493-342.000.
Bell, Dwain C.; and Anderson, Lloyd E. Roll lifting dollies. 4,295,777, Cl. 414-458.000.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Adaptive control of gap voltage and power to control servo operation of an electrical discharge machining apparatus. 4,296,302, Cl. 219-69.00G.
Bell, Robert L., to Besco Industries, Inc. Force responsive transducer. 4,295,376, Cl. 73-724.000.
Bell Telephone Laboratories, Incorporated: *See—*
Hafer, Edward H., 4,296,492, Cl. 370-14.000.
Henry, Paul S., 4,296,374, Cl. 324-77.00B.
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.
Snyder, Dennis R., 4,295,702, Cl. 339-97.00P.
Stone, Dale E., 4,296,337, Cl. 307-356.000.
Wong, William H., 4,296,454, Cl. 361-380.000.
Bellaff, Leslie. Heat reclaimer. 4,295,519, Cl. 165-11.00R.
Bemis, Richard S.; and McCartan, Daniel A., to Owens-Corning Fiberglas Corporation. Fibrous glass blowing insulation and process. 4,296,164, Cl. 428-219.000.
Benedictine Monks Inc.: *See—*
Reedy, Charles B., 4,295,459, Cl. 126-60.000.
Beneke, Wolfgang; and Teichmann, Paul, to Trutzschler GmbH & Co. KG. Carding wire brush arrangement. 4,295,248, Cl. 19-113.000.
Bennett, Alan F.: *See—*
Clayton, Edward R. C.; and Bennett, Alan F., 4,295,605, Cl. 236-56.000.
Bennett, Robert W. Fluid-powered submersible sampling pump. 4,295,801, Cl. 417-397.000.
Benson, Henry E.; and Moravec, Terrence D., to UOP Inc. Apparatus for assembling a plastic mining screen. 4,295,918, Cl. 156-434.000.
Bentley, Arthur P. Sonic pressure wave surface operated pump. 4,295,799, Cl. 417-240.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to

Weyerhaeuser Company. Treating pulp with oxygen. 4,295,925, Cl. 162-19.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to Weyerhaeuser Company. Method and apparatus for treating pulp with oxygen. 4,295,926, Cl. 162-57.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., to Weyerhaeuser Company. Method and apparatus for treating pulp with oxygen and storing the treated pulp. 4,295,927, Cl. 162-57.000.

Bepple, Henry: *See—*
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.000.

Berg, Gunner: *See—*
Hagberg, Gideon, 4,295,969, Cl. 210-223.000.

Berg, Ramon A.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.

Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, to Boehringer Mannheim GmbH. Diagnostic composition for the detection of leukocytes and chromogens useful therein. 4,296,202, Cl. 435-29.000.

Berger, Eugene, to Solvay & Cie. Polymerization of olefins. 4,296,223, Cl. 526-125.000.

Berger, Mitchell H.: *See—*
Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., 4,296,232, Cl. 528-179.000.

Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, to Hoechst Aktiengesellschaft. Process for the production of liquid chlorine. 4,295,945, Cl. 204-128.000.

Berlec, Ivan; and McCarty, Lewis V., to General Electric Company. Incandescent lamp. 4,296,352, Cl. 313-315.000.

Bernier, John A., to Fisher Scientific Company. High-voltage spark source. 4,296,358, Cl. 315-241.00R.

Berrebi, Claudine; and Manoussos, Georges, to L'Oreal. Process for extracting embryonic calf skin and pharmaceutical compositions containing the same. 4,296,099, Cl. 424-105.000.

Berry, Peter J., to Barr & Stroud Limited. Scanning mirror position system. 4,296,325, Cl. 250-347.000.

Besco Industries, Inc.: *See—*
Bell, Robert L., 4,295,376, Cl. 73-724.000.

Betsinger, James D.; and Bailey, James P. Shower apparatus. 4,295,612, Cl. 239-310.000.

Bey, Roger, to Babcock & Wilcox Company, The. Drag ball valve including variable pressure reducing means. 4,295,493, Cl. 138-43.000.

Beyer, Franz; and Sedlmair, Siegfried, to Siemens Aktiengesellschaft. P-I-N type diode high frequency switch for secondary radar interrogation devices and transponders. 4,296,414, Cl. 343-5.0SW.

Bezverkhny, Alexandr M.: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Biela, John A., to Schiffman, Jerome D., deceased. Comb and the method of making same. 4,295,480, Cl. 132-151.000.

Bigalke, Erhard: *See—*
Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, 4,295,551, Cl. 192-0.076.

Bill, Robert C.; and Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Composite seal for turbomachinery. 4,295,786, Cl. 415-174.000.

Binggeli, Bruno K.: *See—*
Kiess, Helmut G.; and Binggeli, Bruno K., 4,296,478, Cl. 365-112.000.

Bingham, Robert M.: *See—*
LeBlanc, Ralph W.; and Bingham, Robert M., 4,295,966, Cl. 210-180.000.

Bishop, John F.; and Bowman, Wayne A., to Eastman Kodak Company. Two-sheet diffusion transfer assemblages and photographic elements. 4,296,195, Cl. 430-215.000.

Bixby, Guy T., to Gates Rubber Company, The. Hose with internal insert member. 4,295,496, Cl. 138-122.000.

Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., to Illinois Tool Works Inc. Self-tapping stainless steel screw and method for producing same. 4,295,351, Cl. 72-38.000.

Black, John W., to Pemco-Kalamazoo, Inc. Disk wheel with resilient bearing support and rigid annular tread mounting surface. 4,295,686, Cl. 301-63.0DD.

Blair, Russell M., to Slickbar, Inc. Floating boom end connectors. 4,295,756, Cl. 405-70.000.

Blake, Charles H.; and Wood, Donald H., to Outboard Marine Corporation. Speed selection for a direct current permanent magnet motor. 4,296,363, Cl. 318-349.000.

Blake, David E.: *See—*
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,295,301, Cl. 51-165.880.

Blanding, Douglass L.: *See—*
Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., 4,296,070, Cl. 422-65.000.

Blanks, James A.: *See—*
Moore, W. Edward C.; and Blanks, James A., 4,295,613, Cl. 241-2.000.

Blasnik, William, to Hardware Designers, Inc. Bearing construction. 4,295,688, Cl. 308-3.800.

Blevins, Charles W.: *See—*
Whitaker, Roger B.; and Blevins, Charles W., 4,296,409, Cl. 340-684.000.

Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., to Tyco Laboratories. Bit pressure gauge for well drilling. 4,296,321, Cl. 250-254.000.

Blodgett, Camille C. Children's sleeping garments. 4,295,230, Cl. 2-69.500.

Blodgett, Norman S.: *See—*
Nicholson, William H., 4,295,506, Cl. 144-193.00D.

Blount, David H. Process for the production of poly (polyisocyanate-polyol-alkali metal silicate) solid or foamed products. 4,296,211, Cl. 521-154.000.

Blue Circle Industries Limited: *See—*
Smith, David E., 4,295,933, Cl. 162-168.0NA.

Blutschkau, Heinke: *See—*
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.

Boart International Limited: *See—*
Holmberg, John M., 4,295,751, Cl. 403-306.000.

Bocquet, Gilbert: *See—*
Droux, Michel; and Bocquet, Gilbert, 4,295,871, Cl. 65-3.410.

Bodart, Robert; and Werts, Jean P. A. R. J., to U.S. Philips Corporation. Method of and arrangement for regenerating start-stop signals. 4,296,493, Cl. 370-48.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Flavoring with 1-ethoxy-1-ethanol acetate. 4,296,137, Cl. 426-534.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Flavoring with 1-n-butoxy-1-ethanol acetate. 4,296,138, Cl. 426-534.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Huber, Bernhard, 4,295,854, Cl. 23-230.0PC.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Fuels and heating oils, a process for their preparation and their use. 4,295,859, Cl. 44-51.000.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Boehringer Mannheim: *See—*
Weiss, Erich; and Ungermann, Dieter, 4,296,071, Cl. 73-864.110.

Boehringer Mannheim GmbH: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Boeing Company, The: *See—*
Adamski, John L., 4,296,327, Cl. 250-423.00R.

Boldt, Wayne A. Liquid egg blend. 4,296,134, Cl. 426-250.000.

Bolte, Steven B.: *See—*
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.

Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., to Hooker Chemicals & Plastics Corp. Film-coated cathodes for halate cells. 4,295,951, Cl. 204-242.000.

Bond, Ned J., III. Pneumatically operated grain handling apparatus. 4,295,614, Cl. 241-34.000.

Boogers, Wilhelmus P. L., to B.V. Arenco P.M.B. Method and device for manufacturing cigars. 4,295,479, Cl. 131-60.000.

Book, Harold M. Diaphragm and ball valve. 4,295,488, Cl. 137-414.000.

Boone, Jacob J.: *See—*
Terry, Robert R.; and Boone, Jacob J., 4,295,573, Cl. 215-348.000.

Bopst, John H., III. System for controlling the movement and locking of tape apparatus. 4,295,921, Cl. 156-577.000.

Borg-Warner Corporation: *See—*
McIntosh, Arthur M., 4,295,798, Cl. 417-212.000.

Borowitz, Raymond P. Side dispensing closure. 4,295,584, Cl. 222-519.000.

Borst, Gaylord M., to Outboard Marine Corporation. Inboard-outboard driving mechanism including a hydraulically assisted steering system. 4,295,833, Cl. 440-63.000.

Borsting, Otto W.: *See—*
Card, Lorin P.; and Borsting, Otto W., 4,295,630, Cl. 251-14.000.

Bortolussi, Everest J. Magnetic safety clutch for rotary lawnmower. 4,295,327, Cl. 56-11.300.

Borzatta, Valerio; Cristofori, Manlio; Morotti, Mauro; and Mascellani, Giuseppe, to Alpha Farmaceutici S.p.A. Derivatives of benzoyl-phenoxyalkanoic acids having normolipemizing activity. 4,296,125, Cl. 424-315.000.

Bosca, Bernard: *See—*
Maurel, Pierre; Nicolas, Francois; and Bosca, Bernard, 4,296,073, Cl. 423-3.000.

Bosch, Erhard: *See—*
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.

Boswell, George T., to Frontier Industries, Inc. Toy projectile. 4,295,290, Cl. 46-74.00C.

Bott, John A. Article carrier for automotive vehicles. 4,295,587, Cl. 224-321.000.

Bottiglia, Augusto, to Sio-Societa per l'Industria Dell'Ossigenc e di Altri Gas. Method and device for welding protected metal parts. 4,296,300, Cl. 219-61.700.

Boucher, Pierre, to Etablissements Boucher Freres. Device for holding a workpiece to be machined in a specific position in relation to a machine-tool on which it may be fixed. 4,295.641, Cl. 269-136.000.



Boudreau, Archie E. Milking apparatus. 4,295,490, Cl. 137-595.000.

Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, to Texas Instruments Incorporated. Weatherproofed condition responsive switch. 4,296,287, Cl. 200-83.00P.

Boultinghouse, Harold D., to Phillips Petroleum Company. Fluorinated polymeric surfaces. 4,296,151, Cl. 427-255.100.

Boussekey, Bernard: *See—*
Chielens, Alain; and Boussekey, Bernard, 4,295,825, Cl. 432-116.000.

Boussuges, Pierre, to Neyrpic. Starting of pumps or turbopumps. 4,295,782, Cl. 415-1.000.

Bouvet, Pierre; and Lalu, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Polyfluorinated sulfonamides. 4,296,034, Cl. 260-326.820.

Bovone, Luigi. Apparatus for automatically producing glazed insulating window or door panels. 4,295,920, Cl. 156-557.000.

Bowden, Edgard A., to Mobil Oil Corporation. On-board analog reproducer unit for ocean-bottom seismometer. 4,296,442, Cl. 360-6.000.

Bowman, Arthur F.: *See—*
Smith, Don H.; Bowman, Arthur F.; and Junk, Norman M., 4,295,424, Cl. 102-322.000.

Bowman, Wayne A.: *See—*
Bishop, John F.; and Bowman, Wayne A., 4,296,195, Cl. 430-215.000.

Bowsky, Benjamin, to Emerson Electric Co. Hermetic refrigeration terminal. 4,296,275, Cl. 174-152.0GM.

Brady, Michael B. C.: *See—*
Esterson, Maurice; and Brady, Michael B. C., 4,296,385, Cl. 331-90.000.

Brand, Derek A.; and Brand, Derek R., to Tyco Industries, Inc. Pick-up shoe and motor contact assembly for toy vehicle. 4,295,295, Cl. 46-259.000.

Brand, Derek R.: *See—*
Brand, Derek A.; and Brand, Derek R., 4,295,295, Cl. 46-259.000.

Brandes, Wilhelm: *See—*
Kaspers, Helmut; and Brandes, Wilhelm, 4,296,116, Cl. 424-272.000.

Brandt, Howard C.; and Grabowski, Leonard R., to General Motors Corporation. Ball nut and screw assembly with travel limit stop. 4,295,384, Cl. 74-424.8NA.

Brandwijk, Willem; and Dam, Herman, to IHC Holland N.V. Support frame for motor, pump and suction tube of a suction dredger. 4,295,286, Cl. 37-58.000.

Braun, Erwin: *See—*
Schuler, Peter; and Braun, Erwin, 4,295,857, Cl. 23-301.000.

Braun, Franz: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., to Hoechst Aktiengesellschaft. Vinyl polymer with acetylacetoxy groups, process for its manufacture and an agent obtained thereof. 4,296,226, Cl. 526-316.000.

Breen, John J., to Eastman Kodak Company. Camera mechanism employing a multifunction control member. 4,295,715, Cl. 354-25.000.

Brendel, Thomas E.: *See—*
Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., 4,295,344, Cl. 62-324.500.

Breslin, Michael D., to Nalco Chemical Company. Phenolic compounds as viscosity preservatives during hypochlorite pulp bleaching. 4,295,928, Cl. 162-73.000.

Bretl, Wayne E.: *See—*
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.

Bricher, Charles W.; and Herpers, Ferdinand J., to Tennant Company. Scarifying machine. 4,295,274, Cl. 30-347.000.

Bridgestone Tire Company Limited: *See—*
Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, 4,295,512, Cl. 152-354.00R.
Ohashi, Takashi; Okoyama, Toru; and Arai, Katsuhiko, 4,296,170, Cl. 428-313.000.
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.

Brink, Dirk Marinus: *See—*
Foxcroft, Garth, 4,295,510, Cl. 152-220.000.

Brinkerhoff, VerDon C. Regenative absorption engine apparatus and method. 4,295,335, Cl. 60-673.000.

Bristol, Robert G., to Emhart Industries, Inc. Capacitive scheme for measuring the level of a liquid. 4,295,370, Cl. 73-304.00C.

British Broadcasting Corporation: *See—*
Drewery, John O.; and Storey, Richard, 4,296,434, Cl. 358-105.000.

British Chrome & Chemicals Ltd.: *See—*
Swales, Danvers A.; and Marshall, Michael A., 4,296,076, Cl. 423-53.000.

Bronstert, Klaus: *See—*
Staiger, Gerhard; and Bronstert, Klaus, 4,296,222, Cl. 526-119.000.

Brookfield Athletic Shoe Company, Inc.: *See—*
Landay, David L.; and Wolf, Alvan H., 4,295,655, Cl. 280-11.200.

Brooklyn Union Gas Company: *See—*
McGowan, John B.; and Trimble, John, 4,295,494, Cl. 138-89.000.

Brown, Frank, Jr., to Sunroc Corporation. Wall mounted drinking fountain with push bar actuator. 4,295,609, Cl. 239-29.000.

Brown Group, Inc.: *See—*
Doerer, Daniel M.; and Brunkhorst, Lloyd E., 4,296,053, Cl. 264-26.000.

Brown, Robert M.: *See—*
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.

Brown, Sheldon H.: *See—*
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.

Brown, Thomas R.: *See—*
Natzke, Ronald C.; and Brown, Thomas R., 4,295,287, Cl. 37-103.000.

Brown, William E.: *See—*
Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, 4,296,101, Cl. 424-119.000.

Browne, Leslie J., to Ciba-Geigy Corporation. Pyridylalkylamines. 4,296,115, Cl. 424-263.000.

Brunkhorst, Lloyd E.: *See—*
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Brunner, Herbert, to Nuken GmbH. Apparatus for conditioning bioinjurious waste. 4,295,745, Cl. 366-302.000.

Brunswick Corporation: *See—*
Mapes, Charles W.; and Snyder, Richard H., 4,295,835, Cl. 440-78.000.

Buchi, Georges H.: *See—*
Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., 4,296,258, Cl. 568-364.000.

Buchta, Ervin A., to FMC Corporation. Manual override control for double-acting actuator. 4,295,390, Cl. 74-625.000.

Buck, Gordon K.; and Kozin, Cynthia H., to Harris Corporation. Apparatus for diagnosing faults in individual cylinders in an internal combustion engine. 4,295,363, Cl. 73-117.300.

Buckingham, James W., to Owens-Illinois, Inc. Thermoplastic gob feeding and transfer method and apparatus. 4,296,061, Cl. 264-138.000.

Buckley, Alan J.; and Singer, Michael, to Imperial Chemical Industries Limited. Method for the control of micro-organisms. 4,295,887, Cl. 106-18.330.

Budd Company, The: *See—*
Dickhart, William W., III; and Marvin, Richard H., 4,295,428, Cl. 105-168.000.
Eggert, Walter S., Jr., 4,295,790, Cl. 416-226.000.

Bugaut, Andree: *See—*
Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.

Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, to Degussa Aktiengesellschaft. Binder for coating compositions and its use. 4,296,006, Cl. 260-23.0EP.

Bulgakov, Evgeny G.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

Bulmer, J. Stewart. Hydraulic press. 4,295,358, Cl. 72-453.060.

Bumbalek, Alois J., to Hermann Wegener Schiffgraben. Method for preparing a filter medium. 4,296,056, Cl. 264-49.000.

Bunch, Jesse C. Energy concentrator system. 4,295,462, Cl. 126-424.000.

Bunker Ramo Corporation: *See—*
Chow, Weichien, 4,295,698, Cl. 339-59.00R.

Bunning, Robin G.: *See—*
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Burk, Emmett H., Jr.: *See—*
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., 4,295,858, Cl. 44-1.0SR.

Burke, Michael R. Tie-down structure. 4,295,765, Cl. 410-101.000.

Burnett, Roy E.: *See—*
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., 4,295,542, Cl. 181-108.000.

Burnop, Victor C. Production of overbased magnesium detergent additives. 4,295,981, Cl. 252-33.400.

Burns, Carmen D., to National Semiconductor Corporation. Apparatus and process for laminating composite tape. 4,295,912, Cl. 156-324.000.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,295,861, Cl. 44-63.000.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,295,862, Cl. 44-72.000.

Burroughs Corporation: *See—*
Nahar, Rathindra; and Dietze, Robert H., 4,295,645, Cl. 271-34.000.
Reid, Gilbert R., 4,296,456, Cl. 361-403.000.

Burstinghaus, Rainer; Kiehs, Karl; and Adolphi, Heinrich, to BASF Aktiengesellschaft. 2,2-Dichlorocyclopropyl-methyl-phosphoric acid derivatives. 4,296,108, Cl. 424-210.000.

Bursztejn, Jacques, to Thomson CSF. Device for measuring the quality of a digital radio link. 4,296,495, Cl. 371-22.000.

Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., to John Wyeth & Brother Limited. Process for preparing hexahydroazepine, piperidine and pyrrolidine derivatives. 4,296,029, Cl. 260-239.30R.

Butler Manufacturing Co.: *See—*
Flachbarth, Charles T., 4,295,575, Cl. 220-3.920.

Buzzi, Fabio; and Carniti, Sergio, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Drive mechanism for a watercraft with a surface propeller. 4,295,834, Cl. 440-76.000.

B.V. Arenco P.M.B.: *See—*
Boogers, Wilhelmus P. L., 4,295,479, Cl. 131-60.000.

C.I.S.E. Centro Informazioni Studi Esperienze S.p.A.: *See—*
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.
Cahen, David: *See—*
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Cain, Robert L., to Robinair Manufacturing Corporation. Selective mode multi-stage vacuum pump. 4,295,794, Cl. 417-62.000.
Cale, Albert D., Jr., to A. H. Robins Company, Incorporated. 4,5-Dihydro-3,3-diphenyl-4-hydrocarbylaminomethylfuran-2(3H) ones. 4,296,037, Cl. 260-343.600.
Calspan Corporation: *See—*
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., 4,296,415, Cl. 343-16.00M.
Calvert, Rodney K., to Mead Corporation, The. Carton with carrying strap. 4,295,598, Cl. 229-52.0AL.
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, to United States of America, Agriculture. Melting icebergs to produce fresh water and mechanical energy. 4,295,333, Cl. 60-641.600.
Cammarata, Jacob J., to Medtronic, Inc. Electrode positioning system. 4,295,270, Cl. 29-828.000.
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Wynosky, Thomas A.; and Campbell, Charles A., 4,295,611, Cl. 239-265.370.
Campbell, Christopher J.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.
Campbell, Crom B. Producer gas fueled burner system and drying apparatus. 4,295,822, Cl. 432-29.000.
Campbell, Henry F., to Campbell Research Corporation. Building construction. 4,295,312, Cl. 52-408.000.
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Campbell, Henry F., 4,295,312, Cl. 52-408.000.
Canadian Patents & Dev. Ltd.: *See—*
Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, 4,296,369, Cl. 323-218.000.
Cannavan, Christopher J. Sugar cane harvester. 4,295,325, Cl. 56-13.900.
Canon Kabushiki Kaisha: *See—*
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
Hara, Toshitami; Sato, Yashushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,296,421, Cl. 346-140.00R.
Ishiwatari, Masumi, 4,295,712, Cl. 350-344.000.
Momiyama, Kikuo; and Kumazawa, Kenichi, 4,295,723, Cl. 354-155.000.
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, 4,295,722, Cl. 354-146.000.
Canron Corp.: *See—*
Rhodes, Curtis A.; Jur, Tim A.; and Keating, Donald A., 4,295,259, Cl. 29-402.180.
Caplin, Peter B.; and Harman, Maurice, to Energy Equipment Co. Ltd., The. Method and means for controlling the operation of fluidized bed combustion apparatus. 4,295,817, Cl. 431-7.000.
Card, Lorin P.; and Borsting, Otto W., to Greer Hydraulics, Incorporated. Fail-safe actuator and hydraulic system incorporating the same. 4,295,630, Cl. 251-14.000.
Cardenas, Carlos G.; and Din, Zia U., to SCM Corporation. Process for producing dihydrocarvone geometric isomers. 4,296,257, Cl. 568-361.000.
Cardenas, Carlos G.: *See—*
Ho, T. L.; Din, Zia U.; and Cardenas, Carlos G., 4,296,251, Cl. 562-506.000.
Cardiac Pacemakers, Inc.: *See—*
Bartelt, James T., 4,295,468, Cl. 128-419.0PT.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See—*
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Carl Kurt Walther GmbH & Co. KG: *See—*
Walther, Carl K.; and Temme, Karl, 4,295,300, Cl. 51-163.200.
Carle, Pierre R.: *See—*
Joly, Robert; Pavan, Charles; and Carle, Pierre R., 4,296,091, Cl. 424-18.000.
Carlson, Alfred D.: *See—*
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Carlson, David H. J., to UOP Inc. Catalytic composite, method of manufacture and process for use. 4,295,993, Cl. 252-430.000.
Carlson, Lawrence E., to Aluminum Company of America. Nestable building wall panel. 4,295,316, Cl. 52-588.000.
Carmody, Michael, to Baker International Corporation. Selective lock with setting and retrieving tools. 4,295,528, Cl. 166-315.000.
Carniti, Sergio: *See—*
Buzzi, Fabio; and Carniti, Sergio, 4,295,834, Cl. 440-76.000.
Carrier Corporation: *See—*
Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., 4,295,344, Cl. 62-324.500.
Nakahama, Syuhei; and Yamashita, Etsu, 4,296,308, Cl. 219-136.000.
Carroll, Noel; and Carroll, William F. Revolving security door. 4,295,297, Cl. 49-42.000.
Carroll, William F.: *See—*
Carroll, Noel; and Carroll, William F., 4,295,297, Cl. 49-42.000.
Carson, Don B., to UOP Inc. Process for the manufacture of ethanol from ethylene. 4,296,261, Cl. 568-890.000.
Casciotti, Albert: *See—*
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Cassedy, Kevin H.: *See—*
Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., 4,296,321, Cl. 250-254.000.
Catanzarite, Vincent O. Coating for lithium anode, thionyl chloride active cathode electrochemical cell. 4,296,185, Cl. 429-48.000.
Caterpillar Tractor Co.: *See—*
Cemenska, Richard A.; and Grim, George B., 4,295,449, Cl. 123-300.000.
Ellington, Rayburn P., III, 4,295,276, Cl. 33-181.00R.
Garman, Ronald H., 4,295,306, Cl. 52-208.000.
Rubenthaler, Randall J., 4,295,691, Cl. 308-238.000.
Sommars, Mark F., 4,295,521, Cl. 165-69.000.
Stevens, Samuel B., 4,295,916, Cl. 156-397.000.
Cavalla, John F.: *See—*
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Chen, John C.; and Davis, Herbert L., 4,296,058, Cl. 264-78.000.
Rhum, David, 4,296,225, Cl. 526-260.000.
Warner, Steven B., 4,295,844, Cl. 8-115.500.
Cemenska, Richard A.; and Grim, George B., to Caterpillar Tractor Co. Rotary fuel injection with sequencing. 4,295,449, Cl. 123-300.000.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Defourny, Jacques, 4,296,304, Cl. 219-86.410.
Economopoulos, Marios, 4,295,902, Cl. 148-144.000.
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Centromint Company Establishment: *See—*
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Kopenhaver, Robert, 4,295,445, Cl. 118-695.000.
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Mahl, Gunard O. B., 4,296,153, Cl. 427-444.000.
Chambers Corporation: *See—*
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Checko, John C. Apparatus for applying sealant material to a workpiece. 4,295,914, Cl. 156-357.000.
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Nomine, Michel; and Chelu, Gerard, 4,296,081, Cl. 423-245.000.
Chen, John C.; and Davis, Herbert L., to Celanese Corporation. Process for enhancing the uniformity of dye uptake of false twist texturized polyethylene terephthalate fibrous materials. 4,296,058, Cl. 264-78.000.
Chevreux, Pierre: *See—*
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, 4,295,948, Cl. 204-159.230.
Chevron Research: *See—*
Edwards, Laroy H., 4,295,874, Cl. 71-67.000.
Hudson, Robert L., 4,296,022, Cl. 260-42.460.
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Farnham, Robert A., 4,295,936, Cl. 202-153.000.
Chielens, Alain; and Boussekey, Bernard, to Fives-Cail Babcock. System for the protection of the delivery end of a rotary kiln. 4,295,825, Cl. 432-116.000.
Childs, Michael E., to UOP Inc. Multifunctional gasoline additives. 4,295,860, Cl. 44-63.000.
Chiyoda Kako Kensetsu Kabushiki Kaisha: *See—*
Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, 4,295,967, Cl. 210-189.000.
Chlorine Engineers Corp., Ltd.: *See—*
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Chow, Weichien, to Bunker Ramo Corporation. Electrical connector housing. 4,295,698, Cl. 339-59.00R.
Christensen, Burton G.; Johnston, David B. R.; and Firestone, Raymond A., to Merck & Co., Inc. 7-(or 6-)Substituted-7-(or 6-)acylimino cephalosporin (or penicillin) compounds. 4,296,236, Cl. 542-420.000.
Christensen, Burton G.: *See—*
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Browne, Leslie J., 4,296,115, Cl. 424-263.000.
Di Benedetto, Marianne, 4,296,005, Cl. 260-18.0EP.
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Haberli, Roland; Mollet, Hans; and Scherer, Gustaaf, 4,295,850, Cl. 8-524.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,296,118, Cl. 424-273.00P.
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, 4,295,851, Cl. 8-524.000.
Petitpierre, Jean C.; and Garner, Robert, 4,295,663, Cl. 282-27.500.
Sallmann, Alfred; and Goschke, Richard, 4,296,128, Cl. 424-309.000.
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Cioca, Gheorge; and Siegler, Marcel, to Seton Company. Method of preparing soluble collagen fibers. 4,295,894, Cl. 106-155.000.
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Citizen Watch Company Limited: *See—*
Nakayama, Yasuaki, 4,296,488, Cl. 368-80.000.
Nishikubo, Yasuhiko, 4,296,490, Cl. 368-87.000.
Citron, Jeffrey M. Flexible V-shaped solar tracking concentrating solar energy collector. 4,295,463, Cl. 126-425.000.
Clark, Eugene A.; and Zubkewych, Morris. Football gloves. 4,295,229, Cl. 2-20.000.
Clark, Lancelot P., to Clarks Limited. Footwear. 4,295,238, Cl. 12-142.0RS.
Clarke, Charles J., Jr.: *See—*
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Clayton, Edward R. C.; and Bennett, Alan F., to Spirax Sarco Limited. Steam traps. 4,295,605, Cl. 236-56.000.
Clebant, Jean C., to Societe Europeenne de Propulsion. Flexible union with passive compensation. 4,295,671, Cl. 285-223.000.
Clemens, Lawrence G., to Phillips Petroleum Company. Tilt alarm in a seismic exploration system. 4,296,485, Cl. 367-77.000.
Clemens, Ronald: *See—*
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Clements, Lloyd W. Irrigation sprinklers. 4,295,610, Cl. 239-230.000.
Clouser, Michael T., to Emhart Industries, Inc. Means controlling a flue damper. 4,295,603, Cl. 236-1.00G.
Cohen, Jacques: *See—*
Ingrain, Raymond A.; and Cohen, Jacques, 4,296,396, Cl. 337-66.000.
Cole, Marc. Desalination with improved chlor-alkali production by electrolyticdialysis. 4,295,950, Cl. 204-180.00P.
Coles, Carl R., to Zero-Seal, Inc. Pressure-compensated diaphragm seals for actuators, with self-equalization. 4,295,653, Cl. 277-2.000.
Colgate-Palmolive Company: *See—*
Pierce, Robert C., 4,296,096, Cl. 424-52.000.
Collura, Peter C.: *See—*
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Colt Industries Operating Corp: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,296,302, Cl. 219-69.00G.
Combustion Engineering, Inc.: *See—*
Anthony, Andrew J., 4,295,935, Cl. 376-285.000.
Comizzoli, Robert B.; and Vibronek, Robert D., to RCA Corporation. Method of detecting a thin insulating film over a conductor. 4,296,370, Cl. 324-54.000.
Commissariat a l'Energie Atomique: *See—*
LeClou, Andre, 4,295,620, Cl. 248-154.000.
Compact Video Systems Inc.: *See—*
Holland, Kenneth F., 4,296,431, Cl. 358-12.000.
Conair Corporation: *See—*
Tomaro, Patrick M., deceased, 4,295,283, Cl. 34-97.000.
Concast AG: *See—*
Gloor, Hans, 4,295,278, Cl. 33-182.000.
Condie, Richard M., to University of Minnesota, The Regents of the. Pure intravenous human and animal gamma globulins. 4,296,027, Cl. 260-112.00B.
Conoco Inc.: *See—*
Jones, Emrys H., Jr.; and Lauer, Stephen D., 4,295,536, Cl. 175-214.000.
Motz, Kaye L., 4,295,980, Cl. 252-8.55D.
Ziegenhain, William C., 4,296,057, Cl. 264-63.000.
Conradty GmbH & Co. Metallelektroden KG: *See—*
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Construction Specialties, Inc.: *See—*
Lynn-Jones, David M.; and Stewart, R. Gordon, 4,295,315, Cl. 52-573.000.
Conti, Allen C. Tube with weakened side wall segment. 4,296,157, Cl. 428-36.000.
Continental Group, Inc., The: *See—*
Gerber, Howard L., 4,296,293, Cl. 219-8.500.
Control Data Corporation: *See—*
Hutson, Maurice L., 4,296,477, Cl. 364-900.000.
Conzelmann, Gerhard: *See—*
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, 4,295,253, Cl. 28-255.000.
Cook, Gerald L.: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.
Cookson, Alan H., to United States of America, Energy. High voltage bushing having weathershed and surrounding stress relief collar. 4,296,274, Cl. 174-142.000.
Cooley, James; and Fogle, Ozzie, to Champion International Corporation. Process for production of vinyl film-cellulosic laminates and laminates produced thereby. 4,295,910, Cl. 156-314.000.
Cooper, Alan: *See—*
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Cooper, Julius, to Ideal Toy Corporation. Toy miniature vehicle racing game. 4,295,649, Cl. 273-86.00B.
Copal Company Limited: *See—*
Inoue, Nobuyoshi, 4,295,726, Cl. 354-246.000.
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Frantello, Alfred A.; and Kefauver, Lester R., 4,295,324, Cl. 56-12.700.
Cornell, William D., to Sherwood Medical Industries Inc. Blood sample collection and phase separation device. 4,295,974, Cl. 210-789.000.
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Luers, George A., 4,295,872, Cl. 65-30.110.
Wu, Che-Kuang, 4,296,479, Cl. 365-119.000.
Cosentino, Cesare C.: *See—*
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Cottrill, William P.; and Cisternino, Andrew J., to Evacuators, Inc. Unloader for hopper cars and method. 4,295,775, Cl. 414-375.000.
Couchman, James C., to General Dynamics Corporation. Fastener incorporating removable ultrasonic transducer. 4,295,377, Cl. 73-761.000.
Cowell, Mark J., to Beckman Instruments, Inc. Centrifuge tube holder. 4,295,601, Cl. 233-26.000.
Cox, Russell C.: *See—*
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Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-6,7-disubstituted-5-(acyl)benzofuran-2-carboxylic acids. 4,296,122, Cl. 424-285.000.
Cragoe, Edward J., Jr., to Merck & Co., Inc. 4-(Pyridyl, piperazinyl and thiazolyl substituted thiazolyl)-3-hydroxy-3-pyrroline-2,5-diones. 4,296,237, Cl. 544-405.000.
Cramer, John J.: *See—*
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Cranston, Douglas R.: *See—*
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Crase, Gary M.; and Trzeciak, Kurt M., to Smith International, Inc. In-hole motor drill with locking bit clutch. 4,295,535, Cl. 175-101.000.
Crawford, William V.: *See—*
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., 4,295,668, Cl. 285-21.000.
Creative Tool Company: *See—*
Dooley, Joseph L.; and Dooley, Daniel J., 4,295,364, Cl. 73-119.00A.
Cristofori, Manlio: *See—*
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Crompton & Knowles Corporation: *See—*
Hoddinott, David C., 4,295,812, Cl. 425-114.000.
Cross, Billy J., to Cross, Billy J. Material handling apparatus. 4,295,560, Cl. 198-517.000.
Cucinella, Salvatore; Mazzei, Alessandro; and Dozzi, Giovanni, to Snamprogetti S.p.A. Process for the preparation of poly-(-N-alkyliminoalanes). 4,296,045, Cl. 260-448.00R.
Cugini, John J.: *See—*
Cugini, Larry, Sr.; and Cugini, John J., 4,295,275, Cl. 33-1.00G.
Cugini, Larry, Sr.; and Cugini, John J. Method and apparatus for making raised and flat letter signs. 4,295,275, Cl. 33-1.00G.
Cullison, Steven B.; and Slack, Charles B., to Altec Corporation. Loudspeaker overload protection circuit. 4,296,278, Cl. 179-1.0VL.
Cummings, J. Francis; and Werner, Alfred O. Friction heat generator apparatus. 4,295,461, Cl. 126-247.000.
Cunniff, James J. Plug cutter. 4,295,763, Cl. 408-86.000.
Curts, Julius: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Polyurethane foams using a polyurea polymer polyol. 4,296,213, Cl. 521-166.000.
Cutler, Barry L. Framework holder for attaching container to floor machine. 4,295,622, Cl. 248-313.000.
Cutting, Gloria T. Medication record-keeping package. 4,295,664, Cl. 283-1.00A.
Dabisch, Kenneth W.; and Richards, John S., to Rockwell International Corporation. Non-contact counter. 4,296,314, Cl. 235-92.0SB.

Dahlberg, Anders, to Tatis Plasttatningar AB. Expansion joint element. 4,295,311, Cl. 52-396.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Hoshino, Masaru, 4,296,068, Cl. 422-62.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Hayashi, Masaaki; Sasaki, Hiroharu; and Tsuneta, Kazuyoshi, 4,296,014, Cl. 260-29.6NR.

Daicel Ltd.: *See—*
Sato, Kazuo, 4,296,243, Cl. 560-210.000.

Daikin Kogyo Co., Ltd.: *See—*
Fukui, Shosin; and Akazawa, Tadashi, 4,296,224, Cl. 526-243.000.
Ohsaka, Yohnosuke; and Tohzuka, Takashi, 4,296,265, Cl. 570-138.000.

Daimler-Benz Aktiengesellschaft: *See—*
Wulf, Helmut, 4,295,520, Cl. 165-41.000.

Dalboussiere, Gerard; and Draper, Wilburn D., to International Business Machines Corp. Select system for priority interface circuitry. 4,296,463, Cl. 364-200.000.

Daly, James E. Game and article for use therewith. 4,295,647, Cl. 273-1.00G.

Dam, Herman: *See—*
Brandwijk, Willem; and Dam, Herman, 4,295,286, Cl. 37-58.000.

Dambach, Thomas F.; and Ricketts, James R., to Marquette Electronics, Inc. Chart recorder having pressurized ink supply and Z fold paper feed and improved chart recording method. 4,296,420, Cl. 346-140.00R.

Damon, Robert E., II, to Sandoz, Inc. Silacycloalkane amides. 4,296,240, Cl. 556-406.000.

Daneffel, Hansruedi, to Feller AG. Electronic voice detector. 4,296,277, Cl. 179-1.0VC.

D'Angelo, Victor: *See—*
Koenig, Robert H.; and D'Angelo, Victor, 4,296,283, Cl. 200-16.00D.

Daniel, Alger T.: *See—*
Nicholson, Robert D.; and Daniel, Alger T., 4,295,594, Cl. 228-160.000.

Daniels, Lowell W.: *See—*
Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., 4,296,310, Cl. 219-440.000.

Data General Corporation: *See—*
Guyer, James M.; and West, Joseph T., 4,296,466, Cl. 364-200.000.

Daussan, Andre: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,295,891, Cl. 501-99.000.

Daussan et Compagnie: *See—*
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Daussan, Gerard: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,295,891, Cl. 501-99.000.

Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, to Daussan et Compagnie. Blanket powder for covering a molten metal bath. 4,295,891, Cl. 501-99.000.

David Brown Tractors Limited: *See—*
Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.

Davis, Charles D., to Armstrong World Industries, Inc. Gripper shuttles. 4,295,498, Cl. 139-196.200.

Davis, Harry C. Circular insulation saw system. 4,295,263, Cl. 29-561.000.

Davis, Herbert L.: *See—*
Chen, John C.; and Davis, Herbert L., 4,296,058, Cl. 264-78.000.

Davis, William O., to AAI Corporation. Rocket assisted projectile and cartridge arrangement with pressure relief skirt. 4,295,425, Cl. 102-326.000.

Davison, Michael J.: *See—*
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,295,453, Cl. 123-499.000.

Davy Powergas GmbH: *See—*
Stauffer, Adolf, 4,296,088, Cl. 423-533.000.

Dayco Corporation: *See—*
Marsh, Richard L., 4,295,837, Cl. 474-153.000.

de la Vega, Alejandro J. Apparatus and method for handling jackets of printed matter. 4,295,643, Cl. 270-57.000.

DeCaro, Charles J., to Textron Inc. Installation tool barrel assembly. 4,295,394, Cl. 81-57.370.

Decuir, Joseph C.: *See—*
Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., 4,296,476, Cl. 364-900.000.

Deere & Company: *See—*
Hurt, James J., 4,296,474, Cl. 364-560.000.

Deflecto Corporation: *See—*
Meyer, Stephen T., 4,295,571, Cl. 211-200.000.

Defourny, Jacques, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Electrode displacement monitoring in resistance welding. 4,296,304, Cl. 219-86.410.

Degger, Wolter W. J.; and Van Kasteren, Adrianus C., to U.S. Philips Corporation. Precision adjusting device. 4,295,625, Cl. 248-466.000.

Degussa Aktiengesellschaft: *See—*
Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, 4,296,006, Cl. 260-23.0EP.

DeHart, John R.; and Majewski, Robert A., to Docutronix, Inc. Envelope processing machine. 4,295,321, Cl. 53-381.00R.

Dehn, Rudolph A.: *See—*
Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., 4,296,296, Cl. 219-10.55B.

Deitz, Bernard, to Deitz Plastic Formers. Waterproof cushion for outdoor use and method for manufacturing the same. 4,295,235, Cl. 5-473.000.

Deitz Plastic Formers: *See—*
Deitz, Bernard, 4,295,235, Cl. 5-473.000.

Della Valle, Francesco, to Fidia S.p.A. Selected process for producing monohalogenated derivatives of 7-hydroxy-coumarin. 4,296,039, Cl. 260-343.450.

Del Soldato, Piero: *See—*
Ghelardoni, Mario; Pestellini, Vittorio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,296,124, Cl. 424-285.000.

Delta Mouldings (Leicester) Limited: *See—*
Williams, William, 4,295,629, Cl. 249-160.000.

DeLuca, Frederick P. Light emitting electronic jewelry. 4,296,459, Cl. 362-104.000.

DeMaria, Francesco, to American Cyanamid Company. Pressure sealing process. 4,296,059, Cl. 264-130.000.

De Maria, Francesco; and Pfeiffer, Ronald E., to American Cyanamid Company. Hollow acrylonitrile polymer fiber. 4,296,175, Cl. 428-398.000.

De Matteo, John; and Villani, Frank, to United States of America, Navy. Gravity measurement apparatus for ships. 4,295,372, Cl. 73-382.00G.

Denerley, Paul M., to Beecham Group Limited. Method for the preparation of penicillanic-$\beta$-lactamase inhibitors. 4,296,032, Cl. 260-245.20R.

Denham, Leslie R.: *See—*
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., 4,295,542, Cl. 181-108.000.

Dennert, Hans V.: *See—*
Dennert, Heinz; and Dennert, Hans V., 4,295,810, Cl. 425-110.000.

Dennert, Heinz; and Dennert, Hans V., to Veit Dennert KG Baustoffbetriebe. Apparatus for insulating building blocks. 4,295,810, Cl. 425-110.000.

Dennesen Electronics Inc.: *See—*
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, 4,295,277, Cl. 33-181.00R.

Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, to Dennesen Electronics Inc. Stylus positioner. 4,295,277, Cl. 33-181.00R.

de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, to Oronzio deNora Impianti Elettrochimici S.p.A. Novel cationic membranes. 4,295,952, Cl. 204-252.000.

Dentsply Research & Development Corp.: *See—*
Rudler, Helmut, 4,295,828, Cl. 433-90.000.

de Paolis, Potito U. Conchless high protein chocolate flavored composition and method of making same. 4,296,141, Cl. 426-613.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,296,011, Cl. 260-29.300.

Desprez, Alfred; Sauerland, Heinz; and Teetz, Wolfgang, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Take-up drive for a multi-head embroidery machine. 4,295,433, Cl. 112-241.000.

Dessaint, Andre L.; and Perronin, Jean, to Produits Chimiques Ugine Kuhlmann. Fluorinated anti-stain and soil release finishes. 4,295,976, Cl. 252-8.900.

Dettinger, Dietrich: *See—*
Abendroth, Paul; and Dettinger, Dietrich, 4,295,421, Cl. 101-216.000.

Deutsch, Leslie J.: *See—*
Deutsch, Ralph; and Deutsch, Leslie J., 4,295,402, Cl. 84-1.030.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Automatic chord accompaniment for a guitar. 4,295,402, Cl. 84-1.030.

Developak Corporation: *See—*
Evers, Jack R., 4,295,922, Cl. 156-583.100.

de Waard, Peter J.: *See—*
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, 4,296,386, Cl. 331-94.50H.

Dexter, Theodore H.: *See—*
Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., 4,295,951, Cl. 204-242.000.

d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., to Zenith Radio Corporation. Luminance signal processing circuit. 4,296,435, Cl. 358-166.000.

Dhondt, Roland O., to Union Oil Company of California. Apparatus and method for introducing solids into a solids upflow vessel. 4,295,773, Cl. 414-187.000.

Diamond, Andrew C.: *See—*
Ashton, Christopher J.; Diamond, Andrew C.; and Greenhill, Derek H., 4,295,754, Cl. 403-369.000.

Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran. Apparatus and method for analysis of motion of a dynamic structure. 4,295,473, Cl. 178-695.000.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,296,264, Cl. 570-128.000.

Diamond Shamrock Technologies S.A.: *See—*
Tomov, Nenad R.; and Roberts, Geoffrey M., 4,295,943, Cl. 204-96.000.

Di Benedetto, Marianne, to Ciba-Geigy Corporation. Adducts containing hydroxyl groups from mononuclear hydantoin glycidyl compounds and non-aromatic dicarboxylic acids. 4,296,005, Cl. 260-18.0EP.

Dickey-john Corporation: *See—*
Whitaker, Roger B.; and Blevins, Charles W., 4,296,409, Cl. 340-684.000.





Dickhart, William W., III; and Marvin, Richard H., to Budd Company, The. Steerable truck for a railway vehicle. 4,295,428, Cl. 105-168.000.

Diehl GmbH & Co.: *See—*
Rhau, Siegfried; and Weber, Adolf, 4,296,180, Cl. 428-558.000.

Dietze, Robert H.: *See—*
Nahar, Rathindra; and Dietze, Robert H., 4,295,645, Cl. 271-34.000.

DiFulvio, Anthony P.: *See—*
Smith, Michael R.; and DiFulvio, Anthony P., 4,296,069, Cl. 422-64.000.

DiMarzio Musical Instrument Pickups, Inc.: *See—*
Smith, Paul R., 4,295,404, Cl. 84-314.00N.

Din, Zia U.: *See—*
Cardenas, Carlos G.; and Din, Zia U., 4,296,257, Cl. 568-361.000.
Ho, T. L.; and Din, Zia U., 4,296,038, Cl. 260-343.210.
Ho, T. L.; Din, Zia U.; and Cardenas, Carlos G., 4,296,251, Cl. 562-506.000.

Dininno, Frank P.: *See—*
Beattie, Thomas R.; Christensen, Burton G.; and Dininno, Frank P., 4,296,111, Cl. 424-246.000.

Disko, Harry: *See—*
Rosenwinkel, Donald A.; Meyer, Burton C.; and Disko, Harry, 4,295,294, Cl. 46-205.000.

Ditgens, Klaus: *See—*
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.

Divers, Robert M. Tool for removing sleeves from cylinders. 4,295,260, Cl. 29-426.500.

Diversey Corporation, The: *See—*
Kakar, Sarwan K.; Kappler, Frank R.; and Cramer, John J., 4,296,165, Cl. 428-264.000.

Dixon Valve & Coupling Co.: *See—*
Goodall, Richard B.; and Goodall, Richard L., 4,295,670, Cl. 285-91.000.

Dixon, William. Corner beading cleaner. 4,295,242, Cl. 15-235.700.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Ritter, Horst, 4,296,049, Cl. 261-111.000.

Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther; and Swassek, Gunter, 4,295,742, Cl. 356-373.000.

Docutronix, Inc.: *See—*
DeHart, John R.; and Majewski, Robert A., 4,295,321, Cl. 53-381.00R.

Dodds, Dennis L., to RCA Corporation. Television display error correction. 4,296,359, Cl. 315-370.000.

Dodds, Robert J., to International Computers Limited. Electrical connectors. 4,295,695, Cl. 339-17.00F.

Dodge, Paul D.: *See—*
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.

Doerer, Daniel M.; and Brunkhorst, Lloyd E., to Brown Group, Inc. Method of making foamed plastisol insoles for shoes. 4,296,053, Cl. 264-26.000.

Domenis, Danilo: *See—*
Moiso, Ugo; Massabo, Vincenzo; and Domenis, Danilo, 4,296,028, Cl. 260-160.000.

Dominey, Samuel C., Jr.: *See—*
Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., 4,296,321, Cl. 250-254.000.

Dooley, Daniel J.: *See—*
Dooley, Joseph L.; and Dooley, Daniel J., 4,295,364, Cl. 73-119.00A.

Dooley, Joseph L.; and Dooley, Daniel J., to Creative Tool Company. Transducer device for monitoring of fuel injection. 4,295,364, Cl. 73-119.00A.

Dorman Smith Traffic Products Limited: *See—*
Minoprio, William E.; and Horsfield, Arthur K., 4,296,460, Cl. 362-200.000.

Doten, Bradford O.; and Svitak, John J., to Western Electric Company, Inc. Methods and apparatus for bonding an article to a metallized substrate. 4,295,596, Cl. 228-180.00A.

Douthett, Joseph A.; and Espy, Ronald H., to Armco Inc. Copper and nitrogen containing austenitic stainless steel and fastener. 4,295,769, Cl. 411-411.000.

Dover Corporation: *See—*
Peschke, Norman, 4,295,802, Cl. 417-405.000.

Dow Chemical Company, The: *See—*
Anand, Joginder N.; Revak, Timothy T.; and Tsang, Floris Y., 4,296,052, Cl. 264-25.000.
Gibbs, Dale S., 4,296,013, Cl. 260-29.6TA.
Gibbs, Ronald L., 4,295,992, Cl. 252-429.00C.
Harris, Wilford D., 4,296,055, Cl. 264-45.500.
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.
Nelson, Alfred R.; and Johnsen, Kenneth E., 4,296,019, Cl. 260-33.40R.
Seeburger, Harold O.; Beattie, Ralph G.; and Stevens, Violete L., 4,296,220, Cl. 525-507.000.
Seeburger, Harold O.; Atchison, George J.; and Stevens, Violete L., 4,296,227, Cl. 526-320.000.
Sutrina, Thomas A.; and Behr, R. Douglas, 4,295,919, Cl. 156-498.000.

Dozzi, Giovanni: *See—*
Cucinella, Salvatore; Mazzei, Alessandro; and Dozzi, Giovanni, 4,296,045, Cl. 260-448.00R.

Draggoo, Vaughn G., to Jersey Nuclear-Avco Isotopes, Inc. Thermally improved dye laser flow channel. 4,296,388, Cl. 331-94.50L.

Dragomir, Stojicic. Boxing gloves without a seam on the frontal strike portion thereof. 4,295,228, Cl. 2-18.000.

Draper, Wilburn D.: *See—*
Dalboussiere, Gerard; and Draper, Wilburn D., 4,296,463, Cl. 364-200.000.

Dresser Industries, Inc.: *See—*
Purton, Robert M., 4,295,487, Cl. 137-242.000.

Drewery, John O.; and Storey, Richard, to British Broadcasting Corporation. Method of and apparatus for movement portrayal with a raster e.g. television, display. 4,296,434, Cl. 358-105.000.

Drori, Mordeki. Backwashable fluid filter. 4,295,963, Cl. 210-108.000.

Droux, Michel; and Bocquet, Gilbert, to Saint-Gobain Industries. Sizing composition and glass fibers treated with the aid of such composition. 4,295,871, Cl. 65-3.410.

Dubbink, David T.; and Vogler, Lynda L. Orthopedic chair. 4,295,683, Cl. 297-377.000.

Duchardt, Karl H.; and Gehrke, Gunter, to Bayer Aktiengesellschaft. Process for the preparation of cationic anthraquinone dyestuffs. 4,296,044, Cl. 260-381.000.

Dudley, Kenneth W.: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 4,296,298, Cl. 219-10.810.

Duffy, John W.: *See—*
Arends, Roger R.; Bailey, Wayne B.; Duffy, John W.; and Springer, Brice D., 4,295,489, Cl. 137-488.000.

Duffy, Robert J.: *See—*
Steyer, William; and Duffy, Robert J., 4,295,332, Cl. 60-264.000.

Duhon, Gerald L.: *See—*
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Duke, Steven R.: *See—*
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., 4,295,410, Cl. 89-12.000.

Duley, Richard K., to Redland Automation Limited. Inductive vehicle detector. 4,296,401, Cl. 340-38.00L.

Dumas, David H., to Hercules Incorporated. Sizing method and sizing composition for use therein. 4,295,931, Cl. 162-158.000.

Dumont, Claude: *See—*
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,296,126, Cl. 424-316.000.

Dungan, D. Patrick. Brake assembly for small vehicles. 4,295,547, Cl. 188-2.00R.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, John E.; Evans, Robert F.; and Gavin, John H., 4,295,254, Cl. 29-33.00M.
Fountain, Frank S., 4,295,360, Cl. 73-15.600.
Hanzel, Robert S.; and Sauer, Paul J., 4,296,174, Cl. 428-389.000.
Johnson, Alexander L., 4,296,110, Cl. 424-244.000.
Kusy, Robert P., 4,295,374, Cl. 73-579.000.
Robinson, Bruce A.; and Thompson, John R., 4,295,252, Cl. 28-248.000.
Windley, William T., 4,295,329, Cl. 57-245.000.

Dupuy, James A. Cable dead ending. 4,295,250, Cl. 24-122.600.

Duracell International Inc.: *See—*
Ciliberti, Frank L., Jr., 4,295,705, Cl. 339-220.00R.
Mallory, Henry R.; and Nichols, Steven J., 4,296,461, Cl. 363-22.000.

Duran, John A., to Avibank Mfg., Inc. Latch mechanism. 4,295,674, Cl. 292-190.000.

Durand, Roger, to Pignons S.A. Photographic shutter. 4,295,725, Cl. 354-244.000.

Duro-Test Corporation: *See—*
Trutner, Donald G.; and Thorington, Luke, 4,295,873, Cl. 65-108.000.

DuRocher, Gideon A., to Essex International, Inc. Pressure sensitive combination switch and circuit breaker construction. 4,295,699, Cl. 339-61.00M.

Dussourd, Jules L.; and Pfannebecker, George W., to Terry Corporation. Turbine wheel and nozzle arrangement. 4,295,788, Cl. 415-202.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Gauchel, Peter; and Wissinger, Waldemar, 4,296,062, Cl. 264-173.000.
Haage, Karl; and Scharff, Dieter, 4,295,911, Cl. 156-315.000.

E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A., 4,296,113, Cl. 424-246.000.
Petrillo, Edward W., Jr.; and Weisenborn, Frank L., 4,296,033, Cl. 260-326.200.
Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, 4,296,101, Cl. 424-119.000.

E-Systems, Inc.: *See—*
Harader, Wayne R., 4,296,416, Cl. 343-792.500.

Eastman Kodak Company: *See—*
Bishop, John F.; and Bowman, Wayne A., 4,296,195, Cl. 430-215.000.
Breen, John J., 4,295,715, Cl. 354-25.000.
Edwards, Evan A., 4,295,713, Cl. 352-235.000.
Montalto, Michael S.; Blanding, Douglass L.; and Smith, Michael R., 4,296,070, Cl. 422-65.000.
Smith, Michael R.; and DiFulvio, Anthony P., 4,296,069, Cl. 422-64.000.

Eaton, Sargent S., Jr.; and Schroeder, Paul R., to Mostek Corporation. Refresh counter. 4,296,480, Cl. 365-222.000.

Ebauches S.A.: *See—*
Randin, Jean-Paul, 4,296,016, Cl. 260-29.6SQ.

Eckhardt, Wolfgang: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,296,118, Cl. 424-273.00P.

Economopoulos, Marios, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Method of manufacturing rolled steel products with high elastic limit. 4,295,902, Cl. 148-144.000.

Edwards, Evan A., to Eastman Kodak Company. Film and photographic apparatus. 4,295,713, Cl. 352-235.000.

Edwards, Laroy H., to Chevron Research. N-Alkyl or aryl-N-(trichlorovinylthio)-halomethane sulfonamides. 4,295,874, Cl. 71-67.000.

Efimov, Vyacheslav T.: *See—*
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; and Shamsha, Ljudmila F., 4,295,946, Cl. 204-149.000.

Eggert, Walter S., Jr., to Budd Company, The. Blade structure for use in a windmill. 4,295,790, Cl. 416-226.000.

Ehretsmann, Jacques: *See—*
Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, 4,295,948, Cl. 204-159.230.

Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., to General Electric Company. Controllable-duty-cycle power supply for microwave oven magnetron and the like. 4,296,296, Cl. 219-10.55B.

Eichelberger, Charles W., to General Electric Company. Relay switching apparatus. 4,296,449, Cl. 361-3.000.

Eichelseder, Christine: *See—*
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.

Eicher, Franz: *See—*
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Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Tetrahydro-1,3-oxazines. 4,295,875, Cl. 71-88.000.

Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, to Canon Kabushiki Kaisha. Recording liquid composition. 4,295,889, Cl. 106-22.000.

Ejiri, Yoshihiro: *See—*
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, 4,295,707, Cl. 350-96.200.

Ekman, C. Frederick W.: *See—*
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., 4,296,176, Cl. 428-407.000.

Eldeen, Gene H. Newal post assembly. 4,295,638, Cl. 256-59.000.

Electric Power Research Institute, Inc.: *See—*
Harrold, Ronald T.; and Ottenberg, Lawrence E., 4,296,003, Cl. 252-570.000.

Ellington, Rayburn P., III, to Caterpillar Tractor Co. Template for aligning a shaft. 4,295,276, Cl. 33-181.00R.

Elmendorf Research, Inc.: *See—*
Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., 4,295,557, Cl. 198-382.000.

Elsner, Ernst: *See—*
Helfer, Friedrich; Elsner, Ernst; and Zaiser, Wolfgang, 4,295,348, Cl. 64-27.00L.

Eltra Corporation: *See—*
Varma, Brajendra P., 4,295,940, Cl. 204-2.100.

Eltvedt, Frank. Guide skirt. 4,295,815, Cl. 425-556.000.

Emerson Electric Co.: *See—*
Bowsky, Benjamin, 4,296,275, Cl. 174-152.0GM.
Hildebrandt, Eugene F.; and Ottersbach, Thomas V., 4,296,366, Cl. 318-793.000.
Punshon, William D.; and Peachee, C. Theodore, 4,295,268, Cl. 29-596.000.

Emhart Industries, Inc.: *See—*
Bristol, Robert G., 4,295,370, Cl. 73-304.00C.
Clouser, Michael T., 4,295,603, Cl. 236-1.00G.
Miller, Theodore H., 4,295,673, Cl. 292-21.000.

Emi, Shingo; and Saiki, Noritsugu, to Teijin Limited. Fibrous composite having elasticity. 4,296,163, Cl. 428-212.000.

Endo, Shigeru: *See—*
Tanaka, Kenji; and Endo, Shigeru, 4,296,133, Cl. 426-23.000.

Energy Equipment Co. Ltd., The: *See—*
Caplin, Peter B.; and Harman, Maurice, 4,295,817, Cl. 431-7.000.

Engel, Christopher M.; and Srivastava, Gopal K., to Zenith Radio Corporation. Dynamic enabling network for a color correction circuit. 4,296,432, Cl. 358-28.000.

Engelhard Min. & Chem. Corp.: *See—*
Heuer, Steven R.; and Zbranek, Zdenka, 4,296,077, Cl. 423-53.000.

Engelke, Roger P., to Barber-Colman Company. Method and apparatus for reducing torque on an air damper. 4,295,632, Cl. 251-127.000.

Engineered Systems, Inc.: *See—*
Sheldon, James R., 4,296,404, Cl. 340-149.00A.
Weimer, Dan G.; and Van Ness, Bradford O., 4,296,315, Cl. 235-460.000.

English Electric Valve Company: *See—*
Esterson, Maurice; and Brady, Michael B. C., 4,296,385, Cl. 331-90.000.

Enomoto, Kazuyoshi: *See—*
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Conjugate of amino sugar-steroid hormone. 4,296,233, Cl. 536-5.000.

Epoxon Products, Inc.: *See—*
Wilson, Thomas T., 4,295,460, Cl. 126-121.000.

EPP Corp.: *See—*
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., 4,296,176, Cl. 428-407.000.

Erb, Tom L.; and Miller, Wendell D., to Ramsey Engineering Company. Method and apparatus for flow measurement using Doppler frequency shift. 4,295,378, Cl. 73-861.250.

Eriksson, Leif; and Liberman, Salomon, to Asea Aktiebolag. Multiphase fault protection circuitry with variable functional level detection. 4,296,452, Cl. 361-82.000.

Erlach, Hans, to Sulzer Brothers Limited. Means for coupling a hand drive with a rotatable shaft. 4,295,552, Cl. 192-81.00C.

Eroshevskaya, Elena D., administrator: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Errichiello, Dominic R. Integrally molded, looseleaf books with ring-binder-mounting posts molded on spine. 4,295,747, Cl. 402-75.000.

Erwin Sick GmbH, Optik-Elektronik: *See—*
Sick, Erwin, 4,295,743, Cl. 356-431.000.

Esperling, Peter: *See—*
Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, 4,296,109, Cl. 424-241.000.

Espy, Ronald H.: *See—*
Douthett, Joseph A.; and Espy, Ronald H., 4,295,769, Cl. 411-411.000.

Essex International, Inc.: *See—*
DuRocher, Gideon A., 4,295,699, Cl. 339-61.00M.

Esterson, Maurice; and Brady, Michael B. C., to English Electric Valve Company. X-Ray assisted multipactor discharge tuned resonant cavity device. 4,296,385, Cl. 331-90.000.

Etablissements Boucher Freres: *See—*
Boucher, Pierre, 4,295,641, Cl. 269-136.000.

Ethyl Corporation: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,295,983, Cl. 252-49.600.

Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., to Elmendorf Research, Inc. Apparatus and method for aligning elongated ligno-cellulosic strands into parallelism. 4,295,557, Cl. 198-382.000.

Eue, Ludwig: *See—*
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.

Evacuators, Inc.: *See—*
Cottrill, William P.; and Cisternino, Andrew J., 4,295,775, Cl. 414-375.000.

Evans, Robert F.: *See—*
Adams, John E.; Evans, Robert F.; and Gavin, John H., 4,295,254, Cl. 29-33.00M.

Evers, Jack R., to Developak Corporation. Tube side seam heat sealer. 4,295,922, Cl. 156-583.100.

Ewen, James H.; and McClellan, Thomas R., to Upjohn Company, The. Elastomeric polyurethane-polyurea polymer prepared from an organic polyisocyanate a polyol and an aromatic diamine having at least one of the ortho positions to each amine lower alkyl. 4,296,212, Cl. 521-163.000.

Ewins, Earle E., Jr.: *See—*
St. Clair, David J.; and Ewins, Earle E., Jr., 4,296,008, Cl. 260-27.0BB.

Exploration Company: *See—*
Weiss, Benjamin F. L., 4,296,481, Cl. 367-20.000.

Exxon Research & Engineering Co.: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,295,995, Cl. 252-431.00C.
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., 4,295,996, Cl. 252-431.00C.
Mauldin, Charles H.; and Baird, William C., Jr., 4,295,957, Cl. 208-138.000.
Mauldin, Charles H.; and Baird, William C., Jr., 4,295,958, Cl. 208-138.000.
Metrailer, William J., 4,295,956, Cl. 208-127.000.
Rosensweig, Ronald E., 4,296,080, Cl. 423-244.000.
Wristers, Harry J., 4,295,991, Cl. 252-429.00B.

Fabris, Mario. Roller entry guides for rod mills. 4,295,356, Cl. 72-250.000.

Fagersta AB: *See—*
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, 4,295,900, Cl. 148-12.00B.

Fahey, Dennis M., to PPG Industries, Inc. Glass fibers with reduced tendency to form gumming deposits and sizing composition comprising two starches with different amylose content. 4,296,173, Cl. 428-378.000.

Fahrig, Robert J.; and Hinrichs, Lansing M., to Standard Oil Company (Indiana). Method and apparatus for improved fluid catalytic riser reactor cracking of hydrocarbon feedstocks. 4,295,961, Cl. 208-161.000.

Fairchild, Peter T.; and Leininger, Joel C., to International Business Machines Corp. Link register storage and restore system for use in an instruction pre-fetch micro-processor interrupt system. 4,296,470, Cl. 364-200.000.

Falk, Edward J., to Wagner Electric Corporation. Master cylinder assembly with detachable reservoir. 4,295,336, Cl. 60-562.000.



Farfaglia, Silvio T., to Phillips Petroleum Company. Container spinning apparatus for container manufacturing machine or the like. 4,295,903, Cl. 156-69.000.

Farnham, Robert A., to Chevron Research Company. Fractionation apparatus providing improved heat recovery from bottom stream. 4,295,936, Cl. 202-153.000.

Faust, Raimund J., to Hoechst Aktiengesellschaft. Photopolymerizable mixture in a transfer element. 4,296,196, Cl. 430-271.000.

Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., to Firmenich SA. Process for the preparation of macrocyclic ketones. 4,296,258, Cl. 568-364.000.

Feller AG: *See—*
Daneffel, Hansruedi, 4,296,277, Cl. 179-1.0VC.

Fensom, Donald J., to ICI Australia Limited. Processes of iron segregation. 4,295,878, Cl. 75-1.00T.

Ferguson, Stewart. Shouldered shake and filler roof structure. 4,295,314, Cl. 52-553.000.

Ferris, Ray: *See—*
Knippel, Willis H.; and Ferris, Ray, 4,295,430, Cl. 105-308.00E.

Feuerbaum, Hans-Peter, to Siemens Aktiengesellschaft. Techniques for impressing a voltage with an electron beam. 4,296,372, Cl. 324-71.0EB.

F'Geppert, Erwin, to United States of America, Army. Shaft-component connection means. 4,295,750, Cl. 403-259.000.

Fidia S.p.A.: *See—*
Della Valle, Francesco, 4,296,039, Cl. 260-343.450.

Fiegel, Joachim: *See—*
Walz, Klaus; and Fiegel, Joachim, 4,295,852, Cl. 8-560.000.

Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, to L. Schuler GmbH. Apparatus for intermittent feeding of web-type or strip-type material. 4,295,399, Cl. 83-251.000.

Firestone, Raymond A.: *See—*
Christensen, Burton G.; Johnston, David B. R.; and Firestone, Raymond A., 4,296,236, Cl. 542-420.000.

Firmenich SA: *See—*
Fehr, Charles; Ohloff, Gunther; and Buchi, Georges H., 4,296,258, Cl. 568-364.000.

Fischell, Robert E., to Johns Hopkins University, The. Recorder with patient alarm and service request systems suitable for use with automatic implantable defibrillator. 4,295,474, Cl. 128-697.000.

Fischli, Albert E.; and Szente, Andre, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,296,031, Cl. 260-239.30D.

Fisher Controls Company, Inc.: *See—*
Arends, Roger R.; Bailey, Wayne B.; Duffy, John W.; and Springer, Brice D., 4,295,489, Cl. 137-488.000.

Fisher Scientific Company: *See—*
Bernier, John A., 4,296,358, Cl. 315-241.00R.

Fisons Limited: *See—*
Appleton, Richard A.; and Johnston, David, 4,296,114, Cl. 424-248.520.

Fitzgerald, Stella; and Beaver, Bryan, to Beaver, Bryan. Demolition derby toy. 4,295,292, Cl. 46-201.000.

Fives-Cail Babcock: *See—*
Chielens, Alain; and Boussekey, Bernard, 4,295,825, Cl. 432-116.000.

Flachbarth, Charles T., to Butler Manufacturing Co. Surface raceway box. 4,295,575, Cl. 220-3.920.

Flemings, Merton C.; and Goodwin, Frank E., to Massachusetts Institute of Technology. Method for making metal alloy compositions and composition. 4,295,896, Cl. 148-1.000.

Floessel, Carl D., to BBC Brown, Boveri & Company Limited. Gas insulated high voltage line and method of assembling same. 4,296,271, Cl. 174-28.000.

FMC Corporation: *See—*
Buchta, Ervin A., 4,295,390, Cl. 74-625.000.

Fogle, Ozzie: *See—*
Cooley, James; and Fogle, Ozzie, 4,295,910, Cl. 156-314.000.

Follett Corporation: *See—*
Hornbeck, Clarence J., 4,295,309, Cl. 52-309.700.

Forlenza, Nicholas G., to Mateflex/Mele Corporation. Method of zoning grate surfaces. 4,296,160, Cl. 428-117.000.

Forrester, James: *See—*
Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.

Forstner, Anton; and Schatzmann, Kurt, to Siemens-Albis Aktiengesellschaft. Apparatus for applying solder to the connections of integrated circuit components. 4,295,441, Cl. 118-425.000.

Foster, Arthur M.: *See—*
Tang, David Y.; and Foster, Arthur M., 4,296,244, Cl. 562-470.000.

Fountain, Frank S., to Du Pont de Nemours, E. I., and Company. Tension measuring apparatus. 4,295,360, Cl. 73-15.600.

Four Star Corporation: *See—*
Kowalski, Daniel J.; and Mareydt, Ray G., 4,295,588, Cl. 224-321.000.

Fourcadier, Chantal: *See—*
Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.

Fox, Bryce J., to Minnesota Mining and Manufacturing Company. Heat and liquid recovery using open cycle heat pump system. 4,295,282, Cl. 34-27.000.

Fox Valley Process Systems & Supply, Inc.: *See—*
Galloway, Tod R., 4,295,491, Cl. 137-625.460.

Foxcroft, Garth, to Brink, Dirk Marinus. Protective tire chain assembly. 4,295,510, Cl. 152-220.000.

Fram Industrial Filter Corp.: *See—*
Jain, Kamlesh K., 4,295,973, Cl. 210-738.000.

Franco, Wayne P. Method of treating the heart for myocardial infarction. 4,296,100, Cl. 424-108.000.

Frangatos, Gerassimos, to Mobil Oil Corporation. Sulfurized aminoguanidine reaction product and lubricant compositions containing same. 4,295,982, Cl. 252-42.000.

Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, to U.S. Philips Corporation. Method of producing microlenses. 4,296,143, Cl. 427-38.000.

Franks, Larry A.; and Nelson, Melvin A., to United States of America, Energy. Waveform synthesizer. 4,296,319, Cl. 250-227.000.

Frantello, Alfred A.; and Kefauver, Lester R., to Corinco, Inc. Balanced mower head for carrying a plurality of monofilament lines. 4,295,324, Cl. 56-12.700.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Riessberger, Klaus, 4,295,764, Cl. 409-296.000.

Fraser, David R., to United States of America, Health and Human Services. Washer for resin-coated photographic prints. 4,295,730, Cl. 354-325.000.

Frechet, Daniel: *See—*
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,296,126, Cl. 424-316.000.

Freeman Chemical Corporation: *See—*
Cordts, Howard P.; and Karloske, Joan E., 4,295,907, Cl. 156-246.000.

Frei, Willi. Process for the production of a tubular heat exchanger, and a tubular heat exchanger produced according to this process. 4,295,522, Cl. 165-79.000.

Freller, Walter: *See—*
Artweger, Wolfgang; and Freller, Walter, 4,295,679, Cl. 296-171.000.

Freundlinger, Ernst; and Hirschvogel, Alfred, to Sigri Elektrographit GmbH. Flexible graphite sheet, material or layer containing metal molybdate. 4,296.177, Cl. 428-408.000.

Frey, Gunter: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Haaf, Friedhelm, 4,295,938, Cl. 202-248.000.

Frielinghaus, Rainer: *See—*
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Friese, Karl-Hermann, to Robert Bosch GmbH. Method to apply multiple layers, including an electrode layer, on a sintered or pre-sintered ion conductive solid electrolyte body. 4,296,148, Cl. 427-125.000.

Frijns, Leon H. B.: *See—*
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., 4,296,245, Cl. 562-494.000.

Frontier Industries, Inc.: *See—*
Boswell, George T., 4,295,290, Cl. 46-74.00C.

Frost, George H. Combined lens cap and sunshade for a camera. 4,295,706, Cl. 350-58.000.

Frost, John W., to W. R. Grace & Co. Variable speed drive. 4,295,383, Cl. 474-83.000.

Fuher, Reginald S.: *See—*
Philpott, Arthur; and Fuher, Reginald S., 4,295,391, Cl. 74-782.000.

Fuji Photo Film Co., Ltd.: *See—*
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Oosaka, Shigenori; and Murakoshi, Makoto, 4,295,589, Cl. 226-122.000.
Yagihara, Morio; and Yokota, Yukio, 4,296,199, Cl. 430-551.000.
Yagihara, Morio; and Yokota, Yukio, 4,296,200, Cl. 430-551.000.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo, 4,295,716, Cl. 354-30.000.

Fujii, Hiroshi: *See—*
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.

Fujii, Shigeo: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.

Fujimori, Ryo: *See—*
Fujiwara, Toshihide; and Fujimori, Ryo, 4,295,949, Cl. 204-180.00G.

Fujioka, Tadashi: *See—*
Nomura, Hirokazu; and Fujioka, Tadashi, 4,296,306, Cl. 219-124.340.

Fujitsu Fanuc Limited: *See—*
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,296,364, Cl. 318-572.000.
Imazeki, Ryoji; and Yamazaki, Etuo, 4,296,473, Cl. 364-520.000.

Fujiwara, Kunio: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.

Fujiwara, Masato: *See—*
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.

Fujiwara, Toshihide; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Method for determining boundary points in electrophoresis. 4,295,949, Cl. 204-180.00G.

Fukatsu, Akihiro; and Tada, Isao, to Toshiba Corporation. Magnetron with cooling means. 4,296,355, Cl. 315-39.510.

Fukuda, Minoru: *See—*
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.

Fukui, Masahisa: *See—*
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.

Fukui, Osamu, to Takara Co., Ltd. Toy figure having repositionable head and limbs. 4,295,291, Cl. 46-161.000.

Fukui, Shosin; and Akazawa, Tadashi, to Daikin Kogyo Co., Ltd. Perfluoroalkyl-acr[methacr]ylate, hydroxy-chloropropyl-acrylate polymer. 4,296,224, Cl. 526-243.000.

Fukunaga, Yasushi: *See—*
Bandoh, Tadaaki; and Fukunaga, Yasushi, 4,296,468, Cl. 364-200.000.

Fukuyama, Hiroomi; and Isobe, Shinichi, to Fujitsu Fanuc Limited. Tool compensation system. 4,296,364, Cl. 318-572.000.

Fuller, Harrison W.; and Stromswold, Chester E., to Sanders Associates, Inc. Crimped coax reflective dispersive delay line. 4,296,389, Cl. 333-160.000.

Furukawa, Yoshimi: *See—*
Sano, Shoichi; and Furukawa, Yoshimi, 4,295,657, Cl. 280-91.000.

Furusawa, Kahei: *See—*
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, 4,295,707, Cl. 350-96.200.

Fuseya, Shigeaki; and Ichisaka, Teruo, to Chlorine Engineers Corp., Ltd. Filter press type ion exchange membrane-method electrolysis cell. 4,295,953, Cl. 204-257.000.

Futamura, Kenichiro: *See—*
Iwahana, Keiiti; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,296,183, Cl. 428-653.000.

G. H. Products, Inc.: *See—*
Griffin, Kary A., 4,295,319, Cl. 52-785.000.

Gagliani, John; and Sorathia, Usman A. K., to International Harvester Company. Methods of preparing polyimides and polyimide precursors. 4,296,208, Cl. 521-77.000.

Gagnon, Peter R.: *See—*
Kimball, Stephen F.; and Gagnon, Peter R., 4,296,351, Cl. 313-222.000.

Gale, John A., to A.P.V. Spiro-Gills Limited. Water chilling plant. 4,295,341, Cl. 62-100.000.

Galloway, Tod R., to Fox Valley Process Systems & Supply, Inc. Double angled-disc diverter valve or the like. 4,295,491, Cl. 137-625.460.

Gambro Dialysatoren GmbH & Co. KG.: *See—*
Rosemeier, Friedrich; and Killmaier, Horst, 4,295,495, Cl. 138-89.000.

Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, to Voest-Alpine Aktiengesellschaft; and Krautkraemer GmbH. Ultrasonic method of testing welded joints. 4,295,375, Cl. 73-582.000.

Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., to Texas Instruments Incorporated. Recording cartridge having a flat smoothing plane with a raised portion. 4,296,448, Cl. 360-135.000.

Garman, Ronald H., to Caterpillar Tractor Co. Window clip retainer. 4,295,306, Cl. 52-208.000.

Garnache, Richard R.; and Kenney, Donald M., to International Business Machines Corporation. Method for providing self-aligned conductor in a V-groove device. 4,295,924, Cl. 156-643.000.

Garner, Robert: *See—*
Petitpierre, Jean C.; and Garner, Robert, 4,295,663, Cl. 282-27.500.

Garrison, Judd F., to John Thomas Batts, Inc. Multi-piece hanger. 4,295,585, Cl. 223-96.000.

Gascoyne, John M.: *See—*
Rowsell, David G.; Gascoyne, John M.; and Hems, Roger, 4,296,093, Cl. 424-45.000.

Gaspar, Randal. Jet sled spoil scoop apparatus. 4,295,757, Cl. 405-163.000.

Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., to Texaco Inc. Method for forming remotely actuated gas lift systems and balanced valve systems made thereby. 4,295,795, Cl. 417-111.000.

Gates, Allen P.: *See—*
Harper, Terence; and Gates, Allen P., 4,296,194, Cl. 430-176.000.

Gates Rubber Company, The: *See—*
Bixby, Guy T., 4,295,496, Cl. 138-122.000.

Gauchel, Peter; and Wissinger, Waldemar, to Dynamit Nobel Aktiengesellschaft. Process for the extrusion of coated skein-shaped profiles, preferably of thermoplastic synthetic resins. 4,296,062, Cl. 264-173.000.

Gauthier, Michel: *See—*
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.

Gavin, John H.: *See—*
Adams, John E.; Evans, Robert F.; and Gavin, John H., 4,295,254, Cl. 29-33.00M.

Gee, Charles E., deceased. Convertible sun shade. 4,295,481, Cl. 135-5.00R.

Gehrig, Heinz: *See—*
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, 4,295,253, Cl. 28-255.000.

Gehrke, Gunter: *See—*
Duchardt, Karl H.; and Gehrke, Gunter, 4,296,044, Cl. 260-381.000.

Geisthoff, Hubert; and von Allwoerden, Wilhelm, to Jean Walterscheid GmbH. Adjustable length upper guide member. 4,295,389, Cl. 74-586.000.

Genco, Vito; and Turco, Vincenzo L., to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Plastic wads and wad assemblies for shot cartridges. 4,295,426, Cl. 102-451.000.

General Dynamics Corporation: *See—*
Couchman, James C., 4,295,377, Cl. 73-761.000.

General Electric Company: *See—*
Berlec, Ivan; and McCarty, Lewis V., 4,296,352, Cl. 313-315.000.
Eichelberger, Charles W.; Dehn, Rudolph A.; and Wojnarowski, Robert J., 4,296,296, Cl. 219-10.55B.
Eichelberger, Charles W., 4,296,449, Cl. 361-3.000.
Jenkins, Thomas E., 4,295,692, Cl. 312-228.000.
Kruszona, Edward G., 4,295,439, Cl. 118-317.000.
Milkovic, Miran, 4,296,413, Cl. 340-870.380.
Miller, Matthew S., 4,296,297, Cl. 219-10.55F.
Mirabella, Paul J., 4,296,329, Cl. 250-491.000.
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., 4,295,410, Cl. 89-12.000.
Pauze, Denis R.; and Zamek, Otto S., 4,296,229, Cl. 528-45.000.
Rabe, Jerry R., 4,296,344, Cl. 310-184.000.
Salem, Robert J., 4,296,312, Cl. 219-501.000.
Simcoe, Robert J., 4,296,335, Cl. 307-200.00B.
Steyer, William; and Duffy, Robert J., 4,295,332, Cl. 60-264.000.
Stottmann, Richard L.; and Smith, Peter H., 4,296,299, Cl. 219-10.810.
Wambach, Allen D., 4,296,021, Cl. 260-40.00R.
Wilkinson, Stanley B., 4,296,451, Cl. 361-80.000.

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Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., 4,296,132, Cl. 426-2.000.

General Foods Inc.: *See—*
Millar, Donald B., 4,296,026, Cl. 260-123.500.

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Brandt, Howard C.; and Grabowski, Leonard R., 4,295,384, Cl. 74-424.8NA.
Johnson, Jesse F., 4,295,791, Cl. 416-241.00B.

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Skanadore, William R., 4,296,336, Cl. 307-300.000.

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Roper, Ralph E., 4,295,357, Cl. 72-344.000.

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Gerber, Howard L., to Continental Group, Inc., The. Progressive welding and forging of overlapped seams in tubular bodies. 4,296,293, Cl. 219-8.500.

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Griesenauer, Neal M.; and Gersi, Julius J., 4,296,178, Cl. 428-462.000.

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Gibbs, Dale S., to Dow Chemical Co., The. Vinylidene chloride polymer microgels. 4,296,013, Cl. 260-29.6TA.

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Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., 4,295,532, Cl. 172-184.000.

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Hagglund, Erik H. M.; and Giler, Roger R., 4,296,311, Cl. 219-464.000.

Gill, Peter J.: *See—*
Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., 4,296,232, Cl. 528-179.000.

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Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., 4,296,302, Cl. 219-69.00G.

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Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Gilmour, Alfred J., to Auto-Flush Systems Ltd. Automatic glass fragmentation decontaminating system for glass containers. 4,295,503, Cl. 141-90.000.

Girling Limited: *See—*
Quiney, Kenneth M., 4,295,548, Cl. 188-72.700.

Giuffre, Luigi: *See—*
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,295,952, Cl. 204-252.000.





Glantz, Per-Olof: *See—*
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Gloor, Hans, to Concast AG. Method and apparatus for measuring out a strand guide arrangement. 4,295,278, Cl. 33-182.000.

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Goodall, Richard L.: *See—*
Goodall, Richard B.; and Goodall, Richard L., 4,295,670, Cl. 285-91.000.

Goodwin, Frank E.: *See—*
Flemings, Merton C.; and Goodwin, Frank E., 4,295,896, Cl. 148-1.000.

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Lovell, John A.; and McIntosh, Kenneth W., 4,295,513, Cl. 152-358.000.

Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., to Mitco Corporation. Air distribution system. 4,295,416, Cl. 98-33.00R.

Gordon, Roy G. Low temperature catalytic reduction. 4,295,986, Cl. 252-188.000.

Goschke, Richard: *See—*
Sallmann, Alfred; and Goschke, Richard, 4,296,128, Cl. 424-309.000.

Goto, Daisaku: *See—*
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, 4,296,276, Cl. 174-179.000.

Goux, Jacques, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Device for initiating in particular the ignition of an internal combustion engine. 4,296,471, Cl. 364-424.000.

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Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.

Grabner, Roy; and Paul, Edward L., to Merck & Co., Inc. Use of motionless mixer as cell culture propagator. 4,296,204, Cl. 435-235.000.

Grabowski, Leonard R.: *See—*
Brandt, Howard C.; and Grabowski, Leonard R., 4,295,384, Cl. 74-424.8NA.

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Graham, Henry A., Jr.; Olekna, David J.; Hawk, Johnna B.; and Barrett, Diane M., to Ortho Diagnostics, Inc. Anti-D test and reagent. 4,296,090, Cl. 424-11.000.

Granada, Wilfredo A. Reading stand. 4,295,624, Cl. 248-456.000.

Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, to Atlantic Richfield Company. Manufacture of tertiary butyl alcohol. 4,296,262, Cl. 568-910.000.

Grantmyre, Innes; and Miedema, Brent, to Joy Manufacturing Company. Impactor. 4,295,411, Cl. 91-165.000.

Grasso, Michael. Utility bucket seat. 4,295,680, Cl. 297-193.000.

Graves, Kevin, to UOP Inc. Spring suspensions for vehicle seats. 4,295,627, Cl. 248-588.000.

Gray, Vincent F., to Western Electric Company, Incorporated. Strain relief for connector wires. 4,295,696, Cl. 339-17.00C.

Greci, John J.: *See—*
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,295,905, Cl. 156-174.000.

Green, Douglas F., to Royer Mowers (Aust.) Pty. Ltd. Self-propelled flail blade lawn mower. 4,295,326, Cl. 56-11.300.

Green, Milton, to United States of America, Navy. Pressure sensitive line transducer. 4,296,487, Cl. 367-169.000.

Greenhill, Derek H.: *See—*
Ashton, Christopher J.; Diamond, Andrew C.; and Greenhill, Derek H., 4,295,754, Cl. 403-369.000.

Greenwood, Gillian M.; and Woodstock, Alan, to Imperial Chemical Industries Limited. Solvent compositions. 4,295,888, Cl. 106-21.000.

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Card, Lorin P.; and Borsting, Otto W., 4,295,630, Cl. 251-14.000.
Zahid, Abduz, 4,295,492, Cl. 138-30.000.

Gregory, Leslie A., to UOP Inc. Seat having lumbar support and vertical height adjustment mechanism therefor. 4,295,681, Cl. 297-284.000.

Gresch, Heinz: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

Gresham, John T., to Avtex Fibers Inc. Flame-retardant polyester fiber compositions. 4,295,886, Cl. 106-18.190.

Griesenauer, Neal M.; and Gersi, Julius J., to Varian Associates, Inc. Article comprising a substrate and chromium alloy coating. 4,296,178, Cl. 428-462.000.

Griffin, Kary A., to G. H. Products, Inc. Floor panel. 4,295,319, Cl. 52-785.000.

Grigoleit Company, The: *See—*
Howie, Robert K., Jr., 4,295,246, Cl. 16-121.000.

Grim, George B.: *See—*
Cemenska, Richard A.; and Grim, George B., 4,295,449, Cl. 123-300.000.

Grime, Paul R., to Owens-Corning Fiberglas Corporation. Electrical power distribution system principally for space-dividing panels in office buildings. 4,295,697, Cl. 339-22.00R.

Grinage, Kim D. Keyhole sighter. 4,295,350, Cl. 70-454.000.

Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, to L'Oreal. Composition for hair dyeing which contains a para base and an ortho base. 4,295,848, Cl. 8-421.000.

Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., to Thermoplastics, Inc. Method of making truck bed cover assembly. 4,295,262, Cl. 29-462.000.

Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., to Xerox Corporation. Electrostatographic toner composition. 4,296,192, Cl. 430-109.000.

GTE Automatic Electric Laboratories, Inc.: *See—*
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Barnes, John E.; Goebel, Franz; and McHugh, William T., 4,296,187, Cl. 429-105.000.
Kimball, Stephen F.; and Gagnon, Peter R., 4,296,351, Cl. 313-222.000.
Maya, Jakob, 4,296,350, Cl. 313-26.000.
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Guerit, Pierre: *See—*
Hicter, Jean-Marie; and Guerit, Pierre, 4,295,884, Cl. 75-93.00R.

Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix. Reusable heat devices containing xylitol as the heat-storage material. 4,295,517, Cl. 165-1.000.

Gulf Research & Development Company: *See—*
Innes, Robert A.; and Kehl, William L., 4,296,046, Cl. 260-465.300.

Gulf & Western Corporation: *See—*
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Gunderson, Gary M.: *See—*
Locatelli, John D.; and Gunderson, Gary M., 4,295,599, Cl. 229-34.00R.

Gunn, Duncan A., to International Standard Electric Corporation. Electrical connector for submarine repeaters or the like. 4,295,701, Cl. 339-94.00A.

Gunter, Thomas G.; Tredennick, Harry L.; and McAlister, Doyle V., to Motorola, Inc. Execution unit for data processor using segmented bus structure. 4,296,469, Cl. 364-200.000.

Gurin, Vasily N.: *See—*
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Gurr, George P., to Sangamo Weston, Inc. Inverter controller. 4,296,462, Cl. 363-96.000.

Gutekunst, Ferdinand; and Schmid, Rolf, to Ciba-Geigy Corporation. Curable epoxide resin mixtures. 4,296,231, Cl. 528-93.000.

Guthlein, Werner: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Guttinger, Kurt, to Sodeco-SAIA SA. Self-starting single-phase synchronous motor. 4,296,341, Cl. 310-41.000.

Gutzwiller, Howard L., to Robinson Industries, Inc. Cover plates for tank heads. 4,295,789, Cl. 416-213.00A.

Guyer, James M.; and West, Joseph T., to Data General Corporation. Data processing system including a separate input/output processor with micro-interrupt request apparatus. 4,296,466, Cl. 364-200.000.

H. L. Plast H. Lundvall AB: *See—*
Westberg, Ake G., 4,295,288, Cl. 40-16.400.

Haaf, Friedhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Coke-oven door assembly. 4,295,938, Cl. 202-248.000.

Haage, Karl; and Scharff, Dieter, to Dynamit Nobel Aktiengesellschaft. Protective layer for surface seals in building construction, underground construction, and civil engineering construction. 4,295,911, Cl. 156-315.000.

Haas, Eduard, to Centromint Company Establishment. Tablet dispenser. 4,295,579, Cl. 221-229.000.

Haas, Gerhard J.: *See—*
Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., 4,296,132, Cl. 426-2.000.

Haberl, John B., to United States of America, Navy. Flexible loop slip ring brush. 4,296,345, Cl. 310-219.000.

Haberli, Roland; Mollet, Hans; and Scherer, Gustaaf, to Ciba-Geigy Corporation. Commercial preparations of dry organic substances. 4,295,850, Cl. 8-524.000.

Hachenberg, Horst: *See—*
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, 4,296,266, Cl. 585-640.000.

Hachiro, Nobuaki, to Nissin Kogyo Kabushiki Kaisha. Hose with a one-way valve for a vacuum operated servomotor. 4,295,412, Cl. 91-468.000.

Hada, Hiroshi: *See—*
Hirayama, Tsutomu; and Hada, Hiroshi, 4,296,357, Cl. 315-169.400.

Haensel, Eckhart, to Siemens Aktiengesellschaft. Method and circuit arrangement for switching and transmitting signals in, or from, a stored program controlled switching system. 4,296,403, Cl. 340-147.00P.

Hafer, Edward H., to Bell Telephone Laboratories, Incorporated. Continuity verification arrangement. 4,296,492, Cl. 370-14.000.

Hagberg, Gideon, to Berg, Gunner; and Stroberg, Sven-Olle. Magnetic fuel purifier with rotating pre-purifier. 4,295,969, Cl. 210-223.000.

Hagerstrom, John R.: *See—*
Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., 4,296,176, Cl. 428-407.000.

Hagglund, Erik H. M.; and Giler, Roger R., to Kanthal Corporation, The. Electric hot plate. 4,296,311, Cl. 219-464.000.

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Hahlganss, Gunter, to VDO Adolf Schindling AG. Apparatus for electrically connecting a plurality of contacts. 4,296,457, Cl. 361-413.000.

Haill, Harry K., to Litton Resources Systems, Inc. Method and means for measuring geophone parameters. 4,296,483, Cl. 367-13.000.

Hajimoto, Yoshioki: *See*—
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.

Hakoi, Tsutomu, to Yoshida Kogyo K.K. Automatic selection and delivery apparatus of assembled mechanical parts. 4,295,570, Cl. 209-657.000.

Halliburton Company: *See*—
Baker, Eugene E.; and Szarka, David D., 4,295,524, Cl. 166-278.000.
McMahan, Michael E., 4,295,361, Cl. 73-40.50R.

Halpaap, Herbert; and Krebs, Karl-Friedrich, to Merck Patent Gesellschaft mit beschrankter Haftung. Separating materials for thin layer chromatography and their preparation. 4,295,968, Cl. 210-198.300.

Hampton, Robert S., Jr.: *See*—
Spainhour, Phillip A.; Morrison, Leonard A.; and Hampton, Robert S., Jr., 4,295,634, Cl. 254-10.500.

Hanada, Toshiro: *See*—
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.

Handotai Kenkyu Shinkokai: *See*—
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Hannesen, Kurt: *See*—
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Hannett, William J.; Brendel, Thomas E.; and Wilson, David S., to Carrier Corporation. Refrigeration unit with water. 4,295,344, Cl. 62-324.500.

Hansen, Gert: *See*—
Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, 4,296,047, Cl. 260-974.000.

Hansen, Roger M., to Stratabolt Corporation. Post tensionable grouted anchor assembly. 4,295,761, Cl. 405-261.000.

Hanzel, Robert S.; and Sauer, Paul J., to Du Pont de Nemours, E. I., and Company. Spandex filaments containing certain metallic soaps. 4,296,174, Cl. 428-389.000.

Hara, Shigeyoshi; and Yamada, Tateyoshi, to Teijin Limited. Heat-curable and solvent-soluble ester group-containing polymer compositions and process for their preparation. 4,296,218, Cl. 525-439.000.

Hara, Toshitami; Sato, Yashushi; Takatori, Yasushi; and Shirato, Yoshiaki, to Canon Kabushiki Kaisha. Ink jet recording device using thermal propulsion and mechanical pressure changes. 4,296,421, Cl. 346-140.00R.

Hara, Toshitami: *See*—
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,296,309, Cl. 219-216.000.

Harader, Wayne R., to E-Systems, Inc. Dual mode log periodic monopole array. 4,296,416, Cl. 343-792.500.

Haraguchi, Noriyuki: *See*—
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.

Harashima, Noboru: *See*—
Kawamura, Toshio; Harashima, Noboru; Ueda, Hideo; and Sano, Seijiro, 4,295,654, Cl. 277-92.000.

Haraszti, Tegzi P., to Rockwell International Corporation. Merged field effect transistor circuit and fabrication process. 4,296,428, Cl. 357-41.000.

Hardware Designers, Inc.: *See*—
Blasnik, William, 4,295,688, Cl. 308-3.800.

Harman, Maurice: *See*—
Caplin, Peter B.; and Harman, Maurice, 4,295,817, Cl. 431-7.000.

Harper, Terence; and Gates, Allen P., to Vickers Limited. Positive-working light sensitive diazo materials with azo dye. 4,296,194, Cl. 430-176.000.

Harrington, Alan L.; Rodov, Vladimir; and Allison, Richard, to TRW Inc. Two-mask VJ-FET transistor structure. 4,295,267, Cl. 29-571.000.

Harris Corporation: *See*—
Buck, Gordon K.; and Kozin, Cynthia H., 4,295,363, Cl. 73-117.300.
Schroeder, James E., 4,296,429, Cl. 357-55.000.

Harris, Jeff B. Adjustable neck attachment for stringed instruments. 4,295,403, Cl. 84-293.000.

Harris, Wilford D., to Dow Chemical Company, The. Method of injection molding thermoplastic resinous products substantially free from sink marks, swirls and related blemishes. 4,296,055, Cl. 264-45.500.

Harrold, Ronald T.; and Ottenberg, Lawrence E., to Electric Power Research Institute, Inc. Atomized dielectric fluid composition with high electrical strength. 4,296,003, Cl. 252-570.000.

Hartmann, Gerhard: *See*—
Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, 4,295,563, Cl. 206-205.000.

Hartmann, Kurt, to International Business Machines Corporation. Arrangement for feeding electrodes in metal paper printers. 4,295,746, Cl. 400-119.000.

Hartmann, Rudolf: *See*—
Schuberth, Christian; and Hartmann, Rudolf, 4,296,292, Cl. 200-336.000.

Haruta, Masahiro: *See*—
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.

Harvey, George R.: *See*—
Middlebrook, Robert E.; Harvey, George R.; and Chupp, John P., 4,296,254, Cl. 564-214.000.

Harvey, William A.: *See*—
Nelson, Gary L.; and Harvey, William A., 4,295,988, Cl. 252-584.000.

Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, to Ricoh Co., Ltd. Photosensitive material for use in electrophotography with a radiation cured binder resin. 4,296,190, Cl. 430-57.000.

Hashido, Akiyoshi: *See*—
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Haslop, John M.; Knapman, Reginald G.; and West, Michael A., to Thomas De La Rue & Company Limited. Watermark detection. 4,296,326, Cl. 250-372.000.

Hasselmann, Detlev E. M. Gasoline vapor recovery system. 4,295,504, Cl. 141-290.000.

Hasselmann, Detlev E. M.; and Labonte, Paul D. Gasoline vapor recovery system. 4,295,505, Cl. 141-301.000.

Hasslauer, Heinz, to Hermann Traub GmbH & Co. Bar feeding mechanism for machines for working rotating bar stock. 4,295,396, Cl. 82-1.00C.

Hatanaka, Isamu: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.

Hatta, Masami; Iwata, Katsumi; and Sasaki, Masao, to Hitachi Metals Precision, Ltd. Automatic coating system for lost wax process. 4,295,444, Cl. 118-668.000.

Hattori, Naohiko: *See*—
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

Hatzikelis, Christopher: *See*—
Madonia, Ciro N.; Hatzikelis, Christopher; and Cosentino, Cesare C., 4,296,155, Cl. 428-31.000.

Hauk, Ernest D.; and Stewart, Larry, to Service Equipment Design Co., Inc. Method and apparatus for connecting steel pipe sections. 4,295,526, Cl. 166-315.000.

Haus, Artur: *See*—
Nonn, Konrad; Wolf, Karlheinz; Haus, Artur; and Hornle, Reinhold, 4,295,849, Cl. 8-524.000.

Hauser, H. William, to Vinings Chemical Company. Method of manufacturing aluminum sulfate from flue gas. 4,296,079, Cl. 423-242.000.

Hautala, Earl: *See*—
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, 4,295,333, Cl. 60-641.600.

Hawk, Johnna B.: *See*—
Graham, Henry A., Jr.; Olekna, David J.; Hawk, Johnna B.; and Barrett, Diane M., 4,296,090, Cl. 424-11.000.

Hawley, Gil R., to Phillips Petroleum Company. Selenium or tellurium treated silica. 4,295,998, Cl. 252-439.000.

Hawley, Gil R., to Phillips Petroleum Company. Titanium impregnated silica-chromium catalysts. 4,296,001, Cl. 252-458.000.

Hayashi, Masaaki; Sasaki, Hiroharu; and Tsuneta, Kazuyoshi, to Dai Nippon Toryo Co., Ltd. Aqueous dispersion type thermosetting coating composition. 4,296,014, Cl. 260-29.6NR.

Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling device. 4,295,550, Cl. 192-58.00B.

Hayashibara, Ken: *See*—
Sugimoto, Kaname, 4,296,025, Cl. 260-112.00R.

Hazama, Katashi; and Yuhara, Akitsuna, to Hitachi, Ltd. Surface-acoustic-wave filter for channel selection system of television receiver. 4,296,391, Cl. 333-193.000.

Healthco Inc.: *See*—
Lustgarten, Stewart J., 4,295,941, Cl. 204-35.00R.

Heckmann, Werner, to Holstein und Kappert GmbH. Device for conveying containers. 4,295,558, Cl. 198-440.000.

Heeb, Adolf, to Interliz Anstalt. Heating boiler and temperature control therefor. 4,295,447, Cl. 122-136.00R.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Thunker, Norbert, 4,295,422, Cl. 101-232.000.

Heidemeyer, Paulus: *See*—
Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, 4,295,551, Cl. 192-0.076.

Heimerl, Joseph: *See*—
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, 4,295,808, Cl. 425-8.600.

Heinz, Theodore A., to Rockwell International Corporation. Deformable mirror with dither. 4,295,710, Cl. 350-310.000.

Helfer, Friedrich; Elsner, Ernst; and Zaiser, Wolfgang, to Voith Getriebe KG. Progressive torque transmission in leaf-spring coupling. 4,295,348, Cl. 64-27.00L.

Hems, Roger: *See*—
Roswell, David G.; Spring, David J.; and Hems, Roger, 4,296,255, Cl. 564-215.000.
Rowsell, David G.; Gascoyne, John M.; and Hems, Roger, 4,296,093, Cl. 424-45.000.

Hengartner, Urs, to Hoffmann-La Roche Inc. Preparation of a 1,4-pentadien-3-ol. 4,296,259, Cl. 568-378.000.



Henkel Corporation: *See*—
Rogier, Edgar R., 4,296,004, Cl. 260-18.0EP.

Henkel Kommanditgesellschaft Auf Aktien: *See*—
Ziche, Horst, 4,296,235, Cl. 536-85.000.

Hennessy, James W.: *See*—
Angel, Henry R.; and Hennessy, James W., 4,296,373, Cl. 324-71.0CP.

Henry Lindsay Limited: *See*—
Alderton, Gordon H. S., 4,295,770, Cl. 411-531.000.

Henry, Paul S., to Bell Telephone Laboratories, Incorporated. Wide-band digital spectrometer. 4,296,374, Cl. 324-77.00B.

Hercules Incorporated: *See*—
Dumas, David H., 4,295,931, Cl. 162-158.000.

Hergaux, Claude. Apparatus for lifting waste containers on to trucks. 4,295,778, Cl. 414-525.00R.

Hergert, Roger A.: *See*—
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.

Herion, Dieter: *See*—
Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, 4,295,253, Cl. 28-255.000.

Hermann Traub GmbH & Co.: *See*—
Hasslauer, Heinz, 4,295,396, Cl. 82-1.00C.

Hermann Wegener Schiffgraben: *See*—
Bumbalek, Alois J., 4,296,056, Cl. 264-49.000.

Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., to Tennant Company. Scrubbing machine with water regeneration. 4,295,244, Cl. 15-320.000.

Herpers, Ferdinand J.: *See*—
Bricher, Charles W.; and Herpers, Ferdinand J., 4,295,274, Cl. 30-347.000.

Herschler, Robert J. Therapeutic dimethyl sulfoxide composition and methods of use. 4,296,104, Cl. 424-153.000.

Herschler, Robert J. Methylsulfonylmethane and methods of use. 4,296,130, Cl. 424-337.000.

Hesston Corporation: *See*—
Hill, Amos G., 4,295,616, Cl. 241-241.000.

Hester, Jackson B., Jr., to Upjohn Company, The. Amino-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 4,296,239, Cl. 546-271.000.

Heuer, Steven R.; and Zbranek, Zdenka, to Engelhard Min. & Chem. Corp. Recovery of molybdenum values from leach muds. 4,296,077, Cl. 423-53.000.

Hicter, Jean-Marie; and Guerit, Pierre, to Societe de Vente de l'Aluminium Pechiney. Process for treating a molten metal or alloy using liquid and solid flux. 4,295,884, Cl. 75-93.00R.

Hieber, Udo: *See*—
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.

Hiei, Shoki, to Toyooki Kogyo Kabushiki Kaisha. Lubricator. 4,295,545, Cl. 184-55.00A.

Higashi, Akio: *See*—
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.

Higgs, Jacob K.; and Avery, Grant D., to Sprague Electric Company. Two-state Hall element proximity sensor device with lamp indicator. 4,296,410, Cl. 340-686.000.

Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, to Nippon Steel Corporation. Method for coating one side only of steel strip with molten coating metal. 4,296,145, Cl. 427-47.000.

Hildebrandt, Eugene F.; and Ottersbach, Thomas V., to Emerson Electric Co. Motor starting switch. 4,296,366, Cl. 318-793.000.

Hildebrecht, Harold V., to Towmotor Corporation. Vehicle brake and engine interlock. 4,295,540, Cl. 180-271.000.

Hilker, Dennis C., to Honeywell Information Systems Inc. Calibration apparatus for CML circuit test unit. 4,295,359, Cl. 73-5.000.

Hill, Amos G., to Hesston Corporation. Chopping mechanism with remote shearbar adjuster. 4,295,616, Cl. 241-241.000.

Hill, Edward D. Ink transfer member. 4,296,172, Cl. 428-331.000.

Hill, Roy K., to Sperry Corporation. Sprocket hole sensing detector for moving translucent paper sheets. 4,296,332, Cl. 250-570.000.

Hinds, Virgil A. Crankless reciprocating engine and gyroscopic power transmission system. 4,295,381, Cl. 74-5.00R.

Hinkel, Lester H.; and Wolske, Lawrence E., to Whirlpool Corporation. Automatic hand washer and drier. 4,295,233, Cl. 4-619.000.

Hino, Masamichi: *See*—
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Hinrichs, Lansing M.: *See*—
Fahrig, Robert J.; and Hinrichs, Lansing M., 4,295,961, Cl. 208-161.000.

Hiraoka & Co., Ltd.: *See*—
Nakai, Shinzo; and Shimizu, Chitomi, 4,295,440, Cl. 118-412.000.

Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Speed control method for AC motors and an apparatus for the control. 4,296,367, Cl. 318-808.000.

Hiratsuka, Motoki: *See*—
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.

Hirayama, Tsutomu; and Hada, Hiroshi, to Nippon Electric Co., Ltd. Plasma display system. 4,296,357, Cl. 315-169.400.

Hirose, Chuji: *See*—
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.

Hirsch, Michael: *See*—
Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.

Hirschvogel, Alfred: *See*—
Freundlinger, Ernst; and Hirschvogel, Alfred, 4,296,177, Cl. 428-408.000.

Hitachi Chemical Company, Ltd.: *See*—
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Achiha, Masahiko, 4,296,436, Cl. 358-167.000.

Hitachi Koki Company, Limited: *See*—
Kubota, Toshifumi, 4,295,272, Cl. 30-276.000.

Hitachi, Ltd.: *See*—
Achiha, Masahiko, 4,296,436, Cl. 358-167.000.
Bandoh, Tadaaki; and Fukunaga, Yasushi, 4,296,468, Cl. 364-200.000.
Hazama, Katashi; and Yuhara, Akitsuna, 4,296,391, Cl. 333-193.000.
Horiuchi, Masatada; and Katto, Hisao, 4,295,265, Cl. 29-571.000.
Imai, Kuninori; and Takahashi, Soji, 4,295,595, Cl. 228-161.000.
Ishikawa, Sakou; Watanabe, Yutaka; and Wakai, Katsuro, 4,296,494, Cl. 371-13.000.
Nakazima, Kooichi; Kazama, Keizo; and Oki, Hiroshi, 4,295,574, Cl. 220-2.10A.
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, 4,295,781, Cl. 415-1.000.
Ohara, Ichiro, 4,295,748, Cl. 403-24.000.
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Saito, Cyuichi; and Teranishi, Katsuya, 4,295,556, Cl. 198-325.000.
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, 4,295,792, Cl. 417-15.000.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.

Hitachi Metals Precision, Ltd.: *See*—
Hatta, Masami; Iwata, Katsumi; and Sasaki, Masao, 4,295,444, Cl. 118-668.000.

Hitachi Service Engineering Co., Ltd.: *See*—
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, 4,295,781, Cl. 415-1.000.

Ho, T. L.; and Din, Zia U., to SCM Corporation. Preparation of (−)-dihydrochrysanthemolactone. 4,296,038, Cl. 260-343.210.

Ho, T. L.; Din, Zia U.; and Cardenas, Carlos G., to SCM Corporation. Synthesis of (+)-cis-homocaronic acid. 4,296,251, Cl. 562-506.000.

Hochiki Corporation: *See*—
Sawa, Hiroshi, 4,295,371, Cl. 73-359.00A.

Hochstrasser geb. Wack, Elisabeth: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,295,759, Cl. 405-243.000.

Hochstrasser, Jurgen: *See*—
Mathieu, Hans; and Hochstrasser, Jurgen, 4,295,759, Cl. 405-243.000.

Hodddinott, David C., to Crompton & Knowles Corporation. Ribbon cable extrusion crosshead. 4,295,812, Cl. 425-114.000.

Hodes, Gary; Cahen, David; and Manassen, Joost, to Yeda Research and Development Company Ltd. Cd(Se,Te) Alloy photovoltaic materials. 4,296,188, Cl. 429-111.000.

Hoechst Aktiengesellschaft: *See*—
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.
Becker, Reinhold; Michel, Wolfgang; and Hartmann, Gerhard, 4,295,563, Cl. 206-205.000.
Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, 4,295,945, Cl. 204-128.000.
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.
Faust, Raimund J., 4,296,196, Cl. 430-271.000.
Mayer, Manfred; and Volz, Roland, 4,295,937, Cl. 202-155.000.
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, 4,296,266, Cl. 585-640.000.
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, 4,296,210, Cl. 521-85.000.

Hoefke, Wolfgang: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Hofer, Bruce E., to Tektronix, Inc. Distortion reduction circuit for an inverting feedback amplifier. 4,296,381, Cl. 330-149.000.

Hoffman, Lawrence C., to Aerojet-General Corporation. Recirculating vapor system for gelling cryogenic liquids. 4,295,346, Cl. 62-500.000.

Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, to Bayer Aktiengesellschaft. Preparation of 3-(2,2-dichlorovinyl)-2,2-dimethyl-cyclopropane-1-carboxylic acid derivatives. 4,296,241, Cl. 560-124.000.

Hoffmann-La Roche Inc.: *See—*
Fischli, Albert E.; and Szente, Andre, 4,296,031, Cl. 260-239.30D.
Hengartner, Urs, 4,296,259, Cl. 568-378.000.

Hogfeldt, Carl-Erik: *See—*
Nasman, John O.; and Hogfeldt, Carl-Erik, 4,296,067, Cl. 422-26.000.

Holland, Kenneth F., to Ygnacio Inc.; and Compact Video Systems Inc. High-resolution television system. 4,296,431, Cl. 358-12.000.

Holmberg, John M., to Boart International Limited. Thread structure for percussion drill elements. 4,295,751, Cl. 403-306.000.

Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, to Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa". Support assembly for high current bus bars. 4,296,273, Cl. 174-99.00B.

Holset Engineering Company Limited: *See—*
Vollett, Eric M., 4,295,546, Cl. 188-378.000.

Holstein und Kappert GmbH: *See—*
Heckmann, Werner, 4,295,558, Cl. 198-440.000.

Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, to Industrie-Wert Beteiligungsgesellschaft mbH. Filter for cleaning hot gases. 4,295,868, Cl. 55-302.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sano, Shoichi; and Furukawa, Yoshimi, 4,295,657, Cl. 280-91.000.

Honeywell, Inc.: *See—*
Schowe, Lester F., Jr., 4,296,445, Cl. 360-65.000.
Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., 4,296,464, Cl. 364-200.000.

Honeywell Information Systems Inc.: *See—*
Hilker, Dennis C., 4,295,359, Cl. 73-5.000.
Lemak, Nicholas S., 4,296,465, Cl. 364-200.000.
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., 4,295,271, Cl. 29-840.000.
Nibby, Chester M., Jr.; and Panepinto, William, Jr., 4,296,467, Cl. 364-200.000.

Hooker Chemicals & Plastics Corp.: *See—*
Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., 4,295,951, Cl. 204-242.000.
Oppen, Dieter, 4,295,899, Cl. 148-6.160.
Tang, David Y.; and Foster, Arthur M., 4,296,244, Cl. 562-470.000.

Hoover, Merle V., to RCA Corporation. Class AB push-pull FET amplifiers. 4,296,382, Cl. 330-264.000.

Hope, Henry F.; and Hope, Stephen F. Apparatus for processing photographic materials. 4,295,590, Cl. 226-183.000.

Hope, Stephen F.: *See—*
Hope, Henry F.; and Hope, Stephen F., 4,295,590, Cl. 226-183.000.

Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, to Beiersdorf Aktiengesellschaft. Dental and mouth care preparations. 4,296,095, Cl. 424-52.000.

Horan, Douglas F., to Intel Corporation. Initializing circuit for MOS integrated circuits. 4,296,340, Cl. 307-550.000.

Horie, Takashi: *See—*
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.

Horiguchi, Makoto: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Horiuchi, Masatada; and Katto, Hisao, to Hitachi, Ltd. Method for producing a nonvolatile semiconductor memory. 4,295,265, Cl. 29-571.000.

Hornbeck, Clarence J., to Follett Corporation. Load support structure. 4,295,309, Cl. 52-309.700.

Horner, John A.; and Wright, Dale W., to Horner, John A. Gear system and method of assembly. 4,296,313, Cl. 235-61.00L.

Horner, John W., Jr. Apparatus and method for recovering organic and non-ferrous metal products from shale and ore bearing rock. 4,295,880, Cl. 75-10.00R.

Hornle, Reinhold: *See—*
Nonn, Konrad; Wolf, Karlheinz; Haus, Artur; and Hornle, Reinhold, 4,295,849, Cl. 8-524.000.

Horsfall, Harry: *See—*
Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.

Horsfield, Arthur K.: *See—*
Minoprio, William E.; and Horsfield, Arthur K., 4,296,460, Cl. 362-200.000.

Hoshino, Masaru, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for sterilizing a succession of food containers or the like. 4,296,068, Cl. 422-62.000.

Hoshinouchi, Susumu: *See—*
Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, 4,295,906, Cl. 156-214.000.

Hosmer/Dorrance Corporation: *See—*
Prout, Wesley C., 4,295,466, Cl. 128-80.00R.

Howie, Robert K., Jr., to Grigoleit Company, The. Knob. 4,295,246, Cl. 16-121.000.

Hoxan Co. Ltd.: *See—*
Kuraoka, Yasuo; and Tsuchida, Yasuhiro, 4,295,339, Cl. 62-64.000.

Hrehovcik, Michael: *See—*
Mann, Samuel J.; and Hrehovcik, Michael, 4,295,467, Cl. 128-303.180.

Hsiao, James C., to Union Special Corporation. Feed mechanism for sewing machines. 4,295,434, Cl. 112-314.000.

Hsu, Sheng T., to RCA Corporation. Method of manufacturing bulk CMOS integrated circuits. 4,295,266, Cl. 29-571.000.

Hubele, Adolf: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,296,118, Cl. 424-273.00P.

Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Apparatus and methods for sample enrichment for flameless atomic absorption spectroscopy. 4,295,854, Cl. 23-230.0PC.

Hubner, Kurt: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

Hudson, Robert L., to Chevron Research. Polypropylene blend compositions. 4,296,022, Cl. 260-42.460.

Huebscher, Wilhelm: *See—*
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.

Hulek, Anton. Guard rail. 4,295,637, Cl. 256-13.100.

Hulke, Donald B. Hanging shelves. 4,295,432, Cl. 108-149.000.

Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., to Xerox Corporation. Bound document apparatus latching mechanism. 4,295,732, Cl. 355-14.00R.

Hurt, James J., to Deere & Company. Inspection system and apparatus therefor. 4,296,474, Cl. 364-560.000.

Hurt, Roger W.: *See—*
Schmid, Michael G.; and Hurt, Roger W., 4,295,577, Cl. 220-86.0AT.

Hutson, Maurice L., to Control Data Corporation. Register device for transmission of data having two data ranks one of which receives data only when the other is full. 4,296,477, Cl. 364-900.000.

Huttenhow, George H. Pivoted lever actuator. 4,295,385, Cl. 74-478.000.

Hutton, James E.: *See—*
Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., 4,295,732, Cl. 355-14.00R.

Hycel, Inc.: *See—*
Angel, Henry R.; and Hennessy, James W., 4,296,373, Cl. 324-71.0CP.

Hydril Company: *See—*
Mott, James D., 4,295,523, Cl. 166-250.000.

Hydro-Quebec: *See—*
Poirier, Marc; Gauthier, Michel; and Belanger, Andre, 4,295,939, Cl. 204-1.00T.

Ibberson, Robert B. Strip brick facing material. 4,296,154, Cl. 428-15.000.

Ichisaka, Teruo: *See—*
Fuseya, Shigeaki; and Ichisaka, Teruo, 4,295,953, Cl. 204-257.000.

ICI Americas Inc.: *See—*
Magrans, Juan J., Jr., 4,296,020, Cl. 260-37.00N.
Markiewitz, Kenneth H., 4,296,215, Cl. 525-28.000.
Sherburne, Edwin C., 4,295,977, Cl. 252-8.900.

ICI Australia Limited: *See—*
Fensom, Donald J., 4,295,878, Cl. 75-1.00T.

Idacon, Inc.: *See—*
Kirchner, Roy P., 4,296,152, Cl. 427-440.000.

Ideal Toy Corporation: *See—*
Cooper, Julius, 4,295,649, Cl. 273-86.00B.

Igawa, Takao: *See—*
Hasegawa, Haruo; Taniguchi. Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.

Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

IHC Holland N.V.: *See—*
Brandwijk, Willem; and Dam, Herman, 4,295,286, Cl. 37-58.000.

Iida, Yoshihiko, to Toyo Kogyo Co., Ltd. Heated fuel intake system in automobile engine. 4,295,454, Cl. 123-556.000.

Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Optical assembly for use in copying machine. 4,295,736, Cl. 355-57.000.

Ikeda, Tokuzo: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.

Ikegami, Shiro: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.

Illes, Janos: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Illinois Tool Works Inc.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.

Imai, Kuninori; and Takahashi, Soji, to Hitachi, Ltd. Method of producing magnetron anode. 4,295,595, Cl. 228-161.000.

Imai, Mitsuru, to Ricoh Co., Ltd. Transfer sheet suitable for electrophotographic pressure-fixing. 4,296,171, Cl. 428-323.000.

Imazeki, Ryoji; and Yamazaki, Etuo, to Fujitsu Fanuc Limited. Profile control system. 4,296,473, Cl. 364-520.000.

Impellizzeri, Julius S.: *See—*
Etzold, Roland; Impellizzeri, Julius S.; and Vaughan, Thomas W., 4,295,557, Cl. 198-382.000.

Imperial Chemical Industries Limited: *See—*
Buckley, Alan J.; and Singer, Michael, 4,295,887, Cl. 106-18.330.
Greenwood, Gillian M.; and Woodstock, Alan, 4,295,888, Cl. 106-21.000.
Stuart-Webb, John, 4,296,217, Cl. 525-390.000.

Ims, Dale R.: *See—*
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.





INCA Limited: *See—*
Tutty, Geoffrey C., 4,295,662, Cl. 282-27.500.

Industrie Pirelli S.p.A.: *See—*
Manini, Silvio; and Pacciarini, Antonio, 4,295,774, Cl. 414-331.000.

Industrie-Wert Beteiligungsgesellschaft mbH: *See—*
Holter, Heinz; Gresch, Heinz; Igelbuscher, Heinrich; Hubner, Kurt; and Weber, Ekkehard, 4,295,868, Cl. 55-302.000.

Ingard, Karl U.: *See—*
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,295,416, Cl. 98-33.00R.

Ingrain, Raymond A.; and Cohen, Jacques, to La Telemecanique Electrique. Manual electric switch with thermal release. 4,296,396, Cl. 337-66.000.

Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, to Wacker-Chemie GmbH. Room temperature curable compositions. 4,296,228, Cl. 528-33.000.

Innes, Robert A.; and Kehl, William L., to Gulf Research & Development Company. Process for the manufacture of acrylonitrile. 4,296,046, Cl. 260-465.300.

Innovative Photograhic Enterprises, Inc.: *See—*
Stevie, Robert W., 4,296,197, Cl. 430-300.000.

Inoue, Atsunori: *See—*
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.

Inoue, Nobuyoshi; to Copal Company Limited. Blade type focal plane shutter. 4,295,726, Cl. 354-246.000.

Institut International de Pathologie Cellulaire et Moleculaire: *See—*
Baurain, Roger M.; and Trouet, Andre B. L., 4,296,105, Cl. 424-180.000.

Intel Corporation: *See—*
Horan, Douglas F., 4,296,340, Cl. 307-550.000.

Interliz Anstalt: *See—*
Heeb, Adolf, 4,295,447, Cl. 122-136.00R.

International Business Machines Corp.: *See—*
Dalboussiere, Gerard; and Draper, Wilburn D., 4,296,463, Cl. 364-200.000.
Fairchild, Peter T.; and Leininger, Joel C., 4,296,470, Cl. 364-200.000.
Garnache, Richard R.; and Kenney, Donald M., 4,295,924, Cl. 156-643.000.
Hartmann, Kurt, 4,295,746, Cl. 400-119.000.
Janssen, Donovan M.; and Seaward, William S., 4,295,733, Cl. 355-14.0SH.
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., 4,296,455, Cl. 361-383.000.

International Computers Limited: *See—*
Dodds, Robert J., 4,295,695, Cl. 339-17.00F.

International Flavors & Fragrances Inc.: *See—*
Boden, Richard M., 4,296,137, Cl. 426-534.000.
Boden, Richard M., 4,296,138, Cl. 426-534.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,295,978, Cl. 252-8.900.

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Gagliani, John; and Sorathia, Usman A. K., 4,296,208, Cl. 521-77.000.

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Gunn, Duncan A., 4,295,701, Cl. 339-94.00A.

International Telephone and Telegraph Corp.: *See—*
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Inverness International Corp.: *See—*
Mann, Samuel J.; and Hrehovcik, Michael, 4,295,467, Cl. 128-303.180.

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Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.

Ishida, Hiroshi: *See—*
Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, 4,295,731, Cl. 355-14.00R.

Ishida, Yukihito: *See—*
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Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.

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Iwano, Yoshimi: *See—*
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Iwase, Yasuhiro: *See—*
Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, 4,295,967, Cl. 210-189.000.

Iwata, Katsumi: *See—*
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Izuhara, Wataru: *See—*
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Izumi, Masahiko. Microbe-removing and air-conditioning apparatus. 4,295,343, Cl. 62-309.000.

J. I. Case Company: *See—*
Maurer, Herman J., 4,295,661, Cl. 280-765.000.
Natzke, Ronald C.; and Brown, Thomas R., 4,295,287, Cl. 37-103.000.
Shumaker, John F., 4,295,779, Cl. 414-685.000.

J. M. Huber Corporation: *See—*
Wason, Satish K., 4,296,000, Cl. 252-455.00R.

J. T. Baker Chemicals B.V.: *See—*
Verbeek, Antonie E.; and Mattheij, Jozef M. J., 4,295,990, Cl. 252-408.000.

Jacobson, Richard L.; and Lin, Timothy T., to Minnesota Mining and Manufacturing Company. Two-layered photoreceptor containing a selenium-tellurium layer and an arsenic-selenium over layer. 4,296,191, Cl. 430-57.000.

Jaeckh, Christof: *See—*
Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, 4,296,149, Cl. 427-130.000.

Jagenberg-Werke AG: *See—*
Lollert, Bernd; and Risse, Heinrich, 4,295,382, Cl. 74-68.000.
Matzner, Erwin, 4,295,502, Cl. 141-11.000.

Jain, Kamlesh K., to Fram Industrial Filter Corp. Process for separating solids from suspensions of influent. 4,295,973, Cl. 210-738.000.

Jakusch, Helmut: *See—*
Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, 4,296,149, Cl. 427-130.000.

Jamison, Keith A.: *See—*
Thomson, George M.; and Jamison, Keith A., 4,296,330, Cl. 250-504.00R.

Jannone, Joseph. Method for measuring the full range in quality of a vapor. 4,295,368, Cl. 73-192.000.

Janssen, Donovan M.; and Seaward, William S., to International Business Machines Corporation. Automatic error collator capacity constraints using spare bfn strategy. 4,295,733, Cl. 355-14.0SH.

Japan Synthetic Rubber Co., Ltd.: *See—*
Aotani, Seiji; and Kanayama, Hisanori, 4,296,015, Cl. 260-29.6ME.

Jaquith, Jack B.; and Church, Allen R., to Tri/Valley Growers. Molded gelled pimiento body. 4,296,140, Cl. 426-575.000.

Jean, Raymond W. Wallcoverings. 4,296,162, Cl. 428-213.000.

Jean Walterscheid GmbH: *See—*
Geisthoff, Hubert; and von Allwoerden, Wilhelm, 4,295,389, Cl. 74-586.000.

Jeandot, Jean-Louis; and Lefort, Emmanuel, to Telecommunications Radioelectriques et Telephoniques T.R.T. Balancing amplifier. 4,296,383, Cl. 330-301.000.

Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., to Dow Chemical Company, The. Polyurethane backed carpet. 4,296,159, Cl. 428-95.000.

Jenkins, Thomas E., to General Electric Company. Dishwasher tub assembly. 4,295,692, Cl. 312-228.000.

Jenner, Michael R.: *See—*
Khan, Riaz A.; and Jenner, Michael R., 4,296,139, Cl. 426-536.000.

Jensen, David C. Modular building structure. 4,295,307, Cl. 52-236.100.
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Jerome, Jonathan A., to Atlantic Richfield Company. Information carrier having inter-track identification code information. 4,296,491, Cl. 369-59.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Draggoo, Vaughn G., 4.296,388, Cl. 331-94.50L.
John, Frank T., to A-T-O Inc. Microminiature palladium oxide gas detector and method of making same. 4,296,399, Cl. 338-34.000.
John Thomas Batts, Inc.: *See—*
Garrison, Judd F., 4,295,585, Cl. 223-96.000.
John Wyeth & Brother Limited: *See—*
Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., 4,296,029, Cl. 260-239.30R.
Johne, Hans; Muller, Wolfgang; Jentzsch, Arndt; and Schumann, Gunter, to VEB Kombinat Polygraph "Werner Lamberz". Liquid distributing roller assembly for printing machines. 4,295,423, Cl. 101-349.000.
Johns Hopkins University, The: *See—*
Fischell, Robert E., 4,295,474, Cl. 128-697.000.
Walser, Mackenzie, 4,296,127, Cl. 424-319.000.
Johns-Manville Corporation: *See—*
LaPrade, Steve A.; and Pallo, John M., 4,295,669, Cl. 285-47.000.
Johnsen, Kenneth E.: *See—*
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Johnson, Alexander L., to Du Pont de Nemours, E. I., and Company. Antihypertensive 1-substituted cyclic lactam-2-carboxylic acids. 4,296,110, Cl. 424-244.000.
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., to Philip Morris Incorporated. Cooling apparatus and method in a liquid cryogen treatment process. 4,295,337, Cl. 62-54.000.
Johnson, Jesse F., to General Motors Corporation. Scalloped ceramic turbine. 4,295,791, Cl. 416-241.00B.
Johnson, Larry K., to Lawrence Brothers, Inc. Bifold door hinge assembly. 4,295,514, Cl. 160-206.000.
Johnson, Lester E. Elevator control adaptor for handicapped users. 4,296,291, Cl. 200-331.000.
Johnson,.Matthey & Co., Limited: *See—*
Whitehead, Paul, 4,296,086, Cl. 423-392.000.
Johnson, Richard N. Parametric energy converter. 4,295,334, Cl. 60-669.000.
Johnson, Romain H. Die forming method and machine. 4,296,301, Cl. 219-69.00M.
Johnston, David: *See—*
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Johnston, David B. R.: *See—*
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Joly, Robert; Pavan, Charles; and Carle, Pierre R., to Roussel Uclaf. Novel synergistic insecticides. 4,296,091, Cl. 424-18.000.
Jones, Emrys H., Jr.; and Lauer, Stephen D., to Conoco Inc. Pressure seal for pumping instruments through drill rod. 4,295,536, Cl. 175-214.000.
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., to Stamicarbon, B.V. Method for the preparation of a pure alkali metal benzoate and benzyl alcohol. 4,296,245, Cl. 562-494.000.
Jorgensen, August H., Jr.: *See—*
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Joy Manufacturing Company: *See—*
Grantmyre, Innes; and Miedema, Brent, 4,295,411, Cl. 91-165.000.
Jubin, John C., Jr.: *See—*
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Junk, Norman M.: *See—*
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Jur, Tim A.: *See—*
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Jurchenko, Anatoly B.: *See—*
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Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
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K S L Corporation: *See—*
Korfanta, Carl, 4,295,308, Cl. 52-296.000.
Kaarlela, William T. Material and method for securing boron filaments to each other and to a substrate and cutting tools therefrom. 4,295,885, Cl. 75-208.00R.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Suzuki, Hajime; and Iwano, Yoshimi, 4,295,499, Cl. 139-370.200.
Kadin, Saul B., to Pfizer Inc. (Carboxy-oxo-pyrrolidino)phenylalkenamides and esters thereof as SRS-A antagonists. 4,296,120, Cl. 424-274.000.
Kadin, Saul B., to Pfizer, Inc. (Carboxyacylamino)phenylalkenamides and esters thereof as SRS-A antagonists. 4,296,129, Cl. 424-309.000.
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., to Scott Paper Company. Dry-formed nonwoven fabric. 4,296,161, Cl. 428-171.000.
Kakar, Sarwan K.; Kappler, Frank R.; and Cramer, John J., to Diversey Corporation, The. Antistatic natural and synthetic textile materials which have been treated with salts of orthophosphoric or polyphosphoric acid. 4,296,165, Cl. 428-264.000.
Kamada, Kazumasa; Nakai, Yoshio; and Abe, Kazunori, to Mitsubishi Rayon Co., Ltd. Methacrylic resin having a high solar radiant energy absorbing property and process for producing the same. 4,296,214, Cl. 525-2.000.
Kamada, Minoru: *See—*
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Kamei, Takeji, to Nihon Automatic Machinery Mfg. Co., Ltd. Method for treating water containing wastes. 4,295,972, Cl. 210-710.000.
Kamimura, Toshio, to Teijin Seiki Company, Limited. Hydraulic actuator. 4,295,413, Cl. 92-5.00L.
Kamm, Lawrence J. Limit switch assembly manufacturing machine. 4,295,555, Cl. 192-139.000.
Kanamaru, Hisanobu: *See—*
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Kane, Vinayak V., to Ortho Pharmaceutical Corporation. Total synthesis of the utero-evacuant substance d,l-zoapatanol. 4,296,035, Cl. 260-333.000.
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Kansai Paint Co., Ltd.: *See—*
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Karasawa, Shinji: *See—*
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Karell, Manuel L. Educational toy. 4,295,832, Cl. 434-168.000.
Karloske, Joan E.: *See—*
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Karlsson, Einar. Limbing and barking device. 4,295,507, Cl. 144-208.00B.
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, to Wako Pure Chemical Industries, Ltd. Method for measuring peroxidic substances. 4,295,853, Cl. 23-230.00B.
Kasai, Masaji: *See—*
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Kashima, Mitsuhiro, to Kayaba Kogyo Kabushiki Kaisha. Front end shock absorbing appartus for wheeled vehicle. 4,295,658, Cl. 280-276.000.
Kaspari, William J. Non-invasive vascular waveform transducer and apparatus. 4,295,471, Cl. 128-675.000.
Kasper, Erich, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing a semiconductor/glass composite material. 4,295,923, Cl. 156-630.000.
Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal agents, processes for their preparation and their use for combating fungi. 4,296,116, Cl. 424-272.000.
Kasuga, Muneo: *See—*
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Kawaguchi, Kenji: *See—*
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Kawaguchi, Yasuyosi; Shimotake, Munetoshi; and Yamamoto, Fujio, to Bridgestone Tire Company Limited. Thick-cord lightweight tire body having an improved fatigue life. 4,295,512, Cl. 152-354.00R.
Kawai Musical Instrument Mfg. Co., Ltd.: *See—*
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Kayaba Kogyo Kabushiki Kaisha: *See—*
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Kearny, Thomas J. Paint spray booth with water wash. 4,295,866, Cl. 55-228.000.
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Keeble, Joseph D. Surface projectile game with mallets and three-sided targets. 4,295,650, Cl. 273-118.00R.
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Keizer, Eugene O.; and Alphonse, Gerard A., to RCA Corporation. System for measuring stylus shoe length. 4,296,371, Cl. 324-61.00R.
Kelly, Robert J., to Reynolds and Reynolds Company, The. Roll fed shingling machine with predetermined numbering. 4,295,642, Cl. 270-53.000.
Kelsey Hayes Company: *See—*
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Kensrue, Milo M. Welding seam back-up means. 4,295,593, Cl. 228-50.000.
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Kerle, Edward J.; and Beaver, Terry R., to Owens-Corning Fiberglas Corporation. Wax-containing unsaturated polyester laminating composition with aromatic tertiary amine. 4,296,009, Cl. 260-28.50R.
Kern, Mark T.; and Cinzori, Robert J., to Santa Barbara Research Center. Dual spectrum infrared fire sensor. 4,296,324, Cl. 250-339.000.
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Khan, Riaz A.; and Jenner, Michael R., to Talres Development (N.A.) N.V. Bittering agents. 4,296,139, Cl. 426-536.000.
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Kiess, Helmut G.; and Binggeli, Bruno K., to RCA Corporation. Read-out of electrostatically stored information. 4,296,478, Cl. 365-112.000.
Killmaier, Horst: *See—*
Rosemeier, Friedrich; and Killmaier, Horst, 4,295,495, Cl. 138-89.000.
Killmeyer, Charles W., deceased; by Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., to PPG Industries, Inc. Method of producing a pultruded, fiber reinforced rod. 4,296,060, Cl. 264-137.000.
Killmeyer, Elizabeth A., administrator: *See—*
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Kim, Kwon S., to Star Manufacturing Company of Oklahoma. Prefabricated panel construction system. 4,295,304, Cl. 52-90.000.
Kimball, Stephen F.; and Gagnon, Peter R., to GTE Products Corporation. Tungsten halogen lamp having lead-in wire comprising tantalum alloy. 4,296,351, Cl. 313-222.000.
Kimiwada, Tadao: *See—*
Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, 4,295,967, Cl. 210-185.000.
Kimoto & Co., Ltd.: *See—*
Moriya, Takeo; and Yamagata, Toshio, 4,296,193, Cl. 430-149.000.
Kimura, Takeo: *See—*
Shibaski, Ichiro; Ohmura, Kaoru; and Kimura, Takeo, 4,296,424, Cl. 357-1.000.
King, James D., to Southwest Research Institute. Apparatus providing enhanced detection of specimens in inhomogeneous fields. 4,296,378, Cl. 324-313.000.
King, Virginia B. Floor treating apparatus. 4,295,243, Cl. 15-320.000.
Kinghorn, Michael H. Vertical garden. 4,295,296, Cl. 47-82.000.
Kinugawa, Kiyoshige: *See—*
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.
Kirchner, Roy P., to Idacon, Inc. Method and composition for treating wood with pentachlorophenol. 4,296,152, Cl. 427-440.000.
Kistler, Manfred: *See—*
Purr, Horst; Kistler, Manfred; and Muller, Rolf, 4,295,913, Cl. 156-345.000.
Kitagawa, Masahiro, to Olympus Optical Company, Ltd. Camera with operation indicator for auto-strobo unit. 4,295,717, Cl. 354-33.000.
Kitagawa, Masahiro: *See—*
Mizokami, Kazunori; and Kitagawa, Masahiro, 4,295,720, Cl. 354-51.000.
Kitamura, Yoichi: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.
Kitasato Kenkyusho: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Kito, Kyoji: *See—*
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.
Kiuchi, Mitsuyuki, to Matsushita Electric Industrial Co., Ltd. Induction heating coil. 4,296,295, Cl. 219-10.49R.
Kiyohara, Takehiko: *See—*
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, 4,295,722, Cl. 354-146.000.
Klaeui, Heinrich: *See—*
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,295,517, Cl. 165-1.000.
Klebe, Wilmer A. Geodetic dome. 4,295,303, Cl. 52-81.000.
Klein, Philipp H.; Addamiano, Arrigo; and Allen, Roger, to United States of America, Navy. Luminescent hafnia composition. 4,295,989, Cl. 252-301.40F.
Kliklok Corporation: *See—*
Baker, Thomas R.; and Collura, Peter C., 4,295,839, Cl. 493-143.000.
Klippel, Friedrich: *See—*
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Klockner-Humboldt-Deutz AG (Zweigniederlassung Fahr): *See—*
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,295,323, Cl. 56-10.200.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Schleiermacher, Herbert, 4,295,457, Cl. 123-574.000.
Kluting, Bernd A.; and Zaverni, Vikram H., to Keiper U.S.A., Inc. Superfine tooth seat back adjuster. 4,295,682, Cl. 297-367.000.
Knapman, Reginald G.: *See—*
Haslop, John M.; Knapman, Reginald G.; and West, Michael A., 4,296,326, Cl. 250-372.000.
Knapp, Heinrich: *See—*
Lembke, Manfred; and Knapp, Heinrich, 4,295,452, Cl. 123-470.000.

Knapp, John F.: *See—*
Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.

Knippel, Willis H.; and Ferris, Ray, to Pullman Incorporated. Railway hopper car latch mechanism. 4,295,430, Cl. 105-308.00E.

Knobbe, Karl-Heinz: *See—*
Beckert, Alexander; and Knobbe, Karl-Heinz, 4,296,294, Cl. 219-10.410.

Knopp, Hans; Herion, Dieter; Conzelmann, Gerhard; and Gehrig, Heinz, to BASF Aktiengesellschaft. Process and apparatus for texturizing filament bundles. 4,295,253, Cl. 28-255.000.

Knudsen, Eric T., to Beecham Group Limited. Medicament container. 4,295,567, Cl. 206-534.000.

Kobatake, Shinzo: *See—*
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.

Kobayashi, Isamu: *See—*
Wada, Yoshimasa; Yamazaki, Sigeki; Kobayashi, Isamu; Haraguchi, Noriyuki; and Fukuda, Minoru, 4,295,780, Cl. 414-749.000.

Kobayashi, Kengo: *See—*
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.

Kodama, Mikio: *See—*
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.

Koehring Company: *See—*
Nicholson, Robert D.; and Daniel, Alger T., 4,295,594, Cl. 228-160.000.

Koenen, Klaus: *See—*
Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, 4,296,400, Cl. 340-32.000.

Koenig, Robert H.; and D'Angelo, Victor, to Tapeswitch Corporation of America. Normally closed wafer switch. 4,296,283, Cl. 200-16.00D.

Kohler, Kranz, to Messerschmitt-Bolkow-Blohm GmbH. Array of solar cells. 4,296,270, Cl. 136-244.000.

Kohyama, Mitsuaki, to Toshiba Corporation. Developing apparatus for electrostatic copying machine. 4,295,443, Cl. 118-657.000.

Koide, Akio: *See—*
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.

Kojima, Tadayoshi: *See—*
Shimamura, Tadao; and Kojima, Tadayoshi, 4,296,051, Cl. 264-118.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, 4,296,439, Cl. 358-257.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakai, Taiichiro; Furusawa, Kahei; and Ejiri, Yoshihiro, 4,295,707, Cl. 350-96.200.

Kokusan Denki Co., Ltd.: *See—*
Kubo, Masaaki, 4,296,368, Cl. 322-75.000.

Kolyada, Vladimir A.: *See—*
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; and Shamsha, Ljudmila F., 4,295,946, Cl. 204-149.000.

Komatsu, Michiyasu: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.

Kondo, Shinichi: *See—*
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.

Kongshaug, Gunnar, to Norsk Hydro a.s. Method for steam cleaning of compressors. 4,295,895, Cl. 134-22.00R.

Konishiroku Photo Industry Co., Ltd.: *See—*
Nakamura, Hiroya, 4,296,423, Cl. 346-160.000.

Kono, Akira: *See—*
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.

Konta, Yukio, to Tomy Kogyo Co., Inc. Pinball actuator and feed mechanism. 4,295,651, Cl. 273-121.00D.

Konz, Elmar: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.

Kopenhaver, Robert, to Certain-teed Corporation. Apparatus for manufacturing roofing shingles having multiple ply-appearance. 4,295,445, Cl. 118-695.000.

Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, to Boehringer Ingelheim GmbH. 1-Aryloxy-2-hydroxy-3-[(Benzimidazolinone-substituted alkyl)-amino]propanes and salts thereof. 4,296,117, Cl. 424-273.00B.

Korfanta, Carl, to K S L Corporation. Pole base assembly, bolt circle adaptor. 4,295,308, Cl. 52-296.000.

Koshida, Osamu: *See—*
Itoh, Koichi; Koshida, Osamu; and Nakayama, Katsuichi, 4,295,354, Cl. 72-225.000.

Koster, Siegfried. Multi-filter chamber aquarium filter. 4,295,965, Cl. 210-169.000.

Kowalski, Daniel J.; and Mareydt, Ray G., to Four Star Corporation. Slotted side rail and movable bracket for article carrier. 4,295,588, Cl. 224-321.000.

Kowalski, David J.: *See—*
Aitken, Thomas; Kowalski, David J.; and Srinivasan, K. G., 4,295,930, Cl. 162-158.000.

Kozin, Cynthia H.: *See—*
Buck, Gordon K.; and Kozin, Cynthia H., 4,295,363, Cl. 73-117.300.

Koziol, Konrad; and Wenk, Erich, to Conradty GmbH & Co. Metallelektroden KG. Process for preparing manganese oxide. 4,295,942, Cl. 204-96.000.

Krasse, Bo: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.

Kraus, Roland. Paint application method and machine. 4,296,317, Cl. 250-215.000.

Krautkraemer GmbH: *See—*
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Krebs, Karl-Friedrich: *See—*
Halpaap, Herbert; and Krebs, Karl-Friedrich, 4,295,968, Cl. 210-198.300.

Krebs, Peter: *See—*
Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, 4,296,289, Cl. 200-148.00R.

Krejcir, Oldrich: *See—*
Pustka, Zdenek; and Krejcir, Oldrich, 4,295,635, Cl. 254-93.0HP.

Kritz, Jacob A., to Sperry Corporation. Parametric array Doppler sonar apparatus. 4,296,482, Cl. 367-91.000.

Krivonos, Vadim P.: *See—*
Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.

Kroll, Harley E.: *See—*
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.

Kruger, Hermann, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with oil pump gear surrounding and driven by crankshaft. 4,295,807, Cl. 418-170.000.

Krupey, John, to American Home Products Corporation. Method of obtaining a lyophilized product. 4,295,280, Cl. 34-5.000.

Krupp-Koppers GmbH: *See—*
Waldhofer, Reinhard, 4,295,448, Cl. 122-164.000.

Kruszona, Edward G., to General Electric Company. Hand operated apparatus for applying a gasketing composition. 4,295,439, Cl. 118-317.000.

Kubo, Masaaki, to Kokusan Denki Co., Ltd. Internal combustion engine driven generator. 4,296,368, Cl. 322-75.000.

Kubota Ltd.: *See—*
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Kubota, Toshifumi, to Hitachi Koki Company, Limited. Vibration control for mowing machine. 4,295,272, Cl. 30-276.000.

Kuhr, Manfred: *See—*
Berger, Dieter; Braun, Franz; Frey, Gunter; Guthlein, Werner; and Kuhr, Manfred, 4,296,202, Cl. 435-29.000.

Kuipers, Peter, to Nordson Corporation. Tube forming shoe and methods of forming a flexible web into a tube. 4,295,322, Cl. 53-450.000.

Kulin, Ralph; and Stauber, Ronald C., to Baxter Travenol Laboratories, Inc. Solution container hanger. 4,295,619, Cl. 248-95.000.

Kulprathipanja, Santi, to UOP Inc. Cellulose acetate butyrate bound zeolite adsorbents. 4,295,994, Cl. 252-430.000.

Kumazawa, Kenichi: *See—*
Momiyama, Kikuo; and Kumazawa, Kenichi, 4,295,723, Cl. 354-155.000.

Kumm, Emerson L. Flat belt transmission with rotary actuator and integrated control system. 4,295,836, Cl. 474-51.000.

Kumura, Teruhiko: *See—*
Matsushima, Yoshio; Kumura, Teruhiko; Kawamura, Isamu; and Kawata, Terushige, 4,296,094, Cl. 424-49.000.

Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Fungicidal 3-[N-(pyrazol-1-yl-acetyl)-N-(substituted phenyl)]-amino-tetrahydro-2-furanones. 4,296,118, Cl. 424-273.00P.

Kupchinsky, Igor I.: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, to Statni vyzkumny ustav materialu. Mold for the injection molding of objects of large dimension and complicated surfaces from plastic material. 4,295,628, Cl. 249-80.000.

Kuppers, Dieter: *See—*
Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, 4,296,143, Cl. 427-38.0ω.

Kuraoka, Yasuo; and Tsuchida, Yasuhiro, to Hoxan Co. Ltd. Cryostat system utilizing a liquefied gas. 4,295,339, Cl. 62-64.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, 4,296,233, Cl. 536-5.000.

Kuriki, Minoru: *See—*
Takeuchi, Minami; and Kuriki, Minoru, 4,296,427, Cl. 357-39.000.

Kurima, Akinori; Iwase, Yasuhiro; and Kimiwada, Tadao, to Chiyoda Kako Kensetsu Kabushiki Kaisha. Fluidized bed contact apparatus. 4,295,967, Cl. 210-189.000.

Kurosaki, Shiro: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.





Kurowski, Adam: *See—*
Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, 4,296,273, Cl. 174-99.00B.

Kusters, Norbert L.: *See—*
Moore, William J. M.; Kusters, Norbert L.; and So, Eddy, 4,296,369, Cl. 323-218.000.

Kusy, Robert P., to Du Pont de Nemours, E. I., and Company. Specimen grips for dynamic mechanical analyzer. 4,295,374, Cl. 73-579.000.

Kuzminski, Henry W., to RCA Corporation. Color picture tube having improved slit type shadow mask and method of making same. 4,296,189, Cl. 430-5.000.

Kyosan Denki Kabushiki Kaisha: *See—*
Mochizuki, Hiroshi; and Seki, Tokio, 4,295,414, Cl. 92-98.000.

Kyowa Chemical Industry Co., Ltd.: *See—*
Matsushima, Yoshio; Kumura, Teruhiko; Kawamura, Isamu; and Kawata, Terushige, 4,296,094, Cl. 424-49.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.

Kyzlink, Josef: *See—*
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, 4,295,628, Cl. 249-80.000.

L. Schuler GmbH: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.

La Telemecanique Electrique: *See—*
Ingrain, Raymond A.; and Cohen, Jacques, 4,296,396, Cl. 337-66.000.

Labonte, Paul D.: *See—*
Hasselmann, Detlev E. M.; and Labonte, Paul D., 4,295,505, Cl. 141-301.000.

Lacombat, Michel; and Gerard, Andre, to Thomson-CSF. Optical projection system having a photorepetition function. 4,295,735, Cl. 355-43.000.

Ladage, Cornelis A.; Van Linge, Douwe J.; and Van Riessen, Huibert A., to ACF Chemiefarma N.V. Pharmaceutical compositions and their use in the prophylaxis and/or treatment of certain diseases. 4,296,131, Cl. 424-347.000.

Lajh, Rajko, to Swiss Aluminium Ltd. Device and method for introducing gases into molten metal. 4,295,883, Cl. 75-68.00R.

Lalu, Jean-Pierre: *See—*
Bouvet, Pierre; and Lalu, Jean-Pierre, 4,296,034, Cl. 260-326.820.

Lam, Man K.: *See—*
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., 4,295,271, Cl. 29-840.000.

Lamarche, Bernard: *See—*
Mialon, Jacques; and Lamarche, Bernard, 4,295,388, Cl. 74-579.00R.

Landay, David L.; and Wolf, Alvan H., to Brookfield Athletic Shoe Company, Inc. Roller skating shoe. 4,295,655, Cl. 280-11.200.

Lander, Lynn H.: *See—*
Sepulveda, Ralph R.; and Lander, Lynn H., 4,295,845, Cl. 8-139.100.

Lane, James E.: *See—*
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.

Lang, Ernst; and Niemeyer, Lutz, to BBC Brown, Boveri & Company Limited. High-voltage, blast-actuated power switch having field electrodes. 4,296,285, Cl. 200-61.080.

Lang-Ree, Nils, to NPI Corporation. Chain broiler doctor blade. 4,295,418, Cl. 99-355.000.

Lang, Stanley A., Jr.; and Murdock, Keith C., to American Cyanamid Company. Metal chelates of 1,4-bis(substituted-amino-5,8-dihydroxyanthraquinones. 4,296,030, Cl. 260-239.00A.

Lange, Karl H., to Balda-Werke. Battery conservation by control of the charging circuit for a built-in electronic flash. 4,295,719, Cl. 354-50.000.

Langer, Alfred: *See—*
Schaefer, Hans G.; and Langer, Alfred, 4,295,908, Cl. 156-251.000.

Langford, Frederic E., to Washington Logging Equipment, Inc. System for inhauling and outhauling lines. 4,295,636, Cl. 254-304.000.

Langhammer, Jerome, to Poulson, Larry. Confined air food heating apparatus. 4,295,419, Cl. 99-427.000.

LaPrade, Steve A.; and Pallo, John M., to Johns-Manville Corporation. Thermal insulation especially for pipe, flanges and fittings. 4,295,669, Cl. 285-47.000.

Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Removable sealing gasket for distributor segments of a jet engine. 4,295,785, Cl. 415-174.000.

Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Removable support for the sealing lining of the casing of jet engine blowers. 4,295,787, Cl. 415-197.000.

Large, Eddie A. J. Resilient mounting for a reclining seat. 4,295,626, Cl. 248-575.000.

Larson, Clifford L., to Baldwin-Korthe Web Controls, Inc. Web severing device. 4,295,400, Cl. 83-545.000.

Larsson, Kare: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.

Laso, Felipe. Method of combating amebiasis in humans. 4,296,102, Cl. 424-130.000.

Laso, Felipe. Stabilized solution of chlorine oxides. 4,296,103, Cl. 424-130.000.

Lattuada, Sergio, to S.T.I. Strumentazione Industriale S.p.A. Method for automating and optimizing the operative cycle in adsorption dehydration plants. 4,295,863, Cl. 55-21.000.

Lauer, Stephen D.: *See—*
Jones, Emrys H., Jr.; and Lauer, Stephen D., 4,295,536, Cl. 175-214.000.

Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, to Schering, Aktiengesellschaft. Corticoid 21-sulfopropionates and the salts thereof, a process for the production thereof and pharmaceutical preparations thereof. 4,296,109, Cl. 424-241.000.

Lawless, William N., to Lawless, William Nicholas. Thallous halide materials for use in cryogenic applications. 4,296,147, Cl. 427-120.000.

Lawless, William Nicholas: *See—*
Lawless, William N., 4,296,147, Cl. 427-120.000.

Lawrence Brothers, Inc.: *See—*
Johnson, Larry K., 4,295,514, Cl. 160-206.000.

Lazarus, Charles R.; Stahl, Howard D.; and Haas, Gerhard J., to General Foods Corporation. Dog food of improved acceptability. 4,296,132, Cl. 426-2.000.

Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., to International Business Machines Corporation. Slotted heat sinks for high powered air cooled modules. 4,296,455, Cl. 361-383.000.

Lebetzki, Egon: *See—*
Schneider, Hartmut; and Lebetzki, Egon, 4,295,870, Cl. 65-3.120.

LeBlanc, Ralph W.; and Bingham, Robert M. Apparatus for removing contaminants from lubricating oil. 4,295,966, Cl. 210-180.000.

Lebost, Barry A. Fluid turbine. 4,295,783, Cl. 415-2.00R.

LeClou, Andre, to Commissariat a l'Energie Atomique. Device for anchoring a vessel in a horizontal foundation raft. 4,295,620, Cl. 248-154.000.

Lee, Man S., to GTE Automatic Electric Laboratories, Inc. Switched capacitor bilinear resistors. 4,296,392, Cl. 333-213.000.

Lee, Ronald B.: *See—*
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.

Lee, Weng Y.; and Sehon, Alec. Suppression of reaginic antibodies to drugs employing polyvinyl alcohol as carrier therefor. 4,296,097, Cl. 424-78.000.

Lefort, Emmanuel: *See—*
Jeandot, Jean-Louis; and Lefort, Emmanuel, 4,296,383, Cl. 330-301.000.

Leggett & Platt, Incorporated: *See—*
Wells, Thomas J., 4,295,639, Cl. 267-91.000.
Whitehead, Larry W., 4,295,234, Cl. 5-184.000.

Leininger, Joel C.: *See—*
Fairchild, Peter T.; and Leininger, Joel C., 4,296,470, Cl. 364-200.000.

Leithem, Phyllis C., to International Telephone and Telegraph Corp. Process for acid sulfite digestion of wood. 4,295,929, Cl. 162-83.000.

Lemak, Nicholas S., to Honeywell Information Systems Inc. Data mover. 4,296,465, Cl. 364-200.000.

Lembke, Manfred; and Knapp, Heinrich, to Robert Bosch GmbH. Fuel injection system. 4,295,452, Cl. 123-470.000.

Leney, Thomas F.: *See—*
Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., 4,296,415, Cl. 343-16.00M.

Lennon, Donald J. J.; Hagerstrom, John R.; and Ekman, C. Frederick W., to EPP Corp. Inks for pulsed electrical printing. 4,296,176, Cl. 428-407.000.

Lenzi, Giuliano: *See—*
Toti, Gabriele; Lenzi, Giuliano; and Monti, Paolo, 4,295,660, Cl. 280-714.000.

Leonard, Verna M. Keyboard simulation with vertical inversion indexes. 4,295,407, Cl. 84-471.00R.

Lerch, John A., to Vulcan Iron Works Inc. Retaining assembly. 4,295,752, Cl. 403-317.000.

Lerch, Ulrich: *See—*
Bartmann, Wilhelm; Beck, Gerhard; Lerch, Ulrich; and Konz, Elmar, 4,296,121, Cl. 424-275.000.

Leslie, Wayne B. Speed indicating device. 4,295,367, Cl. 73-184.000.

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Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, 4,296,266, Cl. 585-640.000.

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Mindt, Lothar F. O., deceased; Payne, Peter R., administrator; and Sanderson, George R., 4,296,234, Cl. 536-47.000.
Sepulveda, Ralph R.; and Lander, Lynn H., 4,295,845, Cl. 8-139.100.

Levine, Irving. Apparatus for molding strand-mounted plastic members. 4,295,813, Cl. 425-121.000.

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Gruber, Robert J.; Bolte, Steven B.; Knapp, John F.; Ims, Dale R.; and Lewis, Richard B., 4,296,192, Cl. 430-109.000.

Lewis, Robert J., to Phillips Petroleum Company. Method for producing carbon black. 4,296,087, Cl. 423-449.000.

Lewis, Terry W., to Minnesota Mining and Manufacturing Company. Information carrying discs. 4,296,158, Cl. 428-65.000.

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Beinitz, Karl; and Schubert, Joachim, 4,296,356, Cl. 315-135.000.

Wechsung, Reiner, 4,296,322, Cl. 250-282.000.
Leybold-Heraeus GmbH & Co. KG: *See—*
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, 4,295,808, Cl. 425-8.000.
Liberman, Salomon: *See—*
Eriksson, Leif; and Liberman, Salomon, 4,296,452, Cl. 361-82.000.
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Kasper, Erich, 4,295,923, Cl. 156-630.000.
Licht, Lazar, to United Technologies Corporation. Adjustable clearance foil journal bearing and method of manufacturing foil element therefor. 4,295,689, Cl. 308-9.000.
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Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M. Machine for continuous flash butt welding. 4,296,305, Cl. 219-101.000.
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Lindgren, Hazelle C. Brassiere construction. 4,295,469, Cl. 128-480.000.
Litton Resources Systems, Inc.: *See—*
Haill, Harry K., 4,296,483, Cl. 367-13.000.
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Rosenheck, Bernard, 4,296,440, Cl. 358-257.000.
Liu, Morris. Inflatable tent. 4,295,302, Cl. 52-2.000.
Locatelli, John D.; and Gunderson, Gary M., to Locatelli, John D. File box. 4,295,599, Cl. 229-34.00R.
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Baccei, Louis J., 4,295,909, Cl. 156-307.300.
Lollert, Bernd; and Risse, Heinrich, to Jagenberg-Werke AG. Irregular-motion mechanism. 4,295,382, Cl. 74-68.000.
Long, E. David, to Allied Chemical Corporation. Closed loop fuel control for internal combustion engine. 4,295,451, Cl. 123-438.000.
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Berrebi, Claudine; and Manoussos, Georges, 4,296,099, Cl. 424-105.000.
Grollier, Jean F.; Bugaut, Andree; Andrillon, Patrick; and Fourcadier, Chantal, 4,295,848, Cl. 8-421.000.
Lott, Donald L., to Siemens-Allis, Inc. Flexible shield for high voltage disconnect switch. 4,296,284, Cl. 200-48.00R.
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., to Phillips Petroleum Company. Adapter for connecting plastic pipe system to cast iron pipe system. 4,295,668, Cl. 285-21.000.
Lovell, John A.; and McIntosh, Kenneth W., to Goodyear Tire & Rubber Company, The. Tire and method of reinforcement. 4,295,513, Cl. 152-358.000.
Lowe, Edward J.; Minshall, Michael W.; and Wilson, Arthur, to Albright & Wilson Limited. Purification of wet process phosphoric acid. 4,296,082, Cl. 423-305.000.
Lowell, Victor: *See—*
Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, 4,296,287, Cl. 200-83.00P.
Lucas Industries Limited: *See—*
Archer, Michael A., 4,296,361, Cl. 318-54.000.
Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., 4,295,453, Cl. 123-499.000.
Young, Donald A.; and Squires, Christopher P., 4,296,342, Cl. 310-77.000.
Ludwig, Lawrence P.: *See—*
Bill, Robert C.; and Ludwig, Lawrence P., 4,295,786, Cl. 415-174.000.
Luebke, Clement J.; Mitchell, John A.; and Daniels, Lowell W., to Alco Standard Corporation. Cooking device with water detecting means. 4,296,310, Cl. 219-440.000.
Luerken, Adolf; and Vogel, William D., to McCulloch Corporation. Torque transmitting apparatus. 4,295,753, Cl. 403-365.000.
Luers, George A., to Corning Glass Works. Producing a multi-color image in polychromatic glass. 4,295,872, Cl. 65-30.110.
Lukas, Walter: *See—*
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Lundstrom, Sten, to Aktiebolaget SKF. Nail press. 4,295,591, Cl. 227-142.000.
Lustgarten, Stewart J., to Healthco Inc. Method of manufacturing a metal ceramic dental restoration. 4,295,941, Cl. 204-35.00R.
Lustig, Stanley; and Vicik, Stephen J., to Union Carbide Corporation. Multilayer film including a polyurethane. 4,296,156, Cl. 428-35.000.
Lustig, Stanley: *See—*
Vasudevan, Ganapathy; and Lustig, Stanley, 4,296,142, Cl. 427-28.000.
Lynn-Jones, David M.; and Stewart, R. Gordon, to Construction Specialties, Inc. Expansion joint cover. 4,295,315, Cl. 52-573.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Abendroth, Paul; and Dettinger, Dietrich, 4,295,421, Cl. 101-216.000.
Maby, Edward W.; Kawamoto, Hirohisa; and Valembois, Pierre V., to RCA Corporation. Ion implanted stylus. 4,296,144, Cl. 427-38.000.
Machinefabriek C. Rijkaart B.V.: *See—*
Rutten, Jacques P., 4,296,135, Cl. 426-275.000.
MacMaster, George H.; and Dudley, Kenneth W., to Raytheon Company. Dielectric cooking apparatus. 4,296,298, Cl. 219-10.810.
Madeyski, Krystyn: *See—*
Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, 4,296,273, Cl. 174-99.00B.
Madnick, Peter: *See—*
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, 4,295,277, Cl. 33-181.00R.
Madonia, Ciro N.; Hatzikelis, Christopher; and Cosentino, Cesare C. Overcoated decorative moulding. 4,296,155, Cl. 428-31.000.
Maegerlein, Helmut: *See—*
Zielke, Rainer; and Maegerlein, Helmut, 4,296,260, Cl. 568-763.000.
Magnaflux Corporation: *See—*
White, Michael L., 4,295,362, Cl. 73-104.000.
Magrans, Juan J., Jr., to ICI Americas Inc. Polyurea thickened molding compositions. 4,296,020, Cl. 260-37.00N.
Mahl, Gunard O. B., to CHA Industries. Vacuum chamber door assembly and method. 4,296,153, Cl. 427-444.000.
Mahuson, Teri J.: *See—*
Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., 4,295,732, Cl. 355-14.00R.
Maier, Martin; Purrer, Josef; and Clemens, Ronald, to Klockner-Humboldt-Deutz AG (Zweigniederlassung Fahr). Towed crop harvester. 4,295,323, Cl. 56-10.200.
Majewski, Robert A.: *See—*
DeHart, John R.; and Majewski, Robert A., 4,295,321, Cl. 53-381.00R.
Malcom, George E. Combination hinge and overcenter closure for a door. 4,295,245, Cl. 16-80.000.
Malecha, Richard J., to Towmotor Corporation. Apparatus for supporting loads. 4,295,541, Cl. 180-315.000.
Mallory, Henry R.; and Nichols, Steven J., to Duracell International Inc. Battery package with DC to DC converter. 4,296,461, Cl. 363-22.000.
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, to Fagersta AB. Rolled wire having a fine-grain structure. 4,295,900, Cl. 148-12.00B.
Manassen, Joost: *See—*
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Manhattan R. F. Die Company: *See—*
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Manini, Silvio; and Pacciarini, Antonio, to Industrie Pirelli S.p.A. Apparatus for automatically turning over and for storing sections of elastomeric material. 4,295,774, Cl. 414-331.000.
Mann, Don C.: *See—*
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.
Mann, Samuel J.; and Hrehovcik, Michael, to Inverness International Corp. Electrolysis apparatus with retractable probe. 4,295,467, Cl. 128-303.180.
Mannesmann Aktiengesellschaft: *See—*
Siegmund, Werner, 4,296,207, Cl. 521-53.000.
Manning, Frank B., to United Technologies Corporation. Variable stator. 4,295,784, Cl. 415-162.000.
Manning, Robert E. Interceptor plug. 4,295,694, Cl. 339-8.00P.
Manoussos, Georges: *See—*
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Mapes, Charles W.; and Snyder, Richard H., to Brunswick Corporation. High speed outboard drive unit. 4,295,835, Cl. 440-78.000.
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Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., to Union Carbide Corporation. Process for preparing polyarylates in the presence of a diphenyl ether compound and a catalyst. 4,296,232, Cl. 528-179.000.
Mareydt, Ray G.: *See—*
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Mark Controls Corporation: *See—*
Priesmeyer, Charles H., 4,295,602, Cl. 236-93.00B.
Markham, Roger G.; and Skinner, Doyle P., Jr., to Xerox Corporation. Ink jet method and apparatus using a thin film piezoelectric excitor for drop generation with spherical and cylindrical fluid chambers. 4,296,417, Cl. 346-75.000.
Markiewitz, Kenneth H., to ICI Americas Inc. Method to thicken dissolved thermoset resins. 4,296,215, Cl. 525-28.000.
Marler Haley Exposystems Limited: *See—*
Ashton, Christopher J.; Diamond, Andrew C.; and Greenhill, Derek H., 4,295,754, Cl. 403-369.000.
Marosi, Laszlo: *See—*
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, 4,295,879, Cl. 75-0.5AA.
Marquette Electronics, Inc.: *See—*
Dambach, Thomas F.; and Ricketts, James R., 4,296,420, Cl. 346-140.00R.
Marsh, Richard L., to Dayco Corporation. Synchronous belt drive system. 4,295,837, Cl. 474-153.000.
Marshall, Jeweral E. Device for human body waste elimination during incapacitation. 4,295,232, Cl. 4-480.000.
Marshall, Michael A.: *See—*
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Marshall and Williams Company: *See—*
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Marth, Ronald M.: *See—*
Sim, William J.; and Marth, Ronald M., 4,296,048, Cl. 261-111.000.
Martin, Howard; and Norris, James P. Endodontic flow through ultrasonic instrument holder attachment. 4,295,827, Cl. 433-81.000.
Martinek, Harold H.: *See—*
Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., 4,295,247, Cl. 17-1.00R.
Martinelli, Claude; and Martinelli epouse Boisson, Marcelle. Tool holder. 4,295,829, Cl. 433-99.000.
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Marvin Glass & Associates: *See—*
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Marvin, Richard H.: *See—*
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Mascellani, Giuseppe: *See—*
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Maschinenfabrik Burckhardt AG: *See—*
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Masologites, George P.: *See—*
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., 4,295,858, Cl. 44-1.0SR.
Massabo, Vincenzo: *See—*
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Massachusetts Institute of Technology: *See—*
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Wurtman, Richard J., 4,296,119, Cl. 424-274.000.
Mastner, Jiri, to BBC Brown, Boveri & Company Limited. Method and apparatus for signal transmission. 4,296,412, Cl. 340-870.190.
Mateflex/Mele Corporation: *See—*
Forlenza, Nicholas G., 4,296,160, Cl. 428-117.000.
Mathias Bauerle GmbH: *See—*
Purr, Horst; Kistler, Manfred; and Muller, Rolf, 4,295,913, Cl. 156-345.000.
Mathieu, Hans; and Hochstrasser, Jurgen, to Hochstrasser geb. Wack, Elisabeth; and Hochstrasser, Jurgen. Device for the control of the internal pressure in a drill pipe for the construction of footings. 4,295,759, Cl. 405-243.000.
Mathuda, Yoshimi: *See—*
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Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, to Mitsui Toatsu Chemicals, Inc. Cephalosporins. 4,296,112, Cl. 424-246.000.
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, to Toyo Seikan Kaisha Limited. Can composed of electrolytically chromated steel. 4,296,182, Cl. 428-629.000.
Matsufuji, Yoji: *See—*
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
Matsuhisa, Tadaaki; Soejima, Shigeo; and Yamamoto, Noboru, to NGK Insulators, Ltd. Cordierite ceramic honeycomb and a method for producing the same. 4,295,892, Cl. 501-120.000.
Matsui, Kazuma: *See—*
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Matsumoto, Keizo: *See—*
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Matsunaga, Tsutomu: *See—*
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Matsushima, Yoshio; Kumura, Teruhiko; Kawamura, Isamu; and Kawata, Terushige, to Kyowa Chemical Industry Co., Ltd. Dental cleaning composition and method. 4,296,094, Cl. 424-49.000.
Matsushita Electric Corporation of America: *See—*
Rzeszewski, Theodore S., 4,296,433, Cl. 358-37.000.
Matsushita Electric Industrial Co.: *See—*
Minakuchi, Hiroshi, 4,296,380, Cl. 328-48.000.
Minakuchi, Hiroshi, 4,296,407, Cl. 340-347.0CC.
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Matsushita Electric Industrial Co., Ltd.: *See—*
Kiuchi, Mitsuyuki, 4,296,295, Cl. 219-10.49R.
Sugino, Takashi; and Itoh, Kunio, 4,296,387, Cl. 331-94.50H.
Tsuchida, Kensaku; and Karasawa, Shinji, 4,296,303, Cl. 219-78.130.
Matsushita Electronics Corporation: *See—*
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Matsuyama, Shigeru: *See—*
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Matt, Frederick C. Computer programming training device. 4,295,831, Cl. 434-118.000.
Mattheij, Jozef M. J.: *See—*
Verbeek, Antonie E.; and Mattheij, Jozef M. J., 4,295,990, Cl. 252-408.000.
Matthews, James. Combination carpet razor knife and guide. 4,295,273, Cl. 30-293.000.
Matweyou, Stephen: *See—*
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Matzner, Erwin, to Jagenberg Werke AG. Method and apparatus for the elimination of foam above the level of a liquid, and particularly above a packaged liquid such as milk. 4,295,502, Cl. 141-11.000.
Mauldin, Charles H.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,295,957, Cl. 208-138.000.
Mauldin, Charles H.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Reforming with multimetallic catalysts. 4,295,958, Cl. 208-138.000.
Maurel, Pierre; Nicolas, Francois; and Bosca, Bernard, to Aluminum Pechiney. High temperature attack of ores by means of a liquor essentially containing a soluble bicarbonate. 4,296,073, Cl. 423-3.000.
Maurer, Fritz: *See—*
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Maurer, Herman J., to J. I. Case Company. Latching mechanism for machine stabilizer arms using hydraulic cylinders. 4,295,661, Cl. 280-765.000.
Mavrovic, Ivo. Urea synthesis process. 4,296,252, Cl. 564-70.000.
Maya, Jakob, to GTE Products Corporation. Gaseous fluorescent discharge lamp. 4,296,350, Cl. 313-26.000.
Mayer, Manfred; and Volz, Roland, to Hoechst Aktiengesellschaft. Rectifier. 4,295,937, Cl. 202-155.000.
Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., to Atari, Inc. Data processing system with programmable graphics generator. 4,296,476, Cl. 364-900.000.
Mazzei, Alessandro: *See—*
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McAleer, William J.; and Miller, William J., to Merck & Co., Inc. Human immune serum globulin with high hepatitis A antibody titer. 4,296,024, Cl. 260-112.00B.
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McAvinn, James D.; Meister, Arthur R.; and Tucker, Samuel M., to Kendall Company, The. Sponge measuring device. 4,295,537, Cl. 177-15.000.
McBride, Jack L. Eye splice fitting. 4,295,749, Cl. 403-211.000.
McCabe, Francis J., to Prefco Products, Inc. Low cost, diffuser concealable, volume control, heat responsive, resettable, butterfly damper operator. 4,295,486, Cl. 137-80.000.
McCartan, Daniel A.: *See—*
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McCarty, Lewis V.: *See—*
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McClellan, Thomas R.: *See—*
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McCulloch Corporation: *See—*
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McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Company. $SO_2$ Activation of supported chromium oxide catalysts. 4,295,997, Cl. 252-439.000.
McGalliard, James D. Fluid sensitive switching controller. 4,295,793, Cl. 417-36.000.
McGalliard, James D. Printed circuit fuse assembly. 4,296,398, Cl. 337-297.000.
McGowan, John B.; and Trimble, John, to UMAC, Inc.; and Brooklyn Union Gas Company, a part interest to each. Method and apparatus for plugging and cutting a gas line or the like without excavation. 4,295,494, Cl. 138-89.000.
McGraw-Edison Company: *See—*
Sokoly, Theodore O.; and Niedzialkowski, John, 4,296,002, Cl. 252-518.000.
McHugh, William T.: *See—*
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McIntosh, Arthur M., to Borg-Warner Corporation. Automatic two-speed pump assembly. 4,295,798, Cl. 417-212.000.
McIntosh, Kenneth W.: *See—*
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McKie, Robert T.: *See—*
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McMahan, Michael E., to Halliburton Company. Drill pipe tester with automatic fill-up. 4,295,361, Cl. 73-40.50R.
McManus, Ira J. Precast concrete joist composite system. 4,295,310, Cl. 52-334.000.

McMillen, Bobby E., to AMBAC Industries, Incorporated. Electric motor housing, or the like, with integral pole and methods for making same. 4,296,343, Cl. 310-154.000.
McMullen, Harold F. Valance support. 4,295,482, Cl. 135-8.000.
McMurry/Hughes, Inc.: *See—*
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Mead Corporation, The: *See—*
Calvert, Rodney K., 4,295,598, Cl. 229-52.0AL.
Wood, Prentice J., 4,295,562, Cl. 206-158.000.
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, to Pelikan A.G. Transparent image marking sheet for projection systems. 4,296,150, Cl. 427-164.000.
Medtronic, Inc.: *See—*
Adams, John M., 4,295,472, Cl. 128-690.000.
Cammarata, Jacob J., 4,295,270, Cl. 29-828.000.
Mehesan, Thomas C., Jr., to Banner Industries, Inc. Portable load handling apparatus. 4,295,771, Cl. 414-5.000.
Meier, Werner, to Sulzer Brothers Ltd. Packing element for an exchange column. 4,296,050, Cl. 261-112.000.
Meisenheimer, Daniel T., Jr. Frangible connector for self-closing breakaway valve assemblies or similar structures. 4,295,484, Cl. 137-68.00R.
Meister, Arthur R.: *See—*
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Meito Sangyo Kabushiki Kaisha: *See—*
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Melanson, Donald G., to United Technologies Corporation. Shrouded tube and coupling therefor. 4,295,666, Cl. 285-14.000.
Meli, Alberto: *See—*
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Meltz, Gerald; and Snitzer, Elias, to United Technologies Corporation. Fiber optic strain sensor. 4,295,738, Cl. 356-32.000.
Meltz, Gerald; and Snitzer, Elias, to United Technologies Corporation. Fiber optic temperature sensor. 4,295,739, Cl. 356-43.000.
Mentrup, Anton: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.
Merck & Co. Inc.: *See—*
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Christensen, Burton G.; Johnston, David B. R.; and Firestone, Raymond A., 4,296,236, Cl. 542-420.000.
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Benson, Henry E.; and Moravec, Terrence D., 4,295,918, Cl. 156-434.000.
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Moritz, Bertil, to ASEA Aktiebolag. Structure for preventing winding collapse. 4,296,395, Cl. 336-60.000.
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Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., 4,295,427, Cl. 104-32.00R.
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Muchowski, Joseph M.; and Venuti, Michael C., to Syntex (U.S.A.) Inc. Preparation of unsaturated aliphatic insect pheromones using cyclic phosphonium ylids. 4,296,042, Cl. 260-345.90R.
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Munson, Harry R., Jr., to A. H. Robins Company, Inc. Mucolytic benzene and thiophene-carbothioic acid 2-aminoalkyl ester acid salts. 4,296,092, Cl. 424-43.000.
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Scriminger, William F., 4,295,744, Cl. 366-3.000.
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Naitoh, Katsumi, to NSK-Warner K.K.; and Nissan Motor Co., Ltd. Safety belt wind-up device. 4,295,684, Cl. 297-475.000.
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Nakamura, Kenichi: *See—*
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Nakayama, Katsuichi: *See—*
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Aitken, Thomas; Kowalski, David J.; and Srinivasan, K. G., 4,295,930, Cl. 162-158.000.
Breslin, Michael D., 4,295,928, Cl. 162-73.000.
Slovinsky, Manuel, 4,295,762, Cl. 405-264.000.
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Sauer, Donald G., 4,295,811, Cl. 425-112.000.
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Becker, James; and Neill, Daniel L., 4,295,687, Cl. 303-20.000.
Nelle, Gunther; and Swassek, Gunter, to Dr. Johannes Heidenhain GmbH. Longitudinal measuring device. 4,295,742, Cl. 356-373.000.
Nelson, Alfred R.; and Johnsen, Kenneth E., to Dow Chemical Co., The. Solvent blends for ethylene copolymers. 4,296,019, Cl. 260-33.40R.
Nelson, David M., to United States Gypsum Company. Steel clad wood door frame. 4,295,299, Cl. 49-504.000.
Nelson, Gary L.; and Harvey, William A., to Sperry Corporation. Magneto-optic $Bi_1$ $Lu_2$ $Fe_5O_{12}$ crystals. 4,295,988, Cl. 252-584.000.
Nelson, Melvin A.: *See—*
Franks, Larry A.; and Nelson, Melvin A., 4,296,319, Cl. 250-227.000.
Neubauer, Douglas G.: *See—*
Mayer, Steven T.; Miner, Jay G.; Neubauer, Douglas G.; and Decuir, Joseph C., 4,296,476, Cl. 364-900.000.
Neubauer, Michael L., to Varian Associates, Inc. Traveling wave tube with frequency variable sever length. 4,296,354, Cl. 315-3.500.
Neuenschwander, Rudolf: *See—*
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., 4,296,161, Cl. 428-171.000.
Neuhoff, Donald; Mones, Arthur H.; and Lam, Man K., to Honeywell Information Systems Inc. Method of soldering a lead to a sintered lead pad. 4,295,271, Cl. 29-840.000.
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, to Ciba-Geigy Corporation. Process for the production of negligibly dusty preparation. 4,295,851, Cl. 8-524.000.
Neuringer, Jules K., to Portronix Communications Inc. Location transmitting system. 4,296,408, Cl. 340-539.000.
Neyrpic: *See—*
Boussuges, Pierre, 4,295,782, Cl. 415-1.000.
NGK Insulators, Ltd.: *See—*
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, 4,296,276, Cl. 174-179.000.
Matsuhisa, Tadaaki; Soejima, Shigeo; and Yamamoto, Noboru, 4,295,892, Cl. 501-120.000.
Nibby, Chester M., Jr.; and Panepinto, William, Jr., to Honeywell Information Systems Inc. Rotating chip selection technique and apparatus. 4,296,467, Cl. 364-200.000.
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Mallory, Henry R.; and Nichols, Steven J., 4,296,461, Cl. 363-22.000.
Nicholson, Robert D.; and Daniel, Alger T., to Koehring Company. Laminated jet pipe receiver plug assembly method and structure. 4,295,594, Cl. 228-160.000.
Nicholson, William H., to Blodgett, Norman S. Wedge. 4,295,506, Cl. 144-193.00D.
Nicodemus, Robert N., Jr.: *See—*
Neal, Warren D.; and Nicodemus, Robert N., Jr., 4,295,559, Cl. 198-598.000.
Nicolas, Francois: *See—*
Maurel, Pierre; Nicolas, Francois; and Bosca, Bernard, 4,296,073, Cl. 423-3.000.
Niederer, Kurt W., to Terrell Machine Company, The. Apparatus for sorting textile bobbins. 4,295,569, Cl. 209-634.000.
Niedzialkowski, John: *See—*
Sokoly, Theodore O.; and Niedzialkowski, John, 4,296,002, Cl. 252-518.000.
Niemeyer, Lutz: *See—*
Lang, Ernst; and Niemeyer, Lutz, 4,296,285, Cl. 200-61.080.
Nifco, Inc.: *See—*
Morota, Kazutoshi; and Yuda, Takuo, 4,295,618, Cl. 248-73.000.
Nihon Automatic Machinery Mfg. Co., Ltd.: *See—*
Kamei, Takeji, 4,295,972, Cl. 210-710.000.
Nippon Electric Co., Ltd.: *See—*
Hirayama, Tsutomu; and Hada, Hiroshi, 4,296,357, Cl. 315-169.400.
Murotani, Tatsunori, 4,296,339, Cl. 307-450.000.
Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Soken, Inc.: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.
Nippon Steel Corporation: *See—*
Arima, Ryoji; Umezawa, Kazushige; and Nisugi, Tokuzo, 4,295,882, Cl. 75-52.000.
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,296,145, Cl. 427-47.000.
Nirasawa, Mitsuharu: *See—*
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Nishida, Katsutoshi: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.
Nishikawa, Akio: *See—*
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, 4,296,219, Cl. 525-488.000.
Nishikawa, Masaji: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,295,734, Cl. 355-15.000.
Nishikubo, Yasuhiko, to Citizen Watch Co. Ltd. Crystal oscillation-type electronic timepiece. 4,296,490, Cl. 368-87.000.



Nishimoto, Kanichi, to Noritsu Koki Co., Ltd. Conveying system with snake motion prevention members incorporated therein for photo treatment apparatus of long length photo-sensitive sheet materials. 4,295,728, Cl. 354-321.000.
Nishizawa, Jun-ichi, to Handotai Kenkyu Shinkokai. Luminescent diode having multiple hetero junctions. 4,296,425, Cl. 357-17.000.
Nishizawa, Toshizo: *See—*
Tanaka, Naoki; Tsuchiya, Kunihiko; and Nishizawa, Toshizo, 4,295,806, Cl. 418-97.000.
Niskin, Shale J. Cover for port light. 4,295,675, Cl. 292-256.600.
Nissan Motor Co., Ltd.: *See—*
Morota, Kazutoshi; and Yuda, Takuo, 4,295,618, Cl. 248-73.000.
Naitoh, Katsumi, 4,295,684, Cl. 297-475.000.
Nissan Motor Co. Ltd: *See—*
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.
Nisshin Flour Milling Co., Ltd.: *See—*
Tanaka, Kenji; and Endo, Shigeru, 4,296,133, Cl. 426-23.000.
Nissin Kogyo Kabushiki Kaisha: *See—*
Hachiro, Nobuaki, 4,295,412, Cl. 91-468.000.
Nisugi, Tokuzo: *See—*
Arima, Ryoji; Umezawa, Kazushige; and Nisugi, Tokuzo, 4,295,882, Cl. 75-52.000.
Noble, Allen T. Land irrigating system and method. 4,295,607, Cl. 239-1.000.
Noma, Tutomu: *See—*
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Nomine, Michel; and Chelu, Gerard, to Charbonnages de France. Process for purifying gaseous effluents. 4,296,081, Cl. 423-245.000.
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust-gas-recirculation system for use in diesel engines. 4,295,456, Cl. 123-569.000.
Nomura, Hirokazu; and Fujioka, Tadashi, to Nippon Kokan Kabushiki Kaisha. Method of welding corrugated metallic materials. 4,296,306, Cl. 219-124.340.
Nonn, Konrad; Wolf, Karlheinz; Haus, Artur; and Hornle, Reinhold. Process for the preparation of dyestuff formulations. 4,295,849, Cl. 8-524.000.
Nordson Corporation: *See—*
Kuipers, Peter, 4,295,322, Cl. 53-450.000.
Terry, Robert R.; and Boone, Jacob J., 4,295,573, Cl. 215-348.000.
Noren, Borje: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Noritsu Koki Co., Ltd.: *See—*
Nishimoto, Kanichi, 4,295,728, Cl. 354-321.000.
Norris, James P.: *See—*
Martin, Howard; and Norris, James P., 4,295,827, Cl. 433-81.000.
Norsk Hydro a.s.: *See—*
Kongshaug, Gunnar, 4,295,895, Cl. 134-22.00R.
Northern Telecom Limited: *See—*
Osborne, Brian T., 4,295,703, Cl. 339-98.000.
Udayasekaran, Rajasekaran, 4,296,281, Cl. 179-18.0EB.
Norton, Henry J.: *See—*
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., 4,296,161, Cl. 428-171.000.
NPI Corporation: *See—*
Lang-Ree, Nils, 4,295,418, Cl. 99-355.000.
NSK-Warner K.K.: *See—*
Naitoh, Katsumi, 4,295,684, Cl. 297-475.000.
Nuken GmbH: *See—*
Brunner, Herbert, 4,295,745, Cl. 366-302.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Mode change-over device for automatic exposure control camera. 4,295,716, Cl. 354-30.000.
Nunner, Hans-Herbert: *See—*
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.
NUS Corporation: *See—*
Mullett, William L., 4,295,401, Cl. 83-864.000.
O'Brien, Joseph P.: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,295,983, Cl. 252-49.600.
Obu, Yuichiro: *See—*
Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, 4,295,549, Cl. 188-218.00A.
Odate, Makoto: *See—*
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, 4,296,112, Cl. 424-246.000.
Odham, Goran: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Oelbermann, Max; and Rademacher, Karl-August, to Rittershaus & Blecher GmbH. Filter conveying device for filter presses. 4,295,970, Cl. 210-230.000.
Oertli AG Dubendorf: *See—*
Schilling, Siegfried, 4,295,821, Cl. 431-353.000.
Officine Savio, S.p.A.: *See—*
Pfeifer, Hermann, 4,295,330, Cl. 57-263.000.
Ogasawara, Fumihiro, to Ricoh Company, Ltd. Photoelectric scanning apparatus. 4,296,441, Cl. 358-293.000.
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, to Sumitomo Cement Co., Ltd. Apparatus for continuously producing a cement clinker. 4,295,823, Cl. 432-106.000.
Ogino, Fumiichi, to Takeda Chemical Industries, Ltd. Air filter of polyurethane mesh containing carbon adsorbent. 4,296,166, Cl. 428-283.000.
Ogiwara, Kenzyu; Kawada, Minoru; and Ashida, Teiji, to Hitachi, Ltd.; and Hitachi Service Engineering Co., Ltd. Method for operating fluid machines in spinning-in-air mode. 4,295,781, Cl. 415-1.000.
Ohara, Ichiro, to Hitachi, Ltd. Mounting structure for magnetrons. 4,295,748, Cl. 403-24.000.
Ohashi, Takashi; Okoyama, Toru; and Arai, Katsuhiko, to Bridgestone Tire Company Limited. Fireproof laminates. 4,296,170, Cl. 428-313.000.
Ohigashi, Hiroji: *See—*
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Ohkubo, Hiroyuki, to Sony Corporation. Magnetic signal field sensor that is substantially immune to angular displacement relative to the signal field. 4,296,377, Cl. 324-252.000.
Ohlinger, Manfred: *See—*
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, 4,295,879, Cl. 75-0.5AA.
Ohloff, Gunther: *See—*
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Ohmura, Kaoru: *See—*
Shibaski, Ichiro; Ohmura, Kaoru; and Kimura, Takeo, 4,296,424, Cl. 357-1.000.
Ohsaka, Yohnosuke; and Tohzuka, Takashi, to Daikin Kogyo Co., Ltd. Process for preparing hexafluoropropene oligomers. 4,296,265, Cl. 570-138.000.
Ohta, Tokuya: *See—*
Eida, Tsuyoshi; Haruta, Masahiro; Yano, Yasuhiro; Matsufuji, Yoji; and Ohta, Tokuya, 4,295,889, Cl. 106-22.000.
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, to Hitachi Chemical Company, Ltd. Photo-curable coating compositions for building materials. 4,295,947, Cl. 204-159.150.
Ojima, Masahiro: *See—*
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, 4,296,419, Cl. 346-135.100.
Okami, Yoshiro: *See—*
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.
Okamoto, Susumu: *See—*
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,296,145, Cl. 427-47.000.
Okano, Shuji: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.
Oki, Hiroshi: *See—*
Nakazima, Kooichi; Kazama, Keizo; and Oki, Hiroshi, 4,295,574, Cl. 220-2.10A.
Okoyama, Toru: *See—*
Ohashi, Takashi; Okoyama, Toru; and Arai, Katsuhiko, 4,296,170, Cl. 428-313.000.
Oktay, Sevgin: *See—*
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., 4,296,455, Cl. 361-383.000.
Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Sizing compositions incorporating ketene dimer. 4,296,012, Cl. 260-29.6XA.
Okuno, Yoshitoshi: *See—*
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.
Olekna, David J.: *See—*
Graham, Henry A., Jr.; Olekna, David J.; Hawk, Johnna B.; and Barrett, Diane M., 4,296,090, Cl. 424-11.000.
Olsson, Jan: *See—*
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.
Olympus Optical Co., Ltd.: *See—*
Fujiwara, Toshihide; and Fujimori, Ryo, 4,295,949, Cl. 204-180.00G.
Kitagawa, Masahiro, 4,295,717, Cl. 354-33.000.
Mizokami, Kazunori, 4,295,718, Cl. 354-50.000.
Mizokami, Kazunori; and Kitagawa, Masahiro, 4,295,720, Cl. 354-51.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,295,734, Cl. 355-15.000.
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, to Kyowa Hakko Kogyo Kabushiki Kaisha; and Kitasato Kenkyusho. Antibiotic nanaomycin E and a process for producing the same. 4,296,040, Cl. 260-345.200.
Omya GmbH: *See—*
Barthelmess, Ulrich, 4,295,803, Cl. 417-423.00R.
Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Mercaptoacyl derivatives of keto substituted proline and pipecolic acid. 4,296,113, Cl. 424-246.000.

O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., to Bell Telephone Laboratories, Incorporated. Incoming call identification arrangement. 4,296,282, Cl. 179-99.0LS.

Ono, Shunichiro: *See—*
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, 4,295,823, Cl. 432-106.000.

Oohashi, Kenichi: *See—*
Takahashi, Akira; and Oohashi, Kenichi, 4,295,893, Cl. 106-120.000.

Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Brush holding apparatus for rotary electric machine. 4,296,346, Cl. 310-242.000.

Oosaka, Shigenori; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Device for feeding web with temperature compensating means. 4,295,589, Cl. 226-122.000.

Oppen, Dieter, to Hooker Chemicals & Plastics Corp. Process for coating iron and steel. 4,295,899, Cl. 148-6.160.

Orcon Corporation: *See—*
Bascom, Hollis H.; Matweyou, Stephen; Andersen, Alan J.; and Greci, John J., 4,295,905, Cl. 156-174.000.

Oronzio deNora Impianti Elettrochimici S.p.A.: *See—*
de Nora, Oronzio; Giuffre, Luigi; and Modica, Giovanni, 4,295,952, Cl. 204-252.000.

Orpen, Kenneth S. E. Pressure frame with bowed side members. 4,295,568, Cl. 206-597.000.

Ortho Diagnostics, Inc.: *See—*
Graham, Henry A., Jr.; Olekna, David J.; Hawk, Johnna B.; and Barrett, Diane M., 4,296,090, Cl. 424-11.000.

Ortho Pharmaceutical Corporation: *See—*
Kane, Vinayak V., 4,296,035, Cl. 260-333.000.

Osborne, Brian T., to Northern Telecom Limited. Connector block. 4,295,703, Cl. 339-98.000.

Oseto, Osamu: *See—*
Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, 4,296,012, Cl. 260-29.6XA.

Ostergren, Carl D.: *See—*
Leaycraft, Edgar C.; Oktay, Sevgin; and Ostergren, Carl D., 4,296,455, Cl. 361-383.000.

Oswell, Herman R., to United States of America, Army. Selectable drag brakes for rocket range control. 4,295,617, Cl. 244-3.290.

Otomaru, Tadao, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary die cutter. 4,295,843, Cl. 493-354.000.

Ottenberg, Lawrence E.: *See—*
Harrold, Ronald T.; and Ottenberg, Lawrence E., 4,296,003, Cl. 252-570.000.

Ottersbach, Thomas V.: *See—*
Hildebrandt, Eugene F.; and Ottersbach, Thomas V., 4,296,366, Cl. 318-793.000.

Outboard Marine Corporation: *See—*
Blake, Charles H.; and Wood, Donald H., 4,296,363, Cl. 318-349.000.
Borst, Gaylord M., 4,295,833, Cl. 440-63.000.

Owens-Corning Fiberglas Corporation: *See—*
Bemis, Richard S.; and McCartan, Daniel A., 4,296,164, Cl. 428-219.000.
Grime, Paul R., 4,295,697, Cl. 339-22.00R.
Kerle, Edward J.; and Beaver, Terry R., 4,296,009, Cl. 260-28.50R.
Shannon, Richard F., 4,296,169, Cl. 428-298.000.

Owens-Illinois, Inc.: *See—*
Amberg, Christopher P., 4,295,580, Cl. 221-268.000.
Buckingham, James W., 4,296,061, Cl. 264-138.000.
Willingham, Wendell D., 4,295,320, Cl. 53-201.000.

Oximetrix, Inc.: *See—*
Shaw, Robert F.; and Sperinde, John, 4,295,470, Cl. 128-634.000.

Pacciarini, Antonio: *See—*
Manini, Silvio; and Pacciarini, Antonio, 4,295,774, Cl. 414-331.000.

Packer, Bernard A. Energy convertor. 4,295,800, Cl. 417-333.000.

Pai, Panemangalore S.: *See—*
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,295,847, Cl. 8-189.000.

Paice, Derek A.; and Shimp, Alan B., to United States of America, Interior. Discriminating circuit breaker protection system direct current power distribution systems. 4,296,450, Cl. 361-50.000.

Pako Corporation: *See—*
Kaufmann, Kenneth M., 4,295,729, Cl. 354-324.000.

Pallo, John M.: *See—*
LaPrade, Steve A.; and Pallo, John M., 4,295,669, Cl. 285-47.000.

Palma, Gary E.; and Mottier, Francois M., to United Technologies Corporation. Two-wavelength phase control system. 4,295,741, Cl. 356-349.000.

Pander, Hans J.: *See—*
Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, 4,295,875, Cl. 71-88.000.

Panepinto, William, Jr.: *See—*
Nibby, Chester M., Jr.; and Panepinto, William, Jr., 4,296,467, Cl. 364-200.000.

Pangeri, Helmut: *See—*
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.

Papay, Andrew G.; and O'Brien, Joseph P., to Ethyl Corporation. Lubricating oil composition containing boronated N-hydroxymethyl succinimide friction reducers. 4,295,983, Cl. 252-49.600.

Parent, Daniel, to Plastiques Modernes Ltee. Contractable closure member. 4,295,578, Cl. 220-234.000.

Parks, Lawrence R., to Procter & Gamble Company, The. Cross-linked sodium polyacrylate absorbent. 4,295,987, Cl. 252-194.000.

Parlman, Robert M.; and Williams, Ralph P., to Phillips Petroleum Company. Recovering copper by flotation using N-mercaptoalkyl amide depressant. 4,295,962, Cl. 209-167.000.

Parno Corporation: *See—*
Beck, Richard A.; and Presley, Glen T., 4,295,539, Cl. 180-243.000.

Parro, James. Heat exchange method using natural flow of heat exchange medium. 4,295,342, Cl. 62-119.000.

Pascal, Robert A. Molded heavy duty wheel. 4,295,256, Cl. 29-159.010.

Pasker, John W., to Pasker, John W. Music teaching apparatus and method. 4,295,408, Cl. 84-484.000.

Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., to General Electric Company. Gun bolt locking system. 4,295,410, Cl. 89-12.000.

Paul, Edward L.: *See—*
Grabner, Roy; and Paul, Edward L., 4,296,204, Cl. 435-235.000.

Pauling, Horst: *See—*
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,295,517, Cl. 165-1.000.

Pauze, Denis R.; and Zamek, Otto S., to General Electric Company. Hot-melt polyesterimide-polyisocyanate electrical coating compositions. 4,296,229, Cl. 528-45.000.

Pavan, Charles: *See—*
Joly, Robert; Pavan, Charles; and Carle, Pierre R., 4,296,091, Cl. 424-18.000.

Payne, Alan; and Bunning, Robin G. Portable inverter for transferring bulk goods between pallets. 4,295,776, Cl. 414-405.000.

Payne, John M. Electrostatic cameras. 4,295,714, Cl. 354-3.000.

Payne, Peter R., administrator; *See—*
Mindt, Lothar F. O., deceased; Payne, Peter R., administrator; and Sanderson, George R., 4,296,234, Cl. 536-47.000.

Peachee, C. Theodore: *See—*
Punshon, William D.; and Peachee, C. Theodore, 4,295,268, Cl. 29-596.000.

Pearson, Billy J., to Sperry Corporation. Pressure sensitive switch structure. 4,296,406, Cl. 340-166.00R.

Pearson, Joe T.: *See—*
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.

Peck, Wallace C. Corked bottle opener. 4,295,392, Cl. 81-3.320.

Pedain, Josef; Uerdingen, Walter; and Muller, Hans-Jurgen, to Bayer Aktiengesellschaft. Polyurethane coatings produced from (1) a polyisocyanate mixture of polyisocyanates from the diphenol methane series and a polyhydroxy polyether containing at least one tertiary amine nitrogen with (2) a polyol in a two component coating system. 4,296,230, Cl. 528-67.000.

Pelikan A.G.: *See—*
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.

Pellerin, Albert. Device for increasing the uniformity of the air-fuel mixture in internal combustion engines. 4,295,458, Cl. 123-590.000.

Pelton, Frank M.; Miller, Clyde A.; and Leney, Thomas F., to Calspan Corporation. Method and apparatus for reducing the effects of scintillation and rejection of clutter in monopulse radars. 4,296,415, Cl. 343-16.00M.

Pemco-Kalamazoo, Inc.: *See—*
Black, John W., 4,295,686, Cl. 301-63.0DD.

Penn, Eric J.; and Teegarden, Derylle L., to National Semiconductor Corporation. Pin puller and inserter. 4,295,258, Cl. 29-283.000.

Penn, Thomas C., to Texas Instruments Incorporated. Method for removing resist layer from substrate with combustible gas burnoff. 4,296,146, Cl. 427-58.000.

Peot, David G., to Singer Company, The. Safety lock-on motor control. 4,296,290, Cl. 200-325.000.

Percarpio, Edward P., to Becton, Dickinson and Company. Cannula pierceable self-sealing closure. 4,295,572, Cl. 215-247.000.

Perkin-Elmer Corporation, The: *See—*
Gerlach, Robert L., 4,296,323, Cl. 250-289.000.

Perlman, Milton, to Monex Corporation. Connector for wooden truss. 4,295,318, Cl. 52-693.000.

Perronin, Jean: *See—*
Dessaint, Andre L.; and Perronin, Jean, 4,295,976, Cl. 252-8.900.

Peschke, Norman, to Dover Corporation. Vapor control system. 4,295,802, Cl. 417-405.000.

Pestellini, Vittorio: *See—*
Ghelardoni, Mario; Pestellini, Vittorio; Del Soldato, Piero; Volterra, Giovanna; and Meli, Alberto, 4,296,124, Cl. 424-285.000.

Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, to BASF Aktiengesellschaft. Process for the production of formaldehyde-free finishing agents for cellulosic textiles and the use of such agents. 4,295,846, Cl. 8-186.000.

Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, to BASF Aktiengesellschaft. Finishing process for textiles. 4,295,847, Cl. 8-189.000.

Petersen, Jorgen N., to Aktieselskabet Brodrene Hartmann. Tray blank for eggs. 4,295,597, Cl. 229-2.5EC.

Peterson, Donald J. Platform stepladder. 4,295,544, Cl. 182-106.000.

Petitpierre, Jean C.; and Garner, Robert, to Ciba-Geigy Corporation. 3-Indolyl-3-bis-amino-phenyl-phthalide compounds. 4,295,663, Cl. 282-27.500.



Petrillo, Edward W., Jr.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. 4-Azido-1-mercaptoacyl proline. 4,296,033, Cl. 260-326.200.

Petrin, Jerome A. Self-dumping hoisting bucket assembly. 4,295,677, Cl. 294-73.000.

Petroleum Designers, Inc.: *See—*
Pierce, Elwood K., 4,295,665, Cl. 285-3.000.

Petrow, Henry G.; and Weissman, Mark L. Method of removal of chlorine retained by human skin and hair after exposure to chlorinated water, and soap and shampoo compositions adapted to effect said removal. 4,295,985, Cl. 252-105.000.

Pezzot, Adriano. Intermediately cooled air vacuum pump with balancing of the pressures. 4,295,804, Cl. 418-15.000.

Pfannebecker, George W.: *See—*
Dussourd, Jules L.; and Pfannebecker, George W., 4,295,788, Cl. 415-202.000.

Pfefferle, William C.: *See—*
Angwin, Meredith J.; Pfefferle, William C.; and Kesselring, John P., 4,295,818, Cl. 431-7.000.

Pfeifer, Hermann, to Officine Savio, S.p.A. Re-attachment device for an open-end type spinning frame. 4,295,330, Cl. 57-263.000.

Pfeiffer, Ronald E.: *See—*
De Maria, Francesco; and Pfeiffer, Ronald E., 4,296,175, Cl. 428-398.000.

Pfizer Inc.: *See—*
Kadin, Saul B., 4,296,120, Cl. 424-274.000.
Kadin, Saul B., 4,296,129, Cl. 424-309.000.
Wernau, William C., 4,296,203, Cl. 435-104.000.

Philagro: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Philip Morris Incorporated: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Philipp, Karl-Heinz: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.

Phillips Petroleum Company: *See—*
Boultinghouse, Harold D., 4,296,151, Cl. 427-255.100.
Burns, Lyle D., 4,295,861, Cl. 44-63.000.
Burns, Lyle D., 4,295,862, Cl. 44-72.000.
Clemens, Lawrence G., 4,296,485, Cl. 367-77.000.
Farfaglia, Silvio T., 4,295,903, Cl. 156-69.000.
Hawley, Gil R., 4,295,998, Cl. 252-439.000.
Hawley, Gil R., 4,296,001, Cl. 252-458.000.
Lewis, Robert J., 4,296,087, Cl. 423-449.000.
Louthan, Jean H.; Cox, Russell C.; and Crawford, William V., 4,295,668, Cl. 285-21.000.
McDaniel, Max P.; and Welch, Melvin B., 4,295,997, Cl. 252-439.000.
Miller, Terry A., 4,296,484, Cl. 367-71.000.
Parlman, Robert M.; and Williams, Ralph P., 4,295,962, Cl. 209-167.000.
Richards, Frank P.; and Taylor, Raymond C., 4,295,838, Cl. 493-105.000.
Tatham, Jack R.; and Shelor, Jerry L., 4,295,251, Cl. 28-112.000.

Philpott, Arthur; and Fuher, Reginald S., to Ready Pen Limited. Transmission assembly. 4,295,391, Cl. 74-782.000.

Pierce, Elwood K., to Petroleum Designers, Inc. Well casing suspension system. 4,295,665, Cl. 285-3.000.

Pierce, Robert C., to Colgate-Palmolive Company. High viscosity dentifrice. 4,296,096, Cl. 424-52.000.

Pignons S.A.: *See—*
Durand, Roger, 4,295,725, Cl. 354-244.000.

Pillon, Daniel: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Pine, Lloyd A.: *See—*
Bearden, Roby, Jr.; Aldridge, Clyde L.; and Pine, Lloyd A., 4,295,996, Cl. 252-431.00C.

Pittmann, Robert W.: *See—*
Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., 4,295,795, Cl. 417-111.000.

Pizzolati, Pierluigi: *See—*
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.

Plastiques Modernes Ltee.: *See—*
Parent, Daniel, 4,295,578, Cl. 220-234.000.

Plessey Handel und Investments A.G.: *See—*
Smith, Leslie; Tew, William; and Woolley, Jack, 4,296,458, Cl. 361-433.000.

Plokhuta, Vyacheslav D.: *See—*
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and Eroshevskaya, Elena D., administrator, 4,295,387, Cl. 74-573.00F.

Pocius, Frances C., to Naloc Chemical Company. Synergistic blend of biocides. 4,295,932, Cl. 162-161.000.

Podola, Nikolai V.: *See—*
Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.

Poignant, Pierre: *See—*
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, 4,295,877, Cl. 71-120.000.

Poirier, Marc; Gauthier, Michel; and Belanger, Andre, to Hydro-Quebec. Method and device for detecting a gaseous anhydride in an oxygen bearing gas. 4,295,939, Cl. 204-1.00T.

Pomonik, George M., to Amtel, Inc. Hose arm coupling for underwater fluid swivel. 4,295,237, Cl. 9-8.00P.

Ponder, James E.: *See—*
Tubbs, Graham S.; and Ponder, James E., 4,295,897, Cl. 148-1.500.

Poole, Carl W.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Porter, Howard L. Rescue locator signal package. 4,295,438, Cl. 116-210.000.

Portronix Communications Inc.: *See—*
Neuringer, Jules K., 4,296,408, Cl. 340-539.000.

Pospich, Gunther: *See—*
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, 4,296,210, Cl. 521-85.000.

Potter, Owen E., to Monash University. Drying solid materials. 4,295,281, Cl. 34-10.000.

Poulson, Larry: *See—*
Langhammer, Jerome, 4,295,419, Cl. 99-427.000.

PPG Industries, Inc.: *See—*
Fahey, Dennis M., 4,296,173, Cl. 428-378.000.
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Stroke, Frederick G., 4,295,890, Cl. 501-90.000.

Prefco Products, Inc.: *See—*
McCabe, Francis J., 4,295,486, Cl. 137-80.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See—*
Schuberth, Christian; and Hartmann, Rudolf, 4,296,292, Cl. 200-336.000.

Preisler, James M., to Rudd, Thomas H. Motorcyle apparatus. 4,295,964, Cl. 210-130.000.

Presley, Glen T.: *See—*
Beck, Richard A.; and Presley, Glen T., 4,295,539, Cl. 180-243.000.

Presley, Michael: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Presley, Waller & Presley: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Presley, William E.: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.

Priesmeyer, Charles H., to Mark Controls Corporation. Control valve. 4,295,602, Cl. 236-93.00B.

Priesnitz, Uwe: *See—*
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,296,241, Cl. 560-124.000.

Procter & Gamble Company, The: *See—*
Parks, Lawrence R., 4,295,987, Cl. 252-194.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Bouvet, Pierre; and Lalu, Jean-Pierre, 4,296,034, Cl. 260-326.820.
Dessaint, Andre L.; and Perronin, Jean, 4,295,976, Cl. 252-8.900.

Proulx, Edward A.: *See—*
Patenaude, Raymond A.; Duke, Steven R.; and Proulx, Edward A., 4,295,410, Cl. 89-12.000.

Prout, Wesley C., to Hosmer/Dorrance Corporation. Limb engaging band for orthotic device. 4,295,466, Cl. 128-80.00R.

Przedsiebiorstwo Montazu Elektrycznego "Elektrobudowa": *See—*
Hologa, Zygmunt; Madeyski, Krystyn; and Kurowski, Adam, 4,296,273, Cl. 174-99.00B.

Pullman Incorporated: *See—*
Knippel, Willis H.; and Ferris, Ray, 4,295,430, Cl. 105-308.00E.

Pundt, Richard A. Window regulator. 4,295,298, Cl. 49-353.000.

Punshon, William D.; and Peachee, C. Theodore, to Emerson Electric Co. Method of assembling an electric motor. 4,295,268, Cl. 29-596.000.

Purr, Horst; Kistler, Manfred; and Muller, Rolf, to Mathias Bauerle GmbH. Electrically operated device, especially duplicating device, with a receptacle to accommodate fluid for the chemical treatment of objects. 4,295,913, Cl. 156-345.000.

Purrer, Josef: *See—*
Maier, Martin; Purrer, Josef; and Clemens, Ronald, 4,295,323, Cl. 56-10.200.

Purton, Robert M., to Dresser Industries, Inc. Cleanout apparatus for flow control valves. 4,295,487, Cl. 137-242.000.

Pustka, Zdenek; and Krejcir, Oldrich, to Vysoka skola strojni a textilni. Universal pneumatic bellows jack lifter. 4,295,635, Cl. 254-93.0HP.

Quaas, Gary F., to Becton, Dickinson and Company. Blood collection assembly for preventing outward movement of the blood container. 4,295,476, Cl. 128-764.000.

Quiney, Kenneth M., to Girling Limited. Brake actuator. 4,295,548, Cl. 188-72.700.

Quinn, Thomas M.: *See—*
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.

Rabe, Jerry R., to General Electric Company. Multi-speed motor. 4,296,344, Cl. 310-184.000.

Racal Recorders, Ltd.: *See—*
Lewis, John A., 4,296,447, Cl. 360-113.000.

Racz, Gabor; and Allen, Forrest, to N.A.D., Inc. Laryngoscope blade. 4,295,465, Cl. 128-11.000.

Rademacher, Karl-August: *See—*
Oelbermann, Max; and Rademacher, Karl-August, 4,295,970, Cl. 210-230.000.

Rader, Charles G.: *See—*
Bommaraju, Tilak V.; Dexter, Theodore H.; and Rader, Charles G., 4,295,951, Cl. 204-242.000.

Radjukevich, Leonid V.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

Ragheb, A. Kadry. Magnetic switching device for contact-dependent and contactless switching. 4,296,394, Cl. 335-207.000.

Railcar Maint. Co.: *See—*
Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., 4,295,427, Cl. 104-32.00R.

Ramos, Rey C.: *See—*
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., 4,296,136, Cl. 426-533.000.

Ramsey Engineering Company: *See—*
Erb, Tom L.; and Miller, Wendell D., 4,295,378, Cl. 73-861.250.

Randall, John M.: *See—*
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, 4,295,333, Cl. 60-641.600.

Randin, Jean-Paul, to Ebauches S.A. Method of preparing a polymeric electrolyte particularly for an electro-optical device. 4,296,016, Cl. 260-29.6SQ.

Rannenberg, George C., to United Technologies Corporation. Combined air cycle heat pump and refrigeration system. 4,295,518, Cl. 165-2.000.

Rasello, Franco: *See—*
Milana, Emilio; and Rasello, Franco, 4,296,333, Cl. 250-572.000.

Rassias, John N. Building blocks, wall structures made therefrom and methods of making the same. 4,295,313, Cl. 52-438.000.

Rauterkus, Karl J.: *See—*
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.

Raven-Donners, Paula A. M.: *See—*
Jongsma, Cornelis; Frijns, Leon H. B.; and Raven-Donners, Paula A. M., 4,296,245, Cl. 562-494.000.

Raymond, Duane: *See—*
Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., 4,295,262, Cl. 29-462.000.

Raytheon Company: *See—*
MacMaster, George H.; and Dudley, Kenneth W., 4,296,298, Cl. 219-10.810.

RCA Corporation: *See—*
Comizzoli, Robert B.; and Vibronek, Robert D., 4,296,370, Cl. 324-54.000.
Dodds, Dennis L., 4,296,359, Cl. 315-370.000.
Hoover, Merle V., 4,296,382, Cl. 330-264.000.
Hsu, Sheng T., 4,295,266, Cl. 29-571.000.
Keizer, Eugene O.; and Alphonse, Gerard A., 4,296,371, Cl. 324-61.00R.
Kiess, Helmut G.; and Binggeli, Bruno K., 4,296,478, Cl. 365-112.000.
Kuzminski, Henry W., 4,296,189, Cl. 430-5.000.
Maby, Edward W.; Kawamoto, Hirohisa; and Valembois, Pierre V., 4,296,144, Cl. 427-38.000.
Schelhorn, Robert L., 4,296,272, Cl. 174-68.500.
Siryj, Bohdan W., 4,295,621, Cl. 248-183.000.
Warren, Henry R., 4,296,430, Cl. 358-8.000.
Zorbalas, George S., 4,296,446, Cl. 360-73.000.

Ready Pen Limited: *See—*
Philpott, Arthur; and Fuher, Reginald S., 4,295,391, Cl. 74-782.000.

Rebikoff, Dimitri. High pressure and high speed optical enclosure system. 4,295,721, Cl. 354-64.000.

Redland Automation Limited: *See—*
Duley, Richard K., 4,296,401, Cl. 340-38.00L.

Reedy, Charles B., to Benedictine Monks Inc. Stove. 4,295,459, Cl. 126-60.000.

Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., to Seiscom Delta Inc. Seismic exploration with disposable seismic detectors. 4,295,542, Cl. 181-108.000.

Regan, Michael D. Apparatus for producing high purity water. 4,296,328, Cl. 250-436.000.

Reichert, Manfred: *See—*
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,295,847, Cl. 8-189.000.

Reid, Gilbert R., to Burroughs Corporation. Electronic package for high density integrated circuits. 4,296,456, Cl. 361-403.000.

Reidt, Werner: *See—*
Bugdahl, Volker; Morlock, Gerhard; Reidt, Werner; and Kerschner, Emil, 4,296,006, Cl. 260-23.0EP.

Reimers, George W.: *See—*
Khalafalla, Sanaa E.; and Reimers, George W., 4,295,971, Cl. 210-695.000.

Reindl, Hermann: *See—*
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Reinert, Friedrich: *See—*
Petersen, Harro; Pai, Panemangalore S.; Klippel, Friedrich; and Reinert, Friedrich, 4,295,846, Cl. 8-186.000.

Reinhard Mohn GmbH: *See—*
Beckert, Alexander; and Knobbe, Karl-Heinz, 4,296,294, Cl. 219-10.410.

Reissner, Frank: *See—*
Muhling, Alois; Reissner, Frank; and Schmidt, Helmut, 4,295,380, Cl. 74-3.500.

Rekant, Uriel. Process for the production of energy from solid hydrocarbon fuels. 4,295,331, Cl. 60-39.020.

Renth, Ernst-Otto: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Resch, Friedrich: *See—*
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, 4,295,851, Cl. 8-524.000.

Revak, Timothy T.: *See—*
Anand, Joginder N.; Revak, Timothy T.; and Tsang, Floris Y., 4,296,052, Cl. 264-25.000.

Reynolds and Reynolds Company, The: *See—*
Kelly, Robert J., 4,295,642, Cl. 270-53.000.

Rhau, Siegfried; and Weber, Adolf, to Diehl GmbH & Co. Process for the production of metallic formed members. 4,296,180, Cl. 428-558.000.

Rheindorf, Hans H.: *See—*
Aigle, Karl; Hieber, Udo; Huebscher, Wilhelm; Rheindorf, Hans H.; and Wiedemann, Rolf, 4,296,453, Cl. 361-275.000.

Rhodes, Curtis A.; Jur, Tim A.; and Keating, Donald A., to Canron Corp. Method of filling spike holes in railway ties. 4,295,259, Cl. 29-402.180.

Rhum, David, to Celanese Corporation. Stable vinyl acetate and amine monomer copolymer emulsions. 4,296,225, Cl. 526-260.000.

Rich, Leonard G., to Gulf & Western Corporation. Device for converting analog signals from a natural leaf scanner into digital signals and method of operating same. 4,296,405, Cl. 340-146.3AG.

Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Method of producing cylindrical containers. 4,295,838, Cl. 493-105.000.

Richards, John S.: *See—*
Dabisch, Kenneth W.; and Richards, John S., 4,296,314, Cl. 235-92.0SB.

Richardson, Warren N., to TRW Inc. Self-referencing position switch. 4,296,286, Cl. 200-61.540.

Richie, Ronald A. Wall mounted speaker system. 4,296,280, Cl. 179-1.00E.

Richter Gedeon Vegyeszeti Gyar: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Ricketts, James R.: *See—*
Dambach, Thomas F.; and Ricketts, James R., 4,296,420, Cl. 346-140.00R.

Ricoh Co., Ltd.: *See—*
Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.
Imai, Mitsuru, 4,296,171, Cl. 428-323.000.
Ogasawara, Fumihiro, 4,296,441, Cl. 358-293.000.
Yamazaki, Hiroshi; and Isayama, Takuro, 4,296,418, Cl. 346-75.000.

Ridgway, Donald H.: *See—*
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.

Riebel, Hans-Jochem: *See—*
Hoffmann, Hellmut; Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,296,241, Cl. 560-124.000.

Riedisser, Gunter: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Riedisser, Gunter; and Voss, Wilfried, 4,295,399, Cl. 83-251.000.

Rieke Corporation: *See—*
Schurr, Robert E., 4,295,583, Cl. 222-478.000.

Riessberger, Klaus: *See—*
Theurer, Josef; and Riessberger, Klaus, 4,295,764, Cl. 409-296.000.

Rilly, Gerard, to Thomson-Brandt. Switched-mode frame-scan control circuit for a videofrequency receiver. 4,296,360, Cl. 315-387.000.

Rinno, Helmut: *See—*
Braun, Helmut; Rinno, Helmut; and Rauterkus, Karl J., 4,296,226, Cl. 526-316.000.

Risse, Heinrich: *See—*
Lollert, Bernd; and Risse, Heinrich, 4,295,382, Cl. 74-68.000.

Ritter, Horst, to Dr. C. Otto & Comp. G.m.b.H. Distributor for washing fluid in a scrubber or stripper. 4,296,049, Cl. 261-111.000.

Rittershaus & Blecher GmbH: *See—*
Oelbermann, Max; and Rademacher, Karl-August, 4,295,970, Cl. 210-230.000.

RJR Archer, Inc.: *See—*
Yeatts, Roy E., 4,295,478, Cl. 131-336.000.

Robert Bosch GmbH: *See—*
Friese, Karl-Hermann, 4,296,148, Cl. 427-125.000.
Lembke, Manfred; and Knapp, Heinrich, 4,295,452, Cl. 123-470.000.
Ruhl, Karl; and Kemmner, Ulrich, 4,295,797, Cl. 417-203.000.
Schlagmuller, Walter; and Babitzka, Rudolf, 4,295,554, Cl. 192-105.0CE.
Sochor, Josef, 4,296,444, Cl. 360-65.000.

Roberts, Geoffrey M.: *See—*
Tomov, Nenad R.; and Roberts, Geoffrey M., 4,295,943, Cl. 204-96.000.

Robertson, Forrest E.: *See—*
Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., 4,295,532, Cl. 172-184.000.



Robertson, Wayne M.; and Wert, John A., to Rockwell International Corporation. Method of imparting a fine grain structure to aluminum alloys having precipitating constituents. 4,295,901, Cl. 148-12.70A.

Robin, Marcel. Liquid-metal-cooled nuclear reactor. 4,295,934, Cl. 376-203.000.

Robinair Manufacturing Corporation: *See—*
Cain, Robert L., 4,295,794, Cl. 417-62.000.

Robinson, B. Joel. Catalyst delivery system. 4,295,816, Cl. 431-4.000.

Robinson, Bruce A.; and Thompson, John R., to Du Pont de Nemours, E. I., and Company. Method for measuring yarn shrinkage and crimp development. 4,295,252, Cl. 28-248.000.

Robinson, Douglas K. Electrical apparatus for comparing dark and light areas on a substrate and which substrate is in a liquid. 4,295,727, Cl. 354-298.000.

Robinson Industries, Inc.: *See—*
Gutzwiller, Howard L., 4,295,789, Cl. 416-213.00A.

Rockwell International Corporation: *See—*
Dabisch, Kenneth W.; and Richards, John S., 4,296,314, Cl. 235-92.0SB.
Haraszti, Tegzi P., 4,296,428, Cl. 357-41.000.
Heinz, Theodore A., 4,295,710, Cl. 350-310.000.
Robertson, Wayne M.; and Wert, John A., 4,295,901, Cl. 148-12.70A.
Sarkis, Barkhoudarian, 4,296,472, Cl. 364-509.000.
Vasile, Carmine F., 4,296,486, Cl. 367-140.000.
Yosim, Samuel J., 4,296,074, Cl. 423-4.000.

Rodov, Vladimir: *See—*
Harrington, Alan L.; Rodov, Vladimir; and Allison, Richard, 4,295,267, Cl. 29-571.000.

Rodriguez, Edward T., to Theta-Corporation. Optically coupled electric power relay. 4,296,331, Cl. 250-551.000.

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Rogers, Gerald D., to Texas Instruments Incorporated. Method of making integrated circuit MOS capacitor using implanted region to change threshold. 4,295,264, Cl. 29-571.000.

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Eicken, Karl; Rohr, Wolfgang; Pander, Hans J.; and Wuerzer, Bruno, 4,295,875, Cl. 71-88.000.

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Roman, Alain; Chevreux, Pierre; Wust, Manfred; and Ehretsmann, Jacques, to Battelle Memorial Institute. Photocurable adhesive from acrylic acid, acrylamide, dimethylaminoethyl methacrylate, benzophenone and methyl ethyl ketone. 4,295,948, Cl. 204-159.230.

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Romanelli, Pat; and Romanelli, Robert J., 4,296,411, Cl. 340-870.020.

Roper, Ralph E., to General Tire & Rubber Co. Apparatus for making metal outers and inners. 4,295,357, Cl. 72-344.000.

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Rosenberg, Peretz. Method and apparatus for producing and assembling articles of molded plastic parts. 4,295,814, Cl. 425-517.000.

Rosenheck, Bernard, to Litton Systems, Inc. Start of message generator for a facsimile system. 4,296,440, Cl. 358-257.000.

Rosensweig, Ronald E., to Exxon Research & Engineering Co. Process for the removal of particulates entrained in a fluid using a magnetically stabilized fluidized bed. 4,296,080, Cl. 423-244.000.

Rosenwinkel, Donald A.; Meyer, Burton C.; and Disko, Harry, to Marvin Glass & Associates. Toy lawn mower. 4,295,294, Cl. 46-205.000.

Roster, Theodore J.: *See—*
Sergev, Sergius S.; and Roster, Theodore J., 4,295,604, Cl. 236-21.00R.

Roswell, David G.; Spring, David J.; and Hems, Roger, to Wilkinson Sword Limited. Acyclic carboxamides having a physiological cooling effect. 4,296,255, Cl. 564-215.000.

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Woolcock, Kenneth W., 4,295,241, Cl. 15-230.110.

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Joly, Robert; Pavan, Charles; and Carle, Pierre R., 4,296,091, Cl. 424-18.000.
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,296,126, Cl. 424-316.000.

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Royer Mowers (Aust.) Pty. Ltd.: *See—*
Green, Douglas F., 4,295,326, Cl. 56-11.300.

Rubenthaler, Randall J., to Caterpillar Tractor Co. Mounting grommet. 4,295,691, Cl. 308-238.000.

Rudd, Thomas H.: *See—*
Preisler, James M., 4,295,964, Cl. 210-130.000.

Rudler, Helmut, to Dentsply Research & Development Corp. Ejector holder for syringe-type cartridge. 4,295,828, Cl. 433-90.000.

Rudolf, Peter; Steck, Werner; Jakusch, Helmut; Vaeth, Guenter; and Jaeckh, Christof, to BASF Aktiengesellschaft. Manufacture of acicular cobalt-containing magnetic iron oxide. 4,296,149, Cl. 427-130.000.

Rudolf, Peter: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Rudolph, Paul; and Becker, Paul D., to Metallgesellschaft Aktiengesellschaft. Process of treating pressurized condensate. 4,295,864, Cl. 55-40.000.

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Stemme, Otto; Ruf, Wolfgang; and Wagensonner, Eduard, 4,296,438, Cl. 358-214.000.

Ruhl, Karl; and Kemmner, Ulrich, to Robert Bosch GmbH. Fuel supply pump. 4,295,797, Cl. 417-203.000.

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Rutten, Jacques P., to Machinefabriek C. Rijkaart B.V. Method of forming a layer of pre-determined thickness from a feedstock of butter or margarine. 4,296,135, Cl. 426-275.000.

Rutz, Peter. Hydrostatic bearing for a radial piston machine. 4,295,690, Cl. 308-9.000.

Rzeszewski, Theodore S., to Matsushita Electric Corporation of America. Color television receiving system with forced chroma transients. 4,296,433, Cl. 358-37.000.

S.T.I. Strumentazione Industriale S.p.A.: *See—*
Lattuada, Sergio, 4,295,863, Cl. 55-21.000.

Sachs, Helmut: *See—*
Roeder, Georg; and Sachs, Helmut, 4,295,820, Cl. 431-191.000.

Sadler, William S. Emergency radio frequency warning device. 4,296,496, Cl. 455-1.000.

Sado, Ryoichi, to Shin-Etsu Polymer Co., Ltd. Interconnectors. 4,295,700, Cl. 339-61.00M.

Saget, Pierre L. Apparatus for the centrifugal separation of at least two liquid phases and one sedimentary phase of a mixture. 4,295,600, Cl. 233-7.000.

Sahara, Masayoshi; and Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Electric self-timer device for cameras. 4,295,724, Cl. 354-238.000.

Saiki, Noritsugu: *See—*
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St. Clair, David J.; and Ewins, Earle E., Jr., to Shell Oil Company. Sealant composition. 4,296,008, Cl. 260-27.0BB.

Saint-Gobain Industries: *See—*
Droux, Michel; and Bocquet, Gilbert, 4,295,871, Cl. 65-3.410.

Saito, Cyuichi; and Teranishi, Katsuya, to Hitachi, Ltd. Passenger conveyor. 4,295,556, Cl. 198-325.000.

Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, to Bridgestone Tire Co., Ltd.; and Toray Industries, Inc. Golf ball. 4,295,652, Cl. 273-235.00R.

Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, to Kubota Ltd. Label handling apparatus. 4,295,915, Cl. 156-361.000.

Sakai, Hideaki: *See—*
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Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, to Sony Corporation. Magnetic head tracking control system. 4,296,443, Cl. 360-10.000.

Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, to Sumitomo Naugatuck Co., Ltd. Thermoplastic resin composition. 4,296,216, Cl. 525-66.000.

Salem, Robert J., to General Electric Company. Electronic temperature sensing system for toaster appliances. 4,296,312, Cl. 219-501.000.

Sallmann, Alfred; and Goschke, Richard, to Ciba-Geigy Corporation. Carboxylic acid hydrazides and processes for their manufacture. 4,296,128, Cl. 424-309.000.

Salters, Roelof H. W.: *See—*
Nederlof, Leendert; and Salters, Roelof H. W., 4,296,475, Cl. 364-900.000.

Sami, Hiroshi: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.

Sanda, Hisanari: *See—*
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Sanders Associates, Inc.: *See—*
Fuller, Harrison W.; and Stromswold, Chester E., 4,296,389, Cl. 333-160.000.

Sanderson, George R.: *See—*
Mindt, Lothar F. O., deceased; Payne, Peter R., administrator; and Sanderson, George R., 4,296,234, Cl. 536-47.000.

Sandoz, Inc.: *See—*
Damon, Robert E., II, 4,296,240, Cl. 556-406.000.

Sangamo Weston, Inc.: *See—*
Gurr, George P., 4,296,462, Cl. 363-96.000.

Sano, Seijiro: *See—*
Kawamura, Toshio; Harashima, Noboru; Ueda, Hideo; and Sano, Seijiro, 4,295,654, Cl. 277-92.000.

Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Steering apparatus for vehicles. 4,295,657, Cl. 280-91.000.

Sansbury, Jerry F., to Sonoco Products Company. Method of constructing composite containers. 4,295,840, Cl. 493-278.000.

Santa Barbara Research Center: *See—*
Kern, Mark T.; and Cinzori, Robert J., 4,296,324, Cl. 250-339.000.

Sarkis, Barkhoudarian, to Rockwell International Corporation. Nonintrusive fluid measuring system. 4,296,472, Cl. 364-509.000.

Sarnecki, Wilhelm: *See—*
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, 4,295,879, Cl. 75-0.5AA.

Sasaki, Hiroharu: *See*—
Hayashi, Masaaki; Sasaki, Hiroharu; and Tsuneta, Kazuyoshi, 4,296,014, Cl. 260-29.6NR.

Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, to Mita Industrial Company Limited. Electrostatic copying apparatus. 4,295,731, Cl. 355-14.00R.

Sasaki, Masao: *See*—
Hatta, Masami; Iwata, Katsumi; and Sasaki, Masao, 4,295,444, Cl. 118-668.000.

Sasaki, Mitsuru: *See*—
Mori, Kenji; and Sasaki, Mitsuru, 4,296,036, Cl. 260-340.700.

Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, to Meito Sangyo Kabushiki Kaisha; and Susumu Sasaki. Method for separating fibrinogen and its constituent components. 4,295,855, Cl. 23-230.00B.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, 4,295,420, Cl. 99-486.000.

Satake, Toshihiko; Kono, Akira; Horie, Takashi; and Mitoma, Yasuharu, to Satake Engineering Co., Ltd. Automatic control system for hulling machine. 4,295,420, Cl. 99-486.000.

Satcher, Angel T. Method and structure for recycling soap chips. 4,296,064, Cl. 264-322.000.

Sato, Kazuo, to Daicel Ltd. Process for producing sorbic acid or its derivatives. 4,296,243, Cl. 560-210.000.

Sato, Masataro. Compositions and methods for the treatment of athlete's foot. 4,296,098, Cl. 424-94.000.

Sato, Ryuichi: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.

Sato, Yashushi: *See*—
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Sato, Yukihiro: *See*—
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, 4,295,711, Cl. 350-334.000.

Satoh, Hiroshi: *See*—
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.

Satoh, Takao; and Seita, Toru, to Toyo Soda Manufacturing Co., Ltd. Electrolysis of aqueous solution of alkali metal chloride. 4,295,944, Cl. 204-98.000.

Sauer, Donald G., to National Can Corporation. Apparatus for making multilayered containers. 4,295,811, Cl. 425-112.000.

Sauer, Hans; Steinbichler, Wolf; and Antonitsch, Sepp. Contact spring arrangement for an electromagnetic relay. 4,296,393, Cl. 335-125.000.

Sauer, Paul J.: *See*—
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Sauerland, Heinz: *See*—
Desprez, Alfred; Sauerland, Heinz; and Teetz, Wolfgang, 4,295,433, Cl. 112-241.000.

Sauermann, Gerhard: *See*—
Hoppe, Udo; Sauermann, Gerhard; Curts, Julius; Glantz, Per-Olof; Krasse, Bo; Larsson, Kare; Noren, Borje; Odham, Goran; and Olsson, Jan, 4,296,095, Cl. 424-52.000.

Saville, James, to Texasgulf Inc. Process for extraction of platinum group metals from chromite-bearing ore. 4,295,881, Cl. 75-10.00R.

Sawa, Hiroshi, to Hochiki Corporation. Temperature detecting device. 4,295,371, Cl. 73-359.00A.

Sawada, Hidekazu: *See*—
Suzuki, Takashi; Sawada, Hidekazu; and Katamoto, Kazuyoshi, 4,296,107, Cl. 424-180.000.

Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, to Hitachi, Ltd. Electromagnetic clutch. 4,295,553, Cl. 192-84.00C.

Schaefer, Hans G.; and Langer, Alfred, to Manhattan R. F. Die Company. Method and apparatus for heat sealing a plurality of sets of continuous plastic strips together by radio frequency energy. 4,295,908, Cl. 156-251.000.

Schafer, August W., to Wilhelm Schafer Maschinenbau. Apparatus for joining and cladding pipe sections. 4,295,592, Cl. 228-17.000.

Scharff, Dieter: *See*—
Haage, Karl; and Scharff, Dieter, 4,295,911, Cl. 156-315.000.

Schatzmann, Kurt: *See*—
Forstner, Anton; and Schatzmann, Kurt, 4,295,441, Cl. 118-425.000.

Scheidl, Helmut: *See*—
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.

Schelhorn, Robert L., to RCA Corporation. Composite substrate. 4,296,272, Cl. 174-68.500.

Schenck, Gunther. Multichamber photoreactor. 4,296,066, Cl. 422-24.000.

Schenkenberger, Ernst: *See*—
Neumann, Konrad; Schenkenberger, Ernst; and Resch, Friedrich, 4,295,851, Cl. 8-524.000.

Scherer, Gustaaf: *See*—
Haberli, Roland; Mollet, Hans; and Scherer, Gustaaf, 4,295,850, Cl. 8-524.000.

Scherer, Richard M., to Chambers Corporation. Method of mounting a thermal insulating door gasket. 4,295,261, Cl. 29-451.000.

Schering, Aktiengesellschaft: *See*—
Laurent, Henry; Esperling, Peter; Kapp, Joachim-Friedrich; and Wiechert, Rudolf, 4,296,109, Cl. 424-241.000.

Schering Corporation: *See*—
Nagabhushan, Tattanahalli L.; and Cooper, Alan, 4,296,242, Cl. 560-160.000.

Schiffman, Jerome D., deceased: *See*—
Biela, John A., 4,295,480, Cl. 132-151.000.

Schiller, August: *See*—
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.

Schilling, Siegfried, to Oertli AG Dubendorf. Apparatus for burning liquid fuel. 4,295,821, Cl. 431-353.000.

Schindler, Hermann: *See*—
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, 4,296,210, Cl. 521-85.000.

Schlagmuller, Walter; and Babitzka, Rudolf, to Robert Bosch GmbH. Centrifugal frictional clutch. 4,295,554, Cl. 192-105.0CE.

Schleiermacher, Herbert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Crankcase ventilating device for reciprocating piston internal combustion engine. 4,295,457, Cl. 123-574.000.

Schmid, Michael G.; and Hurt, Roger W. Anti-theft device for liquid storage tanks. 4,295,577, Cl. 220-86.0AT.

Schmid, Rolf: *See*—
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Schmidt, Friedrich: *See*—
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Schmidt, Hans-Joachim: *See*—
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Schmidt, Helmut: *See*—
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Schmidt, Karl-Julius; Schmidt, Friedrich; Siegle, Peter; and Hansen, Gert, to Bayer Aktiengesellschaft. Continuous preparation of phosphoric acid alkyl ester dichlorides. 4,296,047, Cl. 260-974.000.

Schmidt, Paul. Pneumatically operated ram borer. 4,295,533, Cl. 175-19.000.

Schmidt, Robert R.: *See*—
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.

Schmit, Paul F., to Minnesota Mining and Manufacturing Company. Method of heat sealing a film to the lip of a cup. 4,295,904, Cl. 156-69.000.

Schmitt, Franz U.: *See*—
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.

Schmitt, Frederick L.: *See*—
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Schmuck, Philip W.: *See*—
Swift, Edward R., Jr.; and Schmuck, Philip W., 4,295,525, Cl. 166-312.000.

Schneider, Hartmut; and Lebetzki, Egon, to Siemens Aktiengesellschaft. Process for the production of glass for a glass workpiece for use in drawing a glass light conducting fiber of a low attenuation. 4,295,870, Cl. 65-3.120.

Schneider, Peter J., Jr. Environmentally heated and cooled pre-fabricated insulated concrete building. 4,295,415, Cl. 98-31.000.

Schneiter, Fred E.: *See*—
Adams, Gary V.; and Schneiter, Fred E., 4,296,084, Cl. 423-351.000.

Schowe, Lester F., Jr., to Honeywell, Inc. Phase sensor. 4,296,445, Cl. 360-65.000.

Schrader, Karl-Heinz: *See*—
Mecke, Norbert; Schmitt, Franz U.; Schrader, Karl-Heinz; and Blutschkau, Heinke, 4,296,150, Cl. 427-164.000.

Schroeder, James E., to Harris Corporation. VMOS Transistor and method of fabrication. 4,296,429, Cl. 357-55.000.

Schroeder, Josef, to Bayer Aktiengesellschaft. Process for the preparation of benzanthrones. 4,296,043, Cl. 260-352.000.

Schroeder, Paul R.: *See*—
Eaton, Sargent S., Jr.; and Schroeder, Paul R., 4,296,480, Cl. 365-222.000.

Schromm, Kurt: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,296,117, Cl. 424-273.00B.

Schubert, Joachim: *See*—
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Schubert & Salzer: *See*—
Siemon, Bernhard, 4,295,249, Cl. 19-225.000.

Schuberth, Christian; and Hartmann, Rudolf, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Variable electromechanical device. 4,296,292, Cl. 200-336.000.

Schuler, Peter; and Braun, Erwin. Process for the crystalline precipitation of chromogens. 4,295,857, Cl. 23-301.000.

Schulte, Wilfried: *See*—
Bergner, Dieter; Hannesen, Kurt; Muller, Wolfgang; and Schulte, Wilfried, 4,295,945, Cl. 204-128.000.

Schumacher, Gunter: *See*—
Schumacher, Gustav, II; and Schumacher, Gunter, 4,295,328, Cl. 56-313.000.

Schumacher, Gustav, II; and Schumacher, Gunter. Holding means for grain lifters, support skids and the like. 4,295,328, Cl. 56-313.000.

Schumann, Gunter: *See*—
Johne, Hans; Muller, Wolfgang; Jentzsch, Arndt; and Schumann, Gunter, 4,295,423, Cl. 101-349.000.





Schurr, Robert E., to Rieke Corporation. Closure cap vent. 4,295,583, Cl. 222-478.000.

Schweer, Wilhelm, to Th. Kieserling & Albrecht. Apparatus for peeling pipes. 4,295,397, Cl. 82-20.000.

Schweizer, Eduard H., to Investment Rarities, Inc. Variable position article holder. 4,295,623, Cl. 248-456.000.

SCM Corporation: *See*—
Cardenas, Carlos G.; and Din, Zia U., 4,296,257, Cl. 568-361.000.
Ho, T. L.; and Din, Zia U., 4,296,038, Cl. 260-343.210.
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Scott Paper Company: *See*—
Kaiser, Paul H.; Neuenschwander, Rudolf; and Norton, Henry J., 4,296,161, Cl. 428-171.000.

Scriminger, William F., to Muskogee Environmental Conservation Co. Slurry gun. 4,295,744, Cl. 366-3.000.

Seaward, William S.: *See*—
Janssen, Donovan M.; and Seaward, William S., 4,295,733, Cl. 355-14.05H.

Sedberry, Donald C., to Welsbach Ozone Systems Corporation. Fuse structure for corrosive atmosphere. 4,296,397, Cl. 337-199.000.

Sedlacek, Hans-Harald: *See*—
Ax, Wolfgang; Bauer, Hartwig W.; and Sedlacek, Hans-Harald, 4,296,201, Cl. 435-7.000.

Sedlmair, Siegfried: *See*—
Beyer, Franz; and Sedlmair, Siegfried, 4,296,414, Cl. 343-5.0SW.

Seeburger, Harold O.; Beattie, Ralph G.; and Stevens, Violete L., to Dow Chemical Company, The. Method for preparing vinyl ester resins. 4,296,220, Cl. 525-507.000.

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Sehon, Alec: *See*—
Lee, Weng Y.; and Sehon, Alec, 4,296,097, Cl. 424-78.000.

Seilly, Alec H.; Mowbray, Dorian F.; Mardell, John E.; and Davison, Michael J., to Lucas Industries Limited. Fuel system for an internal combustion engine. 4,295,453, Cl. 123-499.000.

Seiscom Delta Inc.: *See*—
Reeves, H. Neal; Burnett, Roy E.; Denham, Leslie R.; and Shields, George E., 4,295,542, Cl. 181-108.000.

Seita, Toru: *See*—
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Seki, Tokio: *See*—
Mochizuki, Hiroshi; and Seki, Tokio, 4,295,414, Cl. 92-98.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Epoxy ester copolymer aqueous dispersions. 4,296,011, Cl. 260-29.300.

Sendo, Masaaki; and Suzuki, Kinzo, to Mitsubishi Denki Kabushiki Kaisha. Method of producing bracket and gear box of electric motor with gear box and metal mold used with the same. 4,296,063, Cl. 264-273.000.

Sendzimir, Tadeusz. Beam-backed strip mill with attached inserts. 4,295,355, Cl. 72-242.000.

Sepulveda, Ralph R.; and Lander, Lynn H., to Lever Brothers Company. Pretreatment composition for stain removal. 4,295,845, Cl. 8-139.100.

Sergev, Sergius S.; and Roster, Theodore J., to United States of America, Navy. Automatic temperature control system for diver heating system. 4,295,604, Cl. 236-21.00R.

Service Equipment Design Co., Inc.: *See*—
Hauk, Ernest D.; and Stewart, Larry, 4,295,526, Cl. 166-315.000.

Setagayaseiki Co. Ltd.: *See*—
Uchida, Sakae, 4,295,830, Cl. 433-115.000.

Seton Company: *See*—
Cioca, Gheorge; and Siegler, Marcel, 4,295,894, Cl. 106-155.000.

Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,296,011, Cl. 260-29.300.

Shakirov, Rifkhat M.: *See*—
Lifshits, Viktor S.; Krivonos, Vadim P.; Podola, Nikolai V.; Grabchev, Boris L.; Andrianov, Vladimir R.; and Shakirov, Rifkhat M., 4,296,305, Cl. 219-101.000.

Shamsha, Ljudmila F.: *See*—
Nazarian, Miron M.; Efimov, Vyacheslav T.; Axenko, Alexandr A.; Kolyada, Vladimir A.; and Shamsha, Ljudmila F., 4,295,946, Cl. 204-149.000.

Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Wallboard having improved drying rate due to plural contacting fiber networks. 4,296,169, Cl. 428-298.000.

Sharp, Shelby P.; and Yarborough, Lyman, to Standard Oil Company (Indiana). Method and composition for inhibiting corrosion in high temperature, high pressure gas wells. 4,295,979, Cl. 252-8.55E.

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Shaw, Robert F.; and Sperinde, John, to Oximetrix, Inc. Optical catheters and method for making same. 4,295,470, Cl. 128-634.000.

Sheldon, James R., to Engineered Systems, Inc. Remote verification lockout system. 4,296,404, Cl. 340-149.00A.

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St. Clair, David J.; and Ewins, Earle E., Jr., 4,296,008, Cl. 260-27.0BB.
Slaugh, Lynn H., 4,295,999, Cl. 252-455.00R.

Shelor, Jerry L.: *See*—
Tatham, Jack R.; and Shelor, Jerry L., 4,295,251, Cl. 28-112.000.

Shelver, Lyle N. Thermal glass structure and method for forming same. 4,295,305, Cl. 52-172.000.

Shepherd, Robin G.: *See*—
Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., 4,296,029, Cl. 260-239.30R.

Sherburne, Edwin C., to ICI Americas Inc. Nonionic textile softener composition. 4,295,977, Cl. 252-8.900.

Sherwood Medical Industries Inc.: *See*—
Cornell, William D., 4,295,974, Cl. 210-789.000.

Shibaski, Ichiro; Ohmura, Kaoru; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Compound semiconductor device having a semiconductor-converted conductive region. 4,296,424, Cl. 357-1.000.

Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Anti-rust cover for a disc rotor of a vehicle disc brake. 4,295,549, Cl. 188-218.00A.

Shibuya, Kyoichi: *See*—
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Shields, George E.: *See*—
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Shigematsu, Kazuo: *See*—
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Shihata, Alfred A. Ureteric stone extractor with two ballooned catheters. 4,295,464, Cl. 128-1.00R.

Shikoku Kasei Kogyo Co., Ltd.: *See*—
Shimamura, Tadao; and Kojima, Tadayoshi, 4,296,051, Cl. 264-118.000.

Shimada, Wataru; Hoshinouchi, Susumu; Kawaguchi, Kenji; and Yoshida, Akio, to Mitsubishi Denki Kabushiki Kaisha. Method for producing a motion picture screen. 4,295,906, Cl. 156-214.000.

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Shimizu, Akira: *See*—
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Shimizu, Chitomi: *See*—
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Shimotake, Munetoshi: *See*—
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Shin-Etsu Polymer Co., Ltd.: *See*—
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Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Thermal head. 4,296,309, Cl. 219-216.000.

Shinzawa, Motohiro: *See*—
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Shirahata, Kunikatsu: *See*—
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Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, to Sumitomo Electric Industries, Ltd. Process for producing optical transmission fiber. 4,295,869, Cl. 65-3.110.

Shirato, Yoshiaki: *See*—
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Shockley, Norman E. Receptacle support apparatus for bicycle. 4,295,586, Cl. 224-32.00R.

Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V. Apparatus for separating carbon black from carbon-black aerosol. 4,295,867, Cl. 55-288.000.

Shumaker, John F., to J. I. Case Company. Straight arm loader. 4,295,779, Cl. 414-685.000.

Sick, Erwin, to Erwin Sick GmbH, Optik-Elektronik. Apparatus for determining faults in strip material. 4,295,743, Cl. 356-431.000.

Siegle, Peter: *See*—
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Siegler, Marcel: *See*—
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Siegmund, Werner, to Mannesmann Aktiengesellschaft. Antifreeze protection of roads. 4,296,207, Cl. 521-53.000.

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Becker Friedbert; Steinkamp, Johann; and Koenen, Klaus, 4,296,400, Cl. 340-32.000.
Beyer, Franz; and Sedlmair, Siegfried, 4,296,414, Cl. 343-5.0SW.
Feuerbaum, Hans-Peter, 4,296,372, Cl. 324-71.0EB.
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Muhling, Alois; Reissner, Frank; and Schmidt, Helmut, 4,295,380, Cl. 74-3.500.
Schneider, Hartmut; and Lebetzki, Egon, 4,295,870, Cl. 65-3.120.

Siemens-Albis Aktiengesellschaft: *See*—
Forstner, Anton; and Schatzmann, Kurt, 4,295,441, Cl. 118-425.000.

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Siemon, Bernhard, to Schubert & Salzer. Combing machine. 4,295,249, Cl. 19-225.000.

Sienknecht, Walter F. Hand tool leveling apparatus. 4,295,279, Cl. 33-334.000.

Sigmon, James W. Expansible device. 4,295,633, Cl. 251-172.000.
Sigri Elektrographit GmbH: *See—*
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Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-11-hydroxymethyl-19-oxo-$PGF_1$ compounds. 4,296,246, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-9-deoxy-9-methylene-19-oxo-$PGF_1$ compounds. 4,296,247, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-11-hydroxymethyl-19-oxo-$PGE_1$ compounds. 4,296,248, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-9-deoxy-9-methylene-19-oxo-$PGE_1$ compounds. 4,296,249, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-9-deoxy-9-methylene-19-oxo-$PGF_1$ compounds. 4,296,250, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-19-keto-PG compounds. 4,296,256, Cl. 568-330.000.
Sih, John C.: *See—*
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Silverberg, Morton, to Xerox Corporation. Grooved belt document registration system. 4,295,737, Cl. 355-76.000.
Sim, William J.; and Marth, Ronald M. Support bracket for distribution panel for cooling towers and the like. 4,296,048, Cl. 261-111.000.
Simcoe, Robert J., to General Electric Company. High voltage standoff MOS driver circuitry. 4,296,335, Cl. 307-200.00B.
Simogawara, Naoaki: *See—*
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, 4,296,288, Cl. 200-146.00R.
Simons, S. Stoney, Jr., to United States of America, America. Irreversible anti-glucocorticoids. 4,296,206, Cl. 435-240.000.
Simpson, Frank H. Shot and powder dispenser attachment. 4,295,409, Cl. 86-31.000.
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Sio-Societa per l'Industria Dell'Ossigene e di Altri Gas: *See—*
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Siryj, Bohdan W., to RCA Corporation. Solar tracking apparatus. 4,295,621, Cl. 248-183.000.
Skanadore, William R., to General Semiconductor Co., Inc. Switching circuit and method for avoiding secondary breakdown. 4,296,336, Cl. 307-300.000.
Skierski, Edwin J., to USM Corporation. Chip breaker screws. 4,295,768, Cl. 411-387.000.
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Slaugh, Lynn H., to Shell Oil Company. Polymerization catalyst. 4,295,999, Cl. 252-455.00R.
Sleishman, Donald E. Musician's drum. 4,295,405, Cl. 84-413.000.
Slickbar, Inc.: *See—*
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Slovinsky, Manuel, to Nalco Chemical Company. Grouting-soil conditioning systems using polyoxyethylene diacrylates. 4,295,762, Cl. 405-264.000.
Smit Ovens Nijmegen B.V.: *See—*
Wens, Johannes C., 4,295,824, Cl. 432-115.000.
Smith, David E., to Blue Circle Industries Limited. Producing dispersions of preflocculated fillers for use in papermaking. 4,295,933, Cl. 162-168.0NA.
Smith, Don H.; Bowman, Arthur F.; and Junk, Norman M., to Atlas Powder Company. Explosive container for cast primer. 4,295,424, Cl. 102-322.000.
Smith International, Inc.: *See—*
Crase, Gary M.; and Trzeciak, Kurt M., 4,295,535, Cl. 175-101.000.
Smith, James A. Patio door security lock. 4,295,676, Cl. 292-262.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Catechol or pyrogallol containing flexible insulating tape having low gel time. 4,296,018, Cl. 260-32.8EP.
Smith, Larry C. Note translation device. 4,295,406, Cl. 84-470.00R.
Smith, Leslie; Tew, William; and Woolley, Jack, to Plessey Handel und Investments A.G. Electrolyte capacitors with improved anode-to-lead connection. 4,296,458, Cl. 361-433.000.
Smith, Michael R.; and DiFulvio, Anthony P., to Eastman Kodak Company. Apparatus for processing an analysis slide. 4,296,069, Cl. 422-64.000.
Smith, Michael R.: *See—*
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Smith, Paul R., to DiMarzio Musical Instrument Pickups, Inc. Compensated nut for a lute-type instrument. 4,295,404, Cl. 84-314.00N.
Smith, Peter H.: *See—*
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Snitzer, Elias: *See—*
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Snyder, Dennis R., to Bell Telephone Laboratories, Incorporated. Multi-outlet adapter for plug-in telephones. 4,295,702, Cl. 339-97.00P.
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So, Eddy: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
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Sperinde, John: *See—*
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Kritz, Jacob A., 4,296,482, Cl. 367-91.000.
Nelson, Gary L.; and Harvey, William A., 4,295,988, Cl. 252-584.000.
Pearson, Billy J., 4,296,406, Cl. 340-166.00R.
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Spisak, Edward G. Plastic and metal wheel trim assembly. 4,295,685, Cl. 301-37.00P.





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Stamicarbon, B.V.: *See—*
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Meshri, Indurani D., 4,295,365, Cl. 73-153.000.
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Stauffer, Adolf, to Davy Powergas GmbH. Heat exchange techniques for the catalytic oxidation of gaseous sulfur compounds to sulfur trioxide. 4,296,088, Cl. 423-533.000.
Stavlo, Lars G., to AGA AB. Pallet for pressurized gas cylinders. 4,295,431, Cl. 108-55.100.
Steck, Werner; Sarnecki, Wilhelm; Marosi, Laszlo; Ohlinger, Manfred; and Autzen, Horst, to BASF Aktiengesellschaft. Manufacture of acicular ferromagnetic iron particles. 4,295,879, Cl. 75-0.5AA.
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Stemme, Otto; Ruf, Wolfgang; and Wagensonner, Eduard, to AGFA-Gevaert Aktiengesellschaft. Projection and scanning system for producing video signals from motion picture film and control system used therein. 4,296,438, Cl. 358-214.000.
Stephan, Herbert; Aichert, Hans; and Heimerl, Joseph, to Leybold-Heraeus GmbH & Co. KG. Apparatus for the production of high-purity metal powder by means of electron beam heating. 4,295,808, Cl. 425-8.000.
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Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. N-(2,5-Diazolyl)-alkyl-haloacetanilides, compounds and herbicidal compositions. 4,295,876, Cl. 71-90.000.
Stevens, Eric, to Toro Company, The. Snowthrower. 4,295,285, Cl. 37-43.00D.
Stevens, Samuel B., to Caterpillar Tractor Co. Tape brake for tape wrapper. 4,295,916, Cl. 156-397.000.
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Stokes, Richard P.; and Stokes, William, to Unlimited Steel Fabricators, Inc. Die for the formation of semi-closed channels or other complex configurations. 4,295,352, Cl. 72-57.000.
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Stottmann, Richard L.; and Smith, Peter H., to General Electric Company. Apparatus for thawing frozen food in a refrigeration appliance. 4,296,299, Cl. 219-10.810.
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Strickland, Hubert E. Auger-equipped plow. 4,295,531, Cl. 172-42.000.
Strickland, William N. Blow-out preventor. 4,295,529, Cl. 166-325.000.
Stroberg, Sven-Olle: *See—*
Hagberg, Gideon, 4,295,969, Cl. 210-223.000.
Strohs, Robert F. Work stand for vertical turbine pumps. 4,295,257, Cl. 29-240.000.
Stroke, Frederick G., to PPG Industries, Inc. Submicron beta silicon carbide powder and sintered articles of high density prepared therefrom. 4,295,890, Cl. 501-90.000.
Stromback, Theodore D. Baseball pitcher's target. 4,295,648, Cl. 273-26.00A.
Stromswold, Chester E.: *See—*
Fuller, Harrison W.; and Stromswold, Chester E., 4,296,389, Cl. 333-160.000.
Stuart-Webb, John, to Imperial Chemical Industries Limited. Aromatic polyethersulphones having —$OCH_2COR$ end groups. 4,296,217, Cl. 525-390.000.
Sturges, Robert H., Jr., to Westinghouse Electric Corp. Photoelectric docking device. 4,295,740, Cl. 356-152.000.
Su, Wen-Shen. Method for removing dust from flue gases. 4,295,865, Cl. 55-84.000.
Suddeutsche Kalkstickstoff-Werke: *See—*
Aignesberger, Alois; Lukas, Walter; and Weinberg, Ekkehard, 4,296,089, Cl. 423-555.000.
Suganuma, Toshio: *See—*
Matsubara, Akira; Sakai, Hideaki; Odate, Makoto; Suganuma, Toshio; and Nakano, Takuo, 4,296,112, Cl. 424-246.000.
Sugata, Yoshiaki; and Miyagawa, Kiyoshi, to Toyoda Koki Kabushiki Kaisha. Workpiece supporting device. 4,295,398, Cl. 82-31.000.
Sugimoto, Kaname, to Hayashibara, Ken. Process for preparing human interferon. 4,296,025, Cl. 260-112.00R.
Sugino, Takashi; and Itoh, Kunio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser. 4,296,387, Cl. 331-94.50H.
Suginuma, Atsushi: *See—*
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.
Sugiura, Hitoshi: *See—*
Ishihara, Takeshi; Goto, Daisaku; and Sugiura, Hitoshi, 4,296,276, Cl. 174-179.000.
Sugiyama, Goro. Gas lighter. 4,295,819, Cl. 431-143.000.
Sulzer Brothers Limited: *See—*
Erlach, Hans, 4,295,552, Cl. 192-81.00C.
Meier, Werner, 4,296,050, Cl. 261-112.000.
Sumida, Yasuji: *See—*
Sasaki, Koichi; Sumida, Yasuji; and Ishida, Hiroshi, 4,295,731, Cl. 355-14.00R.
Sumitomo Cement Co., Ltd.: *See—*
Ogawa, Tadashi; Ono, Shunichiro; and Shibuya, Kyoichi, 4,295,823, Cl. 432-106.000.
Sumitomo Chemical Company, Limited: *See—*
Mori, Kenji; and Sasaki, Mitsuru, 4,296,036, Cl. 260-340.700.
Yamaguchi, Takashi; Okuno, Yoshitoshi; and Hirose, Chuji, 4,295,581, Cl. 222-192.000.
Sumitomo Electric Industries, Ltd.: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,295,869, Cl. 65-3.110.
Sumitomo Metal Industries, Ltd.: *See—*
Itoh, Koichi; Koshida, Osamu; and Nakayama, Katsuichi, 4,295,354, Cl. 72-225.000.

Sumitomo Naugatuck Co., Ltd.: *See—*
Sakano, Hajime; Kodama, Mikio; Nakayama, Koichi; Yoshida, Isao; and Inoue, Atsunori, 4,296,216, Cl. 525-66.000.
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,295,858, Cl. 44-1.0SR.
Sunroc Corporation: *See—*
Brown, Frank, Jr., 4,295,609, Cl. 239-29.000.
Suponev, Konstantin V.: *See—*
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.
Surovikin, Vitaly F.: *See—*
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.
Susumu Sasaki: *See—*
Sasaki, Susumu; Kito, Kyoji; and Koide, Akio, 4,295,855, Cl. 23-230.00B.
Sutrina, Thomas A.; and Behr, R. Douglas, to Dow Chemical Co., The. Forming an integral closure for a thermoplastic container. 4,295,919, Cl. 156-498.000.
Suzuki, Hajime; and Iwano, Yoshimi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Detection of weft in shuttleless loom. 4,295,499, Cl. 139-370.200.
Suzuki, Kinzo: *See—*
Sendo, Masaaki; and Suzuki, Kinzo, 4,296,063, Cl. 264-273.000.
Suzuki, Miyo: *See—*
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Suzuki, Takashi; Sawada, Hidekazu; and Katamoto, Kazuyoshi, to Takeda Chemical Industries, Ltd. Mildiomycin analogs and a method of production. 4,296,107, Cl. 424-180.000.
Svaty, Vladimir, to Zbrojovka Vsetin. Method of and a device for forming an additional stream of air in a guide comb of an air jet loom. 4,295,500, Cl. 139-435.000.
Svelto, Francesco: *See—*
Mezzetti, Sergio; Pizzolati, Pierluigi; and Svelto, Francesco, 4,296,318, Cl. 250-225.000.
Svitak, John J.: *See—*
Doten, Bradford O.; and Svitak, John J., 4,295,596, Cl. 228-180.00A.
Swales, Danvers A.; and Marshall, Michael A., to British Chrome & Chemicals Ltd. Chromic oxide production. 4,296,076, Cl. 423-53.000.
Swassek, Gunter: *See—*
Nelle, Gunther; and Swassek, Gunter, 4,295,742, Cl. 356-373.000.
Swenson, Paul F. Heating system. 4,295,606, Cl. 237-12.100.
Swift, Edward R., Jr.; and Schmuck, Philip W., to Baker International Corporation. Method and apparatus for quick replacement of cartridge filters used in well fluid cleaning operations. 4,295,525, Cl. 166-312.000.
Swiss Aluminium Ltd.: *See—*
Lajh, Rajko, 4,295,883, Cl. 75-68.00R.
Sygnator, Henry A.: *See—*
Bjorklund, Lowell L.; Berg, Ramon A.; and Sygnator, Henry A., 4,295,351, Cl. 72-38.000.
Syntex (U.S.A.) Inc.: *See—*
Muchowski, Joseph M.; and Venuti, Michael C., 4,296,042, Cl. 260-345.90R.
Szarka, David D.: *See—*
Baker, Eugene E.; and Szarka, David D., 4,295,524, Cl. 166-278.000.
Szczepanski, Slawomir Z. Vehicle anti-theft device. 4,296,402, Cl. 340-64.000.
Szente, Andre: *See—*
Fischli, Albert E.; and Szente, Andre, 4,296,031, Cl. 260-239.30D.
Tabei, Masatoshi: *See—*
Kawaziri, Kazuhiro; Fujiwara, Masato; Hatanaka, Isamu; Tabei, Masatoshi; Higashi, Akio; and Nirasawa, Mitsuharu, 4,296,422, Cl. 346-160.000.
Tachibana, Keiji; Nakayama, Yoshihiko; Kaneko, Junichi; and Ishii, Susumu, to Hitachi, Ltd. Apparatus for controlling operation of fluid pressure raising system. 4,295,792, Cl. 417-15.000.
Tada, Isao: *See—*
Fukatsu, Akihiro; and Tada, Isao, 4,296,355, Cl. 315-39.510.
Taiho Kogyo Co., Ltd.: *See—*
Iwahana, Keiiti; Mathuda, Yoshimi; and Futamura, Kenichiro, 4,296,183, Cl. 428-653.000.
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, to Richter Gedeon Vegyeszeti Gyar. Apparatus for the treatment of wet solids, especially pulpy materials, by heating or cooling. 4,296,072, Cl. 422-254.000.
Takagi, Sadaaki. Method for production of polyurethane cushion material. 4,296,054, Cl. 264-45.300.
Takahashi, Akio; Itoh, Yutaka; Wajima, Motoyo; Morishita, Hirosada; and Nishikawa, Akio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Bismide-ether compounds, compositions thereof, and method of producing same. 4,296,219, Cl. 525-488.000.
Takahashi, Akira; and Oohashi, Kenichi, to Kabushiki Kaisha Osaka Packing Seizosho. Alumina-containing calcium silicate and process for producing same. 4,295,893, Cl. 106-120.000.
Takahashi, Itaru: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Takahashi, Soji: *See—*
Imai, Kuninori; and Takahashi, Soji, 4,295,595, Cl. 228-161.000.
Takara Co., Ltd.: *See—*
Fukui, Osamu, 4,295,291, Cl. 46-161.000.
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Camera for daylight and flash photography. 4,295,722, Cl. 354-146.000.
Takatori, Yasushi: *See—*
Hara, Toshitami; Sato, Yashushi; Takatori, Yasushi; and Shirato, Yoshiaki, 4,296,421, Cl. 346-140.00R.
Takeda Chemical Industries, Ltd.: *See—*
Ogino, Fumiichi, 4,296,166, Cl. 428-283.000.
Suzuki, Takashi; Sawada, Hidekazu; and Katamoto, Kazuyoshi, 4,296,107, Cl. 424-180.000.
Takeuchi, Kiyoyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Film containing magazine. 4,295,565, Cl. 206-455.000.
Takeuchi, Minami; and Kuriki, Minoru, to Tokyo Shibaura Electric Co., Ltd. Reverse conducting amplified gate thyristor with plate-like separator section. 4,296,427, Cl. 357-39.000.
Takezaki, Tsuneo, to Matsushita Electric Industrial Company. Level indicator for indication of maximum values. 4,296,375, Cl. 324-103.00P.
Takikawa, Yoshio: *See—*
Ooki, Norihiro; Motegi, Shoji; Wachi, Yasuyuki; Takikawa, Yoshio; and Yamakawa, Norio, 4,296,346, Cl. 310-242.000.
Talres Development (N.A.) N.V.: *See—*
Khan, Riaz A.; and Jenner, Michael R., 4,296,139, Cl. 426-536.000.
Tanaka, Chiaki: *See—*
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Tanaka, Haruo: *See—*
Omura, Satoshi; Tanaka, Haruo; Takahashi, Itaru; Ishii, Shinzo; Mineura, Kazuyuki; Shirahata, Kunikatsu; and Kasai, Masaji, 4,296,040, Cl. 260-345.200.
Tanaka, Hiromitsu: *See—*
Enomoto, Satoru; Asano, Kiro; and Tanaka, Hiromitsu, 4,296,233, Cl. 536-5.000.
Tanaka, Hironari; Matsuyama, Shigeru; Ishibashi, Tadashi; Kinugawa, Kiyoshige; and Sato, Yukihiro, to Hitachi, Ltd. Liquid crystal display device. 4,295,711, Cl. 350-334.000.
Tanaka, Kenji; and Endo, Shigeru, to Nisshin Flour Milling Co., Ltd. Method for producing bread. 4,296,133, Cl. 426-23.000.
Tanaka, Naoki; Tsuchiya, Kunihiko; and Nishizawa, Toshizo, to Mitsubishi Denki Kabushiki Kaisha. Rotary compressor with wire gauge lubricant separator. 4,295,806, Cl. 418-97.000.
Tanaka, Shigeyoshi: *See—*
Ohtani, Eiichi; Kobayashi, Kengo; Isobe, Asao; and Tanaka, Shigeyoshi, 4,295,947, Cl. 204-159.150.
Tang, David Y.; and Foster, Arthur M., to Hooker Chemicals & Plastics Corp. (3-Trifluoromethylphenyl)-alpha-hydroxyacetic acid and process for preparation. 4,296,244, Cl. 562-470.000.
Taniguchi, Hiroyoshi: *See—*
Hasegawa, Haruo; Taniguchi, Hiroyoshi; and Igawa, Takao, 4,296,190, Cl. 430-57.000.
Tano, Kazuhiro: *See—*
Higuchi, Seizun; Tano, Kazuhiro; Kamada, Minoru; and Okamoto, Susumu, 4,296,145, Cl. 427-47.000.
Tapeswitch Corporation of America: *See—*
Koenig, Robert H.; and D'Angelo, Victor, 4,296,283, Cl. 200-16.00D.
Tarnblom, Stig: *See—*
Malmgren, Nils-Gunnar; Solly, Barry; and Tarnblom, Stig, 4,295,900, Cl. 148-12.00B.
Tatham, Jack R.; and Shelor, Jerry L., to Phillips Petroleum Company. Method for controlling edge uniformity in nonwoven fabrics. 4,295,251, Cl. 28-112.000.
Tatis Plasttatningar AB: *See—*
Dahlberg, Anders, 4,295,311, Cl. 52-396.000.
Tatsumi, Hideo: *See—*
Sayo, Kosaku; Suginuma, Atsushi; Tatsumi, Hideo; and Kanamaru, Hisanobu, 4,295,553, Cl. 192-84.00C.
Taylor, Clyde G.: *See—*
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.
Taylor, Leslie L., Jr.: *See—*
Killmeyer, Charles W., deceased; Killmeyer, Elizabeth A., administrator; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,296,060, Cl. 264-137.000.
Taylor, Raymond C.: *See—*
Richards, Frank P.; and Taylor, Raymond C., 4,295,838, Cl. 493-105.000.
TDK Electronics Co., Ltd.: *See—*
Toda, Kohji, 4,296,348, Cl. 310-334.000.
Teegarden, Derylle L.: *See—*
Penn, Eric J.; and Teegarden, Derylle L., 4,295,258, Cl. 29-283.000.
Teepak, Inc.: *See—*
Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., 4,295,247, Cl. 17-1.00R.
Teetz, Wolfgang: *See—*
Desprez, Alfred; Sauerland, Heinz; and Teetz, Wolfgang, 4,295,433, Cl. 112-241.000.
Teichmann, Paul: *See—*
Beneke, Wolfgang; and Teichmann, Paul, 4,295,248, Cl. 19-113.000.
Teijin Limited: *See—*
Emi, Shingo; and Saiki, Noritsugu, 4,296,163, Cl. 428-212.000.
Hara, Shigeyoshi; and Yamada, Tateyoshi, 4,296,218, Cl. 525-439.000.



Teijin Seiki Company, Limited: *See—*
Kamimura, Toshio, 4,295,413, Cl. 92-5.00L.
Tektronix, Inc.: *See—*
Hofer, Bruce E., 4,296,381, Cl. 330-149.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Jeandot, Jean-Louis; and Lefort, Emmanuel, 4,296,383, Cl. 330-301.000.
Tellis, Cyril B. Separation of hydrogen chloride from gaseous mixtures. 4,296,078, Cl. 423-240.000.
Temme, Karl: *See—*
Walther, Carl K.; and Temme, Karl, 4,295,300, Cl. 51-163.200.
Temple, John W., Jr. Corrosion resistant fastener. 4,295,767, Cl. 411-377.000.
Tennant Company: *See—*
Bricher, Charles W.; and Herpers, Ferdinand J., 4,295,274, Cl. 30-347.000.
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,295,244, Cl. 15-320.000.
Teramura, Hiroichi; Yamazaki, Yasuhiro; Wakahara, Yasushi; Hattori, Naohiko; Yamamoto, Seiichi; and Nakao, Kouzo, to Kokusai Denshin Denwa Co., Ltd. Digital signal control system in a facsimile communication. 4,296,439, Cl. 358-257.000.
Teranishi, Katsuya: *See—*
Saito, Cyuichi; and Teranishi, Katsuya, 4,295,556, Cl. 198-325.000.
Teranuma, Jun: *See—*
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, 4,295,455, Cl. 123-569.000.
Terao, Motoyasu; Shigematsu, Kazuo; Ojima, Masahiro; and Yonezawa, Seiji, to Hitachi, Ltd. Member for recording information. 4,296,419, Cl. 346-135.100.
Terrell Machine Company, The: *See—*
Niederer, Kurt W., 4,295,569, Cl. 209-634.000.
Terry Corporation: *See—*
Dussourd, Jules L.; and Pfannebecker, George W., 4,295,788, Cl. 415-202.000.
Terry, Robert R.; and Boone, Jacob J., to Nordson Corporation. Method of obtaining a seal upon the interior surface of a container closure and resulting product. 4,295,573, Cl. 215-348.000.
Tew, William: *See—*
Smith, Leslie; Tew, William; and Woolley, Jack, 4,296,458, Cl. 361-433.000.
Texaco Inc.: *See—*
Cuscurida, Michael; and Speranza, George P., 4,296,213, Cl. 521-166.000.
Gass, John C.; Kerr, Noell C.; and Pittmann, Robert W., 4,295,795, Cl. 417-111.000.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; Lowell, Victor; and Whipple, Elliot, 4,296,287, Cl. 200-83.00P.
Garcia, Felix, Jr.; Hergert, Roger A.; Mann, Don C.; and Brown, Sheldon H., 4,296,448, Cl. 360-135.000.
Penn, Thomas C., 4,296,146, Cl. 427-58.000.
Rogers, Gerald D., 4,295,264, Cl. 29-571.000.
Tubbs, Graham S.; and Ponder, James E., 4,295,897, Cl. 148-1.500.
Weirauch, Donald F., 4,296,347, Cl. 310-313.00B.
Texasgulf Inc.: *See—*
Saville, James, 4,295,881, Cl. 75-10.00R.
Textron Inc.: *See—*
DeCaro, Charles J., 4,295,394, Cl. 81-57.370.
Th. Kieserling & Albrecht: *See—*
Schweer, Wilhelm, 4,295,397, Cl. 82-20.000.
Thaxter, James B., to Sperry Corporation. Magnetic toner apparatus. 4,295,442, Cl. 118-657.000.
Thermoplastics, Inc.: *See—*
Grote, Daniel; Raymond, Duane; and Mosher, Joseph C., 4,295,262, Cl. 29-462.000.
Theta-Corporation: *See—*
Rodriguez, Edward T., 4,296,331, Cl. 250-551.000.
Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for removing surface irregularities from rail heads. 4,295,764, Cl. 409-296.000.
Thiokol Corporation: *See—*
Adams, Gary V.; and Schneiter, Fred E., 4,296,084, Cl. 423-351.000.
Thizy, Andre; Poignant, Pierre; and Pillon, Daniel, to Philagro. Selective herbicidal method in cotton and soybeans. 4,295,877, Cl. 71-120.000.
Thomas & Betts Corporation: *See—*
Narozny, Ronald S.; and Wyss, Robert P., 4,295,704, Cl. 339-99.00R.
Thomas De La Rue & Company Limited: *See—*
Haslop, John M.; Knapman, Reginald G.; and West, Michael A., 4,296,326, Cl. 250-372.000.
Thomas, James R.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.
Thomas, James S., to Motorola, Inc. Power on and low voltage reset circuit. 4,296,338, Cl. 307-362.000.
Thomas, Rudolf: *See—*
Stetter, Jorg; Ditgens, Klaus; Thomas, Rudolf; Eue, Ludwig; and Schmidt, Robert R., 4,295,876, Cl. 71-90.000.
Thompson, John R.: *See—*
Robinson, Bruce A.; and Thompson, John R., 4,295,252, Cl. 28-248.000.
Thomson-Brandt: *See—*
Rilly, Gerard, 4,296,360, Cl. 315-387.000.
Thomson CSF: *See—*
Bursztejn, Jacques, 4,296,495, Cl. 371-22.000.
Gilles, Jean, 4,296,426, Cl. 357-23.000.
Lacombat, Michel; and Gerard, Andre, 4,295,735, Cl. 355-43.000.
Thomson, George M.; and Jamison, Keith A., to United States of America, Army. Flowing gas discharge source of vacuum ultra-violet line radiation system. 4,296,330, Cl. 250-504.00R.
Thorington, Luke: *See—*
Trutner, Donald G.; and Thorington, Luke, 4,295,873, Cl. 65-108.000.
Thunker, Norbert, to Heidelberger Druckmaschinen Aktiengesellschaft. Camless drive of a swinging pre-gripper feeder. 4,295,422, Cl. 101-232.000.
Thuzimoto, Shigenori: *See—*
Okumichi, Toshiharu; Oseto, Osamu; Matsumoto, Keizo; Thuzimoto, Shigenori; and Sanda, Hisanari, 4,296,012, Cl. 260-29.6XA.
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, to U.S. Philips Corporation. Semiconductor injection laser having a movable laser beam. 4,296,386, Cl. 331-94.50H.
Timex Corporation: *See—*
Wilson, Robert, 4,295,516, Cl. 164-464.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Mikami, Takashi; Fujii, Shigeo; Okano, Shuji; and Ikeda, Tokuzo, 4,295,809, Cl. 425-72.00S.
TOA Valve Co. Ltd.: *See—*
Hagihara, Noboru, 4,296,307, Cl. 219-121.0ED.
Tochio, Yoshihiko: *See—*
Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, 4,295,898, Cl. 148-1.500.
Toda, Kohji, to TDK Electronics Co., Ltd., a part interest. Interdigitated electrode ultrasonic transducer. 4,296,348, Cl. 310-334.000.
Tohi, Atsutomo: *See—*
Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, 4,295,898, Cl. 148-1.500.
Tohzuka, Takashi: *See—*
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Tokuda, Kuniaki: *See—*
Kasahara, Shizuka; Yamanishi, Kazuhiko; Hanada, Toshiro; Tokuda, Kuniaki; and Kobatake, Shinzo, 4,295,853, Cl. 23-230.00B.
Tokyo Juki Industrial Co., Ltd.: *See—*
Uemura, Tamio; Ito, Yoshimasa; and Itakura, Takahiro, 4,295,435, Cl. 112-322.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hirata, Akio, 4,296,367, Cl. 318-808.000.
Takeuchi, Kiyoyuki, 4,295,565, Cl. 206-455.000.
Tsuji, Shigeo; and Aikawa, Takahisa, 4,296,316, Cl. 250-204.000.
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, 4,296,288, Cl. 200-146.00R.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.
Takeuchi, Minami; and Kuriki, Minoru, 4,296,427, Cl. 357-39.000.
Tolliver, Wilbur E. Variegated stirrup mat. 4,295,497, Cl. 138-175.000.
Tolliver, Wilbur E. Spacer bar and related method for concrete pipe manufacture. 4,295,501, Cl. 140-92.100.
Tomaro, Patrick M., deceased (by Tomaro, Rita, executrix), to Conair Corporation. Air diffuser for a hair dryer. 4,295,283, Cl. 34-97.000.
Tomaro, Rita, executrix: *See—*
Tomaro, Patrick M., deceased, 4,295,283, Cl. 34-97.000.
Tomic, Dobrivoje. Material as spongiosacement with effervescent reabsorptive effect. 4,296,209, Cl. 521-85.000.
Tominaga, Akira, to Kansai Paint Co., Ltd. Resin composition for cationic electrodepositing paints. 4,296,010, Cl. 260-29.2TN.
Tomisawa, Setsuo: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.
Tomov, Nenad R.; and Roberts, Geoffrey M., to Diamond Shamrock Technologies S.A. Process for the electrolytic production of manganese dioxide. 4,295,943, Cl. 204-96.000.
Tomy Kogyo Co., Inc.: *See—*
Konta, Yukic, 4,295,651, Cl. 273-121.00D.
Toray Industries, Inc.: *See—*
Nakanishi, Toshiharu; Suzuki, Miyo; and Ohigashi, Hiroji, 4,296,349, Cl. 310-335.000.
Saito, Tasuku; Noma, Tutomu; Matsunaga, Tsutomu; Naito, Nagayoshi; Tanaka, Chiaki; and Hiratsuka, Motoki, 4,295,652, Cl. 273-235.00R.
Tordoff, William L., to Ashland Oil, Inc. Automatic cone and mold-making machine. 4,295,515, Cl. 164-158.000.
Toro Company, The: *See—*
Stevens, Eric, 4,295,285, Cl. 37-43.00D.
Torregrossa, Louis O.: *See—*
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.000.

Torzala, Terence A., to Air Shields, Inc. Probe and system for detecting probe dislodgement. 4,295,475, Cl. 128-736.000.

Toshiba Corporation: *See—*
Fukatsu, Akihiro; and Tada, Isao, 4,296,355, Cl. 315-39.510.
Kohyama, Mitsuaki, 4,295,443, Cl. 118-657.000.

Toshin Kogyo Co. Ltd.: *See—*
Yoshikawa, Takaharu, 4,296,365, Cl. 318-632.000.

Toti, Gabriele; Lenzi, Giuliano; and Monti, Paolo, to Alfa Romeo S.p.A. Active suspensions assembly for a motor car. 4,295,660, Cl. 280-714.000.

Toulan, Roy D., Jr.: *See—*
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, 4,295,277, Cl. 33-181.00R.

Towmotor Corporation: *See—*
Hildebrecht, Harold V., 4,295,540, Cl. 180-271.000.
Malecha, Richard J., 4,295,541, Cl. 180-315.000.

Toyo Kogyo Co., Ltd.: *See—*
Iida, Yoshihiko, 4,295,454, Cl. 123-556.000.

Toyo Seikan Kaisha Limited: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Satoh, Takao; and Seita, Toru, 4,295,944, Cl. 204-98.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Sugata, Yoshiaki; and Miyagawa, Kiyoshi, 4,295,398, Cl. 82-31.000.

Toyooki Kogyo Kabushiki Kaisha: *See—*
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Toyoshima, Shigeru: *See—*
Ishikawa, Akira; Ishida, Yukihito; Ikegami, Shiro; Satoh, Hiroshi; Sato, Ryuichi; Tomisawa, Setsuo; and Toyoshima, Shigeru, 4,296,123, Cl. 424-287.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.
Shibatani, Juichi; Nakamura, Kenichi; Izuhara, Wataru; and Obu, Yuichiro, 4,295,549, Cl. 188-218.00A.

Tracor, Inc.: *See—*
Anderson, Rollen J., 4,295,856, Cl. 23-232.00E.

Trautweiler, Franz, to Ciba-Geigy AG. Photographic process using a thin flexuous layer and reflective layer. 4,296,198, Cl. 430-403.000.

Travnicek, Jiri: *See—*
Kupf, Lubomir; Travnicek, Jiri; Adamek, Radomil; and Kyzlink, Josef, 4,295,628, Cl. 249-80.000.

Tredennick, Harry L.: *See—*
Gunter, Thomas G.; Tredennick, Harry L.; and McAlister, Doyle V., 4,296,469, Cl. 364-200.000.

Tri/Valley Growers: *See—*
Jaquith, Jack B.; and Church, Allen R., 4,296,140, Cl. 426-575.000.

Trimble, John: *See—*
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Trimble, Roy L.; Story, Alfred D.; and Martinek, Harold H., to Teepak, Inc. Gripper-separator device for continuously shirred casings. 4,295,247, Cl. 17-1.00R.

Trishevsky, Igor S.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

Trishevsky, Oleg I.: *See—*
Anisimov, Vyacheslav I.; Bulgakov, Evgeny G.; Gurin, Vasily N.; Radjukevich, Leonid V.; Trishevsky, Igor S.; Trishevsky, Oleg I.; Kheifets, Grigory R.; and Jurchenko, Anatoly B., 4,295,353, Cl. 72-180.000.

Trouet, Andre B. L.: *See—*
Baurain, Roger M.; and Trouet, Andre B. L., 4,296,105, Cl. 424-180.000.

Trutner, Donald G.; and Thorington, Luke, to Duro-Test Corporation. Method and apparatus for reworking a hollow workpiece. 4,295,873, Cl. 65-108.000.

Trutzschler GmbH & Co. KG: *See—*
Beneke, Wolfgang; and Teichmann, Paul, 4,295,248, Cl. 19-113.000.

TRW Inc.: *See—*
Barth, Charles F.; Stelson, Thomas S.; and Blake, David E., 4,295,301, Cl. 51-165.880.
Harrington, Alan L.; Rodov, Vladimir; and Allison, Richard, 4,295,267, Cl. 29-571.000.
Richardson, Warren N., 4,296,286, Cl. 200-61.540.

Trzeciak, Kurt M.: *See—*
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Tsang, Floris Y.: *See—*
Anand, Joginder N.; Revak, Timothy T.; and Tsang, Floris Y., 4,296,052, Cl. 264-25.000.

Tsuchida, Kensaku; and Karasawa, Shinji, to Matsushita Electric Industrial Co., Ltd. Method for making intercell connections in multi-cell storage battery. 4,296,303, Cl. 219-78.130.

Tsuchida, Yasuhiro: *See—*
Kuraoka, Yasuo; and Tsuchida, Yasuhiro, 4,295,339, Cl. 62-64.000.

Tsuchiya, Kunihiko: *See—*
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Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Company Ltd. Filter assembly for collecting used toner of electrophotographic copying machine. 4,295,734, Cl. 355-15.000.

Tsuge, Akihiko: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,296,065, Cl. 264-325.000.

Tsuji, Setsuo: *See—*
Sakaguchi, Tadahiro; Hino, Masamichi; Tsuji, Setsuo; Hashido, Akiyoshi; and Enomoto, Kazuyoshi, 4,295,915, Cl. 156-361.000.

Tsuji, Shigeo; and Aikawa, Takahisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical focusing device. 4,296,316, Cl. 250-204.000.

Tsunekawa, Tokuichi: *See—*
Takashi, Uchiyama; Tsunekawa, Tokuichi; and Kiyohara, Takehiko, 4,295,722, Cl. 354-146.000.

Tsuneta, Kazuyoshi: *See—*
Hayashi, Masaaki; Sasaki, Hiroharu; and Tsuneta, Kazuyoshi, 4,296,014, Cl. 260-29.6NR.

Tsurumaru, Michiko: *See—*
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Tu, Hosheng, to UOP Inc. Attenuation of metal contaminants on cracking catalyst with a boron compound. 4,295,955, Cl. 208-120.000.

Tubbs, Graham S.; and Ponder, James E., to Texas Instruments Incorporated. Method of making CMOS integrated circuit device. 4,295,897, Cl. 148-1.500.

Tucker, Samuel M.: *See—*
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Turchetti, Gianni: *See—*
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Turco, Vincenzo L.: *See—*
Genco, Vito; and Turco, Vincenzo L., 4,295,426, Cl. 102-451.000.

Turenko, Leonid G.: *See—*
Shopin, Viktor M.; Turenko, Leonid G.; Surovikin, Vitaly F.; and Suponev, Konstantin V., 4,295,867, Cl. 55-288.000.

Turner, Robert B.: *See—*
Jenkines, Randall C.; Taylor, Clyde G.; Turner, Robert B.; and Ridgway, Donald H., 4,296,159, Cl. 428-95.000.

Turner, Thomas O.: *See—*
Johnson, Harry D.; Campbell, Christopher J.; Turner, Thomas O.; Poole, Carl W.; Gilmore, James E.; and Thomas, James R., 4,295,337, Cl. 62-54.000.

Tutty, Geoffrey C., to INCA Limited. Image wise developable system. 4,295,662, Cl. 282-27.500.

Tyco Industries, Inc.: *See—*
Brand, Derek A.; and Brand, Derek R., 4,295,295, Cl. 46-259.000.

Tyco Laboratories: *See—*
Blincow, Donald W.; Cassedy, Kevin H.; and Dominey, Samuel C., Jr., 4,296,321, Cl. 250-254.000.

Tyler Refrigeration Corporation: *See—*
Abraham, Fayez F., 4,295,340, Cl. 62-82.000.

Uchida, Sakae, to Setagayaseiki Co. Ltd. Motorized dental handpiece. 4,295,830, Cl. 433-115.000.

Udayasekaran, Rajasekaran, to Northern Telecom Limited. Static, solid state originating register compatible with an electromechanical telephone cross-bar switching system. 4,296,281, Cl. 179-18.0EB.

Ueda, Hideo: *See—*
Kawamura, Toshio; Harashima, Noboru; Ueda, Hideo; and Sano, Seijiro, 4,295,654, Cl. 277-92.000.

Ueda, Tatehito: *See—*
Nomura, Etsuji; Matsui, Kazuma; Miyazaki, Toshikuni; Sami, Hiroshi; and Ueda, Tatehito, 4,295,456, Cl. 123-569.000.

Uemura, Tamio; Ito, Yoshimasa; and Itakura, Takahiro, to Tokyo Juki Industrial Co., Ltd. Cloth feed apparatus. 4,295,435, Cl. 112-322.000.

Ueno, Hiroshi: *See—*
Matsubayashi, Hiroshi; Tsurumaru, Michiko; Horiguchi, Makoto; Ueno, Hiroshi; and Kitamura, Yoichi, 4,296,182, Cl. 428-629.000.

Uerdingen, Walter: *See—*
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UMAC, Inc.: *See—*
McGowan, John B.; and Trimble, John, 4,295,494, Cl. 138-89.000.

Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Istamycins and production thereof. 4,296,106, Cl. 424-181.000.

Umezawa, Kazushige: *See—*
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Ungermann, Dieter: *See—*
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Union Carbide Corporation: *See—*
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Maresca, Louis M.; Gill, Peter J.; and Berger, Mitchell H., 4,296,232, Cl. 528-179.000.
Vasudevan, Ganapathy; and Lustig, Stanley, 4,296,142, Cl. 427-28.000.

Union Oil Company of California: *See—*
Dhondt, Roland O., 4,295,773, Cl. 414-187.000.

Union Special Corporation: *See—*
Hsiao, James C., 4,295,434, Cl. 112-314.000.

United States Gypsum Company: *See—*
Nelson, David M., 4,295,299, Cl. 49-504.000.





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Agriculture: *See—*
Camirand, Wayne M.; Randall, John M.; and Hautala, Earl, 4,295,333, Cl. 60-641.600.

America: *See—*
Angwin, Meredith J.; Pfefferle, William C.; and Kesselring, John P., 4,295,818, Cl. 431-7.000.
Simons, S. Stoney, Jr., 4,296,206, Cl. 435-240.000.

Army: *See—*
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Oswell, Herman R., 4,295,617, Cl. 244-3.290.
Thomson, George M.; and Jamison, Keith A., 4,296,330, Cl. 250-504.00R.
Zura, Boris, 4,295,379, Cl. 73-862.620.

Energy: *See—*
Cookson, Alan H., 4,296,274, Cl. 174-142.000.
Franks, Larry A.; and Nelson, Melvin A., 4,296,319, Cl. 250-227.000.

Health and Human Services: *See—*
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Paice, Derek A.; and Shimp, Alan B., 4,296,450, Cl. 361-50.000.

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Navy: *See—*
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Green, Milton, 4,296,487, Cl. 367-169.000.
Haberl, John B., 4,296,345, Cl. 310-219.000.
Klein, Philipp H.; Addamiano, Arrigo; and Allen, Roger, 4,295,989, Cl. 252-301.40F.
Sergev, Sergius S.; and Roster, Theodore J., 4,295,604, Cl. 236-21.00R.

U.S. Philips Corporation: *See—*
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Degger, Wolter W. J.; and Van Kasteren, Adrianus C., 4,295,625, Cl. 248-466.000.
Franken, Adrianus J. J.; Khoe, Giok D.; and Kuppers, Dieter, 4,296,143, Cl. 427-38.000.
Geurts, Martinus F. A. M., 4,296,437, Cl. 358-173.000.
Nederlof, Leendert; and Salters, Roelof H. W., 4,296,475, Cl. 364-900.000.
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, 4,296,386, Cl. 331-94.50H.

United Technologies Corporation: *See—*
Licht, Lazar, 4,295,689, Cl. 308-9.000.
Manning, Frank B., 4,295,784, Cl. 415-162.000.
Melanson, Donald G., 4,295,666, Cl. 285-14.000.
Meltz, Gerald; and Snitzer, Elias, 4,295,738, Cl. 356-32.000.
Meltz, Gerald; and Snitzer, Elias, 4,295,739, Cl. 356-43.000.
Moffatt, E. Marston, 4,295,373, Cl. 73-505.000.
Palma, Gary E.; and Mottier, Francois M., 4,295,741, Cl. 356-349.000.
Rannenberg, George C., 4,295,518, Cl. 165-2.000.
Wynosky, Thomas A.; and Campbell, Charles A., 4,295,611, Cl. 239-265.370.

University of Minnesota, The Regents of the: *See—*
Condie, Richard M., 4,296,027, Cl. 260-112.00B.

Unlimited Steel Fabricators, Inc.: *See—*
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UOP Inc.: *See—*
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Antos, George J., 4,295,960, Cl. 208-139.000.
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Carlson, David H. J., 4,295,993, Cl. 252-430.000.
Carson, Don B., 4,296,261, Cl. 568-890.000.
Childs, Michael E., 4,295,860, Cl. 44-63.000.
Graves, Kevin, 4,295,627, Cl. 248-588.000.
Gregory, Leslie A., 4,295,681, Cl. 297-284.000.
Kulprathipanja, Santi, 4,295,994, Cl. 252-430.000.
Tu, Hosheng, 4,295,955, Cl. 208-120.000.

Upchurch, Lonnie W., to Advanced Marine Concepts, Inc. Pontoon boat. 4,295,236, Cl. 9-2.00S.

Upjohn Company, The: *See—*
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Ewen, James H.; and McClellan, Thomas R., 4,296,212, Cl. 521-163.000.
Hester, Jackson B., Jr., 4,296,239, Cl. 546-271.000.
Sih, John C., 4,296,041, Cl. 260-345.200.
Sih, John C., 4,296,246, Cl. 562-503.000.
Sih, John C., 4,296,247, Cl. 562-503.000.
Sih, John C., 4,296,248, Cl. 562-503.000.
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Sih, John C., 4,296,250, Cl. 562-503.000.
Sih, John C., 4,296,256, Cl. 568-330.000.

USM Corporation: *See—*
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Vacmetal Gesellschaft fur Vakuum-Metallurgie mbH: *See—*
Zahs, Gernot; and Wahle, Hans-Jurgen, 4,295,667, Cl. 285-18.000.

Vaeth, Guenter: *See—*
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Valembois, Pierre V.: *See—*
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Vanderheyden, Eric E.; and Casciotti, Albert, to AMP Incorporated. Solderless filter mounting for header assemblies. 4,296,390, Cl. 333-182.000.

van der Meulen, Leonard. Device for stacking thin-walled bags. 4,295,644, Cl. 270-60.000.

van Dongen, Teunis: *See—*
Tijburg, Rudolf P.; de Waard, Peter J.; and van Dongen, Teunis, 4,296,386, Cl. 331-94.50H.

Van Kasteren, Adrianus C.: *See—*
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Van Linge, Douwe J.: *See—*
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Van Ness, Bradford O.: *See—*
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Van Riessen, Huibert A.: *See—*
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VanTielen, Willem R. Modular tower and method of constructing same. 4,295,317, Cl. 52-637.000.

Varian Associates, Inc.: *See—*
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Neubauer, Michael L., 4,296,354, Cl. 315-3.500.
Welch, Kimo M., 4,295,338, Cl. 62-55.500.

Varma, Brajendra P., to Eltra Corporation. Method for battery plate. 4,295,940, Cl. 204-2.100.

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Diamond, George; Forrester, James; Hirsch, Michael; and Vas, Ran, 4,295,473, Cl. 178-695.000.

Vasilantone, Michael. Infrared dryer. 4,295,826, Cl. 432-185.000.

Vasile, Carmine F., to Rockwell International Corporation. Shielded electromagnetic acoustic transducers. 4,296,486, Cl. 367-140.000.

Vasudevan, Ganapathy; and Lustig, Stanley, to Union Carbide Corporation. Method for coating a tubular food casing. 4,296,142, Cl. 427-28.000.

Vaughan, Thomas W.: *See—*
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VDO Adolf Schindling AG: *See—*
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VEB Kombinat Polygraph "Werner Lamberz": *See—*
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Veeder Industries Inc.: *See—*
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Veit Dennert KG Baustoffbetriebe: *See—*
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Venuti, Michael C.: *See—*
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Verbeek, Antonie E.; and Mattheij, Jozef M. J., to J. T. Baker Chemicals B.V. Reagent for the quantitative determination of. water. 4,295,990, Cl. 252-408.000.

Vereczkey, Endre: *See—*
Takacs, Istvan; Banos, Zoltan; Illes, Janos; Vereczkey, Endre; Rudolf, Peter; and Kerey, Gyorgy, 4,296,072, Cl. 422-254.000.

Verma, Dharmvir S. Cell culture and continuous dialysis flask and method. 4,296,205, Cl. 435-240.000.

Vibronek, Robert D.: *See—*
Comizzoli, Robert B.; and Vibronek, Robert D., 4,296,370, Cl. 324-54.000.

Vicik, Stephen J.: *See—*
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Villani, Frank: *See—*
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Vincek, Robert C., to Becton, Dickinson and Company. Air-evacuated package with vacuum integrity indicator means. 4,295,566, Cl. 206-457.000.

Vinings Chemical Company: *See—*
Hauser, H. William, 4,296,079, Cl. 423-242.000.

Visconti, James. Simulated gem. 4,295,347, Cl. 63-32.000.

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Vogel, William D.: *See—*
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Moore, Arlan G., 4,295,656, Cl. 280-87.04A.
Vorwerk & Sohn GmbH & Co. KG.: *See—*
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Voss, Clifford C. Collapsible shelter. 4,295,446, Cl. 119-19.000.
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VPI Educational Foundation: *See—*
Moore, W. Edward C.; and Blanks, James A., 4,295,613, Cl. 241-2.000.
Vroomans, Hubertus J., to Stamicarbon, B.V. Vinyl chloride polymer compositions with reduced combustibility and reduced smoke formation under conditions of fire. 4,296,023, Cl. 260-45.75F.
Vulcan Iron Works Inc.: *See—*
Lerch, John A., 4,295,752, Cl. 403-317.000.
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Pustka, Zdenek; and Krejcir, Oldrich, 4,295,635, Cl. 254-93.0HP.
W. R. Grace & Co.: *See—*
Frost, John W., 4,295,383, Cl. 474-83.000.
Wachi, Yasuyuki: *See—*
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Wacker-Chemie GmbH: *See—*
Innertsberger, Ernst; Sommer, Oswin; Bosch, Erhard; Muller, Johann; and Schiller, August, 4,296,228, Cl. 528-33.000.
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, 4,296,017, Cl. 260-30.60R.
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Wade, Philip M.: *See—*
Ashfield, Herbert E.; Horsfall, Harry; and Wade, Philip M., 4,295,530, Cl. 172-7.000.
Wagensonner, Eduard: *See—*
Stemme, Otto; Ruf, Wolfgang; and Wagensonner, Eduard, 4,296,438, Cl. 358-214.000.
Wagner Electric Corporation: *See—*
Falk, Edward J., 4,295,336, Cl. 60-562.000.
Wahle, Hans-Jurgen: *See—*
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Wakisaka, Yoshiaki: *See—*
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Wako Pure Chemical Industries, Ltd.: *See—*
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Waldhofer, Reinhard, to Krupp-Koppers GmbH. Gas generator for fine-grained coal fuels. 4,295,448, Cl. 122-164.000.
Walin, Gosta. Oil collecting method. 4,295,975, Cl. 210-800.000.
Waller, William E.: *See—*
Albrecht, Robert D.; Presley, Michael; Waller, William E.; Cook, Gerald L.; and Presley, William E., 4,295,708, Cl. 350-289.000.
Wallner, Felix: *See—*
Ganglbauer, Otto; Wallner, Felix; Scheidl, Helmut; Reindl, Hermann; and Frielinghaus, Rainer, 4,295,375, Cl. 73-582.000.
Walser, Mackenzie, to Johns Hopkins University, The. Mixed salts of essential or semi-essential amino acids and nitrogen-free analogs thereof. 4,296,127, Cl. 424-319.000.
Walter, Wolfgang, to GTE Products Corporation. Fluorescent lamp having high color rendering index. 4,296,353, Cl. 313-487.000.
Walther, Carl K.; and Temme, Karl, to Carl Kurt Walther GmbH & Co. KG. Flap arranged on discharge and separating devices of vibratory abrasive containers. 4,295,300, Cl. 51-163.200.
Walz, Klaus; and Fiegel, Joachim, to Bayer Aktiengesellschaft. Process for dyeing polyamide fibres. 4,295,852, Cl. 8-560.000.
Wambach, Allen D., to General Electric Company. Reinforced thermoplastic polyester compositions having improved high voltage breakdown resistance. 4,296,021, Cl. 260-40.00R.
Wang, Tse L.: *See—*
O'Neil, Joseph T.; Quinn, Thomas M.; and Wang, Tse L., 4,296,282, Cl. 179-99.0LS.
Ward, Henry D., Jr., to Ward Machinery Company, The. Box blank folding apparatus. 4,295,841, Cl. 493-295.000.
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Bell, Clinton C., 4,295,842, Cl. 493-342.000.
Ward, Henry D., Jr., 4,295,841, Cl. 493-295.000.
Wardwell, Charles R. Frangible bonding using blush lacquer. 4,296,179, Cl. 428-498.000.
Warner, Clifford C. Rock bolt anchor. 4,295,760, Cl. 405-259.000.
Warner, Steven B., to Celanese Corporation. Process for the thermal stabilization of acrylic fibers. 4,295,844, Cl. 8-115.500.
Warren, Henry R., to RCA Corporation. Magnetic recording with reduced cross-talk and interchannel time displacement. 4,296,430, Cl. 358-8.000.
Washington Logging Equipment, Inc.: *See—*
Langford, Frederic E., 4,295,636, Cl. 254-304.000.
Wason, Satish K., to J. M. Huber Corporation. Adsorbents for polyol purification. 4,296,000, Cl. 252-455.00R.
Wasserfaller, Georg. Door lock. 4,295,349, Cl. 70-111.000.
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Waterfield Engineering Limited: *See—*
Waterfield, Timothy O. W., 4,295,485, Cl. 137-74.000.
Waterfield, Timothy O. W., to Waterfield Engineering Limited. Diaphragm valve. 4,295,485, Cl. 137-74.000.
Waterman, Fred W.; McCleery, Jerry E.; and McKie, Robert T., to Morrison-Knudsen Co., Inc.; and Railcar Maint. Co. Car repair apparatus. 4,295,427, Cl. 104-32.00R.
Watkins, Hugh: *See—*
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Wechsung, Reiner, to Leybold-Heraeus Gesellschaft mit beschrankter Haftung. Method for analyzing organic substances. 4,296,322, Cl. 250-282.000.
Weimer, Dan G.; and Van Ness, Bradford O., to Engineered Systems, Inc. Card reader security system. 4,296,315, Cl. 235-460.000.
Weinberg, Ekkehard: *See—*
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Weirauch, Donald F., to Texas Instruments Incorporated. Surface acoustic wave sensor. 4,296,347, Cl. 310-313.00B.
Weisenborn, Frank L.; Brown, William E.; and Meyers, Edward, to E. R. Squibb & Sons, Inc. Antibiotic kristenin. 4,296,101, Cl. 424-119.000.
Weisenborn, Frank L.: *See—*
Petrillo, Edward W., Jr.; and Weisenborn, Frank L., 4,296,033, Cl. 260-326.200.
Weiss, Benjamin F. L., to Exploration Company. Streamer bulkhead. 4,296,481, Cl. 367-20.000.
Weiss, Erich; and Ungermann, Dieter, to Boehringer Mannheim. Pipette with elastic bellows. 4,296,071, Cl. 73-864.110.
Weissgerber, Rudolf; Stoll, Alois; Kandler, Herbert; Nunner, Hans-Herbert; Eichelseder, Christine; and Pangeri, Helmut, to Wacker-Chemie GmbH. Graft copolymer pressure-sensitive adhesives, their manufacture and use. 4,296,017, Cl. 260-30.60R.
Weissman, Mark L.: *See—*
Petrow, Henry G.; and Weissman, Mark L., 4,295,985, Cl. 252-105.000.
Welch, Kimo M., to Varian Associates, Inc. Cryogenic pumping apparatus with replaceable pumping surface elements. 4,295,338, Cl. 62-55.500.
Welch, Melvin B.: *See—*
McDaniel, Max P.; and Welch, Melvin B., 4,295,997, Cl. 252-439.000.
Wells, Thomas J., to Leggett & Platt, Incorporated. Coil spring assembly and forming method. 4,295,639, Cl. 267-91.000.
Welsbach Ozone Systems Corporation: *See—*
Sedberry, Donald C., 4,296,397, Cl. 337-199.000.
Wendelboe, Fred E., to Geosource Inc. Dual magnetic drive for gear meters. 4,295,369, Cl. 73-261.000.
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Wens, Johannes C., to Smit Ovens Nijmegen B.V. System for sealing of kilns. 4,295,824, Cl. 432-115.000.
Wernau, William C., to Pfizer Inc. Xanthomonas bipolymer for use in displacement of oil from partially depleted reservoirs. 4,296,203, Cl. 435-104.000.



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Cummings, J. Francis; and Werner, Alfred O., 4,295,461, Cl. 126-247.000.
Wert, John A.: *See—*
Robertson, Wayne M.; and Wert, John A., 4,295,901, Cl. 148-12.70A.
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West, Michael A.: *See—*
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Westberg, Ake G., to H. L. Plast H. Lundvall AB. Holder for information carriers in strip form. 4,295,288, Cl. 40-16.400.
Western Electric Company, Inc.: *See—*
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Westinghouse Electric Corp.: *See—*
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Sturges, Robert H., Jr., 4,295,740, Cl. 356-152.000.
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Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,925, Cl. 162-19.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,926, Cl. 162-57.000.
Bentvelzen, Jozef M.; Meredith, Michael D.; Bepple, Henry; Torregrossa, Louis O.; Battan, Howard R.; and Justice, Dennis H., 4,295,927, Cl. 162-57.000.
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Whitaker, Roger B.; and Blevins, Charles W., to Dickey-john Corporation. Combine performance monitor. 4,296,409, Cl. 340-684.000.
White, Alan C.: *See—*
Bushnell, Brian J.; Cavalla, John F.; Shepherd, Robin G.; and White, Alan C., 4,296,029, Cl. 260-239.30R.
White, Jeffrey A. Snowmaking nozzle. 4,295,608, Cl. 239-14.000.
White, Michael L., to Magnaflux Corporation. Pentaerythritol in dry developers. 4,295,362, Cl. 73-104.000.
Whitehead, Larry W., to Leggett & Platt, Incorporated. Bed frame. 4,295,234, Cl. 5-184.000.
Whitehead, Paul, to Johnson, Matthey & Co., Limited. Monitoring process and apparatus. 4,296,086, Cl. 423-392.000.
Wiebe, Donald, to A. Stucki Company. Railway truck bolster friction assembly. 4,295,429, Cl. 105-197.0DB.
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Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Use of isochroman musk compounds in augmenting or enhancing the aroma of dryer-added fabric softener articles. 4,295,978, Cl. 252-8.900.
Wilhelm Schafer Maschinenbau: *See—*
Schafer, August W., 4,295,592, Cl. 228-17.000.
Wilkinson, Stanley B., to General Electric Company. Ultra high speed protective relay circuit. 4,296,451, Cl. 361-80.000.
Wilkinson Sword Limited: *See—*
Roswell, David G.; Spring, David J.; and Hems, Roger, 4,296,255, Cl. 564-215.000.
Rowsell, David G.; Gascoyne, John M.; and Hems, Roger, 4,296,093, Cl. 424-45.000.
William H. Rorer, Inc.: *See—*
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Williams, Donald E.; Robertson, Forrest E.; Gigot, C. Dean; and Gigot, Terry K., to Acra-Plant, Inc. Planter with cooperating trash clearing discs. 4,295,532, Cl. 172-184.000.
Williams, Ralph P.: *See—*
Parlman, Robert M.; and Williams, Ralph P., 4,295,962, Cl. 209-167.000.
Williams, Robert A. Flexible tube terminating means. 4,295,672, Cl. 285-287.000.
Williams, William, to Delta Mouldings (Leicester) Limited. Mould assembly for use in the manufacture of spherical or substantially spherical articles. 4,295,629, Cl. 249-160.000.
Willingham, Wendell D., to Owens-Illinois, Inc. Closure conversion apparatus for existing closure applicating machines. 4,295,320, Cl. 53-201.000.
Willke, Herbert L., Jr.: *See—*
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Wilson, David S.: *See—*
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Wilson, Richard S.: *See—*
Dennesen, Francis G.; Wilson, Richard S.; Toulan, Roy D., Jr.; and Madnick, Peter, 4,295,277, Cl. 33-181.00R.
Wilson, Robert, to Timex Corporation. Symmetrical horizontal continuous casting. 4,295,516, Cl. 164-464.000.
Wilson, Thomas T., to Epoxon Products, Inc. Combination heat transfer panel and wall shield for use with stoves and other radiant heaters. 4,295,460, Cl. 126-121.000.
Windley, William T., to Du Pont de Nemours, E. I., and Company. Cobulked continuous filament heather yarn method and product. 4,295,329, Cl. 57-245.000.
Wissinger, Waldemar: *See—*
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Witkin, Philip M., to Marshall and Williams Company. Dryer range. 4,295,284, Cl. 34-155.000.
"Wohn-Art" Freizeitartikel Gesellschaft m.b.H.: *See—*
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Wojnarowski, Robert J.: *See—*
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Wolf, Alvan H.: *See—*
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Wolf, Franz J. Two part pressure relief valve. 4,296,186, Cl. 429-54.000.
Wolf, Karlheinz: *See—*
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Wolske, Lawrence E.: *See—*
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Wong, Gim. Programmable electronic starting device for autos and the like with means selectable to actuate accessories. 4,296,334, Cl. 290-37.00R.
Wong, William H., to Bell Telephone Laboratories, Incorporated. Molded circuit retaining enclosure with a receptacle means for securing individual circuit components. 4,296,454, Cl. 361-380.000.
Wood, Donald H.: *See—*
Blake, Charles H.; and Wood, Donald H., 4,296,363, Cl. 318-349.000.
Wood, Douglas E. Parabolic reflector comprising a plurality of triangular reflecting members forming a reflecting surface supported by a framework having a particular geometric pattern. 4,295,709, Cl. 350-292.000.
Wood, Prentice J., to Mead Corporation, The. Article carrier and blank therefor. 4,295,562, Cl. 206-158.000.
Woods, Rodney G.; Clarke, Charles J., Jr.; and Sodergren, Robert C., to Honeywell Inc. Process control system with local microprocessor control means. 4,296,464, Cl. 364-200.000.
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Wright, Earl R., to Wright Leather Goods Manufacturing Co. Filigreed belt with solid center portion. 4,295,231, Cl. 2-338.000.
Wright Leather Goods Manufacturing Co.: *See—*
Wright, Earl R., 4,295,231, Cl. 2-338.000.
Wright, Ronald F. Truss assembly apparatus. 4,295,269, Cl. 29-798.000.
Wristers, Harry J., to Exxon Research & Engineering Co. Titanium trichloride catalyst component and the process for the production thereof. 4,295,991, Cl. 252-429.00B.
Wu, Che-Kuang, to Corning Glass Works. Method for optical recording in photo-dichroic glass surfaces. 4,296,479, Cl. 365-119.000.
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Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Heat transfer system. 4,295,520, Cl. 165-41.000.
Wunder, Friedrich; Leupold, Ernst I.; Hachenberg, Horst; and Schmidt, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the manufacture of lower olefins from methanol/water mixtures. 4,296,266, Cl. 585-640.000.
Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for reducing blood pressure in animals. 4,296,119, Cl. 424-274.000.
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Wuthrich, Hans-Rudolf; Krebs, Peter; Spiegel, Hubert; and Eicher, Franz, to Sprecher & Schuh AG. Electric gas-blast switch. 4,296,289, Cl. 200-148.00R.
Wynosky, Thomas A.; and Campbell, Charles A., to United Technologies Corporation. Two-dimensional nozzle. 4,295,611, Cl. 239-265.370.
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Hull, Charles J.; Hutton, James E.; and Mahuson, Teri J., 4,295,732, Cl. 355-14.00R.
Markham, Roger G.; and Skinner, Doyle P., Jr., 4,296,417, Cl. 346-75.000.
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Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,296,199, Cl. 430-551.000.
Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,296,200, Cl. 430-551.000.
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Yamazaki, Hiroshi; and Isayama, Takuro, to Ricoh Company, Ltd. Ink jet printing apparatus with reverse solvent flushing means. 4,296,418, Cl. 346-75.000.
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Yan, Tsoung-yuan, to Mobil Oil Corporation. Method for protecting an ion-exchange resin from chemical poisoning. 4,296,075, Cl. 423-7.000.
Yanabu, Satoru; Mizoguchi, Hitoshi; and Simogawara, Naoaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas insulated disconnecting switches. 4,296,288, Cl. 200-146.00R.
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Yashima, Nobuyoshi, to Mitsui Engineering and Shipbuilding Co., Ltd. Working platform for oil drilling operations in ice covered sea areas. 4,295,758, Cl. 405-201.000.
Yasuhara, Seishi; Teranuma, Jun; Shinzawa, Motohiro; and Fujii, Hiroshi, to Nissan Motor Co. Ltd. Exhaust gas recirculation control system for a compression-ignition internal combustion engine. 4,295,455, Cl. 123-569.000.
Yasukawa, Masaru; and Yasukawa, Soji. Conveyor with scrapers. 4,295,561, Cl. 198-735.000.
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Yeatts, Roy E., to RJR Archer, Inc. Composite tipping structure for use on an air-ventilated cigarette and method of manufacturing same. 4,295,478, Cl. 131-336.000.
Yeda Research and Development Company Ltd.: *See—*
Hodes, Gary; Cahen, David; and Manassen, Joost, 4,296,188, Cl. 429-111.000.
Ygnacio Inc.: *See—*
Holland, Kenneth F., 4,296,431, Cl. 358-12.000.
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Hakoi, Tsutomu, 4,295,570, Cl. 209-657.000.
Yoshida, Masakatsu; Tochio, Yoshihiko; and Tohi, Atsutomo, to Matsushita Electronics Corporation. Method of making isolated semiconductor devices utilizing ion-implantation of aluminum and heat treating. 4,295,898, Cl. 148-1.500.
Yoshikawa, Takaharu, to Toshin Kogyo Co. Ltd. Method and apparatus for correcting errors of feeding of endless belt in automatic screen printing. 4,296,365, Cl. 318-632.000.
Yoshizumi, Eizaburo. Ground prospecting method utilizing electrical resistivity measurements for measuring the resistivity of unit blocks of the ground. 4,296,379, Cl. 324-357.000.
Yosim, Samuel J., to Rockwell International Corporation. Method of decladding. 4,296,074, Cl. 423-4.000.
Young, Donald A.; and Squires, Christopher P., to Lucas Industries, Limited. Starter motor. 4,296,342, Cl. 310-77.000.
Yuda, Takuo: *See—*
Morota, Kazutoshi; and Yuda, Takuo, 4,295,618, Cl. 248-73.000.
Yuhara, Akitsuna: *See—*
Hazama, Katashi; and Yuhara, Akitsuna, 4,296,391, Cl. 333-193.000.
Zachmeier, Thomas R. Well boring rigs and spoil handling conveyor apparatus therefor. 4,295,534, Cl. 175-88.000.
Zahid, Abduz, to Greer Hydraulics, Incorporated. Low cost accumulator device. 4,295,492, Cl. 138-30.000.
Zahnradfabrik Friedrichshafen, AG.: *See—*
Liebert, Karl-Heinz, 4,295,805, Cl. 418-61.00B.
Zahs, Gernot; and Wahle, Hans-Jurgen, to Vacmetal Gesellschaft fur Vakuum-Metallurgie mbH. Rotary pipe switch. 4,295,667, Cl. 285-18.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Okami, Yoshiro; and Kondo, Shinichi, 4,296,106, Cl. 424-181.000.
Zaiser, Wolfgang: *See—*
Helfer, Friedrich; Elsner, Ernst; and Zaiser, Wolfgang, 4,295,348, Cl. 64-27.00L.
Zamek, Otto S.: *See—*
Pauze, Denis R.; and Zamek, Otto S., 4,296,229, Cl. 528-45.000.
Zangari, Dominic V.; and Cranston, Douglas R., to Zangari, Dominic V. Cap lining machine. 4,295,436, Cl. 113-80.00D.
Zaverni, Vikram H.: *See—*
Kluting, Bernd A.; and Zaverni, Vikram H., 4,295,682, Cl. 297-367.000.
Zbranek, Zdenka: *See—*
Heuer, Steven R.; and Zbranek, Zdenka, 4,296,077, Cl. 423-53.000.
Zbrojovka Vsetin: *See—*
Svaty, Vladimir, 4,295,500, Cl. 139-435.000.
Zenith Radio Corporation: *See—*
d'Hautecourt, Alain H.; Bretl, Wayne E.; and Lee, Ronald B., 4,296,435, Cl. 358-166.000.
Engel, Christopher M.; and Srivastava, Gopal K., 4,296,432, Cl. 358-28.000.
Zero-Seal, Inc.: *See—*
Coles, Carl R., 4,295,653, Cl. 277-2.000.
Zhivotov, Jury G. Apparatus for balancing bodies of revolution. 4,295,386, Cl. 74-573.00F.
Zhivotov, Jury G.; Kupchinsky, Igor I.; Plokhuta, Vyacheslav D.; Bezverkhny, Alexandr M.; Nabutovsky, Samoil I., deceased; and by Eroshevskaya, Elena D., administrator. Apparatus for balancing bodies of revolution. 4,295,387, Cl. 74-573.00F.
Ziccarelli, Salvatore F.; Ramos, Rey C.; and Brown, Robert M., to Beatrice Foods Company. Coconut powder. 4,296,136, Cl. 426-533.000.
Ziche, Horst, to Henkel Kommanditgesellschaft Auf Aktien. Process for the removal of alkali metal halides from cellulose ethers soluble in cold water and use of the purified products in washing and cleansing agent compositions. 4,296,235, Cl. 536-85.000.
Ziegenhain, William C., to Conoco Inc. Method of making alumina fibers. 4,296,057, Cl. 264-63.000.
Zielke, Rainer; and Maegerlein, Helmut, to Akzona Incorporated. Process for the preparation of phloroglucinol. 4,296,260, Cl. 568-763.000.
Zimmerman, Lawrence. Hay bale stacker. 4,295,772, Cl. 414-38.000.
Zimmermann, Frank; Heidemeyer, Paulus; and Bigalke, Erhard, to Volkswagenwerk Aktiengesellschaft. Automatic clutch system. 4,295,551, Cl. 192-0.076.
Zimmermann, Wolfgang; Schindler, Hermann; and Pospich, Gunther, to Hoechst Aktiengesellschaft. Open-cell shaped article made of acetalized polyvinyl alcohol and process for its manufacture. 4,296,210, Cl. 521-85.000.
Zorbalas, George S., to RCA Corporation. Motor speed control circuit. 4,296,446, Cl. 360-73.000.
Zubkewych, Morris: *See—*
Clark, Eugene A.; and Zubkewych, Morris, 4,295,229, Cl. 2-20.000.
Zura, Boris, to United States of America, Army. Gage to measure track tension. 4,295,379, Cl. 73-862.620.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alfa-Laval AB: *See—*
Stenstrom, Lennart A., Re. 30,780, Cl. 219-10.55M.
Commonwealth Scientific and Industrial Research Organization: *See—*
Plate, Dieter E. A.; and Feehan, John D., Re. 30,776, Cl. 57-86.000.
Cooper, Roydon B., to Pall Corporation. Filter assembly with replaceable filter element. Re. 30,779, Cl. 210-232.000.
Dahlbeck, Edwin L.; and Dahlbeck, Verna H. Lightweight removable cover for a pool, greenhouse or the like. Re. 30,774, Cl. 4-498.000.
Dahlbeck, Verna H.: *See—*
Dahlbeck, Edwin L.; and Dahlbeck, Verna H., Re. 30,774, Cl. 4-498.000.
Delvy, Robert J.: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.
De Mauro, Armando A.: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.
Extraversion, Inc.: *See—*
Ytter, Willy, Re. 30,777, Cl. 160-135.000.
Feehan, John D.: *See—*
Plate, Dieter E. A.; and Feehan, John D., Re. 30,776, Cl. 57-86.000.
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., to Pennsylvania Crusher Corporation. Crusher-dryer and method of crushing. Re. 30,778, Cl. 241-18.000.
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., to Universal Manufacturing Corporation. Automatic capacitor winding machine and method. Re. 30,775, Cl. 29-25.420.
Miyamoto, Yukihiko, to Trio Kabushiki Kaisha. Logarithmic amplifier. Re. 30,781, Cl. 307-490.000.
Nigro, Joseph P.: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.
Pall Corporation: *See—*
Cooper, Roydon B., Re. 30,779, Cl. 210-232.000.
Pennsylvania Crusher Corporation: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.
Plate, Dieter E. A.; and Feehan, John D., to Commonwealth Scientific and Industrial Research Organization. Break-out apparatus for fault prevention in the production of multi-strand yarns. Re. 30,776, Cl. 57-86.000.
Stenstrom, Lennart A., to Alfa-Laval AB. Heat treatment of heat-sensitive products. Re. 30,780, Cl. 219-10.55M.
Trio Kabushiki Kaisha: *See—*
Miyamoto, Yukihiko, Re. 30,781, Cl. 307-490.000.
Universal Manufacturing Corporation: *See—*
Miller, Fredric S.; De Mauro, Armando A.; and Delvy, Robert J., Re. 30,775, Cl. 29-25.420.
Wallitsch, Frank, Jr.: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., Re. 30,778, Cl. 241-18.000.
Ytter, Willy, to Extraversion, Inc. Portable display system. Re. 30,777, Cl. 160-135.000.

# LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Chair or the like. 261,333, 10-20-81, Cl. D6-57.000.
AGFA-Gevaert AG: *See—*
Schlagheck, Norbert, 261,393, Cl. D16-4.000.
Airway Industries, Inc.: *See—*
Davis, Michael, 261,328, Cl. D3-71.000.
Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,380, 10-20-81, Cl. D12-143.000.
Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,381, 10-20-81, Cl. D12-146.000.
Amarger, Guy, to Compagnie Generale des Etablissements Michelin. Tire. 261,383, 10-20-81, Cl. D12-147.000.
Ambler, E. Curtis; and Bies, Sylvester W., to Stanley Works, The. Mitre box. 261,353, 10-20-81, Cl. D8-71.000.
AMC International Alfa Metalcraft Corporation AG: *See—*
Ryser, Theophil, 261,349, Cl. D7-132.000.
Anderson, Charles C. Oropharyngeal airway. 261,442, 10-20-81, Cl. D29-6.000.
Anson, Robert A. Rack for holding dental instruments. 261,424, 10-20-81, Cl. D24-16.000.
Appel, Mel; and Kress, George, to Appel, Mel. Toy kitchen. 261,404, 10-20-81, Cl. D21-122.000.
Aqua-Mist, Inc.: *See—*
Morrow, William B., 261,421, Cl. D23-147.000.
Morrow, William B., 261,422, Cl. D23-147.000.
Ballard, James H. Emergency shelter for underground installation. 261,432, 10-20-81, Cl. D25-36.000.
Barreca, Joseph E., to McGraw-Hill, Inc. Drawing instrument. 261,368, 10-20-81, Cl. D10-62.000.
Barton, Shirley. Vending trailer. 261,431, 10-20-81, Cl. D25-10.000.
Bates Industries, Inc.: *See—*
Beaubien, Thomas S.; Rich, Dennis C.; and Oehring, Robert E., 261,386, Cl. D12-158.000.
Baturin, Peter, to Medical Products Institute Incorporated. Vacuum splint. 261,430, 10-20-81, Cl. D24-64.000.
Bausch & Lomb Incorporated: *See—*
Speaker, Edwin A., 261,397, Cl. D16-131.000.
Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., to Loctite Puerto Rico. Combined adhesive container and dispenser. 261,400, 10-20-81, Cl. D19-66.000.
Beaubien, Thomas S.; Rich, Dennis C.; and Oehring, Robert E., to Bates Industries, Inc. Motorcycle tote box. 261,386, 10-20-81, Cl. D12-158.000.
Bell, Ted A.; and Cooksey, Timothy S., to Pretty Products, Inc. Tape cassette holder for a sunvisor. 261,326, 10-20-81, Cl. D3-35.000.
Benz, Rolf. Adjustable lounge chair or similar article. 261,331, 10-20-81, Cl. D6-37.000.
Bergeron, Timothy J., to J. A. Preston Corporation. Child's crawler. 261,378, 10-20-81, Cl. D12-128.000.
Bianchi, John E.; and Nichols, Richard D. E. Long barrel holster. 261,409, 10-20-81, Cl. D22-13.000.
Bies, Sylvester W.: *See—*
Ambler, E. Curtis; and Bies, Sylvester W., 261,353, Cl. D8-71.000.
Braun Aktiengesellschaft: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,441, Cl. D28-35.000.
Brooksby, Brain T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M. Target slide projectors console. 261,395, 10-20-81, Cl. D16-11.000.
Bruhn, John A., to Zimmer USA, Inc. Bone cement injector handpiece. 261,425, 10-20-81, Cl. D24-26.000.
Bryan, John W. Gaff holder for the spur of a gamecock. 261,408, 10-20-81, Cl. D22-1.000.
Cacciatore, Diego M.: *See—*
Weitz, Harry; and Cacciatore, Diego M., 261,387, Cl. D12-192.000.
California Sounds Ltd.: *See—*
Sandor, Joseph, 261,363, Cl. D9-413.000.
Canon Kabushiki Kaisha: *See—*
Hirata, Takashi; and Fushimoto, Hideo, 261,398, Cl. D18-7.000.
Carper, William B., to Suntrak Industries, Inc. Snow scoop body. 261,351, 10-20-81, Cl. D8-10.000.
Carre, Alain, to Waterman S.A. Watch. 261,365, 10-20-81, Cl. D10-38.000.
Catron, George W., to LeSueur, Leo R. Jeans or the like. 261,323, 10-20-81, Cl. D2-28.000.
Catron, George W., to LeSueur, Leo R. Jeans or the like. 261,324, 10-20-81, Cl. D2-28.000.
Champion International Corporation: *See—*
Faller, Rudolph A., 261,358, Cl. D9-346.000.
Clemens, Donald L., to Thermalloy Incorporated. Card ejector handle for a printed circuit board or similar article. 261,354, 10-20-81, Cl. D8-306.000.
Clyburn, Charles W., to James David Incorporated. Furniture leg and rail connector. 261,340, 10-20-81, Cl. D6-191.000.
Coca-Cola Company, The: *See—*
Harvill, William A., 261,390, Cl. D15-116.000.
Collis, Carroll E. Sign post support. 261,401, 10-20-81, Cl. D20-41.000.

Compagnie Generale des Etablissements Michelin: *See—*
Amarger, Guy, 261,380, Cl. D12-143.000.
Amarger, Guy, 261,381, Cl. D12-146.000.
Amarger, Guy, 261,383, Cl. D12-147.000.
Peron, Jean-Claude, 261,379, Cl. D12-143.000.
Peron, Jean-Claude, 261,382, Cl. D12-147.000.
Peron, Jean-Claude, 261,384, Cl. D12-147.000.
Peron, Jean-Claude, 261,385, Cl. D12-147.000.

Conceptual Factors, Inc.: *See—*
Lutz, William R., 261,347, Cl. D7-130.000.

Conner, Marjorie M., to Trigere, Inc. Chair. 261,335, 10-20-81, Cl. D6-72.000.

Cooksey, Timothy S.: *See—*
Bell, Ted A.; and Cooksey, Timothy S., 261,326, Cl. D3-35.000.

Corbin, Gary L. Skate wheel. 261,406, 10-20-81, Cl. D21-226.000.

Cornelius Company, The: *See—*
Harvill, William A., 261,390, Cl. D15-116.000.
Ranua, Walter E.; and Mackrell, William B., 261,391, Cl. D15-120.000.

Dart Industries Inc.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.

Dauksys, Richard J.: *See—*
Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., 261,400, Cl. D19-66.000.

Davis, Michael, to Airway Industries, Inc. Luggage case. 261,328, 10-20-81, Cl. D3-71.000.

DeLange, William. Wall-mounted mailbox. 261,443, 10-20-81, Cl. D99-33.000.

Doi, Tetsuyuki; and Shohoji, Takeshi, to Ryobi Limited. Fishing rod grip. 261,411, 10-20-81, Cl. D22-23.000.

Doonan, R. Dean. Insulation injection hole plug. 261,357, 10-20-81, Cl. D8-499.000.

Eberle, Gunter F., to Vecta Contract, Inc. Base for a table or the like. 261,341, 10-20-81, Cl. D6-196.000.

Eddleman, Roy T. Vacuum filter. 261,413, 10-20-81, Cl. D23-4.000.

Englishtown Sportswear, Ltd.: *See—*
Heinfling, Martin, 261,320, Cl. D2-25.000.
Heinfling, Martin, 261,321, Cl. D2-25.000.
Heinfling, Martin, 261,322, Cl. D2-25.000.

Epperson, Charles N., to Invention Development Equity Assoc., Inc. Container for liquids or the like. 261,360, 10-20-81, Cl. D9-375.000.

Epperson, Charles N., to Invention Development Equity Assoc., Inc. Container for liquid products or the like. 261,361, 10-20-81, Cl. D9-375.000.

Epperson, Charles N., to Invention Development Equity Assoc., Inc. Stackable container for liquids or the like. 261,362, 10-20-81, Cl. D9-376.000.

Faller, Rudolph A., to Champion International Corporation. Blank for three compartment box. 261,358, 10-20-81, Cl. D9-346.000.

Fink, Raymond W., to Tool Dynamics, Inc. Auxihary towel rack. 261,337, 10-20-81, Cl. D6-99.000.

Fisher, Stanley C. Light-reflecting sculpture. 261,373, 10-20-81, Cl. D11-131.000.

Flexsteel Industries, Inc.: *See—*
Meier, Louis M., 261,330, Cl. D6-37.000.

Fraze, Ermal C.: *See—*
Smyth, George F., 261,364, Cl. D9-438.000.

Free, John H.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.

Fried, Leo A. Earring. 261,372, 10-20-81, Cl. D11-40.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Klose, Odo, 261,417, Cl. D23-35.000.

Frye, Stephen K., to Lion in Frost Inc. Table base. 261,342, 10-20-81, Cl. D6-196.000.

Fushimoto, Hideo: *See—*
Hirata, Takashi; and Fushimoto, Hideo, 261,398, Cl. D18-7.000.

Geissler, Hans-Jurgen, to Rowenta-Werke, GmbH. Denture cleaner or the like. 261,423, 10-20-81, Cl. D24-10.000.

Geissler, Udo M., to Plaubel, Feinmechanik & Optik GmbH. Camera. 261,394, 10-20-81, Cl. D16-06.000.

General Bathroom Products Co.: *See—*
Palka, James J.; and Rekart, Robert, 261,436, Cl. D26-80.000.

Gibiec, Oswald, to Vorwerk & Co. Elektrowerke KG. Basket insert for a kitchen machine. 261,343, 10-20-81, Cl. D7-47.000.

Grant, Benton H. Tub mounted bath lift. 261,377, 10-20-81, Cl. D34-33.000.

Greubel, Jurgen: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,441, Cl. D28-35.000.

Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., to Dart Industries Inc. Ribbed coffee urn lid. 261,348, 10-20-81, Cl. D7-131.000.

Hanna-Burns, Joan. Bed pan seat liner. 261,429, 10-20-81, Cl. D24-51.000.

Harvill, William A., to Coca-Cola Company, The; and Cornelius Company, The. Beverage dispenser. 261,390, 10-20-81, Cl. D15-116.000.

Hayes, Jerry R., to L. R. Nelson Corporation. Sprinkler base. 261,414, 10-20-81, Cl. D23-7.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,320, 10-20-81, Cl. D2-25.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,321, 10-20-81, Cl. D2-25.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,322, 10-20-81, Cl. D2-25.000.

Hirata, Takashi; and Fushimoto, Hideo, to Canon Kabushiki Kaisha. Desk top electronic calculator. 261,398, 10-20-81, Cl. D18-7.000.

Instrument Systems Corporation: *See—*
Weitz, Harry; and Cacciatore, Diego M., 261,387, Cl. D12-192.000.

Invention Development Equity Assoc., Inc.: *See—*
Epperson, Charles N., 261,360, Cl. D9-375.000.
Epperson, Charles N., 261,361, Cl. D9-375.000.
Epperson, Charles N., 261,362, Cl. D9-376.000.

J. A. Preston Corporation: *See—*
Bergeron, Timothy J., 261,378, Cl. D12-128.000.

Jackson, Edward. Combined strainer and plug for a sink or the like. 261,418, 10-20-81, Cl. D23-42.000.

James David Incorporated: *See—*
Clyburn, Charles W., 261,340, Cl. D6-191.000.

Janson, Mats, to Tylo Sauna S.A. Front cover for thermostat regulator housing. 261,367, 10-20-81, Cl. D10-60.000.

John J. Madison Company, Inc.: *See—*
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 261,374, Cl. D11-158.000.
Santa-Eulalia Carvajales, Jesus A.; and Santa-Eulalia Carvajales, Javier B., 261,375, Cl. D11-158.000.

Johnson, Kenneth E., Sr., to T-Shirts Plus, Inc. Display stand. 261,339, 10-20-81, Cl. D6-152.000.

Kikuchi, Yoshikazu, to Mitutoyo Mfg. Co., Ltd. Dial gauge. 261,370, 10-20-81, Cl. D10-73.000.

Klose, Odo, to Friedrich Grohe Armaturenfabrik GmbH & Co. Showerhead. 261,417, 10-20-81, Cl. D23-35.000.

Koeppel, Fritz; and Loizance, Jean-Yves. Decanting cradle. 261,345, 10-20-81, Cl. D7-70.000.

Koshiyama, Taro. Clothes dryer rack. 261,350, 10-20-81, Cl. D32-58.000.

Kress, George: *See—*
Appel, Mel; and Kress, George, 261,404, Cl. D21-122.000.

L. R. Nelson Corporation: *See—*
Hayes, Jerry R., 261,414, Cl. D23-7.000.

Lam, Yanta H. T., to Meyer Aluminium Limited. Microwave detector. 261,366, 10-20-81, Cl. D10-47.000.

LeSueur, Leo R.: *See—*
Catron, George W., 261,323, Cl. D2-28.000.
Catron, George W., 261,324, Cl. D2-28.000.

Lewis, Kenneth T. Burglar alarm housing. 261,371, 10-20-81, Cl. D10-106.000.

Light, Rex E. Seat. 261,334, 10-20-81, Cl. D6-63.000.

Lion in Frost Inc.: *See—*
Frye, Stephen K., 261,342, Cl. D6-196.000.

Loctite Puerto Rico: *See—*
Beall, Glenn L.; Petersen, Lawrence; and Dauksys, Richard J., 261,400, Cl. D19-66.000.

Loizance, Jean-Yves: *See—*
Koeppel, Fritz; and Loizance, Jean-Yves, 261,345, Cl. D7-70.000.

Lovejoy, Robert B., to Mattel, Inc. Basketball game display and control panel or similar article. 261,402, 10-20-81, Cl. D21-13.000.

Ludwig, Douglas D.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,348, Cl. D7-131.000.

Lutz, William R., to Conceptual Factors, Inc. Pot stand assembly for a portable camp stove. 261,347, 10-20-81, Cl. D7-130.000.

Maass, Rudolf, to Robert Krups Stiftung & Co. KG. Wall-hung coffee machine. 261,344, 10-20-81, Cl. D7-62.000.

Mackrell, William B.: *See—*
Ranua, Walter E.; and Mackrell, William B., 261,391, Cl. D15-120.000.

Marconi, Karen D., to Quaker Oats Company, The. Toy rabbit. 261,405, 10-20-81, Cl. D21-187.000.

Marlin Fiberglass, Inc.: *See—*
Reineman, Richard G., 261,426, Cl. D24-38.000.

Mattel, Inc.: *See—*
Lovejoy, Robert B., 261,402, Cl. D21-13.000.

McGraw-Hill, Inc.: *See—*
Barreca, Joseph E., 261,368, Cl. D10-62.000.

Medical Products Institute Incorporated: *See—*
Baturin, Peter, 261,430, Cl. D24-64.000.

Meier, Louis M., to Flexsteel Industries, Inc. Chair. 261,330, 10-20-81, Cl. D6-37.000.

Meyer Aluminium Limited: *See—*
Lam, Yanta H. T., 261,366, Cl. D10-47.000.

Miller, Grover A. Rotatable tie rack. 261,338, 10-20-81, Cl. D6-113.000.

Miller, Louis E. Guide wheel for welding torches. 261,352, 10-20-81, Cl. D8-30.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Kikuchi, Yoshikazu, 261,370, Cl. D10-73.000.

Miyakawa, Eiji, to Miyakawa Industry Company, Limited. Spindlecase attachment for tapping machines to change the rotation of the tool. 261,392, 10-20-81, Cl. D15-140.000.

Miyakawa Industry Company, Limited: *See—*
Miyakawa, Eiji, 261,392, Cl. D15-140.000.

Moreland, Gerald W. Safety suction fitting for hydro-therapy spas. 261,419, 10-20-81, Cl. D23-42.000.

Morrow, William B., to Aqua-Mist, Inc. Humidifier for a hot air furnace or the like. 261,421, 10-20-81, Cl. D23-147.000.

Morrow, William B., to Aqua-Mist, Inc. Humidifier for a hot air furnace or the like. 261,422, 10-20-81, Cl. D23-147.000.

Moss, Charles W. Shelter. 261,407, 10-20-81, Cl. D21-253.000.

Mullins, Dewey C., to Mullins Lure Company. Fishing lure. 261,410, 10-20-81, Cl. D22-29.000.





Mullins Lure Company: *See—*
Mullins, Dewey C., 261,410, Cl. D22-29.000.

Munch, Emil L., to Nestier Corporation. Bakery tray. 261,444, 10-20-81, Cl. D34-43.000.

Murray, Harold J.: *See—*
Brooksby, Brain T.; Murray, Harold J.; Simpson, Anthony; and Peterkin, Stuart M., 261,395, Cl. D16-11.000.

Nass, Henry E. Package of block-shaped articles. 261,359, 10-20-81, Cl. D9-337.000.

Nestier Corporation: *See—*
Munch, Emil L., 261,444, Cl. D34-43.000.

Nichols, Richard D. E.: *See—*
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Sundberg, Alf. Catch assembly for drawers and cupboards. 261,355, 10-20-81, Cl. D8-331.000.

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Ryan, John J. Impatiens plant named Chinook. 4,779, 10-20-81, Cl. 68.000.

Wassiliew, Alexander, heir: *See*—
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# CLASSIFICATION OF PATENTS

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382 4,295,557
440 4,295,558
517 4,295,560
598 4,295,559
735 4,295,561

**CLASS 200**

16 D 4,296,283
48 R 4,296,284
61.08 4,296,285
61.54 4,296,286
83 P 4,296,287
146 R 4,296,288
148 R 4,296,289
325 4,296,290
331 4,296,291
336 4,296,292

**CLASS 202**

153 4,295,936
155 4,295,937
248 4,295,938

**CLASS 204**

1 T 4,295,939
2.1 4,295,940
35 R 4,295,941
96 4,295,942
4,295,943
98 4,295,944
128 4,295,945
149 4,295,946
159.15 4,295,947
159.23 4,295,948
180 G 4,295,949
180 P 4,295,950
242 4,295,951
252 4,295,952
257 4,295,953

**CLASS 206**

158 4,295,562
205 4,295,563
279 4,295,564
455 4,295,565
457 4,295,566
534 4,295,567
597 4,295,568

**CLASS 208**

10 4,295,954
120 4,295,955
127 4,295,956
138 4,295,957
4,295,958
4,295,959
139 4,295,960
161 4,295,961

**CLASS 209**

167 4,295,962
634 4,295,569
657 4,295,570

**CLASS 210**

108 4,295,963
130 4,295,964
169 4,295,965
180 4,295,966
189 4,295,967
198.3 4,295,968
223 4,295,969
230 4,295,970
232 Re.30,779
695 4,295,971
710 4,295,972
738 4,295,973
789 4,295,974
800 4,295,975

**CLASS 211**

200 4,295,571

**CLASS 215**

247 4,295,572
348 4,295,573

**CLASS 219**

8.5 4,296,293
10.41 4,296,294
10.49 R 4,296,295
10.55 B 4,296,296
10.55 F 4,296,297
10.55 M Re.30,780
10.81 4,296,298
4,296,299
61.7 4,296,300
69 G 4,296,302
69 M 4,296,301
78.13 4,296,303
86.41 4,296,304
101 4,296,305
121 ED 4,296,307
124.34 4,296,306
136 4,296,308
216 4,296,309
440 4,296,310
464 4,296,311
501 4,296,312

**CLASS 220**

2.1 A 4,295,574
3.92 4,295,575
21 4,295,576
86 AT 4,295,577
234 4,295,578

**CLASS 221**

229 4,295,579
268 4,295,580

**CLASS 222**

192 4,295,581
213 4,295,582
478 4,295,583
519 4,295,584

**CLASS 223**

96 4,295,585

**CLASS 224**

32 R 4,295,586
321 4,295,587
4,295,588

**CLASS 226**

122 4,295,589
183 4,295,590

**CLASS 227**

142 4,295,591

**CLASS 228**

17 4,295,592
50 4,295,593
160 4,295,594
161 4,295,595
180 A 4,295,596

**CLASS 229**

2.5 EC 4,295,597
34 R 4,295,599
52 AL 4,295,598

**CLASS 233**

7 4,295,600
26 4,295,601

**CLASS 235**

61 L 4,296,313
92 SB 4,296,314
460 4,296,315

**CLASS 236**

1 G 4,295,603
21 R 4,295,604
56 4,295,605
93 B 4,295,602

**CLASS 237**

12.1 4,295,606

**CLASS 239**

1 4,295,607
14 4,295,608
29 4,295,609
230 4,295,610
265.37 4,295,611
310 4,295,612

**CLASS 241**

2 4,295,613
18 Re.30,778
34 4,295,614
182 4,295,615
241 4,295,616

**CLASS 244**

3.29 4,295,617

**CLASS 248**

73 4,295,618
95 4,295,619
154 4,295,620
183 4,295,621
313 4,295,622
456 4,295,623
4,295,624
466 4,295,625
575 4,295,626
588 4,295,627

**CLASS 249**

80 4,295,628
160 4,295,629

**CLASS 250**

204 4,296,316
215 4,296,317
225 4,296,318
227 4,296,319
252 4,296,320
254 4,296,321
282 4,296,322
289 4,296,323
339 4,296,324
347 4,296,325
372 4,296,326
423 R 4,296,327
436 4,296,328
491 4,296,329
504 R 4,296,330
551 4,296,331
570 4,296,332
572 4,296,333

**CLASS 251**

14 4,295,630
30 4,295,631
127 4,295,632
172 4,295,633

**CLASS 252**

8.55 D 4,295,980
8.55 E 4,295,979
8.9 4,295,976
4,295,977
4,295,978
33.4 4,295,981
42 4,295,982
49.6 4,295,983
62 4,295,984
105 4,295,985
188 4,295,986
194 4,295,987
301.4 F 4,295,989
408 4,295,990
429 B 4,295,991
429 C 4,295,992
430 4,295,993
4,295,994
431 C 4,295,995
4,295,996
439 4,295,997
4,295,998
455 R 4,295,999
4,296,000
458 4,296,001
518 4,296,002
570 4,296,003
584 4,295,988

**CLASS 254**

10.5 4,295,634
93 HP 4,295,635
304 4,295,636

**CLASS 256**

13.1 4,295,637
59 4,295,638

**CLASS 260**

18 EP 4,296,004
4,296,005
23 EP 4,296,006
23.7 N 4,296,007
27 BB 4,296,008
28.5 R 4,296,009
29.2 TN 4,296,010
29.3 4,296,011
29.6 ME 4,296,015
29.6 NR 4,296,014
29.6 SQ 4,296,016
29.6 TA 4,296,013
29.6 XA 4,296,012
30.6 R 4,296,017
32.8 EP 4,296,018
33.4 R 4,296,019
37 N 4,296,020
40 R 4,296,021
42.46 4,296,022
45.75 F 4,296,023
112 B 4,296,024
4,296,027
112 R 4,296,025
123.5 4,296,026
160 4,296,028
239 A 4,296,030
239.3 D 4,296,031
239.3 R 4,296,029
245.2 R 4,296,032
326.2 4,296,033
326.82 4,296,034
333 4,296,035
340.7 4,296,036
343.21 4,296,038
343.45 4,296,039
343.6 4,296,037
345.2 4,296,040
4,296,041
345.9 R 4,296,042
352 4,296,043
381 4,296,044
448 R 4,296,045
465.3 4,296,046
974 4,296,047

**CLASS 261**

111 4,296,048
4,296,049
112 4,296,050

**CLASS 264**

25 4,296,052
26 4,296,053
45.3 4,296,054
45.5 4,296,055
49 4,296,056
63 4,296,057
78 4,296,058
118 4,296,051
130 4,296,059
137 4,296,060
138 4,296,061
173 4,296,062
273 4,296,063
322 4,296,064
325 4,296,065

**CLASS 267**

91 4,295,639

**CLASS 269**

47 4,295,640
136 4,295,641

**CLASS 270**

53 4,295,642
57 4,295,643
60 4,295,644

**CLASS 271**

34 4,295,645

**CLASS 272**

76 4,295,646

**CLASS 273**

1 G 4,295,647
26 A 4,295,648
86 B 4,295,649
118 R 4,295,650
121 D 4,295,651
235 R 4,295,652

**CLASS 277**

2 4,295,653
92 4,295,654

**CLASS 280**

11.2 4,295,655
87.04 A 4,295,656
91 4,295,657
276 4,295,658
405 R 4,295,659
714 4,295,660
765 4,295,661

**CLASS 282**

27.5 4,295,662
4,295,663

**CLASS 283**

1 A 4,295,664

**CLASS 285**

3 4,295,665
14 4,295,666
18 4,295,667
21 4,295,668
47 4,295,669
91 4,295,670
223 4,295,671
287 4,295,672

**CLASS 290**

37 R 4,296,334

**CLASS 292**

21 4,295,673
190 4,295,674
256.6 4,295,675
262 4,295,676

**CLASS 294**

73 4,295,677

**CLASS 296**

156 4,295,678
171 4,295,679

**CLASS 297**

193 4,295,680
284 4,295,681
367 4,295,682
377 4,295,683
475 4,295,684

**CLASS 301**

37 P 4,295,685
63 DD 4,295,686

**CLASS 303**

20 4,295,687

**CLASS 307**

200 B 4,296,335
300 4,296,336
356 4,296,337
362 4,296,338
450 4,296,339
490 Re.30,781
550 4,296,340

**CLASS 308**

3.8 4,295,688
9 4,295,689
4,295,690
238 4,295,691

**CLASS 310**

41 4,296,341
77 4,296,342
154 4,296,343
184 4,296,344
219 4,296,345
242 4,296,346
313 B 4,296,347
334 4,296,348
335 4,296,349

**CLASS 312**

228 4,295,692
257 R 4,295,693

**CLASS 313**

26 4,296,350
222 4,296,351
315 4,296,352
487 4,296,353

**CLASS 315**

3.5 4,296,354
39.51 4,296,355
135 4,296,356
169.4 4,296,357
241 R 4,296,358
370 4,296,359
387 4,296,360

**CLASS 318**

54 4,296,361
138 4,296,362
349 4,296,363
572 4,296,364
632 4,296,365
793 4,296,366
808 4,296,367

**CLASS 322**

75 4,296,368

**CLASS 323**

218 4,296,369

**CLASS 324**

54 4,296,370
61 R 4,296,371
71 CP 4,296,373
71 EB 4,296,372
77 B 4,296,374
103 P 4,296,375
235 4,296,376
252 4,296,377
313 4,296,378
357 4,296,379

**CLASS 328**

48 4,296,380

**CLASS 330**

149 4,296,381
264 4,296,382
301 4,296,383

**CLASS 331**

78 4,296,384
90 4,296,385
94.5 H 4,296,386
4,296,387
94.5 L 4,296,388

**CLASS 333**

160 4,296,389
182 4,296,390
193 4,296,391
213 4,296,392

**CLASS 335**

125 4,296,393
207 4,296,394

**CLASS 336**

60 4,296,395

**CLASS 337**

66 4,296,396
199 4,296,397
297 4,296,398

**CLASS 338**

34 4,296,399

**CLASS 339**

8 P 4,295,694
17 C 4,295,696
17 F 4,295,695
22 R 4,295,697
59 R 4,295,698
61 M 4,295,699
4,295,700
94 A 4,295,701
97 P 4,295,702
98 4,295,703
99 R 4,295,704
220 R 4,295,705

**CLASS 340**

32 4,296,400
38 L 4,296,401
64 4,296,402
146.3 AG 4,296,405
147 P 4,296,403
149 A 4,296,404
166 R 4,296,406
347 CC 4,296,407
539 4,296,408
684 4,296,409
686 4,296,410
870.02 4,296,411
870.19 4,296,412
870.38 4,296,413

**CLASS 343**

5 SW 4,296,414
16 M 4,296,415
792.5 4,296,416

**CLASS 346**

75 4,296,417
4,296,418
135.1 4,296,419
140 R 4,296,420
4,296,421
160 4,296,422
4,296,423

**CLASS 350**

58 4,295,706
96.20 4,295,707
289 4,295,708
292 4,295,709
310 4,295,710
334 4,295,711



344 4,295,712

**CLASS 352**

235 4,295,713

**CLASS 354**

3 4,295,714
25 4,295,715
30 4,295,716
33 4,295,717
50 4,295,718
4,295,719
51 4,295,720
64 4,295,721
146 4,295,722
155 4,295,723
238 4,295,724
244 4,295,725
246 4,295,726
298 4,295,727
321 4,295,728
324 4,295,729
325 4,295,730

**CLASS 355**

14 R 4,295,731
4,295,732
14 SH 4,295,733
15 4,295,734
43 4,295,735
57 4,295,736
76 4,295,737

**CLASS 356**

32 4,295,738
43 4,295,739
152 4,295,740
349 4,295,741
373 4,295,742
431 4,295,743

**CLASS 357**

1 4,296,424
17 4,296,425
23 4,296,426
39 4,296,427
41 4,296,428
55 4,296,429

**CLASS 358**

8 4,296,430
12 4,296,431
28 4,296,432
37 4,296,433
105 4,296,434
166 4,296,435
167 4,296,436
173 4,296,437
214 4,296,438
257 4,296,439
4,296,440
293 4,296,441

**CLASS 360**

6 4,296,442
10 4,296,443
65 4,296,444
4,296,445
73 4,296,446
113 4,296,447
135 4,296,448

**CLASS 361**

3 4,296,449
50 4,296,450
80 4,296,451
82 4,296,452
275 4,296,453
380 4,296,454
383 4,296,455
403 4,296,456
413 4,296,457
433 4,296,458

**CLASS 362**

104 4,296,459
200 4,296,460

**CLASS 363**

22 4,296,461
96 4,296,462

**CLASS 364**

200 4,296,463
4,296,464
4,296,465
4,296,466
4,296,467
4,296,468
4,296,469
4,296,470
424 4,296,471
509 4,296,472
520 4,296,473
560 4,296,474
900 4,296,475
4,296,476
4,296,477

**CLASS 365**

112 4,296,478
119 4,296,479
222 4,296,480

**CLASS 366**

3 4,295,744
302 4,295,745

**CLASS 367**

13 4,296,483
20 4,296,481
71 4,296,484
77 4,296,485
91 4,296,482
140 4,296,486
169 4,296,487

**CLASS 368**

80 4,296,488
87 4,296,490
205 4,296,489

**CLASS 369**

59 4,296,491

**CLASS 370**

14 4,296,492
48 4,296,493

**CLASS 371**

13 4,296,494
22 4,296,495

**CLASS 376**

203 4,295,934
285 4,295,935

**CLASS 400**

119 4,295,746

**CLASS 402**

75 4,295,747

**CLASS 403**

24 4,295,748
211 4,295,749
259 4,295,750
306 4,295,751
317 4,295,752
365 4,295,753
369 4,295,754

**CLASS 405**

66 4,295,755
70 4,295,756
163 4,295,757
201 4,295,758
243 4,295,759
259 4,295,760
261 4,295,761
264 4,295,762

**CLASS 408**

86 4,295,763

**CLASS 409**

296 4,295,764

**CLASS 410**

101 4,295,765

**CLASS 411**

113 4,295,766
377 4,295,767
387 4,295,768
411 4,295,769
531 4,295,770

**CLASS 414**

5 4,295,771
38 4,295,772
187 4,295,773
331 4,295,774
375 4,295,775
405 4,295,776
458 4,295,777
525 R 4,295,778
685 4,295,779
749 4,295,780

**CLASS 415**

1 4,295,781
4,295,782
2 R 4,295,783
162 4,295,784
174 4,295,785
4,295,786
197 4,295,787
202 4,295,788

**CLASS 416**

213 A 4,295,789
226 4,295,790
241 B 4,295,791

**CLASS 417**

15 4,295,792
36 4,295,793
62 4,295,794
111 4,295,795
115 4,295,796
203 4,295,797
212 4,295,798
240 4,295,799
333 4,295,800
397 4,295,801
405 4,295,802
423 R 4,295,803

**CLASS 418**

15 4,295,804
61 B 4,295,805
97 4,295,806
170 4,295,807

**CLASS 422**

24 4,296,066
26 4,296,067
62 4,296,068
64 4,296,069
65 4,296,070
254 4,296,072

**CLASS 423**

3 4,296,073
4 4,296,074
7 4,296,075
53 4,296,076
4,296,077
440 4,296,078
444 4,296,079
4,296,080
4,296,081
4,296,082
4,296,083
4,296,084
4,296,085
4,296,086
4,296,087
533 4,296,088
555 4,296,089

**CLASS 424**

11 4,296,090
18 4,296,091
43 4,296,092
45 4,296,093
49 4,296,094
52 4,296,095
4,296,096
4,296,097
4,296,098
105 4,296,099
108 4,296,100
119 4,296,101
130 4,296,102
4,296,103
153 4,296,104
180 4,296,105
4,296,107
181 4,296,106
210 4,296,108
241 4,296,109
244 4,296,110
246 4,296,111
4,296,112
4,296,113
248.52 4,296,114
263 4,296,115
272 4,296,116
273 B 4,296,117
273 P 4,296,118
274 4,296,119
4,296,120
275 4,296,121
285 4,296,122
4,296,124
287 4,296,123
309 4,296,128
4,296,129
315 4,296,125
316 4,296,126
319 4,296,127
337 4,296,130
347 4,296,131

**CLASS 425**

8 4,295,808
72 S 4,295,809
110 4,295,810
112 4,295,811
114 4,295,812
121 4,295,813
517 4,295,814
556 4,295,815

**CLASS 426**

2 4,296,132
23 4,296,133
250 4,296,134
275 4,296,135
533 4,296,136
534 4,296,137
4,296,138
536 4,296,139
575 4,296,140
613 4,296,141

**CLASS 427**

28 4,296,142
38 4,296,143
4,296,144
47 4,296,145
58 4,296,146
120 4,296,147
125 4,296,148
130 4,296,149
164 4,296,150
255.1 4,296,151
440 4,296,152
444 4,296,153

**CLASS 428**

245 4,296,081
305 4,296,082
329 4,296,083
351 4,296,084
359 4,296,085
392 4,296,086
449 4,296,087
533 4,296,088
555 4,296,089

**CLASS 429**

14 4,296,184
48 4,296,185
54 4,296,186
105 4,296,187
111 4,296,188

**CLASS 430**

5 4,296,189
57 4,296,190
4,296,191
109 4,296,192
149 4,296,193
176 4,296,194
215 4,296,195
271 4,296,196
300 4,296,197
403 4,296,198
551 4,296,199
4,296,200

**CLASS 431**

4 4,295,816
7 4,295,817
4,295,818
143 4,295,819
191 4,295,820
353 4,295,821

**CLASS 432**

29 4,295,822
106 4,295,823
115 4,295,824
116 4,295,825
185 4,295,826

**CLASS 433**

81 4,295,827
90 4,295,828
99 4,295,829
115 4,295,830
4,295,831
168 4,295,832

**CLASS 435**

7 4,296,201
29 4,296,202
104 4,296,203
235 4,296,204
240 4,296,205
4,296,206

**CLASS 440**

63 4,295,833
76 4,295,834
78 4,295,835

**CLASS 455**

1 4,296,496

**CLASS 474**

51 4,295,836
83 4,295,383
153 4,295,837

**CLASS 493**

105 4,295,838
143 4,295,839
278 4,295,840
295 4,295,841
342 4,295,842
354 4,295,843

**CLASS 501**

90 4,295,890
99 4,295,891
120 4,295,892
398 4,296,175
407 4,296,176
408 4,296,177
462 4,296,178
498 4,296,179
558 4,296,180
626 4,296,181
629 4,296,182
653 4,296,183

**CLASS 521**

53 4,296,207
77 4,296,208
85 4,296,209
4,296,210
154 4,296,211
163 4,296,212
166 4,296,213

**CLASS 525**

2 4,296,214
28 4,296,215
66 4,296,216
390 4,296,217
439 4,296,218
488 4,296,219
507 4,296,220

**CLASS 526**

87 4,296,221
119 4,296,222
125 4,296,223
243 4,296,224
260 4,296,225
316 4,296,226
320 4,296,227

**CLASS 528**

33 4,296,228
45 4,296,229
67 4,296,230
93 4,296,231
179 4,296,232

**CLASS 536**

5 4,296,233
47 4,296,234
85 4,296,235

**CLASS 542**

420 4,296,236

**CLASS 544**

405 4,296,237

**CLASS 546**

97 4,296,238
271 4,296,239

**CLASS 556**

406 4,296,240

**CLASS 560**

124 4,296,241
160 4,296,242
210 4,296,243

**CLASS 562**

470 4,296,244
494 4,296,245
503 4,296,246
4,296,247
4,296,248
4,296,249
4,296,250
506 4,296,251

**CLASS 564**

70 4,296,252
153 4,296,253
214 4,296,254
215 4,296,255

**CLASS 568**

330 4,296,256
361 4,296,257
364 4,296,258
378 4,296,259
763 4,296,260
890 4,296,261
910 4,296,262
4,296,263

**CLASS 570**

128 4,296,264
138 4,296,265

**CLASS 585**

640 4,296,266

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 25 | 261,320 | | 196 | 261,341 | | 413 | 261,363 | | | 261,385 | | 226 | 261,406 |
| | | 261,321 | | | 261,342 | | 438 | 261,364 | | 158 | 261,386 | | 253 | 261,407 |
| | | 261,322 | D7— | 47 | 261,343 | D10— | 38 | 261,365 | | 192 | 261,387 | D22— | 1 | 261,408 |
| | 28 | 261,323 | | 62 | 261,344 | | 47 | 261,366 | D14— | 25 | 261,388 | | 13 | 261,409 |
| | | 261,324 | | 70 | 261,345 | | 60 | 261,367 | D15— | 112 | 261,389 | | 23 | 261,411 |
| | 309 | 261,325 | | 101 | 261,346 | | 62 | 261,368 | | 116 | 261,390 | | 24 | 261,412 |
| D3— | 35 | 261,326 | | 130 | 261,347 | | 69 | 261,369 | | 120 | 261,391 | | 29 | 261,410 |
| | 36 | 261,327 | | 131 | 261,348 | | 73 | 261,370 | | 140 | 261,392 | D23— | 3 | 261,415 |
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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,621,323,** Re. S.N. 269,599, Filed June 2, 1981, Cl. 313/317, COATED INCANDESCENT ELECTRIC LAMP, William R. Tooke, Jr., Owner of Record: *Thomas Manufacturing Co., Parkton, Md.,* Attorney or Agent: A. W. Breiner, Ex. Gp.: 256

**4,156,973,** Re. S.N. 270,420, Filed June 3, 1981, Cl. 34/86, HEATING VENT FOR ELECTRIC CLOTHES DRYER, James D. Bede, Owner of Record: *Bede Industries, Inc., Bay Village, Ohio,* Attorney or Agent: Charles B. Lyon, et al., Ex. Gp.: 344

**4,174,281,** Re. S.N. 282,001, Filed July 10, 1981, Cl. 210/786, COUNTERCURRENT DECANTATION, Christoper C. Dell, Owner of Record: *National Research Development Corp., London, England,* Attorney or Agent: None, Ex. Gp.: 176

**4,216,062,** Re. S.N. 254,250, Filed April 15, 1981, Cl. 202/248, SEALING MEANS FOR A COKE OVEN CHUCK DOOR, Calvin E. Kelly, et al., Owner of Record: *United States Steel Corp., Pittsburgh, Pa.,* Attorney or Agent: William F. Riesmeyer, III, Ex. Gp.: 177

**4,253,447,** Re. S.N. 282,086, Filed July 10, 1981, Cl. 128/6, COLOR ENDOSCOPE WITH CHARGE COUPLED DEVICE AND TELEVISION VIEWING, William C. Moore, et al., Owner of Record: *Welch Allyn, Inc., Skaneateles Falls, N.Y.,* Attorney or Agent: Richard von K. Bruns, et al., Ex. Gp.: 335

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**D. 233,463,** Reexam. No. 90/000,063, Requested: Sept. 3, 1981, Cl. Dll/90, BEAD, Harold Roger, Owner of Record: *Inventor,* Attorney or Agent: Amster & Rothstein, Ex. Gp.: 292, Requester: Harold Mangelsen & Sons, Inc., c/o Henderson & Sturm, Omaha, Neb.

**3,328,231,** Reexam. No. 90/000,072, Requested: Sept. 18, 1981, Cl. 521/131, METHOD OF PRODUCING CAST SURFACES AND PRODUCTS OBTAINED THEREBY, John A. Sergovic, Owner of Record: *The Burns & Russell Co. of Baltimore City, Baltimore, Md.,* Attorney or Agent: Louis F. Reed, Ex. Gp.: 143, Requester: Trenwyth Industries, Inc., Emigsville, Pa.

**3,817,333,** Reexam. No. 90/000,074, Requested: Sept. 25, 1981, Cl. 172/283, PLOW SYSTEM WITH PLURALITY OF PLOW UNITS AND MEANS FOR ADJUSTING SPACING BETWEEN UNITS IN A CONTINUOUS MANNER, Jon E. Kinzenbaw, Owner of Record: *Dietrich Manufacturing, Inc., Goodfield, Ill.,* Attorney or Agent: James J. Hill, Ex. Gp.: 334 Requester: International Harvester Co., Chicago, Ill.

**4,061,481,** Reexam. No. 90/000,077, Requested: Sept. 30, 1981, Cl. 62/29, NATURAL GAS PROCESSING, Roy E. Campbell, et al., Owner of Record: *The Ortloff Corp., Midland, Tex., c/o Allan H. Bonnell, Esq.,* Attorney or Agent: Allan H. Bonnell, Esq., Ex. Gp.: 177, Requester: The Ortloff Corp., New York, N.Y.

## DEPARTMENT OF COMMERCE

### Patent and Trademark Office
### AUTOMATION STUDY

**Agency:** Patent and Trademark Office, Commerce

**Action:** Request for Automation Technology Information

**Summary:** The Patent and Trademark Office requests information from firms which can provide applicable state-of-the-art technology to support automation in the areas of Patent Automation, Trademark Automation, Internal Operations, Public/Office Communications, and Printing. Such firms should provide sufficient information to allow the Patent and Trademark Office to assess the capability of the technology to meet the requirements which will be established. Such automation efforts are intended to modernize the PTO's patent, trademark, information dissemination, printing, and administrative management programs. This information should be limited to fifteen (15) pages or less and specifically address the type of support (hardware or software) offered, the programs to be supported, and how the support would be applied. If deemed appropriate, the information provided will be included in the final report of the study required by Section 9 of P.L. 96-517, which study must be submitted to the Congress on or before December 12, 1982. Proprietary information should not be submitted.

**Date:** Information must be submitted on or before Nov. 6, 1981.

**Address Information to:**
Commissioner of Patents and Trademarks
Washington, D.C. 20231
ATTN: James A. Green

**For Further Information Contact:** James A. Green by telephone at (703) 557-1610 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.





**Supplemental Information:** Section 9 of P.L. 96-517, which is the basis for the development of the automation plan, states:

"Sec. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act [Dec. 12, 1980], a plan to identify and if necessary develop or have developed computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future."

During the development of the automation plan, analyses of the current state-of-the-art in a wide variety of technological areas will be conducted. The technology which will be addressed includes all types of software for search, retrieval and processing large text data bases, and hardware for mass data storage, text retrieval systems, image enhancement and retrieval, engineering graphics, optical character recognition, automated photocomposition, electronic facsimile transfer, and source data automation.

GERALD J. MOSSINGHOFF,
Oct. 7, 1981. *Commissioner of Patents and Trademarks.*

ROBERT B. ELLERT,
Oct. 8, 1981. *Acting Assistant Secretary for Productivity, Technology and Innovation.*

## DEPARTMENT OF THE TREASURY
## UNITED STATES CUSTOMS SERVICE
## (TMK-2-CO:R:E:E)

*Notice of Application for Recordation of Trade Name "BULGARI"*

Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "BULGARI" or printed with a Roman u *i.e.,* "BULGARI", used by Ditta Sotirio Bulgari di Constantino e Giorgio Bulgari S.A.S., a partnership organized under the laws of Italy, located at 10 Via dei Condotti, Rome, Italy.

The application states that the trade name is used in connection with a wide variety of fine watches, jewelry, ornamental works and artwork made of precious metal and precious or semi-precious stones and various other items made of precious metals, manufactured in Italy. The application states further that Bulgari Distribuzione S.P.A., 6 Via Gregoriana, Rome, Italy and Bulgari S.P.A., 10 Via Dei Condotti, Rome, Italy are authorized to use the trade name. Appropriate accompanying papers were submitted with the application.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person, in opposition to the recordation of this trade name. Any such submission should be addressed to the Commissioner of Customs, Washington, D.C. 20229, in time to be received no later than 30 days from the date of publication of this notice in the Federal Register.

Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

A. PIAZZA,
Sept. 15, 1981. *Acting Director, Entry Procedures and Penalties Division.*

### Patent and Trademark Office

Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on November 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after November 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of November 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after November 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and International Affairs
Box 4
U.S. Patent and Trademark Office
Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

GERALD J. MOSSINGHOFF,
Date: Oct. 15, 1981. *Commissioner of Patents and Trademarks.*

# PATENT NOTICES

**Certificates of Correction for the Week of Oct. 27, 1981**

| | | | |
|---|---|---|---|
| Re. 30,610 | 4,260,371 | 4,272,999 | 4,279,986 |
| Re. 30,635 | 4,260,892 | 4,273,176 | 4,280,073 |
| 3,624,205 | 4,260,960 | 4,273,300 | 4,280,332 |
| 3,730,185 | 4,261,285 | 4,273,357 | 4,280,370 |
| 3,783,976 | 4,262,115 | 4,273,661 | 4,280,384 |
| 3,897,238 | 4,262,657 | 4,274,053 | 4,280,476 |
| 4,142,837 | 4,263,251 | 4,274,262 | 4,280,688 |
| 4,150,864 | 4,263,494 | 4,274,332 | 4,280,898 |
| 4,170,818 | 4,264,201 | 4,274,598 | 4,281,426 |
| 4,179,602 | 4,264,495 | 4,274,814 | 4,281,627 |
| 4,183,040 | 4,264,682 | 4,274,979 | 4,281,658 |
| 4,184,489 | 4,264,685 | 4,275,062 | 4,281,717 |
| 4,185,709 | 4,265,305 | 4,275,347 | 4,281,884 |
| 4,195,157 | 4,265,977 | 4,275,524 | 4,282,043 |
| 4,201,560 | 4,266,067 | 4,275,582 | 4,282,096 |
| 4,205,561 | 4,266,747 | 4,275,964 | 4,282,379 |
| 4,214,157 | 4,267,039 | 4,276,066 | 4,282,483 |
| 4,218,267 | 4,267,107 | 4,276,071 | 4,282,622 |
| 4,227,439 | 4,267,167 | 4,276,428 | 4,282,719 |
| 4,228,580 | 4,267,344 | 4,276,431 | 4,282,908 |
| 4,230,970 | 4,267,619 | 4,276,887 | 4,282,932 |
| 4,231,158 | 4,267,824 | 4,277,207 | 4,282,934 |
| 4,231,662 | 4,267,999 | 4,277,250 | 4,283,306 |
| 4,233,182 | 4,268,777 | 4,277,286 | 4,283,516 |
| 4,233,303 | 4,268,789 | 4,277,508 | 4,283,660 |
| 4,233,620 | 4,268,827 | 4,277,531 | 4,283,832 |
| 4,237,764 | 4,269,556 | 4,277,612 | 4,284,259 |
| 4,243,925 | 4,269,988 | 4,277,613 | 4,284,479 |
| 4,245,047 | 4,269,995 | 4,277,893 | 4,284,694 |
| 4,246,077 | 4,270,038 | 4,277,913 | 4,284,806 |
| 4,249,132 | 4,270,269 | 4,278,071 | 4,284,812 |
| 4,251,636 | 4,270,921 | 4,278,161 | 4,284,936 |
| 4,253,252 | 4,271,312 | 4,278,367 | 4,284,992 |
| 4,253,760 | 4,271,605 | 4,278,564 | 4,285,420 |
| 4,254,848 | 4,272,106 | 4,278,565 | 4,285,424 |
| 4,255,323 | 4,272,185 | 4,278,812 | 4,285,589 |
| 4,256,650 | 4,272,289 | 4,278,815 | 4,285,986 |
| 4,257,164 | 4,272,357 | 4,279,017 | 4,286,039 |
| 4,257,601 | 4,272,409 | 4,279,287 | 4,286,082 |
| 4,257,874 | 4,272,469 | 4,279,432 | |
| 4,259,674 | 4,272,986 | 4,279,836 | |



## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7607 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 222 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2814 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 790-6291 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 226 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

## PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-12-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 10-11-79 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 7-09-80 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 1-12-80 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 5-06-80 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 1-07-80 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 1-18-80 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 1-23-80 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 12-07-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-20-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 2-08-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 1-09-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 6-12-79 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 1-30-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 10-22-79 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-19-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive



# REISSUES

OCTOBER 27, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 30,782**

## METHOD FOR THE MANUFACTURE OF AN ELECTRET FIBROUS FILTER

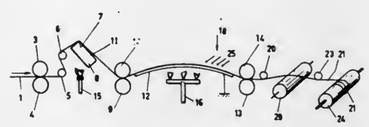
**Jan van Turnhout, Delft, Netherlands, assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.**

**Original No. 3,998,916, dated Dec. 21, 1976, Ser. No. 561,872, Mar. 25, 1975. Application for reissue Jul. 31, 1978, Ser. No. 929,680**

**Claims priority, application Netherlands, Mar. 25, 1974, 7403975**

**Int. Cl.**[3] **B29D** *27/00*

**U.S. Cl. 264—22** **48 Claims**



**1**. A method for the manufacture of an electrically charged fibrous filter from a high molecular non-polar material, comprising the steps of:

continuously feeding a film of high molecular isotactic polypropylene material at a rate of 12.2 meters per minute;

stretching said film in two stages, said first stage of stretching stretches said film at a ratio of 1:6 at a temperature of approximately 110° C., said second stage of stretching stretches said film at a ratio of 1:1.5 at a temperature of substantially 130° C.;

homopolarly charging at least one side of the stretched film with a plurality of corona charging elements, said plurality of corona discharge elements being connected to minus 10 KV, said step of charging including the use of a metal plate connected to an opposite polarity voltage source and a grid whereby said charging corona elements are between said metal plate and said film, said metal plate being connected to a voltage of plus 3 KV, said grid being connected to a voltage of minus 2.3 KV, said corona charging elements being spaced substantially 5 mm from the means for supporting said film during said second stage of stretching;

fibrillating the charged film into fiber material; *and*

collecting the fiber material [; and processing the collected fiber material into a filter] *to form a filter.*

*10. A method for the manufacture of an electrically charged fibrous filter from a highly molecular non-polar material, comprising the steps of:*

*continuously feeding a film of said material;*

*heating said film*

*stretching said film along the longitudinal axis thereof as defined by the path of movement of said film;*

*homopolarly electrically charging at least one side of said film;*

*fibrillating the charged film into fiber material; and*

*collecting the fiber material to form a filter.*

**Re. 30,783**

## FLAME RETARDING LINEAR POLYESTERS AND SHAPED ARTICLES THEREOF

**Hans-Jerg Kleiner, Kronberg; Manfred Finke, Fischbach; Ulrich Bollert, Diedenbergen, and Walter Herwig, Neuenhain, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

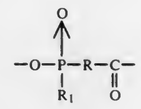
**Original No. 3,941,752, dated Mar. 2, 1976, Ser. No. 505,686, Sep. 13, 1974. Continuation of Ser. No. 880,866, Feb. 23, 1978, abandoned. Application for reissue Feb. 11, 1980, Ser. No. 120,465**

**Claims priority, application Fed. Rep. of Germany, Sep. 17, 1973, 2346787**

**Int. Cl.**[3] **C08G** *63/76*

**U.S. Cl. 528—287** **13 Claims**

**1**. A linear polyester which is the polycondensation product of a dicarboxylic acid, a diol and a flame-retarding carboxyphosphinic acid monomer, said monomer being used in an amount of from 3 to 20 mol percent, based on the total amount of dicarboxylic acid and monomer, said monomer being a source of structural units in said polyester of the formula



wherein R is saturated, open-chain or cyclic alkylene, arylene or aralkylene having one to 15 carbon atoms, and may contain one or more hetero atoms selected from F, Cl, Br, O and S, and $R_1$ is alkyl having up to six carbon atoms, aryl, or aralkyl and may contain one or more hetero atoms selected from F, Cl, Br, O and S, provided that in the R and $R_1$ groups the O, if present, is the oxygen of an ether group, and the S, if present, is the sulfur of a thioether, sulfoxide, sulfone or sulfonate group.

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**Re. 30,784**

## GROUP OPERATED CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC POWER LINES

**Ronald P. Bridges, 9 S. 681 Brookeridge Rd., Downers Grove, Ill. 60515**

**Original No. 4,095,061, dated Jun. 13, 1978, Ser. No. 783,940, Apr. 1, 1977. Application for reissue Aug. 20, 1979, Ser. No. 68,474**

**Int. Cl.**[3] **H01H** *31/00*

**U.S. Cl. 200—48 KB** **16 Claims**

*15. A group operated electric circuit disconnect apparatus for a plurality of overhead electric power distribution lines carried on poles, said apparatus comprising, in combination:*

*a base adapted to be mounted adjacent the top of a pole;*

*a first disconnect switch surmounting the base;*

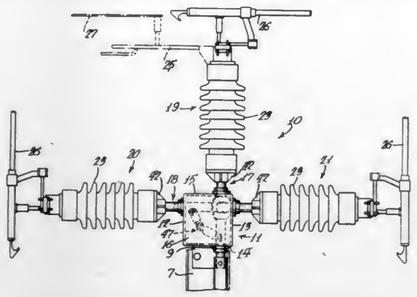
*second and third disconnect switches mounted at opposite sides of the base;*

*an upright shaft means journalled on said base, said upright shaft means being operatively connected to said first switch so that axial rotation of the shaft means opens and closes the first switch;*

*transverse shaft means journalled on said base and operatively connected to said second and third switches so that axial rotation of said transverse shaft means opens and closes said second and third switches;*

*means on one of said shaft means to which a rotational force may be applied to rotate said one of said shaft means axially;*

*and a mechanical connection between said upright shaft means and said transverse shaft means so that axial rotation of said*



*one of said shaft means causes axial rotation of the other of said shaft means.*

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**Re. 30,785**

**MICROCOMPUTER TERMINAL SYSTEM**

**Lawrence R. Lovercheck, Palo Alto; Russell K. Hileman, and Richard W. Calfee, both of San Jose, all of Calif., assignors to Zentec Corporation, Santa Clara, Calif.**

**Original No. 3,973,244, dated Aug. 3, 1976, Ser. No. 553,654, Feb. 27, 1975. Application for reissue May 18, 1979, Ser. No. 40,140**

**Int. Cl.**[3] **G06F** *3/00, 3/153*

**U.S. Cl. 364—200** **31 Claims**

1. An information terminal system comprising:

a. a memory storing character data;

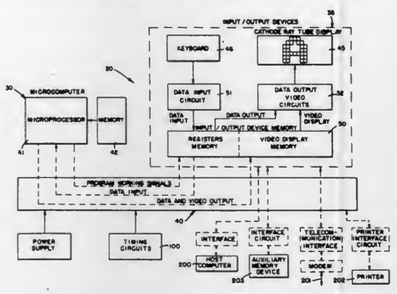
b. data means for entering character data into said memory;

c. a first set of shift registers receiving character data from said memory for storage therein;

d. a second set of shift registers receiving character data from said first set of shift registers for storage therein;

e. video circuit means receiving *successive rows of* character data from said second set of shift registers for producing video signals; [and]

f. means including a character display receiving said video signals from said video circuit means for displaying [a character element] *successive rows of characters corresponding to said successive rows of character data; and*




*g. timing and control means for controlling transfer of character data from said first set of shift registers to said second set of shift registers so that a row of character data transferred to said second set of shift registers causes said video circuit means to produce video signals that produce a display of a row of characters in said character display while the succeeding row of character data is received and stored in said first set of shift registers ready to be transferred to said second set of shift registers to produce video signals in said video circuit means for the succeeding row of characters displayed in said character display.*

# PLANT PATENTS

## GRANTED OCTOBER 27, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,781**

**BEGONIA PLANT**

**James C. Mikkelsen, and Cornelis P. Van den Berg, both of Ashtabula, Ohio, assignors to Mikkelsens Inc., Ashtabula, Ohio**

**Filed Mar. 25, 1980, Ser. No. 133,900**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct cultivar of begonia plant referred to by the cultivar name Fresco, as described and illustrated, and particularly characterized by its large semi-double to double, deep orange-red flowers; heavy infusion of red pigmentation in the foilage; pleasant contrast of flower and foliage color; year round flowering with proper environmental conditions, and by its vigorous growth habit.

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**4,782**

**AFRICAN VIOLET PLANT**

**Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany**

**Filed Jul. 1, 1980, Ser. No. 165,076**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—69** **1 Claim**

1. A new and distinctive cultivar of African Violet plant known by the cultivar name Glacier, as described and illustrated, and particularly characterized by its large white, star-shaped flowers having five to eight petals; strong and upright flower stems; heart-shaped leaves, vigorous growth habit, and by its long lasting, non-dropping flowers.

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**4,783**

**CARNATION PLANT**

**Jack M. Meek, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Aug. 5, 1980, Ser. No. 175,421**

**Int. Cl.**[3] **A01H** *5/00*

**U.S. Cl. Plt.—72** **1 Claim**

1. A new and distinct cultivar of carnation known by the cultivar name Duchess, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, twisting slightly with maturity; medium flower size, dark salmon pink flower color with minimum color oxidation; medium flowering response; 4 to 7 flowers and buds showing color per flowering stem; medium peduncle length; strong peduncle strength; and tall plant height.

# PATENTS

## GRANTED OCT. 27, 1981

### ERRATA

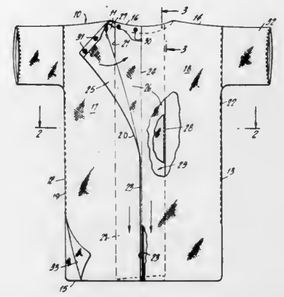
| For CLASS | See PATENT NO. |
|---|---|
| 474–262 | 4,296,640 |
| 294–144 | 4,296,880 |
| 501–002 | 4,297,139 |
| 428–310 | 4,297,140 |
| 501–067 | 4,297,141 |
| 501–077 | 4,297,142 |
| 501–103 | 4,297,143 |
| 376–103 | 4,297,165 |
| 376–194 | 4,297,166 |
| 376–273 | 4,297,167 |
| 376–418 | 4,297,168 |
| 376–418 | 4,297,169 |
| 376–442 | 4,297,170 |
| 376–440 | 4,297,171 |
| 136–256 | 4,297,391 |
| 028–042 | 4,297,403 |
| 030–215 | 4,297,432 |

# PATENTS

GRANTED OCTOBER 27, 1981

## GENERAL AND MECHANICAL

**4,296,497**
**HOSPITAL PATIENT GOWN**
**Seymour S. Herman, New York, N.Y., assignor to Stan Herman Studio, Inc., New York, N.Y.**
**Filed May 16, 1980, Ser. No. 150,324**
**Int. Cl.³ A41B 9/00**
**U.S. Cl. 2—114** **5 Claims**



1. A hospital patient gown comprising a front panel, a first and a second rear panel, longitudinal side margins on each of the said panels, means to secure the front panel and side panels together to form a gown having an elongated vertical rear opening therein, a neck band on said panels, a free portion on the first and the second rear panel, an inverted pleat on one of said free portions said pleated portion extending across the rear opening and underlying the other free portion and means carried by the neck band and pleated portion to secure the rear panels together.

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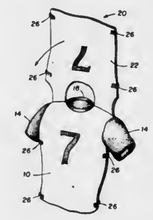
**4,296,498**
**REVERSIBLE GARMENT**
**Joseph J. Vinson, 2009 Blossom La., Marshalltown, Iowa 50159**
**Filed Jun. 2, 1980, Ser. No. 155,417**
**Int. Cl.³ A41B 1/00**
**U.S. Cl. 2—115** **3 Claims**



1. A reversible garment such as a jersey or the like for the upper part of the body, comprising:

(a) a front and back panel joined together at seams having sleeves and a neck opening that form a pullover upper-body garment,

(b) said front panel having an identifying characteristic different from the back panel,

(c) said front and back panels being of substantially the same size and shape,

(d) a reversible flap having cutouts for said sleeves and conforming in size and shape to said front and said back panel and having side and bottom edges.

(e) said flap being permanently affixed to said garment so as to be selectively movable from a position over either the entire front panel or the entire back panel to cover the identifying characteristics of one of said panels when moved into a panel covering position,

(f) said flap having different identifying characteristics on its opposite sides which characteristics correspond to those contained on the front and back panels so that the same identifying characteristics will be displayed on the front and the back of the garment simultaneously regardless of the selected position of the flap, and

(g) a first and a second fastening means for securing the side edges of the flap in one of said selected positions over at least one of said panels.

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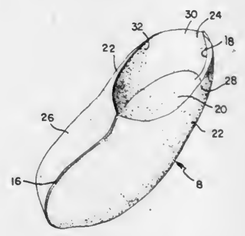
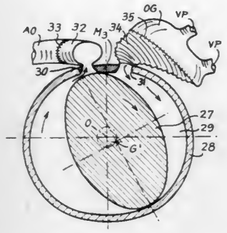
**4,296,499**
**BLISTER PREVENTING FOOT COVER**
**Theodore P. Patterson, 5207 Twilight La., Fort Wayne, Ind. 46815, and Stephen E. Winner, Fort Wayne, Ind., assignors to Theodore P. Patterson, Fort Wayne, Ind.**
**Filed May 29, 1979, Ser. No. 43,459**
**Int. Cl.³ A41B 11/00**
**U.S. Cl. 2—239** **5 Claims**



1. A method for the prevention of blisters on the feet comprising:

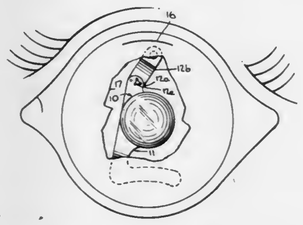
providing a foot cover made of one or more porous, non-woven film-fibril sheets of plexifilamentary strands, said strands having about 200 to 800 point bonds per square inch comprising about 5 to 10 percent of the planar area of the sheet or sheets, and a plurality of minute perforations extending through the thickness of the sheet or sheets with the total cross-sectional area of the perforations being at least 3 percent of the planar area of the sheet or sheets, said sheet or sheets being formed into a foot enveloping shape comprising a bottom portion adapted to lie underneath the sole of the foot, side portions extending upwardly from the bottom portion and adapted to cover the sides of the foot, a heel portion adapted to cover the heel of the foot, and a front portion adapted to cover at least the forward portion of the top of the foot, said cover having a relatively smooth inner surface and a relatively rough outer surface; and placing and wearing the foot cover on the foot directly in contact with the foot and directly underneath an overlying sock such that the smooth inner surface contacts the foot and clings to it and prevents the formation of blisters and the relatively rough outer surface engages the sock and provides some stability with the overlying sock.

**4,296,500**
## ARTIFICAL HEART
**Jean R. Monties, Auriol, and Patrick J. C. Havlik, Marseilles, both of France, assignors to Agence Nationale de valorisation de la Recherche (ANVAR), France**
**Filed May 3, 1978, Ser. No. 902,364**
**Claims priority, application France, May 6, 1977, 77 14470**
**Int. Cl.[3] A61F *1/24;* A61M *1/03***
**U.S. Cl. 3—1.7** **10 Claims**



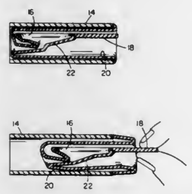

1. An artifical heart comprising a cylindrical rotor and a body which defines a cylindrical cavity, the cross-sections of said rotor and said cavity being respectively a trochoid and the envelope of said trochoid when the rotor is driven both in circular translation and in rotation about its centre, means for driving the rotor in rotation at a uniform speed, the number of revolutions per minute of which is the same as the ormal pulse rate of the patient, whereby the body has at least one fixed narrow region parallel to the generating lines within which the rotor is permanently in substantially tight contact with the inner wall of the cavity, said body having two elongated openings located on either side of the fixed region which are adapted to be connected respectively to the venous system and to an artery leading to the heart of the patient.

**4,296,501**
## INTRAOCULAR LENS AND METHOD OF MAKING THE SAME
**Charles D. Kelman, 269 Grand Central Pkwy., Floral Park, N.Y. 11005**
**Filed Jul. 14, 1980, Ser. No. 168,544**
**Int. Cl.[3] A61F *1/16, 1/24***
**U.S. Cl. 3—13** **14 Claims**




1. An intraocular lens suitable for use as an artificial lens implant anteriorly of the iris, the lens comprising:
a medial, light-focusing lens body; and
at least a pair of lateral position fixation elements connected with said lens body;
at least one of said pair of position fixation elements having a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of said lens body, and
the other of said pair of position fixation elements having a first portion contiguous to and extending generally laterally outwardly from a second region of the periphery of said lens body spaced from and generally opposite said first region and in a direction generally opposite to that of said first portion of said one position fixation element;
said other of said pair of position fixation elements having a second portion pivotable about the end of said first portion of said other of said pair of position fixation elements before being attached to said first portion of said other of said pair of position fixation elements at a selected position before implantation in the eye.

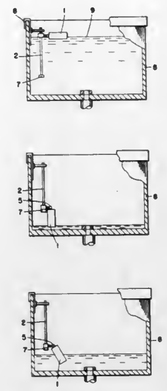
**4,296,502**
## SELF-PACKAGING URINE CONDUIT
**Bonnie Bortle, 62 Newtonville Ave., Newton, Mass. 02158**
**Filed Mar. 17, 1980, Ser. No. 130,738**
**Int. Cl.[3] A61G *9/00;* E03D *13/00;* A47K *11/12***
**U.S. Cl. 4—144.1** **6 Claims**




1. A self packaging urine conduit for women, comprising
a flexible and reversibly deformable fluid-tight tubular medial element, having a first portion of generally uniform inner dimension, and a second generally funnel-shaped portion continuous therewith and having an inner dimension increasing from that of said first portion to a rim dimension at its free edge,
a relatively rigid tubular end piece having an inner dimension approximately equal to that of said medial element first portion, said medial element first portion being connected to said tubular end piece to define at least one connecting area, said medial element first portion and said tubular end piece together forming a continuous fluid-tight channel,
a rim integrally connected to said medial element funnel-shaped portion at said free edge, said rim having an undeformed dimension greater than the inner dimension of said tubular end piece and being resiliently deformable to fit within said tubular end piece, and
a relatively rigid handle element integrally and rigidly connected to said rim and generally coplanar with said rim,
said medial element first portion having a length at least as great as the length of said tubular end piece,
said medial element first portion being reversibly inverted for storage of said rim, said handle and said funnel shaped portion within said tubular end piece.

**4,296,503**
## IN-TANK BATHROOM DEODORIZER/CLEANER
**Anthony Leardi, Middletown, N.Y., assignor to Hercules Incorporated, Wilmington, Del.**
**Filed Feb. 20, 1980, Ser. No. 122,970**
**Int. Cl.[3] E03D *9/02***
**U.S. Cl. 4—228** **1 Claim**

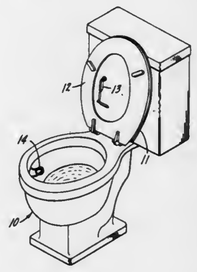
1. An in-tank toilet bowl cleansing and fragrancing device comprising a floatable container adapted to float on the surface of the water in a toilet bowl hold tank and to enclose a solid detergent material while leaving one of the surfaces of said solid detergent material exposed, means for securing said container in a toilet bowl hold tank with the exposed surface of the solid detergent out of contact with the body of water in the tank, and means for causing said container to rotate between a substantially horizontal and a substantially vertical position as




the water level in the tank falls due to flushing and thereafter to return to the horizontal position as the water level recovers.

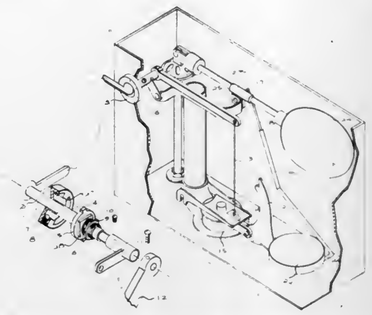


**4,296,504**
## TOILET SEAT LOCK
**Daniel C. Lawson, 6611 W. 174th St., Tinley Park, Ill. 60477**
**Filed Jul. 7, 1980, Ser. No. 166,160**
**Int. Cl.[3] A47K *13/00***
**U.S. Cl. 4—253** **10 Claims**




1. A device for use with a toilet and toilet seat cover comprising:
a lever adapted to fit through a hole in said toilet seat cover so as to allow rotation of said lever when said toilet seat cover is in a horizontal position;
a latch connected to said lever so that said latch will rotate in direct relationship to said lever and pivotally connected to said lever so that when said toilet seat cover is in a vertical position, said latch will lay substantially against said toilet seat cover and when said toilet seat cover is in a horizontal position, said latch will hang away from said toilet seat cover; and,
a retainer which is adapted to be affixed to said toilet and postioned so that when said toilet seat cover is in a horizontal position, rotation of said lever will allow rotation of said latch into or out from said retainer.

**4,296,505**
## STEPLESS CONTROLLED FLUSH CLOSET
**Chiang Chien-Sheng, 6, Alley 15, La. 174, Ta Tung St., Peitu District, Taipei, Taiwan**
**Filed Jan. 16, 1980, Ser. No. 112,467**
**Int. Cl.[3] E03D *1/14, 3/12***
**U.S. Cl. 4—324** **4 Claims**




1. A stepless controlled water tank for a flush toilet comprising a tank having at its bottom an outlet opening, a pivoted closure for said outlet opening, a pivoted control lever for releasably holding said closure in open position, a low level float connected with said control lever and acting by its flotation to position said control lever to hold said closure in open position when the water level is above a predetermined low level, an operating lever shaft rotatably mounted in said tank above normal high water level and extending to the outside of said tank, an operating handle outside said tank fixed to said shaft, an arm on said shaft inside said tank, linkage connecting said arm with said closure to open said closure by operation of said handle, whereupon said closure is held open by said control lever, a high level float on an arm pivotably mounted in said tank at approximately high water level, a slider slidable longitudinally on said float arm, lost-motion means connecting said slider with said control lever, volume discharge control means including a setting member on the outside of said tank, and means connecting said discharge control member with said slider to move said slides to different positions along said float arm, whereby said high water float, as it descends during discharge of water from said tank, acts through said slides and said means connecting said slides with said control means to release said closure to close said outlet at a time depending on the position of said slides on said float arm.

**4,296,506**
## INVALID CHAIR
**Neville Stoute, Sr., New York, N.Y., and Robert J. Pennise, Colmar, Pa., assignors to James A. Falborn and Richard M. Bird, both of New York, N.Y., part interest to each**
**Continuation-in-part of Ser. No. 99,187, Nov. 30, 1979, abandoned. This application Feb. 29, 1980, Ser. No. 126,147**
**Int. Cl.[3] A47K *11/06;* A61G *7/02;* A47K *11/04***
**U.S. Cl. 4—480** **14 Claims**

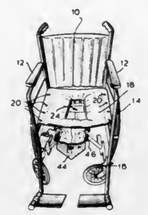
1. A replacement for a collapsible invalid wheelchair which comprises a left side frame member, a right side frame member and means effective between the frame members to hold them apart, said seat comprising:
a flexible padded seat member having a left side edge and right side edge for attachment to the left side frame member and the right side frame member respectively of an existing collapsible wheelchair, said seat member being formed with an elongated, generally rectangular opening extending substantially parallel to the left and right side edges of the seat member,
reinforcing means located within the seat member and at the

underside of the seat member respectively on each side of said opening;

means defining tracks on the underside of the seat member and extending substantially parallel to the left and right side edges of the seat member on each side of the opening;

a removable receptable adapted to fit slidingly in said tracks and extend over the full length of said opening; and

a detachable flexible padded flap removably attached to the seat member at the underside thereof for closing said



opening after the receptacle has been removed, the arrangement being such that the removal and attachment of the flap, and the insertion and removal of the receptacle can all be accomplished from the underside of the seat member, and such that upon removal of the receptacle the seat member can be folded about a line extending substantially parallel to the left and right side edges of the seat member without interference from the reinforcing means or the track defining means.

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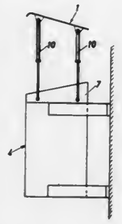
**4,296,507**

## SAUNA HEATING UNIT AND SHIELD THEREFOR

**Mats O. Janson, Port, Switzerland, assignor to Tylo Sauna S.A., Biel-Bienne, Switzerland**

**Filed Oct. 29, 1979, Ser. No. 89,135**
**Claims priority, application Sweden, Nov. 8, 1978, 7811514**
**Int. Cl.³ A61H *33/06***
**U.S. Cl. 4—524** **6 Claims**



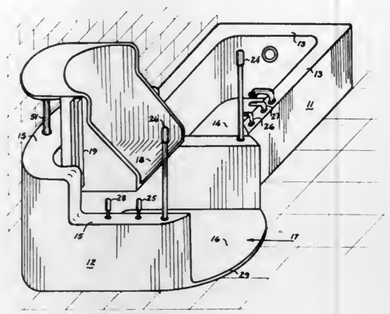
1. A sauna heating unit having a shield for guiding the stream of hot air from said unit into the sauna room comprising a substantially planar sheet member of heat resistant material detachably supported on the sauna heating unit in spaced relationship directly above it, upright members attached to said sheet member and said sauna unit to support said sheet member, said sheet being arranged at an angle to the horizontal plane for directing the stream of hot air from the sauna heating unit obliquely upwards into the sauna room, said sheet member having a shape and dimensions so that it covers an area corresponding to at least a substantial portion of the upper open end of the sauna heating unit.

**4,296,508**

## BATHTUB FOR INVALIDS

**Malachy J. Moran, 13915 Saratoga Rd., Saratoga, Calif. 94070**

**Filed Mar. 31, 1980, Ser. No. 135,393**
**Int. Cl.³ A47K *3/022*; A61H *33/02*; A47K *3/12***
**U.S. Cl. 4—540** **10 Claims**



1. A bathtub which can be entered without stepping over a sidewall and which provides for increased leg room during entry, the bathtub comprising:

a fixed part having a bottom closure, sidewalls extending upwardly on three sides from the bottom closure and having one open side, wherein the faces of the bottom closure and the two sidewalls along the open side form a portion of a concave cylindrical surface having a first radius about a first vertical axis;

an end part rotatable on a second vertical axis located on the bathtub centerline and having bottom closure, a back wall and two parallel sidewalls extending upwardly on three sides from the bottom closure, and having one open side, wherein the faces of the bottom closure and the two parallel sidewalls along the open side form portion of a convex cylindrical surface having a second radius about the first vertical axis; and

said end part being rotatably operable from a first position wherein the open side thereof faces away from the fixed part and provides an entrance to and exit the end part and a second position wherein the cylindrical faces of the rotatable end part and fixed part abut for providing a seal therebetween.

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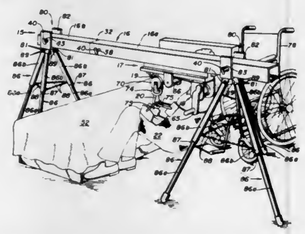
**4,296,509**

## PORTABLE INVALID LIFT

**Dwane P. Simmons, 7465 Olive Tree La., Highland, Calif. 92346, and Ray E. Lynn, 5172 Acacia St., San Bernardino, Calif. 92407**

**Filed Oct. 23, 1979, Ser. No. 87,343**
**Int. Cl.³ A61G *7/08***
**U.S. Cl. 5—81 R** **1 Claim**



1. A portable apparatus for transferring an invalid from a wheel chair to a bed or chair, and vice versa, said apparatus comprising:

an elongated track extending transversely over said bed or chair with one end projecting laterally from one side thereof with aligned holes at both ends of said track's vertical sidewalls;

first support means a tripod with telescoping legs, connected one to another on the upper portion thereof by a safety chain, said tripod set under the outermost portion of said laterally projecting section of said track, said tripod having a short section of channel open at the top mounted horizontally on the apex thereof in which the outer end of the laterally projecting end of said track section rests, said channel having aligned holes in its vertical sidewalls to line up with said aligned holes in said outermost portion of laterally projecting section of track to receive a locking pin, each said tripod leg being in two or more nearly equal sections with the lower sections being of a smaller size than the immediate section above and telescoping therein with each lower section on its upper end having a spring activated inset hard material ball on the outer surface thereof projected laterally when pulled clear by said spring sufficiently to prevent said immediate upper leg section from sliding downward thereon when said leg sections are extended, said ball also preventing said sections from extending downward accidentally when telescoped together by being projected laterally by said spring against the inner wall of said immediate upper leg section with sufficient pressure to cause enough friction to resist the force of gravity;

second support means a tripod identical to said first support means with an identical horizontal channel mounted at the apex thereof in which the outermost portion of the non-laterally projecting section of said track rests identically to said first support means and is secured identically to said first support means by an identical locking pin inserted through identical aligned holes in said channel's vertical sidewalls and aligned holes in the vertical sidewalls of said outermost portion of said non-laterally projecting section of track;

a wheeled carriage movable along the laterally projecting section of said track;

a winch with a rope depending therefrom mounted on said movable wheeled carriage;

a sling in which an invalid person sits; and

means on said rope attachable to said sling, said winch being operable to raise said invalid from said wheel chair or chair and to lower said person into said bed or chair or vice versa, said wheeled carriage being movable with said invalid between a first position on the laterally projecting portion of said track directly over said wheel chair, and a second position over said bed or chair.



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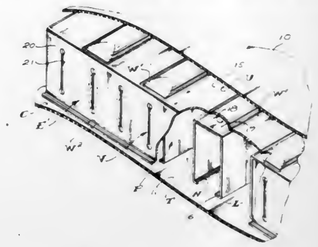
**4,296,510**

## ANTI-SURGE FLOTATION MATTRESS

**Raymond M. Phillips, 5500 W. 83rd St., Los Angeles, Calif. 90045**

**Filed Sep. 4, 1979, Ser. No. 72,126**
**Int. Cl.³ A47C *27/08***
**U.S. Cl. 5—450** **8 Claims**

1. A flotation mattress engageable in a frame having a horizontal platform and vertical side and end rails about and projecting upwardly from the platform; said mattress including an outer bladder of flexible, supple, water impervious sheet material with a flat, horizontal platform engaging bottom wall, vertical rail engaging side and end walls and a flat normally horizontal depressable top wall; a volume of fluid medium within and slackly filling the bladder; a normally flat, horizontal intermediate wall of flexible material in spaced relationship between the top and bottom walls and dividing the interior of the bladder into upper and lower portions; a plurality of spaced, vertical partitions of flexible, supple material fixed with and extending between the bottom and intermediate walls and cooperating therewith to define elongate fluid conducting tunnels with opposite ends in said lower portion of the bladder; flow metering fluid transfer means communicating with and between related ends of the tunnels; flotation means at the intermediate wall normally buoying up and maintaining that wall and the partitions in their normal position within the



bladder and wherein said flow metering transfer means includes fluid conducting chambers at and extending between adjacent ends of adjacent tunnels and membranes of flexible material overlying the ends of the tunnels and having flow metering openings communicating with the tunnels and the chambers.

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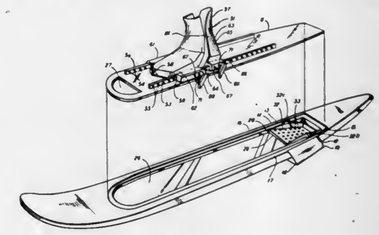
**4,296,511**

## WATER SKI WITH INCREASED STABILITY

**Joe B. Wright, 3728 Gratia Ave., Sacramento, Calif. 95821**

**Filed Jun. 8, 1978, Ser. No. 913,856**
**Int. Cl.³ A63C *5/00, 15/06***
**U.S. Cl. 9—310 A** **24 Claims**



1. A water ski comprising:

a longitudinally and laterally extending member, said member having a front longitudinal end and a rear longitudinal end;

means for causing said member to lie in the water in the rest position with said front longitudinal end pointing upward and said rear longitudinal end pointing downward, said means comprising:

an aperture disposed in the lower surface of and situated toward said rear longitudinal end of said member;

a channel within said member communicating with said aperture; and

a vane pivotally mounted in said aperture for selectively inhibiting the flow of water through said aperture in a direction into said member.

**4,296,512**

## METHOD FOR MAKING FASTENERS

**William A. Kilinskas, Amherst; Ronald J. Selines, Yorktown Heights, and Jaak S. Vand den Sype, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Nov. 9, 1979, Ser. No. 93,014**
**Int. Cl.³ B21K *1/48***
**U.S. Cl. 10—27 E** **9 Claims**

1. A method for making a fastener having a head and a shank from wire or rod consisting essentially of AISI 200 or 300 series stainless steel comprising the following steps:

(a) cooling the wire or rod to a temperature of less than about minus 75° C.;

(b) drawing the cold wire or rod through a die at a strain sufficient to provide a tensile strength for the wire or rod in the range of about 75 ksi to about 160 ksi, the strain and the die size being such that the area of the wire or rod will be reduced by at least about 3 percent; and

(c) dividing the wire or rod into slugs and cold heading each slug to provide the fastener.

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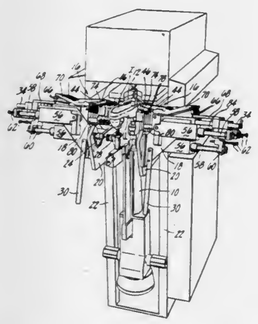
**4,296,513**

## SEAT AND WAIST LASTING MACHINE-INDEPENDENTLY PIVOTABLE SIDE LASTING FINGERS

**David W. Halford; Frank C. Price, and George H. Bosworth, all of Leicester, England, assignors to USM Corporation, Farmington, Conn.**

**Filed Mar. 27, 1980, Ser. No. 134,459**
**Claims priority, application United Kingdom, Apr. 21, 1979, 13952/79**
**Int. Cl.³ A43D *21/00***
**U.S. Cl. 12—12** **16 Claims**



1. A shoe machine for use in the lasting of side portions of shoe uppers, said machine comprising;

a support for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned, and a pair of side lasting assemblies arranged so as to act on opposite side portions of an upper placed on a last supported by said support;

each side lasting assembly comprising a plurality of wiping elements arranged side-by-side so as to engage a corresponding side portion of the upper along the length thereof;

said wiping elements being movable inwardly so as to wipe the upper portion engaged thereby over the insole margin and to press it thereagainst, each element also being mounted for limited pivotal movement independently of the element adjacent thereto about a first axis extending transversely of the last bottom, and also about a second axis extending lengthwise of said last bottom, the arrangement being such that the distance between the second axis and the work-engaging surface of the element along a perpendicular to said surface passing through said second axis is generally equal to the distance between the first axis and a reference plane in which the second axis lies and which extends parallel to said first axis, along a perpendicular to said reference plane passing through said first axis.

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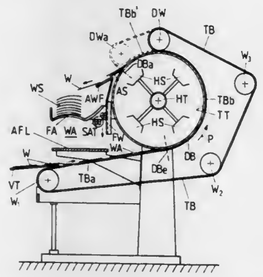
**4,296,514**

## METHOD FOR CONTINUOUS PROCESSING OF FLEXIBLE WORKPIECES

**Jiri Dokoupil, Hochstrasse 9, 6251 Gückingen, and Kurt Hacker, Birkenwaldstrasse 155, 7000 Stuttgart 1, both of Fed. Rep. of Germany**

**Division of Ser. No. 904,496, May 10, 1978. This application Mar. 10, 1980, Ser. No. 128,977**
**Claims priority, application Switzerland, May 17, 1977, 6167/77; Fed. Rep. of Germany, Dec. 27, 1977, 2758349**
**Int. Cl.³ A43D *9/00***
**U.S. Cl. 12—142 R** **8 Claims**




1. A method of continuous processing of laminar flexible workpieces, especially in leather, shoe or clothing production, with pressing, especially hot-press gluing of the workpieces, where the workpieces are carried through at least one pressure zone, characterized in that a continuous path of the workpieces comprises at least one low-pressure zone on the input side for spreading or smoothing the workpieces and at least one succeeding high-pressure zone for pressing the workpieces traversing the path from the input side in a generally upwardly direction toward an outlet side with an outlet motion of the workpieces essentially in the opposite direction to and spatially above the infeed motion of the workpieces.

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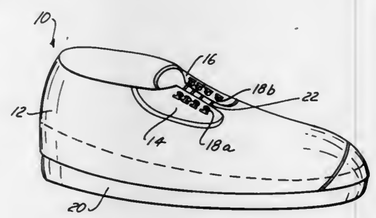
**4,296,515**

## FASTENING OF SHOE UPPERS FOR LASTING

**John Hauser, Calle Chama, Qta. Tony, Colinas de Bello Monte, Caracas 101, Venezuela**

**Filed Jun. 9, 1980, Ser. No. 157,717**
**Int. Cl.³ A43D *5/00, 9/00***
**U.S. Cl. 12—142 LC** **6 Claims**




1. A process for the temporary fastening of the flaps of a shoe upper prior to lasting of the upper, comprising aligning pairs of opposed eyelets formed in said upper, propelling fastening elements including a pair of substantially parallel legs and a bridging element extending between and connecting said



legs through said aligned eyelets such that one of said legs of each fastening element passes through both aligned eyelets following a path which is generally normal to the planes of said eyelets until it passes through the second of the aligned eyelets and then adopts a disposition generally parallel to said second eyelet, the legs of said fastening elements thereafter preventing separation of said flaps beyond a predetermined distance established by the length of the bridging elements.

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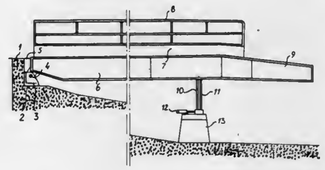
**4,296,516**

## VERTICALLY ADJUSTABLE BRIDGE FOR CONNECTION WITH SHIPS

**Lennart Järnum, Helsingborg, Sweden, assignor to AB Jarnkonstruktioner, Helsingborg, Sweden**

**Filed May 30, 1979, Ser. No. 43,836**
**Claims priority, application Sweden, Sep. 6, 1978, 7809372**
**Int. Cl.³ E01D *1/00***
**U.S. Cl. 14—71.7** **10 Claims**



1. A vertically adjustable bridge for connection with ships comprising a plurality of bridge units, each bridge unit having a ramp including girders and an upper surface suitable as bedding for transport and a land side end rotatably connected to a permanently applied bearing arrangement, the other end of the bridge unit being adjustable to a desired height within a suitable adjustment range and being temporarily lockable in the adjusted position, supporting legs and locking means cooperating with the legs for locking the other end of the bridge unit in the adjusted position, the bridge units being mountable side by side adjacent one another, each bridge unit having straight sides parallel to one another, a raising and lowering arrangement including the supporting legs with fittings located under the ramps of each unit at suitable distances from both ends of the ramp and from its side edges in such a way that a plurality of units, which are individually maneuverable, can be adjusted, when necessary, at the same height close to one another, to effectively widen the bridge.

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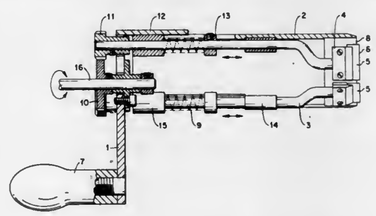
**4,296,517**

## PORTABLE SPINNERET CLEANER

**Joachim Böhler, Grosswallstadt, and Hans Jordon, Rudenau, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.**

**Filed Oct. 17, 1979, Ser. No. 85,839**
**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 7832006[U]**
**Int. Cl.³ B08B *13/00***
**U.S. Cl. 15—93 R** **3 Claims**



1. A portable spinneret cleaning unit, comprising: a base plate; an essentially cylindrical housing mounted on said base plate, said housing having a plane striker face at its free end; at least two guide bars, and means for mounting said guide bars on said housing whereby said guide bars pivot about and move linearly along their axis; mountings on the free end of said guide bars to receive at least one blade, the cutting edge of said blade being aligned parallel with the free end of said housing; spring means mounted on said housing for yieldably urging said blade slightly above said striker face; and means for rotating at least one guide bar.

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**4,296,518**

## TOOTHBRUSH AND GUM MASSAGING ACCESSORY

**Joseph P. Furrier, Northvale, and Allan H. Gilbert, Oradell, both of N.J., assignors to Lever Brothers Company, New York, N.Y.**

**Filed Nov. 30, 1979, Ser. No. 99,343**
**Int. Cl.³ A61H *13/00***
**U.S. Cl. 15—110** **4 Claims**

1. In a toothbrush including a handle and an array of bristles affixed to one end portion of said handle, an improvement comprising a gum massaging accessory movably secured to an opposite end portion of said handle for articulation between a first position in general alignment with said handle to at least a second position askew to said handle, said handle including a recess, said accessory including a resilient member terminating in a free-end portion for gum massaging treatment and an opposite end portion arranged in said recess, and pivot means for movably interconnecting said opposite end portion of said resilient member to said handle in said recess, said pivot means including a generally spherical-like socket, said free-end portion of said resilient member including a generally spherical-like region constrained in said socket for movement between said first and second positions.

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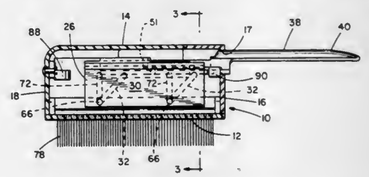
**4,296,519**

## BRUSH

**Wilhelm E. Schmitt, Bensenville, Ill., assignor to Jack S. Friedman, Highland Park, Ill.**

**Continuation of Ser. No. 933,641, Aug. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 782,176, Mar. 28, 1977, abandoned, and Ser. No. 802,793, Jun. 2, 1977, abandoned. This application Nov. 1, 1979, Ser. No. 90,101**
**Int. Cl.³ A46B *9/10***
**U.S. Cl. 15—184** **16 Claims**



1. A brush having retractable bristles comprising:

(a) a casing defining an arcuate panel having a plurality of openings therein,

(b) a cradle member positioned in the casing, said cradle carrying a plurality of elongate support members rotatable with respect to the cradle member,

(c) a plurality of bristles mounted on the elongate support members, with each of the bristles extending into one of the openings in said panel in a close fitting relationship, and

(d) means to retract the bristles into the casting through the openings, said means including a wing member mounted for sliding movement within the casing, said wing member having cam slots therein, said cradle member being mounted in the casing and having follower means thereon engaging said cam slots whereby advancing the wing member in one direction within the casing operates to retract the bristles into the casing through the openings, thereby causing the elongate support members to rotate relative to the cradle and thereby prevent the bristles from being subjected to excessive deformation while the openings exert a cleaning action on the bristles to clean foreign matter therefrom, and advancing the wing member in the opposite direction within the casing operates to extend the bristles from the casing.

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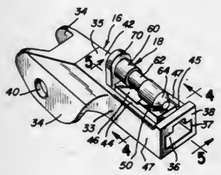
**4,296,520**

## PIN CONNECTOR

**John J. Arndt, Chesterton, Ind., assignor to The Anderson Company of Indiana, Gary, Ind.**

**Filed Oct. 10, 1979, Ser. No. 83,512**
**Int. Cl.³ B60S *1/40***
**U.S. Cl. 15—250.32** **6 Claims**



1. A pin (18) having a cylindrically-shaped body portion (60) for attaching an adaptor (16) to a wiper blade (10), said body portion (60) having an annular recessed midportion (62), a head (70) on one end of said pin (18) extending radially outward from said body portion (60), and a pair of spaced apart tabs (72) lying in the plane of said head (70) and extending parallel to each other in an outward direction from said body portion (60) for retaining said pin (18) on said adaptor (16) prior to use.

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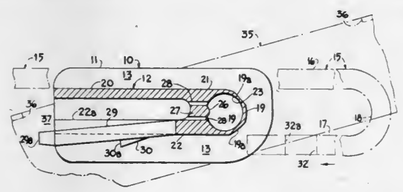
**4,296,521**

## WIPER BLADES

**Peter Mower, Twickenham, England, assignor to Trico Products Corporation, Buffalo, N.Y.**

**Filed Feb. 6, 1980, Ser. No. 119,127**
**Claims priority, application United Kingdom, Feb. 13, 1979, 5036/79; Apr. 4, 1979, 11853/79**
**Int. Cl.³ B60S *1/40***
**U.S. Cl. 15—250.32** **6 Claims**



1. A connecting clip assembly for connecting a wiper arm to a wiper blade, said wiper blade having between its ends an opening with opposite parallel side walls for receiving the connecting clip and the arm for pivotal movement therebetween, and a first pair of aligned holes in said opposite parallel side walls, the connecting clip comprising an elongate unitary body forming a pair of opposite parallel external side faces, a portion for supporting an end portion of a wiper arm longitudinally of the connecting clip including means for retaining the end portion of the wiper arm, a transverse opening through said body at right angles to the side faces terminating in a second pair of aligned holes through the side faces, and a separable pin of a length greater than the distance between the side faces extending through said first and second pairs of aligned holes and said transverse opening in assembled position, interlocking, cooperating abutment means on said body and said pin for retaining said pin in assembled position, the end portions of said pin pivotally engaging said first pair of aligned holes.

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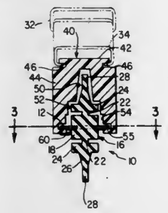
**4,296,522**

## REVERSIBLE DUAL WINDSHIELD WIPER

**Frederick Brack, 67 Pine St., Massapequa, N.Y. 11758**

**Filed Jun. 20, 1979, Ser. No. 50,474**
**Int. Cl.³ B60S *1/38***
**U.S. Cl. 15—250.36** **4 Claims**



1. A revisible dual blade windshield wiper assembly comprising:

a blade holder formed of an elongated piece of material having upper and lower faces and substantially flat edge portions,

a flexible blade of elastomeric material extending from each of the faces of said blade holder, each of said blades having a base which is mounted to said blade holder and from which said blades extend; said blade holder spanning the entire base of each said blade and leaving a said edge portion thereof exposed on each side of each blade, each blade being of the same general shape,

an arm,

and a plurality of retaining clips mounted to said arm, each said retaining clip having a pair of legs which can be spread apart, a slot on the inner face of each of the legs of a said retaining clip in which the edge portions of the blade holder are placed.

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**4,296,523**

## DUST-COLLECTION HEAD FOR A DUST COLLECTION SYSTEM

**William J. Clark, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Mar. 31, 1980, Ser. No. 135,834**
**Int. Cl.³ A47L *9/02***
**U.S. Cl. 15—415 R** **20 Claims**

16. A vacuum-operated dust-collection system for removing dust particles from dust-laden air produced when dumping dust-producing materials into a container, comprising:

a dust-collection head including

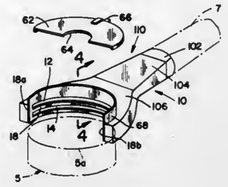
(i) a housing having a chamber formed therein, said housing having an outer section, a central section and an inner section juxtaposed sequentially along one dimension of said housing,

(ii) a curved substantially C-shaped face formed in said outer section, said face have a plurality of parallel slots formed therein to extend generally along the length of said face,



the maximum distance across said face being approximately equal to that across the top of the container, and

(iii) a plurality of flow directors disposed within said chamber to extend inwardly from said face to a location spaced from but proximate to said central section to form a plurality of flow passages in said chamber so that a substantially even dust-capture velocity is provided along said face;



one end of a conduit means connected to said inner section for evacuating the dust particles from said chamber; and means connected to the opposite end of said conduit means for creating a vacuum at said face and for removing the dust particles from the air drawn from said chamber.

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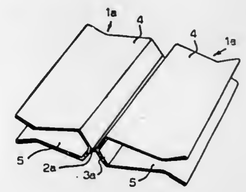
**4,296,524**

## JOINING MEMBER

**Anders Hörholt, 9 Avenue d'Ostende, Monte Carlo, Monaco, and Ulrik Kvist, Virvelvägen 42, 184 00 Åkersberga, Sweden**

**Filed Mar. 20, 1978, Ser. No. 888,399**
**Claims priority, application Sweden, Mar. 23, 1977, 7703319**
**Int. Cl.³ E05D *7/00***
**U.S. Cl. 16—150** **1 Claim**



1. A joining member for joining structure elements having plane connecting portions comprisng at least two profiles the cross-section of each of which is substantially U-shaped for receiving said plane connecting portions between the legs of said U-shaped profiles, said U-shaped profiles including a V-shaped bottom from the arms of which said legs extend, a thin web made in one and the same piece as said U-shaped profiles extending between the tips of each of said V-shaped bottoms articulatingly connecting said profiles, and said arms of said V-shaped bottom extending at a pre-determined angle from each of said tips, the degree to which adjacent of said U-shaped profiles are foldable about said web relative to each other being dependent upon the degree of said angle.

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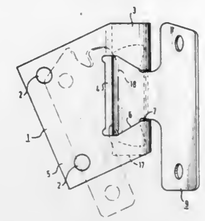
**4,296,525**

## SWIVEL FITTING FOR FITTING PARTS OF A SAFETY BELT

**Johann Schmid, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany**

**Filed Feb. 14, 1980, Ser. No. 121,473**
**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905863**
**Int. Cl.³ E05D *1/06***
**U.S. Cl. 16—174** **6 Claims**

1. Swivel fitting for fitting parts of a safety belt which are connectible together in a swivel relationship, comprising a first fitting part having a fitting portion and a cylindrically-shaped bearing eye integral therewith, said bearing eye having a cutout formed therein with converging edges about said cylindrically-shaped bearing eye forming a wide part thereof disposed adjacent to said fitting portion and a narrow part thereof forming a centering slot centrally disposed in said cylindrical bearing eye, a plastic cylinder pin having a slot formed therein and being inserted in said bearing eye, a second fitting part having



a substantially T-shaped extension integral therewith with a center leg and two side legs, said T-shaped extension being radially insertable into said slot formed in said plastic cylinder pin through the wide part of said cutout formed in said bearing eye and said center leg thereof being swingable into the narrow part of said cutout formed in said bearing eye and lockable therein in the axial direction of said bearing eye in an operating position.

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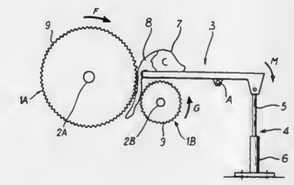
**4,296,526**

## SKINNING MACHINE FOR THE HEADS AND LIMBS OF SLAUGHTERED ANIMALS

**Claude Tournier, Lioujas, 12000 Rodez, France**

**Filed Dec. 4, 1979, Ser. No. 100,227**
**Claims priority, application France, Dec. 4, 1978, 78 34719**
**Int. Cl.³ A22B *5/16***
**U.S. Cl. 17—21** **3 Claims**



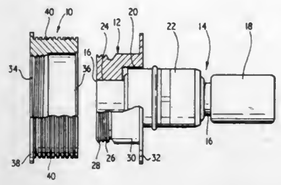
1. Skinning machine, especially for the external processing of a part of a slaughtered animal, comprising a frame, two parallel horizontal rolls rotationally mounted in bearings connected to the said frame, one at least of the said rolls being a drive roll, the rolls being sufficiently separated from each other at their peripheries to allow introduction between them of a flap of skin and to remove said skin by peripheral friction by rotation in opposite directions, a work table allowing support and maintenance of the part that is to be processed, said work table being movably mounted between a first position remote from the drive roll and a second position close to the drive roll with the drive roll being disposed in an extension of the said work table at a short distance from the end of the said table, such that a flap of skin extending over the said end of the table is gripped between the said end and the drive roll to thus initiate gripping of the skin by the drive roll, the second roll being disposed below the said table.

**4,296,527**

## TEXTILE COMBING ROLLER

**Brian K. M. Eadie, Johnstone, Scotland, assignor to Eadie Bros. & Co. Limited, Paisley, Scotland**

**Filed Apr. 19, 1979, Ser. No. 31,472**
**Int. Cl.³ D01G *19/10***
**U.S. Cl. 19—112** **9 Claims**



1. An opening roller for an open-end spinning apparatus comprising: a support part adapted for driving attachment to the spindle of the apparatus and a sleeve-like adapter constructed for releasable connection to said support part, said adapter having teeth secured to a cylindrical external surface thereof, providing the fibre engaging teeth of the roller, the releasable connection being such that it both establishes driving attachment of said adapter to said support part and secures said adapter on said support part without the intervention of a third element.

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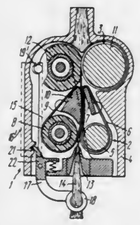
**4,296,528**

## DRAWING MECHANISM

**Gennady N. Shlykov, Chilanzar, kvartal 19, 31 kv. 3; Vitaly I. Zhestkov, Chilanzar, kvartal 19, 26, kv. 41; Valentin N. Tikhonov, ulitsa Shota Rustaveli, 55, kv. 28; Vasily M. Dyachkov, Kuiljuk - 4, 23-a, kv. 11; Vladimir G. Glazov, Chilanzar, kvartal 19, 58, kv. 25, all of Tashkent, and Timur P. Krjuk, prospekt Mira, 90, kv. 11, Moscow, all of U.S.S.R.**

**Filed Jun. 11, 1979, Ser. No. 47,054**
**Claims priority, application U.S.S.R., Jul. 13, 1978, 2643332**
**Int. Cl.³ D01H *5/88***
**U.S. Cl. 19—255** **7 Claims**



1. In an improved drawing mechanism embodying a ringless spinning frame comprising a housing accommodating therein a feed couple including two endless belts, one of said belts being mounted about a driving cylinder and adapted to move in engagement with a movable guide and to drive the other one of said two belts, mounted about the pressure roller of said feed couple and adapted to move in engagement with a stationary guide, and a delivery couple including its own driving cylinder and its own pressure roller adapted to pass therebetween a fibrous material coming from said feed couple, there being mounted at the inlet of said feed couple a guiding member and a compacting member adapted to effect the precompacting of the fibrous material being fed into said feed couple,

the improvement comprising mounting said pressure roller of said delivery couple, and the pressure roller of said feed couple jointly with the stationary guide and the respective belt thereof, the compacting member and the guiding member on a resiliently biased common removable plate which is associated with an adjustable means for retaining said removable plate in a required position; whereby said pressure rollers are uniformly urged against said driving cylinders, thereby providing improved driving conditions, and a handle for said drawing mechanism which when pulled disengages the adjustable means for retaining said removable plate in place.

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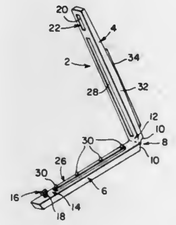
**4,296,529**

## BAG SEALING DEVICE

**Stanley E. Brown, P.O. Box 69, Harriman, N.Y. 10926**

**Filed Jul. 11, 1979, Ser. No. 56,445**
**Int. Cl.³ B65D *77/10***
**U.S. Cl. 24—30.5 P** **8 Claims**



1. A closure device for temporarily sealing flexible bags comprising:

first and second longitudinally extended arms, each arm having an outer end and an inner end and at least one substantially flat inner surface, a hinge connecting said arms at the inner ends thereof, permitting said arms to pivot in one direction into stacked disposition with said inner surfaces disposed adjacent to each other,

a locking assembly disposed on said inner surfaces adjacent to the outer ends of said arms comprising an upwardly projecting male snap lock element located on the inner surface of one of said arms, and a female snap lock element disposed within the inner surface of the other of said arms, said female snap lock element comprising an opening defined primarily by parallel walls being adapted to receive and releasably engage said male snap lock element therein,

a clasping assembly located along said inner surfaces comprising an elongated longitudinal ridge extending along the inner surface of one arm and a longitudinal slot disposed matingly with said ridge along the opposite adjacent inner surface of the other arm, said slot extending only partially through said arm and being adapted to seat said ridge to crimpingly engage the entire girth of said bag,

longitudinally extending reinforcement means located on the outer surface of and being integral with the arm defining said slot being parallel to said slot to maintain the stiffness of said arm when said slot and said ridge engage the surface of said bag, and

release means located at the free end of one of said arms to disengage said locking assembly and release said bag.

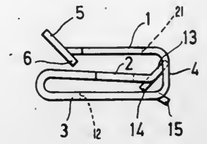


**4,296,530**

## CLAMP FOR TRIM STRIP

**Klaus Muller, Weilhaltinger, and Gerhard Mack, Rheinfelden-Adelhausen, both of Fed. Rep. of Germany, assignors to A. Raymond, Lorrach, Fed. Rep. of Germany**

**Filed Dec. 3, 1979, Ser. No. 99,747**
**Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853254**
**Int. Cl.³ E04F *19/02***
**U.S. Cl. 24—295** **4 Claims**



1. A clamp for fastening trim or protective strips on a support surface having T-shaped studs mounted thereon, said studs having a head and a shank, said trim strip having an inwardly extending projection, said clamp being formed from a one-piece strip of sheet metal and having three spaced superposed legs, the middle one of said legs together with an outer one of said legs constructed to clamp said trim strip projection therebetween, the other of said outer legs being formed with a slot which receives the shank of said stud, said other outer leg and said middle leg clampingly engaging the top and bottom of the head of said stud, said outer legs being joined at the rear of said clamp across the width thereof, by a bridge, said middle leg being bent inwardly from the free end of said lower leg and extending towards said bridge and between said outer legs.

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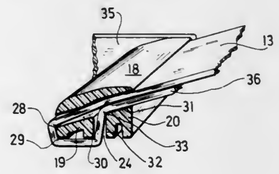
**4,296,531**

## STRAP FASTENING MEANS

**Sigurd W. Bengtsson, Bruksgatan 17, 41451 Gothenburg, Sweden**

**Filed Jun. 8, 1979, Ser. No. 46,702**
**Claims priority, application Sweden, Jun. 9, 1978, 7806704**
**Int. Cl.³ A44B *11/25***
**U.S. Cl. 24—200** **5 Claims**



1. A buckle for a strap comprising:

(a) a generally planar housing including a pair of oppositely located rectangular sidewalls, and at least three parallel bars extending between said sidewalls for the adjustable retention of the strap, said bars being arranged to provide

(b) a first strap passage having an entrance end through the endmost portion of said housing at the narrower ends of said rectangular sidewalls, and an outlet end disposed centrally of said rectangular sidewalls and opening within said housing into an enlarged recess within said housing between said rectangular walls, said first passage extending substantially in the direction of the longer sides of said rectangular sidewalls, said sidewalls and said recess defining an extension of said first strap passage within said housing beyond said outlet end, and said first passage being defined at one side by one of said bars and at its opposite side by two further ones of said bars, the side of said one bar remote from said first passage being an outside surface of the buckle, and

(c) a second strap passage having an external entrance end at one of said longer sides of said rectangular side-walls remote from the endmost portion of said housing and an outlet end opening into said first strap passage, and separating said two further bars and extending substantially parallel to said narrower ends of said rectangular side-walls.

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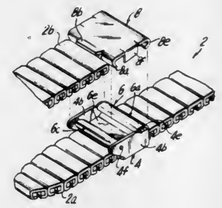
**4,296,532**

## CLASP FOR WATCH STRAP

**Kok-Kit Ho, Kam Tin, N.T., Hong Kong, assignor to Timex Corporation, Waterbury, Conn.**

**Filed Mar. 21, 1980, Ser. No. 132,486**
**Int. Cl.³ A44B *21/00***
**U.S. Cl. 24—206 R** **5 Claims**



1. A clasp construction for releasably connecting the ends of a bracelet together, comprising:

(a) an elongated U-shaped frame having a base plate and spaced upright walls along the sides thereof;

(b) a resilient spring plate mounted between the sidewalls of the frame in spaced relation above the base plate to define a longitudinal passage therebetween for receiving one end of the bracelet and shaped to clamp the bracelet end against the base plate at a selected position, said spring plate having a transversely-oriented hook-engaging surface at one end and a transversely-oriented cam engaging surface at the other end with a pressure surface therebetween to bear against said bracelet end for effecting said clamping action, said bracelet end being adjustable in position along the passage by sliding while the spring plate bias is temporarily released; and

(c) a cover member attached permanently at one end to the other bracelet end with at least one of said other bracelet end and said cover member end having a cam surface adapted to engage in snap-fit relation against the cam-engaging surface of said spring plate, said cover member having at the other end a hook surface adapted to engage around the hook-engaging surface of said spring plate, whereby said cover member is releasably attached to said spring plate by first engaging the hook and hook-engaging surfaces and then pressing down on the cover member to snap-fit the cam and cam-engaging surfaces together.

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**4,296,533**

## SNAP FASTENER COMPONENT STRIP

**Randall H. Doerter, Meadville, Pa., assignor to Talon, Inc., Meadville, Pa.**

**Filed Mar. 13, 1980, Ser. No. 129,912**
**Int. Cl.³ A44B *17/00***
**U.S. Cl. 24—216** **5 Claims**

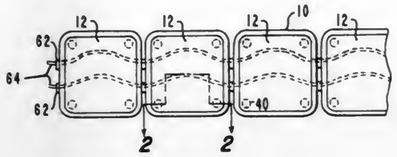
1. A snap fastener component strip particularly adapted for manipulation by automatic machinery comprising

a plurality of like plastic snap components aligned in a row,

a pair of integrally molded plastic connecting portions joining each pair of adjacent components, and

a pair of flexible reinforcing polymer filaments extending

along the row of snap components, a portion of each filament being embedded in each component,




said filaments having substantially greater flexibility than said molded connecting portions to maintain continuity between components even if said molded connecting portions are broken by flexure.

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**4,296,534**

## CLAMP FOR FLEXIBLE HOSES

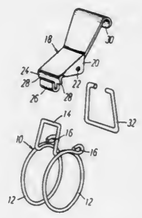
**Kenji Nagano, Minoo, Japan, assignor to Osakasanko Kabushiki Kaisha and Kabushiki Kaisha Taiyohatsujyo Seisakusho, both of Osaka, Japan**

**Filed Feb. 12, 1980, Ser. No. 120,790**

**Claims priority, application Japan, Nov. 1, 1979, 54-151895[U]**

**Int. Cl.**[3] **B65D** *63/00, 45/34;* **F16L** *33/00*

**U.S. Cl. 24—270** **3 Claims**




1. A clamp for flexible hoses consisting of:

a clamping band formed by continuously winding a single springy metal wire to provide a pair of concentric circular rings partly overlapping each other to receive a hose and facing each other with a predetermined spacing therebetween, an inverted U-shaped rising bracket arm spanning the space between said circular rings at one of the respective ends of said rings, and a pair of eyelets formed by bending back the other ends thereof;

an operating lever of metal strip integrally formed with a hook at one end thereof, a pair of eyelets having insertion holes in a middle portion thereof, and a substantially inverted L-shaped finger rest at the other end thereof, said operating lever being mounted immediately above the overlap region of said circular rings with said hook being pivotally engageable with said bracket arm; and

a substantially U-shaped prop arm of metal wire pivotally supported at the upper end thereof in said insertion holes of said operating lever and at the lower end thereof in said eyelets of said circular rings, said prop arm being normally held in its rising position, the arrangement being such that by pressing said lever at said finger rest on its free end side downwardly against said circular rings of the clamping band, the opposite ends of the winding of the clamping band are forced to move away from each other under the resulting lever action, thereby contracting the diameter of the circular rings to clamp the hose.

**4,296,535**

## APPARATUS FOR TEXTURIZING CONTINUOUS FILAMENTS

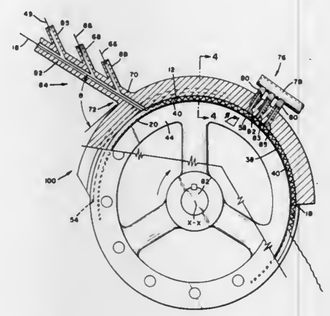
**Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Lake Shawnee, all of N.J., assignors to Allied Chemical Coporation, Morris Township, Morris County, N.J.**

**Continuation-in-part of Ser. No. 799,066, May 20, 1977, Pat. No. 4,133,087, which is a continuation-in-part of Ser. No. 619,085, Oct. 2, 1975, Pat. No. 4,024,611. This application Jan. 8, 1979, Ser. No. 1,618**

**The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.**

**Int. Cl.**[3] **D02G** *1/12, 1/16*

**U.S. Cl. 28—257** **10 Claims**




1. Apparatus for crimping continuous filaments comprising:

(a) a rotatable drum **(44)** having a peripheral recess **(42)** in which a screen **(17)**, **(58)** forms a wall, said screen having a mesh size from 50 to 400 and being designed and constructed to permit escape of fluid therethrough to a discharge passageway **(56)**, **(59)**;

(b) a stationary cover **(34)** having a wall **(39)**, **(60)** opposite to said screen, defining with said recess an arcuate chamber **(12)** through which chamber said screen in said recess continuously moves; said chamber having an inlet through the inlet tube **(35)**, **(70)** specified below, and having an outlet opening **(18)**;

(c) fluid directing means **(37, 70)** comprising an inlet tube adapted to carry fluid and filaments therethrough and positioned with its discharge end in close proximity to a portion **(20)** of said screen which portion changes continuously as the periphery of the drum rotates, said inlet tube making an angle ($\theta$) of 15° to 75° with the surface of said portion of the screen closely proximate to the discharge end of the inlet tube;

(d) a rear extension **(34)**, **(54)** affixed to said cover to the rear of said inlet tube, positioned to prevent broken filaments or plugs thereof from re-entering said chamber after being moved to and emerging from the outlet opening thereof;

(e) heating means upstream of said inlet tube; and

(f) fluid jet heating means **(80)** disposed in said cover in communication with said chamber downstream from said inlet tube.

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**4,296,536**

## METHOD OF MANUFACTURING CARTRIDGE CASES

**David W. Hicke, Joplin, Mo., assignor to Reagent Chemical and Research, Inc., Middlesex, N.J.**

**Filed Jul. 25, 1980, Ser. No. 172,391**

**Int. Cl.**[3] **B21D** *51/54;* **B21K** *21/04;* **B23P** *15/22*

**U.S. Cl. 29—1.3** **40 Claims**

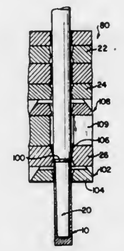
1. A method of manufacturing cartridge cases comprising the steps of:

providing an initial workpiece having substantially flat upper and lower surfaces;

forming a cup-shaped article from said workpiece without any intermediate annealing operations during formation of such cup-shaped article, said formed cup-shaped article having a side wall, a bottom wall defined by inner and outer bottom wall surfaces, and an upper open end, said outer bottom wall surface of said cup-shaped article being formed from said substantially flat lower surface of said initial workpiece; and

engaging said formed cup-shaped article with a punch element and forcing said cup-shaped article through a series of die members to produce said cartridge case without annealing said cup-shaped article after passage through any of said die members, said punch element having an outer side wall and a bottom wall, said bottom wall of said punch element being dimensioned so that the diameter of the peripheral edge of said bottom wall is substantially the






same as the diameter of the peripheral edge of said inner bottom wall surface of said cup-shaped article whereby at least said peripheral edge of said bottom wall of said punch element will contact the peripheral edge of said inner bottom wall surface of said cup-shaped article when said punch element engages said cup-shaped article to thereby align said punch element and said cup-shaped article with one another for forcing said cup-shaped article through said series of die members, and the side wall of said punch element and said die members being of predetermined dimensions in relation to the dimensions of said cup-shaped article so that said cup-shaped article is only subjected to ironing during passage through said die members to thereby increase the length of the side wall of said cup-shaped article while reducing the thickness of the side wall of said cup-shaped article, and so that the thickness of said side wall of said cup-shaped article at a point adjacent the upper open end thereof is reduced during passage through said die members by at least 65%.

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**4,296,537**

## VARIABLE DEFLECTION ROLL CONTROLLED BY HYDRAULICALLY ACTUATED RECIPROCATING ELEMENTS

**Eduard Küsters, Gustav-Fünders-Web 18, 4150 Krefeld, Fed. Rep. of Germany, and Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany**

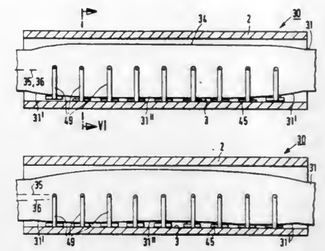
**Filed Oct. 3, 1979, Ser. No. 81,327**

**Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905542**

**Int. Cl.**[3] **B21B** *13/02*

**U.S. Cl. 29—116 AD** **5 Claims**

1. A hydraulically controlled variable deflection roll comprising a rotative shell having an external workrolling surface and a cylindrical inside, a fixed shaft extending through said inside with radial clearance permitting independent bending of the roll and shaft, said shaft having on one side a longitudinally extending series of blind bores extending radially into the shaft and containing reciprocating elements having outer sides connecting with bearing shoes bearing on the shell's said inside, and means for introducing hydraulic pressure behind said elements so that said shoes apply outwardly directed force to the shell's inside and stressing said shaft with force in a direction away from the shell's said inside on which said shoes bear,




said shaft, shaped so as to taper towards its ends and bulge toward its middle, whereby when said shaft is stressed by said force, its said side will form substantially a uniform clearance from the shell's said inside substantially throughout the extent of said series of elements.

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**4,296,538**

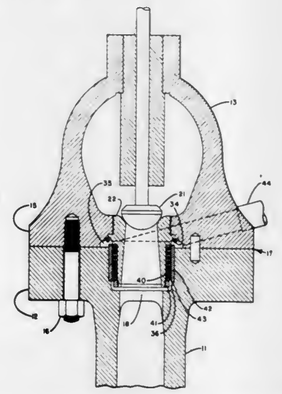
## METHOD OF PROVIDING A SEALING ASSEMBLY BETWEEN A STEAM CHEST AND TURBINE CASING

**William A. Straslicka, Norvelt, Pa., assignor to Carrier Corporation, Syracuse, N.Y.**

**Division of Ser. No. 909,132, May 24, 1978, Pat. No. 4,219,201. This application Nov. 2, 1979, Ser. No. 90,724**

**Int. Cl.**[3] **B23P** *15/00*

**U.S. Cl. 29—156.4 R** **4 Claims**




1. A method of establishing a reduced pressure across an interface between a steam chest and a turbine casing, wherein the steam chest and turbine casing define a fluid aperture for conducting high pressure steam from the steam chest, past the interface, and into an interior of the turbine casing, the method comprising the steps of:

forming a chamber at an end of the interface adjacent the fluid aperture;

separating the interface and the chamber from the fluid aperture to prevent direct contact between the high pressure steam and the interface as steam is conducted through the fluid aperture;

defining a fluid flow path for conducting fluid from the interior of the casing to the chamber;

restricting the fluid flow path from the interior of the casing to the chamber; and

venting the chamber to maintain a reduced pressure lower than the steam chest pressure in the chamber and at the end of the interface adjacent the fluid aperture.

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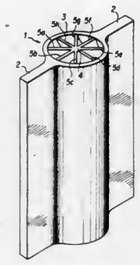
**4,296,539**

## HEAT TRANSFER TUBING FOR NATURAL GAS EVAPORATOR

**Takayoshi Asami, Otsu, Japan, assignor to Kobe Steel, Limited, Kobe, Japan**

**Filed Jan. 29, 1979, Ser. No. 7,324**
**Claims priority, application Japan, Jan. 27, 1978, 53-8601**
**Int. Cl.³ B23P** *15/26*
**U.S. Cl. 29—157.3 A** **13 Claims**



1. A method of making a heat transfer tube which comprises the steps of:

fabricating an elongate tubular body with two integrally attached planar fin members thereon extending longitudinally to the axis of said tubular body and projecting radially outward from the peripheral surface of said tubular body, and at the same time forming a plurality of longitudinally extending flutes on only the outer surfaces of the tubular body and fin members, while leaving the internal surface of the tubular body smooth and free of surface irregularities;

fabricating a helical fin member including at least three fin elements, each of said fin elements radially projecting from and extending longitudinally to a common axis;

inserting said helical fin member into said tubular body; and

drawing said tubular body alone in the direction of the longitudinal axis of said tubular body such that a pressure-fitting relationship is formed between said helical fin member and the inner surface of said tubular body.

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**4,296,540**

## METHOD FOR SEALING A DRYER

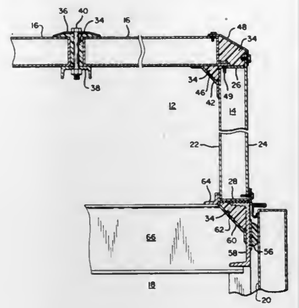
**George R. Potter, Coos Bay, Oreg., assignor to Burley Industries, Inc., Coos Bay, Oreg.**

**Continuation-in-part of Ser. No. 971,845, Dec. 21, 1978, abandoned. This application Sep. 30, 1980, Ser. No. 192,244**
**Int. Cl.³ B23P** *3/00, 19/04*
**U.S. Cl. 29—460** **12 Claims**

1. A method for sealing a veneer dryer, having a chamber defined by planar panels connected to each other at respective elongate joints extending along respective mutually adjacent edges of said panels for confining gas at a dryer operating temperature exceeding the ambient temperature outside the chamber, against leakage of said gas from said chamber, said method comprising:

(a) while said panels are connected to each other, fastening respective elongate enclosing members into abutment with mutually adjacent pairs of said panels along said respective joints such that each of said enclosing members bridges and is longitudinally coextensive with a respective one of said joints and thereby forming respective enclosures between said enclosing members and said panels, the interiors of said respective enclosures being exposed to respective ones of said joints;

(b) injecting into said enclosures, at a temperature less than said dryer operating temperature, a heat-resistant, gas-impermeable closed cell curable foam in such quantity that said enclosures are substantially filled with said closed cell foam;



(c) permitting said foam to cure; and

(d) thereafter operating said dryer at said dryer operating temperature and thereby increasing the temperature of said closed cell foam so as to expand said foam within said enclosures into tight sealing abutment with said joints to prevent leakage of said gas from said chamber through said joints.

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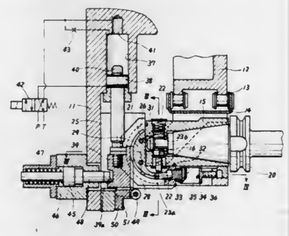
**4,296,541**

## TOOL STORAGE MAGAZINE FOR A MACHINE TOOL

**Akira Tsuboi, and Shiro Kato, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Dec. 6, 1979, Ser. No. 100,722**
**Claims priority, application Japan, Jan. 13, 1979, 54-3320**
**Int. Cl.³ B23Q** *3/157*
**U.S. Cl. 29—568** **5 Claims**



1. A tool storage magazine for a machine tool comprising:

a plurality of tool sockets mounted to be selectively indexable to an exchange position and pivotable at said exchange position;

a holding plunger slidably received in each of said tool sockets and engageable with a tool stored in an associated one of said tool sockets for holding said tool therein;

first bias means provided in each of said tool sockets for urging said holding plunger toward engagement with said tool stored in an associated one of said tool sockets;

a cradle member pivotably mounted at said exchange position about the same axis as the pivotable movement of any of said tool sockets indexed to said exchange position and having means to carry any of said tool sockets indexed to said exchange position;

a pivot drive mechanism connected to said cradle member for pivoting the same between first and second angular positions;

a locking member carried on said cradle member and movable onto the sliding path of said holding plunger of any of said tool sockets carried in said cradle member for inhibiting disengagement of said holding plunger from said tool stored in any of said tool sockets;

second bias means provided on said cradle member for urging said locking member onto the sliding path of said holding plunger of any of said tool sockets carried on said cradle member; and

unlocking means engageable with said locking member for retracting the same against said second bias means from the sliding path of said holding plunger of any tool socket carried on said cradle member when said cradle member is pivoted by said pivot drive mechanism to the vicinity of said second angular position.



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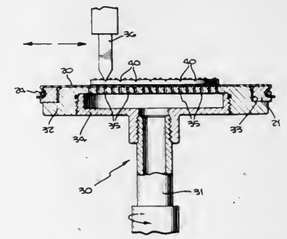
**4,296,542**

## CONTROL OF SMALL PARTS IN A MANUFACTURING OPERATION

**Alexander Gotman, Santa Monica, Calif., assignor to Presco, Inc., Beverly Hills, Calif.**

**Filed Jul. 11, 1980, Ser. No. 167,667**
**Int. Cl.³ H01L** *21/66*
**U.S. Cl. 29—574** **14 Claims**



1. In the process of manufacture of microminiature electronic circuits in which first a flat wafer is formed having a plurality of contact bumps protruding from one flat surface, then the wafer is cut into a number of individual chips each having at least two such contacts, then each chip is individually electrically tested, and thereafter selected chips are incorporated into electrical circuit assemblies;

a method of forming and handling the chips comprising the steps of:

selecting a resilient diaphragm that is larger than the wafer;

stretching the diaphragm and at the same time supporting it in a substantially horizontal position;

placing the wafer upon the upper surface of the prestretched diaphgram with its contacts uppermost;

adhesively securing the entire under surface of the wafer to the upper surface of the diaphragm;

cutting the wafer along two sets of parallel lines so as to form a predetermined array of individual chips supported on the diaphragm;

selectively raising and thereby further stretching a selected portion of the diaphragm so as to elevate a selected one of the chips above the array;

while the selected chip is thus elevated, engaging the protruding contacts thereof for purpose of testing its electrical characteristics;

returning the selected portion of the diaphragm to its original position so that the selected chip resumes its position in the array;

raising other portions of the diaphragm so as to elevate and test other chips;

thereafter again raising the selected portion of the diaphragm so as to again elevate the selected chip; and

then incorporating the selected chip into an electrical assembly.

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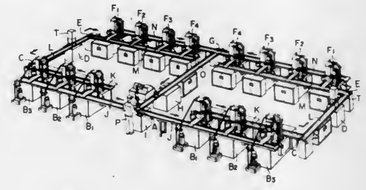
**4,296,543**

## METHOD OF AND APPARATUS FOR FABRICATING STATOR ASSEMBLIES OF ELECTRICAL MACHINES

**Tokuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed May 29, 1979, Ser. No. 43,027**
**Claims priority, application Japan, May 30, 1978, 53-65209**
**Int. Cl.³ H02K** *15/06*
**U.S. Cl. 29—596** **10 Claims**



1. A method of fabricating stator assemblies for electrical machines on an automated assembly line, each of said stator assemblies having a stator core, main coils and auxiliary coils, said assembly line including a plurality of transfer tools each having a plurality of blades rotatably arranged thereon for carrying said main and auxiliary coils; a plurality of conveyors arranged in a closed loop for successively moving said plurality of transfer tools in one direction, said closed loop conveying path including a first main path having an inlet end, first branch paths extending from said first main path, a second main path merging said first branch paths, second branch paths extending from said second main path and a third main path merging said second branch paths and having a terminal end connected to the inlet end of said first main path; a plurality of main coil winding devices located along corresponding ones of said first branch paths a plurality of auxiliary coil winding devices located along corresponding ones of said second branch paths; and a drawing-in device positioned along said third main path for drawing said main and auxiliary coils into said stator core, said method comprising the steps of:

distributing selectively each of said transfer tools into a corresponding one of said main coil winding devices, said devices being in a stand-by state;

transferring at least one of said main coils to each of said transfer tools;

moving each of said transfer tools from its main coil winding device to merge said tools onto said second main path;

pushing said main coils into the bottom of each of said transfer tools;

indexing each of said transfer tools while on said second main path by rotating the blades therein;

distributing selectively each of said transfer tools into a corresponding one of said auxiliary coil winding devices, said devices being in a stand-by state;

transferring at least one of said auxiliary coils to each of said transfer tools;

moving each of said transfer tools from its auxiliary coil winding devices to merge said tools onto said third main path; and

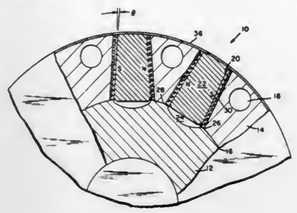
drawing in the main auxiliary coils carried by each of said transfer tools into said stator core, each of said stator assemblies being thereby fabricated by a single operation of said drawing-in device.

**4,296,544**

## METHOD OF MAKING ROTOR ASSEMBLY WITH MAGNET CUSHIONS

**Lyman R. Burgmeier, Cypress; Frederick B. McCarty, San Pedro, and Alexander Silver, Tarzana, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.**

**Division of Ser. No. 973,343, Dec. 26, 1978. This application Mar. 11, 1980, Ser. No. 129,546**
**Int. Cl.³ H02K *15/02***
**U.S. Cl. 29—598** **8 Claims**



1. A method of inserting outwardly converging wedge-shaped magnets into outwardly converging wedge-shaped slots in a rotor assembly, comprising the steps of:
placing cushions in contact with the walls of the slots;
placing the magnets into the outwardly converging wedge-shaped slots in the rotor assembly; and
rotating the rotor assembly until the magnets become wedged in place in the slots by flowing the material of the cushions therebetween.

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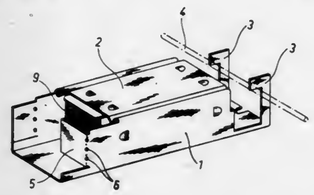
**4,296,545**

## CASING HOOK USED TO IMPREGNATE CHOKE OR TRANSFORMER

**Esko Lampinen, Helsinki, and Kari Kajavo, Espoo, both of Finland, assignors to Oy Helvar, Helsinki, Finland**

**Filed Mar. 31, 1980, Ser. No. 135,890**
**Int. Cl.³ H01F *41/00***
**U.S. Cl. 29—602 R** **6 Claims**



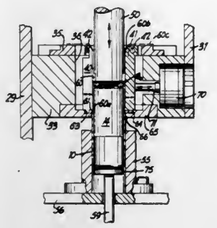
1. A method of conveying chokes or transformers through an impregnation vessel containing an impregnating agent comprising:
forming a plurality of hooks which are of one-piece construction with a casing substantially enclosing said choke or transformer;
engaging said hooks with a suspension means;
suspending said casing and enclosed choke or transformer from said hooks;
immersing said suspended casing and enclosed choke or transformer, exclusive of said hooks and said suspension means, in said impregnating agent for periods sufficient to allow impregnation;
and removing said casing and enclosed choke or transformer from said impregnating agent while said hooks remain engaged by said suspension means;
whereby said casing and enclosed choke or transformer are impregnated with said agent and air dried without immersing said hooks or said suspension means.

**4,296,546**

## APPARATUS FOR ASSEMBLING ELECTROCHEMICAL CELL

**Michael S. Hill, and David A. Poff, both of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.**

**Filed Feb. 15, 1979, Ser. No. 12,659**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—730** **14 Claims**



1. Apparatus for inserting an electrode assembly core into a casing for an electrochemical cell, comprising:
support means for the casing, the casing having an open end for receiving the core;
a collet assembly comprised of a plurality of closely spaced tubular segments which together form a smooth, substantially continuous ring conforming generally to the perimeter of the core to be inserted,
said casing support means being disposed to position the open end of the casing proximate to and in axial alignment with an exit end of said ring,
said ring being inwardly tapered to engage and guide the perimeter of the core into the casing during passage of the core through the collet assembly,
said tapered guiding surface being movable radially inwardly and outwardly for selectively altering the dimension of the perimeter defined thereby;
means for mounting said collet assembly in fixed relation to said casing support means;
controllable mechanical stop means for restricting the radially outward movement of the guiding surface to a first radial dimension, during one portion of the travel of the core through the collet assembly, and to a second radial dimension during another portion of the travel of the core through the collet assembly,
core stuffer means for axially pushing the core through the collet assembly and into the casing; and
means responsive to the axial location of the core for controlling the mechanical stop means.

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**4,296,547**

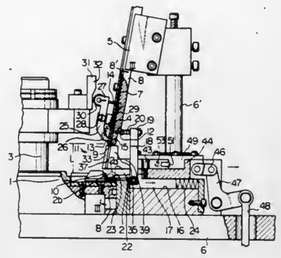
## APPARATUS FOR LOADING A PULL TAB ON A SLIDER BODY

**Tsutomu Hakoi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan**

**Filed Dec. 21, 1979, Ser. No. 106,041**
**Int. Cl.³ B23P *19/00***
**U.S. Cl. 29—766** **3 Claims**

1. An apparatus for loading a pull tab on a slider body in a machine for progressively assembling sliders for slide fasteners, said machine comprising a base, a turret supported on the base for intermittent rotation about its center axis and having a plurality of spaced-apart recesses arranged circumferentially around and on said turret for receiving and holding a slider body, a plurality of assembling stations arranged around the periphery of said turret, and means for intermittently rotating said turret so as to position a slider body holding recess successively opposite each of the stations, said apparatus being at one assembling station of said assembling stations and comprising a pull tab supply means and a pull tab holding means; said pull tab supply means includes a holder provided on the base, a chute supported by said holder and extending substantially vertically for receiving longitudinally aligned pull tabs therein and directing them toward a pull tab receiving portion in said recess by gravity, and means for discharging pull tabs one by one from the chute; said pull tab holding means is positioned between an outlet of said chute and the pull tab receiving portion of said recess and is movable between an advanced





position and a retracted position; said pull tab holding means being arranged to form a guide channel for receiving a pull tab discharged from the chute between said outlet of said chute and the pull tab receiving portion of said recess in said advanced position, and means for opening the guide channel in said retracted position to thereby release a pull tab therefrom to drop said tab into said pull tab receiving portion of said turret recess.

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**4,296,548**

## METHOD FOR SPLICING AN ELECTRICAL CABLE

**James N. Zehren, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio**

**Division of Ser. No. 816,493, Jul. 18, 1977, Pat. No. 4,198,173, which is a continuation of Ser. No. 616,318, Sep. 24, 1975, abandoned. This application Oct. 15, 1979, Ser. No. 84,756**
**Int. Cl.³ H01R *43/04***
**U.S. Cl. 29—871** **3 Claims**

1. A method of splicing first and second sections of electrical cable, comprising the steps of:
providing transversely constrictive sleeve means;
sliding said sleeve means onto said first cable section;
forming an electrical splice between conductors in said first and second cable sections;
positioning said sleeve means over said electrical splice so that the sleeve means receives opposed end portions of said first and second cable sections;
attaching one end of said sleeve means to said first cable section;
pushing said cable sections toward each other to provide slack in said opposed end portions of the cable sections; and
attaching the other end of said sleeve means to said second cable section, wherein each of said attaching steps comprises:
providing a grommet having mating parts adapted to be forced together around a cable section;
forcing the mating parts of the grommet together around the respective cable section to grip the section therebetween;
slipping the respective end of the sleeve means over the grommet;
providing encircling fastening means around the sleeve means; and
tightening the fastening means around the sleeve means over the grommet.

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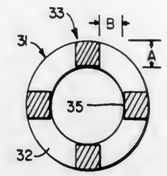
**4,296,549**

## METHOD OF MAKING A LEAD SOCKET INSERT

**Guido Bertoglio, Viganello, Switzerland, assignor to Augat Inc., Attleboro, Mass.**

**Division of Ser. No. 926,227, Jul. 19, 1978, Pat. No. 4,186,990. This application Aug. 3, 1979, Ser. No. 63,382**
**Int. Cl.³ H01R *43/00***
**U.S. Cl. 29—874** **4 Claims**



1. A method for making a lead socket insert, said method comprising the steps of:
center boring a wire segment to form a hollow cylinder;
removing material for a portion of the length of said cylinder parallel to its longitudinal axis and tangential to the inner peripheral surface thereof thereby forming at least two oppositely disposed fingers having confronting spaced parallel flat surfaces; and then
bending said fingers inwardly toward the longitudinal axis of said cylinder to provide a converging configuration;
whereby said fingers flex in the manner of a leaf spring fixed at its proximate end connected with said cylinder.

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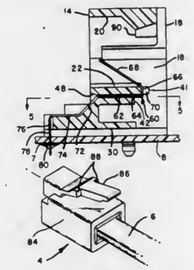
**4,296,550**

## METHOD OF MANUFACTURING ELECTRICAL CONNECTOR RECEPTACLE

**Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Division of Ser. No. 944,095, Sep. 20, 1978, Pat. No. 4,186,988. This application Nov. 8, 1979, Ser. No. 92,618**
**Int. Cl.³ H01R *43/00***
**U.S. Cl. 29—884** **1 Claim**



1. A method of manufacturing an electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said plug-receiving opening having opposed internal sidewalls and opposed internal endwalls, said housing having oppositely directed external sidewalls and oppositely directed external endwalls, a plurality of electrical conductors in side-by-side spaced-apart relationship, each of said conductors comprising a contact spring

extending from one of said internal sidewalls at a location adjacent to said plug-receiving end diagonally into said plug-receiving opening and towards the opposite internal sidewall, and each conductor having a lead portion extending from said plug-receiving end through said housing between said one internal sidewall and the adjacent external sidewall and towards said rearward end, said plug-receiving opening being dimensioned to receive a connector plug having spaced-apart contact members therein which engage contact spring portions of said conductors, said method comprising the steps of:

manufacturing said housing as a one-piece molding having a single conductor-receiving opening extending therethrough from said rearward end to said plug-receiving end, which opening is between said one internal sidewall and the adjacent external sidewall and which has a constricted width at said plug-receiving end which is sufficient to receive all of said conductors,

manufacturing said conductors as a continuous strip of stamped and formed conductors in side-by-side spaced-apart relationship with said conductors extending from a continuous carrier strip means and with the spacing between at least portions of adjacent conductors in said strip the same as the required spacing between adjacent conductors in said connector receptacle,

severing a section of said strip having a number of conductors thereon equal to the number of conductors required in said connector receptacle,

inserting said conductors in said section through said conductor-receiving opening and positioning intermediate portions of said conductors in said conductor-receiving opening,

severing said carrier strip means from said section of strip, and reversely bending first end portions of said conductors which extend beyond said plug-receiving end and positioning said first end portions in said plug-receiving opening whereby said first end portions constitute said contact springs and said intermediate portions constitute said lead portions with second end portions of said conductors extending beyond said rearward face and being adapted for connection to further conductors.

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**4,296,551**

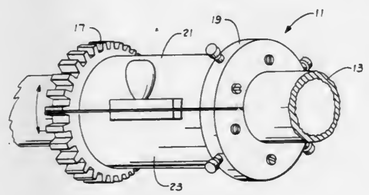
**RACHETING PIPE CUTTER**

**Leroy Boyd, 1900 Fox Ave., Moore, Okla. 73160**

**Filed Dec. 10, 1979, Ser. No. 102,821**

**Int. Cl.³ B23D *21/06;* B26B *27/00***

**U.S. Cl. 30—98** **10 Claims**




1. A pipe cutter comprising:

a cylindrical pipe-receiving body having a turning gear at one end thereof, a pipe cutting means at the other end thereof and a central portion disposed longitudinally therebetween connecting said pipe cutting means and said turning gear, said pipe-receiving body comprising two longitudinal portions joined by a hinge to allow said pipe-receiving body to be opened and closed about a pipe, said hinge being disposed longitudinally on said central portion between said turning gear and said pipe cutting means such that said hinge does not contact and does not extend into said turning gear and said pipe cutting means; and

lever means for rotating said pipe-receiving body about a pipe, said lever means having a lever arm for manual operation of the pipe cutter and a pawl for engaging said turning gear in a ratchet motion, and said lever means having a race for receiving said turning gear.

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**4,296,552**

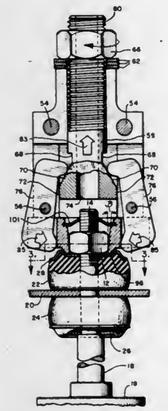
**CUTTING AND SPLITTING TOOL**

**David B. Sabatino, 253 N. California, Mundelein, Ill. 60060**

**Filed Oct. 25, 1979, Ser. No. 87,985**

**Int. Cl.³ B26B *17/00***

**U.S. Cl. 30—183** **19 Claims**



1. An improved cutting tool comprising:

a housing means having a first channel extending along an axis therethrough and at least one second channel substantially perpendicularly intersecting said first channel, said housing means being formed to have an opening at the intersection of said channels;

a shaft means slidably disposed for linear movement in said first channel, said shaft means including a first portion configured to have a tapered camming surface and a second portion;

cutting means slidably disposed for linear movement in said at least one second channel, said cutting means including a cutting edge movable into said opening from one side, said cutting edge being constructed and disposed so that it is substantially parallel to said axis during linear movement of said cutting means;

means coupled to said housing means for forming a surface on a side of said opening opposite to said one side;

cam follower means pivotally mounted in said housing means and having a first surface for engaging said camming surface and a second surface for engaging said cutting means; and

means coupled to said second portion of said shaft means for causing linear movement of said shaft means and corresponding movement of said camming surface;

said camming surface being coupled to rotate said cam follower means upon movement of the shaft means in one direction to cause linear movement of said cutting means in said at least one second channel and corresponding linear movement of said cutting edge in said opening and towards said surface means.



**4,296,553**

**PORTABLE POWER CHAIN SAW**

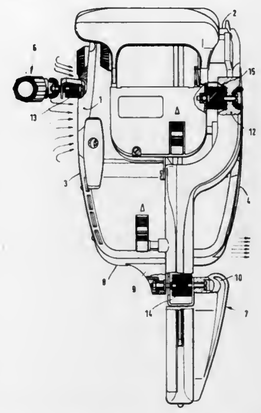
**Rudolf Dirks, Weinstadt-Schnait, and Karl Nitschmann, Schorndorf, both of Fed. Rep. of Germany, assignors to Adreas Stihl, Waiblingen, Fed. Rep. of Germany**

**Filed Nov. 16, 1979, Ser. No. 95,053**

**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911498**

**Int. Cl.³ B27B *17/00***

**U.S. Cl. 30—381** **21 Claims**



1. A portable power ehain saw, comprising in combination:

a housing;

at least one grip including an end for connection and operatively connected to said housing;

vibration attenuating means for each grip connection having a longitudinal central axis as well as being arranged between the end of a grip and said housing;

a support part operatively connected to said housing and the end of said grip belonging therewith for each grip connection as well as being exchanged and installed subsequently for the motor chain saw without great cost and complexity, said support part extending between said housing and a grip belonging therewith, said support part extending generally parallel to the longitudinal central axis of said vibration attenuating means;

at least one of said support part and said housing including an opening, and a securing member inserted in said opening with play and serving to limit movement of said support simultaneously as overload protection for said vibration attenuating means.

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**4,296,554**

**TAPE MEASURE AND MARKING DEVICE**

**Everett A. Hammerstrom, 34016 Edmonton, Farmington Hills, Mich. 48024**

**Filed Aug. 18, 1980, Ser. No. 179,026**

**Int. Cl.³ G01B *3/10;* B43L *9/04***

**U.S. Cl. 33—138** **4 Claims**

1. A marking device for a measuring tape of the type carried in a housing with the tape coiled inside, comprising:

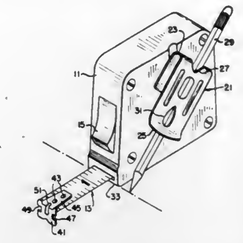
a spring clip attached at one end to the side of the housing, said spring clip having a 180-degree bend adapted to engage the belt, a pocket, or edge of clothing,

a marking member,

said spring clip having an opening adapted to receive said marking member in the bend portion thereof,

said clip further having an ovoid aperture in the end removed from the end attached to said housing, and being adapted to engage said marking member when inserted through said opening,

said spring clip further being curved at said ovoid aperture away from the end attached to said housing,



said spring clip being fixed to said housing at an angle to position said marking member engaged within said opening and said ovoid aperture in alignment with the point on said housing where said tape exits from said housing.

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**4,296,555**

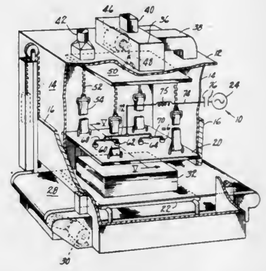
**METHODS AND APPARATUS FOR CONDITIONING PLYWOOD VENEER WITH HIGH FREQUENCY RADIO ENERGY**

**Mark D. Preston, Meeting House Hill Rd., Mason, N.H. 03048**

**Filed Jan. 21, 1980, Ser. No. 113,659**

**Int. Cl.³ F26B *3/34***

**U.S. Cl. 34—1** **15 Claims**



1. A method of conditioning a multiplicity of sheets of veneer in a batch comprising the steps of arranging the sheets in a stack, placing the stack between a pair of electrodes, applying a predetermined pressure to the stack between the electrodes, applying radio frequency energy to the electrodes, sensing changes in moisture content of the stack under the influence of the radio frequency energy, partially relieving the pressure in response reaching a predetermined level of moisture content and continuing the application of radio frequency energy to the electrodes.

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**4,296,556**

**ROD COOLING BOX AIR WIPE NOZZLE**

**Lynn W. Bray, Antioch, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Apr. 10, 1980, Ser. No. 139,074**

**Int. Cl.³ F26B *13/28***

**U.S. Cl. 34—107** **2 Claims**

1. An air wipe nozzle apparatus for removing water from a rod in a rod mill, said apparatus including:

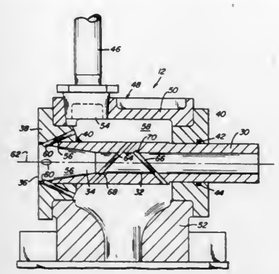
(a) compressed air housing means, including means defining an air inlet connected to a source of compressed air and an air reservoir for receiving compressed air from said air inlet;

(b) air nozzle means extending through said compressed air

housing and being configured as a tube having an entrance end and an exit end permitting the passage of rods axially therethrough, said air nozzle means including:

(i) first air passage means comprising a plurality of holes extending from said air reservoir and communicating at an acute angle with said tube proximate the entrance end to direct compressed air from said reservoir against a rod entering said tube, and

(ii) second air passage means positioned downstream from said first air passage means and comprising a pair of slits



extending through a portion of said tube from said air reservoir oriented at about forty-five degrees with respect to the axis of said tube and the direction of rod movement therethrough and being oriented substantially normal to each other for producing a venturi effect within said tube whereby air is drawn in from the exit end and moved toward the entrance end for wiping a contained tube clean of water and to create water stripping air turbulence at said entrance end and a vacuum at said exit end for ensuring the complete removal of water from said rod.

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**4,296,557**

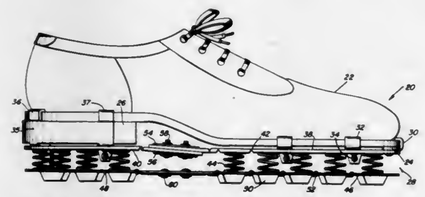
**SHOE WITH SOLE CUSHIONING ASSEMBLY**

**Paul D. Pajevic, 475 N. Northwest Hwy., Park Ridge, Ill. 60068**

**Filed Jan. 31, 1980, Ser. No. 118,076**

**Int. Cl.³ A43B** *3/10;* **A43C** *15/00*

**U.S. Cl. 36—7.8** **14 Claims**



1. A shoe with a sole cushioning assembly comprising a sole, a substantially flat flexible sole segment juxtaposed with said shoe sole and including a plurality of hinges spaced along the length of said sole segment to provide flexibility to said sole segment, a plurality of cushioning means attached to said sole segment and a plurality of cushion pads associated with said cushioning means, said cushion pads being the surface contacting portion of said shoe and being flexibly mounted substantially along the entire length of said sole.

**4,296,558**

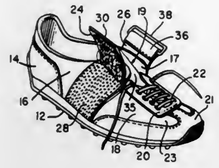
**ADJUSTABLE AND FLEXIBLE CLOSURE ASSEMBLY FOR SHOES WITH SEGMENTED UPPERS**

**Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204**

**Filed Feb. 12, 1979, Ser. No. 11,511**

**Int. Cl.³ A43B** *11/00*

**U.S. Cl. 36—50** **11 Claims**



1. A shoe having a sole, uppers and an opening, said uppers being segmented to form upper and lower sections, each of said sections including a fastening means to independently adjust and fasten said sections, said upper section including a single fastener means formed of an adjustable and flexible closure assembly comprising:

a flexible, multi-adjustable, separable fastener means having first and second fastening members including arrays of complementary, coacting, flexible gripping elements for securing said closure assembly;

a fastener strap included on one side of said shoe having a fixed portion and a free end, said free end including said first fastening member, said second fastening member positioned adjacent said fixed portion of said fastener strap; and

an anchor strap having a fixed portion and a free end, said free end having an opening, said fastener and anchor straps overlaying said upper section and having fixed portions being attached adjacent said sole of said shoe and located to support the arch of the wearer's foot whereby said free end of said fastener strap passes through said opening in said anchor strap permitting the shoe to be adjusted to the precise desired tautness across said upper section of said shoe.

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**4,296,559**

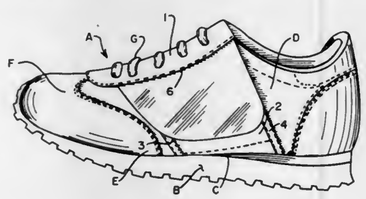
**ATHLETIC SHOE POCKET**

**Robert J. Gamm, Olivette, Mo., assignor to Envoys U.S.A., Inc., St. Louis, Mo.**

**Continuation-in-part of Ser. No. 938,098, Aug. 30, 1978. This application Dec. 26, 1979, Ser. No. 107,092**

**Int. Cl.³ A43B** *23/00*

**U.S. Cl. 36—136** **14 Claims**



1. In a pocket for an athletic shoe and designed to hold smaller size personal items such as keys, coins, or the like as during jogging, comprising, said shoe having a quarter portion fixed to the sole shank at its lower extent, a pocket being stitched to the shoe quarter approximately along its front, back, and lower edges, the upper edge of the pocket being substantially free of connection with the shoe quarter and forming a pocket slot that is capable of being pulled open for insertion of the aforementioned items therein, a cover flap stitched to the shoe along its upper edge approximately along the shoe eyestay and capable of folding over into contiguity upon the said pocket and provide it and its opening slot with coverage, and fastening means provided upon both the cover flap and the exterior of the pocket and cooperating to hold the said flap against the said pocket during shoe usage.

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**4,296,560**

**WATER INJECTION DEVICE FOR A STEAM IRON**

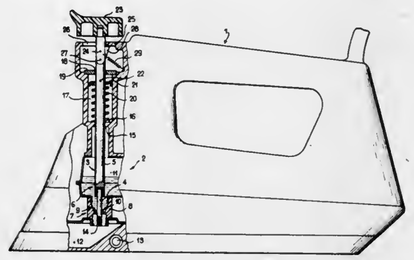
**Pierre Schwob, Lyons, France, assignor to SEB S.A., Selongey, France**

**Filed Jan. 30, 1980, Ser. No. 116,810**

**Claims priority, application France, Feb. 13, 1979, 79 03622**

**Int. Cl.³ D06F** *75/06, 75/18*

**U.S. Cl. 38—77.81** **8 Claims**



1. A water injection device for a steam iron, comprising a plunger adapted to be moved axially over a predetermined range of travel within the orifice of a nozzle formed of elastic material and adapted to encircle said plunger in closely fitting relation thereto, the nozzle orifice being substantially coaxial with the plunger and intended to provide a communication between a water reservoir and a vaporization chamber, a longitudinal groove being formed along part of the length of the plunger, the range of travel of said plunger being such that the two ends of said groove are located on each side of the orifice in a first end position and that the two ends of said groove are located on one side of said orifice in a second end position in which second end position said plunger closes said orifice, wherein the nozzle comprises an annular portion of elastic material, a thin lip being formed on the internal wall of said annular portion in order to delimit the orifice of said nozzle, said nozzle and plunger being in contact with each other in both of said positions.

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**4,296,561**

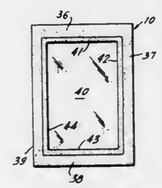
**PICTURE FRAME HAVING INTEGRAL LATCHING MEANS**

**Peter Lawrence, 33 E. 22nd St., New York, N.Y. 10010**

**Continuation-in-part of Ser. No. 34,545, Apr. 30, 1979. This application Mar. 5, 1980, Ser. No. 127,328**

**Int. Cl.³ A47G** *1/06;* **G09F** *1/10*

**U.S. Cl. 40—158 R** **22 Claims**



1. A frame for pictures, prints, or the like, comprising:

a relatively rigid, flat base, having marginal edges; the base having a front surface and an opposite rear surface;

a flat cover formed of flexible material having a degree of resiliency; the cover having a front and a rear surface; the rear surface of the cover being placed over the front surface of the base; the cover having a first edge portion and a second edge portion opposite the first edge portion;

latch means secured to the cover at the first edge portion of the cover; the latch means including a relatively rigid relatively rigid strip having greater rigidity than the flexible material of the cover, the strip being located at the first edge portion and also extending in a distance partway from the relatively rigid first edge portion to the second edge portion, and the strip also extending along the first edge portion; the strip including a surface thereof secured to the adjacent surface of the cover, whereby the strip secured to the flexible cover prevents the cover from flexing where the cover surface and strip surface are secured together;

a rigid flap on the rigid strip for extending down the rear surface of the base; the flap having greater rigidity than the flexible material of the cover; the latch means flap being long enough that the relatively rigid flap holds the cover securely on the base;

the cover being secured to the base at a location away from the first edge portion of the cover, thereby enabling the first edge portion to be latched to the base and to be moved away from the base.

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**4,296,562**

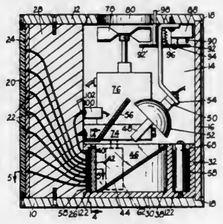
**TRAVELING LIGHT DISPLAY**

**George A. Sanborn, 19210 NE. Clackamas St., Portland, Oreg. 97230**

**Continuation of Ser. No. 887,753, Mar. 7, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,848**

**Int. Cl.³ G09F** *19/00*

**U.S. Cl. 40—438** **4 Claims**



1. A traveling light display, comprising:

(a) an elongated reader member having therethrough a multiplicity of light passageways arranged in laterally and longitudinally spaced-apart relationship,

(b) a source of light spaced from the reader member and arranged for directing light through said passageways, the source of light including an electric lamp in an electric circuit of a source of electric potential,

(c) an elongated opaque tape having therethrough a multiplicity of holes spaced apart laterally and longitudinally for registration with passageways in the reader member and arranged in patterns forming a plurality of longitudinally spaced indicia,

(d) drive means engaging the tape for moving the latter longitudinally past the reader member for producing at the light passageways said indicia patterns as spots of light moving across the reader member from one end to the other, the tape drive means including an electric drive motor in an electric circuit of a source of electric potential, an air fan driven by the tape drive motor, and an electric switch arranged in the electric circuits of the electric lamp and drive motor and operable by a predeter-

mined velocity of air driven from the fan to complete said electric circuits and operable in the absence of said predetermined velocity of air to open said electric circuits,

(e) an elongated viewing member, and

(f) coupler means registering with each passageway in the reader member for causing a spot of light appearing at a passageway to result in the display of a spot of light at the viewing member moving across the latter from one end to the other.

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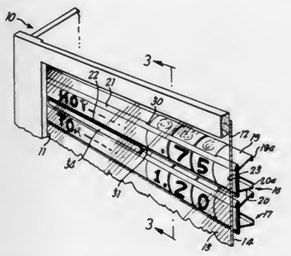
**4,296,563**

## DISPLAY DEVICE WITH PRICE CHANGE CARTRIDGES

**Joseph Clement, Bradenton, Fla., assignor to The Mead Corporation, Dayton, Ohio**

**Filed Aug. 5, 1980, Ser. No. 175,476**
**Int. Cl.³ G09F *11/18***
**U.S. Cl. 40—518** **7 Claims**




1. In a display device of the type comprising a translucent facia, a carrier disposed behind said facia and including a display area, at least one information strip bearing a series of characters and being mounted on said carrier for slidable adjustment so that the characters can be sequentially displayed in said display area, support means on which said carrier is detachably mounted with the display area located adjacent said facia, said facia and support means together defining a space in which said carrier is accommodated, the improvement wherein said support means comprises panels located adjacent opposite ends of said facia and complementary attachment means provided on said carrier and on said support means, said complementary means comprising rails provided on said panels and flanges provided on said carrier.

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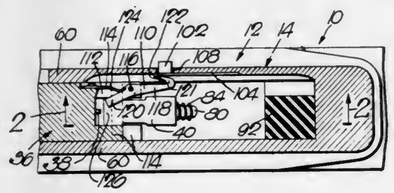
**4,296,564**

## SEMI-AUTOMATIC RELOADING FIREARM

**E. Ernest Oberst, Cheshire, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.**

**Filed Jun. 18, 1979, Ser. No. 49,347**
**Int. Cl.³ F41C *27/12***
**U.S. Cl. 42—1 C** **2 Claims**




1. In a firearm having a receiver member, a firing chamber, a breech bolt member spring-urged into closed position and retracted therefrom into open position by the powder gases of a fired cartridge, a cartridge magazine, a device for feeding a cartridge from the magazine into the firing chamber on each cycle of the breech bolt member into open and closed position, a hidden hammer in said receiver member moved into cocked position by the breech bolt member on its retraction from closed position and spring-advanced into firing position on release in its cocked position, and means including a trigger for releasing said hammer in its cocked position on pulling the trigger, the combination of a visible signal element movable on the receiver member, and an actuator pivoted on said breech bolt member for turning movement thereon, with said actuator being spring-urged into a first position in the path of said hammer to be cammed thereby into a second position on the advance of said hammer into firing position, and said signal element is in and out of follower relation with said actuator in said closed and open positions, respectively, of said breech bolt member, with said signal element when in follower relation with said actuator assuming in said first and second actuator positions corresponding first and second positions denoting firing and non-firing response, respectively, of said hammer to the next trigger pull.

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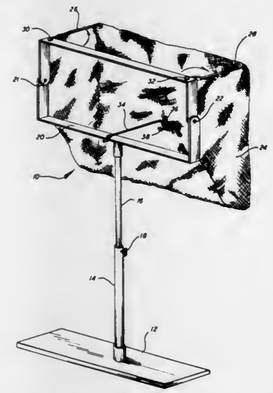
**4,296,565**

## APPARATUS FOR COLLECTING EJECTED CARTRIDGES

**Harry A. Jaffin, 190 Parish St., Canandaigua, N.Y. 14424, and Russell H. Gliewe, R.D. 3, Holcomb, N.Y. 14469**

**Filed Oct. 15, 1979, Ser. No. 84,555**
**Int. Cl.³ F41C *27/00***
**U.S. Cl. 42—1 T** **8 Claims**




1. A free-standing structure for receiving cartridges automatically ejected from a firearm upon firing from a predetermined location, said structure comprising:

(a) wall means of flexible, resilient, unstretched material forming a bag-like enclosure with an unobstructed opening at one end;

(b) a rigid frame attached to said wall means and holding said one end of said wall means in a position laterally adjacent said predetermined location and physically separated from said firearm, with said opening fully occupying a plane intersected by cartridges ejected by said firearm when fired from said predetermined location, whereby said ejected cartridges pass through said opening and strike the interior of said bag-like enclosure; and

(c) support means holding said wall means outwardly from said frame to provide a portion of said wall means directly opposite and spaced from said opening in a slack, unstretched condition to substantially prevent rebound of said cartridges.

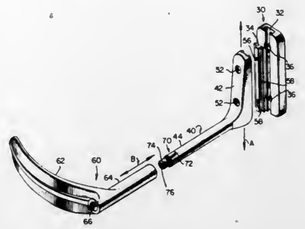


**4,296,566**

## ARM OR SHOULDER ATTACHMENT FOR GUNSTOCKS

**Conrad Campos, P.O. Box 687, Tonopah, Nev. 89049**

**Filed Aug. 28, 1979, Ser. No. 70,420**
**Int. Cl.³ F41C *23/00***
**U.S. Cl. 42—71 R** **2 Claims**




1. In combination with a firearm having a barrel and a rearwardly extending gunstock when the firearm is in the firing position, a gunstock attachment comprising:

a butt plate attachable to the butt end of the gunstock;

track means formed in the butt plate with the longitudinal axis of the track extending in a vertical direction when the firearm is in the firing position;

a first gunstock extending member having a foot portion and a leg portion normal to the foot portion;

track engaging means formed on the foot portion and adapted to engage the track means on the butt plate;

means for releasable securing the track means and track engaging means to each other;

a second gunstock extending member comprising a body engaging arm member and a rod member, said rod member telescopically engaging the leg member of the first gunstock extending member;

means for securing said rod member to the leg member,

wherein the second gunstock member is rotatable relative to the first gunstock extending member;

wherein the means for securing said rod member to the leg member prevents relative telescopic movement and relative rotational movement between the members; and

wherein the securing means for said rod member and the leg member comprise a bolt and split sleeve carried by the extended rearward end of the leg member.

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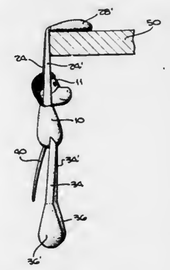
**4,296,567**

## FIGURE TOY WITH FLEXIBLE APPENDAGES

**Pascal M. Kamar, Palos Verdes Estates, Calif., assignor to Kamar International, Inc., Torrance, Calif.**

**Filed Apr. 22, 1980, Ser. No. 142,786**
**Int. Cl.³ A63H *3/46***
**U.S. Cl. 46—163** **6 Claims**




1. A figure toy adapted for undergoing simulated contortions, comprising a body part, the body part having a plurality of appendages, such appendage including a flexible manipulatable portion and an end section, the said portion being between the body part and the end section, the said end section having a construction which is weighted whereby to have a holding capability whereby the toy can be supported or suspended from a surface by way of at least one of the appendages and its end section having engagement with the surface, said end section having sufficient weight to hold the toy suspended.

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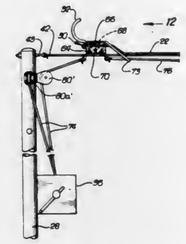
**4,296,568**

## AGRICULTURAL CROP COVER

**Jesse M. Dukes, P.O. Box 1184, Hemet, Calif. 92343**

**Filed Nov. 5, 1979, Ser. No. 91,472**
**Int. Cl.³ A01G *13/00***
**U.S. Cl. 47—20** **10 Claims**




1. An apparatus for protecting crops against frost damage, said apparatus of the type having a framework supported by a plurality of erect posts planted permanently in the earth and a movable cover supported by and above said framework and above the crops, said cover being capable of being extended over the top of the framework to protect the crops from damage resulting from still air radiation frost, the improvement comprising:

a static rigging attached to said posts;

means for connecting said cover to said static rigging at a location along a center row of said posts; and

means for transporting at least one outer edge of said cover between a first outer edge of said framework and any position between said center row location and said outer edge, said transporting means being supported by said static rigging; and being moved by running rigging, and

means for scooping portions of said cover from said static rigging and gathering said cover on said transporting means as said transporting means moves from said first outer edge to said other positions.

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**4,296,569**

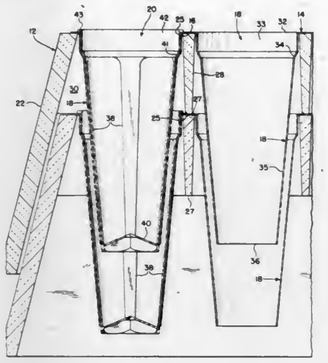
## NESTABLE AND STACKABLE TRANSPLANTING SYSTEM

**Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Oct. 22, 1979, Ser. No. 87,286**
**Int. Cl.³ A01G *23/02***
**U.S. Cl. 47—73** **9 Claims**

1. An assembly adapted for growing a plurality of plants intended to be transplanted, said assembly comprising a support tray, a plurality of integrally interconnected sleeves, said tray having sidewalls and a grid-like upper structure, said sidewalls being inclined upwardly and inwardly from an open bottom of said support tray to said grid-like upper structure, said upper structure comprising a plurality of vertical wall means spaced apart longitudinally and laterally of said tray, said vertical wall means defining a first predetermined vertical dimension from the uppermost surface of the grid-like structure to the lowermost surface of the vertical wall means, the sidewalls defining a second predetermined vertical dimension

from the uppermost surface of the grid-like structure to the lowermost edge surface of the tray, the second predetermined vertical dimension being greater than the first predetermined vertical dimension, said plurality of integrally interconnected sleeves including a plastic sheet forming web means interconnecting the upper extremities of the sleeves, the sleeves depending downwardly from the web means and arranged in a pattern permitting the web means to be disposed on the uppermost surface of the grid-like structure with the sleeves depending between the vertical wall means, each of the sleeves having walls tapering downwardly and inwardly from the uppermost extremity to the lowermost extremity thereof, the vertical dimension of the sleeve being substantially greater than said first predetermined vertical dimension and less than said second predetermined vertical dimension, whereby a plurality of said assemblies are stackable and nestable with each sleeve nesting in a sleeve below, the upper sleeve being spaced from the below sleeve so that said assemblies are freely denested from each other.



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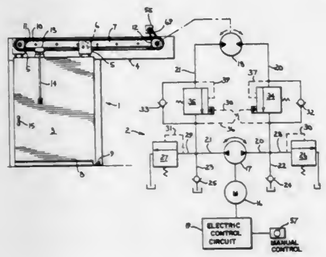
**4,296,570**

## HYDRAULIC DOOR OPERATOR

**George C. Balbach, Lake Forest, Ill., and Robert J. Peterman, Cedarburg, Wis., assignors to Arthur Smith Industries, Inc., Milwaukee, Wis.**

**Filed Sep. 7, 1979, Ser. No. 73,275**
**Int. Cl.³ E05F** *15/02*
**U.S. Cl. 49—360** **14 Claims**




1. A door operator having a hydraulic system for opening and closing a door, comprising:

a hydraulic pump for pumping fluid,

an electric motor for rotating said pump;

an electric control circuit which activates said electric motor to rotate said pump in the appropriate direction;

a reversible hydraulic motor connected through hydraulic control lines with said pump to be driven thereby, said hydraulic control lines comprising a first line between a first side of said hydraulic pump and a corresponding side of said hydraulic motor and a second line between a second side of said hydraulic pump and a corresponding side of said hydraulic motor;

valve means in each of said hydraulic control lines between said hydraulic pump and said hydraulic motor that are normally closed to lock fluid in said hydraulic motor to block turning thereof;

a pilot line extending between each hydraulic control line and the valve means in the other hydraulic control line, whereby pump pressure in one control line opens the valve means in the other control line;

drive means driven by said hydraulic motor to open and close said door; and

a pressure relief valve connected to said control lines for diverting fluid from said motor.

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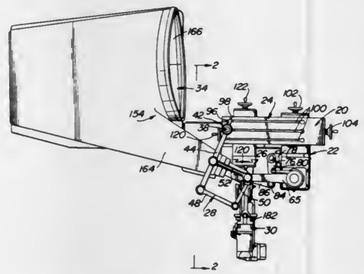
**4,296,571**

## PROFILE GRINDING APPARATUS

**Joseph Horvath, 11 Notch Rd., Clifton, N.J. 07013**

**Filed Aug. 16, 1979, Ser. No. 66,945**
**Int. Cl.³ B24B** *17/02, 49/12, 17/04*
**U.S. Cl. 51—32** **14 Claims**



1. A profile grinding apparatus comprising a stationary frame, a first table adapted for holding a template thereon and mounted on said frame, a second table mounted on said frame, said second table being arranged to hold a workpiece at a fixed position, pantograph means movable in a horizontal plane and comprising guiding means for movement in said plane, first movable support means mounted on said stationary frame and coupled to said pantograph means for following the movement of said guiding means, second movable support means mounted on said stationary frame at a spaced location below said first movable support means and connected to said first movable support means for corresponding movement therewith, grinding means carried by said first and second movable support means and arranged for reciprocation along a vertical axis between said first and second support means to grind a countour on a workpiece held on said second table, both said first and second movable support means being mounted on said stationary frame by a movable support assembly, said movable support assembly comprising first rod means having a longitudinal axis about which said first rod means is rotatable, said first rod means being mounted on said stationary frame with said longitudinal axis vertical, first bracket means fixedly secured to said first rod means, second bracket means fixedly secured to said first rod means below said first bracket means, second rod means having a logitudinal axis about which said second rod means is rotatable, said second rod means being supported with its axis vertical and for rotation thereabout by first and second bracket means, third bracket means fixedly secured to said second rod means, fourth bracket means fixedly secured to said second rod means below said third bracket means, said third bracket means being pivotable connected to said pantograph means and to said first movable support means at a vertical pivot axis, said fourth bracket being pivotably connected to said second movable support means at said vertical pivot axis, said grinding means including a grinding surface located tangent to said vertical pivot axis.



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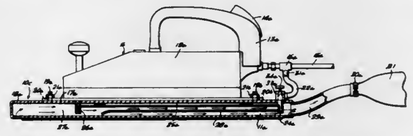
**4,296,572**

## DUST REMOVING ATTACHMENT DEVICE FOR AUTOMATIC AIR FILES

**Pedro Quintana, 1920 E. Wilder Ave., Tampa, Fla. 33610**

**Division of Ser. No. 887,517, Mar. 17, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,330**
**Int. Cl.³ B24B** *55/06*
**U.S. Cl. 51—170 TL** **5 Claims**



1. A dust removing attachment device for pneumatically driven straight-line power files of the type having a reciprocative sole plate comprising, in combination, an elongated, rectangular replacement shoe member, means for removably attaching a flat upper surface portion of said replacement shoe member to said sole plate, said shoe member being substantially hollow to define an end-to-end internal chamber, the underside of said shoe member being formed with a plurality of peripherally-spaced through openings, means energized by pressurized air for creating a vacuum in said chamber operative to withdraw air peripherally from the underside of said shoe member into said vacuum chamber together with abraded particles generated upon use of the automatic air file, a dust bag communicating with one end of said replacement shoe member, said vacuum creating means comprising an air jet directed into the interior of said dust bag through said one end of said dust bag for inflating it with dust-carrying air from said vacuum chamber, said air jet being disposed adjacent said one end of said replacement shoe member, and a second air jet within said vacuum chamber and longitudinally spaced from said first mentioned air jet.

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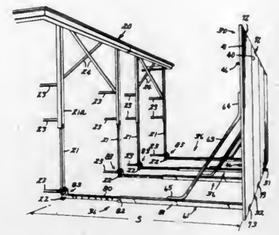
**4,296,573**

## AUDIENCE CONTROL BARRIER

**Kermit H. Wilson, Edina, and Ronald R. Carlson, Excelsior, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.**

**Filed Jul. 18, 1979, Ser. No. 58,669**
**Int. Cl.³ E04D** *3/10;* **E04H** *17/18*
**U.S. Cl. 52—6** **13 Claims**

1. In combination, an elevated stage having support legs, and a modular audience control barrier secured to said legs near the bottoms thereof, said barrier comprising a plurality of modules, each including a rigid panel and bracket means for supporting said panel in a vertical orientation and in spaced relation to said stage, and means interconnecting said modules in edge-to-edge relationship.



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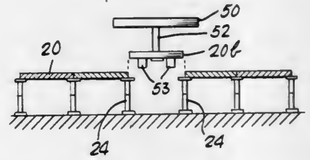
**4,296,574**

## FLOOR PANEL-FURNITURE SUPPORT SYSTEM

**William I. Stephens, Telford, Pa., assignor to Knoll International, Inc., New York, N.Y.**

**Continuation of Ser. No. 877,619, Feb. 14, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 86,751**
**Int. Cl.³ E04F** *15/024*
**U.S. Cl. 52—27** **6 Claims**




1. In a floor panel system that includes a plurality of floor panels, and support means positioned upon a fixed base floor supporting said floor panels in fixed position above said base floor, the improvement in which at least one of said floor panels rests upon said support means in freely-removable relationship therewith and includes as an operatively interconnected part thereof means for holding and supporting a furniture item.

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**4,296,575**

## AUTOMOBILE SHED

**Diara Verable, and Willie M. Gibson, both of 3803 Groton St., San Diego, Calif. 92110**

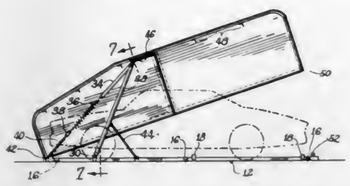
**Filed Dec. 26, 1979, Ser. No. 106,911**
**Int. Cl.³ E04B** *7/16*
**U.S. Cl. 52—66** **1 Claim**

1. A liftable vehicle storage shed comprising:

(a) a horseshoe-shaped box-beam frame having two legs and a rear cross member;

(b) a substantially flattened housing conforming generally to the exterior shape of a vehicle and hinged to said frame crossbeam to fall flush against said horseshoe-shaped frame when in lowered position to define an enclosed space over the surface on which it rests, said housing

being pivotal on said crossbeam from said lowered position to a raised position providing access therewithin;
(c) said box-beam being bolted down to a flat driving surface by inwardly directed L-shaped flanges to prevent tampering with mounting bolts in said flanges when said housing is lowered, and said box beam also mounting upwardly directed parallel guide members to guide the periphery of said housing into seated position;
(d) an access door positioned to substantially align with a vehicle stowed in said shed;



(e) means for maintaining said housing in raised position comprising a rigid strut pivoted at the lower end thereof at a first point on said frame and defining a tracking member at its upper end, and further including an adjustable extension spring means connected between an upper portion of said strut and a point on said frame reward of said first point, and said housing defines a longitudinal track slideable engaging said tracking member; and
(f) a tether connected between said housing and said frame to limit the extent of opening of said housing.

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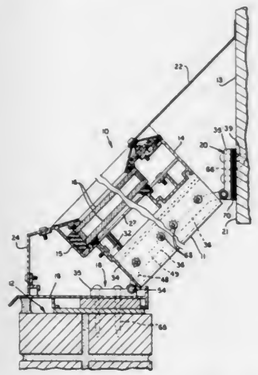
**4,296,576**

**SLOPED WALL STRUCTURE AND ANCHOR CLIP**

**Hoyt G. Rice, Jr., Ellenwood, and Daniel J. Reynolds, Austell, both of Ga., assignors to The Anaconda Company, Denver, Colo.**

**Filed Sep. 12, 1979, Ser. No. 74,875**
**Int. Cl.³ E04B *7/02***
**U.S. Cl. 52—90** **10 Claims**



1. A sloped wall structure for extending between a lower horizontal support and an upper vertical support, a plurality of rectilinear rafters positioned in spaced relationship with respect to one another and inclined upwardly from the lower horizontal support to the upper vertical support, infill sheets mounted on said rafters and forming with said rafters a sloped wall, each of said rafters including in cross section a pair of spaced vertically oriented parallel walls, an anchor clip connected between the lower end of each of said rafters and the lower horizontal support, each of said anchor clips including a base plate and a leg, said base plate including means for rigidly mounting said base plate to the lower horizontal support and a hinge boss at one edge portion thereof, said leg including means for rigidly mounting said leg between the spaced walls of the rafters and a hinge boss at one edge portion thereof constructed to mate with the hinge boss of said base plate, a pivot pin extending through the hinge bosses of the base plate and the leg of each anchor clip to hingedly anchor the sloped wall structure to the lower horizontal support.

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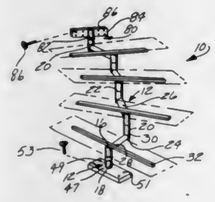
**4,296,577**

**HELICAL STAIRCASE SUPPORT**

**Heinz G. Schuette, 26145 Shook, Mt. Clemens, Mich. 48045**

**Filed Oct. 22, 1979, Ser. No. 87,040**
**Int. Cl.³ E04F *11/00***
**U.S. Cl. 52—187** **6 Claims**



1. A helical staircase comprising:
a plurality of brackets for supporting stair treads;
each bracket including a first vertical tube having an upper end and a lower end;
a transverse member affixed the first vertical tube upper end;
a second vertical tube axially spaced from the first tube having an upper end and a lower end;
a horizontal member extending between tubes affixed at one end to the first tube upper end and affixed at another end to the second tube lower end;
a stair tread abutting said horizontal member longitudinally along a transverse central portion and abutting said transverse member; and
said brackets joinable with said first tube lower end abutting said second tube upper end.

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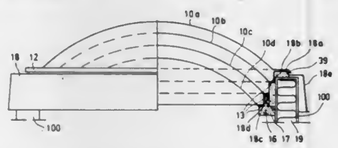
**4,296,578**

**SKYLIGHT APPARATUS**

**Heikki Keckman, It.Harjutie 11, 07900 Loviisa, Finland**

**Filed Jun. 12, 1979, Ser. No. 47,867**
**Claims priority, application Finland, Jun. 13, 1978, 780690; Jun. 13, 1978, 781893; Oct. 20, 1978, 783238**
**Int. Cl.³ E04B *7/18***
**U.S. Cl. 52—200** **14 Claims**



1. Skylight apparatus adapted to be located within a skylight aperture defined by aperture forming building frame components, comprising:
at least two dome-shaped light-transmitting window elements having outer dimensions which vary with respect to each other defining larger and smaller window elements, each of said window elements including peripherally extending outer support edge portions, said window elements being mounted in vertically spaced relationship one above the other at their respective peripheral support edge portions with the largest of said window elements being located at the uppermost position; and
means for mounting said window elements in a manner such that the mutual spacing between regions adjacent to said peripherally extending outer support edge portions of vertically adjacent window elements are substantially equal to the mutual spacing between the central portions thereof and such that the spacing between at least the lowermost window element and the next vertically adjacent window element is located within the skylight aperture forming building component, said mounting means including a frame structure defining a plurality of vertically spaced supporting portions, each of said supporting portions extending around the inner periphery of said supporting structure and wherein each of said plurality of supporting portions extends inwardly to a greater extent than the supporting portion located immediately thereabove, said supporting portions comprising surfaces which slope downwardly and inwardly and wherein said peripheral edge support portions of said window elements extend continuously upwardly and outwardly at a slope which substantially corresponds to the slope of said frame supporting portions, and wherein a plurality of said vertically spaced window elements are provided, each having a dimension which varies with respect to the other of said window elements, said window elements being mounted at their peripheral edge support portions on corresponding supporting portions of said frame structure with the smallest window element being the lowest of said window elements and the largest window element being uppermost, and wherein said frame structure is adapted to be mounted on said skylight aperture forming building frame component.



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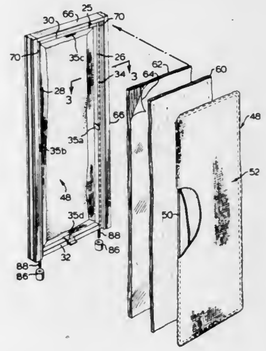
**4,296,579**

**SCREEN PANEL**

**Norman Proud, 16 West St., Oakville, Ontario, Canada (L6L 2Y6)**

**Filed May 9, 1979, Ser. No. 37,563**
**Int. Cl.³ E04B *2/72*; A47G *5/00***
**U.S. Cl. 52—239** **6 Claims**



1. A screen panel comprising:
(a) a frame for said panel, said frame having a closed perimeter and defining front and rear planar surfaces spaced apart in a front to rear direction and extending in parallel lateral planes.
(b) a plurality of clips fixed to said frame and spaced around the perimeter of said frame, some of said clips being associated with said front surface and some of said clips being associated with said rear surface, each clip having a support portion extending in said front to rear direction beyond its associated front or rear surface and a retainer portion extending from the outer end of said support portion and directed outwardly in a direction having a component parallel to a said lateral plane,
(c) two sleeves, each sleeve having:
(i) a self supporting subframe formed from a resilient wire rod which defines a closed perimeter,
(ii) a fabric material extending across said subframe and covering said wire rod,
(d) said wire rod of one sleeve being fitted over said support portions of said clips associated with said front surface and said wire rod of the other sleeve being fitted over said support portions of said clips associated with said rear surface,
whereby a said sleeve may be removed from said panel by deforming a portion of its wire rod in a direction generally laterally outwardly to move such portion clear of the retaining portion of a clip on which such portion is fitted, and then moving such portion outwardly in a front to rear direction, away from said frame.

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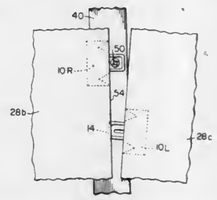
**4,296,580**

**WALL CONSTRUCTED FROM PANELS HELD IN POSITION WITH THE AID OF CONCEALED FASTENERS AND CONCEALABLE FASTENERS FOR USE IN ASSEMBLING SUCH WALL**

**Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075**

**Continuation-in-part of Ser. No. 947,078, Sep. 29, 1978, Pat. No. 4,221,095, which is a continuation-in-part of Ser. No. 736,425, Oct. 28, 1976, Pat. No. 4,117,644. This application Jul. 23, 1980, Ser. No. 171,331**
**Int. Cl.³ E04B *1/00***
**U.S. Cl. 52—281** **22 Claims**



1. A wall or partition comprising first and second coplanar end-abutting panels, substantially invisibly secured together along a joinder line at a wall framing member by a first series of a plurality of spaced apart fasteners joined to the first panel at the abutting end thereof and held to the framing member, and a second series of spaced apart fasteners joined to the second panel at the abutting end thereof and with parts of each of the fasteners of each of both series of fasteners extending parallel to said panels at concealed back major surfaces thereof, said fasteners of the second series of fasteners being so located as to avoid contact with said fasteners of the first series of fasteners, and said extending parts of said fasteners of the second series of fasteners, when the wallboard panels are in coplanar end-abutting relationship, contacting the back major surface of the first panel and, in conjunction with the framing member, the first series of fasteners, means for holding the fasteners of the first series to the framing member, and the first panel, preventing said second panel from moving away from said framing member and from said first panel in a direction having a component at right angles to the plane of the panels, which fasteners of the first series are each comprised of directly connected plate and tongue portions which are essentially flat, with the plate portion contacting the first panel and the tongue portion contacting the second panel, a pair of web portions extending only from the plate portion and installed between first and second panel ends, a pair of impaling portions extending from said web portions and overlying said plate portion and penetrating said first panel at an abutting end

thereof, a framing contacting part of the fastener, and a panel contacting part of the fastener, with such framing contacting and panel contacting parts being connected by a wall member or plurality of wall members, which space(s) them apart and strengthen(s) the fastener, and which fasteners of the second series are of the same structure as those of the first series.

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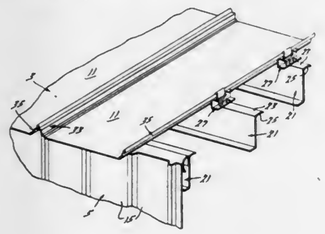
**4,296,581**

## ROOFING STRUCTURE

**Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.**

**Continuation-in-part of Ser. No. 875,524, Feb. 6, 1978, Pat. No. 4,213,282. This application Jul. 31, 1979, Ser. No. 62,300**
**The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.**
**Int. Cl.³ E04D** *1/00, 1/34*
**U.S. Cl. 52—520** **5 Claims**



1. In a paneling construction adapted to be installed by attachment to spaced parallel structural supporting elements such as the roof purlins of buildings, said construction comprising a plurality of elongated panels laid over and transversely to such supporting elements with the side edges of the panels abutting, said panels having generally planar mid-portions lying close to the supporting elements and having upstanding seaming flanges on said side edges folded over and crimped together to provide a mechanical interlock, each of said panels having supporting portions for said seaming flanges, said supporting portions extending angularly upwardly away from each other and from the mid-portion of the panel whereby the supporting portions of adjacent panels define a tunnel-like area and clip means securing the panels to the structural supporting elements, each clip means including a base member, attaching means rigidly securing said base members and clip means to a structural supporting element in the tunnel-like area defined by the supporting portions of adjacent panels, said construction being characterized by:

A. A rim portion incorporated in an intermediate part of each of the supporting portions of each panel, said rim portions lying substantially in a common plane and extending inwardly toward one another from and substantially perpendicularly to the seaming flanges,

B. The base member of each of said clip means having an upstanding column with a top portion closely underlying and supporting said rim portions of the adjacent panels,

C. A holding portion secured to the base member of each clip means and preventing outward movement of the holding portion, said holding portions projecting upwardly from the base member between, and being folded over and crimped together with, the seaming flanges of the adjacent panels to prevent relative movement therebetween,

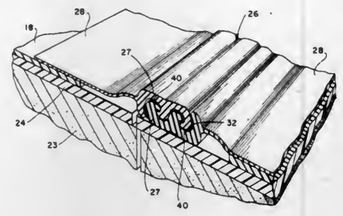
whereby said holding portion and the top portion of the base member co-act with the seaming flanges and with said attaching means to prevent movement of the seaming flanges and of the supporting portions of the panels toward and away from the structural supporting elements and also to hold the holding portion against movement toward the base member.

**4,296,582**

## CONSTRUCTION SYSTEM AND FASTENERS THEREFORE

**Harold G. Simpson, and Michael W. Davis, both of Oklahoma City, Okla., assignors to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.**

**Filed Dec. 31, 1975, Ser. No. 645,566**
**Int. Cl.³ E04C** *1/10*
**U.S. Cl. 52—590** **19 Claims**



1. A fastener adapted to interlock with another similar fastener to provide a seal between the fastener, said fastener including a body portion including a plurality of male and female members for interlocking engagement with similar such members of said similar fastener, said fastener being made by a process including the steps of:

mixing and combining a fastener material including Hypalon, and

manufacturing the fastener from said material; and

utilizing a dust cap prior to connection of said fastener to said similar such fastener to transfer a lubricant to said fastener while protecting the fasteners from an accumulation of dirt.

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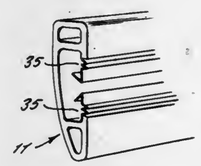
**4,296,583**

## SLAP TRIM INTERIOR MOLDING

**Louis D. Egenlauf, 12634 Saginaw Ave., Chicago, Ill. 60633**

**Filed Aug. 27, 1979, Ser. No. 69,889**
**Int. Cl.³ E04C** *2/38*
**U.S. Cl. 52—717** **1 Claim**



1. A slap trim interior molding, comprising, in combination, an elongated plastic extrusion and a plurality of separate holding pins for holding said extrusion against a room wall; said extrusion comprising a hollow shell having an elongated, decorative-shaped, front wall, and a rear wall intercepted along its longitudinal center by an elongated, straight slot; each said holding pin including an enlarged head having a groove on its opposite sides, for elongated edges of said extrusion rear wall along said slot to snap-fit therein; a portion of said rear wall adjacent each said slot edge being thin-walled respective to a remaining thicker-walled portion of said rear wall, and an angularly inclined flange extending inwardly into said shell from each said slot edge, and a plurality of longitudinally extending, thin-walled accordian pleats are formed between each said thin-walled portion and said thicker-walled portion of said rear wall, for flexing of any portion of said slot edges in a transverse direction either toward or away from each other.

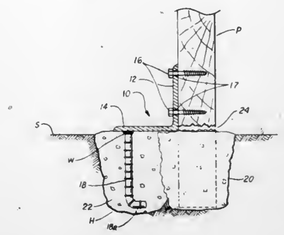


**4,296,584**

## METHOD FOR OFFSET ANCHORING A FENCE POST

**Bernard J. Lempa, Jr., 8422 Carvel La., Houston, Tex. 77036**

**Filed Sep. 4, 1979, Ser. No. 71,988**
**Int. Cl.³ E02D** *27/42*
**U.S. Cl. 52—742** **7 Claims**



1. A method of reanchoring a fence post which is no longer firmly supported in the ground without disturbing the existing post foundation or the fence structure associated therewith comprising the steps of:

digging a hole in said ground adjacent said post foundation;

attaching to the lower end of said post and next to said post foundation the vertical leg of a bracket which also has a horizontal leg from which depends an anchor member for disposition within said hole;

pouring a concrete mixture into said hole and around said anchor member to a level substantially flush with said horizontal bracket leg; and

allowing said concrete mixture to set without disturbing said post and bracket.

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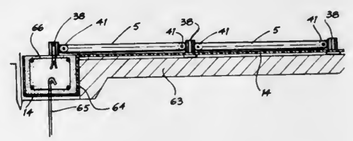
**4,296,585**

## PERMANENT WEATHER COVERS

**Dante Bini, 48 Chandos St., Crows Nest, N.S.W. 2065, Australia**

**Filed May 9, 1979, Ser. No. 37,925**
**Claims priority, application Australia, May 30, 1978, PD4545**
**Int. Cl.³ E04B** *1/34*
**U.S. Cl. 52—745** **5 Claims**



1. A method of forming a self-supporting domed space frame comprising the steps of:

(a) taking a plurality of elongated longitudinal elements, each of said elements having a longitudinal axis and opposed ends and at last some of said elements being extensible and having

(i) a minimum length and an operative length greater than said minimum length, and

(ii) arresting means to prevent a reduction in the length of the element to a value less than said operative length, said arresting means being automatically operable when the element has had its length increased to a value not less than said operative length;

(b) assembling said elements into a substantially planar grid, wherein

(i) an end of each element is pivotally connected to an end of the next adjacent element for pivotal movement about a horizontal axis extending transversely of said elements, and

(ii) the elements are free to twist about the longitudinal axes thereof;

(c) anchoring elements of the grid at the grid periphery in a manner permitting such anchored elements to swing upwardly;

(d) locating an inflatable membrane in lifting relationship to the grid;

(e) inflating the membrane to lift the grid to a point wherein all of the extensible elements have been extended to at least their respective operative lengths;

(f) locking at least certain of the elements against return pivotal movement about said transversely extending axes; and,

(g) releasing the inflation pressure from the membrane to permit said gridwork to be self-supporting.

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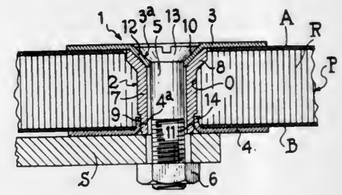
**4,296,586**

## FASTENING DEVICE FOR A HONEYCOMBED PANEL EMPLOYED IN PARTICULAR IN AERONAUTIC STRUCTURES

**Bernard M. Heurteux, Verviers, Belgium, assignor to Shur-Lok International, S.A., Petit-Rechain, Belgium**

**Filed Oct. 30, 1979, Ser. No. 89,459**
**Claims priority, application France, Nov. 6, 1978, 78 31314**
**Int. Cl.³ E04C** *2/54*
**U.S. Cl. 52—787** **2 Claims**



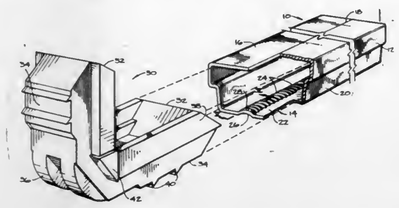
1. A fastening device for mounting in a marginal region of a panel comprising a honeycombed network and skins respectively covering opposed large sides of the network and imparting a required stiffness to the panel, said device comprising a sleeve for placing in an opening formed transversely in the panel, the sleeve having opposed end portions of a given shape, a fastening member extending through the sleeve, and two strengthening means for contributing to the connection of the sleeve with the skins of the panel, said strengthening means comprising thin plates for respectively adhering to the skins of the panel in a region which surrounds the opening formed in the panel and having an area which distinctly exceeds the cross-sectional area of the sleeve, each plate comprising an aperture for substantial alignment with the sleeve, an edge portion of each plate defining the plate aperture substantially conforming to said given shape of the corresponding end portion of the sleeve so as to ensure the transmission of transverse forces exerted on the sleeve by said fastening member to an area of the skins corresponding to at least the extent of said plates, the aperture of at least one of the plates being bordered by an annular flange obtained by deformation of the plate and extending in a direction perpendicular to the general plane of the plate, the corresponding end portion of the sleeve having a bearing surface on which said flange is an interference fit, and at least one of the plates having a flange folded at a right angle for bearing against a lateral edge of the panel.

**4,296,587**

## SPACER FOR DOUBLE GLAZED WINDOWS INCORPORATING INTERLOCK MEANS

**Gunter Berdan, Weston, Canada, assignor to Custom Rollforming Company Limited, Weston, Canada**

**Filed Nov. 27, 1979, Ser. No. 97,773**
**Int. Cl.³ E04C *2/38***
**U.S. Cl. 52—788** **6 Claims**



1. A spacer tube for a hermetically sealed double glazed window, the spacer tube being formed from an elongated strip of metal bent into a hollow elongated tubular shape, the spacer tube having opposing side wall portions, a base extending between and connecting the side wall portions and a further wall spaced from the base, such further wall defining a region wherein the longitudinal edges of the strip extend toward each other, and wherein a surface of the spacer tube which faces into the interior of the spacer tube has a plurality of closely spaced ridges therein, said surface having said ridges therein being the interiorly facing surface of said base, the ridges being spaced apart in the lengthwise direction of the spacer tube and the individual ridges extending generally transversely of the longitudinal axis of the spacer tube, the ridges being located at least in the regions adjacent the ends of the spacer tube whereby, in use, to provide for locking engagement with teeth on the arms of corner pieces when inserted endwise into the ends of the spacer tube, said base being shaped in cross-section so as to define a crest projecting a short distance into the interior of the hollow spacer tube, said transversely disposed ridges being formed in said crest.

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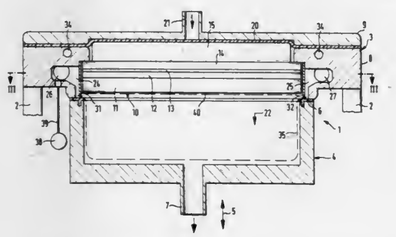
**4,296,588**

## SEALING STATION OF VACUUM PACKAGING MACHINES

**Artur Vetter, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Fed. Rep. of Germany**

**Filed Sep. 26, 1979, Ser. No. 79,043**
**Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843894**
**Int. Cl.³ B65B *31/02***
**U.S. Cl. 53—86** **18 Claims**



1. A vacuum packaging machine for producing sealed vacuum packages having an evacuating and sealing station comprising first and second station portions, a heatable sealing member in said first station portion, means for cooling a portion of said first station portion, a backing member in said second station portion, said sealing member and backing member being movable toward and away from each other, means for moving the sealing member and backing member toward and away from each other, an evacuating chamber defined by said first and second station portions, said evacuating chamber being connected with evacuating means through suction opening means and deflector means to deflect, in operation, a fluid stream sucked off from said evacuation chamber under the action of said evacuation means away from said sealing means, said deflecting means being connected to said first station portion.

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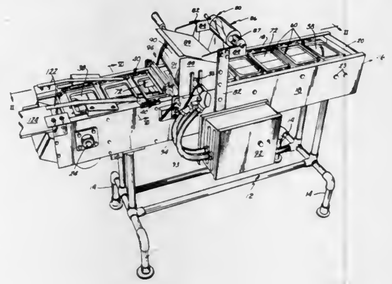
**4,296,589**

## PACKAGING MACHINE WITH CAM-OPERATED CUTTER AND CONTAINER SUPPORTS THEREFOR

**Gary L. Kruse, Spring Lake, Mich., assignor to Dake Corporation, Division of JSJ Corporation, Grand Haven, Mich.**

**Continuation-in-part of Ser. No. 904,216, May 9, 1978, Pat. No. 4,196,561. This application Aug. 23, 1979, Ser. No. 69,100**
**Int. Cl.³ B65B *7/28, 41/16***
**U.S. Cl. 53—300** **14 Claims**



1. A packaging machine for applying and securing a web of material to containers comprising:

conveyor means for supporting and conveying containers in one direction along a path, said conveyor means including a plurality of spaced container support members mounted thereon;

web applying and securing means for applying and securing a continuous web of material to the containers supported by said conveyor means; and

cutting means for separating said web of material intermediate said container support members; said cutting means including a rotatable cutter having two ends and at least three cutting edges equally spaced in fixed positions around the exterior thereof and extending across said conveyor means, support means for rotatably supporting said cutter transversely across and above said conveyor means, said support means including camming means at each of said two ends of said cutter for intermittently rotating said cutter in a circular path, said camming means being offset circumferentially from said cutting edges; said container support members each including at least two projecting means for engaging said camming means, at least one projecting means being aligned with one of said two camming means and at least the other projecting means aligned with the other of said two camming means whereby said cutter is intermittently rotated such that said cutting edges are rotated to a first position by said one projecting means engaging said one camming means and thereafter rotated through a second position between said container support members to sever said web of material therebetween by said other projecting means aligned with the other of said two camming means.

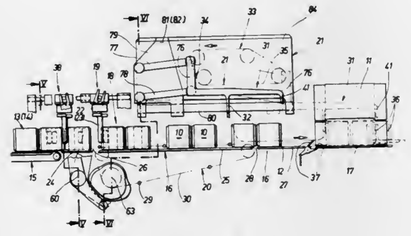


**4,296,590**

## METHOD AND APPARATUS FOR CONVEYING SIX-PACK CONTAINERS TO CARTON BLANK

**Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Bremen, Fed. Rep. of Germany**

**Continuation of Ser. No. 955,827, Oct. 30, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 207,040**
**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750533**
**Int. Cl.³ B65B *35/30***
**U.S. Cl. 53—531** **16 Claims**



1. An apparatus for forming and conveying packs of articles, particularly bottles and cans, to a packing container, comprising:

(a) a feed conveyor (**15**) for continuously supplying article packs (**10**) to an input end of a transport path of the apparatus in two distinct lines (**13,14**),

(b) means including a stopping device (**38**) and a beginning conveyor (**19**) disposed in the transport path following the feed conveyor for receiving the article packs, separating them into plural pack groups (**18**), and delivering the groups to an input end of an intermediate conveyor (**20**) disposed in the transport path following said means, said beginning conveyor (**19**) accelerating the groups (**18**) to the speed of said intermediate conveyor (**20**),

(c) an end conveyor (**21**) disposed in the transport path following the intermediate conveyor for receiving the pack groups therefrom and transporting them to a final stop position at a packing station, said end conveyor comprising:

(1) a movable slide member (**31**) disposed above the transport path,

(2) means for lowering the slide member,

(3) a pusher plate (**32**) depending downwardly from the slide member for engaging the rear ends of pack groups upon the lowering of the slide member,

(4) a counterstop (**41**) spaced from the pusher plate and depending downwardly from the slide member for engaging the front ends of pack groups,

(5) means for driving the slide member at a higher horizontal conveying speed than the intermediate conveyor to thereby accelerate pack groups engaged by the slide member away from those behind to provide sufficient handling time at the stop position before the next pack groups arrive, and

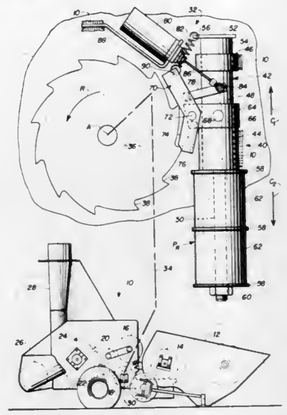
(d) a yieldable end stop (**36**) for determining the stopping position of the pack groups, said end stop being operable to move toward the approaching groups and then be driven back with the groups to said stopping position.

**4,296,591**

## DAMPED APPARATUS FOR QUICK-STOPPING ROTATING MEMBERS

**Wayne B. Martenas, New Holland; Edward H. Priepke, Stevens, and Robert A. Wagstaff, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.**

**Filed Oct. 1, 1980, Ser. No. 192,783**
**Int. Cl.³ A01D *75/18***
**U.S. Cl. 56—10.3** **9 Claims**



1. A damped apparatus for quick-stopping a rotating member comprising:

a reaction member supported adjacent said rotating member, said reaction member including a slide and a slide support, said slide movable relative to said support;

a stop carried by said slide, said stop movable relative to said slide between a first position, free of engagement with said rotating member, and a second position in engagement with said rotating member;

means connected for damping movement of said slide in response to said stop being in said second position; and

means connected for moving said stop between said first and second positions.

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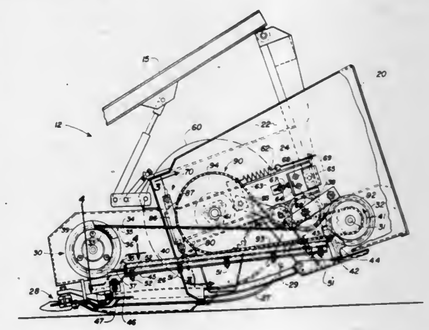
**4,296,592**

## AUGER FLOATATION LIMIT

**Irwin D. McIlwain, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.**

**Filed Nov. 3, 1980, Ser. No. 203,084**
**Int. Cl.³ A01D *41/12***
**U.S. Cl. 56—14.4** **6 Claims**



1. In a crop harvesting header attachable to a mobile crop

harvesting machine to initiate the crop harvesting process, said header having a frame; opposing first and second side sheets supported by said frame, said side sheets being generally vertically inclined and positioned substantially parallel to the direction of travel of said crop harvesting machine; a floor member extending between said side sheets substantially perpendicular thereto, said floor member having a forward edge; a substantially vertical rear wall connected to said floor member rearwardly of said forward edge and extending between said side sheets generally transverse to said forward direction of travel; said rear wall having an opening therethrough for the passage of crop material to said crop harvesting machine; a crop cutting means supported by said frame adjacent said forward edge of said floor member for the severing of standing crop material; crop conveying means mounted on said frame for the movement of severed crop material rearwardly over said floor member; a crop consolidating auger mounted between said side sheets rearwardly of said crop cutting means and forwardly of said rear wall to consolidate severed crop material and discharge rearwardly through said opening in said rear wall towards said crop harvesting machine; an elongated support arm pivotally mounted on said frame adjacent each said side sheet, said auger being rotatably mounted to said support arm at a center of rotation spaced from said pivot such that said auger can generally vertically float relative to said floor member; limit means cooperable with each said support arm for limiting the amount of movement of said auger relative to said floor member; and drive means for operatively powering said cutting means, said conveying means and said auger, an improved limit means comprising:

a first stop selectively movably affixed to the respective said side sheet below said support arm to provide a lower limit for the movement of said auger;

a second stop selectively movably affixed to said respective side sheet above said support arm to provide an upper limit for the movement of said auger;

a vertical adjusting means for selectively moving said first stop in a generally vertical direction so as to position said lower limit of movement of said auger at a desired location relative to said floor member; and

a strap mechanism interconnecting said first and second stops and including a locking means cooperable therewith to selectively lock said first and second stop in a selective position relative to said side sheet, said strap mechanism simultaneously providing equal movement of both said first and second stops such that the amount of flotational movement permitted to said auger does not vary when said vertical adjusting means is manipulated to change the lower limit of movement of said auger.

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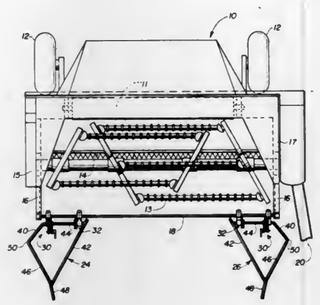
**4,296,593**

## UNIVERSAL CROP DIVIDER MECHANISM

**Bryant F. Webb, Ephrata; Stanley J. Makofka, New Holland; Emmett G. Webster, New Holland, and Edward A. Blakeslee, New Holland, all of Pa., assignors to Sperry - New Holland, New Holland, Pa.**

**Filed Jun. 9, 1980, Ser. No. 157,624**
**Int. Cl.³ A01D *45/02***
**U.S. Cl. 56—98** **15 Claims**

1. Crop divider mechanism for use with an agricultural harvesting and conditioning machine having on the forward end thereof a transverse crop knockdown bar spaced above a cutting head thereon, said divider comprising a pair of similar interchangeable left-hand and right-hand rod members bent substantially into trapezoidal shape with two relatively long and short sides parallel to each other and two intermediate sides sloping toward each other from the said long side toward the short side to provide dividing elements, pairs of bracket members respectively adapted to be attached to said knockdown bar adjacent opposite ends thereof and having bearings therein respectively pivotally receiving one of said intermediate sides of said dividing elements with the long sides of said elements facing each other in spaced relationship along said knockdown bar, similar positioning plates respectively fixed to one of said brackets of each pair and having a first hole through which said one of said intermediate sides of said elements extends and two additional positioning holes spaced even distances from said first hole substantially along axes at ninety degrees to each other relative to said first hole, a second plate fixed to said one of said intermediate sides of said dividing elements adjacent said one of said brackets, and a positioning



pin supported movably by said second plate perpendicularly thereto and spaced from said side of said dividing element a distance equal to the spacing of said two additional holes from said side of said element and said positioning pin being selectively positionable within one of said two additional positioning holes and thereby support said dividing elements selectively in horizontal operative or vertically upward inoperative positions relative to said knockdown bar.

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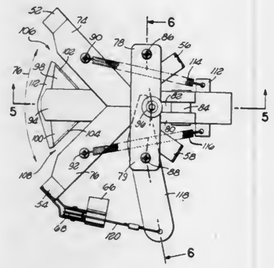
**4,296,594**

## FRUIT PICKER

**Richard J. Faulconer, P.O. Box 164, Barstow, Calif. 92311**

**Continuation-in-part of Ser. No. 92,321, Nov. 8, 1979. This application Jun. 3, 1980, Ser. No. 156,045**
**Int. Cl.³ A01D *46/24***
**U.S. Cl. 56—336** **12 Claims**



1. A fruit picker comprising

an elongated tubular member having an inlet and an outlet at opposite ends thereof defining a bore therethrough, and a plurality of perforations in the wall surrounding said bore;

a handle affixed to the exterior of said tubular member, and a lever mounted on said handle and spaced therefrom a distance such that said handle and said lever may be gripped in one hand and the lever squeezed toward the handle;

a cover member mounted on said tubular member in overlying relation to said inlet and having an outwardly opening notch;

at least one bladeguard formed on one side of said notch;

a knife comprising a shank and at least one blade confronting said bladeguard, and means mounting said knife on said cover member for reciprocal slidable movement of said knife in a plane normal to the axis of said tubular member along a line bisecting said notch;

force transmitting means linking said lever and said knife mounting means for moving said knife from a first position wherein said blade is spaced from said bladeguard into a second position wherein said blade is received in said bladeguard upon actuation of said lever; and

resilient means connecting said knife and said cover member for moving said knife from said second to said first position upon release of said lever.



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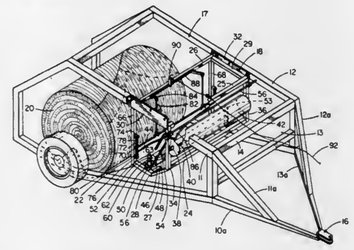
**4,296,595**

## APPARATUS FOR WRAPPING A COVER MATERIAL AROUND ROUND BALES

**Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.**

**Division of Ser. No. 928,507, Jul. 27, 1978, Pat. No. 4,173,112.**
**This application Aug. 29, 1979, Ser. No. 70,621**
**The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.**
**Int. Cl.³ A01D *39/00***
**U.S. Cl. 56—341** **9 Claims**



1. In a round baler of the type having a bale forming mechanism for transport over a field of cut material to gather and form the material into a round bale, the improvement of apparatus for applying a cover sheet over the round bale during the bale forming operation, said improvement comprising in combination:

(a) a wrapping material roll storage member affixed to the baler forward of the bale forming mechanism, said roll storage member being oriented to position an end of a sheet of wrapping material on the roll member in the path of the cut material for wrapping the bale as the bale is being formed;

(b) drive means for the storage member for removing the sheet of wrapping material from the roll member and directing the end of said sheet along the ground for gathering by the bale forming mechanism about the outside surface of the formed bale;

(c) means forward of the bale forming mechanism for terminating flow of cut material to the bale forming mechanism; and

(d) means for cutting the wrapping material intermediate the bale forming mechanism and the roll storage member whereby the sheet may be wrapped about the bale and cut to permit the end of the sheet to be held against the ground by the bale thereby providing

means for holding a cut end of sheet material to a bale formed by the bale forming mechanism.

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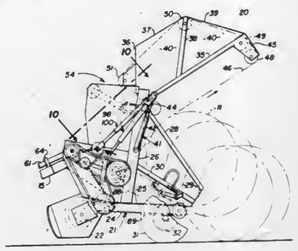
**4,296,596**

## AUTOMATIC BALE EJECTION DRIVE

**T. William Waldrop, New Holland, and Willis R. Campbell, Ephrata, both of Pa., assignors to Sperry Corporation, New Holland, Pa.**

**Division of Ser. No. 25,161, Mar. 29, 1979, Pat. No. 4,208,862.**
**This application Jan. 16, 1980, Ser. No. 112,600**
**The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.**
**Int. Cl.³ A01D *39/00***
**U.S. Cl. 56—341** **6 Claims**



1. A method for forming crop material rolls from a windrow of preformed crop material in a large roll forming machine having a tailgate movable between an open and a closed position and a roll forming region defined generally by upper bale forming means and conveying means comprising the steps of:

(a) moving the machine along and across the windrow of crop material;

(b) picking the crop material up from the windrow and directing it into the roll forming region;

(c) forming the crop material into a roll of crop material of predetermined length and predetermined diameter;

(d) wrapping the bale with a binding material about its periphery upon the bales reaching the predetermined diameter;

(e) raising the tailgate along a predetermined path of travel;

(f) automatically disengaging the drive to the upper bale forming means as the tailgate is raised along the path of travel to stop the upper bale forming means movement in a first direction and then automatically reversing the movement to a second direction of travel of the upper bale forming means as the tailgate continues to be raised along the path of travel to cause the formed bale to be ejected from the roll forming region;

(g) lowering the tailgate upon ejection of the bale;

(h) automatically disengaging the drive to the upper bale forming means as the tailgate is lowered along the path of travel to stop the movement in the second direction of travel and then automatically reversing the movement to the first direction of travel; and

(i) recommencing movement of the machine along and across the windrow of crop material.

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**4,296,597**

## COTTON YARN-LIKE TEXTURED COMPOSITE YARN AND A PROCESS FOR MANUFACTURING THE SAME

**Masayuki Tani; Mitsuhiko Okui, and Mitsuo Matsumoto, all of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan**

**Filed Feb. 6, 1980, Ser. No. 118,987**
**Claims priority, application Japan, Jul. 24, 1979, 54-93189**
**Int. Cl.³ D02G *3/36, 3/38***
**U.S. Cl. 57—205** **15 Claims**

1. A false twist textured composite yarn having the appearance and touch of a cotton yarn, said textured composite yarn comprising a core yarn and a sheath yarn composed of a plurality of filaments, said sheath yarn wrapping around the core yarn with a length difference ratio of at least 15%, wherein a part of said filaments of the sheath yarn wrap around the core

yarn with a successive alternate twist, while said part of filaments being substantially cohered and at least partially adhered to the core yarn by fusion of the core yarn at the boundary region where the component filaments of the sheath yarn and

the core yarn meet, and the remaining component filaments of the sheath yarn being individually separate from each other wrap around the core yarn and the coherent filaments while the remaining filaments are in a crimped state, so that a three-layer structure is formed.

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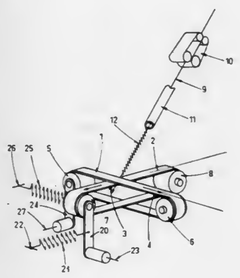
**4,296,598**

## APPARATUS FOR PROVIDING FALSE TWIST TO MOVING YARN

**Jean-Louis Faure, 21, rue des Lilas, Mably - 42300 Roanne, France**

**Filed May 16, 1980, Ser. No. 150,642**
**Claims priority, application France, May 22, 1979, 79 13915**
**Int. Cl.³ D02G *1/06*; D01H *7/92***
**U.S. Cl. 57—284** **10 Claims**




1. Apparatus for providing a false-twist by friction to a moving yarn, comprising

a first endless apron,

a second endless apron positioned at an angle with respect to said first apron, at least one strand of said second apron being in contact with a strand of said first apron, the moving yarn being directed to pass between said first strand and said second strand in the zone of contact to a downstream location,

a first set of rollers fitting said first apron, and

a second set of rollers of external diameter fitting said second apron to permit said second apron to pass inside said first apron,

whereby relative movement of said contacted strands of said first and second aprons impart false-twist to the yarn in the contact zone.

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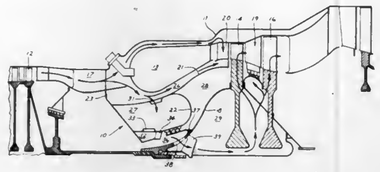
**4,296,599**

## TURBINE COOLING AIR MODULATION APPARATUS

**Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Mar. 30, 1979, Ser. No. 25,300**
**Int. Cl.³ F02C *7/18***
**U.S. Cl. 60—39.23** **13 Claims**

1. An improved turbomachine cooling air delivery system of the type having a source of cooling air and an air delivery channel for fluidly connecting the air delivery system to machine components to be cooled, wherein the improvement comprises a plurality of valves disposed in mutually parallel relationship in the air delivery channel and means for automatically operating each of said valves individually in response to



predetermined conditions of said cooling air for thereby selectively varying the amount of cooling airflow in said air delivery channel.

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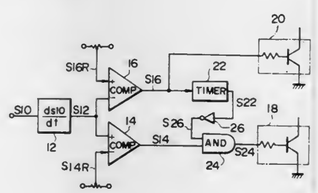
**4,296,600**

## FUEL CONTROL DEVICE FOR A GAS TURBINE

**Toshimi Abo, and Hidetoshi Kanegae, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan**

**Filed Jan. 30, 1980, Ser. No. 116,866**
**Claims priority, application Japan, Feb. 6, 1979, 54-12615**
**Int. Cl.³ F02C *9/32***
**U.S. Cl. 60—39.28 R** **6 Claims**




1. A fuel control device for a gas turbine, comprising:

(a) sensing means for sensing the load on the turbine to output a first signal representative of the rate of change thereof;

(b) increase means responsive to the first signal for temporarily increasing the amount of fuel supplied to the turbine when the rate of increase of the load with time is higher than a reference value;

(c) decrease means responsive to the first signal for temporarily decreasing the amount of fuel supplied to the turbine when the rate of decrease of the load with time is higher than a certain predetermined value; and

(d) reducing means for reducing the amount of increase of fuel supplied by the increase means during a certain predetermined time interval after the end of functioning of the decrease means.

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**4,296,601**

## ELECTRONIC FUEL CONTROL SYSTEM

**Anthony N. Martin, Simsbury, Conn., assignor to Otis Elevator Company, Hartford, Conn.**

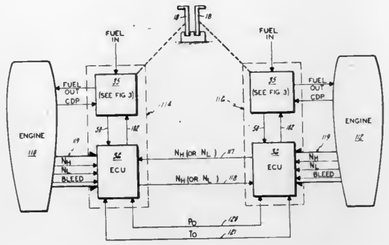
**Filed Aug. 23, 1979, Ser. No. 69,142**
**Int. Cl.³ F02C *9/42***
**U.S. Cl. 60—224** **7 Claims**

1. A fuel control system for gas turbine engines, comprising:

a hydromechanical fuel section for providing fuel flow to the engine at commanded power settings and including means for augmenting said fuel flow in response to a fuel flow modifying signal, and

signal processing means for providing said fuel flow modifying signal in response to signals applied thereto, said signals reflecting power setting, engine speed and ambient and engine conditions,

characterized in that said processing means comprises means for providing a correction signal which is summed with an engine speed signal, said correction signal being selected from a plurality of signals each reflecting a maximum




engine speed, at least one of said signals being related to the power setting, engine speed and any difference between engine speed and a scheduled engine speed for the particular power setting in such a way as to reflect the required change, if any, in engine speed in order to produce, between actual engine speed and maximum engine speed, a ratio which is the same as the ratio between the actual power setting and the maximum power setting.

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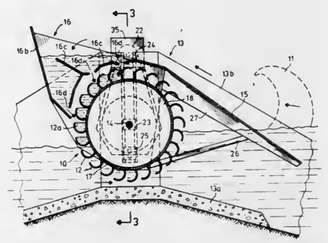
**4,296,602**

## APPARATUS FOR EXTRACTING ENERGY FROM WATER WAVES

**Marwood J. Hales, Box 116, Redmond, Utah 84652, and Cameron L. Thorpe, Axtell, Utah 84621**

**Filed Jan. 10, 1980, Ser. No. 110,932**
**Int. Cl.³ F03B *13/12***
**U.S. Cl. 60—398** **11 Claims**




1. Apparatus for extracting energy from water waves, comprising an elongate water-wheel; foundation means rotatably mounting the water wheel and anchoring it to the bottom of a body of water in which waves are produced, so that at least a portion of the wheel is above the surface of said body of water; a ramp extending substantially the length of the wheel, shielding the wave side of the wheel from the wave impact, and directing water of the wave upwardly over the top of the wheel to imapct said water wheel on the side thereof removed from the wave and to effect rotation thereof; and means for extracting energy from the rotation of the wheel.



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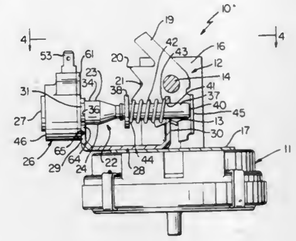
**4,296,603**

## TEMPERATURE RESPONSIVE PISTON AND CYLINDER UNIT HAVING A HEATER CARRIED THEREBY

**Siegfried E. Manecke, and Thomas M. Buckshaw, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 856,404, Dec. 1, 1977, Pat. No. 4,206,780. This application Jan. 28, 1980, Ser. No. 116,318**
**Int. Cl.³ F03G *7/06***
**U.S. Cl. 60—528** **9 Claims**




1. In a temperature responsive piston and cylinder unit wherein the piston thereof is extended relative to the cylinder thereof when the unit is heated and said piston is adapted to be retracted into said cylinder when the unit is cooled, an annular electrical heater means being carried in substantially a concentric manner on said cylinder of said unit for heating said unit to extend said piston thereof when said heater means is activated, the improvement wherein said heater means comprises a pair of telescoping annular electrical insulating members telescoped on said cylinder of said unit, and an electrical heater member disposed between said insulating members to be energized by having an electrical current passed therethrough.

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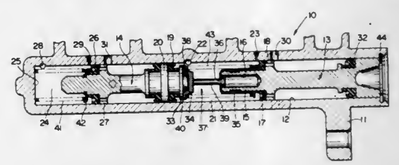
**4,296,604**

## TANDEM MASTER CYLINDER

**Jiro Kizaki, and Takashi Fujii, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Continuation of Ser. No. 966,596, Dec. 5, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,620**
**Claims priority, application Japan, Dec. 5, 1977, 52-163754**
**Int. Cl.³ B60T *11/20***
**U.S. Cl. 60—562** **2 Claims**




1. A tandem master cylinder comprising:

a. a body having an axial bore therein;

b. a first plunger sealingly and slidably fitted within said axial bore;

c. a second plunger sealingly and slidably fitted within the axial bore and being axially spaced from said first plunger for defining a first chamber between said first and second plungers, and being axially spaced from the end of said body remote from said first plunger for defining a second chamber between said body and said second plunger, said second plunger including a reduced diameter flange at its axial end proximate said first plunger and a protrusion extending from the central portion of said flange;

d. first seal means for sealing said first chamber;
e. second seal means for sealing said second chamber;
f. an intermediate member disposed between and movable with respect to said first and second plungers for defining the distance between said plungers, said member including a stick-shaped stem having a head portion secured to one end thereof in slidable engagement with an axial hole in said first plunger and having a hat-shaped head secured to the other end thereof movably abutting said flange and including a centrally located recess complementary to and movably seated over said protrusion on said second plunger, the outer diameter of said hat-shaped head and said flange being substantially equal and being less than the inner diameter of said axial bore for providing an annular gap between said intermediate member and the inner wall of said axial bore and the inner dimensions of said recess restricting radial movement of said hat-shaped head to maintain the gap between the axial bore and the intermediate member;
g. a sleeve-shaped retainer secured to the end of said first plunger opposite said second plunger for retaining said head portion of said intermediate member in said axial hole;
h. a first return spring interposed between said retainer and a seat portion of said hat-shaped head for urging said first and second plungers apart;
i. a second return spring having a setting load smaller than said first return spring disposed in said second chamber for urging said second plunger towards said first plunger;
j. a first compensating port for fluid communication with said first chamber being opened and closed by said first seal means during axial movement of said first plunger; and
k. a second compensating port for fluid communication with said second chamber being opened and closed by said second seal means during axial movement of said second plunger.

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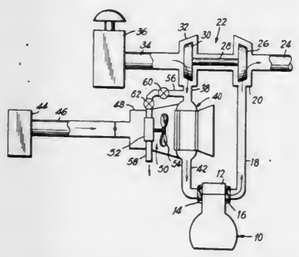
**4,296,605**
**COMPRESSION RELIEF RETARDERS FOR SUPERCHARGED INTERNAL COMBUSTION ENGINES**
**Robert B. Price, Manchester, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.**
**Filed Feb. 11, 1980, Ser. No. 120,557**
**Int. Cl.³ F02B *37/00***
**U.S. Cl. 60—599** **20 Claims**



1. In an engine braking system of the gas compression relief type including an internal combustion engine having inlet and exhaust manifolds, an exhaust gas driven supercharger communicating with said inlet and exhaust manifolds respectively through inlet and exhaust ducts, an air-to-air intercooler communicating with said inlet duct and driven by a turbofan powered by air extracted from said inlet duct through a by-pass duct, engine exhaust valve means, engine exhaust valve opening means to open said engine exhaust valve means near the end of the compression stroke of said engine and electrical circuit means to control said engine exhaust valve opening means, the improvement comprising normally open control valve means located in said by-pass duct and solenoid means mechanically interconnected with said control valve means and electrically interconnected with said electrical circuit means whereby actuation of said electrical circuit means excites said solenoid means and moves said normally open control valve to a closed position to inhibit the flow of air through said by-pass duct.

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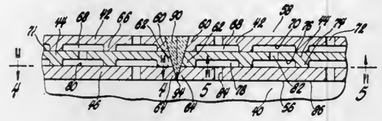
**4,296,606**
**POROUS LAMINATED MATERIAL**
**Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Oct. 17, 1979, Ser. No. 85,818**
**Int. Cl.³ F02C *7/18***
**U.S. Cl. 60—754** **3 Claims**



1. A porous laminated metal fabrication for a high temperature gas turbine engine component comprising first and second walls each having plural lamina with a free edge portion thereon, each of said first and second walls having a first lamina with a surface having a first preformed hole pattern therein, each of said first and second walls including a second lamina bonded to said first lamina, said second lamina having a surface with a second preformed hole pattern therein to form a tortuous air flow path through said first and second walls for cooling the metal therein, said wall holes directing coolant flow to form an air barrier on one of the lamina surfaces, each of said lamina having a solid metal section formed therein between said holes and said edge portions to define a weldable region of uniform metal density throughout a predetermined width between said first and second walls, a weld in said weldable region connecting said edge portions and having a width limited to the width of said region of uniform metal density whereby air flow through the first and second walls is free to flow through the full extent of all the preformed hole patterns in said lamina thereby to maintain full coolant flow therethrough during gas turbine engine operation.

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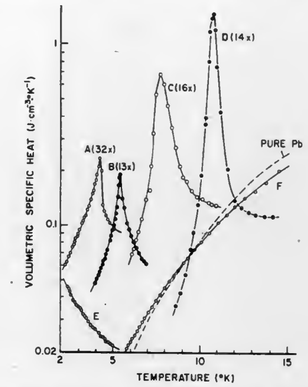
**4,296,607**
**CRYOGENIC CERAMIC AND APPARATUS**
**William N. Lawless, Westerville, Ohio, assignor to Corning Glass Works, Corning, N.Y.**
**Division of Ser. No. 29,554, Apr. 13, 1979, Pat. No. 4,231,231. This application May 19, 1980, Ser. No. 150,810**
**Int. Cl.³ C04B *35/00*; F25B *9/00*; F28D *17/00***
**U.S. Cl. 62—6** **18 Claims**

1. Sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula $ANb_2O_6$ wherein A is selected from one or both of Mn and Ni ions.

8. In cryogenic refrigeration apparatus comprising
a load to be refrigerated,
a refrigerant adapted to refrigerate the load at temperatures below 15° K.,
thermal energy absorbing elements associated with the refrigerant and adapted to function at temperatures below 15° K.,
wherein the improvement comprises at least one of the thermal energy absorbing elements being composed of sintered ceramic material:



(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with




a composition defined by the molar formula $AB_2O_6$ wherein
A is selected from one or both of Mn and Ni ions alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is ion or ions of Mn and Ni, and
B is selected from one or both of Nb and Ta ions.

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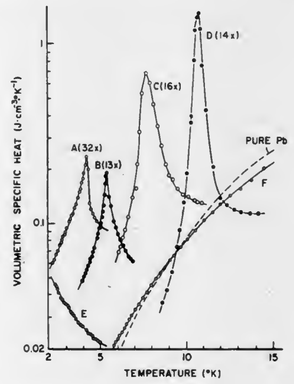
**4,296,608**
**CRYOGENIC CERAMIC AND APPARATUS**
**William N. Lawless, Westerville, Ohio, assignor to Corning Glass Works, Corning, N.Y.**
**Division of Ser. No. 29,554, Apr. 13, 1979, Pat. No. 4,231,231. This application May 22, 1980, Ser. No. 152,404**
**Int. Cl.³ C04B *35/00*; F25B *9/00*; F28D *17/00***
**U.S. Cl. 62—6** **19 Claims**




1. Sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula $A_2BCO_6$ wherein
A is selected from Pb ion alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is Pb ion,
B is Gd ion alone or in combination with one or more of other trivalent metal ions where at least about 90 mole % of B is Gd ion, and
C is selected from one or both of Nb and Ta ions.

8. In cryogenic refrigeration apparatus comprising
a load to be refrigerated,
a refrigerant adapted to refrigerate the load at temperatures below 15° K.,
thermal energy absorbing elements associated with the refrigerant and adapted to function at temperatures below 15° K.,
wherein the improvement comprises at least one of the thermal energy absorbing elements being composed of sintered ceramic material:
(a) characterized by
(1) being a dielectric insulator and
(2) having values of specific heat at selected temperatures below 15° K. that are greater than or at least equal to the values of specific heat of pure Pb at those same temperatures, and
(b) consisting essentially of a crystalline phase with a composition defined by the molar formula $A_2BCO_6$ wherein
A is selected from Pb ion alone or in combination with one or more of other divalent metal ions where at least about 90 mole % of A is Pb ion,
B is either Gd ion or Mn ion alone or in combination with one or more of other trivalent metal ions where at least about 90 mole % of B is Gd ion or Mn ion, and
C is selected from one or both of Nb and Ta ions.

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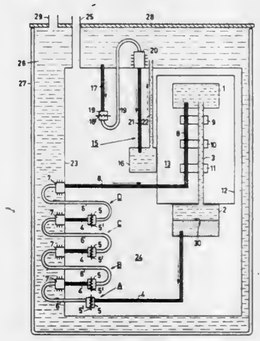
**4,296,609**
**$^3$HE-$^4$HE REFRIGERATOR**
**Adrianus P. Severijns, and Frans A. Staas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Mar. 19, 1980, Ser. No. 132,468**
**Claims priority, application Netherlands, Mar. 29, 1979, 7902438**
**Int. Cl.³ F25B *19/00***
**U.S. Cl. 62—514 R** **3 Claims**



1. A $^3$He-$^4$He refrigerator which comprises a mixing chamber for mixing liquid concentrated $^3$He and superfluid $^4$He; a segregating chamber accommodated at a lower level than the mixing chamber for separating a diluted $^3$He phase and a concentrated $^3$He phase; a connection duct between the mixing chamber and the upper part of the segregating chamber; and a thermomechanical pumping device based on the fountain pump effect for circulating superfluid $^4$He including a first superleak communicating with the lower part of the segregat-

ing chamber for withdrawing superfluid $^4He$ from the segregating chamber and a second superleak opening into the mixing chamber for injecting superfluid $^4He$ into the mixing chamber, said thermomechanical pumping device being constituted by a plurality of series-arranged fountain pumps.

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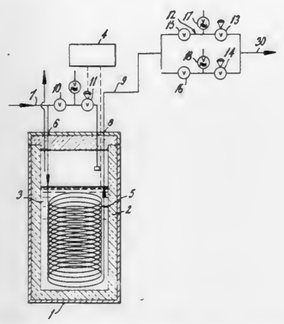
**4,296,610**

## LIQUID CRYOGEN DELIVERY SYSTEM

**Robert B. Davis, Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Apr. 17, 1980, Ser. No. 140,988**
**Int. Cl.³ F17C 7/02**
**U.S. Cl. 62—55** **7 Claims**



1. Apparatus capable of delivering small controlled quantities of a liquid cryogen to a use point in an intermittent manner comprising an on-period during which a predetermined amount of liquid cryogen is delivered to said use point continuously during said on-period, followed by an off-period during which no liquid cryogen is desired at said use point, said apparatus comprising in combination:

(a) insulated conduit means for transferring cryogen from a liquid cryogen supply source to said use point;

(b) subcooling means adjacent said use point and upstream thereof, adapted to condense vaporized cryogen in said conduit means and to subcool said cryogen; and

(c) flow control means located downstream of said subcooling means, adapted to cause a low flow of cryogen downstream of said subcooling means during said off-period, said low flow being sufficient upon vaporization to offset heat leaks in, as well as purge cryogen vapor from, said conduit means downstream of said subcooler, said flow control means also being adapted to cause a high flow of said cryogen during said on-period so that said predetermined amount of liquid cryogen is delivered to said use point essentially free of vapor.

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**4,296,611**

## HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL AND METHOD

**James R. Griffin, and Raymond M. Schreck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.**

**Division of Ser. No. 967,743, Dec. 8, 1978, Pat. No. 4,229,945.**
**This application Mar. 24, 1980, Ser. No. 133,209**
**Int. Cl.³ F25D 17/06**
**U.S. Cl. 62—89** **7 Claims**

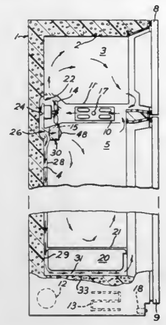
1. The method of controlling the temperature in a refrigerator having a freezer compartment and a fresh food compartment separated by a partition comprising:

(a) flowing a stream of cold air into the fresh food compartment,

(b) locating a temperature sensing element at the top of the fresh food compartment,

(c) shielding the temperature sensing element from the stream of cold air being directed into the fresh food compartment,

(d) controlling the temperature in both the freezer and fresh food compartments without significantly changing the constant ratio of those respective compartment temperatures by utilizing the temperature sensing element,



(e) dividing the stream of cold air entering the fresh food compartment into two streams, one going to the top of the fresh food compartment, and the other going to the bottom of the fresh food compartment, and

(f) controlling in equal ratio the amount of air flowing in the two streams to thereby change the ratio of the temperatures in the freezer and fresh food compartments.

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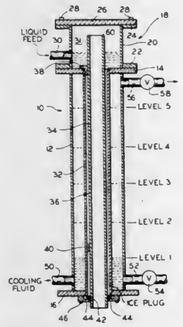
**4,296,612**

## FREEZE EXCHANGER WITH REMOVABLE TUBE LINER

**Vincent F. Allo, Warrenville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.**

**Filed Jun. 18, 1980, Ser. No. 160,667**
**Int. Cl.³ B01D 9/04**
**U.S. Cl. 62—123** **8 Claims**




1. A freeze exchanger comprising:

at least one freeze tube secured in, and penetrating, first and second spaced-apart tube sheets;

a cover beyond the first tube sheet;

a shell around the tube sheets and connected thereto, with said cover supported by the shell;

a removable tubular liner, in the freeze tube, of smaller outside diameter than the inside diameter of the freeze tube thereby defining an annulus between the two tubes;

means to deliver a liquid feed stream into a feed box space between the first tube sheet and the cover; and

means to deliver a cooling fluid around the freeze tube inside of the shell between the first and second tube sheets and means to remove cooling fluid therefrom.



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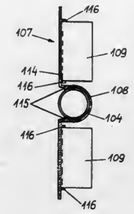
**4,296,613**

## ABSORPTION REFRIGERATOR

**Nicholas Eber, CH-1830 Unterenqstringen, Switzerland**

**Filed Oct. 9, 1979, Ser. No. 82,929**
**Claims priority, application Switzerland, Oct. 18, 1978, 10763/78**
**Int. Cl.³ F25B 39/02; F25F 1/30**
**U.S. Cl. 62—515** **14 Claims**



1. An absorption refrigerator comprising

a heat-insulated box having a wall and a layer of insulation therein;

an absorption refrigeration unit having an evaporator tube for passage of a refrigerant therethrough; and

at least one finned body having a base plate mounted on said wall and defining a convexly curved section receiving said evaporator tube in heat-conductive relation and a plurality of vertically disposed cooling fins mounted on said plate in heat-conductive relation therewith and in spaced vertical relation to said curved section to define a gap, said curved section and said fins being directed towards the interior of said box.

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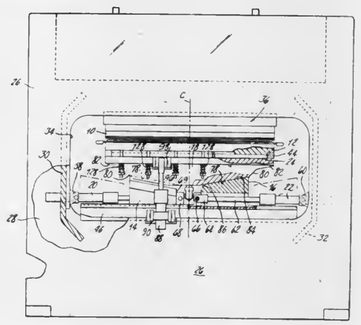
**4,296,614**

## LEATHER PRESS

**Robert K. Valks, Wetherby, England, assignor to USM Corporation, Farmington, Conn.**

**Continuation-in-part of Ser. No. 895,740, Apr. 13, 1978. This application Aug. 17, 1978, Ser. No. 934,602**
**Claims priority, application United Kingdom, Aug. 27, 1977, 36086/77**
**Int. Cl.³ C14B 1/30**
**U.S. Cl. 69—48** **2 Claims**



1. A machine for effecting a pressing operation on an article, said machine comprising;

a first platen and a second platen mounted in a frame of said machine;

a first closing means for urging movement of the first and second platens relative to one another, said article being disposed therebetween;

a second closing means for applying final predetermined pressure on said article disposed between said first and second platens;

said second closing means comprising at least two pressurizable members arranged with one of said platens, each of said pressurizable members includes a pancake ram slidingly disposed in a pancake cylinder in a cylinder plate disposed on a support plate, said pancake rams occupying a substantial surface portion of said platen, with a periphery having a step-like configuration thereon; and

said pancake rams also have a sealing member arranged along its step-like periphery to ensure a sealing fit between said rams and said cylinders, said pancake rams being of elongated shape to permit said rams to extend generally into the corners of said platens.

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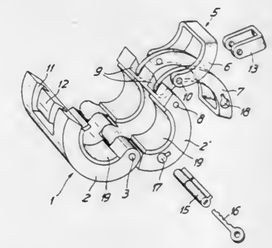
**4,296,615**

## ANTI-THEFT ARRANGEMENT, PARTICULARLY FOR A MAST OF A SAILING CRAFT

**Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder KG, Dachau, Fed. Rep. of Germany**

**Filed Jul. 31, 1979, Ser. No. 62,295**
**Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834338**
**Int. Cl.³ E05B 73/00**
**U.S. Cl. 70—19** **16 Claims**



1. An arrangement for preventing unauthorized removal of a rod-shaped object, particularly a mast of a sailing or similar craft, from a support, comprising an annular attachment in the form of a sleeve consisting of a rigid material and configurated to substantially fittingly embrace a region of the object when in operative position; at least one screw meshing with and penetrating into the interior of said sleeve for clampingly engaging said region of the object; means for locking said screw, at least in said operative position of said attachment; and means for confining said attachment to a particular area of the support.

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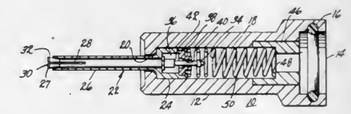
**4,296,616**

## ADAPTOR FOR PLUNGER LOCK OPERATING TOOL

**Richard S. Guiler, Stewartsville, N.J., assignor to E. J. Brooks Company, Newark, N.J.**

**Filed Sep. 14, 1979, Ser. No. 75,849**
**Int. Cl.³ E05B 67/36**
**U.S. Cl. 70—34** **6 Claims**



1. An adaptor tool for temporary assembly onto a plunger lock unlocking tool of a type having forwardly projecting

members which operate to grasp the external surface of the unlocking pin of a plunger lock and pull the pin to the unlocking position, said adaptor tool enabling the unlocking tool to be used to unlock a plunger lock of the type in which the unlocking member is a hollow tube, and comprising a hollow housing having means at the rear end for engaging the front end of the unlocking tool so that the forwardly projecting members extend into the housing, operating means in said housing having a portion positioned for engagement by said members when the tool is operated, said means being spring biased toward the front end of the housing and being movable toward the rear end by the operation of said tool, expandable mechanism projecting from the forward end of the housing for insertion into the hollow unlocking pin of a plunger lock, and means responsive to the movement of said means toward the rear of the housing to cause the expansion of said expandable mechanism and retraction thereof toward the housing.

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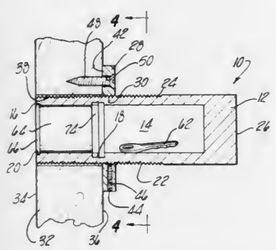
**4,296,617**

## LOCKABLE KEY HOLDING RECEPTACLE

**Barry A. Campagna, Oak Park, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.**

**Filed Dec. 10, 1979, Ser. No. 101,455**
**Int. Cl.³ E05B** *65/52*
**U.S. Cl. 70—63** **8 Claims**



1. A receptacle for a key, said receptacle being attachable to a door or like structure having an interior surface and an exterior surface, said receptacle comprising:

an elongated housing having a length greater than the width of said door, said housing having a longitudinally extending cavity which is open through only one axial end of the housing, said housing being positioned through an aperture in said door so that the open end of said housing faces outwardly flush from the exterior surface of said door so that a portion of the housing protrudes radially inwardly from the interior surface of the door;

means for attaching said housing to the interior surface of said door;

a closure plug receivable within the open axial end of said housing; and

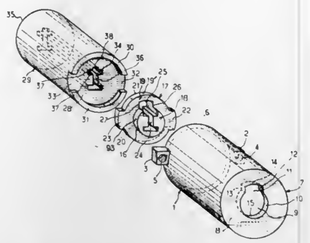
means for removably locking said plug to said housing wherein said cavity is circular in cross-sectional shape and has a circumferentially extending groove formed about its inner periphery at a position spaced from said open end of the housing, and wherein said means for locking said plug to said housing comprises a lock cylinder having a detent a portion of which enters said groove upon rotation of said lock cylinder.

**4,296,618**

## LOCK AND KEY DEVICE

**Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France**

**Filed Dec. 29, 1978, Ser. No. 974,557**
**Claims priority, application France, Dec. 30, 1977, 77 39747**
**Int. Cl.³ E05B** *19/02, 29/02*
**U.S. Cl. 70—358** **3 Claims**



1. A lock and key device, with the key comprising two pairs of slotted wings and the lock comprising a fixed hollow shaft with a rear traverse wall having a notching for the passage of the key, inside the fixed hollow shaft a rotary barrel with a rear partition provided with a conjugate slot of the key profile and interposed between the rotary barrel and the fixed hollow shaft coupling means which can only be rotated when the key has reached a driven-in position which is predetermined by a stop, a housing in back of the rear partition of the rotary barrel provided by extensions thereon, a cylindrical ring complementary to said housing extensions through external ears, a passage in said cylindrical ring of the key profile and having an internal slot with the same width as the wings; said key having, in addition to the slotted wings, on a connecting portion between the wings of one pair and a body of the key a projecting part with the same conjugate shape as said internal slot of the cylindrical ring so that when the key, after being driven into place, is under load stress to make a rotative motion, it will rotate the assembly made up of the ring and the rotary barrel through cooperation of one lateral face of its projecting part with a face opposite the slot, and the other face of the projecting part cooperating, through sliding during the rotative motion, with the front face of said rear traverse wall of the fixed hollow shaft so as to prevent the key from being withdrawn as long as it has not made a complete turn.

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**4,296,619**

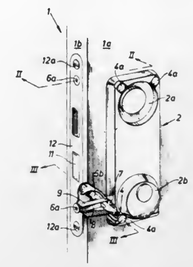
## ANCHORING MEANS FOR DOOR LOCK PLATES

**Bo G. Widen, Torshälla, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden**

**Filed Dec. 20, 1979, Ser. No. 105,490**
**Claims priority, application Sweden, Dec. 29, 1978, 7813472**
**Int. Cl.³ E05B** *9/08*
**U.S. Cl. 70—451** **9 Claims**

1. An anchoring arrangement for a door plate of a lock, said plate being secured to a door or the like by means of at least one upper and one lower securing means, said door accommodating a lock housing secured in a recess formed in a side edge of the door adjacent said plate and covered by a lock pillar, said securing means each cooperating with an anchoring element inserted from the pillar side of the door, said securing means including a rotatable part which is locked against rotation by the anchoring element inserted from the lock-pillar side of the door, each of said anchoring elements comprising a screw, and wherein said screws also secure the lock pillar to the side edge of the door.





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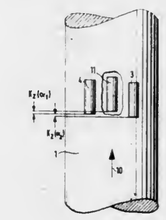
**4,296,620**

## SMOOTHING ROLLING MILL

**Siegfried Bagusche, Loevenich, Fed. Rep. of Germany, assignor to W. Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany**

**Filed Sep. 24, 1979, Ser. No. 77,995**
**Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844974**
**Int. Cl.³ B21D** *19/00*
**U.S. Cl. 72—100** **8 Claims**



1. A smoothing rolling mill apparatus for smoothing roller action on a work piece mounted for rotation about a longitudinal central axis of the work piece, comprising a plurality of smoothing roller means, support means operatively supporting said roller means relative to said work piece, said roller means being distributed unevenly around the longitudinal central axis of said work piece, said support means holding said roller means in spaced positions such that a relative axial offset or displacement Kz is established between the facing ends of said roller means, and wherein said relative axial displacement Kz satisfies at least approximately the following equation:

$$Kz = s\left(1 - \frac{\alpha z \cdot n}{360}\right)$$

wherein s is the feed advance produced by each roller means for each rotation of the work piece, n is the number of roller means distributed about the work piece, and wherein

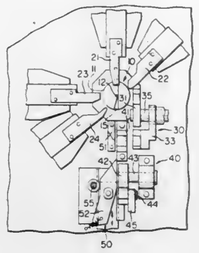
αz is the angle enclosed by the two lines extending radially through said longitudinal central axis of said work piece and radially through the rotational axis of the respective roller means of two neighboring roller means whereby the full feed advance capacity of each said roller means is cumulatively effective.

**4,296,621**

## MACHINES FOR FORMING COILED SPRINGS

**Yozo Ohdai, and Yasuyuki Takahata, both of Kasugai, Japan, assignors to Asahi-Seiki Manufacturing Co., Ltd., Owariasahi, Japan**

**Filed Dec. 4, 1979, Ser. No. 100,246**
**Claims priority, application Japan, Feb. 28, 1979, 54/23921**
**Int. Cl.³ B21F** *35/02, 11/00, 3/027*
**U.S. Cl. 72—130** **9 Claims**



1. A machine for forming coil springs of the type having a coiled body portion and first and second end loops at opposed ends of said body portion comprising:

a wire guide member having a void in one side thereof for receiving a coiled body portion and a wire guide groove therethrough, said wire guide groove permitting a wire to be fed therethrough;

a first tool member having a tapered free end, said first tool members being mounted for movement from a retracted position to an advanced position in which said tapered free end is effective to contact said wire fed through said guide groove for bending and coiling thereof at a first position adjacent an outlet orifice of said guide groove;

a second tool member;

a complementary tool member;

said second and complementary tool members being mounted for movement into gripping abutment with said wire at said first position;

a third tool member for contacting and bending said wire through a large angle while it is gripped at said first position by said second and complementary tool members at a first end of said body adjacent said first position where said wire is gripped;

first holding means operative to grip said body at a first portion thereof;

second holding means operative to grip said body at a second portion thereof; and

bending means for forming a large angle bend at a second end of said body adjacent a second position where said body is gripped by one of said first and second holding means.

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**4,296,622**

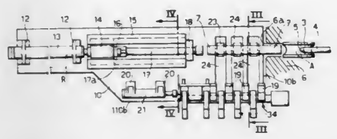
## DEVICE FOR INSERTING AND THRUSTING A BAR INTO A PRESS PIERCING MILL

**Aurindo Nessi, Albate (Como), Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy**

**Filed Apr. 11, 1979, Ser. No. 29,072**
**Claims priority, application Italy, Apr. 21, 1978, 22600 A/78**
**Int. Cl.³ B21B** *17/00, 19/04*
**U.S. Cl. 72—208** **6 Claims**

1. A device for inserting and thrusting a bar into a press piercing mill including a rolling machine having a pair of rolls, a piercing bit mounted along the rolling axis (A) of the machine and on the outlet side thereof, an inlet guide for the rolling machine and a bedplate holding the bar and extending along the rolling axis (A) from the inlet side of the guide, such device comprising:

a motor driven shaft rotatably borne by the inlet guide and having its axis of rotation parallel to the rolling axis (A);
a substantially drum-shaped bedplate coaxially keyed to the said motor-driven shaft;
a first thrust means mounted on the said drum-shaped bedplate and acting in a line (R) parallel to the axis of rotation of the said motor-driven shaft and separated therefrom by a distance equal to the distance between the axis of rotation and the rolling axis (A), the first thrust means being adapted to subject a bar to a thrust having a given value in order to roll and simultaneously pierce the bar;
a second thrust means mounted on the said bedplate and acting in a line ($R_1$) parallel to the line of action (R) of the first thrust means and circumferentially spaced therefrom by a center angle ($\alpha$) of predetermined value, the line of



action ($R_1$) being also at a distance from the axis of rotation of the said motor-driven shaft equal to the distance between the axis of rotation and the rolling axis (A), the second thrust means being adapted to subject said bar to a thrust for inserting it into the rolling machine through the inlet guide thereof; and
a motor for angularly moving the motor-driven shaft around its axis of rotation from a position in which the line of action (R) of the said first thrust means coincides with the rolling axis (A) and the line of action ($R_1$) of the said second thrust means is at an angular distance from the rolling axis (A) to a second position in which the line of action ($R_1$) of the said second thrust means coincides with the rolling axis (A) and the line of action (R) of the first thrust means is at an angular distance therefrom.

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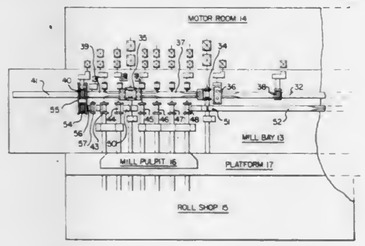
**4,296,623**
**SEMI-CONTINUOUS HOT ROLLING OF METAL STRIP AND PLATES**
**Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.**
**Filed Sep. 12, 1979, Ser. No. 74,876**
**Int. Cl.³ B21B *1/34*; B21C *47/00***
**U.S. Cl. 72—227** **30 Claims**




1. Apparatus for hot rolling metal workpieces into strip or plate without reheating comprising a mill table, a heating furnace adjacent the mill table positioned to discharge heated workpieces thereon, a roughing stand following the mill table, collecting means at the other end of the roughing stand from the mill table for accumulating the rolled product of the roughing stand, a finishing stand spaced both laterally and longitudinally from the roughing stand, delivery means preceding the entry end of the finishing stand laterally adjacent the collecting means, but at a different elevation therefrom, whereby both stands can be driven by separate motors on the same side of the stand, the delivery means feeding the rolled product of the roughing stand into the finishing stand, and means for transferring the rolled product of the roughing stand while it is hot from the collecting means to the delivery means, and a run out table following the finishing stand and extending in a direction different from the path of travel of workpieces leaving the delivery means in front of the discharge end of the heating furnace.

19. An upcoiler and uncoiler for hot rolled strip comprising a cylindrical housing in scroll form split on a vertical plane into a larger and a smaller element, means pivoting each element of the housing about a fixed pivot at its lower edge, those lower edges being spaced vertically from each other so as to form the upper and lower edges of an entry into the housing at the bottom thereof, an entry guide leading into the entry, and parallel driven coil-supporting rolls at the same elevation straddling the vertical plane and forming a continuation of the lower end of the smaller element.

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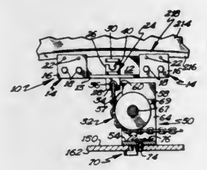
**4,296,624**
**ACCESSORY FOR AN APPARATUS FOR REPAIRING AND STRAIGHTENING**
**Gerald A. Specktor, 409 Cleveland Ave. South, St. Paul, Minn. 55105**
**Division of Ser. No. 722,825, Sep. 13, 1976, Pat. No. 4,138,877, which is a continuation of Ser. No. 550,378, Feb. 18, 1975, abandoned. This application Jan. 5, 1979, Ser. No. 1,082**
**Int. Cl.³ B21D *1/12, 1/14***
**U.S. Cl. 72—308** **10 Claims**



1. Accessory for an apparatus for repairing and straightening including a support surface for supporting a vehicle thereon comprising, in combination: a flexible pulling member including means at one end for attaching to the vehicle; down pull means for directing the flexible pulling member at an angle to the vehicle including substantially vertically of the vehicle; and means, for rotation about a vertical axis, for attaching the down pull means to the support surface vertically below the vehicle, for allowing rotational self-alignment of the down pull means about the vertical axis, and for allowing the down pull means to be substantially in line with the flexible pulling member when a repair force is applied to the other end of the flexible pulling member, wherein the down pull means comprises: a pulley, and means for removably, rotatably mounting the pulley, wherein the removably, rotatably mounting means comprises, in combination: a pin, and a first arm and a second arm upstanding from a center section, with the first and second arms having apertures formed therein for removably receiving the pin, and wherein the support surface has a top surface and a bottom surface defining a finite thickness and further includes at least one regularly shaped aperture passing vertically through the support surface and wherein the attaching, self-alignment, and allowing means comprises, in combination: attachment means having a cross sectional size substantially equal to but slightly less than the size of the aperture and having a removed portion of a thickness substantially equal to but slightly greater than the thickness of the support surface for allowing the attachment means to be vertically inserted into the support surface aperture and moved in a first lateral direction parallel to the support surface to engage the support surface within the removed portion, with a lip being defined by the removed portion for abutting with the bottom surface of the support surface; means for preventing the attachment means from moving in a second lateral direction opposite to the first lateral direction and for preventing unintentional removal of the attachment means from the aperture; and means extending around the preventing means, located on the opposite side of the attachment means from the lip, for abutting with the top surface of the support surface.



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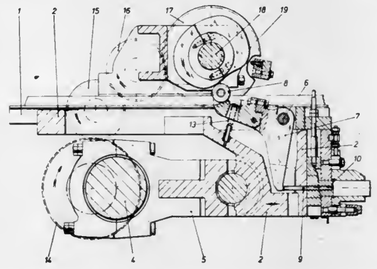
**4,296,625**
**CRANK PRESS WITH LATERAL ROD EJECTOR**
**Alois Weller, Erkrath, and Wolfgang Mai, Kaarst, both of Fed. Rep. of Germany, assignors to Kieserling & Albrecht, Solingen, Fed. Rep. of Germany**
**Filed Jun. 22, 1979, Ser. No. 51,235**
**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827561**
**Int. Cl.³ B21D *45/00***
**U.S. Cl. 72—345** **3 Claims**



1. In an improved crank press arrangement having a frame, a lateral ejector rod, and reciprocating sled movably mounted on said frame which is driven by a crank drive, wherein the ejector rod is slidably mounted in the sled and a positioning bush and coacts with a die, a toggle lever being pivotably mounted on said sled and having a first arm coacting with said ejector rod, and having a second arm on which a cam-follower roller is rotatably mounted, a control cam rotatably mounted and being in operative contact with said cam-follower roller, the improvement comprising that the contour and shape of the control cam, rotatably mounted in said frame, is such that while the cam-follower roller is in continuous contact therewith, nevertheless a temporary standstill of the ejector rod occurs relative to the frame during the operative cycles of the arrangement.

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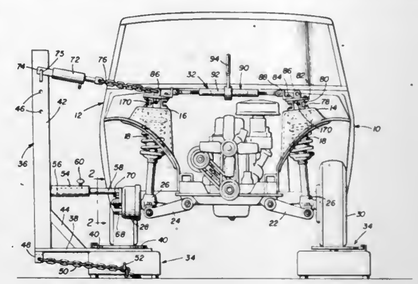
**4,296,626**
**WHEEL ALIGNMENT APPARATUS**
**Davis R. Jarman, 610 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks, both of Brunswick, Ga. 31520**
**Filed Jun. 21, 1979, Ser. No. 50,528**
**Int. Cl.³ B21D *1/12***
**U.S. Cl. 72—392** **11 Claims**

1. An alignment apparatus for a motor vehicle front end system including body sheet metal supported upper suspension strut end anchor locations, a pair of adaptor assemblies, said adaptor assemblies including mounting means for removable anchoring to said anchor locations, an elongated adjustable length thrust member of the push and pull type, means pivotally attaching the opposite end portions of said thrust member to said adaptor assemblies, a stand anchorable to the supporting surface for said vehicle on one side of the latter, an elongated pull structure having one end anchored to an upper portion of said stand and the other end thereof anchored to the adjacent adaptor assembly of said vehicle, an intermediate portion of said stand including a horizontally outwardly projecting adjustable length arm supported therefrom, the outer end of said arm including abutment structure for abutting and securement to an adjacent wheel hub of the associated vehicle, said stand being generally L-shaped in configuration including



a lower horizontal leg and an upper vertical leg whose lower end is anchored to one end of the lower leg and from an intermediate height portion of which said adjustable length arm is supported, the outer end of said lower horizontal leg including a turntable supported therefrom upon which a wheel supported from said wheel hub may rest.

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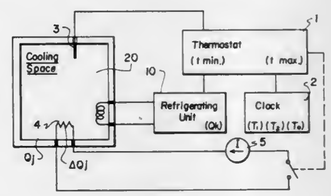
**4,296,627**
**METHOD AND DEVICE FOR MEASURING THE REQUIRED COOLING CAPACITY OF A COLD SPACE AND THE REFRIGERATION CAPACITY OF THE REFRIGERATING MACHINERY**
**Yrjö V. Lindström, Helsinki, Finland, assignor to Alnor Oy, Finland**
**Filed Dec. 28, 1979, Ser. No. 107,767**
**Claims priority, application Finland, Jan. 4, 1979, 790022**
**Int. Cl.³ G01K *17/00***
**U.S. Cl. 73—15 R** **5 Claims**




1. A method of determining the cooling capacity of a container comprising, cooling contents of the container to a first low temperature below an ambient temperature, permitting the contents of the container to rise to a second higher temperature below the ambient temperature during a first period, measuring the length of the first period, cooling the contents of the space again to the first low temperature during a second period, permitting the temperature to rise to the second higher temperature during a third period, heating the contents of the container during the third period by a known amount, and measuring the length of the third period to determine the thermal capacity of the container using the known amount of heating and the measured first and third periods.

**4,296,628**

## SYSTEM FOR DETECTING PARTICLES CARRIED BY A FLUID FLOW

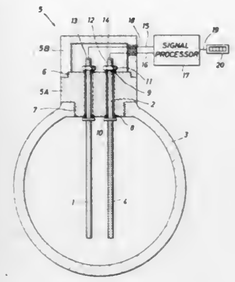
**Harm Mast, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

**Filed Jun. 5, 1980, Ser. No. 156,847**

**Claims priority, application United Kingdom, Jun. 26, 1979, 22277/79**

**Int. Cl.³ G01N** *15/07*

**U.S. Cl. 73—28** **6 Claims**




1. A system for detecting particles carried by a fluid flow, said system including:

at least two metal bodies each cooperating with an acoustical transducer means adapted to detect acoustic energy in the relevant body and to generate electric signals representative of such energy, one of the bodies having at least part of the metal surface thereof covered with a layer of acoustic dampening material; and,

means for substracting one of the electric signals from the other signal and recording the resulting signal.

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**4,296,629**

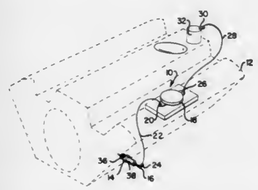
## PISTON TOP-DEAD-CENTER DETECTOR

**John M. Vuyovich, 1369 McDuff St., Los Angeles, Calif. 90026**

**Filed Dec. 17, 1979, Ser. No. 104,374**

**Int. Cl.³ G01M** *15/00*

**U.S. Cl. 73—116** **8 Claims**



1. A piston top-dead-center detector comprising the combination of:

an adapter assembly for making electrical contact with a piston in an internal combustion engine when the piston is in a top-dead-center position, the piston being at a given electrical potential and the adapter assembly comprising a first member adapted to be seated within a sparkplug hole in an internal combustion engine and a second member of electrically conductive material extending through and electrically insulated from the first member, the second member being capable of sliding within the first member and at the same time having a sufficiently snug fit within the first member so as to avoid sliding movement relative to the first member in the absence of the application of a substantial force to the second member;

an electrical terminal having a different potential from the given electrical potential; and

a lamp coupled between the adapter assembly and the electrical terminal.

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**4,296,630**

## APPARATUS FOR CAPACITIVE FILLING-LEVEL MEASURING, PARTICULARLY IN A MOTOR VEHICLE TANK

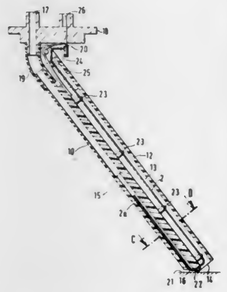
**Wilhelm Jung, Giessen-Kleinlinden, and Karl Rau, Mühlheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Fed. Rep. of Germany**

**Filed Feb. 25, 1980, Ser. No. 124,116**

**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908449**

**Int. Cl.³ G01F** *23/26*

**U.S. Cl. 73—304 C** **11 Claims**



1. For use with a container from which a medium is withdrawn through a suction passage to establish a variable level of the mdium above a bottom of the container,

and apparatus for measuring said level of the medium within the container having insulated electrodes immersed in said medium to form measuring and compensation capacitors, the capacitances of which are dependent on the dielectric constant of the medium, the improvement comprising insulating means within which said electrodes are disposed in non-conductive relation to the medium and having separate sections within which the electrodes respectively form the measuring and compensation capacitors, and support mans mounting only one of the separate sections of the insulating means in constant operative relation to the medium within said suction passage and the other of the sections externally of the suction passage within the container.

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**4,296,631**

## LIQUID CRYSTAL COMPOSITIONS AND DEVICES

**James L. Fergason, Kent, Ohio, assignor to Becton, Dickinson and Company, Rutherford, N.J.**

**Filed Sep. 21, 1979, Ser. No. 77,612**

**Int. Cl.³ C09K** *3/34;* **C01K** *3/00, 11/16*

**U.S. Cl. 73—356** **32 Claims**

14. A process for inhibiting the growth of domains in the isotropic liquid state of a cholesteric-to-liquid crystal composition, which comprises; adjusting the viscosity of said liquid state composition to about 20 to 6500 poise while retaining the twisting power of the cholesteric liquid crystal composition to selectively scatter visible light below the cholesteric-to-liquid transition point.

16. An improved temperature recording device, which comprises;

an opaque support member;

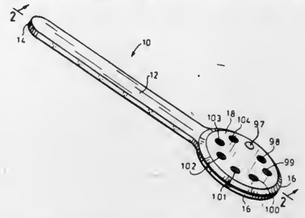
a cholesteric liquid crystal composition disposed on said support member, said composition comprising a mixture of



(a) an optically active liquid crystal compound characterized in part by an intrinsic left-handed helical structure and a liquid viscosity of between about 25 poise and 6500 poise; and

(b) a liquid crystal compound selected from those having an intrinsic right-handed helical structure, nematic liquid crystals and mixtures thereof;

the proportions of (a) and (b) being such as to provide said composition with a cholesteric-to-liquid transition point, a twisting power such that the resulting composition will selectively scatter visible light below said liquid transition point, and will cease to scatter visible light above said



cholesteric-to-liquid transition point; and a liquid viscosity of from about 20 to 6500 poise at the liquid transition point temperature.

31. A temperature indicating cholesteric liquid crystal composition, which comprises; an optionally active liquid crystal composition characterized by an intrinsic helical structure such as to provide a clearing point for the composition within the range of from about 10° to about 70° C. and a twisting power whereby the composition will selectively scatter visible light at a temperature below the clearing point, said composition having a viscosity of from 20 to 6500 poise at the clearing point temperature.

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**4,296,632**

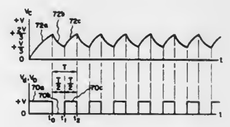
## TEMPERATURE-TO-FREQUENCY CONVERSION APPARATUS

**Milton D. Bloomer, and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 14, 1980, Ser. No. 121,489**

**Int. Cl.³ G01K** *7/16*

**U.S. Cl. 73—362 AR** **27 Claims**



1. In apparatus for converting the magnitude of a sensed parameter to the frequency of an output waveform, of the type having means providing an output waveform cyclically alternating, relative to a preselected potential of fixed magnitude, between first and second output voltage levels, responsive to a voltage at a single input respectively less than or equal to a first reference potential and greater than or equal to a second reference potential, the improvement comprising:

a timing capacitance element connected between the single input and the preselected potential; and

network means connected between said output and said single input for providing an electrical conductance therebetween of magnitude substantially linearly related to the magnitude of the sensed parameter; the conductance of said network means causing said timing capacitance element to cyclically charge and discharge to said second and first reference potentials respectively to provide said output waveform substantially as a squarewave having a frequency established by said preselected timing capacitance and network conductance values and substantially linearly proportional to the conductance value of said network means.

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**4,296,633**

## DEVICE FOR TEMPERATURE MEASUREMENT

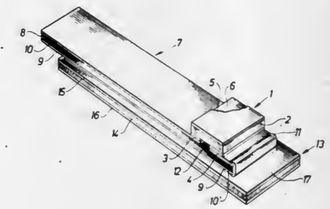
**Hakan B. Hakansson; Lennart P. E. Persson, both of Lund, and Berth-Ove G. Wall, Bjäred, all of Sweden, assignors to Gambro AB, Sweden**

**PCT No. PCT/SE78/00012, § 371 Date Mar. 3, 1980, § 102(e) Date Jun. 1, 1979, PCT Pub. No. WO80/00191, PCT Pub. Date Feb, 7, 1980**

**PCT Filed Jul. 3, 1978, Ser. No. 131,079**

**Int. Cl.³ G01K** *7/22*

**U.S. Cl. 73—362 AR** **21 Claims**



1. A device for temperature measurement comprising a temperature-sensitive sensor (**1**), whose electrical properties, e.g. the resistance, vary with the temperature, e.g. a thermistor, and which is connected via two contacts (**3, 4**) to two electric conductors (**9,10**) arranged on a support (**7**), characterized in that the two electric conductors (**9,10**) are arranged on both sides of the support (**7**) which is in the form of an elongated strip and that the one conductor (**9**) extends directly or via a suitable extension (**11**) over one edge of the support (**7**) in the direction towards the other conductor (**10**) but without reaching as far as the same thus forming a gap, slit or the like (**12**) which is arranged so that it is bridged by the sensor (**1**) one contact (**3,4**) of which is connected to each conductor (**9,10**).

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**4,296,634**

## SEPTUM FOR USE IN GAS CHROMATOGRAPHY AND METHOD OF OPERATION

**Robert H. Goodale, 7355 Yucca Ct., Boulder, Colo. 80301, and George M. DuJack, Jr., 391 Fourth St., Troy, N.Y. 12180**

**Filed Feb. 20, 1980, Ser. No. 122,916**

**Int. Cl.³ G01N** *37/00*

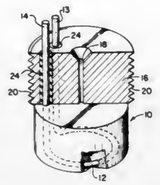
**U.S. Cl. 73—864.86** **16 Claims**

1. A septum for use in gas chromatographic apparatus, the septum comprising,

a septum member of an elastomeric material, and

cooling means positioned internally of the septum member,

whereby the temperature of the septum may be maintained at a lowered level when exposed to column gases at



elevated temperatures while avoiding substantial cooling of such gases by the septum.

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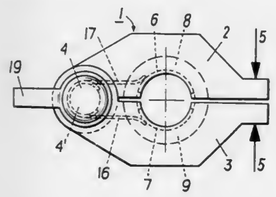
**4,296,635**

## TRANSDUCER DEVICE FOR MEASURING THE INTERNAL PRESSURE IN PIPES

**Peter Claassen; Helmut List, and Rudolf Zeiringer, all of Graz, Austria, assignors to Hans List, Graz, Austria**

**Filed Jun. 11, 1980, Ser. No. 158,515**
**Int. Cl.³ G01L *7/02***
**U.S. Cl. 73—730** **10 Claims**



1. A transducer device for measuring the internal pressure in pipes, comprising two housing parts and a connecting element, wherein said housing parts are articulately connected with one another by said connecting element and adapted to be fixedly mounted on the pipe by means of a clamping device, each of said housing parts contains at least one measuring element with a bipolar take-off of test signals, at least one pole of each take-off is electrically conductingly connected with a part of said connecting element which is electrically insulated relative to the other pole, and the connecting element comprises connection terminals for the further conduction or transmission of the test signals, the said other pole being potentially in direct connection with the pipe.

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**4,296,636**

## NOISE-REDUCING ELECTRODES FOR ELECTROMAGNETIC FLOWMETER

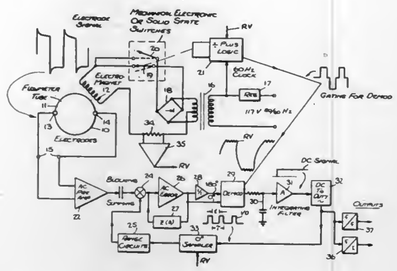
**Elmer D. Mannherz, Bucks County, Pa., assignor to Fischer & Porter Co., Warminster, Pa.**

**Filed May 22, 1980, Ser. No. 152,479**
**Int. Cl.³ G01F *1/58***
**U.S. Cl. 73—861.12** **6 Claims**

1. An electromagnetic flowmeter for measuring the flow rate of a slurry containing solid particles, said flowmeter comprising:

A. a flow tube having a pair of electrodes mounted thereon at diametrically-opposed positions, said electrodes having a surface with a metallurgical hardness of at least Rockwell A85, whereby the impingement of said solid particles thereon does not result in the substantial generation of noise components; and

B. an electromagnet having a coil which is excited by a low frequency wave derived from a standard a-c power line, the frequency of the wave being low relative to that of the line to produce a transverse magnetic field within the tube which is intersected by the slurry, the voltage induced in



the slurry being transferred to said electrodes to provide a flow-induced signal relatively free of noise components.

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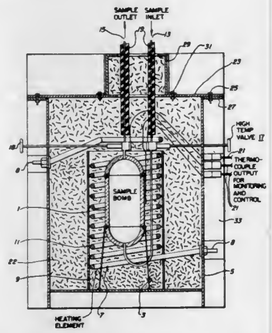
**4,296,637**

## METHOD AND APPARATUS FOR SAMPLING HOT HOMOGENEOUS MIXTURES

**Narasimhan Calamur, and Morris R. Schoenberg, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Mar. 28, 1980, Ser. No. 134,879**
**Int. Cl.³ G01N *1/22*; H05B *3/06***
**U.S. Cl. 73—863.11** **9 Claims**



7. A method for sampling hot homogeneous mixtures which form multiple phases at a temperature above ambient temperature which comprises:

(a) heating a sample vessel and attached inlet and outlet means and valve means to a temperature above the dew point of said homogeneous mixture;

(b) purging said sample vessel and said inlet and outlet means and valve means with an inert gas;

(c) collecting a portion of said hot homogeneous mixture in said sample vessel;

(d) sealing said sample vessel with said valve means; and

(e) maintaining the temperature of said mixture above the dew point of said mixture.

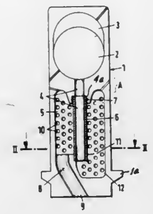


**4,296,638**

## SAMPLING MOLTEN METAL

**Gustav Kolb, Im Ohl 52, 5870 Hemer, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf and Gustav Kolb, Hemer, both of, Fed. Rep. of Germany**

**Filed Nov. 9, 1979, Ser. No. 92,849**
**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849333**
**Int. Cl.³ G01N *1/12***
**U.S. Cl. 73—863.21** **6 Claims**



1. Apparatus for sampling molten metal, e.g., steel, and including a body which contains a plurality of chambers, comprising:

an upper, mold-defining chamber in the body for a sample;

a lower slag retention chamber disposed underneath the mold-defining chamber;

a duct in the body, ending upwardly in a bottom of the mold-defining chamber;

an upright refractory tube, communicating with the duct at its lower end and traversing the slag retention chamber, the tube having a lower end disposed in a lower portion of the slag retention chamber, the tube being held by the body at least at an upper portion of the slag retention chamber;

an eccentrically disposed, flow-reversing chamber as part of the slag retention chamber and extending under, and at a lower level of, the lower end of the tube; and

a feed duct leading from an outside surface to the slag retention chamber.

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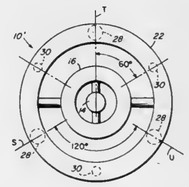
**4,296,639**

## FREE ROTOR GYRO WITH THREE TORQUERS AND THREE PICKOFFS

**Menno G. Koning, Dover, Mass., assignor to Northrop Corporation, Los Angeles, Calif.**

**Filed Jan. 16, 1980, Ser. No. 112,870**
**Int. Cl.³ G01C *19/28, 19/30***
**U.S. Cl. 74—5.46** **12 Claims**



1. In a free gyro having a case, a rotor having an inertial mass distributed about a spin axis, means in said case for imparting constant rotation to said rotor, and means for freely suspending said rotor within said case to make the orientation of the spin axis independent of the orientation of said case over a given range with respect to a nominal reference orientation of said spin axis fixed relative to said case, the improvement comprising

torquer means for applying discretely variable forces to said rotor at three coplanar locations fixed with respect to said case and equally spaced circumferentially about the spin axis in said nominal orientation.

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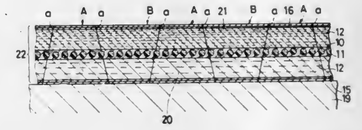
**4,296,640**

## POWER TRANSMISSION V-BELT AND METHOD OF MANUFACTURE

**Soukichi Nosaka, Kobe, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan**

**Filed May 31, 1979, Ser. No. 44,289**
**Claims priority, application Japan, Dec. 16, 1978, 53-156030**
**Int. Cl.³ F16G *5/16, 5/00***
**U.S. Cl. 474—262** **16 Claims**



1. A power transmission V-belt comprising: a tensile number (11) arranged in the form of a layer along the center line of said belt; elastic rubber layers (13, 14) formed respectively on opposite surfaces of the layer of said tensile member; fabric layers (15, 16) bonded to the outside surfaces of said elastic rubber layers respectively, said fabric layers having different amounts of stretchability in the longitudinal direction of said belt, and said belt having a trapezoid cross-section.

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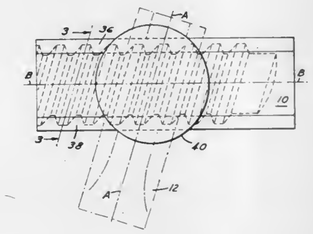
**4,296,641**

## RACK AND PINION GEAR BEARING SUPPORT

**James I. May, Royal Oak, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Mar. 31, 1980, Ser. No. 135,601**
**Int. Cl.³ F16H *1/04***
**U.S. Cl. 74—422** **5 Claims**



1. A rack and pinion gear mechanism comprising:

a driving pinion;

a rack in meshing engagement with and driven by said pinion having at least two bearing surfaces whose center of curvature is located at the midpoint of a radial plane disposed perpendicular to the rack axis and passing through the center of a pinion tooth, the plane extending radially between the projection onto the plane of the radial extremities between which the contact point between a pinion tooth and a rack tooth moves on the face of the pinion tooth; and

a saddle bearing for supporting said rack having bearing surfaces disposed on opposite sides of the plane, mating with and complementary to the bearing surfaces of said rack.

**4,296,642**

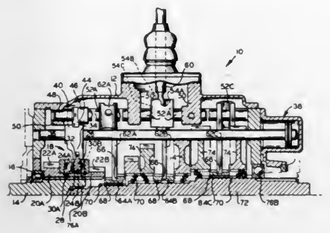
## TRANSMISSION INTERLOCK

**Thomas C. Schetter, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio**

**Filed Aug. 20, 1979, Ser. No. 67,932**

**Int. Cl.**[3] **B60K** *20/00;* **F16H** *57/06;* **G05G** *5/10;* **F16H** *3/02*

**U.S. Cl. 74—475** **13 Claims**



8. A vehicle transmission and mechanical interlock disposed within a unitary housing comprising, in combination,

an input shaft,

an output shaft,

a first gear ratio selection means for effecting at least two distinct gear drive ratios between said input shaft and said output shaft,

at least one axially translatable first shift rail associated with said first gear selection means,

a second gear ratio selection means in tandem with said first gear ratio selection means for effecting at least two distinct gear drive ratios between said input shaft and said output shaft,

at least one axially translatable second shift rail associated with said second gear selection means,

an axially translatable auxiliary rail disposed generally between and parallel to said first and second shift rail,

a linkage means between said auxiliary rail and one of said first and second shift rails for positively axially translating said auxiliary rail with said one of said rails,

a locking member positioned transversely between said auxiliary rail and the other of said first and second shift rails, a plurality of re-entrant detents defined by said auxiliary rail and the other of said shift rails,

whereby seating and interference of said locking member within said detents permits and precludes selection of certain combinations of gear drive ratios.

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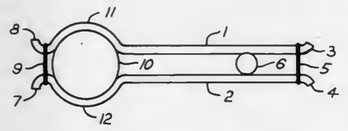
## MOTORCYCLE THROTTLE GRIPPER

**Morris E. Cornelius, Box 91, Yale, Iowa 50277**

**Filed Aug. 13, 1979, Ser. No. 66,429**

**Int. Cl.**[3] **G05G** *5/16*

**U.S. Cl. 74—531** **3 Claims**



1. A motorcycle throttle gripper comprising: an upper friction lever and a lower friction lever with one said friction lever positioned above the throttle grip hand control and brake lever hand control and with one said friction lever positioned below the throttle grip hand control and brake lever hand control, and with an offset concave portion on each said friction lever to provide efficient rotational frictional contact with the throttle grip hand control, and with a straight portion on each said friction lever to provide efficient sliding friction contact with the brake lever hand control, and with the right hand extremities of the two said friction levers bent or hooked slightly to accept a flexing elastic member to keep the two said friction levers in efficient sliding contact with the brake lever hand control, and with the left hand extremities of the two said friction levers bent or hooked slightly to accept a flexing elastic member to keep the two said friction levers in efficient rotational frictional contact with the throttle grip hand control, with the two said efficient friction levers providing near zero backlash throttle gripping control.

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**4,296,644**

## CASING FOR A TRANSMISSION

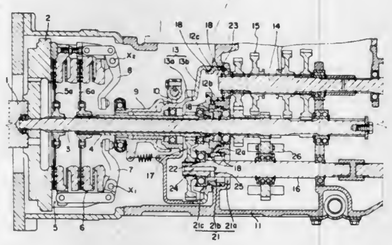
**Kenzo Sada, and Shigeyuki Hayashi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan**

**Filed Apr. 5, 1979, Ser. No. 27,341**

**Claims priority, application Japan, Aug. 10, 1978, 53-110967[U]**

**Int. Cl.**[3] **F16H** *57/02*

**U.S. Cl. 74—606 R** **10 Claims**



7. A casing for a transmission comprising:

a first transmission case having a running system transmission shaft, a running system input shaft mounted below the transmission shaft, and a PTO transmission shaft mounted below the input shaft;

a second transmission case connected to a forward portion of the first transmission case, said input shaft extending forwardly through the second transmission case and operatively connected to a running system clutch, said PTO transmission shaft having a forward end thereof located in the second transmission case;

a tubular PTO input shaft relatively rotatably fitted on said running system input shaft and operatively connected at a forward end thereof to a PTO system clutch, a rearward end of said PTO input shaft being located in the second transmission case;

a gear coupling mechanism mounted in the second transmission case to operatively connect said PTO input shaft and said PTO transmission shaft;

a lower tubular member fitted between the first transmission case and the second transmission case at a position where the PTO transmission shaft extends through the cases, the PTO transmission shaft extending through said lower tubular member;

an oil channel between the lower tubular member and the PTO transmission shaft to provide communication between the first and second transmission cases;

an upper tubular member fitted between the first transmission case and the second transmission case at a position where the running system transmission shaft is supported, said upper tubular member defining an air channel to communicate between the first and second transmission cases; and

oil seals respectively interposed between an outer periphery of the lower tubular member and the first and second transmission cases and between an outer periphery of the upper tubular member and the first and second transmission cases whereby the first and second transmission cases are interconnected in oiltight condition.



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**4,296,645**

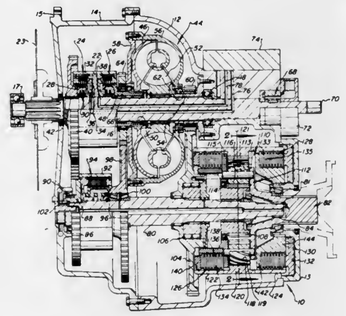
## POWERSHIFT TRANSMISSION WITH DIRECT DRIVE AND MODULATED TORQUE CONVERTER DRIVE IN FORWARD AND REVERSE

**James J. Jameson, Coffeyville, Kans., assignor to Cooper Industries, Inc., Houston, Tex.**

**Filed Sep. 14, 1979, Ser. No. 75,465**

**Int. Cl.**[3] **F16H** *47/08, 57/00*

**U.S. Cl. 74—688** **19 Claims**



1. A multispeed gear transmission comprising:

a housing;

an input shaft rotatably mounted in said housing;

a hydrokinetic torque converter disposed in said housing including an impeller and a turbine;

first and second gears drivenly connected to said turbine;

a countershaft rotatably mounted in said housing and disposed in generally parallel relation to said input shaft;

third and fourth gears mounted on said countershaft and intermeshed respectively with said first and second gears;

clutch means drivingly interconnecting said third gear to said countershaft;

a first fluid actuated clutch drivingly connecting said input shaft to said impeller;

an output shaft; and,

a reversing mechanism interconnecting said countershaft and said output shaft for reversing the direction of rotation of said output shaft with respect to said countershaft.

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**4,296,646**

## AUTOMATIC TRANSMISSION

**Kenneth Thornton, Nantwich, England, assignor to Rolls-Royce Motors Limited, Crewe, England**

**Filed Dec. 6, 1978, Ser. No. 967,150**

**Claims priority, application United Kingdom, Jan. 5, 1978, 00284/78**

**Int. Cl.**[3] **F16H** *47/08, 47/00*

**U.S. Cl. 74—688** **2 Claims**

1. A transmission comprising:

an input means;

an output means;

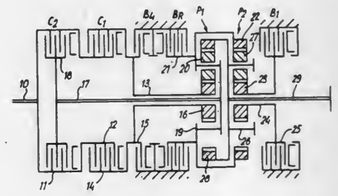
planetary gearing means disposed between said input means and said output means for providing one reverse speed ratio and four forward speed ratios with the fourth forward speed ratio being an overdrive ratio;

said planetary gearing means being operatively associated with a first friction clutch and a second friction clutch and first, second and third reaction brakes and first, second, third and fourth members;

a hydrodynamic torque converter operatively associated with said planetary gearing means and through which drive from said input means to said output means is provided in reverse speed ratio and first speed ratio only, said hydrodynamic torque converter being drivably connected to said first friction clutch and being arranged to be driven from said input means and drivably connected to said second friction clutch which is driven directly and mechanically from said input means, said hydrodynamic torque converter including an impeller, a stator and a turbine;

a one-way clutch provided between said impeller and said turbine to prevent said turbine from rotating at a higher forward speed than said impeller to eliminate power loss in the third speed ratio;

said first member being arranged to be driven from said input means through said fluid coupling and said first clutch in reverse speed ratio, first speed ratio and third speed ratio;



said second member being arranged to be driven directly from said input means in said second speed ratio and said third speed ratio and held stationary through said first reaction brake in reverse speed ratio;

said third member being arranged to be held stationary through said second reaction brake in said first speed ratio and said second speed ratio;

said fourth member being permanently connected to said output means; and

said third reaction brake being provided to operatively hold said first member stationary to provide said fourth speed ratio from said planetary gearing means and said second member being driven through said second friction clutch in said fourth speed ratio.

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**4,296,647**

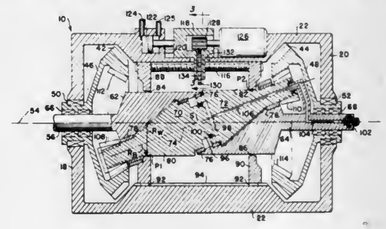
## DIFFERENTIAL TRANSMISSION DRIVE UNIT

**Yves J. Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.**

**Filed May 30, 1979, Ser. No. 43,686**

**Int. Cl.**[3] **F16H** *37/06, 15/16, 37/08, 15/50*

**U.S. Cl. 74—690** **18 Claims**



1. A differential transmission unit for transmitting a mechanical power input to a pair of independently rotatable outputs, said unit comprising:

a unit frame defining a first axis;

an alpha body supported by said frame for rotation on said first axis;
a pair of beta bodies carried by said alpha body on a second axis inclined with respect to and intersecting said first axis at a point of axes intersection, said beta bodies being axially spaced to be positioned on opposite sides of said point of axes intersection and each having a beta rolling surface of revolution about said second axis;
a pair of omega bodies supported by said frame and each having an omega rolling surface of revolution about said first axis, said omega rolling surfaces being positioned on opposite sides of said point of axes intersection;
said beta and omega rolling surfaces being in frictional engagement at two contact points located one on each side of said point of axes intersection thereby to establish one such contact point between each beta and omega body of said pairs and whereby nutational movement of said beta body pair results in torque transmission between said beta and omega rolling surfaces, at least one of said beta and omega rolling surfaces having variable radii along the length thereof relative to the other of said beta and omega surfaces so that the ratio of beta/omega surface radii at said contact points is varied by relative shifting of said beta and omega bodies;
means for drivably connecting the power input and said alpha body;
a pair of rotatable unit output shafts;
means for supporting the respective bodies of one pair of said beta and omega bodies for independent rotation;
means drivably connecting said one pair of said beta and omega bodies to said pair of output shafts;
means holding the other of said beta and omega body pairs against rotation on the rolling surface axis thereof; and
means for relative shifting of said beta and omega bodies in frictional engagement at each of said two contact points to vary the ratio of beta/omega surface radii independently at said respective contact points.

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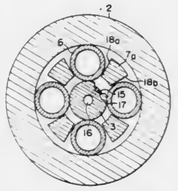
**4,296,648**

## LUBRICATED FRICTION SPEED CHANGE GEARING

**Hiroshi Okano, and Akira Sato, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Kabushiki Kaisha Fujikoshi, Toyama, both of, Japan**

**Filed Oct. 16, 1979, Ser. No. 85,256**
**Claims priority, application Japan, Dec. 15, 1978, 53-156712**
**Int. Cl.³ F16H** *13/08*
**U.S. Cl. 74—798** **4 Claims**



1. A lubricated friction speed change gearing comprising a housing, first and second rotary shafts rotatably supported in said housing on collinear axes, an inner race supported by said first rotary shaft, an outer race supported by said housing to be coaxial with said inner race, a plurality of cylindrical rollers mounted between said inner and outer races and compressed and elastically deformed therebetween, and a spider member supported by said second rotary shaft to engage among said rollers in sliding contact therewith and arranged to drive or be driven by said rollers when they perform planetary movement, said spider member having substantially plane rigid surfaces at its portions where it opposes and slidingly contacts said rollers, said surfaces each having a groove extending in the direction of relative movement of the outer surfaces of the co-operating rollers.

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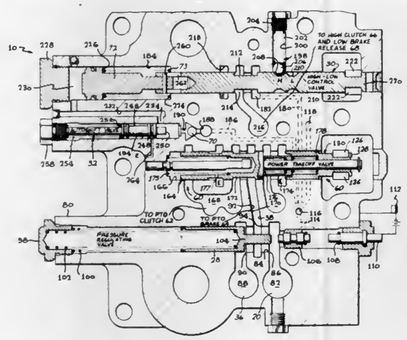
**4,296,649**

## HYDRAULICALLY OPERATED TRANSMISSION CONTROL

**Gordon L. Marquart, Jesup, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Apr. 4, 1979, Ser. No. 27,158**
**Int. Cl.³ F16H** *5/78;* **F16D** *67/04;* **B60K** *17/34*
**U.S. Cl. 74—751** **20 Claims**



1. A control device for a transmission comprising the combination of a source of pressurized fluid, a housing, a pressure regulating valve mounted within the housing, a first chamber within the housing communicating with the pressure regulating valve, means coupling the source of pressurized fluid to the first chamber, an additional chamber within the housing connecting with the pressure regulating valve for providing a path for pressurized fluid provided the first chamber by the source of pressurized fluid, and means for coupling the additional chamber to the transmission to provide pressurized fluid to the transmission, the pressure regulating valve normally coupling the additional chamber to the first chamber and including means responsive to fluid pressure below a predetermined threshold value within the first chamber for cutting off the first chamber from the additional chamber.

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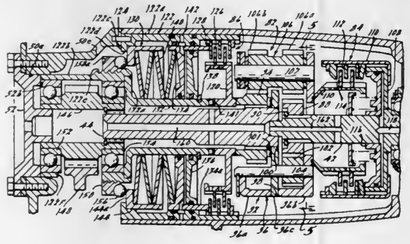
## TWO-SPEED TRANSAXLE

**Ilmars Kalns, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 25, 1979, Ser. No. 51,576**
**Int. Cl.³ F16H** *37/08, 3/74, 3/56*
**U.S. Cl. 74—751** **7 Claims**



1. A transmission comprising:
a housing;



an input and output means mounted for rotation in said housing;
a planetary gear set including an input member rotatably driven by said input means, an output member rotatably driving said output means, and a rotatable reaction member;
a clutch mechanism operative when applied to prevent relative rotation between said members for locking said planetary gear set and effecting a one-to-one speed ratio between said input and output members and operative when released to allow said relative rotation;
a brake mechanism operative when applied to prevent rotation of said reaction member for effecting a different speed ratio between said input and output members and operative when released to allow rotation of said reaction member; and
first and second means operative to apply and release said mechanisms, said first means including preloaded spring means for applying one of said mechanisms and means responsive to pressurized fluid for opposing the force of spring means and releasing said one mechanism, and said second means including means responsive to pressurized fluid for applying the other of said mechanisms and means operative to release said other mechanism in the absence of said pressurized fluid, whereby one of said speed ratios is effected in the absence of pressurized fluid to both of said mechanisms and whereby the other speed ratio is effected in the presence of said pressurized fluid to both of said mechanisms.

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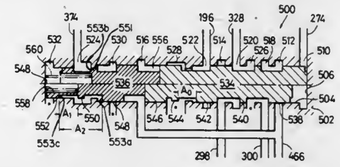
**4,296,651**

## AUTOMATIC POWER TRANSMISSION SHIFT VALVE

**Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Nov. 24, 1978, Ser. No. 963,648**
**Claims priority, application Japan, Sep. 5, 1978, 53-108039**
**Int. Cl.³ B60K** *41/06, 41/10*
**U.S. Cl. 74—869** **15 Claims**



1. A hydraulic control system for an automatic transmission for a motor vehicle, the transmission being shiftable by at least one servo-actuator between a plurality of gear ratios, including at least a pair of relatively higher and lower forward drive ratios, the control system comprising:
a source of fluid;
means communicating with said source of fluid for producing in the hydraulic system a plurality of fluid pressures including a control pressure variable with operating conditions of the motor vehicle, an actuating fluid pressure selectively fed to the servo-actuator to effect shifting between gear ratios, and a kickdown fluid pressure for overriding said control fluid pressure in response to a vehicle condition wherein sudden acceleration is required;
a shift valve, including a movable valve element, communicating with said producing means such that said control pressure effects controlled movement of said valve element in response to vehicle operating conditions and such that movement of said valve element effects selective communication of fluid under the actuating pressure with the servo-actuator to cause shifting from one gear ratio to another, said valve element including a first position for establishing the lower gear ratio and a second position for establishing the higher gear ratio;
said valve element including a first effective kickdown pressure acting area which is selectively exposed to said kickdown pressure when said valve element is in said first position; said first effective kickdown pressure area, when acted upon by said kickdown pressure, urging said valve element to remain in said first position;
said valve element including a second effective kickdown pressure acting area, which is different in area from said first effective kickdown pressure acting area, and which is selectively exposed to said kickdown pressure when said valve element is in said second position, said second effective kickdown pressure area, when acted upon by said kickdown pressure, urging said valve element to move from said second position to said first position;
a passageway extending between said producing means and said shift valve to effect communication therebetween;
a single kickdown pressure port in said shift valve effecting communication between said passageway and both said first and second kickdown pressure acting area.

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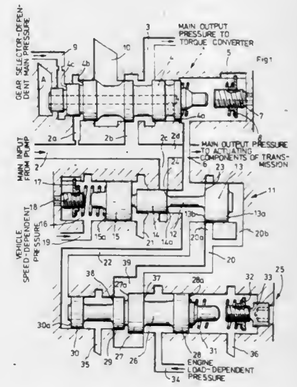
**4,296,652**

## HYDRAULIC CONTROL FOR AN AUTOMATIC VEHICLE TRANSMISSION

**Gerd Oberpichler, Brunswick, and Ernst-August Honig, Wolfsburg, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed Jul. 20, 1979, Ser. No. 59,204**
**Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832345**
**Int. Cl.³ B60K** *41/06*
**U.S. Cl. 74—868** **5 Claims**



1. In a hydraulic control device for an automatic vehicle transmission including a main pressure control valve for delivering an engine load-dependent main output pressure for operating actuating components of the vehicle transmission; and a pressure-limiting valve for delivering an engine load-dependent, upwardly limited control pressure; said pressure-limiting valve including a control piston exposed to said control pressure and to the force of a spring opposing the control pressure; the improvement comprising an additional control valve means for applying to said main pressure control valve an output pressure being a function of a vehicle speed-dependent pressure and said control pressure and being modulated by said control pressure and a higher main input pressure.

**4,296,653**

## METHOD AND A DEVICE FOR REMOVING CORKS FROM VESSELS

**Sune I. Lundgren, Lulea, and Leif E. L. Rehnberg, Boden, both of Sweden, assignors to Kemi-Intressen AB, Sundbyberg, Sweden**

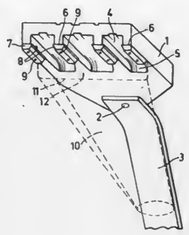
**PCT No. PCT/SE78/00070, § 371 Date Jun. 20, 1979, § 102(e) Date Jun. 20, 1979, PCT Pub. No. WO79/00268, PCT Pub. Date May 17, 1979**

**PCT Filed Nov. 8, 1978, Ser. No. 118,803**

**Claims priority, application Sweden, Nov. 10, 1977, 7712690**

**Int. Cl.³ B67B *7/00***

**U.S. Cl. 81—3.46 R** **9 Claims**



3. A device for removing corks from vessels in situations when the upper part of the cork extends above the orifice of the vessel, which device comprises two elongated knives, each equipped with a knive-edge, and a holding device which supports the knives in a spaced apart relationship in the same horizontal plane and fixes the knives with their knive-edges oriented substantially parallel to each other in the same horizontal plane, directed towards each other and separated by a distance less than the largest diameter of the cork to be removed, said holding device having an inlet opening and an outlet opening and being elongated so as to form a free space which allows linear passage of a cork from said inlet opening to said outlet opening between the substantially parallel spaced apart knife-edges.

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**4,296,654**

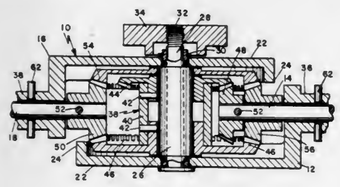
## ADJUSTABLE ANGLED SOCKET WRENCH EXTENSION

**Albert E. Mercer, Box 531, Jacumba, Calif. 92034**

**Filed Aug. 20, 1979, Ser. No. 68,097**

**Int. Cl.³ B25B *17/00***

**U.S. Cl. 81—57.26** **8 Claims**



1. A tool drive mechanism for producing a rotational motion at an output shaft from a selectable motion at an input shaft, said drive mechanism comprising:

(a) an input shaft mounting bracket having said input shaft captured in journaled relation therein such that said shaft is rotational about its longitudinal axis;

(b) an output shaft mounting bracket having said output shaft captured in journaled relation therein, such that said shaft is rotational about its longitudinal axis;

(c) said mounting brackets being pivotally interconnected to define an axis of angular adjustment perpendicular to the rotational axes of said shafts and permitting relative pivotal motion of said shafts in their respective brackets in a common plane substantially including the shafts;

(d) each of said shafts having a pivotally inner end mounting an integral bevel shaft gear captured by the mounting bracket which mounts same;

(e) a gear spool rotational between said brackets about said axis of angular adjustment and defining two inwardly facing bevel gears engaging respective ones of said shaft gears whereby clockwise rotation of one of said shafts about its longitudinal axis produces clockwise motion of the other of said shafts about its longitudinal axis such that rotation of a first one of said shafts can be selectable caused by either the rotation of the other shaft about its longitudinal axis, or the non-rotational pivoting of the other shaft about said axis of angular adjustment, or the non-rotational pivoting of the other shaft about the longitudinal axis of said first one of said shafts;

(f) each of said shaft gears, on the side thereof opposite the side engaging the respective inwardly facing bevel gear, engaging a gear in idling relation; and,

(g) one of said shafts having an idler gear journaled thereon engaging the inwardly facing bevel gear which engages a shaft gear of the other of said shafts, and the last-mentioned gear engaging an inwardly facing idler beveled gear journaled coaxially with the first-mentioned two inwardly facing beveled gears.

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**4,296,655**

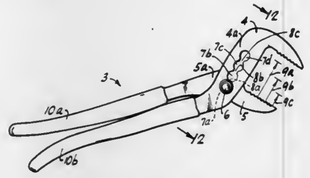
## SLIP JOINT PLIERS

**Joseph Tesoro, 9 Dade Rd., New City, N.Y. 10956**

**Filed May 12, 1980, Ser. No. 149,043**

**Int. Cl.³ B25B *7/04***

**U.S. Cl. 81—405** **4 Claims**



1. Slip joint pliers comprising in combination: a first lever member having one end thereof shaped as a plier's first jaw; a second lever member having one end thereof shaped as a plier's second jaw; the respective first and second lever members having respectively first and second handles; the first lever member having a first single through-aperture intermediate between said first jaw and said first handle; the second lever member having a plurality of consecutively aligned through-apertures in series interconnected by a series of consecutive joining-through-apaces; each consecutive joining-through-space being of samller linear distance between opposing spaced-apart walls than diameter of each of said plurality of consecutively aligned through-apertures; and said first single through-aperture and said plurality each having substantially the same diameters; and pivot means mounted axially through said first single through-aperture and at-least one of said plurality, said pivot means being for pivoting said first and second lever members, and the pivot means including first and second portions continuous with one-another and axially-aligned end-to-end with one-another with the first portion being of a diameter greater than said smaller linear distance and lesser than said diameters of each of said plurality and with the second portion being of a diameter smaller than said smaller linear distance, whereby the first portion is retainable against lateral movement when mounted within one of said plurality and whereby the second portion is movable through said consecutive joining-through-spaces alternately when the second portion is mounted within one of said plurality, said first portion being axially movable to and from any one of said plurality and said second portion being mounted within at least one of said plurality when said first portion is removed therefrom whereby said first lever member may be shifted to alternate pivot positions of said plurality of said second lever member when said first portion is removed from a pivot position of one of said plurality, said pivot means including a spring normally spring biasing said first portion into a pivot-mounting position within one of said plurality, said spring being a coil spring, said first and second portions being of cylindrical shapes and with central axially-extending bores and said coil spring being mounted substantially within said bores, the pivot means additionally including a lock pin and the second portion including an axially-extending slot therein with said lock pin locking said pin to said larger portion and said lock pin being mounted through said axially-extending slot.



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**4,296,656**

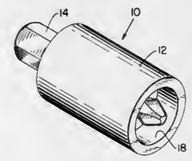
## DRIVER BIT ATTACHMENT

**Richard J. Ernst, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.**

**Filed Apr. 21, 1980, Ser. No. 141,863**

**Int. Cl.³ B25B *23/00***

**U.S. Cl. 81—429** **5 Claims**



1. An attachment for a power tool to permit driving of threaded fasteners said attachment comprising a generally cylindrical body; projection means extending from one end of said body, said projection means being adapted for connection to said power tool to receive rotational torque therefrom; a first longitudinal bore extending axially within said body; a driver bit having a portion which is received within said first bore; securing means within said first bore for retaining the driver bit therein; a second bore which has a larger mean diameter than said first bore, said second bore extending from said first bore to the end opposite the end having the projection, said second bore having an axial length approximately equal to the height of the fastener head with which the adaptor is to be used and a mean diameter larger than the maximum width dimension of the fastener head, a portion of said driver bit being received therein; a set screw threadingly engaged in a tapped hole in the the projecting means and extending into said first bore from said projection means end to position the driver bit within the first and second bores so that the point of disengagement of the driver bit from the fastener head may be varied in order to prevent over torquing of the fastener.

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**4,296,657**

## METHOD AND APPARATUS FOR POSITIONING WORK ON A NUMERICALLY CONTROLLED LATHE

**Shoichi Yasuba, Seto, and Takaharu Ito, Kasugai, both of Japan, assignors to Okuma Machinery Works, Ltd., Nagoya, Japan**

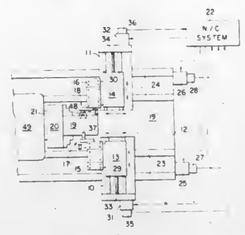
**Filed Mar. 18, 1980, Ser. No. 131,540**

**Claims priority, application Japan, Mar. 23, 1979, 54/34840**

**Int. Cl.³ B23B *3/00, 13/00, 3/16***

**U.S. Cl. 82—1 C** **10 Claims**

1. In a numerically controlled lathe, a method of automatically carrying work from a preassigned standby position on the lathe to a machining position, which method comprises providing a pair of saddles which are mounted on a lathe bed for movement in a first direction as dictated by a numerical control system, providing a pair of cross slides which are mounted on the respective saddles for movement in a second direction at right angles to the first direction as dictated by the numerical control system, the cross slides having mounted thereon a cooperative pair of gripper means for releasably engaging and holding the work therebetween, causing the numerical control system to move the pair of saddles to such positions that the



pair of gripper means are located on opposite sides of the work lying in the standby position, causing the numerical control system to move the pair of cross slides toward each other until the work is engaged between the pair of gripper means, and causing the numerical control system to move at least the pair of saddles for carrying the work to the machining position.

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**4,296,658**

## CLAMPING DEVICE FOR SIMULTANEOUSLY MACHINING INTERNALLY AND/OR EXTERNALLY, THE TWO ENDS OF A WORKPIECE

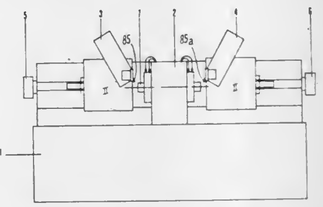
**Marcel Champeau, Niort, and Andre Tabutin, La Celle Saint Cloud, both of France, assignors to Societe Anonyme dite: Ramo S.A., France**

**Filed Jun. 25, 1979, Ser. No. 51,796**

**Claims priority, application France, Jun. 30, 1978, 78 19632**

**Int. Cl.³ B23B *19/02, 25/06***

**U.S. Cl. 82—30** **7 Claims**



1. A clamping device for simultaneously machining, internally and/or externally, two ends of a workpiece, comprising a headstock housing in which a tubular spindle is mounted to rotate, said spindle being internally provided with two annular, monolithic pistons sliding axially and acting respectively on two collets for clamping the workpiece, located at both ends of said spindle, wherein said clamping collets which are respectively mounted in said two pistons have a cone-shaped portion, which cooperates with a corresponding cone-shaped portion in said pistons, and a cylindrical part centered in the boring of said pistons, said collets resting, on the side opposite their cylindrical part, against covers fast with said spindle by means of a cone-shaped face extending radially in order to allow a radial tightening of said collets on the workpiece, and wherein a central sleeve is placed inside said pistons and constitutes a spacer against the ends of which abut said cylindrical parts of said collets so as to ensure the guiding and the positioning of the workpiece in said collets, said central sleeve being provided at its two ends with flanges engaging corresponding counterborings in said collets.

5. A clamping device for simultaneously machining, internally and/or externally, two ends of a workpiece, comprising a headstock housing in which a tubular spindle is mounted to rotate, said spindle being internally provided with two annular pistons sliding axially and acting respectively on two collets for clamping the workpiece, located at both ends of said spindle, wherein said clamping collets which are respectively mounted in said two pistons have a cone-shaped portion, which cooperates with a corresponding cone-shaped portion in said pistons, and a cylindrical part centered in the boring of said pistons, said collets resting, on the side opposite their cylindrical part, against covers fast with said spindle by means of a cone-shaped face extending radially in order to allow a radial tightening of said collets on the workpiece, each end of said spindle being provided with means for detecting the clamping and loosening positions of said collets, each of said detecting means including a housing mounted on said headstock housing and in which extends one end of said spindle on which is secured an annular piece carrying two collars, fast in rotation with said spindle and adapted to move radially, one by a means sensitive to the movement of the collet while in the clamping position and the other by a means sensitive to the movement of the collet while in the loosening position, said collars being provided with a magnetic screen cooperating, when said collars are in an eccentric position, with members for detecting the clamping and loosening positions of the collet.

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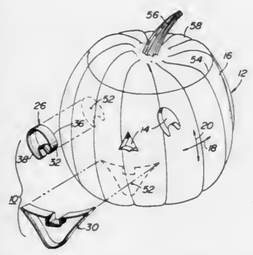
**4,296,659**

## JACK-O-LANTERN FORMING METHOD

**Christopher A. Nauman, 160-A Willowdale Dr., #103, Frederick, Md. 21701**

**Filed Sep. 21, 1979, Ser. No. 77,554**
**Int. Cl.³ B26D *3/00*; B26F *1/46***
**U.S. Cl. 83—54** **6 Claims**



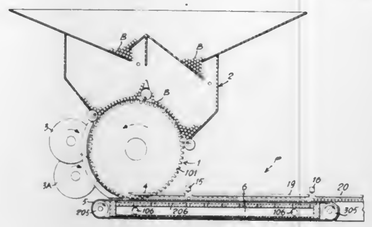
1. A method of forming a Jack-O-Lantern from a pumpkin including the steps of:
(a) providing a closed contour pumpkin die element defining a continuous sidewall element forming a through opening, said pumpkin die element having an upper edge and a lower edge;
(b) positioning said pumpkin die element adjacent an outer surface of said pumpkin at a predetermined location;
(c) striking said upper edge of said pumpkin die element; and,
(d) displacing said pumpkin die element entirely through a wall of said pumpkin to a position internal said pumpkin.

**4,296,660**

## DEVICE FOR FEEDING ROD-LIKE ARTICLES

**Athos Cristiani, Bologna, Italy, assignor to CIR - S.p.A. Divisione SASIB, Bologna, Italy**

**Filed Jan. 19, 1979, Ser. No. 4,873**
**Claims priority, application Italy, Jan. 31, 1978, 12445 A/78**
**Int. Cl.³ A24C *5/50*; B26D *7/06*; B23Q *7/16*; B65G *65//42***
**U.S. Cl. 83—100** **8 Claims**



1. A device for feeding rod-like articles, such as cigarette filter plugs, comprising, in combination:
(a) a hopper for containing a bulk supply of the articles, said hopper being closed at its bottom end by a rotatable removing drum presenting flutes capable of housing said articles, whereby rotation of the drum causes removal of the articles from the hopper;
(b) a suction belt arranged substantially horizontal below the removing drum to receive from the said removing drum the articles removed from the hopper;
(c) a fixed horizontal sliding surface which receives the articles moving in at least one row transversely to their length, the movement of the articles on the said sliding surface being caused by the pushing action of the articles delivered from the suction belt;
(d) an abutment member provided at the delivery end of the fixed sliding surface, in order to stop the horizontal movement of the leading article of the row of articles on the sliding surface;
(e) a rotatable collecting drum arranged at the delivery end of the fixed sliding surface, and provided with pick-up elements for collecting the leading article which has been stopped by the said abutment member.

5. A device according to claim 1, in which the articles are multiple length filter or cigarette rods, further comprising cutting means arranged in the arc of the removing drum between the hopper and the delivery point on the suction belt, said cutting means being provided to cut the articles in at least two segments; and parallel and interspaced side partitions provided along the said suction belt and along the said fixed sliding surface in order to subdivide the said suction belt and sliding surface into at least two parallel longitudinal tracks, each track terminating with an abutment member for stopping the leading segment of each row of segments.

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**4,296,661**

## FEED CONTROL FOR HORIZONTAL BANDSAW MACHINES

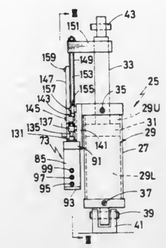
**Tomonobu Kaneko, Isehara, Japan, assignor to Amada Company, Limited, Isehara, Japan**

**Filed Apr. 24, 1979, Ser. No. 32,924**
**Claims priority, application Japan, Apr. 28, 1978, 53-50155; Apr. 28, 1978, 53-50156**
**Int. Cl.³ B23D *53/04*; B27B *13/04***
**U.S. Cl. 83—796** **2 Claims**

1. In a horizontal bandsaw machine having a hydraulic piston-cylinder unit for pivotally operating a cutting head assembly relative to a fixed base, wherein the flow of hydraulic fluid bled from unit during a cutting operation is controlled by a valve which is adjusted in response to movement of a cam follower along an inclined cam surface, the improvement



comprising: the cam surface and the cam follower being connected respectively to the piston and cylinder of said unit in a



manner such that axial movement of said piston relative to said cylinder will produce corresponding movement of said cam surface relative to said cam follower.

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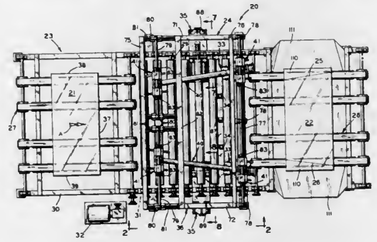
**4,296,662**

## METHOD OF AND APPARATUS FOR CUTTING SHEETS OF GLASS

**Ronald R. Reed, Toledo; William F. Crone, Jr., Bowling Green, and G. Robert Meyer, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed Mar. 17, 1980, Ser. No. 130,746**
**Int. Cl.³ B26D *3/08*; C03B *33/02***
**U.S. Cl. 83—880** **11 Claims**



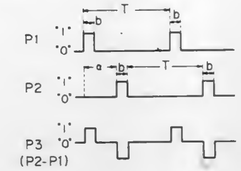
4. An apparatus for scoring glass sheets, the apparatus comprising:
a. a scoring station;
b. a continuously operating means for conveying the glass sheets along a rectilinear path beneath said scoring station and for supporting the glass sheet at said scoring station;
c. means for capturing and holding the glass sheet in a stationary position at the scoring station during scoring of the glass sheet;
d. at least one guide rail extending along the rectilinear path at an angle other than 90° relative thereto, and bridged over the glass sheets above said predetermined location;
e. means for positionably suspending said guide rail above said conveying means above said predetermined location of the glass sheet; and
f. a scoring tool movable along said guide rail for scoring the captured glass sheet along a predetermined path.

**4,296,663**

## ELECTRONIC MUSICAL INSTRUMENT

**Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan**

**Filed Sep. 13, 1979, Ser. No. 75,227**
**Claims priority, application Japan, Sep. 14, 1978, 53-113735; Sep. 14, 1978, 53-127397[U]**
**Int. Cl.³ G10H *1/00***
**U.S. Cl. 84—1.01** **10 Claims**




1. An electronic musical instrument comprising:
keyboard means including keys to be operated for musical performance;
a pulse signal generating circuit connected to said keyboard means and for generating a pluality of pulse trains of a same frequency corresponding to the tonal pitch of the operated key but of different phases, each said pulse train being constituted by "logic 1's" and "logic 0's";
an envelope waveshape generator connected to said keyboard means and for generating an envelope waveshape having a selected polarity upon every key operation; and
musical tone waveshape generating means for sampling said envelope wavehshape and selectively reversing the polarity of sampled values therefrom, said musical tone waveshape generating means being connected to said pulse signal generating circuit and to said envelope waveshape generator, and sampling said envelope waveshape as a function of said pulse trains applied thereto, and said musical tone waveshape generating means further acting to reverse the polarity of sampled values of said envelope waveshape as a function of said pulse trains.

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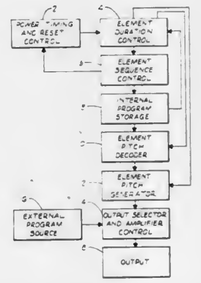
**4,296,664**

## SOUND BROADCASTING APPARATUS

**Kenneth O. Woolbright, 5601 NW. 37th, Oklahoma City, Okla.**

**Filed Nov. 19, 1979, Ser. No. 95,424**
**Int. Cl.³ G10H *1/42, 7/00***
**U.S. Cl. 84—1.03** **9 Claims**




1. An apparatus for reproducing sound from data electrically stored in an electronic memory device, said apparatus comprising:
timing control means;
element duration control means including a first counter

receiving input from said timing control and means providing output to a first pulse generator;

element sequence control means including a second counter controlled by said element duration control means, and including a first controllable switch means;

internal program storage means controlled by said element duration control means and said first controllable switch means to provide data output;

element pitch decoder means receiving said data output to output retrieved individual signal elements;

means for converting the retrieved elements into respective audio signals;

means for audibly broadcasting the respective audio signals.

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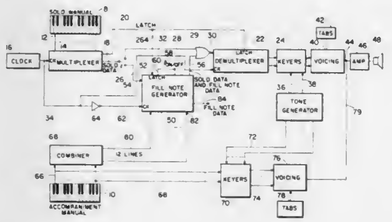
**4,296,665**

## FILL NOTE GENERATOR FOR ELECTRONIC ORGAN

**Stephen L. Howell, Huntingburg, Ind., assignor to Kimball International, Inc., Jasper, Ind.**

**Filed May 12, 1980, Ser. No. 149,262**
**Int. Cl.³ G10F *1/00*; G10H *1/02***
**U.S. Cl. 84—1.03** **20 Claims**



**1**. An electronic musical instrument comprising:

a keyboard having a plurality of playing keys actuating respective keyswitches and comprising a solo portion customarily played by the right hand and an accompaniment portion customarily played by the left hand, said playing keys corresponding to notes of the musical scale,

multiplexer means for scanning the keyswitches of the solo portion of said keyboard and generating on an output a time division multiplexed solo data stream on each scan of the keyboard comprising keydown signals in respective discrete time slots for each actuated keyswitch of the solo portion of the keyboard,

at least a group of the keyswitches of the accompaniment portion of the keyboard being interconnected in a plurality of sets such that each set comprises all of the keyswitches in said group corresponding to a particular diverse pitch of an octave length chromatic scale, and the keyswitches in each set being connected to a common output,

a multistage shift register means synchronized with said multiplexer means and having a plurality of load inputs at respective ones of its stages connected to the respective outputs of said accompaniment portion keyswitches, and producing on an output a fill note time division multiplexed data stream comprising keydown signals in time slots corresponding to keydown signals loaded into its inputs from the outputs of the sets of accompaniment portion keyswitches,

window means having an input connected to the output of said shift register means and an input connected to the output on which the solo data stream appears and an output, said window means gating to its output the data stream on the output of said shift register means for a predetermined number of time slots following receipt by said window means of a predetermined keydown signal in the solo data stream, and

output means connected to the output of said window means and controlled by the fill note data stream on the output of said window means for producing tones in accordance with the keydown signals in the fill note data stream on the output of said window means.

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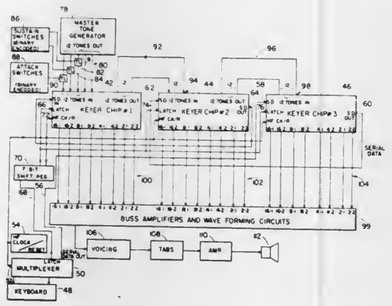
**4,296,666**

## SOLO SUSTAIN KEYER SYSTEM

**Brian N. Wilcox, Kettering, Ohio, and John W. Robinson, Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.**

**Division of Ser. No. 962,003, Nov. 20, 1978, Pat. No. 4,217,801.**
**This application May 15, 1980, Ser. No. 150,089**
**Int. Cl.³ G10H *1/02***
**U.S. Cl. 84—1.26** **3 Claims**



**1**. In an electronic organ or the like having a source of tone signals, a plurality of keyers each including a control terminal, and keyboard controlled means for selectively supplying keyer actuating voltages to the control terminals of the keyers, a plurality of envelope generators interposed between the keyboard controlled means and the keyers each comprising: an input terminal connected with the keyer actuating voltage, an output terminal connected with the control terminal of the respective keyer, first means for storing a voltage, second means connected to said output terminal for storing a voltage, third variable conductivity means connected between said first means and said input terminal for providing when actuated a path between said input terminal and said first means whereby the voltage level at said input terminal can be transferred to said first means, and fourth variable conductivity means connected between said first and second means providing when actuated a path between said first and second means whereby the voltage level at said first means can be transferred to said second means, the improvement being means for repetitively and alternately actuating said third and fourth means to transfer the voltage level at said input through said first means to said second means by increments over a period of time comprising a clock driven counter having a variable effective count length and having its output connected to said third and fourth means for actuating the same, and means connected to said counter for varying the effective count length of said counter so as to vary the rate at which said third and fourth means are repetitively and cyclically actuated, said means for varying the effective length of said counter comprising a source of count length control signals, and said means for varying comprising a plurality of multilevel decoders connected respectively to the count length control signals, each said decoder having one input terminal connected to at least one of said count length control signals and to at least one of the tone signals and further having a plurality of outputs on which the signals on its input terminal appear, respectively, the outputs of said multilevel decoders that carry the tone signals being operatively coupled to respective ones of the keyers.

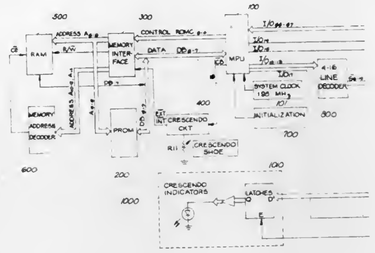


**4,296,667**

## CAPTURE COMBINATION ACTION SYSTEM FOR ELECTRONIC ORGANS

**David R. Wade, Cincinnati, Ohio, and Walter Munch, Ft. Thomas, Ky., assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio**

**Filed Feb. 14, 1980, Ser. No. 121,591**
**Int. Cl.³ G09B *15/00*; G10B *3/10***
**U.S. Cl. 84—345** **26 Claims**



**1**. A capture combination action system for use in an electronic organ for selecting a predetermined combination of stops to define the organ voicing, said system comprising:

a. a plurality of stop tabs for setting and resetting said stops, each of said tabs including a switch having a pair of normally open contacts which are momentarily closed to provide an electrical path when said tab is manually actuated by the organist;

b. a plurality of pistons for setting a desired combination of said stops to a predetermined condition, each of said pistons including a pair of normally open contacts which are closed to provide an electrical path when said piston is actuated;

c. random access memory means for storing data and for storing the current status of all organ stops associated with a selected combination of stops;

d. read only memory means containing a permanently stored operating program comprising a plurality of operating instructions; and

e. processing means responsive to said operating instructions including;

i. means for continually and sequentially scanning each pair of said stop tab and piston contacts to detect a contact closure;

ii. means for selecting stops having contacts detected momentarily closed by said scanning means;

iii. means for storing in said random access memory means data associated with a selected one of said pistons for a selected combination of stops;

iv. means for recalling from said random access memory means said selected stop combination data when said scanning means detects closure of said selected piston contacts;

v. means utilizing said recalled data to select said combination of stops and;

vi. means responsive to said scanning means for continually updating the data stored in said memory means to reflect the current status of all organ stops.

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**4,296,668**

## REED PROTECTOR FOR A WOODWIND INSTRUMENT

**Robert A. Lorenzini, P.O. Box 91, Hancock, Mass. 01237**

**Continuation-in-part of Ser. No. 967,989, Dec. 11, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,753**
**Int. Cl.³ G03D *9/02***
**U.S. Cl. 84—383 R** **2 Claims**

**1**. An improved reed protector for a mouthpiece of a woodwind instrument utilizing a reed held by a ligature, said instrument having a back end where the mouthpiece is located and a forward end opposite from said mouthpiece, said improvement comprising:

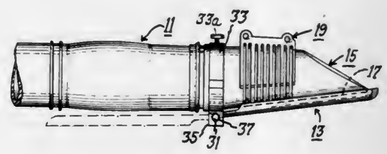
a sleeve adapted to slip fit over the mouthpiece of a woodwind instrument, and to be located on the mouthpiece adjacent and separate from the ligature toward the forward end of said instrument, the interior of said sleeve being generally circular, a pair of protrusions, parallel to one another and extending from the exterior of said sleeve, each of said protrusions having interior surfaces which face each other, the interior of said sleeve including a flat sector located between said pair of protrusions for providing clearance between said sleeve and said reed;

a unitary protective cap having a back end and a forward end with two substantially parallel sides extending between the back end and the forward end, said protective cap being rotatably mounted on the pair of protrusions, and being adapted to be held in its protective position over the reed on the mouthpiece and being adapted to be held in its playing position away from the reed and on the instrument;

each of said protrusions having an opening therein;

said unitary protective cap having a reinforced bar at its forward end, said reinforced bar having pins extending from each end, said pins mounted in said openings on said protrusions for rotatably mounting said unitary protective cap;

said reinforced bar having two pair of lugs thereon, one pair of lugs engaging a portion of said sleeve between said protrusions to hold said protective cap in its protective position, the other pair of lugs engaging a portion of said sleeve between said protrusions to hold said protective cap in its playing position.



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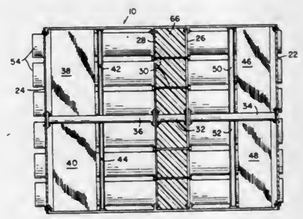
**4,296,669**

## ROCKET TUBE LAUNCHER WITH CAST-IN PLACE TUBE SUPPORT BULKHEAD

**Edward J. Debona; Boyd L. Neblett; Walter J. Krueger; William J. Laird; Billy H. Campbell, and Gerald H. Matthews, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed May 25, 1979, Ser. No. 42,667**
**Int. Cl.³ F41F *3/04***
**U.S. Cl. 89—1.816** **7 Claims**



**1**. A rocket tube launcher comprising an elongated housing structure having forward and rear ends, a rear bulkhead mounted at said rear end of said elongated housing structure, a

forward bulkhead mounted at said forward end of said elongated housing structure, a pair of center bulkheads mounted in said elongated housing structure and being relatively close together relative to the spacing between said pair of center bulkheads and said forward and rear bulkheads; each of said rear bulkhead, said forward bulkhead, and said pair of center bulkheads having a multiplicity of openings therethrough with the openings of each bulkhead being aligned with the openings of each of the other bulkheads; a launch tube mounted in each of said openings and being welded to the forward bulkhead and secured to the rear bulkhead; rigid foam means of polyurethane foam mounted between said pair of center bulkheads and surrounding the launch tubes to provide a unibody structural support for the launch tubes near a center portion thereof, center structural support means secured to said front bulkhead, said rear bulkhead, said center bulkheads and said elongated housing structure to brace these members relative to each other, said front bulkhead, said rear bulkhead, and said pair of center bulkheads each being bolted to said elongated housing structure, and said pair of center bulkheads having bolt securing means at spaced positions about said center bulkheads to maintain a substantially constant spacing between said pair of center bulkheads.

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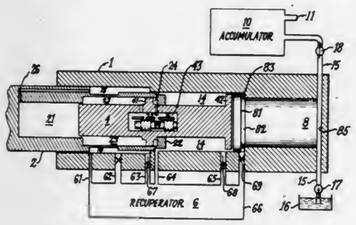
**4,296,670**

## ORDNANCE RECOIL ENERGY CONTROL AND RECOVERY SYSTEM

**Robert P. Northup, and Robert L. Anderson, both of Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 29, 1979, Ser. No. 53,336**
**Int. Cl.³ F41F** *19/14*
**U.S. Cl. 89—43 R** **15 Claims**




1. A recoil mechanism for controlling movement of a recoil mass relative to a mount comprising:

(a) a pressurized gas recuperator system including available capacity gas chamber means interconnecting said recoil mass and said mount for opposing recoil, for collecting recoil energy in the form of gas pressure in a gas recuperator as recoil movement of said recoil mass decreases the capacity of said variable capacity gas chamber means forcing gas therefrom into said gas recuperator, for driving said recoil mass in counterrecoil with use of only part of said collected energy and for transferring the remainder of said collected energy to another system subsequent to counterrecoil;

(b) a hydraulic accumulator system for supplying, holding and distributing hydraulic fluid under pressure including a variable capacity hydraulic pump chamber; and

(c) interface means responsive to said gas recuperator means for utilizing gas pressure collected in said recuperator for reducing the capacity of said hydraulic pump chamber to force hydraulic fluid from said chamber under pressure to effect a transfer of recoil energy from gas pressure to hydraulic pressure,

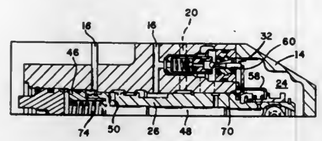
whereby recoil energy can be generated and collected in the form of gas pressure during recoil, partially dissipated to drive the recoil mass in counterrecoil and thereafter transferred to a hydraulic system for use.

**4,296,671**

## HYDRAULIC BRAKE BOOSTER AND CONTROL VALVE THEREFOR

**Louis S. Tang, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jan. 24, 1980, Ser. No. 114,799**
**Int. Cl.³ F15B** *20/00*
**U.S. Cl. 91—5** **11 Claims**



1. In a hydraulic brake booster, a housing having an inlet and substantially defining a pressure chamber, a control valve movably disposed within the housing and being operable to communicate fluid pressure from the inlet to the pressure chamber, an accumulator normally storing fluid pressure and communicating with the pressure chamber when the control valve is operable and the fluid pressure within the pressure chamber is below a predetermined value, valve means cooperating with the accumulator to normally close communication between the accumulator and the pressure chamber, a sleeve member carried by the control valve and being movable relative to the control valve to close communication between the inlet and the pressure chamber when the fluid pressure in the latter is below the predetermined value, and an annular member engageable with the valve means to open communication between the accumulator and the pressure chamber, characterized by the sleeve member including a portion which is engageable with the housing to limit movement of the sleeve member when the control valve is operable and the annular member is movable with the control valve when the portion is engageable with the housing to engage the annular member with the valve means.

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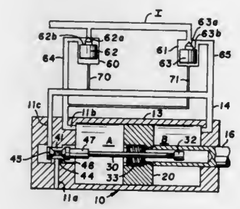
**4,296,672**

## RECIPROCATING PISTON-CYLINDER COMBINATION AND VALVING CONTROL THEREFOR

**Harold G. Inhofer, Hopkins, Minn., assignor to Proteus Corporation, Minneapolis, Minn.**

**Filed Nov. 13, 1979, Ser. No. 93,876**
**Int. Cl.³ F01L** *15/16, 25/06, 23/00*
**U.S. Cl. 91—271** **9 Claims**



1. A reciprocating, piston-cylinder assembly and valving control therefore, including:

a. a cylinder;

b. a piston arranged for reciprocating movement within said cylinder;

c. means for providing fluid under pressure to said assembly;

d. a pair of inlet valving members receiving fluid under pressure and each being shiftable from a first open, fluid admitting position to direct fluid to one side of said piston for movement thereof to a second closed position;



e. said inlet valving members being fluidically connected to provide fluid under pressure from one of said valve members in said first position to the other of said valve members to positively hold said other of said valves in the second closed position; and,

f. a pair of exhaust valving members arranged to exhaust fluid from said cylinder in response to the movement of the piston therein.

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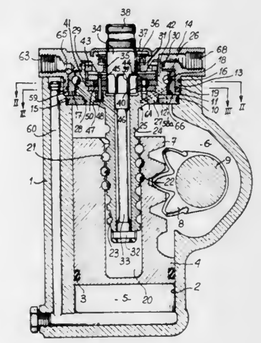
**4,296,673**

## POWER STEERING MECHANISM

**Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain**

**Filed Jun. 8, 1978, Ser. No. 913,620**
**Claims priority, application Spain, Jun. 11, 1977, 459.711; Jun. 14, 1977, 459.740**
**Int. Cl.³ F15B** *9/10, 15/22, 13/042*
**U.S. Cl. 91—375 A** **11 Claims**



1. Control valve in particular for power steering mechanism having rotatable coaxial input and output members, characterized in that said control valve comprises a substantially disc-shaped chamber defined in one of said input and output members and coaxial with said members, and a rotor rotatably connected to the other of said input and output members, said rotor sealingly separating said disc-shaped chamber into a plurality of peripheral chambers communicating alternately with corresponding working chambers of a double acting servo actuating cylinder of the power steering mechanism, at least one of the axial surfaces of the disc-shaped chamber being formed with ports connected alternately to the fluid inlet and outlet of a fluid supply and arranged at angular positions such as to be partially closed by the rotor when the valve is in its normal position, while in every operating position the inlet and outlet communicate with the corresponding chambers of the servo-actuator, one of the axial surfaces of the disc-shaped chamber being defined by a member movable along the axis of said chamber, between a first position in which it engages with the adjacent surface of the rotor to sealingly separate the distribution chambers, and a second position away from the rotor surface, in which second position it interconnects said distributing chambers and equalizes the pressure in the working chambers of the actuating cylinder.

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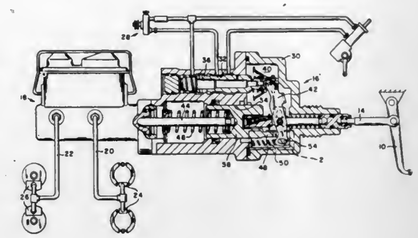
**4,296,674**

## QUICK TAKE-UP BRAKE BOOSTER

**William E. Monroe, Syracuse, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jun. 21, 1979, Ser. No. 50,912**
**Int. Cl.³ F15B** *13/10*
**U.S. Cl. 91—391 R** **6 Claims**

1. In a hydraulic brake booster, a housing substantially defining a pressure chamber, a control valve cooperating with the housing to communicate fluid pressure to the pressure chamber, a pressure responsive member carried by the housing and movable in response to fluid pressure within the pressure chamber from a rest position to effectuate a brake application, an input member extending into the housing and being movable by an operator during a brake application, a lever engageable with the input member, the pressure responsive member



and the control valve, the lever forming a connection with the pressure responsive member which permits the pressure responsive member to move relative to the lever in response to fluid pressure within the pressure chamber, and a resilient member engages the housing and the lever to bias the latter to a rest position engaging the housing.

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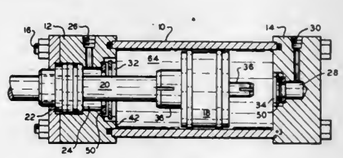
**4,296,675**

## CYLINDER CUSHION WITH CONTRACTABLE RING

**Paul E. Gies, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.**

**Filed Jul. 16, 1979, Ser. No. 57,598**
**Int. Cl.³ F15B** *15/22*
**U.S. Cl. 91—396** **6 Claims**



1. A fluid pressure actuator comprising, in combination, a cylinder defining a chamber and having a head provided with a port through which fluid may be admitted to the cylinder or exhausted therefrom, piston structure slidable in said cylinder toward and away from said head, an annular ring of non-compressible material mounted on said head adjacent and substantially coaxial to said port, said ring including annular inner and outer surfaces defining a radial dimension, said ring being severed through said radial dimension whereby the diametrical dimension of said ring may vary between a normal radially contracted diameter and a radially expanded diameter, an elongated valve member mounted on said piston structure telescopingly received within said port and ring when said piston structure is adjacent said head controlling the flow of fluid through said port, said valve member including an outer surface slidingly engaged by said ring inner surface, the normal contracted diameter of said ring inner surface being slightly less than the diameter of said valve member outer surface whereby said ring firmly receives said valve member, ring expanding means defined on said valve member initially engaging and expanding said ring to said expanded diameter upon engagement by said valve member, and ring mounting means mounting said ring upon said head limiting axial movement of said ring and permitting radial contraction and expansion thereof.

**4,296,676**

## CONTROL MECHANISM

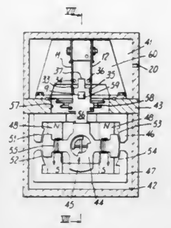
**David K. Andrews, Cheltenham, and Michael W. Smart, Gloucester, both of England, assignors to Dowty Fuel Systems Limited, Cheltenham, England**

**Filed Dec. 11, 1979, Ser. No. 102,416**

**Claims priority, application United Kingdom, Dec. 15, 1978, 48787/78**

**Int. Cl.³ F15B** *13/044*

**U.S. Cl. 91—417 R** **9 Claims**



**1**. A mechanism for controlling the position of a movable member comprising a valve having a closed position and an open position, a hydraulic displacement device secured for movement with the member and a hydraulic connection between the valve and the device such that for the valve-closed position the device and member are hydraulically locked against movement and for the valve-open position the member and device may move, the valve being formed by a pair of relatively-slidable valve components having co-operating flat surfaces, one of said components being slidably carried in and projecting outwardly from an aperture formed in a pivotally mounted arm and the other being fixed so that angular movement of the arm causes sliding movement of the one component over the fixed component, at least one of said components having at least one port in its flat surface closable by the other of said components in the valve-closed position, loading means housed within said arm and bearing on said one component to urge it in a direction outwardly of said arm and thereby hold its flat surface in sliding sealing engagement with the co-operating flat surface of said fixed component, a preloaded spring assembly comprising a pair of stops carried by said arm, a pair of leaf springs mounted to press oppositely with pre-load on said arm stops, and a pair of fixed stops adapted to contact the leaf springs at positions adjacent said arm stops, said leaf springs thereby acting between said components in a direction parallel to said co-operating flat surfaces so that the spring pre-load on its own may move said components to the valve-closed position, and a force motor which is capable, when energised, of exerting a force to move one said component relative to the other against the pre-load of the spring assembly towards the valve-open position.

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**4,296,677**

## TANDEM HYDRAULIC ACTUATOR

**Jane Little, Long Beach, and Del F. Greene, Los Angeles, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Jun. 25, 1979, Ser. No. 51,815**

**Int. Cl.³ F15B** *13/00*

**U.S. Cl. 91—510** **10 Claims**

**1**. A fluid actuated cylinder comprising:

a housing having a cylindrical bore;

gland means dividing said cylindrical bore in said housing into a first chamber and a second chamber;

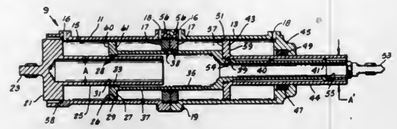
an end wall, having an internal tail rod with an area 'A' closing said second chamber of said housing;

a first piston for movement in said first chamber;

a second piston for movement in said second chamber;

rod means penetrating said gland means, operatively connecting said first piston to said second piston in tandem, said pistons are axially aligned and moveably disposed in their respective chambers to move in cooperation between extend and retract positions with one end of said rod means having a bore to accommodate said internal tail rod, an output rod connected to said first piston having an area 'A', extending from said first chamber;

a rod end wall closing said first chamber of said cylindrical bore in said housing and having a bore therein to accommodate said output rod extending from said first chamber; and



means for admitting pressure fluid against a first pressure surface on one side of said first piston and second pressure surface on one side of said second piston while exhausting fluid acting on a third pressure surface on the opposing side of said first piston and fourth pressure surface on the opposing side of said second piston so as to move said pistons in either direction, alternatively, the first and fourth pressure surfaces being equally dimensioned and the second and third pressure surfaces being equally dimensioned, whereby to define a fluid actuated, tandem, linear actuator having redundant chambers and equal combined areas in both extend and retract positions.

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**4,296,678**

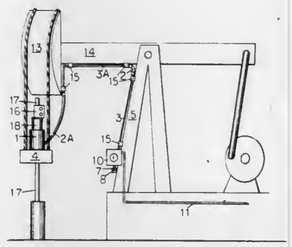
## POLISH ROD JACK SYSTEM

**Donald W. Felder, 1609 S. Vaden, Sherman, Tex. 75090**

**Filed Feb. 12, 1979, Ser. No. 11,692**

**Int. Cl.³ F01B** *31/14;* **F15B** *15/24*

**U.S. Cl. 92—13.1** **3 Claims**



**1**. In an oil well pumping unit including a walking beam pivotally mounted in a stationary support and supporting a horse head for vertical reciprocal movement, and a carrier bar suspended from the horse head reciprocally carrying a polish rod constituting the upper section of a sucker rod for operating a bottom hole pump, a hydraulic polish rod jack system comprising:

(a) a hydraulic ram mounted on the carrier bar,

(b) a ram piston mounted in said ram for vertical reciprocal movement,

(c) support means operatively connected to the polish rod for vertical reciprocal movement of the polish rod with said ram piston,

(d) a hydraulic conduit having first and second ends,

(e) a hydraulic quick-disconnect inlet fitting mounted on the stationary support and connected to said first end of said hydraulic conduit, said inlet fitting being adapted to be quickly connected to and disconnected from a pressurized source of hydraulic fluid,



(f) a hydraulic fliud quick-disconnect ram fitting on said ram, said ram fitting being adapted to be quickly connected to and disconnected from said second end of said hydraulic conduit,

(g) at least portions of said hydraulic conduit being flexible,

(h) clamp means holding portions of said conduit on the stationary support and on at least a portion of the horse head or the walking beam, so that said ram is in continuous fluid communication with said inlet fitting, even during the reciprocal movement of said ram.

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**4,296,679**

## CYLINDER WITH TWO-STAGE MOVEMENT, ESPECIALLY A WELDING CYLINDER

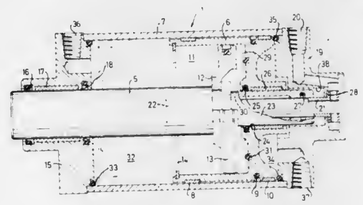
**Karl-Erik H. Mattsson, Näsum, Sweden, assignor to AB Volvo, Gothenburg, Sweden**

**Filed Oct. 31, 1979, Ser. No. 90,055**

**Claims priority, application Sweden, Nov. 7, 1981, 7811488**

**Int. Cl.³ F01B** *7/20*

**U.S. Cl. 92—52** **5 Claims**



**1**. In a cylinder with two-stage movement, in which a first piston which seals against the inside of a housing is axially displaceable in the housing, and in which a second piston, arranged coaxially with the first piston, seals in an axial cavity in one end of the first piston, is axially displaceable in said cavity and carries a piston rod which slides sealingly through one housing end which faces the cavity in the first piston, and in which in the other housing end there is arranged a pressure medium inlet tube which extends through the first piston and into the piston rod, via which tube pressure medium can be brought into or out of a first chamber delimited by the first and the second pistons, and in which second and third chambers in the housing, on the sides of the first and second pistons that face away from each other, have pressure medium connections; the improvement comprising, on the side of the second piston facing away from the piston rod, a tubular, axially oriented guide member which is sealingly guided in the first piston and slides on the inlet tube and seals against the outside of the tube and extends through the first piston, the inlet tube, at its end facing away from the guide member, being movably mounted in said other housing end.

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**4,296,680**

## COUPLED SHELLS FOR VACUUM POWER SERVO BOOSTER

**Ryuji Ohta, and Michio Kobayashi, both of Matsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan**

**Filed Oct. 17, 1979, Ser. No. 85,830**

**Claims priority, application Japan, Dec. 1, 1978, 53/148803; Dec. 1, 1978, 53/148804**

**Int. Cl.³ F01B** *19/00;* **F16J** *3/02*

**U.S. Cl. 92—98 D** **6 Claims**

**1**. A vacuum power servo booster comprising:

a generally disc-shaped first shell,

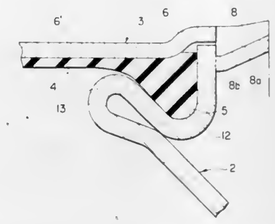
a generally cup-shaped second shell, said first and second shells defining an outer casing of said booster, and

a diaphragm secured between said first and second shells which divides the casing into two chambers,

an annular groove being integrally formed at a peripheral end portion of said first shell, said annular groove opening radially outwardly and said annular groove being defined by a first annular bent portion bulging radially inwardly from the peripheral end portion of said first shell and a second annular bent portion at an inward position of said first shell, said second annular bent portion being oriented approximately along the axial direction of said booster and bulging toward said second shell,

said second shell having a cylindrical portion adapted for insertion of said first shell therein, peripheral end portions of said diaphragm being interposed between said annular groove and said cylindrical portion, and

said second shell being provided with at least one axial recess in said cylindrical portion, said first shell being



provided with at least one radially outward protrusion adapted to be received in said recess, said first shell being further provided with a plurality of arcuate radial recesses at the outer peripheral surface thereof, and a plurality of locking portions arranged in an alternating manner between said recesses, said second shell being provided with locking means for engaging said locking portions, said locking means comprising radially inwardly extending arcuate locking pawls, said pawls being inclined toward the axis of said second shell so as to define guide surfaces, whereby peripheral portions of said diaphragm may smoothly pass over said guide surfaces in sliding contact therewith, without damage to said diaphragm.

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**4,296,681**

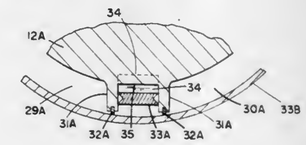
## FLUID DRIVEN SERVOMECHANISM

**Mark E. Rosheim, 1851 Chester #4, Royal Oak, Mich. 48073**

**Continuation-in-part of Ser. No. 884,903, Mar. 9, 1978, Pat. No. 4,194,437. This application Nov. 14, 1979, Ser. No. 94,045**

**Int. Cl.³ F01C** *9/00*

**U.S. Cl. 92—122** **12 Claims**



**1**. A fluid driven servomechanism comprising:

a support means;

a central drive member mounted on said support means in a manner which permits rotational motion about one axis and also about a second axis which is generally perpendicular to said one axis;

channel means disposed about said central drive member having a first channel partially circumscribing said one axis and a second channel partially circumscribing said second axis, each channel having walls and a bottom;

a first sealing means disposed along a substantial portion of said first channel so as to enclose said substantial portion of said channel, said first sealing means including fluid admission ports therein to permit fluid to enter said sub-

stantial portion of said first channel and further including second sealing means disposed along a substantial portion of said second channel so as to enclose said substantial portion of said second channel, said second sealing means including fluid admission ports to allow fluid to enter said substantial portion of said second channel; and

a first dividing means on said drive member and in said substantial portion of said first channel so as to divide the enclosed portion of said first channel and move said drive member about said one axis in response to a differential fluid pressure on opposite sides of said first dividing means and further including second dividing means similar to said first dividing means except located in said substantial portion of said second channel.

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**4,296,682**

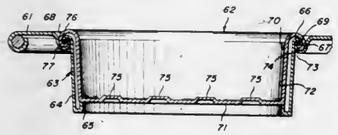
## ENGLISH MUFFIN, METHOD AND APPARATUS

**Jerome B. Thompson, Box 231 - Rte. 3, Cumberland, Md. 21502**

**Division of Ser. No. 964,509, Nov. 29, 1978, Pat. No. 4,216,241, which is a continuation-in-part of Ser. No. 843,498, Oct. 19, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,212**

**Int. Cl.³ A47J** *37/01*

**U.S. Cl. 99—426** **5 Claims**




1. Apparatus for the baking of an English muffin in a conventional bun oven comprising a baking pan, a plurality of spaced cup units positioned in said pan, each of said cup units comprising an outer cup portion which will be in direct engagement with the oven heat and an inner cup portion positioned within said outer cup portion in inwardly spaced relationship therewith forming a dead air space between the sidewalls of each inner cup portion and each outer cup portion, means associated between each of said inner and outer cup portions adjacent the respective bottom ends of each to close the dead air space formed between the respective sidewalls of each and to place the bottom surface of each inner cup portion in an open state and to position the bottom surface of each of said inner cup portions in upwardly spaced relationship from an oven heating surface, said inner cup portion adapted to receive the English muffin dough piece therein and will be baked indirectly by the oven heat, and complementary cover plate means for positioning on the top of said baking pan to cover same, said cover means having a plurality of spaced areas having pattern-creating openings therein, one of each of said areas being in vertically spaced registry with one of said cup units, means for retaining the cover plate means and the baking means in tight engagement with one another so that said cover means will remain in contact with the baking pan throughout the baking operation and thereby forming on the surface of the English muffin a pattern effect corresponding to the perforations in said cover, said cover means being perforated to an extent such that a considerable portion of the cover means will be open, thus exposing a considerable area of the dough pieces to the direct heat of the baking oven, but the size and configuration of the perforations in the cover means are such that the dough will not rise or extrude through the openings to a point above the top surface of the cover means.

**4,296,683**

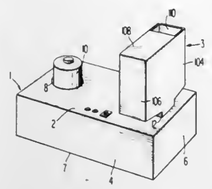
## CAN CRUSHER

**Albert F. Lidik, 105 Cherry St., and Randall E. Talley, III, 2910 Johnson St., both of Kissimmee, Fla. 32741**

**Filed Jul. 6, 1979, Ser. No. 55,205**

**Int. Cl.³ B30B** *9/32*

**U.S. Cl. 100—53** **8 Claims**




1. A can crusher comprising:

a housing;

a hopper removably attached to the housing;

a first frame secured within the housing, including motor mounting means at one end thereof, ram support mounting means at the opposite end, and sprocket wheels supporting means on the frame between the motor mounting means and the ram support mounting means;

a motor secured to the motor mounting means;

a ram support pivotally mounted to the ram support mounting means comprising, a can engaging plate, a pair of plates secured to a block, the space between the ends of said pair of plates and said block define guide means, said pair of plates and said block secured to the can engaging plate, an aperture extending through the pair of plates and the block, and means secured in said aperture for rotatably supporting the ram support to the ram support mounting means;

a sprocket wheel rotatably supported on the sprocket wheel supporting means, said sprocket wheel having a hub integrally secured thereto, a crank pin block secured to said hub and rotatable therewith, said crank pin block having an aperture therein;

means for connecting the sprocket wheel and the motor whereby the sprocket wheel turns upon actuation of the motor;

a ram comprising a pair of horizontally spaced apart guide rails for reciprocating in said guide means, a can engaging plate secured to one end of the guide rails, a can cradle secured between the guide rails for supporting a can between the can engaging plate secured to the guide rails and the can engaging plate of the ram support, means for connecting the opposite ends of the guide rails to the crank pin block of the sprocket wheel hub so that as the sprocket wheel turns, the guide rails pivot with the ram support and reciprocate in the guide means whereby the can engaging plate of the guide rails advances toward the can engaging plate of the ram support crushing a can supported between said can engaging plates;

a second frame having means for securing one end thereof to the motor, and hopper supporting means at the opposite ends of the frame whereby the hopper is removably attached thereto, ram support plate mounted on the frame and means for securing the ram support plate, the ram support and the first frame together;

a switch mounted on the inside of the housing;

a switch arm extending from the switch into the housing a distance sufficient to contact the crank pin during rotation thereof, said switch arm inoperable to activate the switch during counterclockwise revolution of the crank pin and operable to activate the switch to stop the motor during clockwise rotation of the crank pin; and

an indicator operable in response to activation of the switch and stopping of the motor to indicate a jammed condition.



**4,296,684**

## APPARATUS FOR STACKING FOLDED PRINTING PRODUCTS

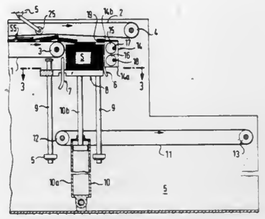
**Jochen Wangermann, Appen, Fed. Rep. of Germany, assignor to Gruner & Jahr AG & Co., Itzehoe, Fed. Rep. of Germany**

**Filed Jan. 14, 1980, Ser. No. 111,924**

**Claims priority, application Fed. Rep. of Germany, Jan. 22, 1979, 2902285**

**Int. Cl.³ B30B** *1/26;* **B65H** *29/38, 31/10*

**U.S. Cl. 100—292** **8 Claims**



1. Apparatus for forming a vertical stack from folded printing products sequentially conveyed along a path with the folds in the leading position, said apparatus comprising

conveyor means (**1, 2**) for defining the path and for conveying the products (P) sequentially therealong:

stop means (**6***a*, **6***b*, **6***c*) interposed in the path and toward which the products move

support means (**8**) adjacent said stop means for receiving the sequentially conveyed printing products in a vertical stack with the folds abutting said stop means:

pressing means (**14–20**) operatively associated with said stop means, said pressing means including at least three groups of presser members (**14, 14'**) arranged in spaced relationship along said stop means and across said path; said presser member groups having drive means (**21**) for driving said presser members in an endless path, said path having a first upper position in which said presser members overlie the product stack, a second, lower position in which said presser members contact and press the stack on the support means, and having a portion in which said presser members have a component of motion, when in contact with the stack, drawing the product toward the stop means; the movements of said presser member groups being phase shifted with respect to each other such that one group returns from the lower position to the upper position when a second group overlies the product stack and a third group presses the stack: and

control means coupled to said conveyor means and drive means for synchronizing the supply of the printing products with the operation of said pressing means.

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**4,296,685**

## WARHEAD WITH SLAVE MISSILES DISPOSED IN A FIRING TUBE

**Rudolf Romer, Kaarst, and Hans-Egon Schepp, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany**

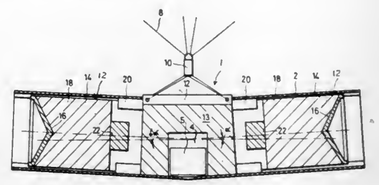
**Filed Sep. 4, 1979, Ser. No. 72,434**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838347**

**Int. Cl.³ F42B** *25/02*

**U.S. Cl. 102—387** **6 Claims**

1. In a warhead adapted to be disposed with a plurality of similar warheads axially in a load-carrying missile for ejection therefrom behind the other, the warhead carrying slave missiles disposed in firing tubes, the warhead having a parachute connected thereto to cause the directional, braked descent thereof in the target area, the slave missiles having proximity fuses causing their firing, the improvement wherein the warhead comprises a firing tube which is open at both ends and in which two slave missiles are disposed with a common propel-



lant charge between them, the parachute being secured to the firing tube centrally of the length of the firing tube.

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**4,296,686**

## REMOTE CONTROL DEVICE FOR ACTIVATING OR INACTIVATING A PNEUMATIC WAR MINE

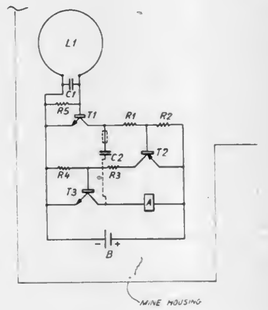
**Joseph Marer, Lyss, Switzerland, assignor to Redon Trust, Schaan, Liechtenstein**

**Filed Jul. 25, 1979, Ser. No. 60,333**

**Claims priority, application Switzerland, Jul. 27, 1978, 8072/78**

**Int. Cl.³ F42C** *15/14*

**U.S. Cl. 102—427** **2 Claims**




1. In a pneumatic war mine, a remote control device for activating and deactivating the mine, comprising

an electromagnetic relay operative for arming and disarming the mine;

a self-contained power supply;

a receiver circuit operative for receiving a transmitted control signal; and

an electric control circuit connected with said relay, power supply and receiver circuit, said control circuit being normally passive and beginning to draw power from said power supply only upon being triggered by receipt of a control signal at said receiver circuit.

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**4,296,687**

## SEGMENTED SABOT PROJECTILE

**Harold E. Garrett, Santa Ana, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

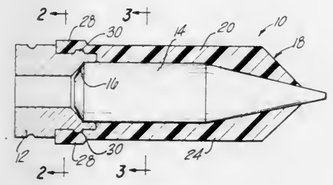
**Filed Jul. 16, 1979, Ser. No. 57,778**

**Int. Cl.³ F42B** *13/16*

**U.S. Cl. 102—518** **1 Claim**

1. A spin-stabilized discarding sabot projectile comprising a base, a core seated on the base, a multi-piece sabot encircling the core and the forward section of the base; said sabot comprising a first set of plastic segments evenly spaced around the core circumference, a second set of plastic segments occupying

circumferential spaces between adjacent ones of the first segments, and a plastic spinner band located at the rear end of the sabot to project radially outwardly beyond the sabot side surface, said band being integrally formed with the second set of plastic segments to define a one piece molding; said plastic band having a relatively thin radial dimension corresponding to the rifling thickness in a gun barrel whereby the band is severed by the rifling lands in the gun barrel as the projectile is fired out of the barrel; the plastic band being arranged in surrounding relation to the first plastic segments whereby the band constitutes a mechanism for retaining the plastic segments on the core, such that severing of the band enables the segments to be centrifugally separated from the core as the projectile exits from the gun barrel; each sabot segment having a circumferentially projecting rib (**34**) in one of its side edges, and a circumferentially projecting slot (**32**) in its other side




edge, the ribs and slots extending forwardly from the aforementioned base to the front end of the sabot, the ribs and slots on adjacent segments being interlocked together only while the projectile is within the gun barrel; the sabot segments having cylindrical outer surfaces cooperatively defining a cylindrical sabot outer surface, said segments occupying the entire circumferential space around the core without any intervening void spaces; one set of plastic segments being formed as a one piece molding using the base and core as a mold surface, the other set of plastic segments being formed by material molded into the circumferential spaces defined by said one segments, adjacent ones of the segments having non-adherent engagement with each other; the ogive portion of the core extending forwardly beyond the sabot segments so that adjacent segments are interconnected solely by the aforementioned plastic band and interlocked rib-slot connections.

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**4,296,688**

## ELECTRIC CIRCUIT FOR FIRING A DETONATOR

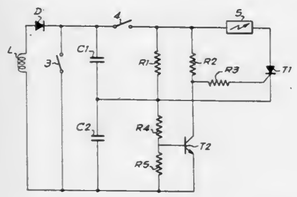
**Robert G. Orlandi, Prilly, Switzerland, assignor to S.A. PRB Societe Anonyme, Brussels, Belgium**

**Filed Sep. 4, 1979, Ser. No. 72,100**

**Claims priority, application Switzerland, Sep. 5, 1978, 9329/78**

**Int. Cl.**[3] **F42C** *11/06*

**U.S. Cl. 102—218** **3 Claims**




**1**. Electric circuit for firing a detonator for a projectile, comprising a generator for charging a first condenser and a second condenser connected in series, the aforesaid first condenser being connected in series with a contactor, a primer and a semi-conductor component with a controlled conductibility, and means for stabilizing the voltage of one of the aforesaid condensers and for preventing the firing of the primer during a predetermined time, in which the aforesaid means comprise a first voltage divider connected in parallel with the series connection of the aforesaid first condenser and second condenser and aforesaid contactor, the control electrode of the aforesaid semi-conductor component being connected with the intermediate point of the aforesaid first voltage divider comprising a resistor and a transistor, the base of which is connected with the intermediate point of a second voltage divider connected in parallel with the aforesaid second condenser, the capacity of which is many times greater than the capacity of the first condenser.

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**4,296,689**

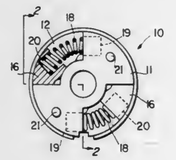
## ROTARY LOCKING MECHANISM

**Thomas K. C. Hardesty, Ednor, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 25, 1979, Ser. No. 60,557**

**Int. Cl.**[3] **F42C** *15/20*

**U.S. Cl. 102—260** **6 Claims**




**1**. A rotary-acting, safing and arming, ball-lock mechanism for releasably locking an arming shaft of a weapon against axial movement, said arming shaft having an engageable surface, comprising:

a base member having a central longitudinal aperture therein for receiving the arming shaft;

a rotor mounted for limited rotary movement on said base member;

a plurality of radial apertures formed in said base member and communicating with said central longitudinal aperture;

a plurality of balls disposed in said radial apertures;

a plurality of cam surfaces formed on said rotor for moving said balls partially through said radial apertures into said central aperture and into engagement with the arming shaft engageable surface to lock the shaft against movement when said rotor is moved to a safe position;

means for locking said base member and said rotor in the safe position; and

a pair of compression springs interposed between said base member and said rotor for moving said rotor to an arming position when said locking means is released whereby said balls are free to disengage the arming shaft engageable surface, release the arming shaft and permit axial movement of the arming shaft to the arming position to arm the weapon.

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**4,296,690**

## HANGER FOR TRACK-TYPE SUSPENDED RAILWAY

**Rudolf Baltensperger, Alte Keiserstuhlstr. 157, CH 8181 Höri, and Hans B. Pfister, Frohhaldenstr. 20, CH 8180 Bülach, both of Switzerland**

**Filed Nov. 1, 1978, Ser. No. 956,654**

**Claims priority, application Switzerland, Nov. 11, 1977, 13779/77**

**Int. Cl.**[3] **E01B** *3/00*

**U.S. Cl. 104—91** **9 Claims**

**1**. In a suspended railway having at least one suspension cable lying generally in a vertical plane and an at least generally horizontally elongated track formed by a pair of generally parallel hollow beams having upper sides constituting an upper surface and a predetermined transverse horizontal width and lying generally in said plane below said cable, a hanger comprising:

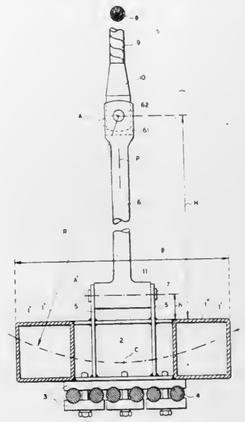
an upper part secured to said suspension cable;

a lower part secured to said track below said upper part;

a rigid T-shaped intermediate part between said upper and lower parts;

an upper pivot interconnecting said upper and intermediate





parts and defining therebetween a generally horizontal upper pivot axis extending generally in said plane and spaced at said hanger above said upper surface of said track by a vertical distance at least equal to said transverse width; and

a lower pivot interconnecting said intermediate and lower parts and defining therebetween a lower pivot axis extending generally perpendicular to said plane and closely juxtaposed with said upper surface at said hanger, said pivot axes being relatively fixed and immovable relative to each other.

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**4,296,691**

## APPARATUS FOR USE ON VEHICLE TRANSPORTERS

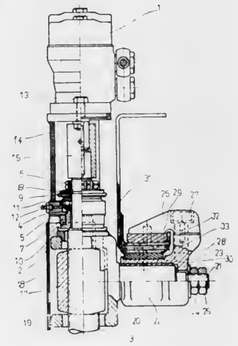
**Robert Lohr, 14, rue du 14 Juillet, 67980 Hangenbieten, France**

**Filed Sep. 11, 1978, Ser. No. 941,246**

**Claims priority, application France, Sep. 16, 1977, 77 28555**

**Int. Cl.**[3] **B60P** *3/06;* **B61D** *3/06*

**U.S. Cl. 105—370** **12 Claims**



**1**. In an apparatus for vertically moving an upper platform of vehicle transporter trailer comprising a lower platform disposed on a chassis and an upper platform supported at a distance from the lower platform for movement toward and away from the lower platform, front and rear vertical support posts secured to the lower platform for supporting front and rear portions of the upper platform, vertical screws housed in at least one of said front and rear posts, drive means for rotating the screws, and a nut and guide assembly on each rotatable screw adapted for vertical displacement along the screw in response to rotation thereof by the drive means, said assembly supportably and drivably engaging the upper platform, the improvement wherein the nut and guide assembly comprises a screw driven nut vertically displaced upon rotation of the screw and a separate support fork disconnected from and resting on the nut for vertical movement therewith, said support fork being transversely moveable relative to the drive nut to permit guiding of the upper platform while only imposing axial forces on the screw and the drive nut.

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**4,296,692**

## RAILWAY CAR CEILING PANEL

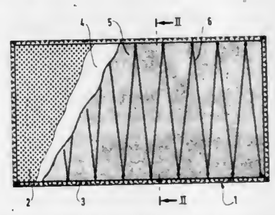
**Marc Roux, La Rochelle, France, assignor to Alsthom-Atlantique, Paris, France**

**Filed Sep. 6, 1979, Ser. No. 73,037**

**Claims priority, application France, Sep. 13, 1978, 78 26247**

**Int. Cl.**[3] **B60R** *13/08;* **B61D** *17/18;* **E04B** *13/08*

**U.S. Cl. 105—397** **4 Claims**




**1**. A ceiling component, in particular for rail vehicles, said component being formed by a curved panel and having a support which supports a layer of sound-proofing and heat insulating material, the improvement wherein the support is made in one piece and is constituted by a metal sheet having double edge portions forming a peripheral flange spaced slightly inwardly projecting from one surface of said panel, said double edge portions alone providing the rigidity necessary for the panel and wherein each edge portion is bent twice, firstly completely inwards on itself and, secondly, in a plane which is substantially perpendicular to the first bend and which alone forms the peripheral flange.

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**4,296,693**

## BEACH UMBRELLA SUPPORT

**Richard W. Archer, 4/66 Beresford Rd., Rose Bay, New South Wales, 2029, Australia**

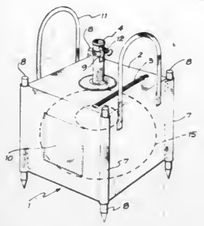
**Filed Feb. 8, 1979, Ser. No. 10,407**

**Int. Cl.**[3] **A47B** *41/04, 35/00*

**U.S. Cl. 108—28** **3 Claims**

**1**. A support for the shaft of a beach umbrella comprising a flat bottom collapsible container adapted to receive solid or liquid material, said container having a top part with a filler opening therein, a tubular member extending centrally from the top part of said container and adapted to receive the shaft of said beach umbrella, means to clamp said beach umbrella

shaft to said tubular member, a central opening in the bottom of said container large enough to allow said beach umbrella



shaft to pass therethrough and a doughnut shaped water-tight insert in said container.

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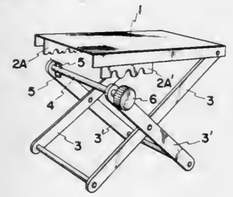
**4,296,694**

## GUITARIST'S FOOT-REST

**Itaru Kobayashi, 1-15-2, Motomachi, Kiyose City, Tokyo, Japan**

**Filed Dec. 20, 1979, Ser. No. 105,569**
**Claims priority, application Japan, Dec. 26, 1978, 53/159122**
**Int. Cl.[3] A47C** *9/12*
**U.S. Cl. 108—116** **2 Claims**



1. Guitarist's foot-rest comprising;
a tread-board,
a pair of cross legs for supporting said tread-board,
a rod connecting the upper ends of the free legs having single wire staple or double wire staples, and
a pair of parallel height regulating plates attached below the tread-board, each of said height regulating plates being provided with a number of recesses for receiving the connecting rod and recesses for receiving single or double wire staples.

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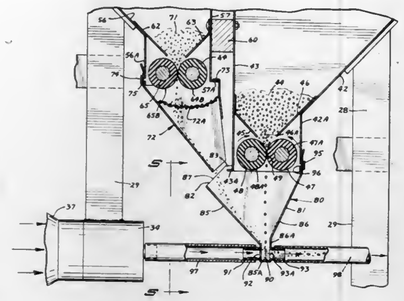
**4,296,695**

## SEEDING DEVICE WITH AIR DISTRIBUTION SYSTEM

**Sherman H. Quanbeck, Aneta, N. Dak., assignor to Wil-Rich, Inc., Wahpeton, N. Dak.**

**Continuation of Ser. No. 892,985, Apr. 3, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,250**
**Int. Cl.[3] A01C** *7/20, 7/06, 15/04*
**U.S. Cl. 111—34** **20 Claims**

1. In a pneumatic distributor arrangement for distributing particulate materials from a storage tank and having a pair of elastomeric rollers having a length extending across the storage tank for metering discrete particles from said storage tank in a substantially continuous line extending along the length of said metering rollers, the rollers being substantially contiguous along the length thereof, the improvement comprising a plurality of individual cups positioned below said metering rollers to receive material being dispensed, said cups being individually removably attached to said storage tank and positioned therebelow, said cups having fore and aft walls and side walls joining said fore and aft walls to form an open topped cup, the fore and aft walls having lower portions, a bottom wall joining the lower portions and extending therebetween to define a chamber adjacent the bottom of each of said cups, an inlet orifice defined in one of the lower portions and an outlet opening of larger diameter than the inlet orifice substantially directly axially aligned with said inlet orifice and defined in the other lower portion, each side wall having an upper edge substantially contiguous with the upper edges of the side walls of ajdacent cups, the upper edges of the side walls of adjacent cups extending transverse to the length of said metering rollers



and forming the sole means of dividing the line of dispensed material from the metering rollers into separated portions in each cup, said lower portions of the fore and aft walls being spaced a distance apart to permit the particulate material to drop into the chamber of each cup and into the flow of fluid passing from each inlet orifice to the respective outlet opening.

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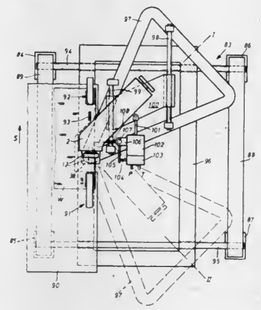
**4,296,696**

## DEVICE FOR PRODUCING SEWING SEAM PATTERNS OF STITCH GROUPS

**Hermann Taddicken, Schwäbisch Gmünd-Unterbettringen, and Wolfgang Sachs, Mögglingen, both of Fed. Rep. of Germany, assignors to Eisele Apparate-und Gerätebau GmbH, Fed. Rep. of Germany**

**Filed Aug. 29, 1980, Ser. No. 182,777**
**Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935763**
**Int. Cl.[3] D05B** *3/06*
**U.S. Cl. 112—70** **13 Claims**



1. A device for producing sewing seam patterns of stitch groups in a workpiece, for example buttonholes, including a holding mechanism for displacing the work intermittently to perform individual sewing operations, and a sewing machine equipped with a work clamping mechanism which is displaceable relative to a needle bar performing a swinging motion, and which engages the work in the area of the seam pattern to be sewn, comprising, guide means connected to the sewing machine for displacement of the sewing machine parallel to the direction of displacement of the clamping mechanism, and a drive mechanism connected to the guide means and controlled



by motion of the clamping mechanism through which cyclic motions in conformity with stitch formation are imparted to the sewing machine along a distance corresponding to the length of a seam pattern to be formed, which motions are opposite in direction to those of the clamping mechanism.

12. A method of producing sewing seam patterns as stitch groups comprising:
intermittently displacing a workpiece to receive seam patterns in a workpiece feed direction;
clamping the workpiece in an area thereof to receive a seam pattern;
moving the clamped workpiece area from an initial position past a sewing needle and looper of a sewing machine, in a first seam forming direction for a length of one side of a seam pattern to be formed, to form the one side of the seam pattern;
moving the sewing machine in a direction opposite the first seam forming direction for the length of the one side to return the workpiece area to its initial position;
unclamping the workpiece area; and
intermittently displacing the workpiece by a distance equal to a spacing between adjacent seam patterns to be formed.

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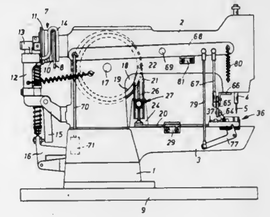
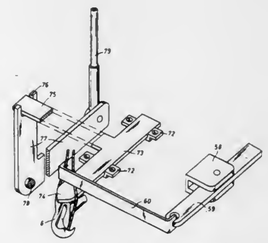
**4,296,697**

## SEWING MACHINE WITH A WORK HOLDER FOR WRAPPING BUTTON SHANKS

**Karl Barth; Ernst Albrecht, both of Hochspeyer, and Horst Stahlschmitt, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany**

**Filed Dec. 3, 1980, Ser. No. 212,563**
**Claims priority, application Fed. Rep. of Germany, Dec. 5, 1979, 7934154**
**Int. Cl.[3] D05B** *3/16, 53/00*
**U.S. Cl. 112—109** **8 Claims**





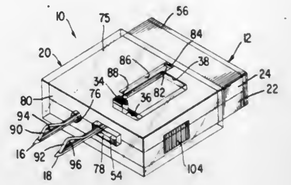
1. A device for wrapping button shanks connecting a workpiece to a button, with thread in a sewing machine comprising, a first holding element against which the workpiece can bear, a second holding element against which the button can bear spaced from the first holding element with the shank extending between the first and second holding elements, and adjustment means connected to the first and second holding elements for adjusting the spacing therebetween.

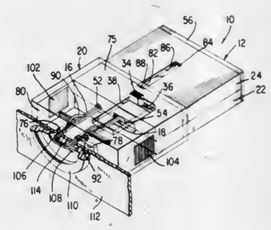
**4,296,698**

## BUTTON ATTACHING HAND TOOL WITH BUTTON STORAGE COMPARTMENT

**Donald R. Davidson, Berkeley Heights, and Walter H. W. Marsh, Fanwood, both of N.J., assignors to The Singer Company, Stamford, Conn.**

**Filed Jul. 14, 1980, Ser. No. 167,984**
**Int. Cl.[3] D05B** *3/14*
**U.S. Cl. 112—110** **10 Claims**





1. A button attaching hand tool including a box-like structure with a button storage compartment, a needle affixed in said structure, a second needle movable in said structure, means for adjusting the position of the second needle in said structure relative to the fixed needle to establish a spacing between the needles corresponding to the spacing between the holes of a button to be attached to a piece of material with said tool, and a slidable shroud on the box-like structure for use in removing the material and button from the tool, the shroud being slidable between one position wherein the shroud shields an operator from injury by the needles and another position wherein the needles are exposed for button attaching use.

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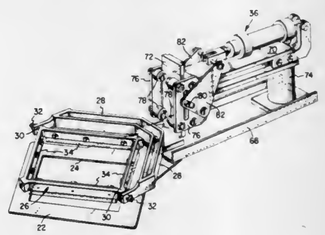
**4,296,699**

## FABRIC CLAMP

**Artin G. Vartoukian, Roselle Park, N.J., assignor to The Singer Company, Stamford, Conn.**

**Division of Ser. No. 952,901, Oct. 19, 1978, Pat. No. 4,186,673. This application Jun. 27, 1979, Ser. No. 53,144**
**Int. Cl.[3] D05B** *21/00;* **D05C** *9/04;* **G05B** *19/32*
**U.S. Cl. 112—121.15** **4 Claims**



1. A fabric clamp for supporting and guiding fabric to be

sewn in cooperative disposition with respect to the needle of a sewing machine, for use with a variable translation fabric feeding mechanism, said clamp comprising:

a lower supporting structure;

an upper supporting structure rigidly connected to the lower supporting structure;

a lower, flat plate extending from the lower supporting structure and having a cutout in its interior portion of a size and shape slightly larger than the excursion of said variable translation fabric feeding mechanism;

an upright section connected in vertically slidable fashion to one end of the upper supporting structure; and

an upper clamp plate having a fork-shaped section which is fixedly secured to the upright section, and a rigid, open frame pivotably mounted at two diagonally opposed corners to the ends of the fork-shaped section, the opening in said open frame being about the same size and shape as the cutout in the lower, flat plate.

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**4,296,700**

## DEVICE FOR THE AUTOMATIC GUIDING OF A WORKPIECE ON A SEWING MACHINE

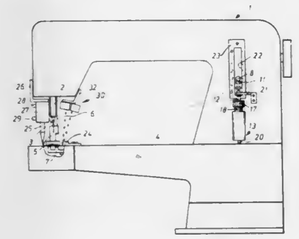
**Fritz Jehle, Enkenbach-Alsenborn, and Erich Willenbacher, Kaiserslautern, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany**

**Filed Apr. 28, 1980, Ser. No. 144,039**

**Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2917950**

**Int. Cl.³ D05B** *35/10*

**U.S. Cl. 112—153** **4 Claims**



**1**. A device for the automatic guiding of a workpiece on a sewing machine so as to produce a curved edge parallel seam and in a sewing machine which includes a reciprocating needle and a presser foot which are engageable with the workpiece and a feed member which is engageable with the workpiece as it moves through a substantially rectangular feed path to move it relative to the needle and, including a guide rule disposed in spaced relationship to the needle for guiding the edge of the workpiece and a scanner scanning the workpiece edge for sensing its position, the improvement comprising a plunger mounted above the workpiece and being movable into and out of engagement with the workpiece to hold the workpiece upon engagement therewith so as to permit the turning thereof during the feeding movement of said feed member, first drive means connected to said plunger to move said plunger toward and away from engagement with the workpiece, a stitch length setting mechanism connected to said feed member including a stitch length setting lever which is movable to change the length of feeding movement of said feeding member, a second drive mechanism including a rod movable through a path to engage said stitch length setting lever and displace it to adjust a feeding length of said feed member, said first drive means being connected to said second drive means so as to operate said second drive means as a function of said first drive means.

**4,296,701**

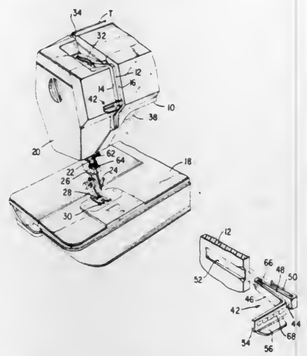
## THREADING ARRANGEMENT FOR CHAINSTITCH SEWING ON A SEWING MACHINE

**Robert H. Larsen, Middletown, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Nov. 6, 1980, Ser. No. 204,420**

**Int. Cl.³ D05B** *1/14*

**U.S. Cl. 112—168** **9 Claims**



**1**. In a sewing machine which includes a partitioning wall in a bracket arm between thread receiving channels, and wherein needle thread extends down one of said channels, around the bottom edge of the partition wall and into the other channel, upwardly through a check spring to a movable thread pulling and thread supplying take-up lever, and downwardly from the take-up lever on the way to a sewing needle; a chainstitch thread guide attached to the partitioning wall and including a thread guiding trough extending into said other channel to receive the needle thread extending from the check spring to the take-up lever and the thread extending downwardly from the take-up lever on the way to the needle, the inner end of the trough being located to decrease the thread supplying capability of the take-up lever.

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**4,296,702**

## STORAGE COMPARTMENT FOR SEWING MACHINE FOOT CONTROLLER

**Willi Meier, Karlsruhe-Durlach, and Bernd Rojahn, Herxheim, both of Fed. Rep. of Germany, assignors to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany**

**Filed Mar. 19, 1979, Ser. No. 21,834**

**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 7808896[U]**

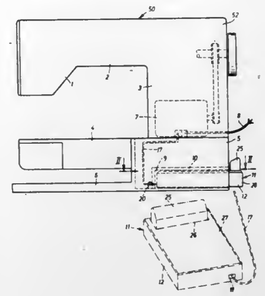
**Int. Cl.³ D05B** *69/10, 75/00*

**U.S. Cl. 112—258** **10 Claims**

**1**. A sewing machine comprising, a casing, a drive motor for driving said sewing machine mounted on said casing, a recess defined within said casing opening outwardly to one side thereof, a foot control member for said motor having a housing portion removably positionable in said recess and a control portion for regulating the speed of said motor in said housing portion, a cable fixedly attached to said casing and electrically interconnected with said control portion and said motor through said housing portion, a winding reel rotatably mounted in said housing portion about said control portion and having a drum portion around which at least part of said cable is wound, said winding reel rotatable with respect to said



housing portion for winding and unwinding said cable to permit movement to said control member out said recess, and



spring means mounted on said drum portion for biasing said winding reel in a direction to rewind said cable.

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**4,296,703**

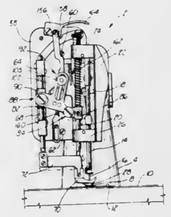
## SEWING MACHINE CONVERSION APPARATUS

**Elmer R. Thompson, 2408 47th St., Lubbock, Tex. 79412**

**Filed Oct. 3, 1979, Ser. No. 81,345**

**Int. Cl.³ D05D** *27/00, 27/20*

**U.S. Cl. 112—310** **16 Claims**



**1**. Apparatus for converting a sewing machine capable of sewing lightweight material to one capable of sewing heavier material and also capable of maintaining the material's seam connectible designs in alignment, the unconverted sewing machine having a main crankshaft coupled to a primary lift shaft and to a primary feed shaft and further having a feed dog for feeding a workpiece across a workpiece supporting surface of the machine, said apparatus comprising:

means for pivotally connecting a needle bar and a feed foot to said sewing machine;

means, responsive to actuation of said primary feed shaft, for oscillatably pivoting said connecting means in a feed direction and a reverse feed direction;

means, responsive to actuation of said primary lift shaft, for clamping said workpiece against said workpiece supporting surface during said reverse-feed direction pivotation; and

means, responsive to actuation of said primary lift shaft, for lowering and raising said feed dog at the substantial extreme of said feed direction pivotation and at the substantial extreme of said reverse-feed direction pivotation, respectively.

**4,296,704**

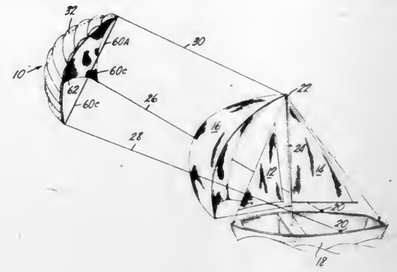
## ANTI-GRAVITY SPINNAKER

**John G. Bridge, P.O. Box 503, Poughkeepsie, N.Y. 12601**

**Filed May 7, 1979, Ser. No. 36,802**

**Int. Cl.³ B63H** *9/04*

**U.S. Cl. 114—103** **8 Claims**



**1**. A spinnaker large enough to aid a sailboat when sailing with the wind behind the boat, comprising:

a piece of flexible sail fabric having a top end, a bottom end and at least two sides, an interior surface and an exterior surface;

a plurality of tubular shaped inflatable bags of variable widths attached to the exterior surface of the fabric and containing a lighter-than-air gas;

stabilizing lines extending from the corners of the interior surface of the fabric said lines joined above the surface of the fabric at about the mid-point of the interior surface; and

means at three pointss on the spinnaker for attaching riggings from the spinnaker to both sides of the hull of the boat and to the top of the mast.

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**4,296,705**

## PNEUMATIC MARINE FENDER

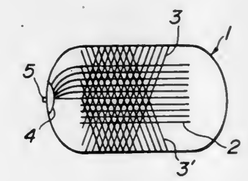
**Hisanari Uruta, Tokyo; Kaneaki Takahashi, Yokohama; Hirotsugu Masuda, Yokohama, and Tomoyuki Kurata, Yokohama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan**

**Filed Feb. 28, 1979, Ser. No. 16,705**

**Claims priority, application Japan, Mar. 3, 1978, 53/23601**

**Int. Cl.³ B63B** *59/02*

**U.S. Cl. 114—219** **2 Claims**



**1**. A pneumatic marine fender composed of cylindrical barrel serving as a shock receiving face, comprising a hollow cylindrical shell formed of rubber or rubber-like elastic material and a composite inner reinforcement composed of two kinds of cord layers comprising an axially extending cord layer substantially covering the end surface of said cylindrical shell and at least two circumferentially extending cord layers whose cords are slightly inclined at an angle of the order of smaller than 30°, preferably 19° with respect to the circumferential line of the cylindrical barrel and symmetrical arranged with respect to the circumferential line of the cylindrical shell in reverse directions and helically wound around the cylindrical

shell, the inclined cut ends of said circumferentially extending cords aligned at one end of said cylindrical barrel.

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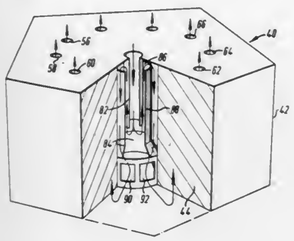
**4,296,706**
**ANCHOR**
**Eugene M. Hughes, Richmond, England, assignor to The British Petroleum Company Limited, London, England**
**Filed Aug. 28, 1979, Ser. No. 70,442**
**Claims priority, application United Kingdom, Jul. 13, 1978, 29741/78**
**Int. Cl.³ B63B *21/24***
**U.S. Cl. 114—294** **5 Claims**



4. A gravity anchor comprising:
a set of bouyancy tanks;
a container affixed to said tanks and having an interior volume for the reception of liquid ballast;
a conduit extending vertically to the interior of said container from an opening in an upper surface of said container; and
a wall upstanding from a floor of said container and surrounding an opening at the bottom of said conduit to serve as a weir for the distribution of ballast conducted into said container via said conduit.

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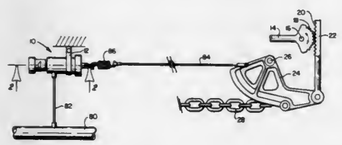
**4,296,707**
**RAILROAD CAR HAND BRAKE SIGNAL DEVICE**
**Leroy P. Kennedy, Mahwah, N.J., assignor to Abex Corporation, New York, N.Y.**
**Filed Feb. 13, 1980, Ser. No. 120,964**
**Int. Cl.³ B61D *49/00*; G01L *19/12***
**U.S. Cl. 116—58 A** **2 Claims**



1. A railroad car hand brake signal device for alerting a train crew that a hand brake is applied when air is supplied to a train brake pipe during operation of the train, the signal device comprising a housing and means for mounting the housing on a railroad car; characterized by a port formed laterally in a wall in the housing which is connected to the railroad car brake pipe, blocking means for blocking the port movable within the housing between a first position which blocks the port and a second position which opens the port to bleed air in the brake pipe into the housing, an air operated whistle formed in the housing, a passage formed in means connecting the whistle to the housing which connects the port with the whistle, the passage being sized to cause significant bleed off of air in the brake pipe when the port is open to signal the train crew, and means for connecting the blocking means with a movable element of the hand brake wherein when the hand brake is applied the element moves in one direction to thereby move the blocking means to the second position to uncover the port to cause air to bleed from the brake pipe and the whistle to operate.

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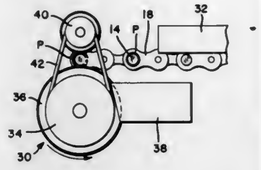
**4,296,708**
**APPARATUS FOR COATING METAL SUBSTRATES WITH ADHESIVE**
**Kenneth L. Robertson, Covington, and Curtis A. Heslep, Piqua, both of Ohio, assignors to Ken-Koat, Inc., Troy, Ohio**
**Filed Feb. 1, 1980, Ser. No. 117,693**
**Int. Cl.³ B05C *1/00***
**U.S. Cl. 118—233** **3 Claims**



1. Apparatus for uniformly coating a metal substrate with an adhesive comprising at least one coating station and at least one drying station, said coating station including a coating roll covered with an all natural fiber felt, means to rotate said coating roll, a reservoir means for supplying a solvent-based adhesive to said coating roll, and an idler roll adapted to be disposed on the opposite side of said metal substrate from said coating roll, and belt means connecting said idler roll to said coating roll for rotating said idler roll in the same direction as said coating roll and for pressing said metal substrate against said coating roll, said drying station including means to heat the air in said station, and means for conveying said metal substrate successively to said at least one coating station and at least one drying station said means for conveying comprising an endless chain having a mandrel extending outwardly from each link.

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**4,296,709**
**ANIMAL LITTER PREPARATION**
**Benjamin M. Schulein, Jr., St. Louis, Mo., assignor to Alfa-Pet, Inc., St. Louis, Mo.**
**Filed Jun. 22, 1979, Ser. No. 51,209**
**Int. Cl.³ A01K *1/015***
**U.S. Cl. 119—1** **6 Claims**

1. An animal litter consisting essentially of a chlorophyll-containing agent from the class consisting of alfalfa, algae, broom grass and timothy grass, and a relatively high density cellulosic agent consisting of corncob grits, said chlorophyll-containing agent and said grits being physically intermixed in a dry, discrete state, said intermixture being free of chemical agents, compounds, and preparations, said grits constituting between approximately 50% to 70% by weight of the litter and said chlorophyll-containing agent constituting approximately 50% to 30% of the litter.

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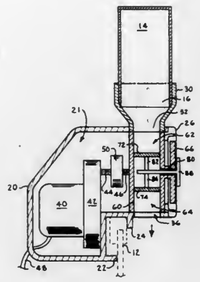
**4,296,710**
**AUTOMATIC FEEDING APPARATUS**
**William M. Sillers, III, P.O. Box 227, Grant, Fla. 32949**
**Filed Apr. 8, 1980, Ser. No. 138,355**
**Int. Cl.³ A01K *61/02***
**U.S. Cl. 119—51.11** **11 Claims**

1. An automatic feeding apparatus for periodically dispensing fish food into an aquarium, said apparatus comprising in combination:
a body member for being removably coupled to the aquarium;



a hopper carried by said body member for receiving a storage canister of fish food;
valve means movably coupled to said body member for periodically receiving in a first position the fish food from said hopper and for discharging in a second position the fish food into the aquarium, said valve means including,
a generally cylindrical drum dispenser which is rotatably carried within a circumferential section of said body member, with said drum dispenser including therein an open metering bore, and



a first piston movable within said bore so as to adjust the capacity of a first food receptacle defined by said metering bore, said first piston and said circumferential section of said body member;
actuator means for rotating said valve means between said first and said second positions; and
clutch means interposed between said actuator means and said valve means for allowing the operating position of said valve means to be continuously adjusted between said first and said second positions, whereby the exact discharge time of the fish food into the aquarium may be adjusted.

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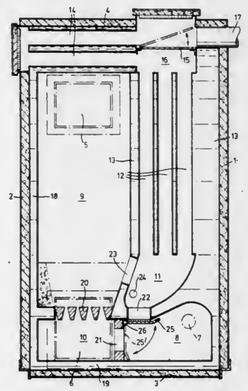
**4,296,711**
**HEATING BOILER**
**Erik A. Bilberg, Strängnäs, Sweden, assignor to EABVV Utvecklings Aktiebolag, Strängnäs, Sweden**
**Filed Feb. 15, 1980, Ser. No. 121,659**
**Claims priority, application Sweden, Apr. 10, 1979, 7903172**
**Int. Cl.³ F22B *31/04***
**U.S. Cl. 122—22** **6 Claims**



1. In a heating boiler for combined firing with liquid fuel and/or solid fuel, comprising a liquid fuel combustion chamber, a solid fuel combustion chamber having a grate, at least one flue in communication with said chambers and in contact with water, and at least the walls of the solid fuel combustion chamber in contact with water, the improvement comprising a first connection between said liquid fuel combustion chamber and said flue, a second connection between said liquid fuel combustion chamber and said solid fuel combustion chamber, closure means for closing said first connection while opening said second connection to couple said combustion chambers in series through said grate, and for closing said second connection while opening said first connection, whereby the available fuels can be adapted to the heat requirements of said boiler.

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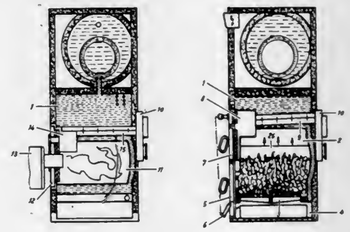
**4,296,712**
**TWO-CHAMBER BOILER FOR BURNER FIRING AND SOLID FUEL FIRING**
**Alfred Vogt, Schaan, Liechtenstein, assignor to Hoval Interliz AG, Vaduz-Neugut, Liechtenstein**
**Filed Mar. 27, 1980, Ser. No. 134,613**
**Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913205**
**Int. Cl.³ F22B *31/04***
**U.S. Cl. 122—22** **6 Claims**



1. A two-chamber boiler comprising
a horizontal outer boiler body enclosing a common water region,
a burner chamber adapted for a burner firing system and a combustion chamber adapted for a solid fuel firing system being arranged laterally adjacent one another in said outer boiler body in the common water region,
two separate horizontal ancillary heating passages disposed in said water region, one of said passages respectively being disposed above said chambers respectively communicating therewith and leading to a flue gas collector of the boiler,
a fire grate disposed at the bottom of said boiler body and formed with air passage openings communicating with said combustion chamber,
said combustion chamber comprises a horizontally extending hollow body closed at a rear end and having an approximately elliptical cross-section with a vertical major diameter tapering downwards approximately conically to said fire grate, the cross-section of said hollow body below said fire grate transfering into an ash space of box form,
a first ancillary heating passage of rectangular cross-section arranged axially parallel to and above said combustion chamber in the boiler water region and communicating with a forward end of said combustion chamber, said first ancillary heating passage having a large cross-sectional width extending horizontally and said first ancillary heating passage having vertically directed ribbing of comb-type cross-section disposed inside said first ancillary heating passage,
said burner chamber comprises a horizontally extending round cylinder closed at a rear end, a longitudinal center line of said burner chamber being substantially at the level of a longitudinal center line of said combustion chamber.

a second ancillary heating passage of rectangular cross-section arranged axially parallel to and above said burner chamber in the boiler water region and communicating with a forward end of said burner chamber, said second ancillary heating passage having a larger cross-sectional width extending horizontally and said second ancillary heating passage having vertically directed ribbing of comb-type cross section disposed inside second ancillary heating passage,

said outer boiler body comprising a metal sheet shaped in one piece by rolling into a hollow body having a noncircular round-like cross-section comprising an upper curve portion, a lower curve portion and two lateral curve portions constituting four curve portions,

three transition curve portions having smaller radii of curvature than said four curve portions, said upper, said lower and said lateral curve portions merging into one another above said two chambers and below said burner chamber via said three transition curve portions, one of said lateral curve portions being laterally adjacent said combustion chamber and the other of said lateral curve portions being laterally adjacent said burner chamber,

said lower curve portion and said one of said lateral curve portions terminating at the ash space of said combustion chamber, and

the height of said other of said lateral curve portions being less than the height of said one of said lateral curve portions.

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**4,296,713**

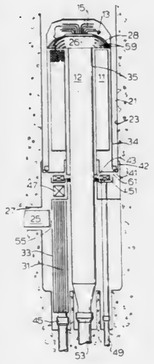
## VAPOR GENERATOR

**Edward S. Taylor, Del Mar, Calif., and George W. Hirschle, Wiesendangen, Switzerland, assignors to General Atomic Company, San Diego, Calif.**

**Filed Feb. 7, 1979, Ser. No. 10,090**

**Int. Cl.³ F22B *1/18***

**U.S. Cl. 122—32** **7 Claims**



**1**. A vapor generator comprising, a high temperature section having a plurality of substantially straight tubes substantially parallel with each other forming an elongated tube bundle, a low temperature section having a plurality of substantially helical tubes forming an annular tube bundle positioned axially of said high temperature section, said tubes of said low temperature section being comprised of different metals having different coefficients of thermal expansion, said high temperature and low temperature sections being subject to thermal expansion of different amounts, means for directing a heating fluid through one of said tube bundles substantially parallel to the coaxes of said bundles and then through the other of said tube bundles in the opposite direction, said directing means including plate means extending transversely at one end of said vapor generator for turning the heating fluid through a substantially 180° turn, and a plurality of cross-over loops joining the tubes in said high temperature section to the tubes in said low temperature section, said cross-over loops each having portions of said different metals joined, respectively, to said section having the same metal, said cross-over loops each having a bimetal weld joining said portions of different metals, said bimetal welds being positioned on opposite sides of said plate means from said high temperature and low temperature sections to be out of the flow of the heating fluid.

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**4,296,714**

## DUAL PISTON TWO STROKE ENGINE

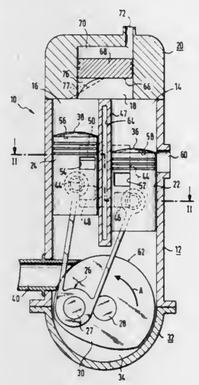
**Bernhard Büchner, Ott-Heinrich-Strasse 25, D-8070 Ingolstadt-Unsernherrn, Fed. Rep. of Germany**

**Filed Apr. 18, 1980, Ser. No. 141,569**

**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923941**

**Int. Cl.³ F02B *25/12***

**U.S. Cl. 123—53 B** **12 Claims**



**1**. In a two stroke reciprocating engine, the combination of:

first and second cylinders;

first and second pistons reciprocably disposed in corresponding ones of said cylinders;

a crank chamber connecting said cylinders on corresponding ends thereof;

a combustion chamber connecting said cylinders on the ends thereof opposite said corresponding ends;

a crank rotatable in said crank chamber;

means connecting both of said pistons to said crank such that for one direction of rotation of said crank said first piston precedes said second piston during a reciprocating cycle thereof;

a transfer port for transferring at least combustion air from the crank chamber sides of said pistons to the combustion chamber sides of said pistons, said transfer port having first and second inlets in said first and second cylinders respectively and an outlet only in said second cylinder; and

control surfaces on said pistons for opening and closing said inlets and outlet such that said second inlet remains open later in said reciprocating cycle than said first inlet to thereby lengthen the period in said reciprocating cycle during which said transfer of at least combustion air may occur.



**4,296,715**

## APPARATUS FOR EXTERNAL COOLING OF AN EXHAUST VALVE

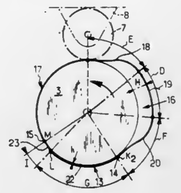
**Remi Curtil, Montsoult, and Alain Devaux, Saint Mande, both of France, assignors to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France**

**Filed Feb. 2, 1979, Ser. No. 9,072**

**Claims priority, application France, Feb. 24, 1978, 78 05399**

**Int. Cl.³ F01L *1/34***

**U.S. Cl. 123—90.15** **5 Claims**



**1**. Apparatus for improving the external cooling of an exhaust valve of an internal combustion engine having a working piston in a cylinder, an intake valve for admitting air into said cylinder, an exhaust valve for exhausting combustion gases from said cylinder, and operating cams, each having a circular base profile and a main boss with a leading valve opening profile, an intermediate full open profile, and a trailing valve closing profile, for controlling the opening and closing of said intake valve and exhaust valve, respectively, such that the open periods of the intake valve and the exhaust valve normally mutually overlap by a predetermined value, wherein the improvement comprises:

said operating cam of the exhaust valve having a residual lift portion of substantially constant radius, the leading part of which merges smoothly and progressively with the valve closing profile of the main boss of said cam and the trailing part of which merges smoothly and progressively with the circular base profile of the cam, said residual lift portion extending through a circular angle corresponding to at least the major part of the intake valve opening period, and the radial height of the residual lift portion being such that the residual lift portion produces a small free flow section between the valve and its seat relative to the free flow section of the fully open valve.

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**4,296,716**

## INTERNAL COMBUSTION ENGINE FOR AN AUTOMOBILE WITH A DIVIDED OIL PAN

**Peter Hofbauer; Michael Willmann, and Egon Wundrak, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed May 31, 1979, Ser. No. 44,050**

**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824415**

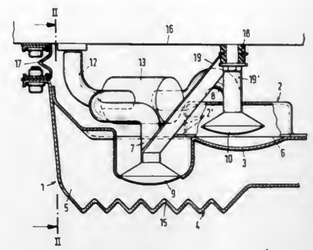
**Int. Cl.³ F01M *11/06***

**U.S. Cl. 123—195 C** **12 Claims**

**1**. An internal combustion engine for an automobile with an oil pan divided into two chambers from which two lubricating oil quantities having different temperatures are obtained, the two chambers are in communication with each other and are equipped with suction lines, the bottom of a first one of said chambers being placed at a distance above the bottom of the oil pan, which is also the bottom of the second one of said chambers, characterized in that

at least the bottom region of the oil pan is exposed to the slip stream of the automobile and is designed in a heat-transmitting manner; and

a suction line from each chamber opens into a common delivery line by way of a thermostat valve, said thermostat valve forms a connection means wherein at low oil temperatures, at least predominantly, effects communication of the delivery line only with the first of the chambers and at oil temperatures above a preselected level, at least



predominantly, effects communication of the delivery line only with the second chamber instead of the first.

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**4,296,717**

## DRIVE ARRANGEMENT FOR AUXILIARY AGGREGATES OF AN INTERNAL COMBUSTION ENGINE

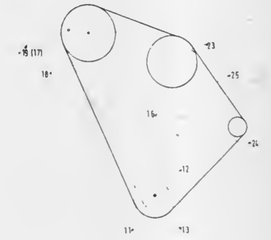
**Walter Schlagmüller, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 1, 1979, Ser. No. 44,553**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838343**

**Int. Cl.³ F02F *7/00***

**U.S. Cl. 123—195 A** **8 Claims**



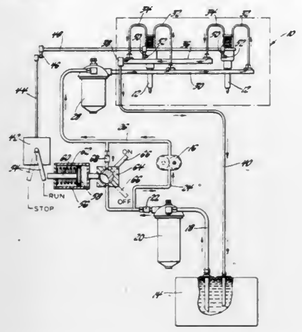
**1**. A drive arrangement of the character described, especially for motor vehicles, comprising a combustion engine having a drive shaft and a cam shaft driven by the drive shaft; a first pulley freely rotatably mounted on said drive shaft; centrifugal clutch means on said drive shaft for connecting said first pulley to said drive shaft when the latter rotates up to a predetermined speed and for disconnecting the drive of said first pulley by said drive shaft when the latter rotates above said predetermined speed; an intermediate pulley having a free wheel coupling driven at least indirectly by said cam shaft; a belt connecting said first pulley with said intermediate pulley; a plurality of auxiliary aggregates each having a shaft and a pulley fixedly mounted thereon, said first pulley, said intermediate pulley and the pulleys of said auxiliary aggregates being located in one plane and said belt connecting said first pulley to said intermediate pulley extending also about the pulleys of said auxiliary aggregates, whereby during rotation of said drive shaft up to said predetermined speed said auxiliary aggregates are driven by said first pulley and when said drive shaft rotates above said predetermined speed said auxiliary aggregates are driven by said intermediate pulley which is at least indirectly driven by said cam shaft.

**4,296,718**

## DIESEL ENGINE SHUTDOWN CONTROL SYSTEM

**Edward D. Baugh, and Mark B. Hoffman, both of Union Lake, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 17, 1979, Ser. No. 75,954**
**Int. Cl.³ F02M** *63/02*
**U.S. Cl. 123—198 D** **4 Claims**




1. A diesel engine fuel supply and shutdown control system comprising fuel injection means to inject fuel into the engine combustion chambers, a control lever movable into "stop" and "run" positions to respectively prevent or permit fuel injection to the combustion chambers, an engine driven fuel pump capable of generating pressure in either direction of rotation and connected to supply fuel to the fuel injection means from a source of supply, a check valve to prevent reverse fuel flow from the fuel pump to the supply source and shutdown means including a pressure actuator operatively engaging said control lever and responsive to fuel pump pressure to move said lever to its stop position, said actuator being biased toward a nonoperative position that permits location of said lever in its run position, first and second conduit means connecting said actuator with opposite sides of said fuel pump to supply pressure therefrom in either direction of pump operation and selector valve means connected in said first and second conduit means and movable into "on" and "off" positions to control engine operation, said selector valve means being operative in the "on" position to shut off the first conduit from the engine side of the pump and open the second conduit from the supply side of the pump to permit normal engine operation but prevent reverse operation and said selector valve means being operative in the "off" position to shut off the second conduit from the supply side of the pump and open the first conduit from the engine side of the pump to supply pump pressure to the actuator during normal operation and thereby shut down the engine.

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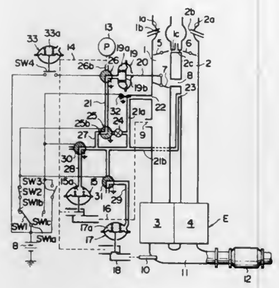
**4,296,719**

## MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINE HAVING MIXTURE CUT OFF MEANS

**Koichi Takahashi; Fumio Hinatase, and Akira Shibanaka, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan**

**Filed Sep. 20, 1979, Ser. No. 77,278**
**Claims priority, application Japan, Sep. 22, 1978, 53/117120; Sep. 25, 1978, 53/118158; Sep. 26, 1978, 53/118778**
**Int. Cl.³ F02D** *17/00*
**U.S. Cl. 123—198 F** **9 Claims**

1. Internal combustion engine comprising a plurality of cylinders, intake passage means including first passage means leading to at least one of said cylinders and second passage means leading to the remainder of said cylinders, throttle valve means provided in said intake passage means and having a minimum opening position, means for providing a supply of combustible air and fuel mixture to said first and second passage means, shut-off valve means provided in said first passage means downstream of said mixture supply means and movable to a closed position for blocking the supply of the mixture to the cylinder associated with said first passage means, means for detecting that the throttle valve means is in the minimum opening position and moving the shut-off valve means to said closed position when the throttle valve means is in the minimum opening position, means for providing a supply of air to




said cylinder associated with said first passage means, control means sensible to engine speed and throttle valve position and controlling said air supply means so that a substantial amount of air is supplied to said cylinder associated with said first passage means when the throttle valve means is in the minimum opening position and the engine speed is below a predetermined value but the air supply is essentially interrupted when the engine speed is beyond the predetermined value.

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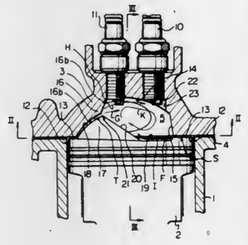
**4,296,720**

## COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

**Kiyoshi Nakanishi; Takeshi Okumura; Ryuichi Deguchi, all of Susono, and Toshio Tanahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed May 30, 1979, Ser. No. 43,670**
**Claims priority, application Japan, Jul. 20, 1978, 53-87662**
**Int. Cl.³ F02B** *23/08;* **F02P** *15/08*
**U.S. Cl. 123—309** **12 Claims**



1. An internal combustion engine comprising:
a cylinder block having a cylinder bore therein;
a cylinder head having an inner wall mounted on said cylinder block;
a first raised portion formed on the periphery of the inner wall of said cylinder head, having a flat bottom face and projecting downwardly;
a piston reciprocally movable in said cylinder bore and



having a top face with a flat peripheral portion approachable to said flat bottom face, creating a first squish area therebetween at the end of the compression stroke for spouting out a first squish flow along the top face of said piston, said first squish area comprising an annular area between the flat peripheral portion of the top face of the piston and the flat bottom face of the cylinder head, said first squish area extending substantially along the entire periphery of the top face of said piston;
a combustion chamber defined by the inner wall of the cylinder head and the top face of said piston;
an intake valve movably mounted on said cylinder head in fluid communication with said combustion chamber;
an exhaust valve movably mounted on said cylinder head in fluid communication with said combustion chamber;
a second raised portion formed on the top face of said piston at a position opposite to said first raised portion with respect to an axis of said piston, having a rear face and a front face exposed to said combustion chamber, said rear face being approachable to the inner wall of said cylinder head so as to create a second squish area therebetween at the end of compression stroke for spouting out a second squish flow which moves forward in the upper interior of said combustion chamber in a direction opposite to the spouting direction of said first squish flow, said first and second squish flows cooperating with each other to create a strong swirl motion rotating about a horizontal axis in said combustion chamber;
a third raised portion formed on the inner wall of said cylinder head above said second raised portion having a bottom wall which cooperates with said rear face of said second raised portion for creating said second squish area; and
a pair of spark plugs located in said combustion chamber, comprising a first spark plug located near said first raised portion in a recess formed on the inner wall of said combustion chamber, said recess being located on an extension of said second squish area and extending outwardly beyond a straight line extending between the peripheries of said intake and exhaust valves, and a second spark plug located near said third raised portion, said first squish area extending inwardly from the periphery of the top face of the piston to a continuous, sinuous inner periphery which extends around and is almost vertically under the intake valve, the exhaust valve, and said spark plug recess and adjacent to said second raised portion, the surface area ratio of the sum of the first and second squish areas formed on the inner wall of the cylinder head and the first and second squish areas formed on the top face of the piston to the sum of the cross-sectional area of the cylinder bore and the surface area of the inner wall of the cylinder head, excluding the surface area of the vertical side wall of said first raised portion, is in the range of from 30 to 50 percent.

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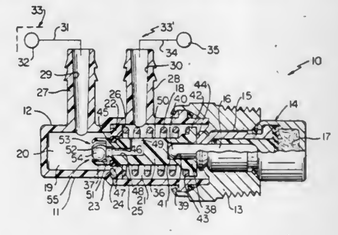
**4,296,721**

## CONTROL SYSTEM HAVING AN IMPROVED CONDITION RESPONSIVE VALVE CONSTRUCTION

**Everett T. Steele, Jr., Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Division of Ser. No. 808,875, Jun. 22, 1977, Pat. No. 4,147,180. This application Jan. 10, 1979, Ser. No. 2,381**
**Int. Cl.³ F02P** *5/04*
**U.S. Cl. 123—407** **1 Claim**

1. In a control system for an internal combustion engine having a vacuum manifold and a vacuum operated control device that is to be always interconnected to said manifold by a self-contained condition responsive valve construction when the temperature of said engine is above a certain temperature and is to be only substantially interconnected to said manifold through said valve construction when the vacuum valve of said manifold is greater than the vacuum value at said control device and the temperature of said engine is below said certain temperature, said self-contained condition responsive valve construction having a check valve means therein that substantially blocks the fluid interconnection between said manifold and said control device when said manifold vacuum value is less than the vacuum value of said control device and said temperature of said engine is below said certain temperature whereby said check valve means forms part of the self-contained structure of said valve constructure, said valve construction having valve seat means disposed between a pair of ports to interconnect the same together and having valve member means for opening and closing said valve seat means in response to a condition sensed thereby, one of said ports being interconnected to said manifold and the other of said ports being interconnected to said control device, said valve member means having a by-pass passage means therein for fluidly interconnecting said ports together even though said valve seat means is closed by said valve member means, said by-pass passage means having said check valve means therein to permit fluid flow through said by-pass passage means in only one



direction, said valve construction having a housing means carrying said valve seat means and said valve member means, said valve seat means being annular and said valve member means comprising a plunger that axially moves in said annular valve seat means, said plunger having a free end portion that projects beyond one side of said valve seat means in all positions of said plunger, said by-pass passage means having one end thereof leading to the exterior of said plunger at said free end portion thereof, said check valve means comprising a valve seat in said by-pass passage means at said free end portion of said plunger and a valve member for opening and closing said valve seat, the improvement wherein, said free end portion of said plunger has a restrictor means therein that leads from the exterior of said free end portion to said by-pass passage means intermediate said check valve seat and the other side of said valve seat means to always fluidly interconnect said ports together at a controlled rate.

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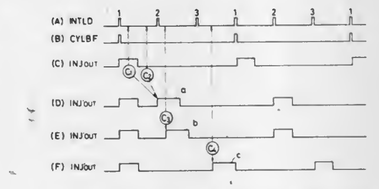
**4,296,722**

## CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

**Toshio Furuhashi, and Osamu Abe, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 26, 1979, Ser. No. 60,751**
**Claims priority, application Japan, Jul. 26, 1978, 53-90432**
**Int. Cl.³ F02B** *3/10;* **G06F** *15/20*
**U.S. Cl. 123—492** **13 Claims**




1. A control apparatus for an internal combustion engine comprising:

first means for generating a pulse train having a predetermined relation to the angle of rotation of the engine crankshaft, said pulse train including a plurality of reference pulses generated within each time period corresponding to one revolution of the engine crankshaft;

second means for generating a normal fuel injection signal, to control a fuel injector, the time of occurrence of which signal depends upon the time of occurrence of one of said reference pulses;

third means for detecting an accelerating engine condition;

fourth means, coupled to said third means, for detecting whether the accelerating condition has occurred at a time between said one of the reference pulses and an adjacent subsequent reference pulse; and

fifth means for generating a corrective fuel injection signal, the initiation of which is governed by a subsequent to said adjacent subsequent reference pulse in response to the detected information from said fourth means, so that said corrective fuel injection signal does not overlap the normal fuel injection signal.

10. A method of controlling the supply of fuel to an internal combustion engine so as to augment the supply of fuel normally supplied to the engine, in the event of an acceleration condition, comprising the steps of:

(a) generating a train of pulses in accordance with the rotation of the engine crankshaft, said train of pulses containing a plurality of reference pulses for every one revolution of the engine crankshaft;

(b) generating a first fuel supply signal to control the normal supply of fuel to the engine, the time of occurrence of which is governed by one of said reference pulses;

(c) detecting an acceleration condition of the engine;

(d) detecting whether the occurrence of the acceleration condition of the engine has occurred at a time between said one of said reference pulses and a subsequent adjacent reference pulse; and

(e) generating a second fuel supply signal the time of occurrence of which is synchronized with or subsequent to said subsequent adjacent reference pulse, whereby the supply of fuel to the engine is augmented so as not to overlap the normal supply of fuel to the engine.

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**4,296,723**

## ENGINE FUEL SYSTEM WITH FUEL/WATER SEPARATION

**Frederic C. Aldrich, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.**

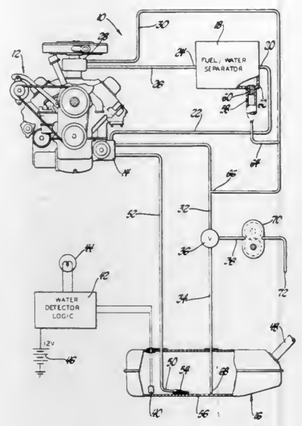
**Filed Dec. 17, 1979, Ser. No. 104,308**
**Int. Cl.³ F02M *55/00*; B01D *17/00***
**U.S. Cl. 123—510** **1 Claim**

1. A liquid fuel supply system for an engine in which the fuel may have some water entrained therein which should be removed before the fuel is used in the engine, said system comprising:

a fuel storage tank having a fuel inlet, a fuel outlet, a return inlet and means for detecting a predetermined level of water in the tank and alerting the engine operator that the predetermined water level has been reached;

a fuel pump connected with said fuel outlet to receive fuel from said tank and when operating pressurizing the fuel so received;

a fuel/water separator having an inlet receiving pressurized fuel from said fuel pump, means separating the fuel and any water entrained in the fuel received from the fuel pump, a first outlet delivering pressurized fuel from said separating means to said engine for use therein, a second outlet including orifice means receiving water from said separating means, said second outlet being connected to said tank return inlet for returning pressurized separated water to said tank;




said separated water being retained in said tank and activating said detecting and alerting means when said predetermined water level in said tank is reached;

and means for removing water from said tank.

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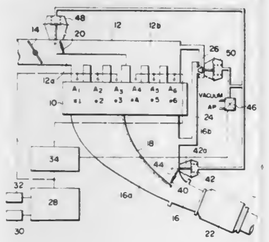
**4,296,724**

## INTERNAL COMBUSTION ENGINE

**Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Dec. 28, 1979, Ser. No. 108,228**
**Claims priority, application Japan, Jan. 8, 1979, 54-1186**
**Int. Cl.³ F02M *25/06***
**U.S. Cl. 123—568** **8 Claims**




1. An internal combustion engine comprising:

(a) a plurality of cylinders split into first and second groups;

(b) an intake passage provided therein with a throttle valve and being divided downstream of said throttle valve into first and second branches, said first branch communicating with said first group of cylinders, and said second branch communicating with said second group of cylinders;

(c) an exhaust passage having its upstream portion divided into first and second branches, said first branch communicating with said first group of cylinders, and said second branch communicating with said second group of cylinders;

(d) an EGR passage having its one end opening into said second branch of said exhaust passage and the other end opening into said second branch of said intake passage;

(e) control means for providing a first signal under high engine load conditions and a second signal under low engine load conditions;

(f) first valve means provided in said second branch of said exhaust passage downstream of the opening of said EGR passage, said first valve means being responsive to the first signal for opening said second branch of said exhaust passage and being responsive to the second signal for closing the same;

(g) second valve means provided in said second branch of said intake passage, said second valve means being responsive to the first signal for opening said second branch of said intake passage and being responsive to the second signal therefrom for closing the same; and

(h) third valve means provided in said EGR passage, said third valve means being responsive to the first signal for closing said EGR passage and being responsive to the second signal for opening the same.



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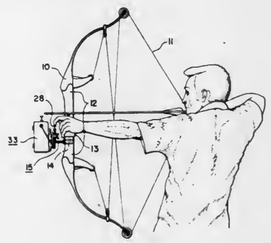
**4,296,725**

## ARCHERY BOW IMPROVEMENT AND CAMERA THEREFOR

**Ronald J. Broderick, 3183 S. 8240 West, Magna, Utah 84044**

**Filed Jul. 27, 1979, Ser. No. 61,483**
**Int. Cl.³ F41B *5/00***
**U.S. Cl. 124—24 R** **3 Claims**



1. In combination, an archery bow, and forwardly-facing camera means attached to said archery bow, said camera means comprising a camera, a padded case encasing said camera and having aperture means accommodating exposure-functioning of said camera, said case being provided with spring-biased means for effecting selective camera film-advance, said case also being provided with shutter-trip control means adjustably secured relative to said archery bow.

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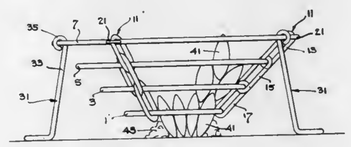
**4,296,726**

## COLLAPSIBLE CHARCOAL LIGHTING HOLDER

**Jim Ross, P.O. Box 5204, and John Vilicich, 836 S. Gaffey St., both of San Pedro, Calif. 90731**

**Filed Nov. 26, 1979, Ser. No. 97,518**
**Int. Cl.³ A47J *37/00***
**U.S. Cl. 126—25 B** **6 Claims**



1. An operably collapsible device for holding charcoal in a manner to facilitate ignition, comprising

a series of successively larger, nesting, similar, plane geometric shapes

at least three slidable interconnecting means spaced equidistant around the circumference of said plane geometric shapes such that,

when the largest of said plane geometric shapes is suspended horizontally, the series of shapes depend therefrom, spaced apart approximately equally, to form an inverted truncated cone or pyramid, and

when said plane geometric shapes are allowed to rest on a horizontal surface said plane geometric shapes nest together in one horizontal plane

at least two support members foldably connected to the largest of said plane geometric shapes such that

as a first alternative, said support members may be positioned fully erect causing the largest said plane geometric shape be suspended approximately horizontally, with the remaining plane geometric shapes depending therefrom to form an inverted truncated cone or pyramid, the lowest portion of which is suspended slightly above the plane of the lower extremities of said support members, and

as a second alternative, said support members may be positioned extending radially out from the largest of said plane geometric shapes, and

as a third alternative, said support members may be positioned folded over said plane geometric shapes.

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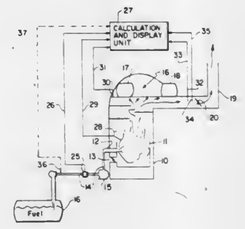
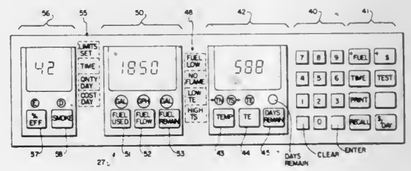
**4,296,727**

## FURNACE MONITORING SYSTEM

**Edward L. Bryan, Dallas, Tex., assignor to Micro-Burner Systems Corporation, Addison, Tex.**

**Filed Apr. 2, 1980, Ser. No. 136,719**
**Int. Cl.³ F24H *3/00*; G01L *3/26*; F23N *1/00***
**U.S. Cl. 126—116 A** **8 Claims**




1. A monitoring and display apparatus for use in combination with a heating system of the type having a combustion chamber, adjustable means for supplying air to said combustion chamber to support combustion, an exhaust duct for exhausting combustion products from the combustion chamber, a fuel input nozzle and conduit means connectable to a fuel source for supplying fuel to the combustion chamber, and a heat exchanger in the gas flow path between the combustion chamber and the exhaust duct for heating a fluid medium, the apparatus comprising

first and second transducer means for sensing the temperatures at the combustion chamber and the exhaust duct, respectively, and for producing electrical signals representative of said temperature;

third transducer means coupled to said conduit means for

sensing the rate of flow of fuel to said fuel input nozzle and;

logic display means electrically connected to said transducer means for calculating and selectively displaying parameters representative of the operation of said heating system comprising

a clock;

memory means for storing digital data representative of the temperature and flow rate parameters sensed by said transducers and of preselected limit values for selected ones of said parameters;

input means including a keyboard for manually supplying said preselected limit values to said memory means;

calculator means responsive to said clock and to the sensed parameters stored in said memory means for calculating fuel usage per unit time and for supplying signal representative thereof to said memory means; and

alarm means for periodically comparing said limit values with the sensed parameters and for providing a perceivaable indication when said limit values are exceeded.

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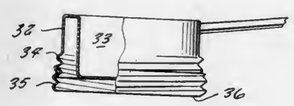
**4,296,728**

## ENERGY SAVING POTS, PANS AND ADAPTER

**Robert A. Hofstetter, 2436 Birch Log Way, Hacienda Heights, Calif. 91745**

**Filed Oct. 30, 1978, Ser. No. 899,984**
**Int. Cl.³ A47J *27/00*; B65D *8/06***
**U.S. Cl. 126—376** **1 Claim**




1. An energy saving cooking vessel, comprising a container member including a bottom wall and a first side wall extending upwardly from said bottom wall, a continuous, peripheral, transverse wall extending radially outwardly from the top periphery of said first side wall, a second wall extending downwardly from the outer periphery of said transverse wall, said second side wall surrounding and spaced from said first side wall from said outer periphery to substantially the same plane as said bottom wall, the space defined between the first and second side walls being axially opened at the bottom thereof while being otherwise enclosed, said second side wall and said transverse wall together defining heat shield means to retain rising heat from a stove burner entering said space to thereby conserve energy needed during cooking, a heat shield extension adjustably attached by securement means to said cooking vessel at the lower portion of said second side wall, said securement means including said second side wall and said heat shield extension each being screw-threaded for adjustably telescoping one within the other by relative rotary movement of the vessel and extension, said heat shield extension allowing said cooking vessel to be elevated at different heights and aiding in retaining rising heat within said space at the elevated heights.

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**4,296,729**

## SOLAR HOT WATER HEATING SYSTEM

**George H. Cooper, Bridgton, Me., assignor to Suntime, Inc., Bridgton, Me.**

**Filed Feb. 4, 1980, Ser. No. 118,486**
**Int. Cl.³ F24J *3/02*; F24D *11/00***
**U.S. Cl. 126—421** **8 Claims**

7. A solar hot water heating system comprising

a solar heat collector

a primary water heating and storage tank located at a level above said collector

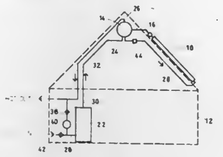
a heat exchanger within said tank

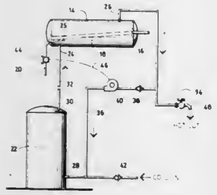
means for circulating a heat absorbing medium through said collector and heat exchanger so that it receives heat in the collector and releases its heat in the heat exchanger and returns by gravity to the collector

a secondary water preheating and storage tank located at a level below said collector and said primary tank

the inlet of said secondary tank being adapted to be connected to a source of cold water under pressure and having its outlet connected to the inlet of said primary tank

means for recirculating hot water from said primary tank to said secondary tank,





said recirculating means comprising a conduit connecting the hot water outlet of said primary tank to the inlet of said secondary tank, a circulating pump in said conduit and a check valve in said conduit to prevent reverse flow of cold water therethrough, and

control means responsive to a condition in said primary tank for activating and deactivating said pump so that only surplus hot water from said primary tank will be returned to said secondary tank.

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**4,296,730**

## CONTROL SYSTEM FOR A SOLAR STEAM GENERATOR

**Allan J. Zadiraka, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Division of Ser. No. 941,700, Sep. 12, 1978. This application May 5, 1980, Ser. No. 146,925**
**Int. Cl.³ F24J *3/00***
**U.S. Cl. 126—421** **5 Claims**

1. A control system for a solar steam generator comprising:

a series of solar-heated panels connected together to allow fluid flow therethrough;

first measuring means for measuring the temperature of the fluid at one point in said series of solar-heated panels and establishing a signal indicative thereof;

second measuring means for measuring the temperature of the fluid at another point in said series of solar-heated panels and establishing a signal indicative thereof;

attemperation means for controllably adding attemperation fluid into said series of solar-heated panels;

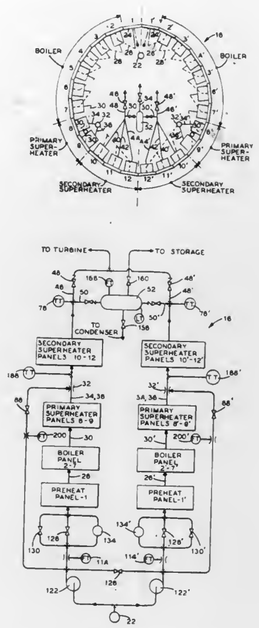
first combining means for combining the temperature measurement signals of said first and second means to establish a first control signal for controlling the amount of flow through said attemperation means;

variable fluid flow means for providing a variable flow of fluid through said solar-heated panels;

fluid flow measuring means for measuring the amount of fluid flow through said solar-heated panels and establishing a signal indicative thereof; and

second combining means for combining said first control






signal from said first combining means with the signal from said fluid flow measuring means to establish a second control signal for controlling fluid flow from said variable fluid flow means.

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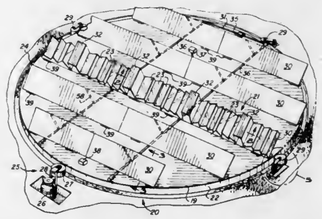
**4,296,731**

## TRACKING BOOSTER AND MULTIPLE MIRROR CONCENTRATOR FLOATING COLLECTOR

**C. Brent Cluff, 5525 N. Grande, Tucson, Ariz. 85704**

**Continuation-in-part of Ser. No. 836,356, Sep. 26, 1977, Pat. No. 4,148,301. This application Jun. 1, 1978, Ser. No. 911,434**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—424** **15 Claims**



1. A heat exchange means comprising:

a floating platform,

means for positioning said platform for arcuate movement through a given path when floating on a liquid,

a plurality of arrays of juxtapositioned parallelly arranged reflectors each mounted on the top of said platform,

at least one solar ray collector panel mounted on each array to extend longitudinally of said reflectors and disposed with its axis in the focal zone of said reflectors,

each array of said reflectors comprising at least one pair of reflector surfaces with one of each pair being angularly arranged on different sides of a given collector panel for directing the solar rays toward the collector panel, and

platform actuating means for moving said platform about an arcuate path for tracking the sun in an azimuthal mode.

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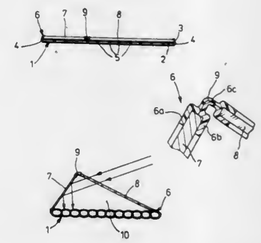
**4,296,732**

## SOLAR RADIATION COLLECTOR

**Winfried Bernhardt; Edgard Grundmann, and Rudolf Kroll, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany**

**Filed Jan. 29, 1980, Ser. No. 116,397**
**Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903775**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—426** **4 Claims**



1. In a solar radiation collector composed of a mat formed of a black foil member and a radiation pervious foil member, the two members being joined together along the outer edges of the mat and at interior locations of the mat to form an extended flow path and an inlet and outlet for a fluid heat carrier medium, the collector further including cover means connected to the mat along opposed edges thereof and arranged to be disposed in the path of solar radiation toward the mat with an air space being defined between the mat and the cover means, the improvement wherein said cover means includes flexible mounting means formed adjacent opposed edges thereof for holding at least one radiation pervious pane and at least one reflecting panel, and said flexible mounting means and said mat are dimensioned such that, when such pane and panel are held by said flexible mounting means and said mat is filled with such carrier medium, said flexible mounting means holds the pane and panel in relative positions such that the pane, the panel and said mat constitute the legs of a triangle enclosing the air space.

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**4,296,733**

## HEATING, LIGHTING AND VENTILATION SYSTEMS

**Norman B. Saunders, 15 Ellis Rd., Weston, Mass. 02193**

**Filed Aug. 5, 1976, Ser. No. 712,098**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—428** **30 Claims**

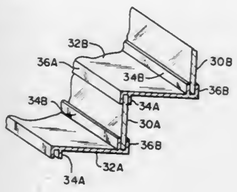
1. A device for controlling the amount of incoming solar radiation entering an enclosed structure and for reducing the amount of interior heat radiation loss from said structure, said device comprising, in combination:

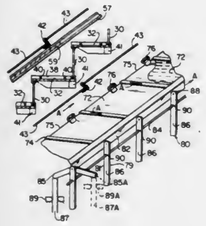
a first plurality of substantially flat members each substantially reflective to said solar radiation;

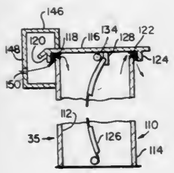
a second plurality of substantially flat members, each substantially transmissive to said solar radiation; means for securing said first and second plurality of substantially flat members to one another and to said enclosed structure so that said members of said first plurality are oriented in substantially horizontal parallel planes between adjacent members of said

second plurality and members of said second plurality are oriented in substantially vertical parallel planes between adjacent members of said first plurality so as to form a staircase-like construction, and so that said construction is inclined from the top of said construction to the bottom of said construction toward the equator and so that said incoming solar radiation, the direction of which varies according to the altitude and azimuth of the sun, is transmitted at least in part directly through said members of said second plurality when the sun is at average winter altitudes and substantially reflected from said members of said first plurality away from said enclosed structure when the sun is at average summer altitudes; and

a pair of panel assemblies mountable on said enclosed structure so as to be spaced and disposed parallel to one another on the interior and exterior sides of said first and second plurality of said members.





**22**. Apparatus for controlling the amount of solar radiation entering an enclosed structure comprising, in combination;

a plurality of window units, each of said units including means for reducing the amount of heat transfer through said unit, at least two panels transmissive to said solar radiation, and means for drawing air from the exterior of said structure along a path defined between said panels to the interior of said structure so as to reduce the loss of heat from the interior of said structure through said units; and

means disposable around the perimeter of said structure for providing air exterior of and from all sides of said structure to said path defined between said panels of each unit so as to substantially equalize the pressure of said air drawn through said units.

**24**. Apparatus for controlling the amount of direct solar heat and light entering an enclosed structure, said apparatus comprising, in combination;

tank storage means substantially transparent to said light for absorbing at least a part of said direct solar heat and for reradiating stored heat into the interior of said enclosed structure; and

a plurality of adjustable louvers disposed between said tank storage means and said interior of said enclosed structure for controlling the heat and light transfer between the sun and the interior of said enclosed structure and the heat and light transfer between said tank means and the interior of said enclosed structure.

**28**. For use in an enclosed structure, a device including a window unit comprising:

at least two spaced apart panels transmissive to solar radiation;

a retractable shade disposed between said panels for controlling the amount of said solar radiation transmitted through said panels, said shade being retractable to a retracted position wherein solar radiation is transmitted through said panels and extendable to an extended position so as to reduce the amount of solar radiation transmitted through said panels;

means for drawing air along a path from the exterior of said enclosed structure, through the space between said panels to the interior of said enclosed structure so as to reduce the loss of heat from the interior of said enclosure to the exterior of said enclosure; and

means for guiding said shade so that when said shade is extended to said extended position said shade assumes a convex, contoured shape to define said path for said air between said panels.

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**4,296,734**

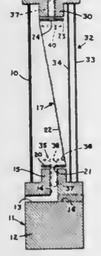
## SOLAR COLLECTOR

**Robert L. Nevins, Rte. 28A, Boiseville, N.Y. 12412**

**Filed Mar. 10, 1980, Ser. No. 129,033**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—431** **2 Claims**



**1**. A heating and cooling structure comprising a pair of spaced translucent glazes, a frame for mounting said spaced glazes, said frame having members at two opposite ends of said glazes for engaging said glazes therebetween, passageways formed in said oppositely disposed members to selectively establish fluid communication from either of the sides of said members with the volume established within said frame, a heat sink mounted within said frame between said spaced translucent glazes in order to absorb radiant solar heat applied to said structure and to transfer the heat to said fluid flowing through said volume established within said frame from either of said selected sides of said frame members, said heat sink being a mesh disposed within said frame volume, said mesh being generally coextensive with said spaced glazes, a laterally slidable vent cover received in said frame for movement therewithin, and a plurality of uniformly spaced apertures formed in said vent cover for selective alignment and misalignment with said frame passageways in order to promote and to stop fluid



flow between the side of the frame member in which said vent cover is received and the volume established within said frame.

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**4,296,735**

## DEVICES TO EXPLOIT SOLAR ENERGY

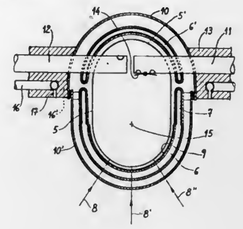
**Alfredo B. Llorach, 17-B Bellavista St,, San Antonio Abad (Ibiza), Spain**

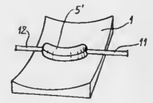
**Filed Oct. 13, 1978, Ser. No. 951,240**

**Claims priority, application Spain, Oct. 20, 1977, 463.413; Sep. 22, 1978, 473.620**

**Int. Cl.³ F24J** *3/02;* **G02B** *11/04, 5/08*

**U.S. Cl. 126—438** **6 Claims**





**1**. An improved solar collector comprising, in combination, a plurality of concave reflecting elements, each of said reflecting elements being disposed adjacent to another reflecting element to define a panel, each of said reflecting elements having an identical reflecting surface with a focal point, said focal point of each other reflecting surface not coninciding, a solar radiation absorbing element having an absorbing surface disposed on said focal polnts of each of said elements, means for directing a fluid medium through the radiation absorbing element to convey heat from said absorbing element, each of said reflecting elements having a periphery defined by a projection of a polygon so that the periphery of all the reflecting elements match the periphery of their adjacent reflecting elements, the concavity of each of said adjacent elements contacting each other along the periphery of each polygon, the total surface areas of the reflecting surface of said elements not being less than the area defined by the periphery of said panel, the concavity of each of said reflecting elements being defined by a predetermined curvature to achieve in the solar beam reflecting a focal zone above the reflection surface thereof due to the course of the sun, and said absorbing surface of said absorbing element being coincident with said focal zone.

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**4,296,736**

## FOLDED PLATE SOLAR ENERGY COLLECTOR

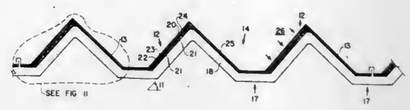
**Olaf Soot, 9 Tomahawk La., Greenwich, Conn. 06830**

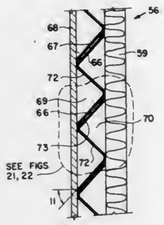
**Filed Dec. 3, 1979, Ser. No. 100,016**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—438** **15 Claims**

**5**. A wall or roof panel for use in a building in a solar collector system, comprising an elongated folded plate structural member composed of at least one collector first plate element and at least one adjoining connecting second plate element alternately arranged in a substantially zig-zag manner, structural means connecting together the adjacent edges of each collector first plate with the adjoining connecting second plate, the plane of the collector first plate extending at a predetermined tilt angle with respect to the plane of the second plate whereby the collector first plate can be located transverse to impinging solar energy when the panel is mounted in operative position, said collector first plate having an areal portion absorbent of solar energy and a wall transparent to solar energy mounted in front of the absorbent portion, means for heat insulating the absorbent portion from ambient temperature, and means providing fluid flow across the collector first plate and in heat-exchange relationship with the absorbent portion, whereby solar energy when impinging on said transparent wall will be transmitted therethrough to be absorbed by the absorbent portion which in turn transfers heat to the fluid passing across the collector first plate, said folded plate structural member and said edge connections between connecting first and second plate elements forming a stiffened integral structure which is substantially self-supporting and capable of functioning as a load-bearing solar-energy-receiving structural element when installed in said operative position as an integral wall or roof panel of a building.

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**4,296,737**

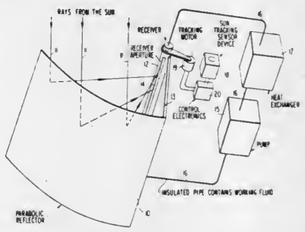
## PARABOLIC TROUGH CONCENTRATING SOLAR COLLECTOR

**John K. Silk, Wellesley, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.**

**Filed Dec. 5, 1979, Ser. No. 100,612**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—438** **11 Claims**




**1**. A concentrating solar collector for use in a solar energy system, said collector comprising a radiation reflective surface having the configuration of a paraboloid of translation, said paraboloid defining a focal line that is spaced from the parabolic cross section of said surface and extends in a direction transverse to the axis of said parabolic cross section, one of the outermost extremities of said reflective surface being defined by an elongated lip that is positioned substantially in a plane passing through said focal line and oriented perpendicular to said axis, and means for supporting an elongated solar energy

receiver along said focal line, said receiver having an elongated entrance aperture of fixed dimensions therein for admission of solar energy reflected by said surface, said entrance aperture being oriented at an angle to said axis, the plane of said entrance aperture being displaced from said axis by a fixed angle in the range of 20° to 40°.

8. A concentrating solar collector for use in a solar energy system, comprising a radiation reflective surface which includes a pair of paraboloids, the axial extent of each said paraboloid being substantially confined between a first plane lying along the axis of the parabolic cross section of said paraboloid and passing through the apex of said paraboloid and a second plane oriented perpendicular to said axis and passing through the focus of said parabolic cross section, said collector including a solar energy receiver having a pair of elongated fixed entrance apertures therein which are oppositely disposed to one another and which are associated with said pair of paraboloids respectively, each of said apertures being disposed substantially along the focal line of an associated one of said paraboloids for the admission to said receiver of solar energy reflected by said paraboloid with the plane of said entrance aperture being disposed at an angle to said axis, and said pair of paraboloids being interconnected to one another adjacent their respective apices by an intervening elongated flat region which separates said apices from one another by a distance substantially equal to the diameter of said solar energy receiver.

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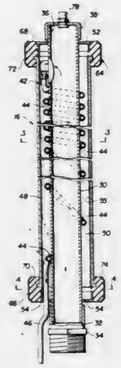
**4,296,738**

## CYLINDRICAL SOLAR ENERGY COLLECTOR

**Wallace G. Kelton, 1748 NE. 58th St., Fort Lauderdale, Fla. 33334**

**Filed Jun. 3, 1980, Ser. No. 156,147**
**Int. Cl.³ F24J *3/02*; F28F *1/00***
**U.S. Cl. 126—443** **15 Claims**



1. A solar energy collector for utilizing solar energy to heat a working fluid, said solar energy collector comprising:

a generally hollow metallic core cylinder having a working fluid inlet at one end thereof and closure means fitted across the other end thereof;

a single metallic return conduit means having an inlet end tapped into said core cylinder in a posture generally at the other end of said core cylinder and a fluid outlet end extending generally adjacent to said inlet end of said core cylinder. said return conduit means being wrapped in intimate heat exchange contact about said core cylinder;

transparent cylindrical tube means coaxially mounted about said core cylinder and having a diameter sufficiently greater than said core cylinder such that a peripheral space exists between the interior of said transparent cylinder and the exterior of said return conduit means wrapped about said core cylinder; and

annular means at each end of said transparent cylinder means and said core cylinder for maintaining the spatial coaxial relationship of said core cylinder within said transparent cylindrical tube means and for forming an annular air insulation chamber around said core cylinder and said metallic return conduit means, wherein working fluid may be pumped into said core cylinder, pass through said core cylinder and said metallic return conduit within said transparent tube means and be heated by solar energy within the air insulation envelope.

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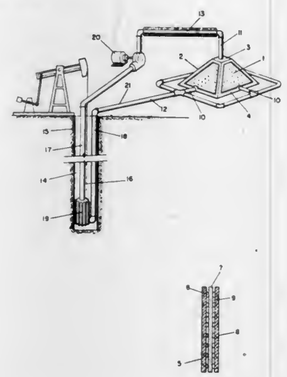
**4,296,739**

## SOLAR COLLECTOR USING COTTON SEED OIL TO TRANSFER HEAT TO HEAVY OIL WELLS

**Gaines H. Bolding, Box 389, Farmington, N. Mex. 87401**

**Filed Jun. 23, 1980, Ser. No. 162,367**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—444** **3 Claims**



1. A solar collector having a generally truncated pyramid shape comprising a top, a bottom and four side panels wherein;

each side panel is constructed of a heat conductive metal, and has a center plate, an interior plate and an exterior plate, and;

the interior plate is dimpled and the exterior plate is dimpled and the center plate is flat, and the sides of each panel are sealed and a plurality of outlet ports are sealed into the top of each panel, and a plurality of inlet ports are sealed into the bottom of each panel, and the panels are mounted in a pyramid frame, and

the top and the bottom of the collector are sealed with non conductive material, and a suitable heat transfer fluid is forced to pass between the exterior plate and center plate, and between the interior plate and center plate, and wherein the collector is connected to circulating pipes of the system using heat.

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**4,296,740**

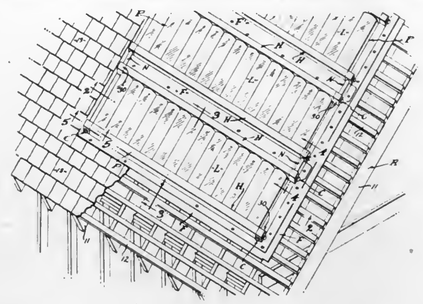
## MODULAR SOLAR INSOLATION PANELS

**Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343**

**Continuation-in-part of Ser. No. 828,773, Aug. 29, 1977, Pat. No. 4,165,036. This application Jun. 26, 1979, Ser. No. 52,434**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—448** **22 Claims**

1. A solar insolation panel for installation upon an inclined roof plane substantially normal to the plane of the sun's traverse across the sky, and including; a multiplicity of transparent light focusing tubes disposed in substantially normal relation to the traverse plane of the sun and extending between spaced headers and open therethrough for the transport of fluid media therein, the transport tubes having elongated prismatic lens walls exposed to the sun's rays and focused to condense the sun's rays into the fluid media within the tubes to absorb heat during the sun's traverse across the sky, and a





structural backing of insulation material underlying the tubes mounted thereto and secured to the roof.

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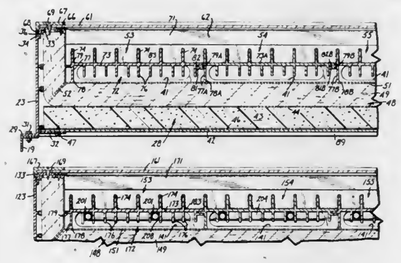
**4,296,741**

## SOLAR ENERGY COLLECTING PANEL ASSEMBLY

**Willard J. Harder, Minneapolis, Minn., assignor to Bethany Fellowship, Inc., Minneapolis, Minn.**

**Filed Feb. 26, 1979, Ser. No. 15,313**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—449** **22 Claims**



1. A solar energy collector unit comprising: an elongated generally flat plate having a first side, a second side, a first side edge, and a second side edge, a plurality of ribs secured to and projected away from the first side of the plate, said ribs extended in the longitudinal direction of the plate and disposed generally parallel to each other and having substantially the same height, a plurality of fins secured to and projected away from the second side of the plate, said fins extended in the longitudinal direction of the plate and disposed generally parallel to each other, each rib is a flat continuous rib member, said rib members being laterally spaced from each other a distance greater than the height of a rib, each fin is a flat continuous fin member, each of said rib members being in longitudinal alignment with a fin member, a longitudinal single foot secured to and projected away from the second side of the piate, said foot having a height greater than the height of the fins, first means on the first side edge of the plate adapted to be connected to a first adjacent collector unit, said first means comprising a flange extended generally parallel with said plate and spaced therefrom forming a longitudinal groove extended in a direction generally parallel to the plate, and second means on the second side edge of the collector unit adapted to be connected to a second adjacent collector unit, said second means comprising a tongue projected laterally away from the plate and extended in a direction generally parallel to the plate, said tongue adapted to fit into a longitudinal groove of the second adjacent collector unit.

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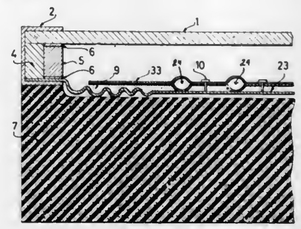
**4,296,742**

## FLAT SOLAR ENERGY COLLECTOR WITH LOW HEAT CONTACT BETWEEN ABSORBER AND EDGE OF COLLECTOR

**Eckart Hussmann, Ober-Olm, Fed. Rep. of Germany, assignor to JENAer Glaswerk Schott & Gen., Fed. Rep. of Germany**

**Filed Jun. 6, 1978, Ser. No. 913,189**
**Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725633**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—450** **9 Claims**



1. A gas-tight solar collector unit for converting solar radiation into heat, said solar collector comprising:

a solar energy and infrared absorber means;

a cover means transparent to radiant solar energy overlying and in a spaced relation to said absorber means;

edge structure means for maintaining said absorber means and cover means in spaced relation to provide an airspace located therebetween; and

said absorber means having means for connecting said absorber means to said edge structure means such that no direct thermal contact exists between the edge of said absorber means and said edge structure means and providing a gas-tight seal for said airspace.

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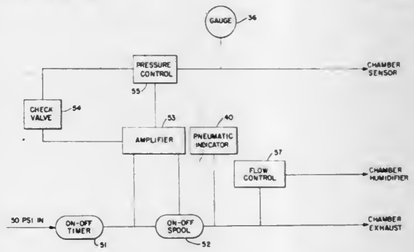
**4,296,743**

## HYPERBARIC OXYGEN CHAMBER WITH FLUIDIC CONTROL

**Robert A. Lasley, 11 Wardell Ave., Rumson, N.J. 01760**

**Filed May 24, 1979, Ser. No. 42,114**
**Int. Cl.³ A61H *31/02***
**U.S. Cl. 128—30** **2 Claims**




1. A low pressure hyperbaric device for treatment of a patient including a two part chamber with means for holding the two parts in assembled and sealed condition, the chamber having an entrance adapted to allow the introduction of a body part, means associated with the entrance to seal the body part to thereby provide an air tight chamber, a pressured source of oxygen and means for cyclically pressurizing the hyperbaric chamber with oxygen and exhausting the hyperbaric chamber said means comprising:

timing means for controlling overall treatment time connected in series with the pressurized source of oxygen,

said timing means including an on-off valve for starting and stopping flow, a spool valve fluidly connected to the timing means, said spool valve being moved to the open position upon receiving the oxygen flow from the valve in the timing means, a flow control device connected on its inlet side to the spool valve and to the hyperbaric chamber on its outlet side, said flow control device controlling flow into the hyperbaric chamber, a second flow line extending from the spool valve to an exhaust valve for the hyperbaric chamber, pressure control means having an inlet in communication with the pressure in the hyperbaric chamber and an outlet in communication with the spool valve whereby when the prescribed pressure is reached within the hyperbaric chamber the pressure control means closes the spool valve thereby releasing the exhaust valve so that the hyperbaric chamber pressure will be exhausted and whereby upon the return of the chamber to ambient pressure the spool valve is returned to open position for a new cycle.

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**4,296,744**

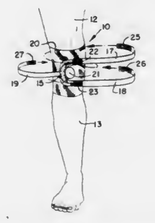
## DYNAMIC PATELLAR BRACE

**Pasquale M. Palumbo, 906 Frome La., McLean, Va. 22101**

**Continuation of Ser. No. 949,121, Oct. 6, 1978, abandoned. This application May 27, 1980, Ser. No. 153,708**

**Int. Cl.³ A61F** *3/00*

**U.S. Cl. 128—80 C** **12 Claims**



**1**. A dynamic patellar brace for preventing subluxation of a patella throughout the complete physiologic range of flexion and movement of the knee comprising:

means for bracing the patella;

means for maintaining said patellar bracing means positioned laterally of the patella throughout the complete physiologic range of flexion and movement of the knee when the brace is in use; and

means for causing said patellar bracing means positioned laterally of the patella to apply a resultant force in the medial direction to the patella throughout the complete physiologic range of flexion and movement of the knee when the brace is in use.

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**4,296,745**

## SURGICAL SEALANT COMPOSITION

**Christopher D. Raymond, High Wycombe, England, assignor to G. D. Searle & Co., Skokie, Ill.**

**Filed Nov. 13, 1979, Ser. No. 93,351**

**Claims priority, application United Kingdom, Nov. 20, 1978, 45281/78**

**Int. Cl.³ A61L** *15/00*

**U.S. Cl. 128—156** **10 Claims**

**1**. An adhesive surgical dressing which comprises a backing material provided on one side with a composition comprising per 100 parts, by weight, of a non-biodegradable, tacky, polymeric binding agent, selected from a group consisting of polyisoprene, polyurethane, silicone, and polyisobutylene, from 12 to 25 parts, by weight, of an inert reinforcing filler and a coating on at least the intended skin contacting face of the dressing of a non-biogradeable, water-activated polyacrylamide adhesive/thickner.

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**4,296,746**

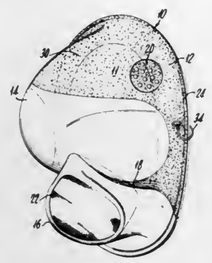
## DISPOSABLE FULL-FACE SURGICAL MASK

**Stanley I. Mason, Jr., Weston, and Michael D. Handler, Ridgefield, both of Conn., assignors to Surgikos, New Brunswick, N.J.**

**Filed Dec. 18, 1979, Ser. No. 104,948**

**Int. Cl.³ A62B** *7/10*

**U.S. Cl. 128—201.15** **11 Claims**



**9**. A comfortable, lightweight, disposable full face mask adapted to be worn without claustrophobic effect, said face mask comprising:

a shell having an upper portion and a lower portion and formed of transparent plastic material having a generally oval periphery having a rim extending outwardly of the periphery at a substantial angle to the periphery;

the upper portion of the mask having vent means to dissipate heat and moisture, said vent means including a filtration means to prevent escape of particulate matter through said vent means,

the lower portion of the mask covering the mouth of the wearer and having a region comprising an air filtration medium which is an effective bacterial filtration medium,

a strip of soft, flexible material fixed to said rim along the periphery and extending inwardly of said rim; and

means for securing said face mask on the head of the wearer such that, when said mask is worn, said strip is hingedly flexed and lightly compressed against the head of a wearer with said shell covering the face of a wearer but positioned from a wearer's face.

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**4,296,747**

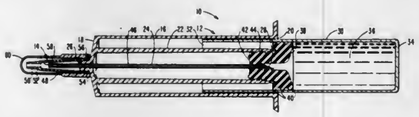
## CATH-A-JET

**Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, El Monte, Calif.**

**Filed Feb. 11, 1980, Ser. No. 120,532**

**Int. Cl.³ A61M** *5/00*

**U.S. Cl. 128—220** **5 Claims**



**1**. A device for introducing fluid into catheters of the type which are partially receivable in the human urethra to drain urine from the bladder and have a free end fitment and/or a pierceable injection site, comprising:

syringe means actuable to expel fluid from an outlet at one end thereof;

connector means extending from said one end of the syringe means and defining an axial fluid passage communicating with said outlet;

a first axially tapered surface portion of the connector means receivable in sealing relationship within the free end fitments of urethral catheters;

a second axially tapered surface portion of the connector means engageable in sealing relationship with a luer needle fitment;

said second tapered surface portion being smaller in diameter than and positioned outwardly of said first tapered surface portion; and

a transition surface portion between the first and second tapered surface portions, said transition surface portion comprising a step in the diameter of the connector means.

whereby fluid can be introduced into urethral catheters either through a free end fitment or an injection site for passage toward the human urethra.



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**4,296,748**

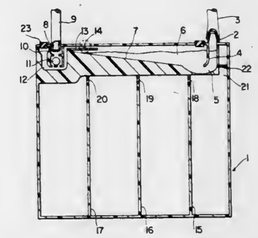
## UNDERWATER DRAINAGE APPARATUS WITH SEPARABLE SUCTION CONTROL CHAMBER

**Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.**

**Filed Jun. 27, 1979, Ser. No. 52,825**

**Int. Cl.³ A61M** *1/00*

**U.S. Cl. 128—276** **5 Claims**



**1**. An underwater drainage apparatus comprising an integral container having an inlet adapted to be connected to the pleural cavity of a patient, an underwater seal chamber disposed beneath said inlet, a tube extending from said inlet into the lower end of said underwater seal chamber, a collection chamber for receiving fluid overflowing from said underwater seal chamber, an outlet in the upper end of said container, an outlet chamber surrounding said outlet within the container, a passageway interconnecting said outlet chamber with said underwater seal chamber, diaphragm means disposed within said outlet chamber, a separable suction control chamber attachable to said integral container, said suction control chamber including a U tube manometer having a small arm open to atmosphere and a large arm, a passageway extending downwardly from the upper end of the large arm of the U tube manometer and needle means having a bore therethrough disposed at the lower end of said passageway.

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**4,296,749**

## COLOSTOMY APPLIANCE

**Edward J. Pontifex, Virginia Beach, Va., assignor to Louis B. Fine, Norfolk, Va., a part interest**

**Filed Jul. 18, 1980, Ser. No. 170,057**

**Int. Cl.³ A61F** *5/44*

**U.S. Cl. 128—283** **17 Claims**

**1**. A colostomy appliance comprising, in combination,

a first pouch formed from first and second imperforate wall members of flexible plastic material connected together to form a flexible generally flat elongated container having a closed top and an open bottom,

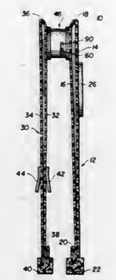
an inlet opening formed in the first sheet of the first pouch in downwardly spaced relation to the closed top,

attaching means surrounding the inlet opening for attaching the first pouch to the body of the person using the appliance,

a gas outlet opening formed in the second sheet of the first pouch adjacent the closed top thereof,

means for closing the open bottom end of the first pouch,

a second pouch formed from flexible synthetic resin sheet material and having a gas inlet opening therein, and



coupling means for releasably connecting the gas inlet opening of the second pouch to the gas outlet opening of the first pouch and providing a sealed gas flow path therebetween,

the coupling means including valve means for closing the gas outlet opening and the gas inlet opening when the gas inlet opening of the second pouch is not connected to the gas outlet opening of the first pouch.

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**4,296,750**

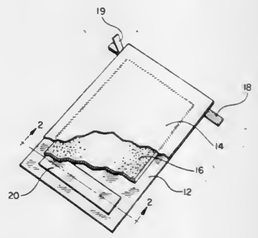
## REFASTENABLE PRESSURE-SENSITIVE TAPE CLOSURE SYSTEM FOR DISPOSABLE DIAPERS AND METHOD FOR ITS MANUFACTURE

**Lin-Sun Woon, Appleton, and John C. Wilson, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Jun. 22, 1979, Ser. No. 51,048**

**Int. Cl.³ A41B** *13/02*

**U.S. Cl. 128—287** **9 Claims**



**1**. A pressure-sensitive tape closure system for disposable diapers, said diaper having in combination:

a fluid permeable facing sheet;

a backing sheet of a thin polyolefin film attached to the facing sheet along the periphery of the latter;

an absorbent pad disposed between said facing sheet and said backing sheet;

a pair of pressure-sensitive tape tab strips having a higher peel adhesion value than the tensile strength and tear resistance of said backing sheet attached to the backing sheet near the diaper corners along a portion of the length of said strips, said unattached portions being designed to

engage the exterior of said backing sheet in a predetermined attachment zone; and

a hot melt adhesive layer having a lower modulus of elasticity and a Ring & Ball softening point lower than the modulus of elasticity and the heat distortion temperature of said backing sheet, respectively, the adhesive layer selectively located in the interior of said backing sheet underneath said attachment zone thereby increasing the stiffness of the film in said zone, said adhesive layer attached only to said backing in said zone.

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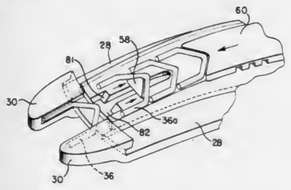
**4,296,751**

## SURGICAL DEVICE

**Joseph W. Blake, III, R.R. #2, Box 106, Kitchewan Rd., South Salem, N.Y. 10590, and Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566**

**Filed Aug. 2, 1979, Ser. No. 63,268**
**Int. Cl.³ A61B *17/12***
**U.S. Cl. 128—325** **19 Claims**




1. A surgical device, particularly a hemostat, comprising

an applicator having a pair of cooperating jaws provided with anvils and being movable between an open and a closed position; and

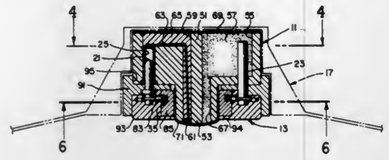
supply means for feeding surgical clips to said jaws, said supply means comprising a cartridge including a housing adapted to accommodate a string of clips, means for advancing the string towards the jaws for seriatim insertion of the respectively leading clip of the string between said anvils while the jaws are in said open position so as to become cinched between said anvils when the jaws move to said closed position, and means for retracting all except the respectively leading clip in direction away from said anvils prior to movement of said anvils from said open end towards said closed position, said housing comprising a body having a leading end section and a trailing end section and two substantially parallel tracks both extending between said end sections, said advancing means comprising biasing means for biasing a string of clips in one of said tracks lengthwise of the same towards said leading end section, and said retracting means including a retracting member in the other of said tracks and having a leading portion extending into and moveable in said one track between one position in which said leading portion is disengaged from said clips and permits the respectively leading clip to issue from said leading end section and another position in which said leading portion engages the clip immediately upstream of the leading clip and retracts it, and thereby said string of clips, in direction towards said trailing end section.

**4,296,752**

## TRANSCUTANEOUS OXYGEN SENSOR WITH ADJACENT HEATER

**Luther Welsh, San Clemente; Daryl J. Bergquist, Huntington Beach, and Hideo Watanabe, Fullerton, all of Calif., assignors to Johnson & Johnson, New Brunswick, N.J.**

**Division of Ser. No. 726,710, Sep. 24, 1976. This application May 11, 1979, Ser. No. 37,650**
**Int. Cl.³ A61B *5/00***
**U.S. Cl. 128—635** **10 Claims**




1. A sensor for transcutaneous measurement of partial pressure of gas, comprising:

a heater assembly;

a transcutaneous gas sensing cell which includes (a) a cathode, (b) a reservoir, (c) a membrane, and (d) electrolyte in the reservoir and forming an electrolyte path between the cathode and the reservoir;

said membrane including (i) a first portion having a front side disposed for direct contact with the patient's skin, and a back side adjacent the cathode but being separated from the cathode by a layer of said electrolyte defining said electrolyte path, and (ii) a second portion surrounding the gas sensing cell and disposed to be out of contact with the skin of the patient when the sensor is in use;

said heater assembly comprising (i) an annular heat conductive element surrounding said gas sensing cell but so spaced therefrom that heat is substantially not coupled from said element directly to said gas sensing cell, and (ii) means for heating said element;

said heater assembly being so constructed, disposed and spaced relatively to said gas sensing cell as to be attachable to the skin of the patient for transfer of heat from said element to the skin, without such heat passing to the skin through the membrane and without substantial transfer of heat from said element to said gas sensing cell.

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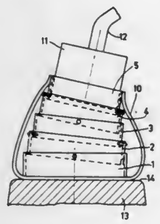
**4,296,753**

## SUPPORT FOR A TRANSDUCER FOR EMITTING AND/OR RECEIVING ULTRASONIC SIGNALS IN A GIVEN ANGULAR SECTOR

**Robert Goudin, La Varenne-St-Hilaire, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 17, 1979, Ser. No. 76,025**
**Claims priority, application France, Sep. 19, 1978, 78 26771**
**Int. Cl.³ A61B *10/00***
**U.S. Cl. 128—660** **5 Claims**




1. A support for a transducer for emitting and/or receiving ultrasound signals in a given angular sector with respect to a plane at the surface of an object, comprising:

a series of rotationally symmetrical, coaxial rings which includes a first ring, one or more intermediate rings, and a last ring, disposed one behind another along a line which connects the transducer with the surface of the object, the first ring being adapted for placement adjacent the surface of the object and the last ring being adapted for attachment to the transducer, the first and each succeeding intermediate ring in the series being pivotably connected to the following ring in the series so that the transducer can achieve a total angular rotation with respect to the first ring which at least equals the given angular sector and so that the distance between the transducer and the plane remains substantially constant as the transducer is rotated through that sector;

a deformable, liquid-tight bag enclosing the rings; and

coupling liquid means which fill the bag and surrounds the rings for coupling ultrasound signals from the transducer to the object.



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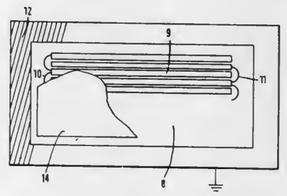
**4,296,754**

## METHOD FOR DETERMINING THE VALUE OF CARDIOLOGIC QUANTITIES AND APPARATUS FOR PERFORMING SAID METHOD

**Ewald M. C. Hennig, Ostendstrasse 62, D-6000 Frankfurt 1, and Klaus Nicol, Adelheidstrasse 13, D-6000 Frankfurt 50, both of Fed. Rep. of Germany**

**Filed Jul. 3, 1979, Ser. No. 54,438**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829269**
**Int. Cl.³ A61N *5/02***
**U.S. Cl. 128—694** **9 Claims**




1. A method for determining the value of cardiologic quantities comprising:

encircling a portion of a body having a blood-conveying vessel with capacitor plates of a capacitor, so that the body portion engages the capacitor and defines the dielectric of the capacitor;

maintaining the capacitor plates fixed relative to one another; and

measuring changes in the capacitance of the capacitor.

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**4,296,755**

## METHOD AND APPARATUS FOR DETERMINING VENTRICULAR FIBRILLATION

**Neil H. K. Judell, N. Kingstown, R.I., assignor to Datamedix Inc., Boca Raton, Fla.**

**Filed Mar. 19, 1980, Ser. No. 131,587**
**Int. Cl.³ A61B *5/04***
**U.S. Cl. 128—705** **30 Claims**

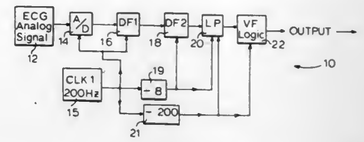
1. A method for declaring the presence of ventricular fibrillation from an incoming electrocardiograph signal comprising:

sampling said signal at a first frequency;

filtering said sampled signal to produce an output signal at a second frequency lower than said first frequency and to remove any DC components and baseline wander;

examining the spectrum of said filtered signal by passing the same to a linear predictor which fits a model signal spectrum to the actual signal spectrum and computes coefficients representative of bandwith and mean frequency of said signal over a short time interval; and

comparing said coefficient of bandwith with a preselected threshold value to determine whether it exceeds same, and




comparing said coefficient of mean frequency with a range of values to determine whether it falls within said range, and if both said determinations are positive, declaring ventricular fibrillation to be present.

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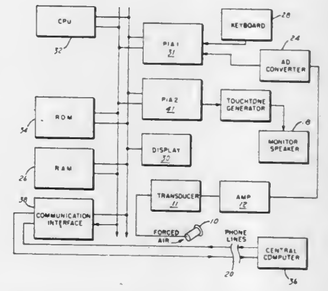
**4,296,756**

## REMOTE PULMONARY FUNCTION TESTER

**Ted E. Dunning, Denver, and Paul L. Enright, Englewood, both of Colo., assignors to Cyber Diagnostics, Inc., Denver, Colo.**

**Filed Jul. 26, 1979, Ser. No. 61,051**
**Int. Cl.³ A61B *5/08***
**U.S. Cl. 128—716** **8 Claims**




1. A pulmonary function tester capable of accurately producing, storing, transmitting, receiving and displaying selected information relating to the breathing maneuver of a test subject comprising:

a remote unit,

entry means associated with said remote unit for entering test subject data;

means communicating with said remote unit for accepting the breathing maneuver of a test subject,

means communicating with said accepting means for producing electrical signals proportional to the flow rates of the breathing maneuver of the test subject;

digitizing means communicating with said signal production means for converting the signals produced by the flow rates from the breathing maneuver into digital form representative of expiration flow rate and expiration time;

read/write memory means communicating with said entry means and said digitizing means for retrievably storing the test subject data entered through said entry means, and digitized test subject data from said digitizing means,

communication interface means communicating with said digitizing means and said read/write memory means for communication of signals including digitized test subject data, to and from at least one locus external to said remote unit,

display means communicating with said digitizing means, said rear/write memory means, said entry means and said communication interface means, for the display of test

subject data, entry data and communications fed back to said communication interface means; and

computer processing means for controlling the functioning of said remote unit including the representations displayed by said display means and responsive to preselected criteria obtained from said read/write memory, means said communication interface means and input from said entry means, and the sequence of function and manner of function of said communication interface means and said read/write memory means, so as to provide data on a test subject breathing maneuver which compares test subject flow rates with total expired volume for the subsequent diagnostic interpretation of pulmonary function.

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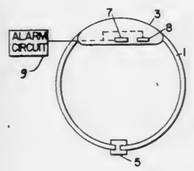
**4,296,757**

## RESPIRATORY MONITOR AND EXCESSIVE INTRATHORACIC OR ABDOMINAL PRESSURE INDICATOR

**Thomas Taylor, 421 Randolph St., N.W., Washington, D.C. 20011**

**Filed Apr. 14, 1980, Ser. No. 139,686**
**Int. Cl.³ A61B** *5/08, 5/10*
**U.S. Cl. 128—721** **12 Claims**




1. A respiratory monitor for monitoring the respiration of a person said respiratory monitor comprising:

(a) detector means for detecting the expansion of the chest of the person;

(b) alarm circuit means coupled to said detector means for producing an alarm signal if said detector means does not detect expansion of the chest for a predetermined period of time; and

(c) strap means for mounting said detector means on the persons chest said strap means including compression means for compressing when the persons weight is placed thereon wherein said detector means are mounted on said strap means such that when the person lies on his chest the persons weight is absorbed by said compression means whereby said detector means is not affected by the position of the person.

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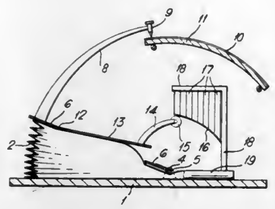
**4,296,758**

## SPIROMETERS

**Dietmar R. Garbe, Maids Moreton House, Maids Moreton, Buckingham, England**

**Filed Oct. 16, 1979, Ser. No. 85,273**
**Claims priority, application United Kingdom, Oct. 16, 1978, 40690/78; Jan. 25, 1979, 02625/79**
**Int. Cl.³ A61B** *5/08*
**U.S. Cl. 128—728** **13 Claims**

1. A spirometer having an inflatable bellows, inlet means for inflating said bellows, a movable member connected to said bellows having a locus along which said member is drivable progressively by said bellows during progressive inflation thereof, track means positioned, and having a course configured, to be engaged by and followed by said movable member during the progressive driving thereof along said locus and adjusting means for adjusting said configuration of said track means to provide locally adjustable opposition to movement of




the movable member and, thereby, to the inflation of said bellows.

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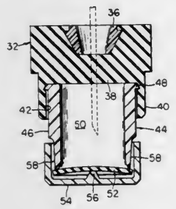
**4,296,759**

## BLOOD COLLECTION DEVICE AND METHOD WITH ANTI-BACKFLOW MEANS

**Joel A. Joslin, Sunset Hills, and Alan B. Ranford, Des Peres, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.**

**Filed Jun. 27, 1977, Ser. No. 810,257**
**Int. Cl.³ A61M** *5/00*
**U.S. Cl. 128—766** **14 Claims**




1. A blood collection device comprising a container having one end closed and a blood collection chamber for receiving a blood sample, a needlepierceable stopper closing the opposite end of said container, said collection chamber normally having a negative pressure maintained therein by said stopper, and a one-way valve disposed in said container between said stopper and said collection chamber and operable to allow blood flow from a needle piercing said stopper to said collection chamber but preventing blood flow from said collection chamber to the needle.

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**4,296,760**

## ELECTRICAL STIMULATOR

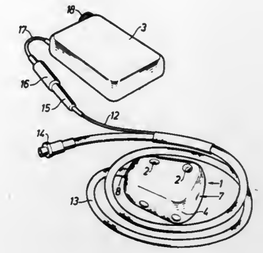
**Per-Olov A. V. Carlsson, Sosdala, and Bo H. Hakansson, Lund, both of Sweden, assignors to Gambro AB, Sweden**

**Filed Nov. 26, 1979, Ser. No. 97,380**
**Claims priority, application Sweden, Nov. 27, 1978, 7812159**
**Int. Cl.³ A61N** *1/04*
**U.S. Cl. 128—788** **13 Claims**

1. An electrical stimulator comprising an elongated element adapted for vaginal placement, said elongated element including a longitudinal axis, said longitudinal axis including a first end corresponding with a first end of said electrical stimulator and a second end corresponding with a second end of said electrical stimulator, said elongated element including a transverse cross-section throughout the length of said elongated element from said first end of said longitudinal axis to said second end of said longitudinal axis, said transverse cross-section having first and second perpendicular axes, said first perpendicular axis being greater than said second perpendicular



axis, and a plurality of electrodes carried by said elongated element, said electrodes being located on the surface of said elongated element on one side of a longitudinal cross-section of said elongated element corresponding with said first perpen-




dicular axis, so that when said stimulator is vaginally placed in a direction corresponding with said longitudinal axis said elongated element is stabilized against rotation with all of said electrodes facing in a predetermined direction.

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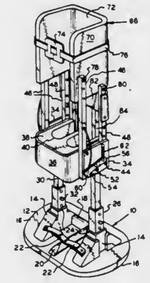
**4,296,761**

## CONVERTIBLE PARAPODIUM

**James H. Tyo, Jackson, Mich., assignor to Camp International, Inc., Jackson, Mich.**

**Filed Apr. 25, 1980, Ser. No. 143,608**
**Int. Cl.³ A61F** *3/00*
**U.S. Cl. 128—80 G** **7 Claims**




1. A parapodium for permitting crutchless standing and convertible to a seat without structural modification comprising, in combination, a base having a standing surface defined thereon and including lateral sides, a column mounted adjacent each base lateral side extending upwardly from said base each having an upper end, a pivot plate mounted upon each column upper end, a pair of parallelogram linkages each having a first end pivotally mounted upon a pivot plate and a second end each pivotally affixed to a back supporting member, horizontal leg bracing means extending between said pivot plates, a seat affixed to said linkages adjacent said back supporting member, elongated leg means supported by said back supporting member, and linkage locking means defined upon said pivot plates selectively engaging and releasing said linkages permitting said linkages to be pivoted from a vertical standing position wherein said seat is substantially vertically oriented and said leg means are in a raised position above said base to a substantially horizontal sitting position wherein said seat is substantially horizontally oriented and said leg means are in a lowered ground supported position off-set with respect to said base.

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**4,296,762**

## SMOKABLE PRODUCTS

**Theobald Eicher, Dormagen, and Friedemann Müller, Neuss, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jun. 14, 1978, Ser. No. 915,490**
**Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729759**
**Int. Cl.³ A24B** *15/30, 15/42;* **A24D** *1/18*
**U.S. Cl. 131—359** **12 Claims**

1. A process for the preparation of a smokable product based on cellulose and combustion-modifying substances which comprises saturating, spraying or coating a combustible, prefabricated material which is based on cellulose and optionally contains fillers customerily used in smokable products and which can be used as a smokable product with an electrostatically stabilized dispersion of solids as the internal phase in an external aqueous phase, the solids being electrically charged and having an average particle diameter of less than 2μ, the aqueous phase being a solution of salts of monobasic or polybasic carboxylic acids, whereby the solids are preferentially distributed on the surfaces of the smokable product.

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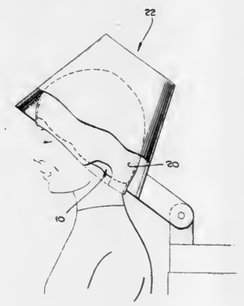
**4,296,763**

## HAIR CONDITIONER

**Clayton W. Priest, 1413 E. 19th St., Santa Ana, Calif. 92701, and Edward T. Solomon, Huntington Beach, Calif., assignors to Clayton W. Priest, Redlands, Calif.**

**Filed Mar. 7, 1979, Ser. No. 18,424**
**Int. Cl.³ A45D** *1/00*
**U.S. Cl. 132—7** **4 Claims**




1. Process of applying hot oil to human hair including:

selecting a pervious, flexible, open celled, inert synthetic foam substrate which is generally uniformly preimpregnated with a hair revitalizing oil composition and adapted to conform generally to the scalp portion of a human head, said composition being generally a solid having a melting point from about 115 to 130 degrees Fahrenheit and being substantially all retained in said preimpregnated substrate at room temperature;

placing said preimpregnated substrate in direct contact with the scalp portion of a human head;

placing an oil impervious film over substantially the entire exterior of said substrate; and

applying heat at said substrate for a period of at least approximately 15 minutes to melt said composition and to release said composition from said substrate and to allow said composition to permeate said hair.

**4,296,764**

## HAIR WAVING AND STRAIGHTENING METHOD

**Thomas J. Pallone, Monroe; Mark Lynch, Southbury; Janice E. Corvino, Stratford, and John P. McCook, Madison, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.**

**Filed Dec. 26, 1979, Ser. No. 107,746**
**Int. Cl.³ A45D** *7/00*
**U.S. Cl. 132—7** **11 Claims**

1. In a process for the cold waving or straightening of hair, the improvement which serves to provide longer-lasting results with less tendency to undergo hair lightening and increased tightness and springiness when used as a waving solution, comprising contacting the hair with an alkaline cold waving or straightening solution containing acidic metal sulfite and/or acidic metal bisulfite, capable of generating sulfur dioxide, followed by treating with an aqueous neutralizer solution having a pH between 2.0 and 5.0 and containing hydrogen peroxide in a concentration between 0.65 and 3.4 percent by weight giving a ratio of weight percent hydrogen peroxide in the neutralizer to weight percent sulfur dioxide from the waving/straightening solution of between 0.26 and 0.34.

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**4,296,765**

## METHOD AND APPARATUS FOR SECURING A HAIRPIECE

**Stephen R. Bachtell, 1727 Crystal La., Mt. Prospect, Ill. 60056**

**Filed Dec. 18, 1978, Ser. No. 970,104**
**Int. Cl.³ A41G** *3/00*
**U.S. Cl. 132—53** **2 Claims**

1. A method of attaching a hairpiece to the head of a recipient having at least some natural hair with the use of apparatus that includes two lines each having one end for attachment to the hair and the other end for attaching selected line tension weights, the hairpiece having a plurality of loops to which natural hair can be secured, comprising the steps of:
(a) positioning the hairpiece on the head of the recipient so that a series of the loops are disposed adjacent the recipient's natural hair;
(b) pulling a first group of the natural hair through an adjacent loop at a first attachment site;
(c) securing a first line to the end of said first group of hair;
(d) orienting said line and the first group of hair secured thereto to a predetermined angle with respect to the head of the recipient;
(e) applying a weight of preselected size to the other end of said line so as to impart a controlled amount of tension to said line and the group hair secured thereto such that said first group of hair is held without manual assistance in predetermined outwardly extending orientation with respect to said head;
(f) pulling a second group of natural hair adjacent said first attachment site outwardly from the recipient's head;
(g) securing a second line to the ends of said second group of hair;
(h) orienting said second line and said second group of hair attached thereto to a predetermined angle to the head while said first group of hair is held by said first line such that the first and second groups cross against each other over the loop;
(i) applying a weight of preselected size to the other end of said second line so as to impart a controlled amount of tension to said second line and said second group of hair secured thereto so that said first and second crossing groups of hair dispose the loop against the recipients head without manual assistance;
(j) securing together said two groups of hair while they are held in crossing relation extending outwardly from the recipient's head by said first and second lines so as to secure said loop in position on the head; and
(k) detaching said first and second lines from said groups of hair.

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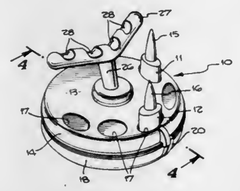
**4,296,766**

## MANICURING CASE AND SUPPORTING APPARATUS

**Isak Benis, 525 N. Kings Rd., Los Angeles, Calif. 90048**

**Filed Jul. 14, 1980, Ser. No. 167,817**
**Int. Cl.³ A45D** *29/00*
**U.S. Cl. 132—73** **5 Claims**



1. A manicuring case and supporting apparatus for use with liquid storing bottles having a tapered cross-section, said manicuring case and supporting apparatus comprising:
(a) a container having top and bottom members which define an interior cavity therebetween, said top and bottom members being pivotally coupled to one another to provide access to said interior cavity, said top member having a plurality of apertures disposed therethrough which are adapted to receive the liquid storing bottles;
(b) a resilient layer disposed upon and secured to the bottom member within the interior cavity whereby the liquid storing bottles are held in place intermediate said top and bottom members when the top and bottom members are pivoted adjacent one another; and
(c) support means for supporting the user's hand depending upwardly from the top member of said container, said support means including a base having a plurality of substantially uniform depressions disposed upon the top surface thereof.

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**4,296,767**

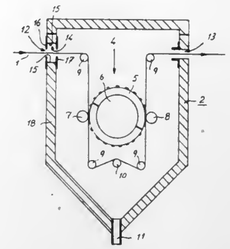
## METHOD AND APPARATUS FOR CLEANING A CONTINUOUS WEB OF MATERIAL

**Jan E. Hammar, Enebyberg, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden**

**Filed Mar. 12, 1980, Ser. No. 129,673**
**Claims priority, application Sweden, Mar. 16, 1979, 7902382**
**Int. Cl.³ B08B** *5/04*
**U.S. Cl. 134—15** **16 Claims**

4. A method for cleaning a web of material (1) to remove dust and other loose particles from the material (1) and comprising the steps of moving the web of material (1) through a suction chamber (2) having a web inlet (12) and a web outlet (13) having substantially the same cross sectional area, and at least one air outlet (11), connecting the one air outlet (11) to a source of sub-pressure, and restricting the amount of air entering the suction chamber (2) through the web inlet (12) to cause a greater amount of air to flow into the suction chamber (2) through the web outlet (13) than flows into the suction chamber (2) through the web inlet (12).





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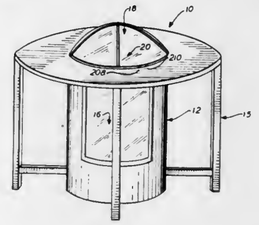
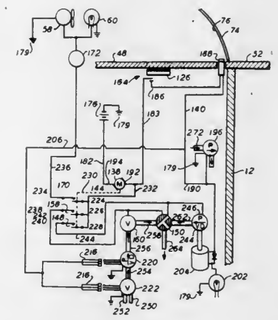
**4,296,768**

## PORTABLE DISHWASHER

**Rudy E. Saucedo, 1508 Bahama Way, San Jose, Calif. 95122**

**Filed Oct. 1, 1979, Ser. No. 80,416**
**Int. Cl.³ B08B** *3/02*.
**U.S. Cl. 134—47** **18 Claims**





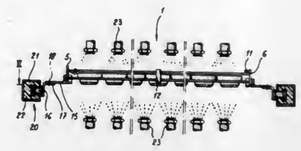
1. A dishwasher of the type intended to receive therein and wash dishes and including a source of electrical power, said dishwasher comprising:
(a) a housing; said housing comprises a plurality of dish-receiving compartments;
(b) means within said housing for washing dishes so as to act upon dishes within said compartments;
(c) means for selectively coupling said washing means to at least a predetermined one of said compartments; and
(d) means for operating said dishwasher upon condition that said coupling means having first coupled said washing means to said compartment.

**4,296,769**

## CLOSURE TREATMENT MACHINE

**Arie van der Lugt, Krimpen an der Isssel, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands**

**Filed Mar. 20, 1980, Ser. No. 131,911**
**Claims priority, application Netherlands, Mar. 21, 1979, 7902218**
**Int. Cl.³ B08B** *3/02*
**U.S. Cl. 134—68** **13 Claims**



1. Machine for the treatment of head-shaped closures especially rubber closures fit for vials for containment of infusion or injection liquids provided with at least a means holding said closures during the cleansing stage and with nozzles in such positions that the cleansing liquid may be sprayed under several angles towards the closures characterized in that the means holdig the closures comprises one or more caskets having a number of parallel bars which are connected at both ends to each other by coupling plates whereby the parallel bars are arranged in such a way that the closures may find a place there between in the form of a row of a previously defined number and thereby held in such a way that the closures cannot be moved out of the space between the bars but do have such a tolerance that the cleansing liquid can reach any side of the closures whereby at least one of the coupling plates has an opening for passing the closures and the other coupling plate may form an eventual temporary barrier for the closures whereas a carrying means may lead the caskets filled with closures along nozzles spraying cleansing liquid.

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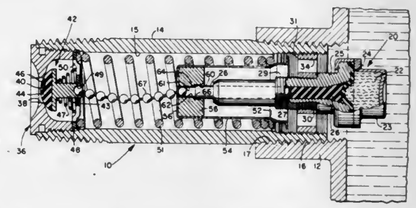
**4,296,770**

## FREEZE DRAIN VALVE

**Robert A. Rice, Chicago, Ill., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jan. 28, 1980, Ser. No. 116,368**
**Int. Cl.³ F16K** *17/00*; **G05D** *23/02*
**U.S. Cl. 137—62** **12 Claims**



1. A temperature responsive valve for connection to a fluid conduit, said valve comprising:
(a) housing means defining a fluid chamber having an inlet and an outlet in communication therewith, said inlet being adapted for connection to a fluid conduit;
(b) valve means disposed without said chamber adjacent said outlet and including means movable between a first position effecting blockage of fluid flow from said inlet to said outlet and a second position enabling such fluid flow;
(c) means biasing said movable means to said first position;
(d) temperature sensitive means associated with said housing means and disposed adjacent said inlet, said temperature sensitive means operative to sense the temperature of fluid at said inlet and including actuator means movable with

respect to said housing means in response to said sensed fluid temperature; and,

(e) tension means operatively connecting said actuator means to said movable means wherein said tension means normally exerts no force on said movable means, but upon said temperature sensitive means experiencing fluid temperatures less than a predetermined value, said tension means enables said actuator means to move said movable means to said second position and at all fluid temperatures above said predetermined value said tension means is inoperative to transmit force from said actuator means to said movable means.

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**4,296,771**

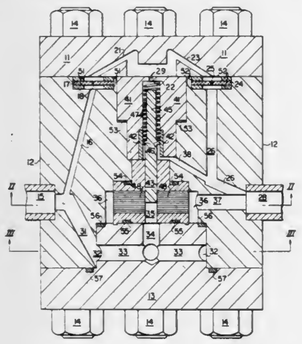
## QUIET IMPULSE STEAM TRAP

**Richard D. Claffy, Glen Burnie, Md., and Reginald B. Lovelace, West Palm Beach, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Continuation-in-part of Ser. No. 969,741, Dec. 14, 1978, abandoned. This application Aug. 27, 1980, Ser. No. 181,931**

**Int. Cl.[3] G05D** *11/00*

**U.S. Cl. 137—110** **9 Claims**



1. A steam trap comprising:

a first orifice and a second orifice connected in series, the first orifice connected to the input of the trap and the second orifice connected to the output of the trap wherein the flow of fluid through the two orifices is continuous and, the size of the orifices proportioned to minimize the leakage of steam therethrough;

an annular fluid throttling element positioned between the input and the output of the trap, the throttling element having a plurality of resistive fluid flow passages;

inlet and outlet passageways respectively connecting the fluid throttling element to the input and the output of the trap;

a cylinder formed in the steam trap and located adjacent to the throttling element;

a control piston positioned in the cylinder, the cylinder is pressurized at one end portion by the fluid flowing between the first orifice and the second orifice wherein the fluid pressure between the orifices is applied to one end portion of the control piston, and the other end portion of the cylinder is connected to the trap output wherein the output fluid pressure is applied to the other end portion of the control piston; and

an elongated valve plug positioned within the throttling element for movement between an open and a closed position wherein one end portion of the valve plug is connected to the control piston, and the other end portion of the valve plug communicates with the inlet passageway for applying the inlet fluid pressure to said other end portion of the valve plug to urge the valve plug toward an open position wherein the fluid flow through the resistive fluid flow passages is increased.

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**4,296,772**

## NON-RETURN VALVE

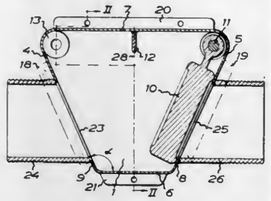
**Robert Nilsson, Bromölla, Sweden, assignor to Evak Sanitar AB, Bromöolla, Sweden**

**Filed Jan. 23, 1980, Ser. No. 114,773**

**Claims priority, application Sweden, Feb. 2, 1979, 7900925**

**Int. Cl.[3] F16K** *17/12*

**U.S. Cl. 137—269.5** **5 Claims**



1. A reversible flap-type non-return valve comprising

a valve housing with two through-flow openings substantially facing each other, said valve housing minimizing its interior volume and having in a first plane the basic cross-sectional form of a trapezoid, the parallel sides of said trapezoid being lower and upper transverse sides of said housing and the non-parallel sides of said trapezoid being transverse sides of the housing including said openings;

a removable inspection cover forming one side of said housing being substantially plane and disposed substantially parallel to said first plane;

bearing means attached to the valve housing defining two turning axes perpendicular to said first plane and including two pairs of bearing bushings, each pair having a fixed position one for each of said turning axes and one bearing bushing of each pair being at least in part in said removable inspection cover; and

a movable valve flap disposed at one of the turning axes of the bearing means and suitable as a closing member at both of the two through-flow openings.

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**4,296,773**

## HYDRAULIC SELECTOR VALVE HAVING JOY STICK CONTROL

**Ronald W. Harshman, Greencastle, and Lynn A. Dietrich, Chambersburg, both of Pa., assignors to Walter Kidde & Company, Inc., Clifton, N.J.**

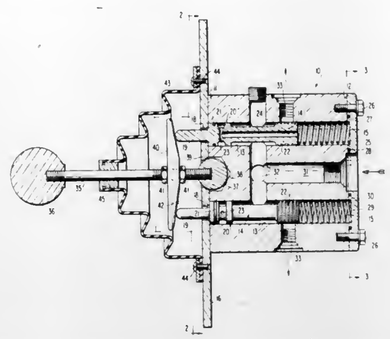
**Filed Feb. 12, 1979, Ser. No. 11,762**

**Int. Cl.[3] F16K** *29/00*

**U.S. Cl. 137—312** **3 Claims**

1. A selector valve comprising a valve body having plural spaced parallel bores, motive fluid inlet passage means leading to said bores and plural motive fluid delivery ports corresponding in number to said bores and leading from the bores, a valve spool positioned in each said bore of the valve body and being biased to a closing position in relation to the adjacent delivery port and having an extension projecting exteriorly of the valve body at one end thereof, a joy stick controller for said valve spools and having a universal swiveled connection with the valve body at said one end and between said bores, an end cover plate for the valve body at the end thereof remote from said joy stick controller and having an annular collector recess in its interior face in registration with said bores, said cover plate having a drain port in communication with said collector recess, and an actuating disc mounted on said joy stick controller and cammingly engaging all of said valve spool extensions and movable with the joy stick controller to selectively shift a single valve spool or a pair of such spools to an open position





in relation to a single delivery port or a pair of such ports of the valve body.

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**4,296,774**

## DEVICE FOR DETACHABLY COUPLING THE ORIFICE OF A BRANCHLINE TO A LINE CARRYING A PRESSURE MEDIUM

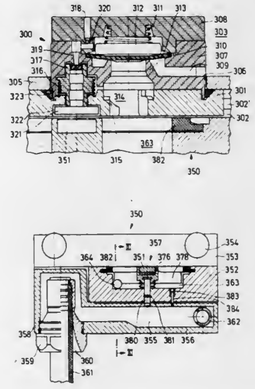
**Bruno Kägi, Meilen; Georg Hirmann, Zurich, and Rolf Luginbühl, Küsnacht, all of Switzerland, assignors to Bachofen AG., Uster, Switzerland**

**Filed Aug. 22, 1979, Ser. No. 68,614**

**Claims priority, application Switzerland, Aug. 25, 1978, 9003/78; Apr. 17, 1979, 3595/79; Jul. 20, 1979, 6788/79**

**Int. Cl.[3] F16L** *29/00, 37/28*

**U.S. Cl. 137—322** **20 Claims**



1. A device for detachably coupling an orifice of a branchline to a conduit carrying a pressure medium and having a plurality of discharge valves disposed spaced apart from each other along said conduit, each of said valves having a discharge opening, and a closing element as well as opening means for each of said openings, each of said discharge valves including an expansible chamber for receiving the pressure medium therein for maintaining said closing element in a position to close the respective openings, a coupling device having said orifice disposed therein, said coupling device being longitudinally displaceable along said conduit and connectable with the conduit by opening one of the discharge valves, said coupling device being guided along said conduit and having sealing and coupling means becoming effective automatically in the coupling position with the discharge opening being at least partially in alignment with the orifice, and actuating means effective to open the respective one of said discharge valves magnetically via pre-control means without physically contacting the same in the coupling position of the coupling device for bleeding the expansible chamber of the respective discharge valve, said actuating means including magnetic control elements on the side of the displaceable coupling device and on the side of any of the different discharge valves such that by displacing the coupling device a selected one of the discharge valves can be opened and connected with the orifice of the branchline.

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**4,296,775**

## DEVICE FOR DETACHABLY COUPLING A BRANCHLINE TO A PRESSURE LINE

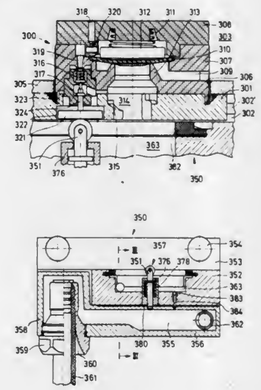
**Bruno Kägi, Meilen; Georg Hirmann, Zürich, and Rolf Luginbühl, Küsnacht, all of Switzerland, assignors to Bachofen, AG., Uster, Switzerland**

**Filed Aug. 22, 1979, Ser. No. 68,879**

**Claims priority, application Switzerland, Nov. 27, 1978, 12139/78; Apr. 17, 1979, 3595/79; Jul. 20, 1979, 6788/79**

**Int. Cl.[3] F16L** *29/00, 37/28*

**U.S. Cl. 137—322** **13 Claims**



1. A device for detachably coupling an orifice of a branchline to a conduit carrying a pressure medium and having a plurality of discharge valves disposed spaced apart from each other along said conduit, each of said valves having a discharge opening, and a closing element for each of said openings, each of said discharge valves including an expansible chamber for receiving the pressure medium therein for maintaining said closing element in a position to close the respective openings, a coupling device having said orifice disposed therein, said coupling device being longitudinally displaceable along said conduit and connectable with the conduit by opening one of the discharge valves, said coupling device being guided along said conduit and having sealing and coupling means becoming effective automatically in the coupling position with the discharge opening being at least partially in alignment with the orifice, and actuating means effective to open by contact a respective one of said discharge valves in the coupling position of the coupling device, wherein said actuating means actuates the respective discharge valve indirectly via pre-control means for bleeding the expansible chamber of the respective discharge valve.

4,296,776

## GATE VALVE FOR USE IN LARGE SIZE CONDUITS

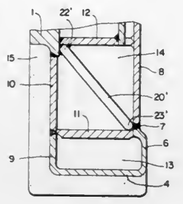
Rudolf Müller, Merzenich; Franz Lengsfeld, Julich, and Johannes Uerlichs, Woffelsbach, all of Fed. Rep. of Germany, assignors to Hermann Rappold & Co. GmbH, Duren, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,885

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909467

Int. Cl.[3] F16K *49/00*

U.S. Cl. 137—340 10 Claims



1. In a gate valve for use in large size conduits or pipe lines, particularly hot air conduits, said gate valve being of the type including a water cooled valve casing coaxially attachable to a conduit and a valve plate mounted in said valve casing for sliding movement relative thereto between open and closed positions of the conduit, the improvement wherein said valve casing comprises:

a pair of annular mounting flanges adapted to be connected to the conduit;

a pair of annular U-shaped sealing rings, each said sealing ring being positioned radially inwardly of a respective said mounting flange, said sealing rings being positioned on opposite axial sides of said valve plate;

each said sealing ring including a web portion, an inner leg extending generally radially outwardly from said web portion and forming a sealing surface for said valve plate, and an outer leg extending generally radially outwardly from said web portion;

means for connecting each said outer leg to the respective said mounting flange;

said valve casing defining therein an enclosed interior space through which cooling water is adapted to flow; and

support means, positioned within said interior space, for transmitting to at least one said mounting flange stress applied to the respective said sealing surface by said valve plate, said support means including a first end portion supported against and fixed to said one mounting flange and a second end portion freely contacting the respective said inner leg without attachment thereto, said support means having a cross-section substantially transverse to the direction of flow of cooling water within said interior space such that said support means does not appreciably interefere with or restrict such flow.

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4,296,777

## MULTIPLE COUPLING FOR LUBRICATING SYSTEMS

Karl Rodemer, Heidelberg, Fed. Rep. of Germany, assignor to Lincoln-Helios GmbH, Walldorf, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,843

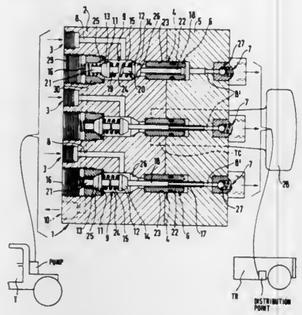
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827137

Int. Cl.[3] B60R *17/00;* F16L *29/00*

U.S. Cl. 137—351 13 Claims

13. Liquid coupling apparatus for coupling a liquid under pressure from a source to a utilization device comprising in combination,

a plug box, said plug box having means forming an inlet passageway adapted to be connected to said source of liquid, means forming a return passageway to said source of liquid, means forming an outlet passageway, a valve chamber in said plug box forming a connecting passageway between said inlet passageway, said return passageway and said outlet passageway, valve seat means formed at the entrance to each of said return passageway and said outlet passageway, a pair of piston valve elements in said valve chamber, each piston valve element assigned and adapted to seat on one of said valve seats, respectively, a first compression spring between said piston valve elements, a second compression spring biasing both said valve elements in a direction to seat the valve element associated with the valve seat at said outlet passageway, an extension member on the piston valve element associated with said outlet passageway,



a plug-in piece coupled to said utilization device and having an inlet passageway corresponding and adapted to be aligned with said outlet passageway, a valve actuator member forming an extension of said plug-in piece at said inlet passageway and adapted, when said plug-in piece is mated with said plug box, to engage said extension member and unseat the valve element associated with said outlet valve seat and, through said first compression spring, seat the said piston valve element on the valve seat associated with said return passageway.

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4,296,778

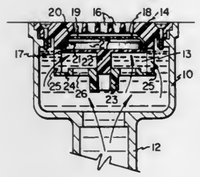
## ANTI-BACKFLOW VALVE FOR SEWER TRAPS

Alonzo B. Anderson, 1238 Pagos Ave., Salt Lake City, Utah 84117

Filed Aug. 13, 1979, Ser. No. 66,088

Int. Cl.[3] F16K *31/22, 33/00*

U.S. Cl. 137—433 6 Claims



1. An anti-backflow valve for installation in a sewer catch basin, comprising in combination:

a valve housing having an upper cover plate for attachment to a catch basin and an open lower end; said valve housing being adapted for mounting within a catch basin; said valve housing having first fluid flow apertures therein;

an upper sealing seat means disposed within the upper end of said valve housing;

a bouyant sealing member reciprocatingly disposed within said valve housing for vertical movement and having means for sealing upwardly against said upper sealing seat to shut-off fluid flow through said first apertures, said sealing member having a downwardly extending elongate guide member attached thereto;

a detachable bottom plate means for mounting on the bottom side of said valve housing, said bottom plate means includes second fluid flow apertures for permitting fluid flow therethrough in an upward direction to move said sealing member against said sealing seat means to shut-off fluid flow through said first apertures and to prevent upward fluid flow simultaneously, and when said sealing member moves downwardly said first apertures are open to fluid therethrough and the second apertures are closed to upward fluid therethrough by said sealiing member, and said bottom plate means having a guide way member for receiving and reciprocatingly holding said guide member of said sealing member.



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4,296,779

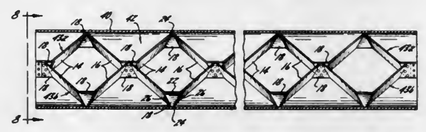
## TURBULATOR WITH GANGED STRIPS

Ronald H. Smick, 745 Chapel St., Ottawa, Ill. 61350

Filed Oct. 9, 1979, Ser. No. 82,576

Int. Cl.[3] B01F *15/06;* F15D *1/02*

U.S. Cl. 138—38 10 Claims



1. An improved turbulator unit for insertion in a heat exchanger tube having substantially straight longitudinal internal walls, comprising, in combination, a plurality of elongated turbulator strips of metal each formed of a series of alternately angling and oppositely tilting deflection panels successively joined together by substantially triangular bridging portions, said strips being ganged together with every other one of said triangular bridging portions of opposing ones of said strips being disposed and anchored substantially on the axis of the heat exchanger tube and the other ones of said triangular bridging portions of each turbulator strip disposed with the apexes thereof directed toward and adjacent the inner wall of said tube.

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4,296,780

## APPARATUS INCLUDING THROTTLING DEVICE FOR USE IN VENTILATION DUCT

Per Norbäch, Askrikevagen, Sweden, assignor to A. B. Carl Munters, Sollentuna, Sweden

Continuation-in-part of Ser. No. 50,519, Jun. 21, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,442

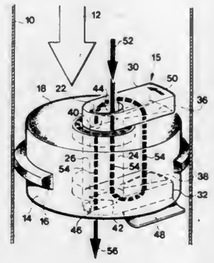
Claims priority, application Sweden, Jun. 21, 1978, 7807129; Norway, Dec. 13, 1979, 794084

Int. Cl.[3] F15D *1/02*

U.S. Cl. 138—40 12 Claims

1. An apparatus for use in ventilation ducts comprising a throttling device including a body having opposite air inlet and outlet sides and a plurality of fine elongated through passages extending therebetween and producing a pressure drop for conveying air flowing from said inlet through said elongated passages to said outlet side thereof, and deflector shield means mounted adjacent said inlet side of said body to allow relative movement of said body with respect thereto while cleaning the surface of said inlet side of the body, said apparatus including means for rotating one of said body and said deflector shield means relative to the other, said shield means having an opening facing said inlet side of the body which is caused to sweep over said inlet side of the body during such relative movement and means for providing flow communication between said shield means and the lower air pressure on the outlet side of the throttling device whereby the drop of pressure across the throttling device diverts a partial air flow through said shield means in another direction than the main air flow into the body of the throttling device in order to clean the surface of said inlet side of the body and then discharges said partial air flow downstream of the body in the same direction as the main air flow.

11. The combination comprising a ventilation duct and a throttling device rotatably mounted in said duct including a body having opposite air inlet and outlet sides and a plurality of fine elongated through passages extending therebetween and producing a pressure drop for conveying air flowing from said inlet through said elongaged passages to said outlet side thereof, and deflector shield means fixed in said duct adjacent



said inlet side of said body to allow relative movment of said body with respect thereto while cleaning the surface of said inlet side of the body, and means for rotating said body, said shield means having an opening facing said inlet side of the body which is caused to sweep over said inlet side of the body during rotation of the body and means for providing flow communication between said shield means and the lower air pressure on the outlet side of the throttling device whereby the drop of pressure across the throttling device diverts a partial air flow through said shield means in another direction than the main air flow into the body of the throttling device in order to clean the surface of said inlet side of the body and then discharges said partial air flow downstream of the body in the same direction as the main air flow.

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4,296,781

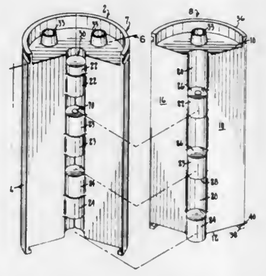
## SECTIONAL PIPE AND TUBULAR MEMBERS FOR FORMING SAME

Paul G. Magnus, Apple Valley, Minn., assignor to Magnusystem, Inc., Apple Valley, Minn.

Filed Apr. 23, 1979, Ser. No. 32,249

Int. Cl.[3] F16L *9/22;* E04H *12/18*

U.S. Cl. 138—155 16 Claims



1. A tubular member which is elongated along a longitudinal axis extending therethrough and which is made from a plurality of sections, wherein each section has a transverse cross-sec-

tional configuration which includes a radially outward circumferential surface that defines part of the exterior of the tubular member and two generally radially extending side surfaces which converge from the radially outward circumferential surface to a radially inward circumferential surface that extends parallel to the longitudinal axis, and further including a plurality of longitudinally spaced lugs, one of said lugs located on the radially inward circumferential surface of each secton, wherein the lugs on adjacent sections are colinear with and longitudinally staggered relative to one another to interfit with one another to lock the plural sections together to form the tubular member and also to prevent relative longitudinal movement between the sections, wherein the lugs extend inwardly from the radially inward circumferential surfaces of their respective sections to lie generally along the longitudinal axis of the tubular member.

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**4,296,782**

## DOUBLE-LIFT OPEN-SHED JACQUARD MACHINE

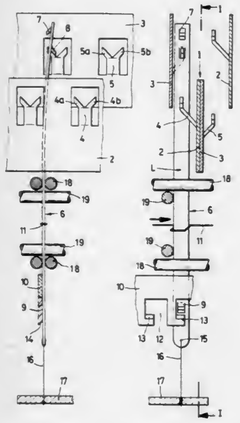
**Hubert Kremer, Grefrath, Fed. Rep. of Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany**

**Filed Oct. 26, 1979, Ser. No. 88,381**

**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846792**

**Int. Cl.³ D03C** *3/06, 3/30*

**U.S. Cl. 139—65** **11 Claims**



1. In a double-lift open-shed Jacquard machine with two lifting bars which are movable in opposite directions relative to each other and pass each other, and with flat-bar lifters which can be controlled by main needles, whose maximum moment of resistance is parallel to the direction of movement of the main needles, and which have two main projections associated with the movable knives, a holder-up projection assoicated with a fixed upper-shed knife, and at the lower end an engagement point for a harness cord, the improvement wherein

a flat-bar lifter has two main projections, a holder-up projection and an engagement point for the harness cord, said two main projections, said holder-up projection and said engagement point lie on a straight line oriented crosswise to the direction of movement of the main needles,

said holder-up projection is positioned adjacent the flat-bar lifter in a direction transverse to the direction of movement of the main needles.

**4,296,783**

## WEFT YARN END TREATING DEVICE FOR SHUTTLELESS LOOM

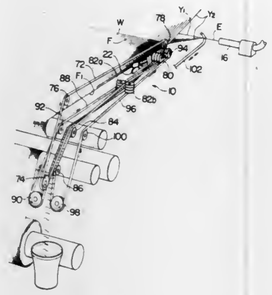
**Eiji Ichimatsu, Koganei, Japan, assignor to Nissan Motor Company, Ltd., Japan**

**Filed Nov. 29, 1978, Ser. No. 964,716**

**Claims priority, application Japan, Dec. 1, 1977, 52-143308**

**Int. Cl.³ D03D** *49/70*

**U.S. Cl. 139—302** **34 Claims**



1. In a shuttleless loom having yarn inserting means located adjacent a first side of the array of warp yarns from which inserting means a weft yarn is picked into the shed of the warp yarns to weave a fabric, a weft yarn end treating device for treating an end portion of the picked weft yarn which end portion is projected from a second side of the array of the warp yarns, the second side being opposite to the first side and remote away from the yarn inserting means, said weft yarn end treating device comprising:

conveying means for conveying the projected end portion of the weft yarn in a direction generally the same as the moving direction of woven fabric from a portion adjacent the weave front of a woven fabric, when the projected end portion is held to contact therewith;

holding means for holding the projected end portion to contact with said conveying means;

thrusting means for thrusting the projected end portion of the weft yarn into a location at which the projected end portion begins to be held to contact with the conveying means, said thrusting means being actuated in connection with the operation of said loom, said thrusting means including a movable rod member swingably supported on the frame of a reed of said shuttleless loom, said movable rod member including upper and lower portions which extend generally oppositely with respect to a portion at which said movable rod member is swingably supported, and a push rod member disposed stationary relative to the frame of said shuttleless loom, said push rod member being strikable against the upper portion of said movable rod member to move the lower portion of said movable rod member so as to carry the projected end portion of the weft yarn into said location; and

cutting means for cutting the projected end portion of the weft yarn in close proximity to a side of the fabric corresponding to the second side of the warp yarn array, after the projected end portion is thrust into said location, said cutting means being located between the fabric and said conveying means.



**4,296,784**

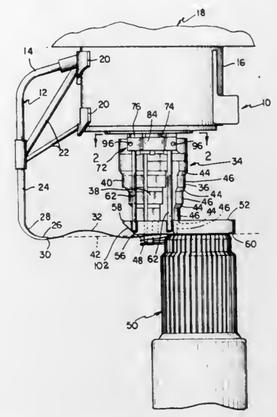
## WIRE VIBRATION DAMPING DEVICE AND METHOD FOR COIL WINDING APPARATUS

**Philip G. Rodenbeck, and Fredrick Koenig, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.**

**Filed Oct. 26, 1979, Ser. No. 88,569**

**Int. Cl.³ H02K** *15/04*

**U.S. Cl. 140—92.2** **10 Claims**



1. Apparatus for forming coils of wire windings for electric motors, said apparatus comprising: a coil form support structure, a coil form adapted for having wire wound thereabout, said coil form being connected to and supported by said support structure and having a free end, flyer means rotatable about said coil form for winding turns of wire about said coil form, said flyer means having a wire discharge point from which wire is fed directly about said coil form, the discharge point rotating in a winding plane, and a wire vibration damping device having a surface at least partially encircling said coil form and which defines a plane parallel and in close proximity to the winding plane on the opposite side of the winding plane as the free end of the coil form, said surface being inside the path of rotation of said flyer.

10. In a method of forming coils of wire for electric motor windings, the method comprising generating a plurality of turns of wire about coil form means by dispensing wire thereabout and moving at least some turns of a given coil along the coil form means toward and into turn receiving means while at least one other turn for the same coil is being generated, and wherein all of the turns are generated in the same general winding plane, by a flyer arm that guides wire along a path in which the wire is caused to make a turn with respect to a center of curvature prior to exiting the arm at the wire discharge point, wherein the center of curvature is located on one side of the winding plane, the improvement comprising: interfering with oscillatory wire movement on said one side of the winding plane and thereby damping oscillations of the wire while the turns are being generated.

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**4,296,785**

## SYSTEM FOR GENERATING AND CONTAINERIZING RADIOISOTOPES

**John P. Vitello, Weston, Mass., and Glenn D. Grummon, Richmond Heights, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.**

**Filed Jul. 9, 1979, Ser. No. 55,784**

**Int. Cl.³ B65B** *3/04*

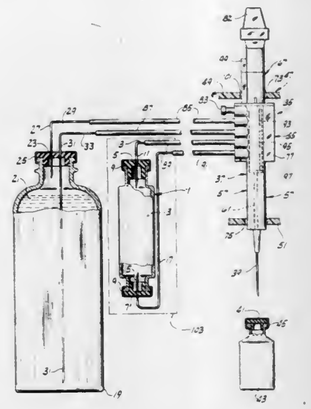
**U.S. Cl. 141—105** **10 Claims**

1. A system for eluting a daughter radioisotope from a parent radioisotope and for containerizing the resultant eluate in an evacuated container having a closure adapted to be pierced by a needle, said apparatus comprising:

a generator containing a supply of the parent radioisotope, said generator having an inlet for an eluant for eluting the daughter radioisotope from the parent radioisotope and an outlet for the resultant eluate;

a reservoir for holding a supply of the eluant, said reservoir having an outlet for delivery of eluant to the inlet of the generator and an air inlet for admission to the reservoir of air from the atmosphere to apply atmospheric air pressure to eluant in the reservoir;

a tubular needle for piercing the closure of an evacuated container;



and valve means comprising a first port constituting an air inlet in communication with the atmosphere, a second port in communication with said reservoir air inlet, a third port interconnected with said reservoir outlet, a fourth port interconnected with said generator inlet, a fifth port interconnected with said generator outlet for delivery of eluate to the needle, and means for blocking communication between said first and second ports, between said third and fourth ports, and between said fifth port and the needle, and operable to place the first port in communication with the second, the third in communication with the fourth and the fifth in communication with the needle.

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**4,296,786**

## TRANSFER DEVICE FOR USE IN MIXING A PRIMARY SOLUTION AND A SECONDARY OR ADDITIVE SUBSTANCE

**Dominic J. Brignola, Phoenixville, Pa., assignor to The West Company, Phoenixville, Pa.**

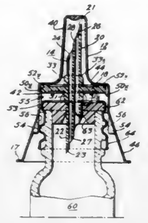
**Continuation of Ser. No. 661,869, Feb. 27, 1967, abandoned, which is a continuation-in-part of Ser. No. 333,650, Feb. 20, 1973, abandoned. This application Sep. 28, 1979, Ser. No. 79,867**

**Int. Cl.³ B65B** *3/06*

**U.S. Cl. 141—309** **32 Claims**

1. A transfer device for use in mixing substances in different containers comprising a central body portion and a pair of cannulas projecting from opposite sides of said central body portion, each of said cannulas having an outer tip portion, means defining at least one pair of transfer passages extending through said cannulas and extending the full length of said cannulas from the tip portion of one cannula to the tip portion of the other cannula, the cross sectional area of one of said transfer passages adjacent the tip of one cannula being greater than the cross sectional area of said one transfer passage adja-

cent the tip of said other cannula, each of the transfer passages being of circular cross section, one of said transfer passages converging toward the tip of one cannula and the other transfer passage converging toward the tip of the other cannula.



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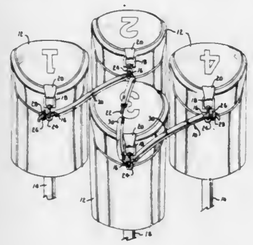
**4,296,787**
**CONNECTION DEVICE FOR GOLF CLUB HEAD COVERS**

**C. D. Barton, 815 W. 53rd Ter., Kansas City, Mo. 64112**

**Filed Apr. 15, 1980, Ser. No. 140,439**
**Int. Cl.³ B65B *11/00*; B65D *65/02*; B65N *81/00***
**U.S. Cl. 150—52 G** **10 Claims**



1. A device for interconnecting a plurality of golf club head covers each having an eyelet, said device comprising:

an elongate flexible member extending between the eyelets of the head covers, said flexible member passing through the eyelet of each head cover to connect the head covers to one another;

means associated with opposite end portions of said flexible member for preventing the opposite end portions from passing through the eyelets located nearest the end portions; and

a plurality of tubular elements sleeved on said flexible member and extending substantially between the eyelets of the respective head covers in a manner to maintain the head covers spaced apart from one another, said tubular elements being resilient to permit flexing thereof.

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**4,296,788**
**CARRYING DEVICE**

**Peter G. Slater, 9 Ganung Dr., Ossining, N.Y. 10562**

**Filed Jun. 10, 1980, Ser. No. 158,150**
**Int. Cl.³ B65B *11/00*; B65D *65/02*; B65N *81/00***
**U.S. Cl. 150—52 R** **5 Claims**

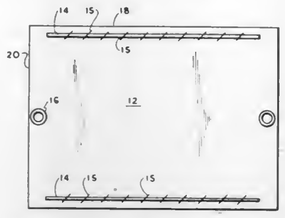
1. A flexible fabric carrier comprising:

(a) a sheet member of substantially rectangular shape,

(b) an elongated substantially rigid member adapted to be positioned along a first side portion of the sheet,

(c) supporting elements affixed to the sheet along said first side portion and adapted to receive the elongated rigid member, and

(d) attachment means at each of the end portions of the sheet not opposite said first side portion,



whereby said attachment means may be connected to the elongated rigid member so that any material placed on the sheet will be contained by the folded sheet formed by the connection of the attachment means to the rigid member.

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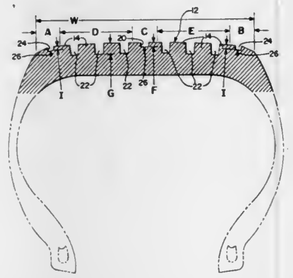
**4,296,789**
**TREAD FOR PNEUMATIC TIRE**

**Charles W. Roberts, Akron; Michael A. Kolowski, Tallmadge; Daniel J. Lindner, North Canton; John E. Lynch, Bedford; Terrence M. Ruip, Akron, all of Ohio, and Harold D. Fetty, Birmingham, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Continuation of Ser. No. 877,790, Feb. 14, 1978, abandoned.**
**This application Dec. 11, 1980, Ser. No. 215,208**
**Int. Cl.³ B60C *11/10***
**U.S. Cl. 152—209 R** **8 Claims**



1. A pneumatic tire having a ground-engaging tread portion, said tread portion consisting of a plurality of independent buttons or projections placed circumferentially about said tire, said independent buttons or projections being spaced apart so as to provide a plurality of grooves adjacent the periphery of said buttons or projections, said grooves being sufficiently wide so as not to close up at the ground contacting surface when in the footprint of the tire, said tire characterized in that said tread is provided with a central zone and two shoulder zones which extend circumferentially about said tire, the width of said central zone and each of said shoulder zones being substantially less than the width of said tread, said central zone being located such that the longitudinal axial edges of said zone are spaced equidistant from the mid-circumferential plane of said tire, said central zone having a width ranging from 5% to 20% of the width of the tread of said tire and the depth of the recesses in between said projections in said central zone being between 25% and 60% of the depth of the recesses in between said projection in said remaining portion in between said central zone and said shoulder zones, said shoulder zones are spaced from and located axially outward from said central zone, one on either side of said central zone, and extend from each tread edge toward the mid-circumferential plane of said tire, said shoulder zones having a width from about 5% to 20% of the width of said tread of said tire and the recesses in between said projections in said shoulder zone being from about 25% to 60% of the depth of the recesses in between said projection in said remaining portion in between said central zone and said shoulder zone.



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**4,296,790**
**LIGHT TIRE BODIES USING THICK CORDS**

**Yoshihiro Sakai, Kawasaki; Ryosaku Tanaka, Akigawa; Toshio Kita; Munetoshi Shimotake, both of Kodairo; Tsuguyoshi Yamada, Higashimurayama, and Hiroshi Ueda, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

**Filed Dec. 17, 1979, Ser. No. 104,217**
**Claims priority, application Japan, Dec. 27, 1978, 53/159694**
**Int. Cl.³ B60C *9/06, 15/06***
**U.S. Cl. 152—354 R** **2 Claims**

1. A light tire body for heavy vehicles comprising, a bias-structured carcass composed of rubberized plies each including thick organic fiber cords having a cord diameter equal to or larger than that of nylon 1,890 d/2, rubber interposed between said carcass plies having a thickness corresponding to $hm/ho \leqq 0.5$ where, hm is an average rubber gauge between said plies at a center position in the widthwise direction of the tire, and ho is a diameter of said thick cord and being prepared from a compounding recipe of at least one rubber ingredient selected from natural rubber and diene synthetic rubbers, a softener, an organic vulcanization accelerator and sulfur as well as at least 30% by weight of carbon black having an average iodine adsorption value of 40–90 mg/g and an average dibutyl phthalate absorption value of 60–140 ml/100 g, and said rubber having a dynamic modulus of elasticity at 100° C. under 2% elongation of not less than $6.0 \times 10^7$ dyne/cm$^2$, a dynamic loss angle the tangent of which is not more than 0.095 and a tensile strength of not less than 100 kg/cm$^2$ as properties after vulcanization; and said carcass being provided with an apex rubber for stiffening a turnup portion of the carcass and a ratio in the dynamic modulus of elasticity of said apex rubber to said rubber interposed between the plies is within a range of 0.9–1.3.

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**4,296,791**
**FOLDING DOOR OR LIKE CLOSURE DEVICE**

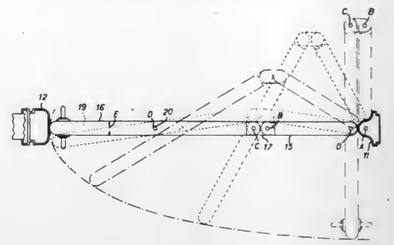
**Bernard Chaumat, 10 Bd. Jourdan, 75014 Paris; Georges Gallet, 6 rue du 11 Novembre, 95110 Sannois; Jacques Lamare, 21 Bd. Richard Wallace, 92200 Neuilly-sur-Seine, and Guy Peyssard, 30 rue Raze, 33000 Bordeaux, all of France**

**Filed Jan. 22, 1980, Ser. No. 114,429**
**Claims priority, application France, Jan. 25, 1979, 79 01931**
**Int. Cl.³ E05D *15/26***
**U.S. Cl. 160—206** **9 Claims**

1. A door or like closure device, comprising a fixed frame, a primary panel pivoted about a first axis A on the frame and at least one secondary panel connected to the primary panel by a link articulated by a second axis B to the primary panel and a third axis C to the secondary panel, said secondary panel being in addition guided at a fourth axis D in a slide guide extending perpendicular to the first axis A, and wherein:

(i) the four axes A, B, C, and D are disposed in the centre of the thickness of the panels;

(ii) the distance between the second axis B and the third axis C is equal to the thickness of the panels;



(iii) the distance between the third axis C and the fourth axis D is equal to the distance between the first axis A and the second axis B;

(iv) the fourth axis D is carried by the secondary panel at an intermediate point thereof; and

(v) means are provided for holding said link constantly perpendicular to the bisector plane of the primary and secondary panels.

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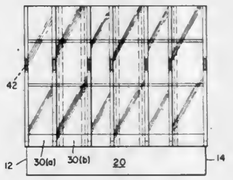
**4,296,792**
**TRANSPARENT REACH-THROUGH CURTAIN FOR OPEN REFRIGERATORS**

**Kenneth N. Gidge, Nashua, N.H., and Henry J. Richard, Lowell, Mass., assignors to BSL Corporation, Nashua, N.H.**

**Filed Feb. 5, 1979, Ser. No. 9,049**
**Int. Cl.³ A47H *1/00***
**U.S. Cl. 160—332** **6 Claims**



1. A reach-through curtain for use over the opening in an open display type refrigerator or the like, comprising

(a) a plurality of elongated, flexible, transparent, imperforate panels of generally rectangular outline each connectable at least at one end to said refrigerator proximate to an edge of said opening,

(b) said panels extending in parallel, overlapped relation across said opening and defining slit access means between adjacent panels,

(c) each of said panels being of a length sufficient to span said opening in one direction,

(d) said panels being of a sufficient number and width to span said opening in another direction perpendicular to said one direction,

(e) the long edges of each of said panels being tubular, and,

(f) a colored, relatively short sleeve mounted in each tubular edge of said panel for visibly enhancing the access joints between adjacent panels and for reinforcing the tubular shape of the long edges.

**4,296,793**

## REFRACTORY SUSPENSION FOR MAKING FOUNDRY MOULDS

**Konstantin K. Yasinsky, ulitsa Spartakovskaya, 18, kv. 52; Sergei G. Glazunov, Leninsky prospekt, 41, kv. 62, both of Moscow; Jury N. Ross, ulitsa Patrioticheskaya, 74, kv. 36, and Igor D. Bykov, ulitsa Turgeneva, 44, kv. 6, both of Zaporozhie, all of U.S.S.R.**

**Continuation of Ser. No. 835,689, Sep. 22, 1977, abandoned. This application May 10, 1979, Ser. No. 37,839**

**Int. Cl.³ B28B** *7/36*

**U.S. Cl. 164—24** **9 Claims**

**1**. A refractory suspension for making lost wax foundry moulds for casting pieces of chemically-active metals, the ratio of suspension constituents consisting essentially of as follows (parts by weight): coke, 10–60; a powdered metal selected from the group consisting of titanium, zirconium and a mixture thereof, 0.3–5.0; resol resins, 5–50; a hardener selected from the group consisting of an organic and inorganic acids, 2–30; an organic solvent, 20–60.

**8**. A method for making lost wax foundry moulds comprising the steps of:

(a) forming a suspension consisting essentially, in percent by weight, of coke, 10–60; a powdered metal selected from the group consisting of titanium, zirconium, and mixtures thereof, 0.3–5.0; resol resins, 5–50; a hardener selected from the group consisting of organic and inorganic acids, 2–30; and an organic solvent, 20–60;

(b) providing a wax pattern;

(c) coating the pattern with the suspension at least four times, and sprinkling said pattern with powdered coke;

(d) drying the coating to obtain a rigid mould;

(e) melting the wax pattern from its rigid mould; and

(f) curing the mould by heating to about 1300°–1350° C.

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**4,296,794**

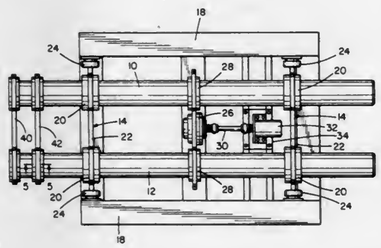
## METHOD OF TRANSMISSION OF SONIC ENERGY TO WORK PIECES

**Raymond M. Leliaert, South Bend, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.**

**Filed Jan. 14, 1980, Ser. No. 111,487**

**Int. Cl.³ B22D** *29/00*

**U.S. Cl. 164—131** **3 Claims**




**1**. A method for transmitting vibratory energy to a part from a vibratory member adapted to vibrate at sonic frequency comprising securing a fixture to said vibratory member, said fixture having spaced abutment surfaces, inserting the part into the fixture to between said abutment surfaces whereby the clearance between one abutment surface and the adjacent surface of the work piece, while the work piece is at rest on the other abutment surface, is within the range of ±50% of the amplitude of the vibrations at the point of attachment of the fixture to the vibration generator.

**4,296,795**

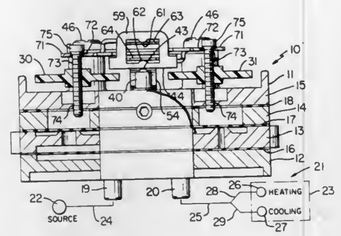
## PNEUMATICALLY OPERATED CONTROL SYSTEM AND UNIT THEREFOR AND METHODS OF MAKING THE SAME

**Jay L. Lewis, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed May 2, 1980, Ser. No. 146,337**

**Int. Cl.³ F25B** *29/00*

**U.S. Cl. 165—27** **40 Claims**




**1**. In a pneumatically operated system having control means provided with a single inlet interconnected to a one pressure level pneumatic source and having outlet means interconnected to pneumatically operated heating and cooling heat exchanger means to control the same in either its heating mode or its cooling mode in relation to the pressure value of the pneumatic signal means being directed thereto from said control means through said outlet means thereof, said control means having temperature sensing means for controlling said value of said signal means in relation to the sensed output temperature effect of said heat exchanger means by operating bleed means of said control means, the improvement wherein said outlet means comprises a single outlet and said bleed means comprises a single bleed device having an arrangement of parts thereof that is the same regardless of whether said heat exchanger means is operating in its heating mode or in its cooling mode whereby said heat exchanger means is adapted to be operated in either its heating mode or its cooling mode by said single bleed device without changing said arrangement of said parts of said bleed means.

**2**. In a pneumatically operated system having control means provided with a single inlet interconnected to a one pressure level pneumatic source and having outlet means interconnected to pneumatically operated heating and cooling heat exchanger means to control the same in either its heating mode or its cooling mode in relation to the pressure value of the pneumatic signal means being directed thereto from said control means through said outlet means thereof, said control means having temperature sensing means for controlling said value of said signal means in relation to the sensed output temperature effect of said heat exchanger means by operating bleed means of said control means, the improvement wherein said outlet means comprises a single outlet and said bleed means comprises a single bleed device whereby said heat exchanger means is adapted to be operated in either its heating mode or its cooling mode by said single bleed device, said sensing means having means providing a "dead band" temperature range so that said bleed device will remain in a certain condition thereof to provide said signal means with a certain value as long as said sensed output temperature effect falls within said "dead band" temperature range.



**4,296,796**

## HEAT TRANSFER SYSTEM

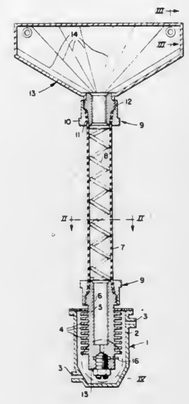
**Helmut Wulf, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 28, 1979, Ser. No. 70,505**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841051**

**Int. Cl.³ F28D** *15/00*

**U.S. Cl. 165—46** **6 Claims**



**1**. A heat transfer system for transferring heat between a heat-emitting means and a heat-consuming means in accordance with a heat pipe principle, characterized in that a vacuum-tight hose conduit means is arranged between the heat-emitting means and the heat-transfer means for communicating the respective means with each other, a longitudinally-extending groove structure is disposed interiorly of the hose conduit means for supporting the hose conduit means against excessive external pressure and for providing an internal capillary structure, and in that a threaded connection means is provided for connecting respective ends of the hose conduit means into a heat transfer path.

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**4,296,797**

## RIGID SHELL FOR BUILDING STRUCTURES

**George R. Beggs, 602 S. Tejon, Colorado Springs, Colo. 80903**

**Filed Dec. 6, 1979, Ser. No. 100,954**

**Int. Cl.³ F25B** *29/00*

**U.S. Cl. 165—48 S** **8 Claims**

**1**. A rigid shell for a building structure, which comprises:

(a) a pair of rigid, vertical supporting frames disposed parallel to and spaced from one another by a distance equal to the length of the shell, each of the frames comprising:

(1) a pair of spaced, horizontally disposed load-bearing elements and

(2) a pair of spaced, vertically disposed load-bearing members integral with and secured to the pair of horizontal elements at points spaced from the ends of said elements by from ⅛th to ¼th their respective lengths;

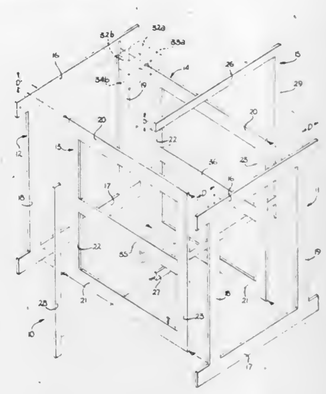
(b) a second pair of rigid, vertical supporting frame disposed parallel to and spaced from one another widthwise of the shell and at right angles to the first pair of supporting frames, each of the second pair of frames comprising:

(1) a second pair of spaced, horizontally disposed load-bearing elements and

(2) a second pair of spaced, vertically disposed load-bearing members integral with and secured to the second pair of horizontal elements, said members abutting the vertical load-bearing members of the first pair of supporting frames and being secured thereto along substantially their entire length to define four vertically disposed, load-bearing columns for the shell;

(c) a plurality of further rigid, vertical supporting frames in spaced relation lengthwise of the shell, intermediate and parallel to the first pair of supporting frames, each of the plurality of frames comprising:

(1) a third pair of spaced, horizontally disposed load-bearing elements extending across and being supported by the respective members of the pair of horizontal load-bearing elements of each of the second pair of supporting frames, and



(2) a third pair of spaced, vertically disposed load-bearing members integral with and secured to the third pair of horizontal elements;

the plurality of further supporting frames being supported by the first and second pairs of supporting frames and, in turn, providing the structural support for the side walls, roof and floor of the building structure defined by said shell; and

(d) structurally supporting materials covering at least 20% of the side and end wall and roof surfaces defined by said shell to impart sufficient stability to resist climatic torsional and eccentric loading conditions imposed thereon.

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**4,296,798**

## INTEGRATED HOUSE

**Horst Schramm, Schellingstr. 16,, D-6000 Frankfurt am Main, Fed. Rep. of Germany**

**Filed Nov. 13, 1978, Ser. No. 959,417**

**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750918**

**Int. Cl.³ F24D** *5/10;* **F24J** *3/02;* **E04B** *1/70*

**U.S. Cl. 165—56** **8 Claims**

**6**. An integrated house comprising:

an intensively insulated outside shell comprising:

intensively insulated exterior walls;

an insulated roof attached to and disposed above said exterior walls;

an insulated cellar attached to and disposed below said exterior walls; and

at least one window located on said exterior walls and each of which comprise:

two panes;

a window frame spacing apart and holding said panes; and

an inner and outer portion formed by said exterior wall and receiving said window frame in sealed-together relationship; and

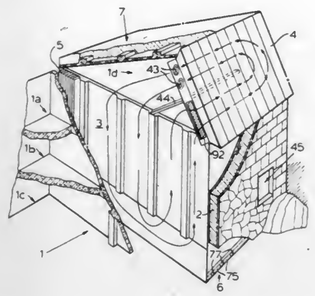
a plurality of connected interior walls and floors, forming a structure which is attached to and surrounded by said outer shell, and comprising:

two ribbed, pre-formed concrete slabs, interpositioned in

order to have hollow spaces therebetween, said interior walls and floors arranged in order to integrate said hollow spaces and form air circuits;

a heating means connected to said air circuits; and

a cooling means connected to said air circuits,



whereby heat may be transferred to and taken from said interior walls and floors via air passing through said interior walls and floors in said air circuit thus heating or cooling said integrated house.

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**4,296,799**

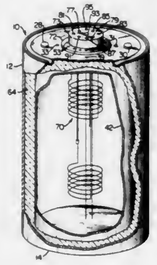
## SOLAR WATER TANK AND METHOD OF MAKING SAME

**Richard S. Steele, 897 E. 12th Ave., Broomfield, Colo. 80020**

**Filed May 29, 1979, Ser. No. 43,131**

**Int. Cl.³ F28D** *1/06*

**U.S. Cl. 165—74** **26 Claims**



**1**. A water tank adapted for solar heating systems, comprising:

an insulated rigid shell enclosing a chamber therein adapted for containing a fluid medium, said shell having an access hole therein, including a flexible plastic liner positioned within said chamber around the periphery thereof a spaced distance inwardly from said shell, and a foam insulation material uniformly filling the space between said shell and said liner;

an insulated cover for said access hole adapted to be positioned over said access hole and to be removably attached in that position to said shell;

a flow systems assembly extending through and attached to said cover, said flow systems assembly including fluid inlet and outlet tubes and water inlet and outlet tubes for conducting the flow of fluids and water, respectively, into and out of said chamber, and heat exchanger means for facilitating heat transfer from the fluid to the water within said chamber; and

attachment means on said cover and said shell for removably attaching said cover to said shell over said access hole with said flow systems assembly extending therethrough and positioned inside said shell.

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**4,296,800**

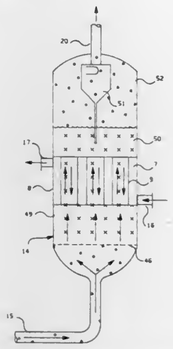
## WASTE HEAT RECOVERY

**Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Apr. 18, 1980, Ser. No. 141,502**

**Int. Cl.³ F28D** *13/00*

**U.S. Cl. 165—95** **3 Claims**



**1**. A fluidized bed shell-tube heat exchange vessel adapted to recover heat from or transfer heat to gas streams containing suspended light solids flowing upwardly through a multiplicity of vertically disposed tubes on the tube side of said exchanger to a fluid flowing through the shell side of said exchanger, said tubes containing particulate heat exchange solids, said solids being maintained as a fixed fluidized bed of solids within each of said tubes by the upward flow through said tubes of said fluid containing light suspended solids which comprises, in combination:

(a) an elongated substantially vertical vessel having an inlet conduit connected to a lower portion and an outlet conduit connected to an upper portion of said vessel,

(b) a grid or distributor plate in the lower portion of said vessel adapted to support a bed of particulate solids above said grid and allow gas to pass into said bed of particulate solids,

(c) a fixed bed of particulate fluidizable solids extending a substantial distance above said grid into an intermediate portion of said vessel,

(d) a shell-tube heat exchanger section having a plurality of tubes positioned within said vessel above said grid but below the top of said fixed bed of solids with the tubes being substantially vertical and all being filled with said particulate solids and in open communication with the inlet and outlet conduits so that the heat exchange fluid passing through the shell side can absorb heat from or transfer heat to a gas stream containing entrained solids passing through the tubes containing said particulate solids, said tubes in said shell-tube heat exchanger being so sized as to be of a diameter of at least one foot and sufficient height to diameter ratio to allow recirculation of the particulate solids within each tube to maintain the inner peripheries of the tubes substantially freed from deposits to permit efficient heat exchange, and

(e) a gas-solids separator positioned within an upper portion of said vessel connected to said outlet conduit and adapted to separate entrained particulate solids from the gas stream exiting said vessel and return same to said bed.



**4,296,801**

## REUSABLE HEAT DEVICES CONTAINING XYLITOL AS THE HEAT-STORAGE MATERIAL

**Woldemar Guex, 4 Spechtweg, Bottmingen; Heinrich Klaeui, 77 Kilchgrundstrasse, Riehen; Horst Pauling, 39 Ruchholzstrasse, Bottmingen, and Felix Voirol, 26 Poolstrasse, Füllinsdorf, all of Switzerland**

**Continuation of Ser. No. 916,242, Jun. 16, 1978, abandoned. This application May 20, 1980, Ser. No. 151,568**

**Claims priority, application Fed. Rep. of Germany, Oct. 24, 1977, 2747664**

**Int. Cl.³ F28D** *13/00;* **F24H** *7/00*

**U.S. Cl. 165—104.17** **6 Claims**

**1**. A heat device comprising a container having therein xylitol as a heat-storage material.

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**4,296,802**

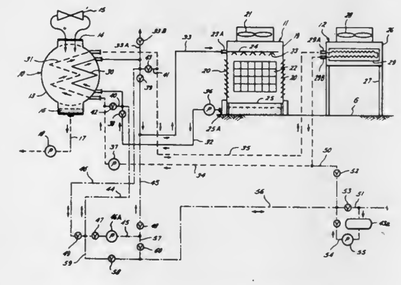
## STEAM CONDENSING APPARATUS

**Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.**

**Continuation-in-part of Ser. No. 585,951, Jun. 16, 1975, abandoned. This application May 28, 1976, Ser. No. 690,883**

**Int. Cl.³ F28B** *9/06*

**U.S. Cl. 165—110** **4 Claims**



**1**. Apparatus for use in condensing steam from the turbine exhaust of a power plant or the like, comprising a steam condenser having inlet means for receiving steam from the turbine exhaust, hot well means to receive condensed steam, and outlet means for returning condensate from the hot well to the power cycle, cooling tower means having a wet section and a dry section, the wet tower section having an inlet to receive a first cooling medium, an outlet for discharging the first medium, and means for cooling the first medium with ambient air as it passes from the inlet to the outlet, the dry tower section having an inlet to receive a second cooling medium, an outlet for discharging the second medium, and means for cooling the second medium with ambient air as it passes from the inlet to the outlet, means for circulating the first medium from the outlet from the wet cooling tower section into and through tubes within the condenser and then returning it to the inlet to said wet cooling tower section, means for circulating the second medium from the outlet from the dry cooling tower section into and through the condenser and then returning it to the inlet to said dry cooling tower section, means for interrupting the circulation of said first medium between said wet tower section and said condenser tubes, means for emptying said first medium from the tubes and then filling said tubes with the second medium, when such circulation is interrupted, and means for emptying the second medium from the tubes and then refilling the tubes with the first medium, whereby circulation of said first medium between said wet tower section and said condenser tubes may be resumed.

**4,296,803**

## PLATE USED IN CONDENSER

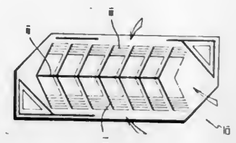
**Hiroyuki Sumitomo, Osaka, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan**

**Continuation of Ser. No. 927,689, Jul. 25, 1978, Pat. No. 4,228,850. This application Nov. 14, 1979, Ser. No. 93,983**

**Claims priority, application Japan, Nov. 8, 1977, 52-134254**

**Int. Cl.³ F28B** *9/08;* **F28D** *9/02;* **F28F** *3/08*

**U.S. Cl. 165—110** **1 Claim**



**1**. A plate for use in a condenser for condensing a vapor to a condensate, said plate having a surface and including condensate collecting and discharging elements, said vapor and said condensate flowing downwardly through the condenser, said condensate collecting and discharging elements comprising a plurality of V-shaped inclined grooves downwardly sloped towards a central portion of said plate, and a single vertical groove formed along said central portion of said plate connecting with a lowest portion of each of said inclined grooves, said vertical groove having an axis, each of said inclined grooves having a pair of edges comprising a first edge and a second edge at the intersection of said inclined groove and the vertical groove, each pair of edges being in a single plane perpendicular to the plane of the surface of said plate and perpendicular to the axis of the vertical groove, wherein said inclined grooves form ramps leading to said vertical groove and said vertical groove forms a recessed channel, the direction of flow of said condensate substantially coinciding with the direction of flow of said vapor across the entire surface of the plate, whereby said inclined grooves and said vertical groove minimizes the area of a filmy downflow liquid layer and prevents a film from growing too thick, thereby improving the heat transfer surface of said plate.

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**4,296,804**

## CORROSION RESISTANT HEAT EXCHANGER ELEMENT AND METHOD OF MANUFACTURE

**Irving D. Press, West Orange; Harvey R. Nickerson, Roscland, and Helm Rink, North Haledon, all of N.J., assignors to Resistoflex Corporation, N.J.**

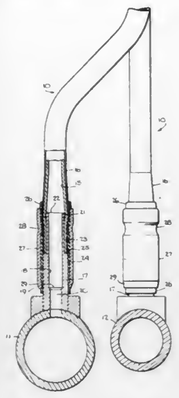
**Filed Jun. 28, 1979, Ser. No. 52,759**

**Int. Cl.³ F28F** *9/16, 19/04*

**U.S. Cl. 165—133** **12 Claims**

**1**. A heat exchanger element for use in a corrosive environment comprising a metal tube jacketed at least over a substantial portion of its length including at least one end with an extruded layer of a given fluorocarbon resin having a thickness within the limits affording efficient heat transfer combined with resistance to corrosion of said tube, said given resin being of the type which has a high viscosity in the melt stage, a nipple of corrosion resistant metal, said nipple having a first end with a circumferential shoulder thereat and an axial region adjacent said shoulder which region has a lesser diameter than said shoulder providing an undercut annular groove therebehind, said first end of said nipple being telescopingly engaged within said one end of said metal tube, and said nipple having an opposite end which projects from said one end of said metal tube, a sleeve of fluorocarbon resin surrounding said one end of said metal tube and at least a portion of said opposite end of

said nipple, said sleeve extending over said metal tube and its jacket layer of resin to a point beyond the location of said nipple shoulder, and a corrosion resistant metal ferrule surrounding said sleeve of resin and being substantially coextensive therewith, said ferrule being contracted radially squeezing



said metal tube within said axial region behind said nipple shoulder thereby effecting interlocking engagement between said metal tube and said nipple and establishing a fluid-tight seal between said ferrule, said nipple, said metal tube and the intervening resin material.

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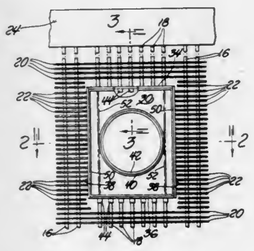
**4,296,805**

**ACCESSORY CLEARANCE HOLE**

**James C. Fleury, Ora, Ind., assignor to Ex-Cell-O Corporation, Troy, Mich.**

**Filed Dec. 17, 1979, Ser. No. 104,588**
**Int. Cl.[3] F28D *1/04***
**U.S. Cl. 165—151** **10 Claims**



**1**. A heat exchanger assembly comprising; a core having front and rear faces and including tubes parallel to said faces and fins extending transversely to said faces and said tubes respectively and interconnecting said tubes, a group of said tubes and a first plurality of said fins defining an opening extending between said faces along the lengths thereof and between the opposite ends of said tubes and said fins, said opening being defined by each of said tubes in said group being devoid of a length thereof so that each of said tubes in said group has spaced first and second open ends and each of said fins in said first plurality being devoid of a length thereof so that each of said fins in said plurality has spaced ends, a single tank in fluid communication with said first and second ends to establish fluid communication therebetween, said tank having front and rear walls disposed adjacent said front and rear faces respectively of said core and a peripheral wall extending about said opening and interconnecting said front and rear walls to define an enclosed volume within said tank, and a tubular member extending through said volume between said front and rear walls and in spaced relationship to said peripheral wall for defining a clearance hole allowing access through said core between the opposite faces thereof, said peripheral wall including a plurality of ferrules integral therewith with each ferrule surrounding and in sealing engagement with one of said first and second ends of said group of tubes said peripheral wall including top and bottom walls and said ferrules extending from said top and bottom walls in the same direction.

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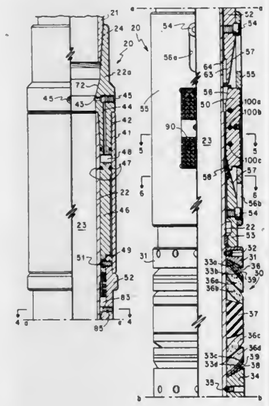
**4,296,806**

**HIGH TEMPERATURE WELL PACKER**

**Donald F. Taylor, Dallas, and James H. Bostock, Denton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.**

**Filed Oct. 5, 1979, Ser. No. 82,406**
**Int. Cl.[3] E21B *33/128, 33/129;* F16J *15/12, 15/14***
**U.S. Cl. 166—120** **22 Claims**



**11**. In a packer for forming a seal with the inner wall of a casing string and having a sealing unit carried on a mandrel means, the sealing unit comprising:

a. each end element having a partially elliptical cross section with parallel cylindrical inside and outside diameters;

b. the major axis of the partially elliptical cross sections forming an acute angle with the exterior of the mandrel means when the sealing unit is in its first position; and

c. the major axis moving towards a position normal to the mandrel means when the sealing unit is in its second position.

**17**. In a well packer, for sealing between the outside diameter of a tubing string and the inside diameter of a casing string disposed within a well bore, the sealing unit, carried on the exterior of a mandrel means, comprising a center element, end elements, and backup rings wherein:

a. the center element is selected from the group consisting of ethlene propylene-diene terpolymer, vinylidene fluoride and hexafluoropropylene copolymer, and polytetrafluoroethylene; and

b. the end elements are selected from the group consisting of vinylidene fluoride, hexafluoropropylene copolymer, asbestos, graphite, and ceramic fibers with each being reinforced by wire mesh.

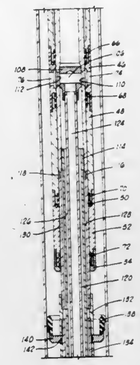


**4,296,807**

**CROSSOVER TOOL**

**James D. Hendrickson, Carrollton, and Pat M. White, Lewisville, both of Tex., assignors to Halliburton Company, Duncan, Okla.**

**Filed Dec. 27, 1979, Ser. No. 107,752**
**Int. Cl.[3] E21B *33/124***
**U.S. Cl. 166—184** **23 Claims**



**1**. A crossover tool for use in a well bore, comprising:

body means having first and second passage means therethrough, said first passage means extending from the top of said body to the bottom thereof at a first location, said second passage means extending from at least one side of said body to the bottom thereof at a second location;

sleeve means longitudinally slidably disposed about said body means, said first passage means communicating with the bore of said sleeve means, said sleeve means having at least one port therethrough circumferentially aligned with said side extent of said second passage means and being juxtaposed therewith in a first sleeve position and longitudinally removed therefrom in a second sleeve position;

packer means disposed about said body means below the lowest point of longitudinal travel of said sleeve means;

selectively closeable bypass passage means in said body means extending from the outside of said body means above said packer means to the outside of said body means below said packer means; and

selection means to select each of said positions in response to longitudinal movement of said sleeve means.

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**4,296,808**

**ISOLATION PACKER EXTENSION**

**Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Services, Duncan, Okla.**

**Division of Ser. No. 958,706, Nov. 8, 1978. This application Aug. 4, 1980, Ser. No. 174,820**
**Int. Cl.[3] E21B *33/124***
**U.S. Cl. 166—191** **5 Claims**

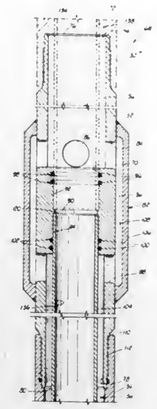
**1**. An isolation packer extension, comprising:

a cylindrical middle body, said middle body including an axial bore therethrough for receiving an upper inner mandrel therein, a first axial counterbore communicating with an upper end of said middle body, and a second axial counterbore communicating with a lower end of said middle body;

a bypass means, communicating said first axial counterbore with said second axial counterbore;

a spacer coupling, connected at an upper end to said middle body, said spacer coupling being constructed for connection at its lower end to a lower body, to which lower body is attached a lower packer assembly; and

a lower inner mandrel, an upper end of which is closely received in said axial bore of said middle body, and a



lower end of which is constructed to be closely received within an axial bore of said lower body.

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**4,296,809**

**IN SITU GASIFICATION OF BITUMINOUS COAL**

**Shirley C. Tsai, Pittsburgh; Richard H. Graham, O'Hara Township, Allegheny County, and Robin R. Oder, Export, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Jul. 21, 1980, Ser. No. 170,796**
**Int. Cl.[3] E21B *43/247;* E21C *43/00***
**U.S. Cl. 166—259** **11 Claims**

**1**. In the underground gasification of a swellable bituminous coal by the injection of air into the high gas flow linkage between an injection hole and a production hole accompanied by the concurrent underground partial combustion and gasification of said coal, a method for pretreating and conditioning the coal proximate to said linkage before said partial combustion and gasification is initiated which comprises the step of injecting pretreating air at a temperature between about 100° C. and up to about the softening temperature of said coal into said injection hole and through said linkage to said production hole in the absence of combustion at a flow rate and for such time as will substantially reduce the swelling of said coal proximate to said linkage, whereby the gas permeability of said coal proximate to said linkage is enhanced and the plugging of said linkage in the subsequent partial combustion and gasification step is suppressed.

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**4,296,810**

**METHOD OF PRODUCING OIL FROM A FORMATION FLUID CONTAINING BOTH OIL AND WATER**

**Ernest H. Price, 1266 Pepper Dr., El Centro, Calif. 99243**

**Filed Aug. 1, 1980, Ser. No. 174,350**
**Int. Cl.[3] E21B *43/02. 43/38***
**U.S. Cl. 166—265** **6 Claims**

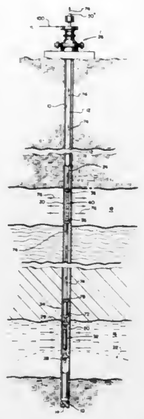
**1**. A method of producing oil from a formation fluid containing both oil and water comprising the steps of:

providing a production casing in a well bore traversing both a production zone and a disposal zone located at vertically spaced apart levels with respective sets of perforations connecting the interior of the production casing with the two said zones;

drawing formation fluid from the production zone through said perforations into a separator assembly disposed within said casing in the region of the production zone, causing the formation fluid to pass in contact with a sur-

face of filter medium of the separator assembly, which filter medium is permeable to one component of the formation fluid;

maintaining a pressure gradient across said filter medium; and



pumping the separated oil from one side of the filter medium to the surface and pumping the separated water from the other side of the filter medium through the production casing to said disposal region and discharging said water at said disposal level.

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**4,296,811**

## METHOD FOR PERMEABILITY CORRECTION BY IN SITU GENESIS OF MACROEMULSIONS IN HARD BRINE

**Charles W. Morris, Sante Fe Springs, Calif., and Ronald E. Terry, Lawrence, Kans., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 6, 1978, Ser. No. 922,453**
**Int. Cl.³ E21B *33/138, 43/22***
**U.S. Cl. 166—273** **17 Claims**

**1**. A process for recovering oil from a subterranean oil-bearing reservoir having zones of varying permeability and containing connate water having divalent ions comprising the steps of:

(a) injecting into said reservoir through at least one injection well a surfactant system, thereby selectively plugging high permeability zones, said surfactant system comprising: water; 0.5 to 12 weight percent based on the weight of said water of a petroleum sulfonate surfactant having an average equivalent weight within the range of 375 to 500; 250 to 17,000 parts per million by weight of a predominantly sodium chloride electrolyte based on the weight of said water; and 1 to 12 weight percent based on the weight of said water of a cosurfactant selected from the group consisting of amides, amines, esters, aldehydes and ketones containing 1 to 20 carbon atoms and alcohols containing 4 to 7 carbon atoms, which cosurfactant has a solubility in water within the range of 0.5 to 20 grams per 100 grams of water, said surfactant system having less than 1 weight percent oil;

(b) thereafter injecting a secondary or tertiary oil recovery system through at least one injection well so as to displace oil toward at least one recovery well; and

(c) recovering oil from said at least one production well.

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**4,296,812**

## SURFACANT WATERFLOODING OIL RECOVERY METHOD

**George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 46,132, Jun. 6, 1979, abandoned. This application Dec. 21, 1979, Ser. No. 106,212**
**Int. Cl.³ E21B *43/22***
**U.S. Cl. 166—274** **14 Claims**

**1**. In a method for recovering petroleum from a subterranean, permeable, petroleum-containing earth formation penetrated by at least one injection well and by at least one production well, by a surfactant waterflooding method comprising injecting an aqueous fluid containing from 0.5 to 10.0 percent of an alklypolyalkoxyalkylene sulfonate, an alkylarylpolyalkoxyalkylene sulfonate, or a mixture thereof, having the following formula:

$$R_aO(R_a'O)_{na}R_a''SO_3^-M^+$$

wherein $R_a$ is an alkyl group having from 6 to 24 carbon atoms, or an alkylaryl consisting of benzene, toluene or xylene having attached thereto at least one alkyl group containing from 5 to 22 carbon atoms, $R_a'$ is ethylene or a mixture of ethylene and higher molecular weight alkylene with relatively more ethylene than higher alkylene, $R_a''$ is ethylene, propylene, hydroxypropylene or butylene, $n_a$ is a number from 1 to 20, and M is sodium, potassium, lithium or ammonium, said fluid being injected into the formation via the injection well and displacing petroleum through the formation to the producing well where it is recovered to the surface of the earth, the improvement which for increasing the oil recovery effectiveness of the aqueous surfactant fluid comprises:

incorporating in the surfactant fluid, an effective amount in the range of from 10 to 1000 parts per million of silica-polydialkylsiloxane comprising silica having particle size in the range from 0.005 microns to 2.0 microns wherein the polydialkylsiloxane has the following formula:

$$HO(SiR_bR_b'O)_{nb}H$$

wherein $R_b$ and $R_b'$ are each a $C_1$ to $C_6$ alkyl, nb is a number from 1 to 2000, H is hydrogen, O is oxygen, and Si is silicon.

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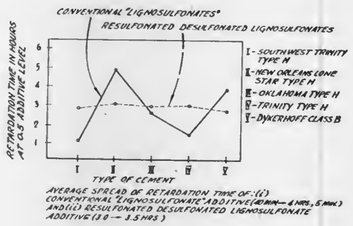
**4,296,813**

## WELL CEMENTING

**William J. Detroit, Schofield, and Michael E. Sanford, Wausau, both of Wis., assignors to American Can Company, Greenwich, Conn.**

**Division of Ser. No. 671,159, Mar. 29, 1976, Pat. No. 4,065,318. This application Feb. 7, 1977, Ser. No. 766,079**
**Int. Cl.³ C04B *7/02, 7/35;* C07G *1/00;* E21B *33/13***
**U.S. Cl. 166—293** **18 Claims**




AVERAGE SPREAD OF RETARDATION TIME OF: (i) CONVENTIONAL "LIGNOSULFONATE" ADDITIVE (4 MIN. — 4 HRS., 5 MIN.) AND (ii) RESULFONATED DESULFONATED LIGNOSULFONATE ADDITIVE (3.0 — 3.5 HRS.)

**1**. In the process of drilling wells and borings into the earth's surface, including the injection of a hydraulic cement mixture thereinto, the improvement that comprises including in said hydraulic cement mixture, between about 0.05 percent and about 3 percent by weight of the resulting mixture, of a retarding agent composition for said hydraulic cement mixture that is an alkaline oxidized, hydrolyzed, partially desulfonated and subsequently resulfonated lignosulfonate, said resulfonated lignosulfonate having substituted therein as the resulfonation units, those of the formula:

$$-SO_3H,$$

said resulfonated lignosulfonate containing, on a percent by weight basis, based on composition weight, between about 1½ weight percent and about 15 weight percent of total sulfur in combined organic sulfonic sulfonate form; said lignosulfonate prior to resulfonation having a relative molecular size of substantially 1,000 to 20,000.



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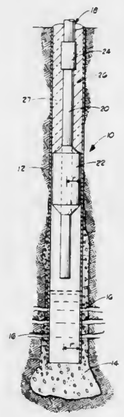
**4,296,814**

## METHOD FOR THERMALLY INSULATING WELLBORES

**John L. Stalder, Ventura, Calif., and William L. Martin, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Jul. 18, 1980, Ser. No. 170,273**
**Int. Cl.³ E21B *43/24***
**U.S. Cl. 166—303** **23 Claims**



**1**. A method of thermally insulating a well bore containing a tubing string to reduce heat transfer between the well bore and surrounding formations comprising the steps of:

introducing a heat-activated gel-forming fluid having heat insulating properties when gelled between said well bore and tubing string; and

causing said gel-forming fluid to be heated and thereby gelled.

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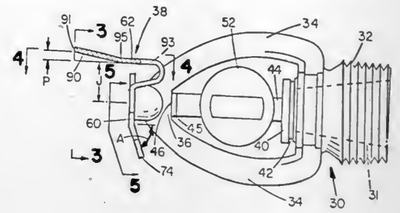
**4,296,815**

## DEFLECTOR WITH CONVERGING LOWER TINES FOR HORIZONTAL SPRINKLER

**James W. Mears, Warwick, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.**

**Filed Mar. 10, 1980, Ser. No. 128,818**
**Int. Cl.³ A62C *37/08***
**U.S. Cl. 169—37** **6 Claims**

**1**. A fire protection sprinkler head including a throat through which a nearly horizontal stream of fire retardant fluid can flow and a deflector spaced downstream from the flow emerging out of said throat, said deflector including a generally planar confining element more nearly horizontal than vertical which is positioned above the longitudinal axis of said throat for the purpose of confining the upward trajectory of a portion of the stream and a plurality of fluid-deflecting elements positioned below the confining element for the purpose of deflecting and distributing other portions of the stream, some of said fluid-deflecting elements defining between themselves a plurality of slots extending generally outwardly from beneath said axis, at least one of said slots extending generally downward from said axis, the improvement wherein said downwardly-extending slot is substantially narrower in width at its outermost extremity than at an intermediate location that is closer to said axis, so as to raise the trajectory of fluid passing through said slot.



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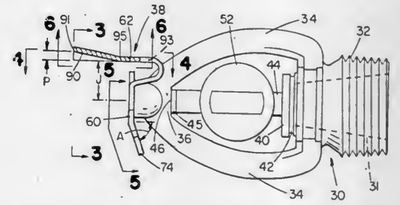
**4,296,816**

## HORIZONTAL SPRINKLER DEFLECTOR WITH FLOW LIFTING FORMATION

**Michael A. Fischer, North Kingstown, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.**

**Filed Mar. 10, 1980, Ser. No. 128,820**
**Int. Cl.³ A62C *37/08***
**U.S. Cl. 169—37** **19 Claims**



**1**. In a fire-protection sprinkler head of the horizontal-sidewall type, including a throat through which a horizontal stream of fire-retardant fluid can flow, a deflector spaced from said throat and in the path of said stream for generating a spray into an area, said deflector including a generally planar confining element more nearly horizontal than vertical disposed above the longitudinal axis of said throat for the purpose of confining the upward trajectory of a portion of said stream and a deflector structure below said element for the purpose of deflecting and distributing other portions of said stream in various desired directions, said confining element extending generally longitudinally along the direction of said axis from an upstream end to a downstream end, a portion of said stream being incident upon the undersurface of said confining element and being caused to flow generally parallel to said under surface from said upstream end to said downstream end, the improvement wherein

said confining element is deformed upwardly along an area extending longitudinally from said downstream end to a region intermediate said upstream and downstream ends, thereby forming

an upwardly-deformed area and

generally undeformed areas laterally adjacent to said upwardly-deformed area,

the undersurface of said upwardly-deformed area being inclined upward relative to the undersurfaces of said generally undeformed areas, and

said upward inclination being chosen so that a portion of said stream entering said upwardly-deformed area is lifted upwardly from a flow direction generally parallel to the undersurface of said generally undeformed areas to a relatively upwardly inclined flow direction,

whereby the lifted portion of said stream departs from said confining element with a trajectory more upwardly inclined than the trajectory of other portions of said stream, thereby causing said lifted portion to reach more distant areas from said sprinkler head.

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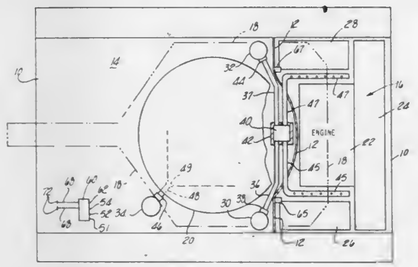
**4,296,817**

## FIRE SUPPRESSION SYSTEM FOR MILITARY TANKS

**Anthony J. Monte, Utica, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Nov. 5, 1979, Ser. No. 91,423**
**Int. Cl.³ A62C *35/12***
**U.S. Cl. 169—62** **1 Claim**



1. In a military tank, a hull having an internal bulkhead defining a driver compartment and an engine compartment, a rotary turret carried by the hull, and a man-accommodating basket depending from the turret into the drive compartment; the improvement consisting of means for suppressing fires in the engine compartment or in the hull space beneath the basket; said fire-suppressing means comprising first, second and third pressure-resistant bottles positioned in the driver compartment; vaporizable pressurized fire-suppressant charged into each bottle; first conduit means oriented to discharge first bottle suppressant into the engine compartment; a first electrically-operated valve for controlling flow through the first conduit means; second conduit means oriented to discharge second bottle suppressant into the engine compartment; a second electrically-operated valve for controlling flow through the second conduit means; third conduit means oriented to discharge third bottle suppressant into the hull space beneath the basket; a third electrically-operated valve for controlling flow thorugh the third conduit means; a cabinet located in the hull within reach of the human driver; first, second and third manual switches located in the cabinet for actuation by the driver to trigger respective ones of the valves to their open conditions; flame-responsive sensor means for detecting the occurrence of a fireball in the engine compartment; an alarm device located in the cabinet and energizable by said sensor means to alert the driver to the presence of a fire in the engine compartment; an electrical circuit operated by the sensor means to trigger at least one of the first and second valves to the open condition, whereby fires in the engine compartment can be suppressed automatically or under manual control, and fires in the hull space beneath the basket can be suppressed under manual control; fourth, fifth and sixth manual switches located within the cabinet in electrical parallelism with respective ones of the first, second and third switches; and a cable operator for each of the fourth, fifth and sixth switches; each cable operator being accessible from a point external to the hull; each of the fourth, fifth and sixth switches being a toggle switch having a lever operator; each cable operator including an apertured element (66) and a tension spring (70); each apertured element having one of its ends thereof connected to a cable and its other end connected to a spring; each spring being anchored within the aforementioned cabinet to draw the associated toggle switch to a circuit-open position.

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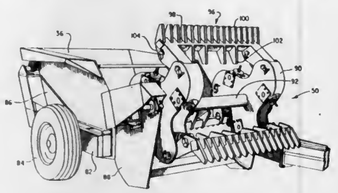
**4,296,818**

## ROTARY ROCK PICKER

**Leon Malinowski, and Kenneth Lange, both of Yorkton, Canada, assignors to Leon's Manufacturing Co., Ltd., Saskatchewan, Canada**

**Filed Apr. 10, 1979, Ser. No. 28,661**
**Claims priority, application Canada, Jan. 16, 1979, 319699**
**Int. Cl.³ A01B *43/00***
**U.S. Cl. 171—63** **4 Claims**



1. A rock picking apparatus comprising a mobile frame, a pair of spaced assembly support members on said frame, a fork and reel assembly on said support members of the frame for picking rocks from the ground and a dumpable stone storage bucket mounted on said frame behind said fork, said fork and reel assembly including an axle and a pair of spaced side plates at each end of the axle, and journalled for rotation in the assembly support members and supporting between them a plurality of rakes; each said rake having a pair of spaced legs pivotally mounted to said side plates; and compression spring means connecting the trailing sides of said rakes to said pairs of side plates and biasing said rakes to an operative position wherein one end of each spring means is pivotally secured to the trailing side of a rake and the other end of the spring means is supported between one of said pairs of side plates; the fork and reel assembly including a lower cross member extending between and secured to said assembly support members adjacent the lower ends thereof and a parallel, upper cross member also secured to the support members, said fork having a plurality of tines spaced along said cross members at right angles thereto to mesh with the teeth of said rakes; all of the tines being secured adjacent their lower ends to the lower cross members and alternate tines being secured adjacent their upper ends to the upper cross member.

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**4,296,819**

## CABLE TENSIONER FOR A DOWNCROWDING DEVICE FOR EARTH BORING MACHINES

**Charles R. Griste, Corsicana, Tex., assignor to Hughes Tool Company, Houston, Tex.**

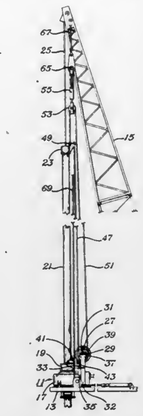
**Filed May 12, 1980, Ser. No. 147,999**
**Int. Cl.³ B23Q *5/027, 5/033***
**U.S. Cl. 173—147** **2 Claims**

1. In an earth boring apparatus having a kelly suspended by a mast, a downcrowding device having a rotatable drum, hydraulic ram means for moving the drum downwardly, brake means for preventing rotation of the drum, and a downcrowding cable connected directly to the top of the kelly and wrapped around the drum, an improved take-up means for removing slack in the downcrowding cable when raising the drum, comprising in combination:

a take-up sheave carried below the mast;

a take-up cable wrapped around the drum and extending from the drum on a side opposite to the side that the downcrowding cable extends from, the take-up cable being reeved over the take-up sheave and connected to the top of the kelly; and

cable tensioner means connected between the take-up sheave and the mast for allowing the take-up sheave to move downwardly with respect to the mast as the kelly and drum move downwardly during drilling, and for urging the take-up sheave upwardly with respect to the mast to rotate the drum and take up slack as the drum is moved upwardly with the brake being released.



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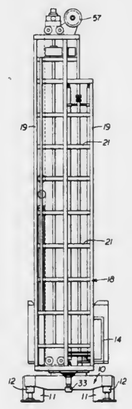
**4,296,820**

## DRILLING APPARATUS

**James B. Loftis, P.O. Box 38, Remlap, Ala. 35217**

**Filed Feb. 1, 1980, Ser. No. 117,562**
**Int. Cl.³ E21C *11/02***
**U.S. Cl. 175—52** **19 Claims**



1. The combination with drilling apparatus having an elongated frame supporting a transmission unit for longitudinal movement therein with the transmission unit operatively connecting a longitudinally extending polygonal drive shaft to a driven head disposed to be threadedly connected to one end of an adjacent drill rod section extending in axial alignment therewith with the other end of the drill rod section being threadedly connected selectively to another drill rod section and a drill bit for drilling a hole into the earth, the improvement comprising:

(a) a drill rod rack mounted for rotation about an axis within said elongated frame and adapted to carry a plurality of angularly spaced drill rod sections with said drill rod sections being movable sequentially into axial alignment with said driven head upon rotation of said drill rod rack to selected angular positions about said axis so that as each drill rod section carried by said drill rod rack is moved into axial alignment with said driven head it is positioned to drill a hole while said drill rod section and said driven head move through said drill rod rack, and

(b) a breaker unit carried by the end of said elongated frame adjacent the hole being drilled into the earth and in axial alignment with said driven head for breaking the joint selectively between said driven head and a drill rod section, between drill rod sections and between a drill rod section and a drill bit.

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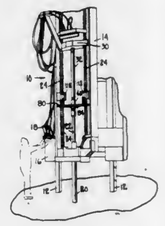
**4,296,821**

## DRILLING RIG AND CONVERSION APPARATUS

**Leslie Larson, P.O. Box 334, Mabel, Minn. 55954**

**Filed Feb. 7, 1980, Ser. No. 119,461**
**Int. Cl.³ E21B *4/06, 6/00, 7/20***
**U.S. Cl. 175—87** **13 Claims**



1. Apparatus for converting a bottom-hole percussion drilling rig of the type including a ram adapted to apply linear force in a desired direction to a length of drill rod extending from said ram in said direction, a percussion assembly attached to said drill rod at an end opposite the end at which said drill rod extends from said ram and having a receptacle open and extending axially in the direction in which the linear force is applied, to which assembly the linear force and rotational movement about the axis with respect to which the receptacle extends are applied by said drill rod, a piston mounted within the receptacle for reciprocating axial movement, and a bit element normally disposed within the receptacle so that the piston can percussively engage an anvil portion of the element, to a top-of-the-hole rig wherein said percussion assembly is mounted to said rig proximate said ram with said receptacle open and extending axially in the direction in which said ram applies linear force, and wherein said drill rod extends generally from said percussion assembly with said bit element attached to said drill rod at an end opposite an end by which said rod extends generally from said percussion assembly, which rig can simultaneously effect hole drilling and driving of casing, enclosing said drill rod, for retaining the inner surface of the hole, comprising:

first means configured to be operatively connected to the percussion assembly and disposed within said receptacle in place of said bit element for transmitting percussive force generated by the reciprocating axial movement of the piston and the linear force of the ram to an axial end of the casing; and

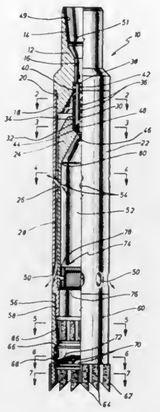
second means attached to said first means for transmitting said percussive force, the linear force of the ram, and the rotational movement to the drill rod.

**4,296,822**

## MULTIPURPOSE FLUID FLOW ASSISTED DOWNHOLE TOOL

**Ronald D. Ormsby, Woodlands, Tex., assignor to Omega Tools International, Houston, Tex.**

**Filed Nov. 26, 1979, Ser. No. 97,496**
**Int. Cl.³ E21B** *25/12*
**U.S. Cl. 175—249** **21 Claims**



1. A multipurpose fluid flow assisted downhole tool for removing metal objects and formation core samples from the bottom of wells, said downhole tool comprising:

a tubular connection sub for connecting said tool to a pipe string to be extended into a well bore:

elongated tubular housing means being secured to said connection means and defining an internal object receiving chamber, said housing means further defining fluid flow means allowing circulation of fluid from said pipe string through said connection sub and through at least a portion of said housing means, said housing means including

an outer barrel being connected at the upper extremity thereof to said tubular connection sub, said outer barrel defining velocity jet means,

an inner barrel being fixedly disposed within said outer barrel, said inner barrel defining an internal chamber and cooperating with said outer barrel to define first fluid passage means between said inner and outer barrels, said first fluid passage means being in communication with said velocity jet means, and

means for selectively directing fluid flowing through said tubular connection sub to said fluid passage means and for selectively directing fluid flowing through said tubular connection to said internal chamber;

an object receptacle being provided at the lower extremity of said housing means and defining an object receiving opening;

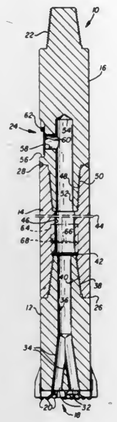
a plurality of flexible radial fingers being connected to the interior of said object receptacle and extending transversely toward the center of said object receptacle and being positioned in upwardly inclined relation, said radial fingers being sufficiently flexible in the upward direction to allow passage of an object past said fingers into said object receptacle and being sufficiently rigid in the downward direction to prevent objects from falling out of said object receptacle.

**4,296,823**

## CABLE TOOL WITH CIRCULATING DRILL STEM

**Wayne Gholson, Scottsville, Ky., assignor to Varel Manufacturing Company, Dallas, Tex.**

**Filed Oct. 11, 1979, Ser. No. 83,988**
**Int. Cl.³ E21B** *7/00, 10/36, 27/00*
**U.S. Cl. 175—308** **18 Claims**



1. In a cable tool for crushing and cutting rock and earth by a dropping action to form a well hole, the cable tool having a tool bit with a cutting face for dropping against rock and earth and having an upper tool body connected to the tool bit with an upper body end for connection to a cable for extending down the well hole, the improvement comprising:

at least one opening in the cutting face of the tool bit for receiving and removing rock and earth particles from the bottom of the well hole to facilitate the crushing and cutting of the rock and earth;

a passageway in the tool bit extending from said opening to the upper tool body for transmitting rock and earth particles upwardly away from the cutting face and the bottom of the well hole;

a retention chamber formed in the upper tool body for receiving rock and earth particles from said passageway to contain and store the rock and earth particles for subsequent removal when the cable tool is removed from the well hole; and

pressure relief drain means formed through the side of the upper tool body from the exterior thereof to the retention chamber for draining liquid and releasing pressure from said retention chamber, whereby liquid, rock and earth particles are received through the opening, transmitted through said passageway, with rock and earth particles retained within the retention chamber and liquid passing through said chamber and out of said pressure relief drain means.

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**4,296,824**

## NOZZLE PLACEMENT IN LARGE DIAMETER EARTH BORING BITS

**Kerry S. Kennington, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.**

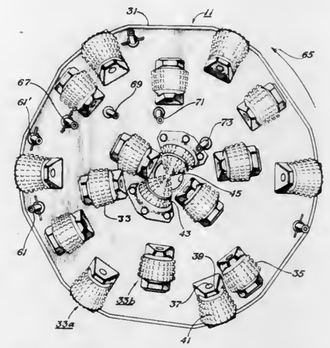
**Filed Jun. 29, 1978, Ser. No. 920,561**
**Int. Cl.³ E21B** *10/18*
**U.S. Cl. 175—340** **6 Claims**

1. In a drill bit for drilling a borehole in the earth of the type having cutter support means, a plurality of rotatable cutters mounted to the cutter support means for cutting an annular outer zone at the periphery of the borehole and a circular inner zone bounded by the outer zone, connection means for connecting the cutter support means to a string of drill pipe having at least one input and one return flow passage extending from the drill bit to the surface for pumping fluid to the drill bit and returning fluid and cuttings to the surface, and an intake port in the cutter support means in communication with the return flow passage for transmitting cuttings to the return flow passage, an improved nozzle means for discharging fluid from the input passage against the borehole, comprising:

at least one outer zone nozzle mounted adjacent the periphery of the cutter support means, the outer zone nozzle being in communication with the input passage and pointed so that the center of its discharge strikes the outer zone; and

a plurality of inner zone nozzles spaced at selected points on the cutter support means and pointed so that the centers of





their discharges strike the inner zone, one of the inner zone nozzles being located near the outer zone nozzle, another inner zone nozzle near the intake port, and at least one inner zone nozzle spaced between, the outer zone nozzle and each inner zone nozzle having a nonrotating area of influence, the area of influence of the outer zone nozzle leading, being further outward, and overlapping the area of influence of the nearest inward inner zone nozzle, the area of influence of each inner zone nozzle leading, being further outward, and overlapping the area of influence of its nearest inward inner zone nozzle, the area of influence of the inner zone nozzle closest to the intake port extending below the intake port, to create a continuous stream flowing from the periphery of the borehole to the intake port.

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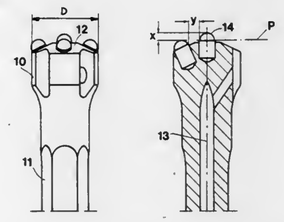
**4,296,825**

## ROCK DRILL

**Lars E. Larsson, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden**

**Continuation-in-part of Ser. No. 854,752, Nov. 25, 1977, abandoned. This application Oct. 4, 1979, Ser. No. 81,785**
**Int. Cl.³ E21C** *13/01*
**U.S. Cl. 175—410** **11 Claims**



1. A rock drill for percussion drilling comprising a bit body, said bit body including a front face extending generally transversely relative to the longitudinal axis of said bit body, a substantially central button insert of hard material, said central button insert extending longitudinally outwardly of said front face substantially in alignment with said longitudinal axis, and at least a first row of circumferentially spaced outer button inserts of hard material, there being more than two outer inserts disposed on more than two different radii from said axis, said outer button inserts extending outwardly of said front face and being inclined at an angle relative to said longitudinal axis and being arranged to define an outer diameter (D) of the hole drilled by the rock drill, said central and outer inserts each including a working surface disposed on the front of a mounting portion of the insert, said mounting portion being embedded along substantially all of its length within said bit body, said working surface being characterized by an absence of an edge extending radially of said longitudinal axis when viewed along said axis, the improvement wherein the ratio of Y to D is in the range of 8% to 22%, where Y is the distance between opposed side faces on said central button insert and at least one of said outer button inserts when measured at said front face, and the ratio of X to D is no greater than 20%, where X is the outward extent of the outer end of said central button insert beyond a transverse plane through the outer end of at least one of said outer button inserts.

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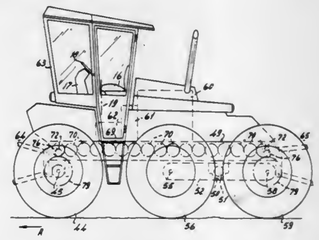
**4,296,826**

## VEHICLE HAVING BOGIE MOUNTED WHEELS

**Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland**

**Filed Apr. 20, 1979, Ser. No. 32,030**
**Claims priority, application Netherlands, Apr. 26, 1978, 7804438**
**Int. Cl.³ B62D** *61/10*
**U.S. Cl. 180—24** **10 Claims**



1. An agricultural tractor comprising a frame, an engine carried by said frame, a tractor hitching device mounted on the rear of said frame, at least three ground engaging wheels mounted on each side of said frame, said ground engaging wheels on each side being aligned one behind the other with respect to the tractor's direction of travel, a cradle frame part, said cradle frame part comprising two carrier beams which are effectively parallel to the tractor's plane of symmetry, at least two but not all of said aligned wheels on each side of said frame mounted on a corresponding said carrier beam of said cradle frame part, each said carrier beam being independently pivotable relative to said tractor frame about a substantially fixed axis extending normally relative to the tractor's plane of symmetry and between the axes of rotation of said two wheels which are mounted on each said carrier beam, steerable wheels mounted at the front of said frame forward of said cradle frame part, said steerable wheels being pivotable relative to said frame about at least one horizontal axis substantially directed parallel to the tractor's plane of symmetry, drive means connecting said front steerable wheels and the rear wheels mounted on said cradle frame part whereby such wheels are driven by said engine, and steering means for said tractor connected to said steerable wheels and only the rearmost

wheels of said wheels mounted on each side of said cradle frame part.

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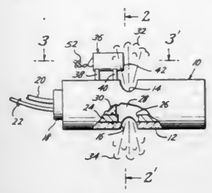
**4,296,827**
**AIR-GUN FIRE TIME SENSOR**
**Ben B. Thigpen, and James A. Porter, Jr., both of Houston, Tex., assignors to Western Geophysical Company of America, Houston, Tex.**
**Filed Jul. 10, 1978, Ser. No. 922,952**
**Int. Cl.³ G01V** *1/137, 1/38*
**U.S. Cl. 181—107** **8 Claims**



1. A resistive sensor for determining the firing instant of an air gun that is used in seismic exploration in a body of water, the air gun including an air exhaust port for emitting a jet of compressed air, the sensor comprising:
an electrode assembly exposed to the surrounding water mounted adjacent the air exhaust port; and
means for detecting the change in electrical resistance across said electrode assembly when said air gun is fired.

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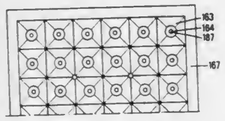
**4,296,828**
**MOBILE DEVICE FOR GENERATING ACOUSTIC SHEAR WAVES**
**Pierre-Claude Layotte, Les Mathes, and Andre James, Royan, both of France, assignors to Institut Francais du Petrole, Ruell-Malmaison, France**
**Filed Jul. 5, 1979, Ser. No. 55,098**
**Claims priority, application France, Jul. 5, 1978, 78 20009**
**Int. Cl.³ G01V** *1/047*
**U.S. Cl. 181—121** **8 Claims**



1. A device for generating acoustic shear waves in the earth comprising;
a target-member having a coupling surface for coupling with the earth;
mass means for striking said target-member when coupled to the earth;
moving means operatively associated with said mass means for imparting to said mass means a velocity component parallel to said coupling surface;
coupling means comprising a plurality of independent zones on said coupling surface for coupling with the earth; and suction means connected to said target-member for generating a suction in each zone of said plurality of independent zones for coupling said target-member with the earth at said each zone.

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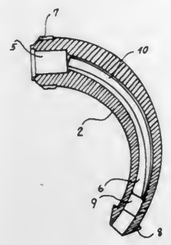
**4,296,829**
**HOOK-SHAPED PART OF A BEHIND-THE-EAR HEARING AID**
**Jorgen R. Pedersen, Gentofte, Denmark, assignor to Danavox A/S, Copenhagen, Denmark**
**Filed Dec. 14, 1979, Ser. No. 103,651**
**Claims priority, application Denmark, Dec. 15, 1978, 5662/78**
**Int. Cl.³ H04R** *25/02*
**U.S. Cl. 181—129** **6 Claims**



1. An improved hook shaped part for a behind-the-ear hearing aid, said hook shaped part being hollow and at one end formed to be connected to an acoustic output from the upper front end of the hearing aid case and serving to transmit sound from the hearing aid in the direction of the ear, normally through a tube and an ear plug, and also serving to support the hearing aid upon the outer ear, the improvement comprising an acoustic filter arranged in the hook shaped part at the end furthest from the hearing aid and the hook shaped part having a channel of progressively increasing cross-sectional area in the direction away from the hearing aid.

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**4,296,830**
**PRODUCT PROVIDED WITH SOUND DAMPING ELEMENT**
**Bror L. E. Rossander; Lennart C. Ermebrant, both of Fagersta, and Martin Lesser, Lulea, all of Sweden, assignors to Fagersta A.B., Fagersta, Sweden**
**Filed Jul. 10, 1979, Ser. No. 56,293**
**Claims priority, application Sweden, Jul. 12, 1978, 7807779**
**Int. Cl.³ F16F** *15/00*
**U.S. Cl. 181—208** **9 Claims**

1. In a product of metal formed with a hole or cavity, particularly a rock drill steel, and provided with at least one element of hard material for damping noise produced during use deriving from the product when it is subjected to impacts, percussions or vibrations generating in the product sound waves annoying to the human ear, the improvement comprising the



sound damping element, which is arranged within the hole in the product, is a hollow tubular member and has at least one contact surface, which contacts the wall of the hole during use, loosely arranged relative to the wall of the hole, said sound damping element being fixedly attached within said hole to said product at at least one position of the damping element other than said contact surface to prevent longitudinal displacement of said element with respect to said product, and at least along said contact surface having a small cross-sectional area in relation to the cross-section of the hole, and said contact surface being located between the nodes of the sound waves so as to create a dry friction-producing relative movement between said contact surface of the damping element and the wall of the hole.

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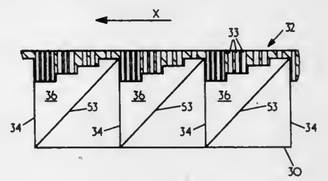
**4,296,831**
**ACOUSTIC LINER FOR ATTENUATING NOISE**
**Stuart C. Bennett, Derby, England, assignor to Coal Industry (Patents) Limited, London, England**
**Filed Apr. 17, 1980, Ser. No. 141,250**
**Claims priority, application United Kingdom, May 23, 1979, 17965/79**
**Int. Cl.³ E04F** *17/04*
**U.S. Cl. 181—224** **10 Claims**



1. An acoustic liner for attenuating noise, comprising a backing face, a perforated facing sheet and a wave guide assembly extending between the backing face and the perforated facing sheet to define a plurality of cells, the portion of the perforated facing sheet associated with each cell having a non-uniform thickness.

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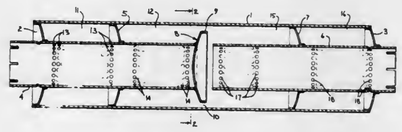
**4,296,832**
**EXHAUST MUFFLER**
**Kenneth J. Kicinski, Stoughton, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.**
**Filed Nov. 14, 1979, Ser. No. 94,001**
**Int. Cl.³ F01N** *1/00*
**U.S. Cl. 181—255** **7 Claims**



1. An exhaust muffler, comprising an outer casing including a body having open opposite ends and including a pair of heads to enclose the open ends of the body, an exhaust inlet tube adapted to conduct exhaust gas to the muffler and mounted within an opening in the casing, a gas outlet tube mounted within an opening in the casing, a first baffle disposed within the casing and secured across the inner end of the inlet tube, said baffle extending radially outward beyond said inlet tube, and the peripheral edge of said baffle being spaced from the inner wall of said body, a flange disposed on the outer peripheral edge of said baffle and extending longitudinally of said body to provide an annular passage between said flange and said body said baffle being free of attachment to said body, said inlet tube being spaced inwardly from said body to provide a chamber therebetween and said inlet tube having a plurality of perforations providing communication between the interior of the inlet tube and said chamber, said baffle having an imperforate central section closing off the inner end of said inlet tube, whereby the exhaust gas and the sound energy is directed outwardly through said perforations into said chamber and then passes through said annular passage for discharge through said outlet tube.

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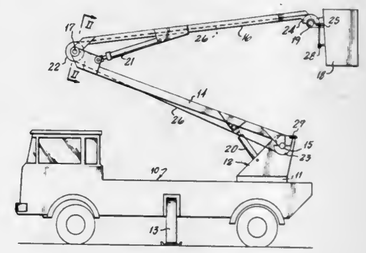
**4,296,833**
**HYDRAULICALLY OPERATED ACCESS EQUIPMENT**
**Denis H. Ashworth, Wombourne, England, assignor to Simon Engineering Dudley Limited, Dudley, England**
**Filed Apr. 13, 1979, Ser. No. 30,447**
**Int. Cl.³ B66F** *11/04*
**U.S. Cl. 182—2** **11 Claims**



1. Access equipment of the kind comprising a supporting structure upon which is mounted an articulated boom assembly comprisng one or more booms, the or each boom being connected to the supporting structure or to the next adjacent boom so as to be pivotable relative thereto about a horizontal axis to enable the outermost end of the boom assembly to be raised and lowered with respect to the supporting structure, and including hydraulic actuating rams for effecting movements of the boom assembly, characterised in that a guide member is provided at each end of the or each boom, in that at least one support line, being flexible throughout at least a part of its length, is attached at one end to the supporting structure and extends to dispose its other end at the outermost end of the boom assembly, lying substantially parallel to the boom or booms, and passing around said guide members at the ends thereof and is secured at the said outermost end, in that the said support line is maintained taut along a path whose length remains constant irrespective of the configuration of the boom assembly, and in that one or more flexible control lines are arrayed parallel with said support line, from said supporting structure, around said guide members and to the outermost end of said boom assembly, whereby said one or more control lines are retained taut and in close association with said support line in all phases of articulation of said boom to thus minimize wear of said one or more control lines caused by boom movement.

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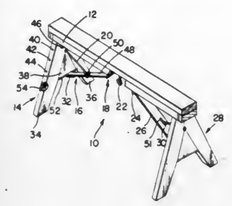
**4,296,834**
**FOLDING SAWHORSE**
**Walter Kroger, P.O. Box 331, Custer, S. Dak. 57730**
**Filed Jun. 1, 1979, Ser. No. 44,454**
**Int. Cl.³ F16M** *11/00*
**U.S. Cl. 182—155** **14 Claims**

1. In a folding sawhorse having a top, two sets of folding leg pairs, and a pair of braces of resilient material each associated with one of said sets of leg pairs, each of said braces pivotally mounted at one end on one of said associated leg pairs so as to extend between said associated leg pair and said top in the sawhorse set set up position, and brace locking means on said

top engagable with the other end of each of said braces to retain said brace in a state of compression between said associated leg pair and said top with said sawhorse in a set up position, and interlock latching means for each of said braces,



which interlock means extends rigidly between a brace and either a leg pair of said sawhorse top maintaining said brace in said state of compression to provide a highly stable folding sawhorse.

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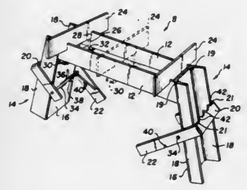
**4,296,835**
**BRACKET**
**Leonard E. Koffski, R.R. #4, 7534 Trans Canada Hwy., Duncan, British Columbia, Canada (V9L 3W8)**
**Continuation-in-part of Ser. No. 916,143, Jun. 16, 1978. This application Jun. 21, 1979, Ser. No. 50,558**
**Int. Cl.³ F16M *11/00***
**U.S. Cl. 182—184** **12 Claims**



**1**. A bracket for carrying a plank by means of support legs, which have a predetermined rectangular cross sectional configuration, comprising:
(a) a cross piece of predetermined length for carrying a plank;
(b) respective open faced channel members connected at each end of said cross piece and extending downwardly and outwardly therefrom, the open faces of said channel members opening in opposite directions and in the direction of the length of said cross piece, said channel members having a pair of internally rounded corners and an internal cross sectional widthwise dimension slightly larger than the widthwise dimension of said support legs such that said support legs engage with said channel members by respective contact of two corners of said support legs with the pair rounded corners of said channel members when said support legs are inserted in said channel members; and
(c) a bracket sleeve pivotally connected to each of the channel members for receiving and retaining support legs in a stationary position relative to said channel members.

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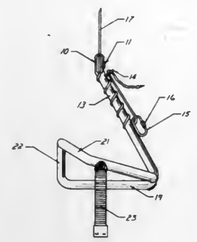
**4,296,836**
**SKY SEAT SAFETY DESCENT APPARATUS**
**Thomas F. Cooper, Lisco, Garden County, Nebr. 69148**
**Filed Mar. 20, 1978, Ser. No. 888,573**
**Int. Cl.³ A62B *1/00***
**U.S. Cl. 182—193** **2 Claims**

**1**. A descent apparatus comprising of a seat frame with an attached center post for retension and descending of a support rope, whereas the said support rope is placed through a confining means at the top of said center post wrapped several times around said center post placed through a lower confining



means at the lower portion of said center post and fastened to a tie-off hook attached to said center post directly below top said confining means.

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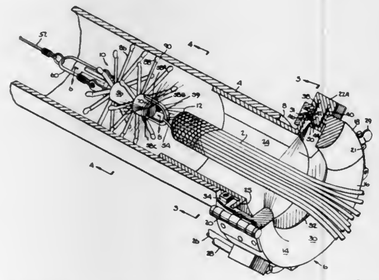
**4,296,837**
**APPARATUS AND PROCESS FOR LUBRICATING ELECTRICAL CABLE**
**Webster T. Charlton, Lowell, Mass., assignor to Stone & Webster Engineering Corp., Boston, Mass.**
**Filed May 15, 1979, Ser. No. 39,484**
**Int. Cl.³ F16N *9/00***
**U.S. Cl. 184—15 R** **13 Claims**



**10**. A process for lubricating cable being pulled through a conduit comprising the steps of:
delivering lubricant through a nozzle to the cable at the entry end of the conduit; and
delivering lubricant to the walls of the conduit in advance of the leading end of the cable as the cable moves through the conduit.

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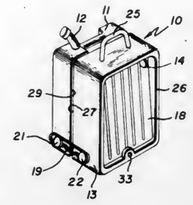
**4,296,838**
**AUTOMOTIVE OIL SYSTEM**
**Merrill L. Cohen, 222 Summer St., Worcester, Mass. 01608**
**Filed Jul. 27, 1979, Ser. No. 61,507**
**Int. Cl.³ B65D *85/00*; F16N *31/00***
**U.S. Cl. 184—106** **7 Claims**

**1**. Automotive oil system, comprising:
(a) a new oil container having a pouring spout,
(b) a container for used oil having an admission opening,



(c) first means holding the two containers together before use, and



(d) second means holding the containers together after use, including a closure for the admission opening in the container for used oil.

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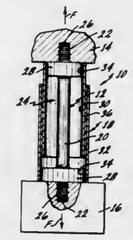
**4,296,839**
**STRUCTURALLY DAMPED BOLT**
**Robert C. Peller, and Jack E. Dyer, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.**
**Filed Sep. 26, 1979, Ser. No. 79,237**
**Int. Cl.³ F16F *7/08***
**U.S. Cl. 188—378** **1 Claim**



**1**. A structurally damped device for attenuating the vibrations between two structural members and having means for connecting said device to said structural members comprising:
means defining a first primary load path designed to take the basic load between said structural elements; and
means defining a second structural load path in parallel with said primary load path;
said means for defining a primary load path is a spring comprising a bolt having end bosses integral therewith and wherein said means for defining a secondary load path comprises sleeves of material one attached to each of the end bosses and placed in overlapping relationship with viscoelastic damping material located between the sleeves and loaded in shear.

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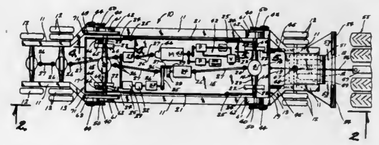
**4,296,840**
**TRACTOR PULL SLED**
**Richard J. Payne, R.R. #1, Box 293, Grand Island, Nebr. 68801**
**Filed Oct. 11, 1979, Ser. No. 83,748**
**Int. Cl.³ B62B *17/08***
**U.S. Cl. 188—8** **18 Claims**



**1**. A tractor pull sled comprising:
a frame having a forward end and a rearward end;
a plurality of ground engaging wheels attached to and supporting said forward end and said rearward end;
a pan movably mounted on said frame; said pan being movable between a first position wherein the weight of said pan is supported by said frame, and a second lowered position wherein said pan engages the ground and the weight of said pan is unsupported by said frame; and
means for moving said pan between said first position and said second position at a rate which is a function of the distance of forward travel of said sled.

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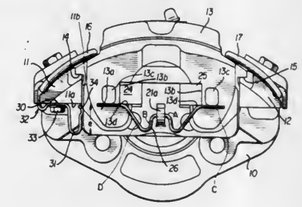
**4,296,841**
**ANTIRATTLE SPRING FOR A DISC BRAKE OF VEHICLES**
**Fumio Fujimori; Masatada Yokoi; Masakazu Ishikawa; Hiroshi Uemura, and Akira Shirai, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**
**Continuation of Ser. No. 868,214, Jan. 9, 1978, Pat. No. 4,214,649. This application Jan. 31, 1980, Ser. No. 117,358**
**Claims priority, application Japan, Jan. 8, 1977, 52-1095**
**Int. Cl.³ F16D *65/04***
**U.S. Cl. 188—73.38** **5 Claims**



**1**. A disc brake having a rotor including a pair of opposed friction faces, comprising:
a fixed torque taking member;
a pair of frictional elements, respectively disposed adjacent the opposite friction faces of the rotor;
a caliper straddling a part of said rotor together with said friction elements and free to slide on said torque taking member in the direction of the axis of rotation of the rotor;
hydraulic fluid acting means incorporated into said caliper and adapted to respectively urge said friction elements to the opposite friction faces of said rotor;
a pair of radially extending portions projecting from said caliper which includes internal faces and connecting with one of said friction elements;
a resilient member comprising a middle portion, a pair of radially extending portions extending radially inwardly from opposite ends of said middle portion, opposite end portions spaced radially outwardly from said middle portion and intermediate portions interconnecting said opposite end portions with said pair of radially extending portions, respectively, said resilient member being sustained at said middle portion thereof by said one of said friction elements and resiliently abuts said radially extending portions of said caliper at said opposite end portions thereof to thereby normally urge said one of said friction elements toward abutment against said internal faces of said radially extending portions of said caliper, wherein said radially extending portions of said caliper, respectively, include a pair of axially extending projections for restraining said opposite end portions of said resilient member from upward free movement and wherein said one of said friction elements includes a projection formed at a middle part thereof and having a receiving portion formed therein such that said resilient member is force fitted in said receiving portion;

said resilient member comprising a single wire;
a pair of notches formed in said radially extending portions of said caliper;
a pair of circumferentially spaced projections on said one of said pair of friction elements respectively slidably fitted in said pair of notches; and
said resilient member being bent at both ends of said middle portion to form said pair of radially extending portions which abut said one of said friction elements; said intermediate portions, said pair of radially extending portions and said pair of axially extending projections of said caliper restraining said opposite end portions from radial free movement while radially urging said one of said friction elements against said pair of notches at said pair of projections.

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**4,296,842**
**PAWL AND RATCHET MECHANISM**
**Larry G. Keast, Houston, Tex., and Herbert D. Horton, Mayhill, N. Mex., assignors to World Wide Oil Tools, Inc., Houston, Tex.**
**Filed Oct. 9, 1979, Ser. No. 83,162**
**Int. Cl.³ F16D** *63/00*
**U.S. Cl. 188—61** **12 Claims**

1. A pawl and ratchet mechanism comprising:
a housing having portions defining a plurality of apertures, each aperture of said plurality of apertures disposed within said housing at a fixed distance from each of the other apertures in said plurality of apertures;
a toothed track associated with said housing, said teeth of said track having spaces therebetween; and
a pawl element disposed within and movable within each of said plurality of apertures within said housing, said pawl elements being movable into and out of the spaces between the teeth of said toothed track and wherein at least one of said plurality of said pawl elements is movable into at least one of the spaces between the teeth of said toothed track irrespective of the location of said housing with respect to said toothed track when said housing engages said toothed track.

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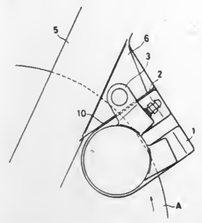
**4,296,843**
**DISC BRAKE FOR TWO-WHEELED VEHICLE**
**Yukinori Nishiyama, and Hideji Ichikawa, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**
**Filed Jan. 18, 1980, Ser. No. 113,422**
**Claims priority, application Japan, Jan. 19, 1979, 54-7036[U]**
**Int. Cl.³ F16D** *55/224*
**U.S. Cl. 188—73.43** **2 Claims**

1. A floating type disc brake for a two-wheeled vehicle comprising: two pad assemblies, a caliper including a caliper cylinder and a caliper arm, one of said pad assemblies being operatively coupled to said caliper cylinder and the other of said pad assemblies being supported by said caliper arm, a pin for securing said caliper to a stationary member of a fork member of said vehicle, said pin being disposed in a through-hole in said stationary member, recesses being provided in one of said stationary member and said pin within said through-hole, elastic members disposed in said recesses to at least partially fill a portion of a gap between said stationary member and said pin wherein upon application of a sufficiently high force said pin is brought into operative abutment with said stationary member so as to stop compression of said elastic members, and a collar member positioned around said pin, said



recesses in which said elastic members are disposed being provided in an outer wall of said collar.

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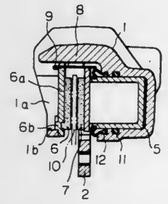
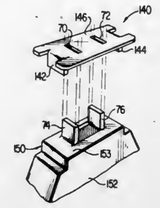
**4,296,844**
**FLOATING CALIPER TYPE DISC BRAKE**
**Koichi Tamura, Tokyo, and Tetsuo Haraikawa, Funabashi, both of Japan, assignors to Tokico Ltd., Japan**
**Filed Sep. 11, 1979, Ser. No. 74,807**
**Claims priority, application Japan, Sep. 20, 1978, 53-129172**
**Int. Cl.³ F16D** *65/04*
**U.S. Cl. 188—73.38** **5 Claims**



1. A floating caliper disc brake which comprises:
a. a rotatable disc to be braked,
b. a stationary member adapted to be secured to a non-rotatable structure carrying said disc,
c. a caliper slidably mounted on said stationary member through a resilient member and said caliper having a bridge portion which bridges said disc in the direction of the rotational axis of said disc and a pawl portion which is substantially normal to said rotational axis.
d. a brake actuating means providing within said caliper,
e. first and second friction pads, respectively having first and second backing plates, said pads positioned on opposite sides of said disc,
said first friction pad being adjacent to said stationary member and said second friction pad being adjacent to said pawl portion,
said second backing plate having a projection on the back portion thereof,
f. a stationary guide member attached to said stationary member and said second backing plate being suspended from said guide member and slidably guided thereon in the direction of the rotational axis of said disc,
g. a pad spring provided beneath said bridge portion, said spring imparting a biasing force on said second backing plate in the radially inward direction with respect to the circumference of said disc and a reaction force on said bridge portion,
h. a retaining member formed in said pawl portion of said caliper and being engaged by and retaining said projection, thereby countering the reaction force of said pad spring on said bridge portion.



**4,296,845**
**ANCHOR PLATE FOR A DRUM BRAKE ASSEMBLY**
**James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.**
**Filed Sep. 10, 1979, Ser. No. 73,754**
**Int. Cl.³ F16D** *51/00*
**U.S. Cl. 188—341** **4 Claims**



1. In a drum brake assembly having a backing plate and a pair of brake shoes arranged in end-to-end relationship on said backing plate, each brake shoe comprising an arcuate rim and a substantially planar web extending transversely from said rim, the improvement comprising said backing plate having an embossed knob adjacent one end of the shoes and defining a pair of knob faces extending into the plane defined by the planar webs;
an anchor plate being force-fit into overlying engagement with said knob, said anchor plate having a substantially rectangular plate with three tabs located along two opposite edges of the plate, the central tab of said three tabs extending substantially perpendicular to said plate and defining a load bearing tab, the two tabs adjacent said central tab lying coplanar with said plate and overlying said planar webs to retain said webs in engagement with said load bearing tab; and
retaining means for securing said anchor plate to said knob.

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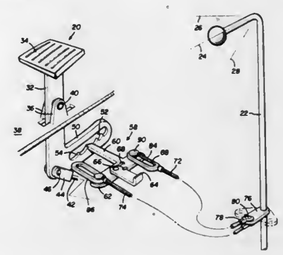
**4,296,846**
**BRAKE RELEASE MECHANISM**
**Samuel L. Benson, Clinton Vermillion, Ind., assignor to J. I. Case Company, Racine, Wis.**
**Filed Feb. 19, 1980, Ser. No. 122,545**
**Int. Cl.³ B60K** *41/26*
**U.S. Cl. 192—4 A** **6 Claims**



1. A brake release mechanism for a machine having a brake and a hydrostatic transmission, a transmission control means rotatable about one axis to control the input to said hydrostatic transmission, a brake control means including a brake control arm rotatable about a pivot axis and a brake cable connected to said control arm spaced from said pivot axis, the rotation of said brake control arm tensioning said brake cable to actuate said brake, and a latch means adapted to releasably retain said control arm rotational position with said brake cable tensioned to lock said brake, the improved brake release mechanism, comprising a lever connected to said transmission control means and rotatable therewith, said latch means having a rotatable latching element, said latching element rotatable into and out of latching engagement with said brake control arm, and a cable connector means interconnecting said lever and said latch means, said cable means adapted to rotate said latching element out of latching engagement with said brake control arm upon rotation of said transmission control means in either direction from a neutral position.

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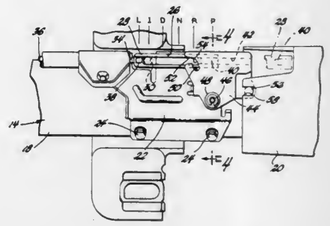
**4,296,847**
**TRANSMISSION SHIFT LEVER BACKDRIVE AND COLUMN LOCKING MECHANISM**
**Frederick P. Arndt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Mar. 25, 1980, Ser. No. 133,890**
**Int. Cl.³ B60K** *41/26*
**U.S. Cl. 192—4 A** **2 Claims**



1. A transmission shift lever backdrive and column locking mechanism for use in a motor vehicle having a floor-mounted transmission shift lever movable in a plurality of operating conditions including "Park" and "Reverse", and a lockable steering column shift bowl operable to be positioned for locking only when the transmission is in the "Park" operating condition, said mechanism comprising; a support bracket mounted on the steering column and having integrally formed guide means; coupling means slidably disposed in said guide means and including cam means and linear guide means; flexible force and motion transmitting means connected between said coupling means and the transmission shift lever for transmitting the selected operative condition from the transmission shift lever to the coupling means; and actuator means pivotally mounted on said steering column and operatively connected with the shift bowl, said actuator means including cam slot means selectively engageable by said cam means for enforcing pivoting of the actuator means when the shift lever is moved from the "Reverse" operating condition to the "Park" operating condition for positioning the shift bowl to permit locking of the steering column, and linear guide slot means for selectively engaging said linear guide means when the transmission shift lever is moved from the "Reverse" operating condition to the other operating conditions for preventing pivoting of the actuator means and thereby preventing positioning of the shift bowl to prevent locking of the steering column.

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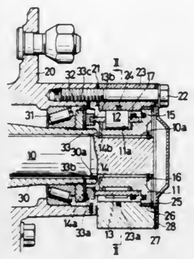
**4,296,848**
**FREE WHEEL HUB MECHANISM**
**Tooru Kagata, Toyota, and Hiromi Goto, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**
**Filed Jul. 26, 1978, Ser. No. 928,263**
**Claims priority, application Japan, Jul. 27, 1977, 52-100981[U]**
**Int. Cl.³ F16D** *13/04*
**U.S. Cl. 192—35** **4 Claims**

1. A free wheel hub mechanism comprising:
a body secured to a wheel;
an inner race secured to an axle shaft and rotatable therewith;
means for engaging said inner race with said body only upon

rotation of said shaft and for permitting the free rotation of said body upon non-rotation of said shaft;

a shoe receiving member secured to a spindle sleeve of said axle shaft and having a receiving surface located entirely in a plane which crosses said axle shaft at a substantially right angle;

a shoe means for maintaining said engaging means in its engaged condition and having a sliding surface located entirely in a plane which crosses said axle shaft at a substantially right angle; and



a spring biasing said sliding surface of said shoe means against said receiving surface of said shoe receiving member whereby the sliding contact between said sliding surface and said receiving surface maintains the engagement of said engaging means,

wherein said engaging means comprises a cage arranged between said inner race and said body, and rollers positioned within said cage, said rollers being urged outwardly by a cam surface provided on said inner race upon rotation of said shaft and being thus squeezed against said body.

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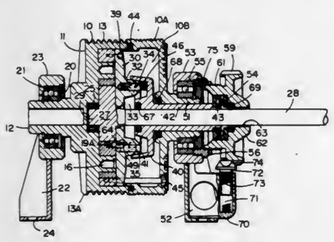
**4,296,849**

## AUTOMATIC TORQUE REGULATOR

**Luigi Pellegrino, Conicit Apdo. 70,617 Los Ruices, Carcas, Venezuela (107)**

**Filed Jul. 9, 1979, Ser. No. 55,604**
**Claims priority, application Venezuela, Jan. 12, 1979, 44/68**
**Int. Cl.³ F16D** *31/04*
**U.S. Cl. 192—61** **15 Claims**



1. An automatic torque regulator comprising:

a chassis defining a cavity;

a central gear positioned in said cavity;

axis means for rotatably mounting said chassis and said central gear so that said central gear can be rotated independently from said chassis;

a satellite gear positioned in said cavity in engagement with said central gear;

means for rotatably mounting said satellite gear to said chassis;

means for defining first and second pressure chambers near the initial and final areas of contact between said central gear and said satellite gear;

means for providing fluid communication between said pressure chamber means and said cavity; and,

means for regulating the flow of fluid in said communication means; and

wherein said regulating means includes passages means for providing greater resistance to fluid flow therethrough in one direction than in the reverse direction.

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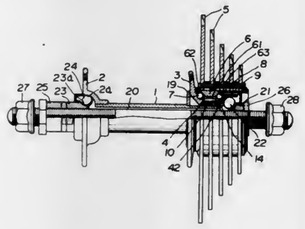
**4,296,850**

## REAR HUB HAVING IMPROVED MOUNTING OF A CYLINDRICAL BEARING MEMBER TO AN INNER MEMBER

**Mitsuhide Isobe, Toyonaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan**

**Filed Mar. 10, 1980, Ser. No. 128,832**
**Claims priority, application Japan, Mar. 19, 1979, 54-36082**
**Int. Cl.³ F16D** *41/18;* **F16C** *35/07;* **F16H** *55/30*
**U.S. Cl. 192—64** **9 Claims**



1. In a rear hub for a bicycle, which is provided with a tubular hub shell having first and second hub flanges, an inner member fixed to said hub shell and having a ball race formed axially inwardly of the inner member, an outer member supported rotatably with respect to said inner member and having at least one sprocket at the outer periphery of the outer member, first and second bearings carrying said outer member rotatably with respect to said inner member, a unidirectional rotary transmission interposed between the outer periphery of said inner member and the inner periphery of said outer member, and a cylindrical bearing member mounted on said inner member axially outwardly thereof and having ball races, the improvement comprising: a tubular receiving portion provided at said inner member axially outwardly thereof for insertably receiving said cylindrical bearing member; a fitting portion provided at one axial side of said cylindrical bearing member and having an inner periphery of larger diameter than an outer diameter of said receiving portion, to form an annular space between the outer periphery of said receiving portion and the inner periphery of said fitting portion; and, a sleeve press-fit into said annular space, said sleeve having a thickness larger than a radial width of said annular space, said sleeve, when inserted within said annular space, said cylindrical bearing member at a desired position on said receiving portion.

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**4,296,851**

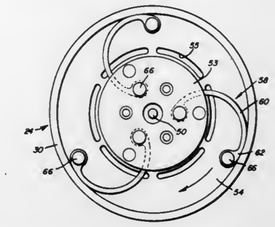
## DRIVE HUB WITH CURVED SPRINGS AND DRIVE KEYS FOR ELECTRO-MAGNETIC CLUTCH

**William C. Pierce, Dallas, Tex., assignor to Pitts Industries, Inc., Dallas, Tex.**

**Filed Jun. 1, 1979, Ser. No. 44,775**
**Int. Cl.³ F16D** *3/00, 27/10*
**U.S. Cl. 192—84 C** **3 Claims**

1. In a magnetic clutch for driving a shaft including a rotatable element having a friction face positioned around and independent of the shaft, an armature disk positioned around the shaft and including a friction face in opposed relation to the friction face on the rotatable element, an electromagnet for selectively moving the friction faces into driving engagement, that improvement comprising a flexible drive coupling between the armature disk and drive shaft, said coupling comprising a plurality of arcuately curved leaf springs, each spring having one end connected with the armature disk, means drivingly connecting the other end of each spring with the shaft to enable flexibly resilient axial, radial and circumferential relative movement between the armature disk and drive shaft, said means drivingly connecting the springs and drive shaft comprising a hub affixed to the drive shaft and including a hub plate, the armature disk being positioned around the hub plate with the inner ends of the arcuately curved springs being connected to the hub plate, each of the springs being generally





U-shaped and including an elongated central arcuate portion and radially inwardly offset ends anchored to said hub plate and armature disk, respectively, the end of each spring attached to the armature disk lying along a radius of the hub plate and armature disk and the end of the spring attached to the hub plate being disposed adjacent to but in slightly trailing relation to the same radius when the springs are not deflected, the central portion of each spring including a concave edge opening in the direction of rotation with transmission of torque between the armature disk and hub plate being transmitted through the springs with the degree of deflective elongation of the springs being determined by the torque transmitted thereby causing the central portions of the springs to straighten to increase the distance between the ends.

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**4,296,852**

## AUTOMATIC TWO-WAY CENTRIFUGAL CLUTCH FOR MOTOR DRIVEN APPARATUS

**Adolf Luerken, Palos Verdes, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.**

**Continuation of Ser. No. 850,136, Nov. 10, 1977, abandoned.**
**This application Mar. 6, 1978, Ser. No. 883,655**
**Int. Cl.³ F16D** *23/10, 43/24*
**U.S. Cl. 192—104 B** **6 Claims**

5. An automatically acting centrifugal clutch comprising

a rotating support member having a first rotation axis,

first and second single element clutch members, each said clutch member being supported by said support member along a respective pivot axis for pivotal rotation movement about said pivot axis in a plane normal to said rotation axis, and each pivot axis being parallel to, separated from, and symmetrically placed with respect to said rotation axis,

a rotatable clutch drum having

an axis of rotation concentric with said first rotation axis, and

a circular, inwardly facing, frictional drive surface radially spaced from and parallel to said rotation axis,

said clutch members each further having a center of gravity

a driving surface and a driven surface, said surfaces having a radius of curvature substantially equal to the radius of curvature of said frictional drive surface, and

said clutch members being pivotably supported so that said driven surfaces each engage said friction drive surface in a first pivotal position of each clutch member, and said driving clutch surfaces each engage said frictional drive surface in a second pivotal position of said clutch members,

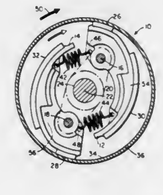
first and second spring members, each connected in a fixed positional relationship relative to said driven and driving surfaces, and between the first and second clutch members,

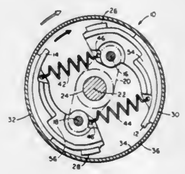
said first and second springs each having a first end connected to the first and second clutch members respectively substantially at the respective pivot axis of the clutch member whereby said first ends maintain a substantially fixed position as the respective clutch member pivots about the respective pivot axis,

each of said springs being under tension, and

each spring, at a respective second end, being connected to a respective clutch member for urging said corresponding driving surface against said frictional drive surface in a start-up state, and connected at a position spaced further from said clutch pivot point than the center of gravity of said respective clutch member and

said single element clutch members each having a fixed mass distribution and said springs having a spring constant whereby





whenever the rate of rotation of said support member is below a first rotational speed, said driven surface engages and is in contact with said frictional drive surface,

upon rotation of said support member beyond said first rotation speed and less than a second rotation speed greater than the first rotation speed, said driven clutch surface pivots out of engagement with the frictional drive surface, and

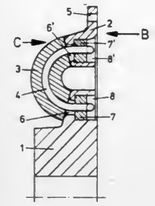
upon rotation of said support member beyond said second rotation speed, said driving clutch surface is urged against and engages said friction drive surface with a force which is a monotonically increasing function of the rotation speed, and

whereby, when said clutch members pivot from said first position wherein said driven clutch surfaces engage said frictional drive surface to said second position wherein said driving clutch surfaces engage said frictional drive surface, said spring members extend at a rate greater than the radial rate of travel of each clutch member center of gravity thereby defining a range of rotational speed in which the clutch surfaces do not engage the frictional drive surface.

**4,296,853**
## ROTATION-ELASTIC, SHOCK AND VIBRATION DAMPING CLUTCH

**Curt Krönert, Mülheim, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany**

**Filed Oct. 16, 1979, Ser. No. 85,220**
**Claims priority, application Fed. Rep. of Germany, Oct. 14, 1979, 2844849**
**Int. Cl.³ F16D** *3/68*
**U.S. Cl. 192—106.1** **7 Claims**




1. A rotation-elastic, shock and vibration damping clutch, comprising, an outer ring part, an inner ring part arranged within said outer ring part, each of said outer and inner ring parts having a plurality of generally axially extending apertures therethrough which are arranged in circumferentially spaced locations, an elastic pressure pad of arc-shaped cross-section extending between said inner and outer ring portions and having respective ends abutting against respective sides of said inner and outer ring portions around each of the respective apertures, at least one non-elastic rope having a diameter substantially smaller than that of said apertures extending through said elastic pressure pad and being connected thereto and also extending through each of the respective apertures and being evenly distributed around the circumference of said rings, and spring means resiliently supporting said rope adjacent each of said apertures so that said rope does not touch said ring parts in any areas bounding the apertures.

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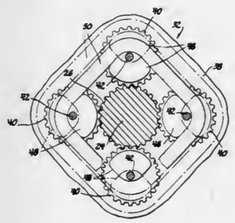
**4,296,854**
## FLEXIBLE CLUTCH WITH AN ELASTOMERIC VIBRATION DAMPER

**Vincent M. Staub, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 21, 1980, Ser. No. 131,923**
**Int. Cl.³ F16D** *3/14*
**U.S. Cl. 192—106.1** **1 Claim**




1. An elastomeric drive mechanism disposed in series with a friction drive mechanism, comprising: an input pressure plate member; an output shaft having a splined exterior; a plurality of gear members rotatably mounted on said pressure plate and meshing with said splined portion of said output shaft, a cam member secured to each of said gear members for unitary rotary movement therewith; and an elastomeric band means operatively connected with and circumscribing the outer portion of said cam members, said gear members providing a drive connection between said pressure plate and said output shaft and said elastomeric band means permitting relative angular excursion between said pressure plate and said output shaft, and said cam members generating increased tension forces within said band means upon increased angular excursion between said pressure plate and said output shaft to provide increased torque capacity in said elastomeric drive mechanism while limiting the transmission of torsional vibrations.

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**4,296,855**
## ELECTRICALLY CONDUCTIVE FABRIC

**Gary L. Blalock, Canal Fulton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Continuation of Ser. No. 941,871, Sep. 13, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,291**
**Int. Cl.³ B65G** *43/00*
**U.S. Cl. 198—502** **5 Claims**

3. For use as a controlling antenna to detect rips in a flexible conveyor belt in which it is located,

a flexible fabric constructed of first yarns extending in a first direction and second yarns extending in a second direction transverse to said first direction,

the yarns in at least one of said directions extending from end to end of the fabric and being formed of a plurality of strands previously and continuously provided along their entire lengths with electrically conductive particles to form a continuous electrically conductive path across the fabric and substantially from edge to edge of the conveyor belt in which it is located,

said first and second yarns being joined together in an open mesh configuration with interstices therebetween, and

elastomeric material of the conveyor belt in which the fabric is located being on both sides of said yarns and in contact therewith and extending through the interstices of said fabric to hold said fabric in its open mesh configuration and fixedly positioned within the conveyor belt in which it is located.

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**4,296,856**
## MATERIAL GATHERING DEVICE FOR A MINING MACHINE

**Donald L. Freed, Jr., Belleville, Ill., assignor to National Mine Service Company, Pittsburgh, Pa.**

**Filed Jan. 3, 1980, Ser. No. 109,333**
**Int. Cl.³ B65G** *65/02*
**U.S. Cl. 198—514** **9 Claims**

1. A material gathering device for a mining machine comprising,

a gathering platform extending forwardly from said mining machine for slidable engagement with the mine floor,

said gathering platform having a forward edge portion and opposite side portions extending rearwardly from said forward edge portion,

deflector means for deflecting loose material deposited on the mine floor adjacent said forward edge portion and said opposite side portions onto said gathering platform,

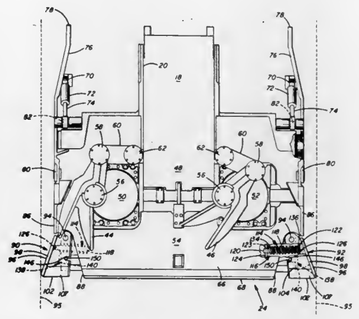
means for pivotally mounting said deflector means on said gathering platform adjacent said opposite side portions,

said deflector means having an upstanding wall portion adapted to be positioned closely adjacent the mine wall and a material receiving surface extending from said upstanding wall portion toward said respective opposite side portion of said gathering platform,

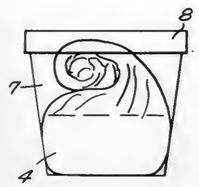
resilient means extending between said gathering platform and said deflector means for urging said delector means upstanding wall portion to a position to deflect the loose material located on the mine floor at the mine wall onto said material receiving surface for movement therefrom onto said gathering platform,

said resilient means being freely movable between a compressed length and an uncompressed, free length to permit pivotal movement of said deflector means between a retracted position and an extended position relative to said gathering platform side portions,





container, the volume of said paste being sufficiently less than the volume of said external rigid container with said lid thereon that the remaining volume when filled with said krin-




kled film of the internal container that it acts as a cushion and shock absorber during transportation and prevent the internal container from moving unnecessarily while permitting ready removal of said internal container from said external container.

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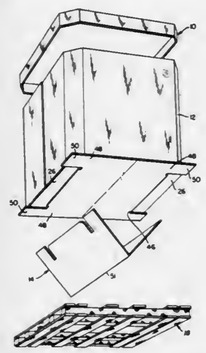
**4,296,860**

**BULK MATERIAL BOX**

**Fu-Tong Hsu, Bridgewater, and John F. Kantz, Oxford, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Nov. 28, 1979, Ser. No. 98,066**
**Int. Cl.³ B65D** *19/06*
**U.S. Cl. 206—386** **13 Claims**



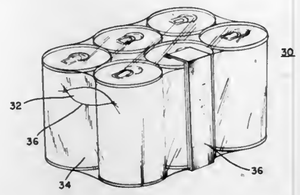
6. A unitary storing and shipping container assembly for bulk solid material comprising: a box having a removable top, a body member, and a base member, and a rigid pallet secured to and supporting said box at its base; said box formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending integral flaps inwardly folded within said outer periphery to form a portion of the base of said box and providing, when infolded, two opposing pairs of infolded flaps, the first of said opposed pairs having panels defining a rectangular configuration and the second of said opposed pairs having panels defining a trapezoidal configuration, said base member having opposite ends which interlock with each of the panels of said first opposed pair; said infolded flaps and base member providing the base and alignment of said box to said supporting pallet and the resultant unitary container assembly.

**4,296,861**

**ELASTIC BAND AND HANDLE STRUCTURE FOR FORMING PACKAGES OF GROUPS OF CONTAINERS**

**Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.**

**Continuation-in-part of Ser. No. 65,421, Aug. 10, 1979. This application Jun. 20, 1980, Ser. No. 161,493**
**The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.**
**Int. Cl.³ B65D** *75/56, 85/62*
**U.S. Cl. 206—428** **7 Claims**




1. In combination with a wrapper of material defining a package configuration:
an elongated handle strap of finite length extending over substantially a like finite adjacent surface length of a said wrapper;
said handle strap having first and second ends secured to said wrapper and having the surface area intermediate its ends substantially juxtaposed with the adjacent said surface of said wrapper;
said wrapper comprising an endless band of elastic material for surrounding a said package configuration in a stretched and tensioned condition;
said handle strap being in substantially unstretched condition when said endless band is in said stretched and tensioned condition;
said handle strap being in a relatively loose and nonjuxtaposed condition with respect to said adjacent surface of said endless band when the latter is in an unstretched condition; and
said handle strap comprising:
an elongated strip of material having a coextensive layer of adhesive thereon;
a central gripping portion defined by a centrally disposed laminate adhered to said adhesive layer while leaving an exposed area of said layer of adhesive at each end thereof;
said exposed areas of said layer of adhesive providing securing means for holding said handle strap on said wrapper.

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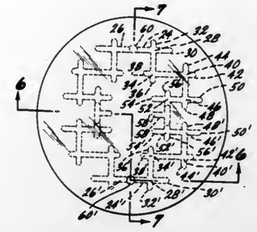
**4,296,862**

**DEVIOUS PATH BACTERIAL BARRIER**

**James L. Armentrout, 21 Barlovento Ct., Newport Beach, Calif. 92663, and George H. Schneider, 22475 Overlake Dr., El Toro, Calif. 92630**

**Filed Aug. 27, 1979, Ser. No. 70,134**
**Int. Cl.³ B65D** *81/24, 33/16, 51/16*
**U.S. Cl. 206—439** **24 Claims**

1. A devious path bacterial barrier for providing an air/gas pathway into and out of a sealed package from an exterior environment through an aperture in one wall of the package, including
a flat member lying within a plane and having spaced openings extending into the flat member on opposite sides of the flat member and with one of the openings for communicating with the exterior environment and with the other of the openings for overlying the aperture in the one wall of the package,
a pathway extending between the openings of the flat member and with the pathway extending within the flat member and along the plane of the flat member for interconnecting the openings and providing an air/gas pathway for both directions of air/gas flow between the one opening of the flat member and the other opening, and




the pathway including a plurality of bends along its length and with each bend providing an eara to trap any bacteria introduced into the pathway from the exterior environment to the one opening and with all the bacteria trapped at a distance along the pathway before the other opening.

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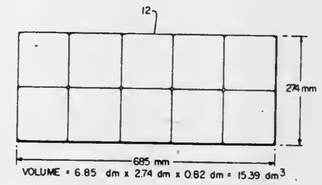
**4,296,863**

**LIDDED CONTAINER STRUCTURE AND PACKAGE STRUCTURE FOR SAME**

**Henk Stokkers, Groenlo, Netherlands, assignor to Maryland Cup Corporation, Owings Mills, Md.**

**Division of Ser. No. 900,743, Apr. 27, 1978, Pat. No. 4,195,465. This application Dec. 18, 1979, Ser. No. 104,821**
**Int. Cl.³ B65D** *21/02, 85/62*
**U.S. Cl. 206—504** **3 Claims**




3. A package structure characterized by minimized exterior dimensions for a given number of filled, open-mouthed containers each having a circular bottom wall and an initially frusto-conical sidewall initially defining an open container mouth of circular configuration opposite said bottom wall, said package structure comprising:
a square configured lid means on each of said filled containers deformably engaging each said sidewall and covering said container mouth therein to constrain said container mouth to assume a square configuration and said sidewall to assume a transitional configuration from said circular bottom wall to said square configured lid and container mouth;
a said given number of said filled containers in juxtaposition through their respective square configured lid means to define a rectangular grouping of said given number of containers; and
a bulk package means confining said rectangular group of containers.

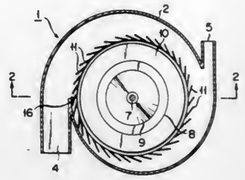


**4,296,864**

**AIR CLASSIFIER**

**Takaaki Misaka, Koganei; Takeshi Furukawa, Kawasaki, and Eiichi Onuma, Narashino, all of Japan, assignors to Onoda Cement Co., Ltd., Japan**

**Filed Jul. 9, 1980, Ser. No. 167,048**
**Claims priority, application Japan, Jul. 17, 1979, 54/89793; Jul. 17, 1979, 54/89794**
**Int. Cl.³ B04C** *5/103*
**U.S. Cl. 209—144** **31 Claims**




1. An air classifier which comprises:
a casing formed of a generally hollow cylindrical vertical casing body and a hopper fitted to the lower end of said casing body;
a fine product outlet duct set at the center of the upper end wall of the casing body;
an air-powder raw material inlet duct tangentially projecting outward from the casing body;
a rotary shaft concentrically extending through the casing body;
a rotary disc member concentrically fixed in the casing body and set at a boundary between the casing body and the hopper to concurrently carry out the dispersion and classification of a powdered material; and
guide vanes provided in the casing body in a state equidistantly spaced from each other in the circumferential direction of said casing body to conduct a mixture of air and a powder raw material into said casing.

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**4,296,865**

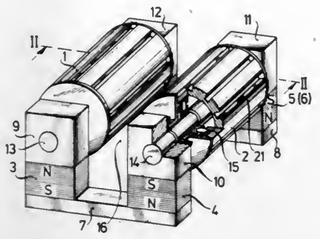
**MAGNETIC SEPARATOR HAVING TWO ROTATING MAGNETIC DRUMS OF OPPOSITE POLARITY**

**Heinrich Spodig, Netteberge 202, D-4714 Selm/Westf., Fed. Rep. of Germany**

**PCT No. PCT/DE78/00009, § 371 Date Mar. 25, 1979, § 102(e) Date Mar. 19, 1979, PCT Pub. No. WO79/00060, PCT Pub. Date Feb. 22, 1979**
**PCT Filed Jul. 5, 1978, Ser. No. 24,181**
**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1977, 2733473**
**The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.**
**Int. Cl.³ B03C** *1/02, 1/26*
**U.S. Cl. 209—216** **1 Claim**

1. A magnetic separator comprising the combination of two rotatable magnetic drums of opposite polarity forming a working air-gap therebetween, each said drum including a plurality of grooves distributed in a radial direction around their peripheries and extending in an axial direction, said combination further including two directionally magnetized block magnets arranged on each side of said magnetic drums, said drums being arranged in a housing comprising a pair of slide plates positioned in the working air-gap, said plates converging at the inlet and diverging at the outlet, said block magnets being disposed in a closed magnetic circuit and being connected in pairs at the bottom part of their poles of unlike polarity by means of soft-iron parts, said block magnets having on the

upper side of their poles of unlike polarity a pair of axially spaced apart pole shoes in which soft-iron parts are disposed



and which last mentioned soft-iron parts serve as the axles for said rotatable magnetic drums.

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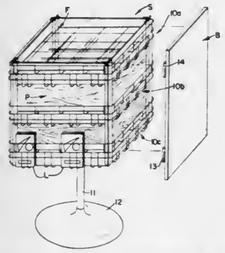
**4,296,866**

**ARTICLE DISPLAY STAND**

**Stanley J. Learnard, 12659 Willow Spring Ct., Herndon, Va. 22070**

**Filed Apr. 5, 1979, Ser. No. 27,385**
**Int. Cl.[3] A47F *5/01, 5/02***
**U.S. Cl. 211—131** **12 Claims**



1. An article display stand, comprising: a frame; and a plurality of pairs of stacked wire baskets supported on the frame, with each pair including a top basket and a bottom basket, the top basket including first wires spaced apart a first distance, and the bottom basket including second wires spaced apart a second distance less than the first distance, and the wires of both baskets of each pair defining a plurality of article supporting and display pockets wherein the first wires of the top basket define side supports for the articles in the pockets and the second wires of the bottom basket define bottom supports for the articles in the pockets.

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**4,296,867**

**DEVICE FOR LOCKING SLEWING PORTION OF CARGO CRANE**

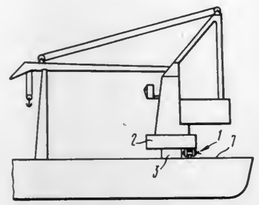
**Iosif M. Berkhin, prospekt Gagarina, 17, kv. 35; Robert A. Gudze, prospekt Gagarina, 17, kv. 11; Vasily I. Kekalo, ulitsa Letchikov, 33, kv. 88, all of Sevastopol; Nikolai N. Panasenko, Volgodonsk, ulitsa Morskaya, 118, kv. 46, Rostovskaya oblast; Viktor I. Podbeltsev, ulitsa B. Morskaya, 38, kv. 4, Sevastopol; Zinaida D. Tsypina, ulitsa Volodarskogo, 5, kv. 5, Sevastopol, and Vladislav N. Mukhin, ulitsa B. Morskaya, 52/2, kv. 36, Sevastopol, all of U.S.S.R.**

**Filed Sep. 16, 1979, Ser. No. 75,108**
**Int. Cl.[3] B66C *23/62***
**U.S. Cl. 212—229** **7 Claims**

1. In a cargo crane having a slewing portion movable with respect to a stationary portion, a device for locking the slewing portion relative to the stationary portion comprising:

first stop means rigidly secured on the slewing portion of the crane;

second stop means rigidly secured on the stationary portion of the crane, said first and said second stop means having confronting surfaces spaced from each other when said slewing portion is in a position to be locked;



wedge means movable into a space between the confronting surfaces for frictionally engaging each of the confronting surfaces to thereby lock said first stop means relative to said second stop means; and

drive means for bringing said wedge means into and out of frictional engagement with said confronting surfaces.

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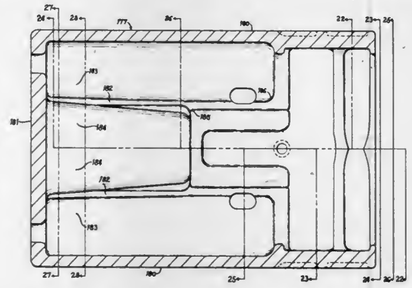
**4,296,868**

**HOUSING FOR DRAFT GEAR**

**Richard J. Housman, Dolton, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.**

**Continuation of Ser. No. 841,769, Oct. 13, 1977, abandoned. This application Nov. 21, 1979, Ser. No. 96,342**
**Int. Cl.[3] B61G *9/20***
**U.S. Cl. 213—50** **3 Claims**



1. A draft gear housing of a generally rectangular cross section defined by a top wall, a bottom wall, a pair of opposing side walls, a rear wall and an open end opposite said rear wall; said top wall and said bottom wall having internally disposed thereon longitudinally extending strengthening ribs partially defining a main spring chamber and corner spring chambers, each of said ribs having a rear portion comprising a pair of opposing arcuate sides culminating at a peak, one of said arcuate sides of each rib partially defining one of said corner spring chambers, and the other of said arcuate sides of each rib partially defining said main spring chamber, said other of said arcuate side of each of said ribs gradually increasing in radius of curvature from said rear wall toward said open end so as to produce a decrease in both width and height of each said ribs.

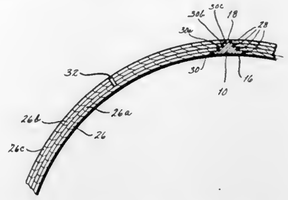


**4,296,869**

**PRESSURE VESSEL HEAD**

**Maan Jawad, Collinsville, Ill., assignor to Nooter Corporation, St. Louis, Mo.**

**Filed May 18, 1979, Ser. No. 40,597**
**Int. Cl.[3] E04B *1/32***
**U.S. Cl. 220—3** **10 Claims**



1. A head for a pressure vessel, said head comprising: a frame having stiffeners arranged to form a grid, with each stiffener having a series of alternate lands and shoulders; plates closing the openings in the grid, there being a plurality of plates in each opening of the grid with the plates of each opening becoming progressively larger in surface area through the opening, the plates in each grid opening being stacked one upon the other such that the adjacent plates of each opening are directly against each other, the plates of each grid opening further being configured and positioned such that the shoulders for the stiffeners that are along the opening face the side edges of the stacked plates and the lands of the stiffeners underlie the peripheral portions of the plates; and welds along the peripheries of the plates and adjacent surfaces of the stiffeners for attaching the plates to the stiffeners, the welds for successive plates being offset from each other by reason of the variances in the size of the plates.

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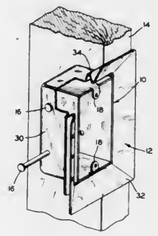
**4,296,870**

**COVERS FOR ELECTRICAL BOXES**

**G. Russell Balkwill, 2429 Howard Ave., Windsor, Ontario, Canada (N8X 3Y5); Jules P. Robinet, 2865 Virginia Park, Windsor, Ontario, Canada (N9E 2B8), and John F. Tamasovics, 2530 Todd La., Windsor, Ontario, Canada (N9H 1K5)**

**Continuation-in-part of Ser. No. 36,436, May 7, 1979, abandoned, which is a continuation of Ser. No. 908,223, May 22, 1978, Pat. No. 4,158,420. This application Jun. 12, 1979, Ser. No. 47,793**
**The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.**
**Int. Cl.[3] H02G *3/08***
**U.S. Cl. 220—3.3** **14 Claims**



1. In combination, a metal electrical box having an open face, a cover of flexible plastic material having a receptacle extending around and enclosing the back and at least portions of the sides of said box and forming an air and vapor barrier around said box, said cover leaving the open face of said box uncovered, said cover having a slanted flange around the perimeter near the open face of said box and having a slanted front surface extending outwardly therefrom and slanting away from said cover, whereby the peripheral edge of the flange can tightly contact the back surface of a wall or the like around the open face of the box, said cover providing a barrier to prevent water from entering the outlet box through the sides and back thereof, and said cover having means by which the open face of said electrical box can extend beyond said slanted flange by varying distances.

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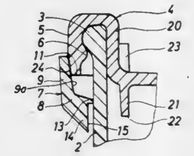
**4,296,871**

**RECEPTACLE WITH A COVER OF PLASTICS MATERIAL**

**Poul G. Andersson, Salzburg, Austria, assignor to Ring Lock Container S. A., Panama City, Panama**

**Filed Jul. 23, 1979, Ser. No. 59,685**
**Int. Cl.[3] B65D *43/10, 43/03, 17/28***
**U.S. Cl. 220—306** **11 Claims**



1. In a receptacle of the type which has a continuous sidewall with an open top end; an external circumferential bead on said sidewall substantially at said open top end, a cover of plastic material which has a depending circumferential flange provided with an internal circumferential bead which snaps beneath the lower portion of said external bead to tightly close the cover onto the receptacle sidewall, and a downward extension of said flange below said internal bead, the improvement comprising, in combination:

an integral external locking ring surrounding said receptacle sidewall, said locking ring being effectively L-shaped in cross section with a lower ledge beneath the cover flange and an upright annular rib encircling at least a major portion of the downward extension of the cover flange,

an integral annular wall on said cover having an outwardly facing surface fitting snugly against the inner surface of the receptacle sidewall radially inwardly of said beads,

connecting means connecting the locking ring lower ledge to the receptacle sidewall, said connecting means being defined at least in part by circumferentially spaced connections creating a zone of weakening, and

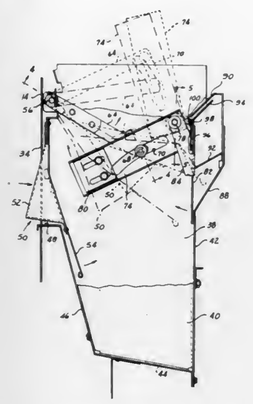
reinforcing means extending downwardly from said spaced connections in close proximity to the container wall, said reinforcing means permitting rupture of said connections by a downward translational force applied to the locking ring parallel to the receptacle sidewall to give access to the lower edge of the cover flange to remove the cover from the container, while the close proximity of said reinforcing means to the container wall limits inward displacement of said reinforcing means and correspondingly limits outward displacement of said rib to a distance insufficient to give access to the lower edge of the cover flange, thereby to effectively prevent removal of said cover from the container as long as said connections remain unruptured.

**4,296,872**

## DELIVERY BOX ASSEMBLY FOR MERCHANDISING MACHINE

**Robert P. Mitchell, Pequannock, and Frank T. Scalera, Maplewood, both of N.J., assignors to Rowe International, Inc., Whippany, N.J.**

**Filed Sep. 21, 1979, Ser. No. 77,611**
**Int. Cl.³ G07F *11/00***
**U.S. Cl. 221—195** **11 Claims**



5. A delivery box assembly for receiving an article of merchandise from a dispensing unit and for holding the article at a location at which it is accessible to a customer including in combination, a box having a first opening through which said box is to receive an article from said dispensing unit and having a second opening through which said article may be removed by a customer, a door, first shaft means mounting said door adjacent to said second opening for movement between an open position and a closed position, a baffle, second shaft means mounting said baffle for movement between an inoperative position and an operative position at which it effectively blocks said first opening, respective left-hand and right-hand first cranks on said door mounting shaft means for movement therewith, respective left-hand and right-hand second cranks on said baffle shaft means for movement therewith, pins carried respectively by one of each of said first and second cranks, the other of each of said first and second cranks being formed with a slot for receiving one of said pins to provide connections between said first and second cranks, said pin and slot connections being such that said baffle moves to its operative position in response to movement of said door to its open position.

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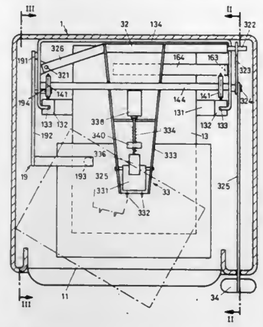
**4,296,873**

## AUTOMATIC VENDING ARRANGEMENT

**Alois Schlumpf, Zumikon, Switzerland, assignor to Tax o mex AG, Switzerland**

**Filed Dec. 11, 1979, Ser. No. 102,362**
**Claims priority, application Switzerland, Dec. 12, 1978, 12645/78**
**Int. Cl.³ B65H *3/22***
**U.S. Cl. 221—213** **6 Claims**

1. In an automatic vending arrangement for the sale of newspapers or periodicals, a housing having a dispensing slot at the upper front side thereof; including a cash box arrangement and a dispensing arrangement, said cash box arrangement including coin testing means, coin return means and coin receiving means; and actuating means for said dispensing arrangement, said dispensing arrangement including a vertically displaceably guided support table and a lever-actuated dispenser, the improvement comprising: at least one set of pulleys for raising said support table having one end of the pulley fastened to said table and another end to said housing; spring means for pulling said pulley downwardly; sensor means having sensor arm means supported in a horizontal pivot bearing at one end thereof, including a sensor feeler directed against said support table and sensor pin means engageable in the raised position into a sprocket roll for rendering stationary said set of pulleys; a pivot lever pivotable in a horizontal plane about a vertical



rotational axle arranged sidewise of the area of said support table; linkage means connecting the free end of said pivot lever with a handgrip for changing a direction of movement; and a gripper arm being vertically movably linked to said pivot lever and arranged at least approximate the middle axis of said support table, said gripper arm including a vertically movable gripper pawl linked thereto having gripper needles and release and latching means for said gripper latch.

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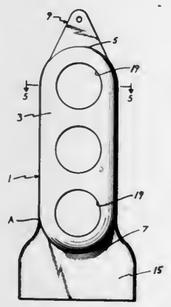
**4,296,874**

## BALL HOLDER

**Roger C. Evans, 10214 Dogwood Ave., Palm Beach Gardens, Fla. 33410**

**Filed Dec. 1, 1976, Ser. No. 746,592**
**Int. Cl.³ B65D *85/58***
**U.S. Cl. 221—307** **1 Claim**



1. A ball holder comprising a tubular body member for holding balls, said tubular body member having a bottom for supporting balls, said bottom having a slot therein, a flattened tubular member extending from the bottom of said tubular body member around said slot and forming the bottom end of the holder, said tubular body member having a closed top, said top having a holding means for supporting the ball holder, said bottom of said tubular body member and said flattened tubular member being formed of a resilient material so that they can be temporarily deformed to a size to permit a ball to pass therethrough, the interior of the bottom of the tubular body member being spherically shaped for matching the contour of the balls being held to support a ball by having surface contact.



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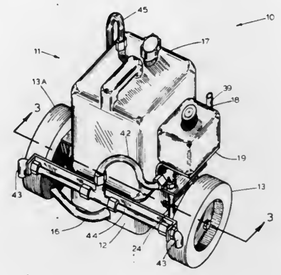
**4,296,875**

## FOAM DISPENSING APPARATUS FOR MARKING ON A GROUND SURFACE THE WORKING PATTERN OF A SURFACE WORKING VEHICLE

**Richard P. Borglum, Janesville, Iowa, assignor to Richway Industries Ltd., Janesville, Iowa**

**Filed Nov. 29, 1979, Ser. No. 98,500**
**Int. Cl.³ A01C *15/00*; B05B *7/30***
**U.S. Cl. 222—617** **3 Claims**



1. A foam dispensing apparatus mountable on a ground surface working vehicle for marking on the ground surface the working pattern of the vehicle on said surface, said apparatus comprising:
(a) a storage tank on said vehicle for containing a foaming agent solution;
(b) a combination air pump and foam generating unit including a rotary driven member rotatably mounted on said vehicle;
(c) a series of circumferentially spaced roller members;
(d) means mounting said roller members on said rotatable member in a circular row about the axis of rotation of said rotary member;
(e) a flexible tube member arranged in a plane parallel to the plane of rotation of said rotary member having an inlet section, an outlet section, and an intermediate section;
(f) means mounting said tube member on the vehicle with said intermediate section trained about and in pressing engagement with certain of said rollers, said pressing engagement acting to close said tube at each of said certain rollers;
(g) means for fluid coupling said inlet section of the tube, with said tank to receive the foaming agent solution;
(h) an air inlet for supplying air to said tube inlet section;
(i) a valve unit in said fluid coupling means located between said tank and said air inlet for controlling the rate of admission of the foaming agent solution into said inlet section for mixing with the air from said air inlet, with portions of the foaming agent solution and air being mixed and successively moved through the tube by the engaged rollers for flow into the outlet section in a foam form and,
(j) a foam discharge unit connected to the outlet section for directing the foam to the ground surface adjacent one side of said vehicle.

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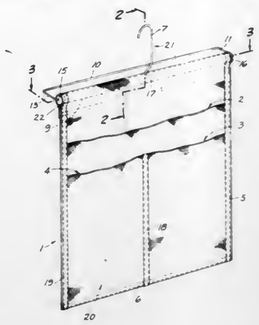
**4,296,876**

## GARMENT CHECKING BAG

**Henry R. Lefebvre, Laguna Hills, Calif., assignor to Sun Aired Bag Co., Inc., Sunland, Calif.**

**Filed Mar. 29, 1979, Ser. No. 25,197**
**Int. Cl.³ A47J *51/08, 51/14***
**U.S. Cl. 223—91** **3 Claims**

1. A garment bag structure including horizontal bar means, hook means projecting upwardly from an opening in an intermediate portion of said horizontal bar means, a foraminous bag attached to and depending from said bar means, and a horizontal rod means attached to said bar means, said horizontal bar means comprising a cylindrical member having an opening in



each end thereof, and said horizontal rod means having bent portions at each end thereof that rotatably engage the openings at the ends of said horizontal bar means, said horizontal rod means being rotatable to a position contiguous with said bag, whereby said structure occupies a relatively narrow space.

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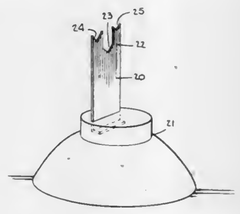
**4,296,877**

## NEEDLE THREADER

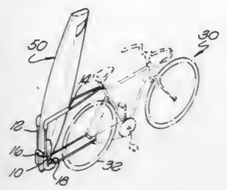
**Allen Lubow, 300 Clinton Ave., Brooklyn, N.Y. 11205**

**Filed Jan. 7, 1977, Ser. No. 757,685**
**Int. Cl.³ D05B *87/02***
**U.S. Cl. 223—99** **6 Claims**



1. A needle threader usable by individuals who find it difficult to thread a needle in a conventional manner, said needle having an alongated eye with a predetermined length and width, said threader comprising:
A. a blade whose upper end is of uniform width and thickness and is cut to define a V-notched head, across whose trough the end of the yarn or filament to be threaded is loosely laid, said blade end having a width which is less than the length of the eye and a thickness which is less than the width of the eye which makes it possible to pass the eye of the needle to be threaded over the end of the blade to a point well below the trough to cause the end of the yarn or filament to be curved into a sizable loop whose feet are clamped to the sides of the blade by the eye of the needle, whereby when the needle is thereafter retracted from the head it carries from the loop therewith, which loop can then be grasped and pulled out to thread the needle, said head being effectively divided into at least two notched sections of different width, with troughs of different depths; and
B. means to anchor the lower end of the blade.

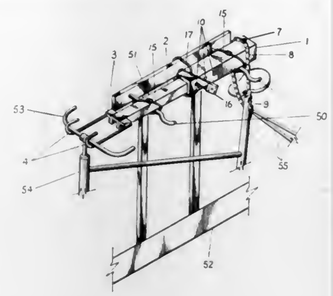
**4,296,878**
## SURFBOARD CARRIER
**Franklin D. Ward, and Rock A. Engeman, both of 5582 Kern, Huntington Beach, Calif. 92649**
**Filed Jun. 8, 1979, Ser. No. 46,989**
**Int. Cl.³ B62J** *7/00*
**U.S. Cl. 224—32 A** **4 Claims**



1. A surfboard carrier for bicycles comprising:
a pair of U-shaped members extending rearward of and opening toward the bicycle for being positioned on opposite sides of the rear wheel of the bicycle, each U-shaped member having an upper attachment end for being attached to an upper portion of the bicycle and a lower attachment end for being attached to a lower portion of the bycicle;
first and second cross members attached between the pair of U-shaped members at spaced locations rearward of the bicycle for defining a lower, generally rectangular, retention region;
a third cross member attached between the pair of U-shaped members at a location above the first and second cross members for defining an upper, generally U-shaped, retention region opening away from the bicycle, wherein the third cross member is forward of the first and second cross members for positioning the upper U-shaped retention region forward of the lower rectangular retention region for holding the surfboard with its nose end down and its skag end tilted forward for positioning the center of gravity of the board generally over the rear wheel of the bicycle;
first elastomeric holding means attached about the inside of the lower retention region for simultaneously pressing against a top and an opposite bottom surface region and opposite edge regions about a nose end peripheral portion of the surfboard for holding the nose end peripheral portion substantially immovable side-to-side and back-and-forth; and
second elastomeric holding means attached about the inside of the upper retention region for pressing against a top and opposite bottom surface region at a central portion of the surfboard for holding the surfboard at the central portion substantially immovable side-to-side.

**4,296,879**
## BIKE CARRYING ADAPTER
**Harold G. Jordening, 1541 E. La Palma, A-3, Anaheim, Calif. 92805**
**Filed Aug. 29, 1980, Ser. No. 182,477**
**Int. Cl.³ B60R** *9/10*
**U.S. Cl. 224—42.45 R** **4 Claims**

1. A device for adapting a vehicle mountable bicycle carrier capable of carrying one size bicycle to permit the carrier to carry bicycles of various sizes comprising:
(a) an extensible support member,
(b) means for securing the length of the extensible support member at a selected one of a plurality of selectable lengths,
(c) means for fastening the extensible support member to a vehicle-mountable bicycle carrier,
(d) means near the rear end of the extensible support member for supporting the rear portion of a bicycle, and
(e) means near the front end of the extensible support member for supporting the handle bars of a bicycle, said bicycle handle bar supporting means, comprising a pair of parallel J-hooks fastened to either side of the extensible support member near said front end of the extensible



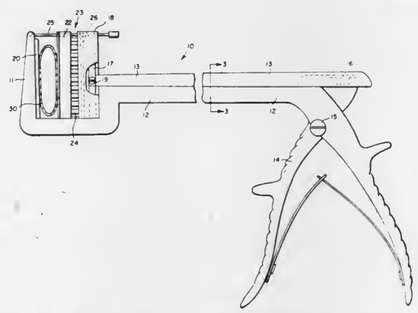
support member, the J-hooks extending outward from said front end of the extensible support member with the long straight portions of the J's parallel to the axis of extensibility of the extensible support member and the U-shaped ends of the J-hooks lying in parallel vertical planes on opposite sides of the extensible support member with the interior portions of the U-shaped ends facing towards the rear end of the extensible support member.

**4,296,880**
## COMBINATION STORAGE AND CARRYING DEVICE
**Frank A. Olshefsky, 3578 Guilderland Rd., Schenectady, N.Y. 12306**
**Filed Jul. 2, 1979, Ser. No. 53,863**
**Int. Cl.³ A47G** *23/06*
**U.S. Cl. 294—144** **10 Claims**

1. A combination storage and carrying device for transporting and storing a quantity of firewood and the like, and comprising:
a substantially flat base portion having first and second pairs of spaced apertures extending therethrough;
a first handle member positioned on an upwardly facing side of said base portion and having a pair of separate leg sections extending through and beyond said first pair of apertures to a downwardly facing side of said base portion, and a second handle member also positioned on said upwardly facing side of said base portion and having a pair of separate leg sections extending through and beyond said second pair of apertures;
each leg section extending through and beyond one of said apertures including first and second portions having longitudinal axes forming an acute angle, and a third, smoothly curved portion joining said first and second portions to one another, whereby the first portions of a pair of leg sections forming a handle member rest against the upwardly facing side of said base portion and the second portions contact a storage support surface to elevate said base portion above said storage support surface when said respective handle member assumes a fully reclined position, whereby the third portions of each pair of leg sections forming a handle member contact the storage support surface and the second portions each contact a downwardly facing side of said base portion to elevate said base portion above said support surface when said respective handle member assumes a fully open position;
side wall means extending from predetermined locations on the upwardly facing side of said base portion for resisting pivotal movement of said first and second handle members away from said upwardly facing side of said base portion beyond a predetermined location corresponding to their fully open positions.



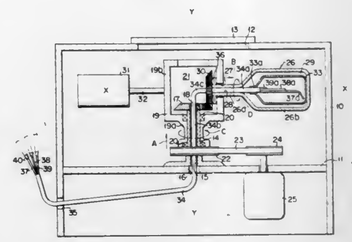
**4,296,881**
## SURGICAL STAPLER USING CARTRIDGE
**Sukoo Lee, 30 Widewaters La., Pittsford, N.Y. 14534**
**Filed Apr. 3, 1980, Ser. No. 136,785**
**Int. Cl.³ B27F** *7/00;* **A61B** *17/04*
**U.S. Cl. 227—30** **6 Claims**



1. A surgical stapling tool using disposable cartridge elements and having a staple folding anvil, an actuator movable toward and away from said anvil, a holder for an array of staples oriented toward said anvil, and a pusher for pushing said staples from said holder through tissue to be stapled and against said anvil, said tool comprising:
a. said movable actuator and said staple pusher being shaped relative to each other so said pusher mounts on said actuator in a retention fit and moves with said actuator toward said anvil;
b. said holder being shaped for a retention fit on said pusher for movement with said pusher independently of said actuator and said anvil;
c. said pusher being movable relative to said holder by force overcoming a predetermined frictional resistance between said pusher and said holder; and
d. said actuator being movable through a distance sufficient to advance said pusher and said holder until said holder presses against and is stopped by tissue supported by said anvil and then continuing to advance said pusher into said holder to drive said staples through said tissue and against said anvil to staple said tissue.

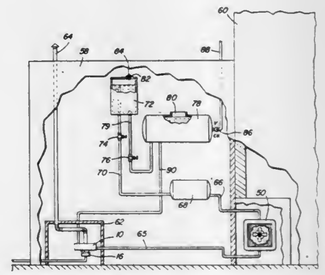
**4,296,882**
## CENTRIFUGAL FLUID PROCESSING DEVICE
**Susumu Kobayashi, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan**
**Filed Feb. 19, 1980, Ser. No. 122,188**
**Claims priority, application Japan, Feb. 26, 1979, 54-21716**
**Int. Cl.³ B04B** *11/00, 9/08*
**U.S. Cl. 233—21** **16 Claims**

1. A centrifugal fluid processing device comprising:
a stationary base;
a vertically extended support mounted on said stationary base and having a vertical axis;
a rotor rotatably supported on said vertically extended support and being rotatable about the vertical axis of said vertically extended support;
a rotor drive assembly coupled to said rotor;
fluid processing container means rotatable along with said rotor about said vertical axis and being further rotatable independently of said rotor about an axis of rotation disposed radially or perpendicular to said vertical axis;
a flexible communication conduit which has one end thereof



extended into said fluid processing container means and the other end thereof led to the outside of the device and through which a fluid to be processed is fed into said fluid processing container means, said flexible fluid communication conduit comprising at least a radially extending section which extends along said radially disposed axis of rotation and a vertically extending section which extends along said vertical axis of said vertically extended support; and
means to drive said fluid processing container means for rotating the same about said radially disposed axis of rotation.

**4,296,883**
## HEAT GENERATION AND DISTRIBUTION SYSTEM
**Andrew F. Yanna, 4389 Jean Rd., Bay City, Mich. 48706**
**Filed May 18, 1979, Ser. No. 40,457**
**Int. Cl.³ F24D** *3/00*
**U.S. Cl. 237—59** **7 Claims**



1. In combination with a heat source, a closed heat distribution system for delivery of heat from the heat source to a location of use for dissipation of heat below or level with the heat source wherein the system contains a liquid heat transfer medium, a generating tank adjacent said heat source and containing said liquid medium for absorption of heat by the liquid medium, radiator means for withdrawal of heat from the liquid medium and delivery of heat to the location of use, the radiator means being located in a horizontal or downwardly sloping run from said generating tank and being connected thereby to

the generating tank, a return tank connected to the radiator means for receiving the output of liquid medium from the radiator means, a vacuum tank for receiving the output of liquid medium from the return tank, said vacuum tank having a vacuum space adjacent the tanktop, said output being received within the vacuum space and a supply tank for receiving the output of liquid medium from the vacuum tank and for feeding liquid medium to the generating tank, said supply tank being connected to the generating tank by a connecting line which extends upwardly into the supply tank and has an opening within the space defined inside the supply tank, said supply tank being open to ambient surroundings and being connected to the vacuum tank by a downwardly sloping traverse pipe from adjacent the bottom of said vacuum tank, said vacuum tank being located above said return tank and supply tank and is enclosed, having covering means provided with a valve for selectively admitting air from the ambient surroundings to the interior of the vacuum tank, said generating tank, said radiator means and said return tank being closed and sequentially connected, the return tank being higher in elevation than the generating tank and radiator means, the distribution system being operable continuously through application of heat from the heat source to the generating tank without use of any mechanical pumping means.

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**4,296,884**

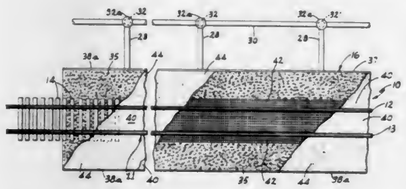
## CONTAINMENT RESERVOIR AND METHOD

**Robert W. Luebke, Hudson, Ohio, assignor to True Temper Corporation, Cleveland, Ohio**

**Filed Jan. 23, 1979, Ser. No. 5,699**

**Int. Cl.³ E01B *2/00*; E02D *27/48***

**U.S. Cl. 238—2** **19 Claims**



1. A containment reservoir for a liquid, such as petroleum based oil, comprising, a walled containment space opening upwardly, said space containing a flexible liquid impervious liner generally following the contour thereof, in at least one direction thereof, said liner comprising a layer of liquid pervious fabric material having on at least one of its sides an attached layer of liquid impervious material, such as rubber, which is resistant to oil degradation, said liner being operable to prevent escape of liquid from said reservoir through said liner from said containment space, a relatively coarse particle bed located on said liner and filling said containment space, a layer of liquid pervious flexible fabric filter material supported on said bed and covering the open top of said bed, and means coacting with said liner covered containment space for removing liquid therefrom.

**4,296,885**

## PROCEDURE FOR THE CAREFUL APPLICATION OF LIQUIDS TO PLANTS IN AGRICULTURAL STANDS

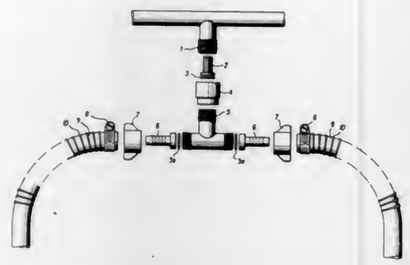
**Jürgen Norden, Bochum, and Bruno Ucinhazska, Dülmen, both of Fed. Rep. of Germany, assignors to Ruhr-Stickstoff Aktiengesellschaft, Bochum, Fed. Rep. of Germany**

**Filed Dec. 13, 1979, Ser. No. 103,542**

**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853773**

**Int. Cl.³ A01C *23/00***

**U.S. Cl. 239—1** **18 Claims**



1. A method of spraying agricultural stands with a liquid, comprising the steps of:

supplying said liquid from a portable source of plant spray liquid, including a spray rod having apertures for liquids at 50 cm intervals to a distributor element connected to each of said apertures, at least one flexible drag hose connected at one end to each said distributor element, each said flexible drag hose having at least one nozzle adjacent the other end, said drag hoses having a length such that said other end of said drag hoses are free hanging at a point below the leafy rooves of said stands, and at least one metering device associated with each said distributor element; and

feeding said liquid to said agricultural stands from said nozzles,

whereby the leafy rooves of said stands are not damaged by said liquid.

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**4,296,886**

## SHOWER FITTINGS

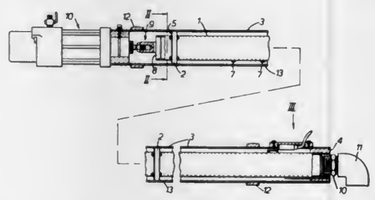
**Lionel T. Bloyce, Maidenhead, and Michael J. Morley, Bray, both of England, assignors to Albany International Corporation, Albany, N.Y.**

**Filed Sep. 17, 1979, Ser. No. 76,292**

**Claims priority, application United Kingdom, Sep. 21, 1978, 37666/78**

**Int. Cl.³ B05B *3/18***

**U.S. Cl. 239—264** **4 Claims**



1. A shower fitting comprising in combination a first tubular member with an interior passageway therethrough, closure means at one end of said passageway, fluid connection means positioned at the other end of said first member to enable the passageway to be connected to a source of fluid, a series of aligned spray jets mounted upon the said first tubular member at spaced intervals along the length thereof and being in communication with said passageway, a second tubular member, said first tubular member being housed within said second tubular member, said spray jets being wholly contained within said second tubular member, support means at the ends of said second tubular member, further support means located at spaced points along the length of said first tubular member and being secured to the latter, said support means and said further support means supporting said first tubular member within said second tubular member for reciprocatory movement relatively thereto, a longitudinal slot in said second tubular member, said slot being aligned with said spray jets and permitting fluid discharged therefrom to emerge from said second member, driving means mounted upon said second tubular member, and drive connection means extending within the second member from the driving means to said closure means to impart reciprocatory movement to said first tubular member.



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**4,296,887**

## HEAT PROTECTED FUEL INJECTION PLUG FOR INTERNAL COMBUSTION ENGINES

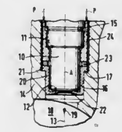
**Karl Hofmann, Remseck, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

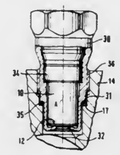
**Filed Sep. 17, 1979, Ser. No. 75,907**

**Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 7827497[U]**

**Int. Cl.³ F02N *61/14***

**U.S. Cl. 239—397.5** **4 Claims**





1. Heat protection construction for a fuel injection plug (**10**), adapted for insertion into an opening (**15, 16**) in the cylinder block (**14**) of a Diesel internal combustion (IC) engine,

wherein the plug has an end surface (**12**) facing the combustion chamber of the engine and a fuel injection opening formed in said end surface;

and comprising a bushing (**20, 30**) surrounding the plug in the region of the injection opening thereof, said bushing integrally including, in accordance with the invention,

an external flange (**21, 31**) fitting against a matching seat (**17**) formed in the opening (**15, 16**) of the cylinder block,

and a resiliently deformable terminal sealing lip (**22, 32**) integrally connected with said external flange and formed as an in-turned inwardly directed resilient flange portion overlapping a portion of the terminal end face surface (**12**) of the plug (**10**) and in resilient sealing and heat protecting engagement with said terminal end face surface.

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**4,296,888**

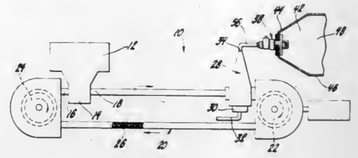
## POWDERED COAL AIR DISPERSION NOZZLE

**Thomas P. Kosek, East Detroit, and Eric A. Steinhilper, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Feb. 28, 1980, Ser. No. 125,469**

**Int. Cl.³ B05B *7/10***

**U.S. Cl. 239—403** **4 Claims**



1. A powdered coal/air dispersion nozzle for introducing a fluidized coal/air fuel mixture as a finely atomized dispersed spray for uniform combustion in a gas turbine engine combustor apparatus comprising: an elongated nozzle tube having an inlet for connection to a fluidized coal/air source with a coal particle size in the range of one to three hundred microns, said elongated nozzle tube having an outlet therefrom, scroll means including a sheet element located within said nozzle tube having spaced longitudinal edges thereon in engagement with said tube, said sheet element having a thin cross-section at all points throughout the twisted length thereof to prevent build-up of coal particles through the length of said scroll means, said sheet element being twisted along its length to impart a continuous swirl to the fluidized coal/air fuel mixture supplied to the inlet and said sheet element having a length-to-width ratio greater than one to impart a swirl in the fluidized coal/air mixture which is sustained as the fluidized coal/air fuel mixture is directed from said outlet, and pintle means overlying said outlet and operative to direct said sustained swirl of the fluidized coal/air mixture as a spray cone for combustion within the combustor.

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**4,296,889**

## METHOD AND APPARATUS FOR WINDING TEXTILE YARNS

**Gerhard Martens, Remscheid, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 18, 1979, Ser. No. 104,969**

**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855616**

**Int. Cl.³ B65H *54/38***

**U.S. Cl. 242—18.1** **40 Claims**

1. In a method of winding textile yarns into core-supported packages in which the yarn is wound about the core at a substantially constant rate while the yarn is guided onto the core by a traversing yarn guide and in which the traverse motion speed of the yarn guide is continually changed by accelerating and decelerating the traverse motion of the yarn guide, the improvement therein comprising changing aperiodically the traverse motion speed of the yarn guide by varying aperiodically at least one of the time intervals between switching from acceleration to deceleration or vice versa, the rate of acceleration and/or deceleration and the traverse motion speed attained between switching from acceleration to deceleration or

vice versa to prevent undesirable pattern formation in the yarn windings in the package formed thereby.

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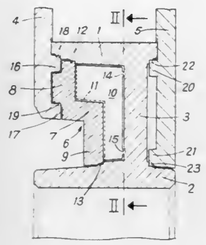
**4,296,890**

## PROCESS FOR THE SIMPLIFIED PACKING OF A MAGNETIC TAPE FOR COMPUTER AND WINDING CORE FOR CARRYING OUT THIS PROCESS

**Patrick Posso, 10, Avenue Jurigoz, Lausanne, Switzerland (CH-1006)**

**Filed May 7, 1980, Ser. No. 147,520**
**Claims priority, application France, May 14, 1979, 79 12221**
**Int. Cl.³ B65H** *75/18*
**U.S. Cl. 242—71.8** **6 Claims**



1. Process for the simplified packing of a magnetic tape for a computer consisting in delivering large width magnetic film under tension, in splitting this film lengthwise into a plurality of tapes having the required width, in providing a plurality of cores, in winding each tape on a core and in mounting on this core when it is filled with tape at least one side element in order to constitute a packing spool, this process making it possible to eliminate the operation of rewinding the tape stored around a core in a preconstituted spool, each core comprising a peripheral tubular ring for winding and a central drive hub, concentric with respect to each other and connected together by a web, each core further comprising reinforcing means disposed in the free space existing between said ring and said hub over virtually the whole width of said core, in order to ensure the strength and precision of the core, and each core also comprising means for mounting said side element on on the side of said core.

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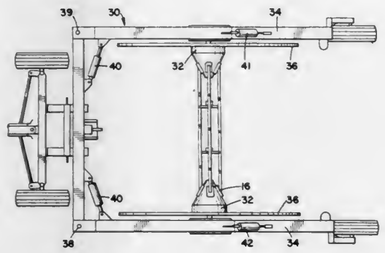
**4,296,891**

## EXPANDABLE CORE FOR ROLLS OF TUBING

**H. John Sidaway, Findlay, Ohio, and Maynard Good, Elkhart, Ind., assignors to Hancor, Inc., Findlay, Ohio**

**Filed Feb. 4, 1980, Ser. No. 118,085**
**Int. Cl.³ B65H** *75/24, 75/40*
**U.S. Cl. 242—110** **19 Claims**



1. An expandable reel for rolls of tubing comprising a base rod extending generally along the longitudinal axis of said reel; a plurality of support members disposed radially outwardly from said base rod and extending substantially parallel thereto; a plurality of connecting links extending between and operatively connecting said support members and said base rod, said links hingedly connected to a first point along the length of said links for pivotal movement about a hinge; camming surfaces at the terminal ends of said support members; and, means for selectively expanding said reel from a first to second expanded position adapted to engage said camming surfaces.

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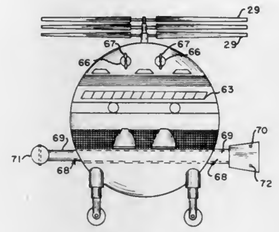
**4,296,892**

## SPHERICAL LIVING MODULE OR SPACE

**Presley O. Barge, 2868 Pine Pl., St. Louis, Mo. 63115**

**Filed Jan. 2, 1979, Ser. No. 26**
**Int. Cl.³ B64C** *35/00, 37/00, 39/02*
**U.S. Cl. 244—2** **2 Claims**



1. A substantially spherical self-propelled human living space comprising a shell, a plurality of elongated coaxial shafts journalled for rotation in said shell and projecting radially therefrom, helicopter blades mounted on said shafts outside said shell, and means within said shell for rotating said blades; and elongated pontoons, a set of said pontoons projecting chordally from said shell, spaced apart and parallel to one another, in one direction, and another set of said pontoons projecting chordally from said shell in the opposite direction, said sets of pontoons being aligned with one another, and coupling means carried by and at the ends of said pontoons, for engaging and coupling the complementary coupling means carried by pontoons of another of said living spaces.

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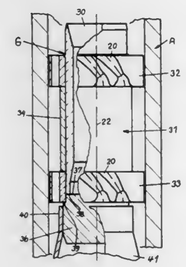
**4,296,893**

## PROJECTILE WITH SPIN-PRODUCING FLOW PASSAGES

**Josef Ballmann, Oberforstbacher Str. 228, D-5100 Aachen, Fed. Rep. of Germany**

**PCT No. PCT/DE78/00007, § 371 Date Mar. 9, 1979, § 102(e) Date Mar. 8, 1979, PCT Pub. No. WO79/00038, PCT Pub. Date Feb. 8, 1979**
**PCT Filed Jul. 3, 1978, Ser. No. 21,606**
**Int. Cl.³ F42B** *13/24, 15/14*
**U.S. Cl. 244—3.23** **12 Claims**



1. A projectile for shooting from a gun barrel in response to the force of a propellant gas emanating from the aperture of a propellant container, comprising a projectile body having a plurality of spin-producing propellant gas flow passages associated therewith, said passages annularly surrounding, and having their respective axes extending obliquely to, the longitudinal axis of the projectile body, wherein each passage has an inlet portion converging to an adjoining constricted portion, and a diverging portion extending downstream from the constricted portion, the axis of each passage being curved over the entire length of its converging inlet portion and substantially rectilinear over its diverging portion, and the walls of the diverging portion of each passage having a substantially rectilinear form, as viewed in the direction of propellant gas flow.

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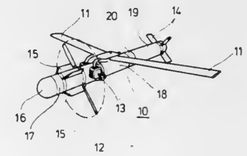
**4,296,894**

## DRONE-TYPE MISSILE

**Werner Schnäbele, Wolfratshausen; Jack Buckley, Albaching, and Ulrich Rieger, Feldkirchen-Westerham, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany**

**Filed Feb. 23, 1979, Ser. No. 14,720**
**Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904749**
**Int. Cl.³ F42B** *13/32, 15/16*
**U.S. Cl. 244—3.27** **8 Claims**



1. A drone missile system, comprising:
a missile having a target-seeking head,
a guidance system,
a self-propulsion and take-off system,
electronic means for storing individual mission data prior to the mission,
a pair of wings,
a tail assembly, and
a propeller,
said missile having a shape defining a longitudinal direction,
said wings, as well as said tail assembly and said propeller being foldable in the longitudinal direction of the missile and automatically unfoldable transverse to the longitudinal direction of the missile,
said wings and said propeller being automatically detachable in flight after launching, and
a container for storing as well as transporting and launching the missile when the wings as well as said tail assembly and said propeller are folded in the longitudinal direction.

2. A drone missile system, comprising:
a missile having a target-seeking head,
a guidance system,
a self-propulsion and take-off system,
electronic means for storing individual mission data prior to the mission,
a pair of wings,
a tail assembly, and
a propeller,
said missile having a shape defining a longitudinal direction,
means for allowing folding of said wings as well as said tail assembly and said propeller in the longitudinal direction of the missile and for automatically unfolding them transverse to the longitudinal direction of the missile,
means for automatically detaching said wings and said propeller in flight after launching, and
a container for storing as well as transporting and launching the missile when the wings as well as said tail assembly and said propeller are folded in the longitudinal direction.

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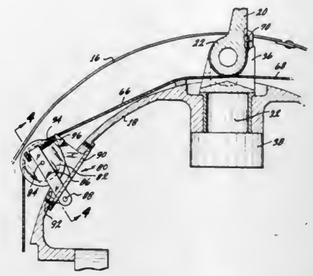
**4,296,895**

## FIN ERECTION MECHANISM

**Ladislao Pazmany, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.**

**Filed Jan. 15, 1979, Ser. No. 3,358**
**Int. Cl.³ F12B** *15/16*
**U.S. Cl. 244—3.29** **7 Claims**



1. Fin erection mechanism for a missile having a longitudinally cylindrical body frame and a plurality of foldable fins for flight control comprising,
means longitudinally of said missile for connecting said fins to said missile,
means for bracing said fins toward an erect position,
means for interconnecting said fins together so that erection of all of said fins occurs simultaneously, said means for interconnecting comprises cable means for connecting one fin to fins located on each side of said one fin so that erection of said one fin influences the erection of said finds located on each side of one fin,
each fin of said fins is formed with a pulley means and wherein said cable means is attached and guided by said pulley means during the erection of said fins, and
control means disposed radially of said main axis of said missile for rotating said fins while erected for flight control and wherein said pulley means is located on the axis of rotation of said control means so that said cable means do not interfere with limited rotation of said fins.

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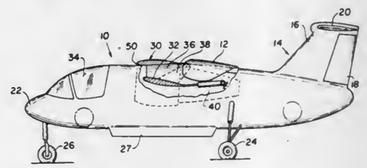
**4,296,896**

## VTOL AIRPLANE

**Robert W. Kress, Lloyd Harbor, and Anthony C. Bacchi, Massapequa, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Aug. 27, 1979, Ser. No. 70,260**
**Int. Cl.³ B64C** *29/00, 15/12*
**U.S. Cl. 244—12.4** **6 Claims**



1. An airplane and powerplant combination comprising:
an airplane fuselage;
a stub wing mounted through said fuselage so as to be movable relative thereto;

fan jet means mounted to said stub wing at least one on either side of said fuselage;

an airplane wing joined to said fuselage behind said stub wing with said fan jet means extending from ahead of said stub wing, under the airplane wing to a position adjacent the trailing edge of the airplane wing;

a pivot arm means fixed to said stub wing;

a means to connect said pivot arm means to said fuselage so as to rotate about an axis above said stub wing;

an actuator connected between said fuselage and said stub wing to rotate said stub wing about the axis above said stub wing in positioning said fan jet means in a plane ahead of, and normal to the chord of the airplane wing whereby the thrust axis of said fan jet means may be rotated from a position parallel to a longitudinal axis of the fuselage to a position normal to said longitudinal axis of the fuselage.

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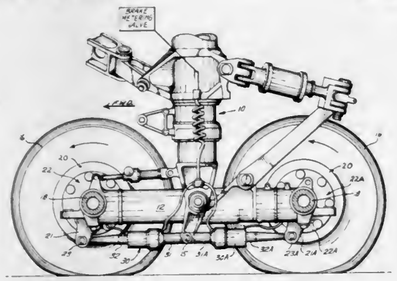
**4,296,897**

## BRAKE TORQUE LIMITER

**Bernard B. Thompson, Bainbridge Island, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jan. 22, 1979, Ser. No. 5,253**
**Int. Cl.³ B60T *8/12*; B64C *25/46***
**U.S. Cl. 244—111** **6 Claims**



**1**. A torque responsive brake control apparatus for controlling a fluid pressure operated brake mechanism, operatively connected to a rotatable member, comprising: said fluid pressure operated brake mechanism being mounted substantially coaxial with said rotatable member and adapted for exerting a braking force to resist rotation of said rotatable member; a metering valve being manually operated for controlling a flow of pressurized fluid to said brake mechanism; a torque arm connected to said brake mechanism; said torque arm being angularly movable in response to brake reaction torque associated with said rotatable member when a braking force is applied to resist rotation of said rotatable member; said torque responsive control apparatus having a brake rod assembly attached at one end to said torque arm and attached at an opposite end to a fixed support; said brake rod assembly being arranged between said torque arm and said fixed support, for resisting angular displacement of said torque arm; a brake torque limiter incorporated within said brake rod assembly and being interposed in the fluid circuit between said manually operated metering valve and said brake mechanism, for controlling the supply and release of fluid under pressure to and from said brake mechanism; said brake torque limiter comprising a cylinder head section with a dual-diameter internally stepped cylinder section, and a matching dual-diameter stepped piston slidably mounted therein; said brake rod assembly comprising a first brake rod segment fixedly attached to said dual-diameter stepped piston, and a second brake rod segment fixedly attached to said dual-diameter stepped cylinder and head section of said brake torque limiter; a first chamber formed between said cylinder head section and said dual-diameter stepped piston; said brake torque limiter being constructed and arranged with respect to said brake rod assembly, so as to normally bias said brake rod assembly in one direction of extending said brake rod assembly to its maximum overall length, by directing fluid pressure from said manually operated metering valve into said first chamber, and in the opposite direction for decreasing the overall length of said brake rod assembly by torque resulting from application of brakes; a control valve incorporated within said brake torque limiter and interposed in the fluid circuit through which fluid under pressure from said manually operated metering valve, is supplied to the brake mechanism; said control valve being normally in an open position, when said brake rod assembly is at its maximum overall length, for circulating fluid pressure from said metering valve through said control valve to said brake mechanism; said control valve being actuated to a closed position, when said brake rod assembly is decreased from its maximum overall length by predetermined excessive braking torque of said rotatable member, for blocking fluid flow between said brake mechanism and said manually operated metering valve, and for trapping metered fluid pressure between said brake torque limiter and said brake mechanism; a second chamber formed between said step sections of the dual-diameter piston and matching internal dual-diameter cylinder, for creating an expanding annulus volume in response to contraction of the overall length of said brake rod assembly, to receive hydraulic fluid trapped between said brake torque limiter and said brake mechanism, and thereby decrease the pressure of said trapped hydraulic fluid resulting in a decrease in the ratio of brake torque reaction relative to metered hydraulic pressure.

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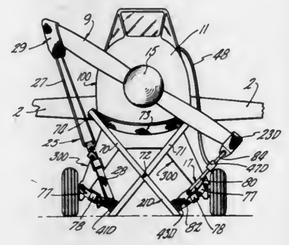
**4,296,898**

## ANCHOR DEVICE FOR PROPELLER ROTATOR

**Ronald S. Watson, P.O. Box 9599, San Diego, Calif. 92109**

**Division of Ser. No. 863,984, Dec. 23, 1977, Pat. No. 4,131,249.**
**This application Dec. 21, 1978, Ser. No. 974,169**
**Int. Cl.³ B64F *1/12, 1/16*; B64D *31/04***
**U.S. Cl. 244—115** **14 Claims**



**1**. An anchor means for placing between a forward portion of a propeller driven aircraft and a landing surface including, a section of said anchor means located behind the plane of a propeller of said aircraft and engaged by said aircraft to hold the anchor means fixedly against said landing surface, a pair of arms extending forwardly from said section held by said aircraft, said arms having forward ends for positioning substantially under a propeller, said forward ends of said arms having holding means for positioning substantially under the center mounting of the propeller adapted to be connected to said propeller.

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**4,296,899**

## APPARATUS AND METHOD FOR MANUFACTURING LAMINAR FLOW CONTROL AIRCRAFT STRUCTURE

**Jack M. Isenberg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.**

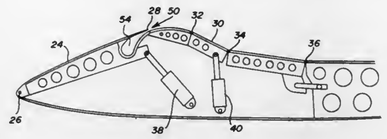
**Continuation of Ser. No. 811,744, Jun. 30, 1977, Pat. No. 4,171,785. This application Feb. 26, 1979, Ser. No. 15,085**
**Int. Cl.³ B64C *3/26, 21/06***
**U.S. Cl. 244—207** **6 Claims**

**1**. A self-positioning slot assembly tape for defining a passageway for boundary layer air on an aircraft having a laminar flow control means comprising:

a removable cover plate having an upper and a lower surface; and

a pair of sidewall members each including an upper surface removably bonded to the lower surface of said cover plate with a first adhesive and spaced apart a predetermined





distance so as to form a continuous longitudinal slot of uniform width therebetween for passage of boundary layer air to said laminar flow control means, said removable cover plate providing means for maintaining a fixed spacing between said sidewalls and having sufficient transverse rigidity for maintaining a coplanar relationship between the respective upper surfaces of said sidewalls.

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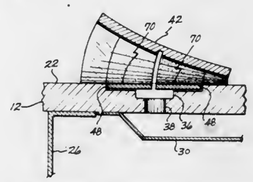
**4,296,900**

## AIRFOIL CONSTRUCTION

**Kenneth M. Krall, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.**

**Filed Apr. 23, 1979, Ser. No. 32,438**
**Int. Cl.³ B64C *3/48***
**U.S. Cl. 244—219** **4 Claims**



**1**. An airfoil construction, comprising:

(a) upper and lower surface structure which connects leading and trailing edges so as to form a relatively thin profile which is adapted to foster high speed flight, with one portion of the upper surface structure being pivotable upward about a hinge line that coincides generally with the leading edge of the airfoil, for increasing the thickness of the airfoil, and the chordwise length of said pivotable portion being substantially less than the chord length;

(b) a connecting section which forms part of the airfoil upper surface structure immediately aft of the pivotable portion, and said section being positionable for presenting a substantially continuous and rigid surface to the air moving over the upper surface structure during such times as the pivotable portion is being pivoted upward and downward, and the connecting section cooperating with the remainder of the airfoil upper surface when the connecting section is lowered to establish an elongated convex cross section for high speed fight, and the connecting section also cooperating with the remainder of the airfoil upper surface when the connecting section is fully raised to establish a compound curvature having both concave and convex portions for fostering low speed flight;

(c) a rearwardly directed nozzle located adjacent the aft edge of the pivotable portion and oriented such that it can discharge a gaseous fluid over the connecting section;

(d) a source of pressurized fluid adapted to be connected with said nozzle; and

(e) control means for adjusting the discharge of fluid from said source over the connecting section.

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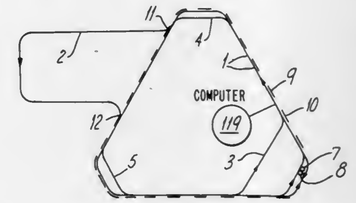
**4,296,901**

## TRANSPORTATION SYSTEMS

**Francis C. Perrott, The Manor House, South Cerney, Cirencester, Gloucestershire, England**

**Filed Jan. 2, 1980, Ser. No. 109,182**
**Claims priority, application United Kingdom, Jan. 2, 1979, 00046/79; Apr. 27, 1979, 14658/79; Sep. 29, 1979, 33865/79**
**Int. Cl.³ B61L *3/00***
**U.S. Cl. 246—167 R** **12 Claims**




**1**. A transportation system comprising a track, driven vehicles movable along the track, and control means for generating control signals effectively defining a series of spaced control areas movable along the track, each control area being of such length as to be capable of accommodating a plurality of vehicles simultaneously, wherein each vehicle is provided with on-board detection means responsive to the control signals for maintaining the vehicle within the confines of a control area, and the control means includes vehicle closing means for sensing the presence of gaps between a plurality of vehicles confined within a single control area and for causing relative movement of said vehicle with respect to one another to close up the gaps.

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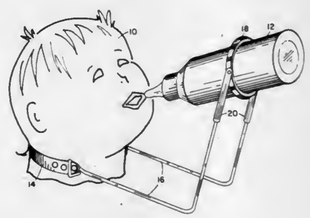
**4,296,902**

## BABY BOTTLE SUPPORT JIG

**William G. Dachtler, 1021 Emory, Imperial Beach, Calif. 92032**

**Filed Sep. 10, 1979, Ser. No. 74,004**
**Int. Cl.³ A47D *15/00***
**U.S. Cl. 248—102** **5 Claims**



**1**. A baby bottle support jig comprising:

(a) a soft strap to loop over the head and pass behind the neck of a baby in a reclining position;

(b) a pair of substantially rigid support arms having ends lying alonside the opposite sides of the neck and being connected respectively to the ends of said strap, passing down in contact with the baby's chest, and extending to upper ends spaced from the baby's face and chest; and

(c) a bottle-holding cradle mounted to the upper ends of said support arms, whereby a baby bottle with the nipple thereof in the baby's mouth can be supported at its upper portion in said cradle.

**4,296,903**

## ACTUATOR BUTTON APPARATUS FOR ADJUSTABLE CHAIRS

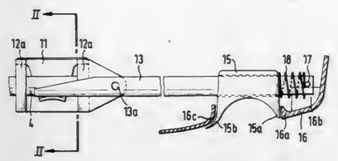
**Hans J. Edel, Minden, Fed. Rep. of Germany, assignor to Drabert Söhne Minden, Fed. Rep. of Germany**

**Filed Oct. 19, 1979, Ser. No. 86,610**

**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 7831578[U]**

**Int. Cl.³ F16M** *11/00;* **A47C** *3/22*

**U.S. Cl. 248—162.1** **8 Claims**



1. An actuator button apparatus for actuating a chair positioning linkage mounted for movement within a chair base housing, said apparatus comprising:

an aperture in said housing;

a linkage element mounted for movement within said housing;

an actuator button moveable within said aperture, said button being slidably mounted on said linkage element and adapted for movement with said linkage element at least partially into said housing and then along said linkage element at an angle transverse to the initial direction of pressure exerted to move said button into said housing; and

means located within said housing for releasably retaining said button after said button has been pressed into said housing and moved along said linkage element.

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**4,296,904**

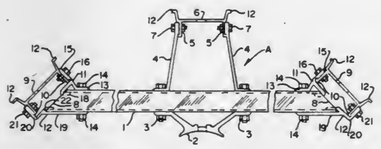
## ELECTRICAL EQUIPMENT MOUNT

**Marion R. Farmer, Germantown, Tenn., assignor to Aluma Form, Inc., Memphis, Tenn.**

**Filed Aug. 9, 1979, Ser. No. 65,076**

**Int. Cl.³ E04G** *3/00*

**U.S. Cl. 248—218.4** **9 Claims**



1. An improved electrical equipment mount for holding transformers or related electrical equipment and for attachment to a utility pole, the mount being formed from components that interengage to provide enhanced structural support, comprising, a horizontally disposed crossarm, said crossarm fabricated having a channel member and including front and back surfaces and end edges, means for holding said crossarm to a utility pole, a bracket having a mounting pad connecting to each end of the crossarm, said bracket being mounted to the crossarm and disposed for orienting its held transformer towards the front, rear, or side of the equipment mount, each crossarm end being formed to accommodate the mounting of its associated bracket in its desired disposition, connectors securing with the front and back edges of each end of the crossarm for securing its respective bracket to the crossarm end, the connector securing with the back end edge of the crossarm including a first leg, said leg provided for abutting against the back surface of the crossarm and capable of being secured thereto, an integral second leg extending angularly from the first leg of the connector, and said second leg securing with the bracket for retention of the same.

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**4,296,905**

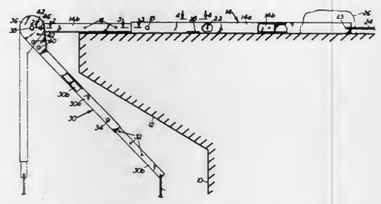
## BUILDING SCAFFOLD SUPPORT

**Charles R. Powell, 6729 N. Richmond Ave., Portland, Oreg. 97203**

**Continuation-in-part of Ser. No. 836,027, Sep. 23, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 928,237**

**Int. Cl.³ A47G** *29/02*

**U.S. Cl. 248—237** **3 Claims**



1. A scaffold support for buildings comprising

(a) an elongated base member having front and rear end portions and arranged to lie on a top surface of a building with said front end portion projecting beyond a side of the building,

(b) means on said base member arranged to hold it down on a building,

(c) rigid plate means depending integrally from the front end of said base member,

(d) a rigid scaffold supporting arm having upper and lower ends,

(e) means on the lower end of said arm for connecting a scaffold thereto,

(f) pivot support means pivotally connecting the upper end of said arm to the lower end of said plate means,

(g) rigid extension means having upper and lower ends,

(h) the lower end of said extension means being secured integrally to said arm at a point downward from said pivot connection of said arm with said plate means,

(i) said extension means extending upwardly along a rearward side portion of said plate means,

(j) said rearward portion of said plate means having a pin receiving aperture above said base member and said extension means having a plurality of spaced pin receiving apertures,

(k) and cross pin means arranged for removable mounting in the apertures in said plate means and in said extension means to provide selected angular disposition of said arm relative to said base member.

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**4,296,906**

## DEVICE HAVING A BALANCED PIVOTABLE ARM

**Matthijs Matthijsse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 20, 1979, Ser. No. 77,423**

**Claims priority, application Netherlands, Sep. 29, 1978, 7809850**

**Int. Cl.³ E04G** *3/00*

**U.S. Cl. 248—280.1** **4 Claims**

1. A counterbalancing device comprising:

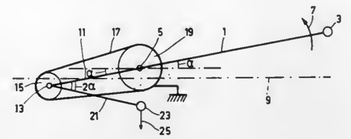
a first axle (**5**);

an arm (**1**) pivotably affixed for rotation around the first axle in a first plane;

a second axle (**9**) disposed in the first plane perpendicular to the first axle;

means pivotably affixing the first axle and the arm for rotation around the second axle so that the center of gravity of the arm is disposed on a first side of the second axle;

a counterweight (**23**) disposed on a second side of the second axle opposite the center of gravity of the arm; and



transmission means which couple pivoting motion of the arm around the first axle to motion of the counterweight so that the counterweight moves in an approximately straight line in the first plane when the arm is rotated around the first axle.

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**4,296,907**

## SUPPORT ASSEMBLY FOR AN EXHAUST SYSTEM OF A MOTOR VEHICLE

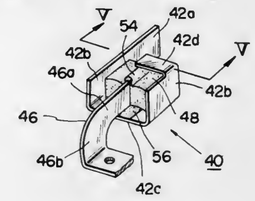
**Takashi Ishida, Yokohama, and Mamoru Tanaka, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Oct. 29, 1979, Ser. No. 88,755**

**Claims priority, application Japan, Nov. 14, 1978, 53-156954[U]**

**Int. Cl.³ F16M** *13/00*

**U.S. Cl. 248—573** **2 Claims**



1. A support assembly for an exhaust system of a motor vehicle, comprising:

(a) a first U-shaped bracket adapted to be mounted at one side to the body of the motor vehicle and provided with two substantially parallel spaced side walls in such a manner that the open side of said U-shaped bracket faces upwardly;

(b) a second bracket of substantially strip construction adapted for mounting at one end portion to the exhaust system and inserted at a second end portion between, and substantially parallel to, the two side walls of said U-shaped bracket in such a manner that the surface of said strip is normal to the bottom surface of the U-shaped bracket so as to form two spaces between the second end portion of the second bracket and each of the two side walls of the first bracket;

(c) two vibration absorbing members being inserted into the two spaces, the two members being respectively joined firmly to the second end portion of the second bracket and the two parallel side walls of the first bracket to absorb lateral and vertical vibrations of the second bracket;

(d) a stop extending from an upper portion of one of said two side walls toward the other side wall so as to prevent the movement of the second end portion of the second bracket beyond the stop; and

(e) a third vibration absorbing member disposed on one of the facing surfaces of said stop and said second end portion of said second bracket in such a manner that there is an appropriate spacing between the third vibration absorbing member and the other of said stop and said second end portion of said second bracket.

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**4,296,908**

## MOLD FOR INTEGRAL BASE FOR CASTING CERAMIC MATERIAL IN THE FORM OF A SLIP

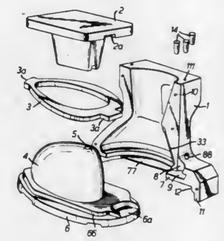
**Giuseppe Lippa, Brescia, Italy, assignor to American Standard Inc., New York, N.Y.**

**Filed Jul. 28, 1980, Ser. No. 172,792**

**Claims priority, application Italy, Aug. 8, 1979, 46864 A/79**

**Int. Cl.³ B29C** *1/14;* **B28C** *7/06, 7/34, 7/16*

**U.S. Cl. 249—58** **15 Claims**



1. A mold for casting ceramic material in slip form, which comprises a lower mold part resting on a support; at least two further mold parts adapted to be assembled with said lower mold part to define, in combination therewith, a cavity for casting and molding the article to be cast in the mold, said further mold parts including a removable ring and shelf portions on lateral mold members adapted to be positioned on said lower mold part to define the base of said cavity; said further mold parts being removable from said lower mold part after completion of the cast article so that the latter remains positioned on said lower part of the mold; said lower part bearing said ring to support said cast article on its lower rim in relation to its casting position, said ring being removably positioned on the inside of said lower part of the mold, and being supported by the lower part of the mold below said shelf portions so that, after casting, when the further mold parts have been removed from the lower mold part and the molded article, said ring may be lifted to contact said molded article so as to lift it out from the lower mold part.

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**4,296,909**

## APPARATUS FOR FORMING RECESS AROUND A PICKUP BOLT OF A CONCRETE BODY

**Ernst Haeussler, Grashofstr. 47, 4300 Essen-Bredeney, Fed. Rep. of Germany**

**Filed Sep. 3, 1980, Ser. No. 183,925**

**Claims priority, application Fed. Rep. of Germany, Sep. 5, 1979, 2935825**

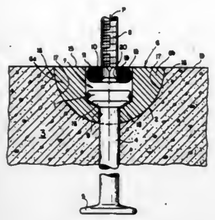
**Int. Cl.³ B28B** *7/04, 7/30, 7/16*

**U.S. Cl. 249—94** **10 Claims**

1. An apparatus for forming in a concrete body during casting thereof a recess around the head of a pickup bolt having a stem inbedded in said body, said recess having a part-spherical inner surface, said apparatus comprising:

a pair of like elements each having an outer surface complementary to a respective half of said inner surface defined by a line bisecting said inner surface at said stem, said elements being formed with respective halves of a seat

complementarily surrounding said bolt head and stem in said recess;



a bridge provided with a pair of pivots defining pivot axes parallel to said line, said elements being pivoted on said bridge element at said pivot axes; and

a manipulating member connected to said bridge.

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**4,296,910**

**HYDRAULICALLY CONTROLLED SAFETY VALVE**

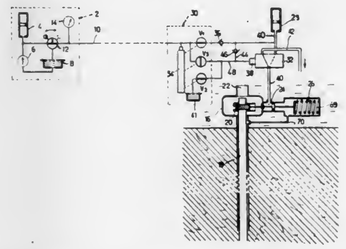
**Jean L. Gratzmuller, 66 Boulevard Maurice Barres, 92200 Neuilly sur Seine, France**

**Filed Aug. 24, 1978, Ser. No. 936,510**

**Claims priority, application France, Aug. 29, 1977, 77 26157; Jul. 12, 1978, 78 20767**

**Int. Cl.³ F16K** *31/12, 31/122*

**U.S. Cl. 251—28** **11 Claims**



1. In a safety valve control installation comprising:

a control station having a source of fluid under pressure;

a safety valve situated at a receiving station remote from said control station, said safety valve having a closure member;

a fluid operated jack attached to said closure member for actuating said closure member in an opening direction on pressurization of said jack;

resilient means acting in opposition to said jack for returning said closure member to the closed position when said jack is under low pressure;

a single small-section fluid flow line connecting the source of fluid under pressure at said control station to said receiving station and comprising, at said control station, a control valve permitting to selectively connect said line to said source or to a discharge means;

a fluid energy accumulator at said receiving station; and

a pressure-controlled feed/bleed relay connected between said accumulator and said actuating jack and having a control input;

the improvement comprising manostat means sensitive to the pressure in said line for successively actuating individual valve means which regulate, in response soley to said line pressure, a unidirectional communication of said line pressure with said accumulator, a closing of a communication of said relay control input with an outlet through one of said valve means in response to increased line pressure detected by said monostat means, and a communication of said line pressure through one of said valve means to said relay control input and unidirectionally to said accumulator in response to a further increase in line pressure detected by said monstat means.

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**4,296,911**

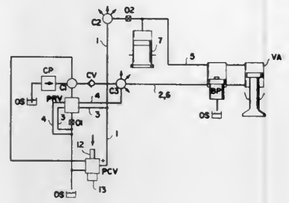
**HYDRAULIC CONTROLLED SONIC INDUCTION SYSTEM**

**Alfonso S. Escobosa, 2034 Brittany Pl., Placentia, Calif. 92670**

**Filed Feb. 7, 1979, Ser. No. 10,001**

**Int. Cl.³ F16V** *31/122;* **F01L** *1/34, 9/02*

**U.S. Cl. 251—57** **4 Claims**



1. A hydraulic controlled sonic induction system including a hydraulic actuation system adapted to provide a prescribed lift profile to engine intake valves, said actuation system receives hydraulic fluid for effecting the opening of each of the said intake valves by a cam follower piston, said hydraulic fluid conveyed to an actuator/port unit by means of a valve-opening control line, said actuator/port unit containing a single-ended, doubleacting valve actuator including, a piston, an actuator, an actuator cylinder, a poppet valve, a valve seat and a valve port, the shaft of said actuator being connected with the stem of the valve, the top face of said actuator piston being connected with the face of said cam follower piston by means of said valve-opening control line, the bottom annular piston face of said actuator piston being connected to a valve-closing circuit, said valve-closing circuit consisting of a first fluid compliance, a third fluid compliance, a check valve allowing the passage of fluid from the first fluid compliance to the third fluid compliance, and a variable pressure source connected to said first compliance, the bottom annular face of the actuator piston being connected to the third fluid compliance of the valve-closing circuit by means of a valve-closing control line, said variable pressure source comprising a hydraulic fluid charging pump, a pressure release valve, and a flow restricting orifice, said pressure release valve and said flow restricting orifice being in series with each other and being connected in shunt with the charging pump, the pressure relief fluid of said pressure release valve is returned to a oil sump, through said flow restricting orifice said cam follower piston, said actuator piston, and said actuator shaft define sliding surface clearances within the interior of said cylinder and forming finite leakage seals therewith, the actuator shaft finite leakage seal, in turn, divided into interior and exterior seals with leakage from the interior seal returned to the oil sump, a retractable elastomeric seal in series with the finite leakage interior shaft seal for the purpose of positively containing the interior (control) fluid and for latching each of the intake valves at some time during the engine turn-off period, another retractable elastomeric seal in series with the finite leakage seal of the cam follower piston again for the purpose of holding the interior fluid during the engine turn-off period, said hydraulic controlled induction system further includes lift control members for varying the opening of said intake valves, said control members comprising (1) a bypass piston contained in each of said intake valve actuator/port units and connected therein in parallel with the actuator piston through the valve-opening control line to a first bypass piston chamber and through the valve-closing control line to a second bypass piston chamber, (2) a flow distribution orifice connected to each of the valve-opening control lines, (3) a second fluid compliance means being connected to the flow distribution orifices that lead to the valve-opening control



lines, and (4) a three-way pressure control valve, a supply pressure port thereof being connected to said first fluid compliance means, a return port thereof being connected to the oil sump and a control pressure port thereof being connected to said second fluid compliance means, the two sliding surface clearances of said bypass piston form two finite leakage seals with leakage from the finite leakage seal of the smaller diameter being returned to the oil sump, a retractable elastomeric seal in series with the smaller diameter finite leakage seal for the purpose of positively holding the interior (control) fluid and latching the bypass piston corresponding to each of the intake valves at sometime during the engine turn-off period.

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**4,296,912**

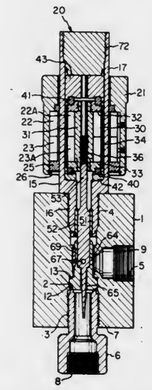
**MAGNETICALLY ACTUATED METERING VALVE**

**Robert F. Ruyak, Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.**

**Filed Aug. 30, 1979, Ser. No. 71,014**

**Int. Cl.³ F16K** *31/08*

**U.S. Cl. 251—65** **1 Claim**



1. A valve suitable for metering fluids pressurized in excess of 2000 psi comprising a pressurizable valve body defining a metering passage, a first fluid passage in communication with one of the metering passage and a second fluid passage in communication with the other end of the metering passage and a valve actuator passage extending away from the metering passage,

a nonmagnetic elongate cylindrical tubular pressurizable bonnet having an extending axis passing through the metering passage and in direct fluid communication with the passages in said valve body,

a cylindrical holder coaxial with and surrounding said tubular bonnet, said holder mounted rotatably thereto, said holder carrying rare earth cobalt magnets defining an even number of north and south poles,

a driven magnet assembly carrying rare earth cobalt magnets defining an even number of north and south poles rotatably supported in the bonnet substantially coaxial with said bonnet by thrust bearings to resist axial movement of the driven magnet assembly,

a valve stem substantially coaxial with said bonnet journaled for free axial movement in the valve actuator passage threadably engaging the driven magnet assembly,

a tapered metering element fixed to said valve stem which when moved axially enlarges or decreases the minimum area of the metering passage through which flow may take place, means for keying the valve stem to prevent rotation thereof,

whereby rotation of said driven magnet assembly in one direction concomitantly raises the valve stem and rotation of said driven magnet assembly in the other direction lowers said valve stem.

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**4,296,913**

**BALL VALVE**

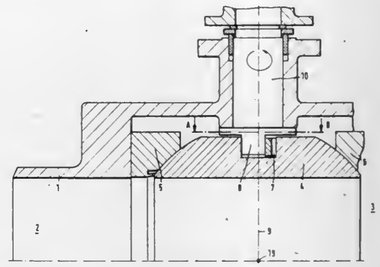
**Ernst H. J. Hoyer, Lohwurt 11, D-2000 Hamburg 57, Fed. Rep. of Germany**

**Filed Jun. 19, 1979, Ser. No. 49,882**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827720**

**Int. Cl.³ F16K** *31/44*

**U.S. Cl. 251—76** **11 Claims**



1. A ball valve comprising:

a housing having inlet and outlet openings for a flow medium;

a perforated ball floatingly supported in a pair of rings in the housing for rotation about first and second rotary axes displaced from each other and extending through the center of the ball, said ball being rotatable about said first rotary axis to a first position in which the ball connects the inlet and outlet openings and to a second position in which the ball interrupts the inlet and outlet openings; and

an actuator rotatable with the ball and in engagement therewith, said ball and actuator being so formed that their coaction is capable of imparting an initial movement to the ball about said second rotary axis for overcoming adhesion friction of the ball and thereafter imparts a rotation to the ball about said first rotary axis.

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**4,296,914**

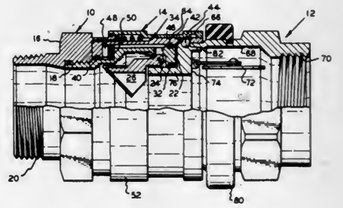
**FULL FLOW BREAKAWAY COUPLING**

**Alan R. Allread, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.**

**Filed Dec. 26, 1979, Ser. No. 107,152**

**Int. Cl.³ F16L** *37/22, 37/28*

**U.S. Cl. 251—149.2** **6 Claims**



1. A breakaway fluid coupling comprising, in combination, male and female body parts each having an axis, an axially extending passage, conduit attachment means in communication with the associated passage, a valve within the associated passage adapted to close upon the parts being uncoupled, a

connection end, and latch means adapted to engage with the latch means defined on the other part for maintaining said parts in coupled intercommunication, said latch means defined on one part including a radially extending abutment surface facing said conduit attachment means of the associated part, a detent support axially slidably mounted on the other part between latched and release positions thereon, biasing means interposed between said other part and said detent support axially biasing said support toward said latched position, at least one radially displaceable detent mounted on said detent support adapted to engage said abutment surface upon said parts being coupled maintaining said parts coupled, detent positioning means defined on said other part having a first axial portion engaging said detent when said detent support is in said latched position maintaining said detent in engagement with said abutment surface and a second axial portion permitting radial displacement of said detent when said detent support is in said release position to disengage said detent and abutment surface and permit said parts to uncouple solely upon tension forces within said body parts compressing said biasing means to permit alignment of said second axial portion with said detent, and means supporting said detent positioning means on said other part having a normal condition restraining said detent positioning means against axial movement toward the associated connection end and permitting manual axial displacement away from said connection end whereby said detent positioning means may be manually axially displaced to disengage said detent and abutment surface.

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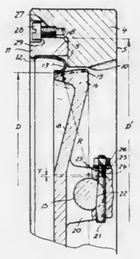
**4,296,915**

## ECCENTRIC ROTARY DISK VALVE WITH ELASTIC METAL SEAL

**Hans D. Baumann, 32 Pine St., Rye, N.H. 03870**

**Filed Aug. 21, 1980, Ser. No. 179,944**
**Int. Cl.³ F16K *1/226***
**U.S. Cl. 251—174** **5 Claims**



1. Eccentric rotary disk valve for tight shut-off purposes comprising:

a. tubular housing;

b. one inlet and one outlet formed in said housing, inlet and outlet ends adapted to be coupled to a pipeline;

c. a straight cylindrical passage formed in said housing towards a stop shoulder, forming a reduced cross section at that point;

d. a ring shaped seal retainer removably and adjustably placed within the straight cylindrical passage having an inner bore on an axis which is parallel to but offset from that of the exterior diameter of the seal retainer;

e. a shaft located perpendicular to and offset from the longitudinal axis of the tubular housing and being retained on either end by the outer walls of said housing;

f. an eccentric rotating disk tiltingly engaged with said shaft and within the reduced cross section of said housing, said disk having an annular continuous, partially spherical periphery forming a seating surface;

g. a flexible metal seal ring having a generally U-shaped cross-sectional configuration when viewed in the circumferential direction, wherein the outer straight portion of said U-shaped configuration is engaged within the inner bore of said seal retainer and suitably fastened to the same at its terminating end, while the inner straight portion of said U-shaped configuration forms a central circular seating bore to engage the eccentric disk in the closed valve position, the bottom portion of said U-shaped configuration facing said disk and the straight portions of said U-shaped configuration being generally parallel to said longitudinal axis of said tubular housing.

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**4,296,916**

## SUBMERSIBLE PUMP PULLER

**M. Pearson Jewett, P.O. Box 442, Rockland, Me. 04841**

**Filed Nov. 26, 1979, Ser. No. 97,526**
**Int. Cl.³ B66D *3/00***
**U.S. Cl. 254—380** **2 Claims**

1. A device for pulling a submersible pump from a well casing in which it is suspended by a cable, said device comprising

a pair of rails, one of which is longer than the other;

a threaded bolt, spacer and wing-nut assembly connecting the upper end of the shorter rail to the longer rail at a point spaced below the upper end of the latter so that said rails are adjustably held in parallel spaced relation with portions of the longer rail protruding both above and below the corresponding ends of the shorter rail;

a second threaded bolt and wing-nut assembly interconnecting said rails at a location spaced both from said first assembly and from the lower end of said shorter rail, and

a winch mounted on the upwardly protruding portion of said longer rail,

whereby said device may be clamped to the rim of a well casing by tightening said wing-nut assemblies with said longer leg extending inside the casing and a portion of said shorter leg extending downwardly outside said casing so that said winch is suspended over the casing in position to pull a submerged pump by means of said cable.

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**4,296,917**

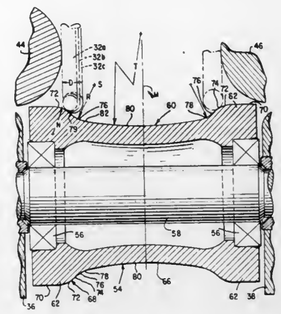
## CONTOURED CABLE ROLLER

**Ralph R. Day, Aurora, and B. James Wulff, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Apr. 3, 1980, Ser. No. 137,068**
**Int. Cl.³ B66D *1/36***
**U.S. Cl. 254—400** **14 Claims**

1. A fairlead (**26**) for a log skidder (**10**) having a power winch (**229**, said fairlead (**26**) having a pair of vertically oriented, spaced apart side rollers (**44,46**) and a main guide roller (**54**) extending transverse to said side rollers (**44,46**), said main guide roller (**54**) having a pair of side portions (**62,62**) and a central portion (**66**) intermediate said side portions (**62,62**), a shoulder (**68**) formed on each of said side portions (**62,62**), each shoulder (**68**) having a convex section (**72**) and a concave section (**76**) merging into each other and extending toward the central portion (**66**) of said main guide roller (**54**), said concave section (**76**) lying tangent to said central portion (**66**), said main guide roller (**54**) being of a construction sufficient for urging a





cable (**32**), passing through said fairlead (**26**) and in contact with one of said side rollers (**44,46**) from the adjacent shoulder (**68**) toward the central portion (**66**) of said main guide roller (**54**).

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**4,296,918**

## ANIMAL PEN POST

**Werner Hölscher, Emsbüren, Fed. Rep. of Germany, assignor to Hölscher & Leuschner GmbH & Co., Emsbüren, Fed. Rep. of Germany**

**Filed May 6, 1980, Ser. No. 147,003**
**Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919414; May 15, 1979, 7913963[U]**
**Int. Cl.³ E04H *17/14***
**U.S. Cl. 256—68** **2 Claims**

1. A post for an animal pen installed in a livestock shed or the like having at least two outwardly facing longitudinally extending surfaces which are adjacent to one another and which extend generally in planes disposed at right angles with respect to one another, the post being made in one piece and comprising semi-cylindrically shaped recesses in each of said longitinal surfaces for receiving horizontal rigid tubular rails, said semi-cylindrical recesses having a diameter corresponding to the diameter of said tubular rails such that said semi-cylindrical recesses accommodate and seat therein semi-cylindrical portions of said tubular rails, said recesses extending transversely of said longitudinal extending surfaces and being open at both ends, said recesses being disposed in said surfaces in pairs with one recess of each pair being in one of said longitudinal surfaces and the other of said pair being in the other longitudinal surface and with the spacing between said pairs decreasing toward the bottom of said post, said recesses being offset in height with respect to one another by at least the diameter of said recesses so that a tubular rail seated in one recess of a pair of recesses will be offset from the tubular rail seated in the other recess of said pair a distance in height at least equal to the diameter of said semi-cylindrical recesses, and for each recess at least one securing hole passing through the post for receiving a securing element for securing the tubular rail in its seated position in its respective semi-cylindrical recess in said pole, thereby providing a highly rigid animal pen.

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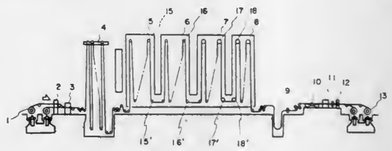
**4,296,919**

## APPARATUS FOR CONTINUOUSLY PRODUCING A HIGH STRENGTH DUAL-PHASE STEEL STRIP OR SHEET

**Koichi Sakurai, Kitakyusyushi; Takashi Furukawa, Machidashi; Hiroshi Takechi, Kisarazushi, and Munetsugu Matsuo, Kawasakishi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Aug. 13, 1980, Ser. No. 178,015**
**Int. Cl.³ C21D *9/56***
**U.S. Cl. 266—111** **3 Claims**



1. An apparatus for continuously producing a high strength dual-phase steel strip or sheet having a metallurgical composition which produces a dual-phase structure composed of ferrite grains and a low temperature transformed phase when rapidly cooled from the $(\alpha+\gamma)$ temperature range or from the $\gamma$ temperature range, which apparatus comprises a vertical type continuous heat treatment furnace having a heating zone, a soaking zone and a cooling zone, said cooling zone having an upper hearth roll group, a lower hearth roll group and means for cooling the strip at a rate in the range between 1° and 300° C./sec. for retaining the austenite, the hearth rolls of each hearth roll group being positioned for guiding the strip coming from the soaking zone up and down and alternatively around the upper hearth rolls and the lower hearth rolls from the inlet end to the outlet end of the cooling zone, and the hearth roll at the position where the strip is subjected to straining and begins to work harden as a result of the bending and the subsequent hearth rolls having a diameter D in millimeters according to the formula which is for the condition where the strip temperature is greater than 200° C.:

$$\frac{t}{D} + \beta \cdot T \cdot \log(CR) \cdot \frac{1}{100} \leqq \epsilon WH$$

Wherein;

t=Maximum strip thickness in millimeters;

$\epsilon WH$=0.2% (Strain at which the retained austenite starts to undergo strain induced transformation into martensite and the strip begins to work harden);

$\beta$=Linear thermal expansion coefficient ($12\times10^{-6}$);

T=Temperature at which the strip is subjected to cooling, in degrees C;

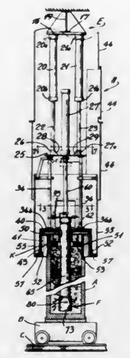
CR: Cooling rate of the strip in degrees/second. whereby the strain induced phase transformation of the retained austenite and consequently the work hardening of the strip when it is passed around the hearth rolls is avoided.

**4,296,920**

## MOLTEN METAL TREATMENT

**Kirk D. Miller, Rexdale; John B. Flood, Willowdale; George Dimou, Toronto; Frederick E. Kara, Islington, and Richard W. Amos, Etobicoke, all of Canada, assignors to Canron Inc., Montreal, Canada**

**Division of Ser. No. 806,094, Jun. 13, 1977, Pat. No. 4,199,353. This application Jan. 23, 1980, Ser. No. 114,726**
**Claims priority, application Canada, Jan. 18, 1977, 269973**
**Int. Cl.³ C21C *7/00***
**U.S. Cl. 266—216** **6 Claims**



2. An apparatus, as defined in claim 1, including,
a mounting device for a plunging rod of the type described, comprising,
an adapter having a base plate provided with a socket for receiving the end of an elevating rod extending upwards therefrom,
a boss extending downwards from said plate and having a recess for receiving a connector from the rod,
a bracket slidably seated on the base plate and having a fixed connection to the adapter,
and means for clamping the plate and bracket together to prevent their relative movement.

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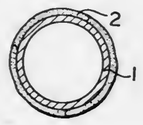
**4,296,921**

## LANCE PIPE FOR REFINING AND METHOD OF MAKING THE SAME

**Yoshihiro Hayashi, Ohtsu, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan**

**Filed Aug. 2, 1979, Ser. No. 63,121**
**Claims priority, application Japan, Aug. 28, 1978, 53-104745; Oct. 13, 1978, 53-125163**
**Int. Cl.³ C21B *7/16***
**U.S. Cl. 266—270** **9 Claims**



1. A method of producing a heat-resistant lance pipe which comprises:
(a) providing a hollow refractory tube, and
(b) applying to at least part of the outer surface thereof a first layer of an impregnated fibrous refractory material, with said fiber being based on alumina or silica and having a diameter ranging from 0.5 to 15.0 mm, said fibers being impregnated with a mixture consisting of 40–90% by weight of a refractory aggregate having a particle size of less than −10 mesh which contains in excess of 15% by weight of particles having a particle size of −200 mesh and in excess of 15% by weight of particles having a particle size of 28–200 mesh, and from 10–50% by weight of a refractory binder which includes at least one material from the group consisting of silica sol including 5–40% by weight of solid parts, hydrolyzed ethyl silicate and fire clay suspension.

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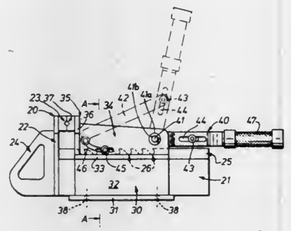
**4,296,922**

## BENCH CLAMP DEVICE

**Lindsay T. McGrath, 89 Sydney St., Muswellbrook, New South Wales, and Gilbert T. McGrath, 25 Mulcare Crescent, Churchill, Victoria, both of Australia**

**Filed May 19, 1980, Ser. No. 151,399**
**Int. Cl.³ B25B *1/14***
**U.S. Cl. 269—211** **8 Claims**



1. A tension clamp device which comprises, in combination, a movable jaw co-extensive with an elongated adjusting arm, a hollow housing through which said adjusting arm is adapted to pass freely, said hollow housing being adapted to be mounted on a fixed base and having a main jaw integral therewith, a tension lever pivotally attached to and between two spaced, parallel side cheeks of said housing, a secondary lever pivotally fastened at one end thereof to said tension lever, the other end of said secondary lever being constrained with respect to said housing by means of a pin in sliding relationship with respect to a pair of registering travelling slots, each formed within a respective one of said side cheeks of said housing, said pin being adapted to engage selectively one of a plurality of notches formed in a rack extending longitudinally of said adjusting arm, and said pair of travelling slots being adapted to guide sliding movement of said pin therealong from a first position wherein said pin is free of engagement with said notches to a second position wherein said pin engages said one of said notches, whereby pivotal movement of said tension lever with respect to said housing initially causes said pin to slide along said pair of travelling slots from said first position to said second position whereby free sliding motion of said adjusting arm within said housing is prevented by the engagement of said pin in said notch, and then causes said housing to lock securely with respect to said adjusting arm by an over-centre action to grip firmly within said jaws any work-piece located therebetween, each of said pair of travelling slots being arcuate at the end thereof corresponding to said first position of said pin.

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**4,296,923**

## PLAYGROUND SWING

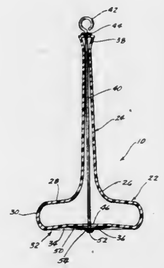
**Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa**

**Filed Oct. 11, 1979, Ser. No. 84,053**
**Int. Cl.³ A63G *9/00***
**U.S. Cl. 272—85** **1 Claim**

1. A playground swing comprising:
an elevated support;
a flexible line having upper and lower ends, and being connected at its upper end to said support;



an integral hollow plastic body including a seat unit and an upstanding stem, wherein said seat unit is substantially rigid, substantially circular in cross-section, and has a cylindrical seat portion with a flat top section including rounded upper and lower edges, and an outer convex peripheral surface, and being of a depth sufficient to allow the seat portion to be comfortably gripped between the user's thighs and the back of the user's legs to stabilize the user on said body during the operation of said swing, and wherein said upstanding stem is substantially rigid, fixably connected to and substantially centrally disposed on said seat portion cylindrical along its substantial length and flaring outwardly into said seat portion at its lower end, and outwardly into an enlarged portion at its upper end, and being substantially longer than the maximum dimensions of said seat portion, whereby a hand hold is provided for a user seated on said seat portion;



a pressure plate having a centrally disposed aperture and a nut means;
and a rod having an eyelet at one end and engaging the aperture and nut means at the other end, and extending from beyond the bottom of said seat portion through and beyond the length of said stem, and wherein said eyelet is connected to the lower end of said flexible line and said other end extends through the aperture of said pressure plate into engagement with said nut means to press said plate against the outer bottom surface of said seat portion, whereby a user pulls on said stem in a pumping action to initiate the swinging motion of the swing with said stem pivoting about a horizontal axis through said eyelet, thereby moving the swing out of the plane of the flexible line and at an angle to the vertical plane.

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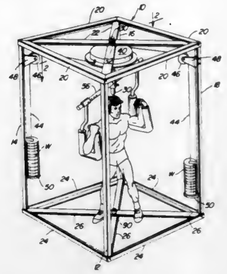
**4,296,924**

## TORSION EXERCISE APPARATUS

**Alfred B. Anzaldua; David A. Anzaldua, and Benjamin R. Sturgeon, all of Peoria, Ill., assignors to Health Innovations, Inc., Peoria, Ill.**

**Filed Aug. 4, 1980, Ser. No. 175,147**
**Int. Cl.³ A63B *21/06***
**U.S. Cl. 272—117** **12 Claims**

1. Exercise apparatus comprising:
a vertically oriented framework;
wheel means carried by said framework and rotatable about a vertical axis;
adjustable resistance means connected to said wheel means and adapted to resist rotation thereof; and
a pair of horizontally spaced handle means connected to said wheel means for simultaneous rotation in the same direction, each said handle means including a handle,
said handles being spaced apart sufficiently to accommodate a user therebetween and permit the user to grip both handles simultaneously with his hands and, by rotating the handles and his torso about the wheel's vertical axis, rotate



said wheel means in either a clockwise or counterclockwise direction and work against said resistance means.

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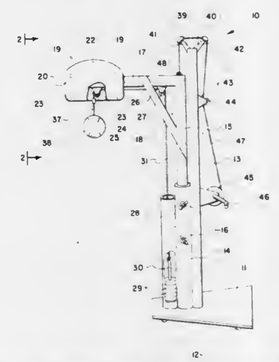
**4,296,925**

## JUMP TRAINER

**William G. Alston, 151-A Treetop Dr., Fayetteville, N.C. 28301**

**Filed Jun. 23, 1980, Ser. No. 161,746**
**Int. Cl.³ A63B *5/16, 69/00***
**U.S. Cl. 273—1.5 A** **12 Claims**



1. A jump training device comprising: a pair of beat boards disposed back to back; means for supporting said beat boards a predetermined distance from a playing surface; and a game type ball suspended adjacent to and below said beat boards whereby an improved jump training device is provided.

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**4,296,926**

## RED LIGHT - GREEN LIGHT GAME

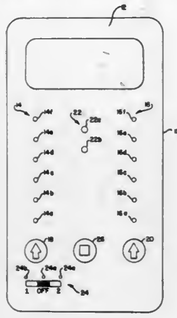
**Gordon H. Buck, Torrance, and Martha K. Hardwick, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.**

**Filed Dec. 26, 1979, Ser. No. 106,715**
**Int. Cl.³ A63F *9/14***
**U.S. Cl. 273—86 R** **15 Claims**

1. An electronic game comprising:
a first array of discrete, illuminatable display elements for displaying the position of a first player's piece indicium,
a second array of discrete, illuminatable display elements for displaying the position of a second player's piece indicium,
a stop/go indicator having first and second states,
a first manual input, comprising a first momentary contact switch, inputting to a position control means,

a second manual input, comprising a momentary contact switch, inputting to said position control means,

stop and go control means, outputting to said stop/go indicator alternately establishing the first and second states of said indicator, for controlling said position control means, said position control means being for moving the first player's piece indicium in one direction by sequentially turning on one display element and turning off another in response to each contact of said first momentary contact switch in said first array when the first manual input is



operated during the first state of said indicator and in the opposite direction in said first array when the first manual input is operated during the second state of said indicator and moving the second player's piece indicium in one direction by sequentially turning on one display element and turning off another in response to each contact of said second momentary contact switch in said second array when the second manual input is operated during the first state of said indicator and in the opposite direction in said second array when the second manual input is operated during the second state of said indicator.

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**4,296,927**

**GAME BOARD AND CARDS**

**Russell E. Larsen, 1517 E. Garfield, Apt. #71, Glendale, Calif. 91205**

**Filed Oct. 30, 1978, Ser. No. 956,022**

**The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.**

**Int. Cl.³ A63F *3/00***

**U.S. Cl. 273—248** **8 Claims**

1. A game apparatus including:

(a) a game board with a pluarlity of separate movement zones for each player, each zone having multiple locations for movement of markers positioned therein;

(b) markers for placement in each respective zone; and

(c) a plurality of cards defining movement instructions, each card having at least two symbols representing separate but concurrent move options for a player having possession of said card, each of said symbols having corresponding identity relationship with a specific movement zone based on total numbers of columns representing directions of movement within the given movement zone to limit marker movement within said zone.

**4,296,928**

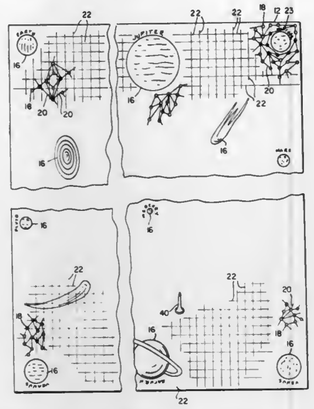
**INTERPLANETARY CONFLICT GAME**

**Howard H. Nick, Darren Rd., La Grangeville, N.Y. 12540**

**Filed Dec. 5, 1979, Ser. No. 100,463**

**Int. Cl.³ A63F *3/00, 3/04***

**U.S. Cl. 273—262** **7 Claims**



1. An interplanetary conflict game comprising:

(a) a gameboard having first indicia thereon symbolic of the solar system including planets, stars, and travel routes between the stars, said gameboard further including second indicia to determine the distance between said stars,

(b) a plurality of rocket markers for each player to be manually moved by a player between said stars and planets and to fire at an opponent player's rocket or to capture an opponent's planet,

(c) a group of colored rating spheres, each having an external curved surface, a conical-shaped passageway extending along a center line through a rating sphere, and a slot extending the length of the center line for easy removal of the rating sphere from a rocket marker to which it is attached in order to indicate the numerical rating of the rocket markers,

(d) a firing chart for determining a firing range between a player's rocket and an opponent's rocket,

(e) a promotion chart for determining the proper rating sphere for said rocket markers,

(f) a legend chart for indicating the number of moves for a rocket marker as indicated by its rating sphere,

(g) a group of firing cards to be drawn by a player desiring to fire his rocket at a rocket belonging to an opponent player instructing the player as to whether the rocket hits or misses.

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**4,296,929**

**ELECTRIC EYE ACTUATED GUN ARCADE**

**Burton C. Meyer, Downers Grove; Gunars Licitis, Lombard, and Derek A. Brand, Naperville, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Filed Feb. 19, 1976, Ser. No. 659,216**

**Int. Cl.³ F41J *5/02***

**U.S. Cl. 273—310** **11 Claims**

1. A target shooting apparatus, comprising:

a plurality of target devices;

a frame for removably supporting said plurality of target devices;

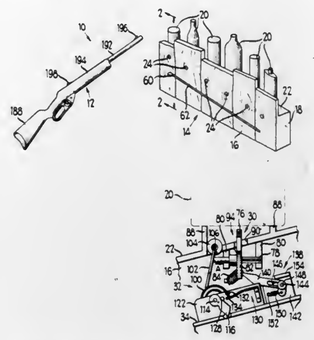
a plurality of actuatable target impellers mounted on the frame and each associated with one of said targets to knock the respective target off of said frame when the respective target impeller is actuated;

circuit means including a photodetector remotely disposed



from the targets providing an output signal upon the sensing of a properly aimed light beam;

control means including a power supply and drive means associated with said circuit means and one of said target impellers for actuation thereof in response to receipt of the output signal from said circuit means, said circuit means and control means being movably mounted on a carriage for movement from a first target impeller seriatim to a



second target impeller after actuation of said first target impeller whereupon each of said targets may be sequentially knocked off of said frame upon sequential actuation of the respective target impellers; and

a selectively operable aiming device including a light source therein for directing a beam of light therefrom, said light source being arranged so as to direct the light beam toward the photodetector when the aiming device is properly aimed toward the respective target.

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**4,296,930**

**TV GAME APPARATUS**

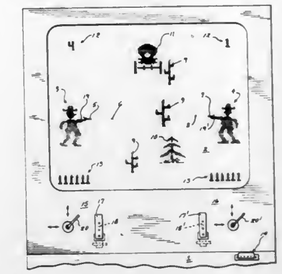
**Jeffrey E. Frederiksen, Milwaukee, Wis., assignor to Bally Manufacturing Corporation, Chicago, Ill.**

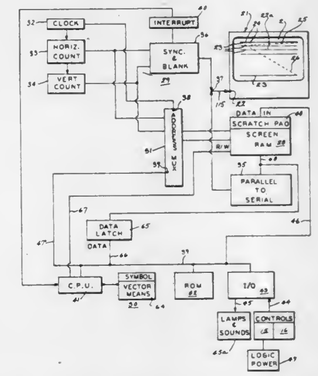
**Continuation of Ser. No. 635,406, Nov. 26, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,662**

**Int. Cl.³ A63F *9/22***

**U.S. Cl. 273—313** **26 Claims**

2. A player-operated game apparatus for use with a display screen means having an intensity control means for varying the intensities of picture elements for the presentation of movable symbols on a screen, said apparatus comprising player-operated means including input elements adapted to be operated by a player and signal means actuable by said input elements for affecting the display of symbols and initiation interaction of the player with the symbols on the screen; random access memory for storing in a digital form a set of digital bits representing the intensities necessary for generating a display on said screen and locating the symbols within the display; display controller means for addressing said random access memory and reading the set of bits in the random access memory in time-spaced read periods separated by reading idle periods, in each of which read periods one or more bits associated with a desired display are read from the random access memory, said display controller means being adapted for connection to said intensity control means of the display means to transmit the bits to said intensity control means to present the desired display stored in said random access memory; a microprocessor; program means; communicating port means for connecting the signal means of the player-operated means to the microprocessor, said microprocessor having means for accessing said program means and means for reading from and writing to said random access memory to represent symbols in response to said signal means and said program means whereby the microprocessor revises and controls interaction of the symbols within the display; control means operatively coupling the random access memory to the microprocessor during said reading idle periods to change said random access memory between said read periods; and processing means operatively coupled to the microprocessor for receiving therefrom control signals and symbol signals representative of a symbol to be displayed on the display, the control signals activating the






processing means for transforming the symbol signals to produce transformed symbol signals so that a symbol represented by the transformed symbol signals is different than a symbol represented by the symbol signals relative to the display, and for providing smooth appearing continuous movement of the symbols on the display.

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**4,296,931**

**PROJECTING-TYPE SHOOTING GAME APPARATUS**

**Gunpei Yokoi, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan**

**Filed Mar. 26, 1979, Ser. No. 23,780**

**Claims priority, application Japan, Apr. 20, 1978, 53-047325; Apr. 20, 1978, 53-047326; Apr. 29, 1978, 53-051869; Apr. 29, 1978, 53-059077[U]**

**Int. Cl.³ A63F *9/02***

**U.S. Cl. 273—316** **5 Claims**

1. A projector-type shooting game apparatus comprising:

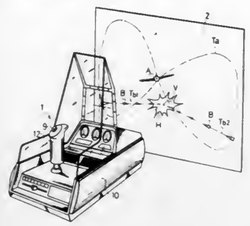
a screen;

a housing having a longitudinal axis and for projecting a target image onto said screen;

a mirror rotatably coupled to said housing such that said mirror is rotatable in first and second axes mutually perpendicular to each other and both of said first and second axes being perpendicular to said longitudinal axis;

a means for changing an angle of said mirror about said first axis;

a means for changing an angle of said mirror about said second axis;
a driving means for driving both said angle changing means;
a lever manually movable about third and fourth axes;



a means for mechanically coupling said lever's movement to both said means for changing the angle of said mirror, whereby the motion of said mirror is effected by said driving means and by a player's manual operation of said lever.

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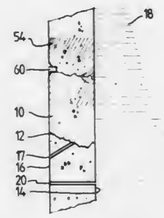
**4,296,932**

**SEALING OF LEAKS IN TANKS AND THE LIKE**

**Johannes H. Grobler, 668 Main Pretoria Rd., Wynberg, Johannesburg, South Africa**

**Filed Sep. 13, 1979, Ser. No. 74,858**
**Int. Cl.³ F16J** *15/02*
**U.S. Cl. 277—1** **4 Claims**



1. The method of sealing a fluid passage in a body comprising forming in the body a second passage which intersects the fluid passage and introducing through the second passage to the fluid passage a composition comprising a rubber latex and a bituminous material in sufficient quantity to form an aggregate which effectively seals the fluid passage in the presence of a coagulating agent.

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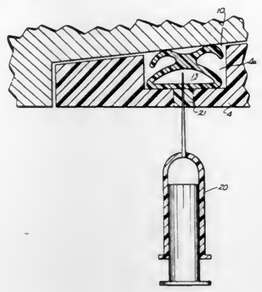
**4,296,933**

**PIPE JOINT SEAL**

**Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423**

**Division of Ser. No. 40,273, May 17, 1979, Pat. No. 4,209,179.**
**This application Jan. 18, 1980, Ser. No. 113,358**
**Int. Cl.³ F16J** *15/32, 15/46*
**U.S. Cl. 277—34.3** **3 Claims**

1. A pipe joint seal and coupler collar for sealing and connecting pipe sections comprising: an annular channel in said coupler collar; said seal being annular and being positioned in said channel; said seal including a hollow, annular inflatable bladder; said coupler collar including an inflation access means extending from an external surface of said coupler collar to said channel whereby inflating means can be inserted through said inflation access means and into said bladder for inflating said seal when it is in its operative sealing position and wherein said seal further includes an annular base member and at least one annular and outwardly curved sealing flange curving upwardly, outwardly and then downwardly from said base member for tightening against the pipe joint surface which it



abuts when fluid pressure is exerted against the seal; said bladder being located in said base member.

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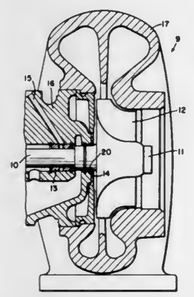
**4,296,934**

**SEALING ASSEMBLY**

**Howard S. Atkin, Leeds, England, assignor to Holset Engineering Company Limited, Huddersfield, England**

**Filed Jun. 7, 1979, Ser. No. 46,409**
**Claims priority, application United Kingdom, Jun. 9, 1978, 26635/78**
**Int. Cl.³ F16J** *15/34, 15/46*
**U.S. Cl. 277—81 R** **3 Claims**



1. A turbine assembly comprising:
a turbine housing having an internal cylindrical surface;
a turbine wheel shaft rotatable relative to said housing and having an external cylindrical surface opposing the internal cylindrical surface, said turbine wheel shaft having an annular groove formed therein;
a sealing ring positioned in said annular groove and having a cylindrical radially outer surface engaging the cylindrical surface of said turbine housing;
one of the axial faces of said sealing ring having a chamfered portion so that the axial dimension of the radially inner surface of the sealing ring is less than the axial dimension of the cylindrical radially outer surface of the sealing ring, the annular groove including a complementary shaped cone-like wedging surface for cooperating engagement with the chamfered surface of the sealing ring.

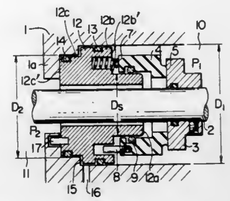


**4,296,935**

**MECHANICAL SEAL**

**Hiroshi Inouye, Minorimachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 10, 1979, Ser. No. 83,340**
**Claims priority, application Japan, Oct. 9, 1978, 53-123620**
**Int. Cl.³ F16J** *15/34, 15/48*
**U.S. Cl. 277—81 R** **2 Claims**



1. A mechanical seal for sealing the rotary shaft of a rotary machine wherein the pressure difference between the internal and external liquid acting on said mechanical seal changes from positive to negative or from negative to positive, characterized in that
an axially movable but nonrotatable ring and a seat ring are formed with seal faces which coact to seal between the internal liquid present externally of a retainer and the external liquid present internally of said retainer,
said seat ring is liquid-tightly and securely mounted on said rotary shaft,
said retainer is disposed for axial movement, but is prevented from rotating about the axis of said rotary shaft by a bias spring and a stop means,
said bias spring normally biases said retainer against said seat ring and provides the sealing force for pressing the seal face of said retainer against the seal face of said seat ring when the external liquid pressure becomes higher than the internal liquid pressure, but the difference therebetween is small and less than a predetermined level, said retainer is disposed within a casing and is forced to move axially depending upon the difference in pressure between the internal and external liquids, and
O-rings are interposed between the casing and the retainer and between the retainer and the axially movable, but nonrotatable ring.

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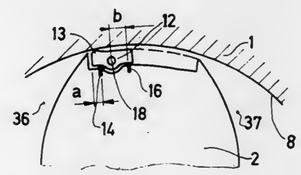
**4,296,936**

**SEAL MECHANISM FOR THE ROTOR PERIPHERY OF A ROTARY PISTON ENGINE**

**Felix Wankel, Bregenzer Strasse 82, D-899 Lindau, Fed. Rep. of Germany**

**Filed Mar. 25, 1980, Ser. No. 133,784**
**Claims priority, application Switzerland, Mar. 27, 1979, 2841/79**
**Int. Cl.³ F16J** *15/48;* **F01C** *19/02*
**U.S. Cl. 277—81 P** **18 Claims**



1. A seal mechanism for the periphery of the rotor of a rotary piston engine operating with a fluid working medium comprising: a sealing ledge extending generally parallel to the axis of said rotor and supported on said rotor so as to be pivotable about an axis extending in the longitudinal direction thereof, said sealing ledge being arranged for sealing contact along a limited region of its periphery with an opposed sealing surface in said engine; and secondary seal means provided at least one point on the periphery of said sealing ledge extending parallel thereto and acting between said sealing ledge and said rotor, said secondary seal means operating to establish on said sealing edge a surface area upon which the pressure of said fluid working medium acts such that there are developed on said sealing ledge resulting forces having a desired magnitude and directed to place said limited region of said sealing ledge into sealing contact with said opposed sealing surface.

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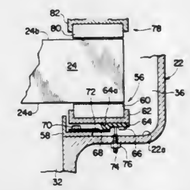
**4,296,937**

**RUBBING-CONTACT SEALING STRUCTURE FOR ROTARY HEAT REGENERATOR**

**Noritoshi Handa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jul. 13, 1979, Ser. No. 57,291**
**Claims priority, application Japan, Jul. 20, 1978, 53-100631[U]**
**Int. Cl.³ F28D** *19/04*
**U.S. Cl. 277—88** **15 Claims**



1. A rubbing-contact sealing structure for a heat regenerative core rotatable within a stationary housing structure having high-pressure and low-pressure fluid chambers arranged in counter-flow relationship adjacent one face of the heat regenerative core and a high-pressure space surrounding the heat regenerative core and communicating with the high-pressure fluid chamber, comprising: a main seal element having an inner end face to be in rubbing contact with said face of the heat regenerative core, and an elastic pressing member in the form of a substantially flat single plate provided in sealing engagement between said main seal element and said housing structure and at least in part elastically deformable toward and away from said face of the heat regenerative core, the pressing member having an outer face at least in part exposed to said fluid space and laterally extending substantially in parallel with said face of the heat regenerative core in the absence of a differential fluid pressure between the two sides of the pressing member, one end of said pressing member being secured to the housing structure while the other end thereof elastically presses said main seal element against the regenerative core with the aid of the pressure difference between the two sides of said pressing member.

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**4,296,938**

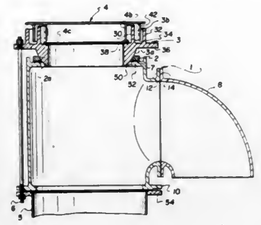
**IMMERSION-TYPE SEAL FOR THE STANDPIPE OPENING OF COKE OVENS**

**Ludwig Offermann, Olfen, and Rheinhold Wippich, Recklinghausen, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & KG, Recklinghausen, Fed. Rep. of Germany**

**Filed May 2, 1980, Ser. No. 145,976**
**Claims priority, application Fed. Rep. of Germany, May 17, 1979, 7914320[U]**
**Int. Cl.³ C10B** *25/20;* **F16J** *15/40*
**U.S. Cl. 277—135** **6 Claims**

1. An immersion-type seal for a standpipe opening of coke

ovens, comprising a standpipe having a top opening with an annular encircling rim, an annular seal frame having a bottom peripheral spherical edge overyling said rim and sealing the



opening, said seal frame having wall portions defining an open topped water sealing trough, and a standpipe lid having an annular skirt portion engaged in said water trough and a top closing the top of said seal frame.

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**4,296,939**

**SPEED UP DEVICE FOR BICYCLE**

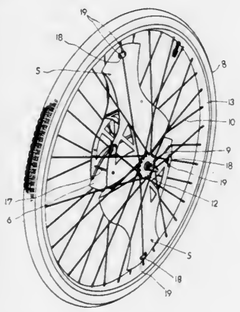
**Masaru Iwamoto, 98 Otsukawa-Hiedacho, Handa City, Aichi Prefecture, Japan**

**Filed Feb. 9, 1979, Ser. No. 10,838**

**Claims priority, application Japan, Jun. 2, 1978, 53-75718[U]**

**Int. Cl.³ B62M** *1/10*

**U.S. Cl. 280—212** **1 Claim**



1. In the known combination of a bicycle wheel that includes a rim, an axle and two sets of spokes extending from opposite ends of said axle outwardly toward said rim, the improvement which comprises:

(a) at least two devices located within said rim, around said axle and between said two sets of spokes,

(b) each said device including a pair of axe-shaped sheet members positioned in opposed relationship with each other with

portions of said sheet members being joined together at their edge portions, and

other portions of said sheet members being spaced apart with respect to each other,

(c) the bottom edge of each sheet member being disposed adjacent the axle of the wheel,

(d) the top edge of each sheet member being disposed adjacent the rim of the wheel,

(e) each sheet member having spaced apart side edges that extend between said top and bottom edges,

(f) the top edges of each pair of opposed sheet members being joined together so as to essentially form an elongated outer edge,

(g) one of the two pairs of opposed side edges of each pair of opposed sheet members being joined together so as to form a leading side edge,

(h) guide grooves located along the bottom edge of each sheet member,

(i) a spacing member mounted in said guide grooves intermediate each pair of opposed sheet members, which spacing member is shaped so that when it is inserted in said guide grooves it

causes one of said two pair of side edges of opposed sheet members to be spread apart with respect to each other, and

causes the other of said two pair of side edges of opposed sheet members to converge with respect to each other, and

(j) mounting means for securely mounting each said device in a position between said two sets of spokes,

(k) each said device being widest near the axles, somewhat less wide near the rim and narrowest at a point intermediate the rim and said axle.

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**4,296,940**

**FOLDING BICYCLE**

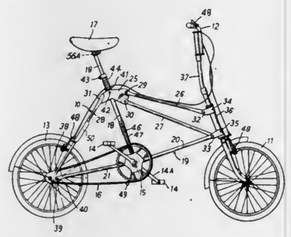
**Hugh G. Herbert, 1B Limpsfield Ave., London SW19 6DL, England**

**Filed May 14, 1979, Ser. No. 38,732**

**Claims priority, application United Kingdom, May 22, 1978, 21056/78**

**Int. Cl.³ B62K** *15/00*

**U.S. Cl. 280—278** **12 Claims**



1. In a folding bicycle comprising a frame, a front wheel and handlebars at the front end of the frame, a rear wheel at the rear end of the frame, and a saddle carried at an intermediate part of the frame, the improvement wherein said frame comprises a base including generally-aligned end-to-end tie members having adjacent ends and remote ends, a bearing unit to which said tie members are pivotally connected at their adjacent ends, an apex joint having a bearing opening, strut members connected between said apex joint and the remote ends of the tie members, and a support member, which extends from said bearing unit to which it is secured and slidably through said bearing opening in the apex joint to carry said saddle, said frame being collapsible on raising said support member to move said bearing unit towards said apex joint and so swing the front and rear wheels downwardly into positions alongside one another.

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**4,296,941**

**FOLDING GOOSENECK ASSEMBLY**

**Bernard Van Wassenhove, Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.**

**Filed Aug. 6, 1979, Ser. No. 63,955**

**Int. Cl.³ B60P** *1/04*

**U.S. Cl. 280—423 B** **18 Claims**

1. An improved linkage assembly for use with a folding gooseneck trailer having a forward gooseneck member and a load carrying means, said forward gooseneck member having a forward end portion and a rearward end portion, the rearward end portion including an upper portion and a lower portion, said load carrying means having a forwardly extending end portion and a rearward end portion, said linkage assembly operably connecting the forward end portion of the load carrying means to the rearward end portion of the forward gooseneck member, said improved linkage assembly comprising:

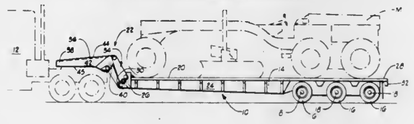
a. first linkage means for connecting the forward gooseneck member to said load carrying means, said first linkage means having a forward end portion and an opposed rearward end portion, the forward end portion of the first linkage means pivotally secured to the upper portion of the rearward end portion of said forward gooseneck member;

b. camming means operatively connecting the opposed rearward end portion of said first linkage means to the forwardly extending end portion of said load carrying means, said camming means being pivotally connected to the opposed rearward end portion of said first linkage means and connected to said forwardly extending end portion of said load carrying means for permitting sliding movement of said first linkage means along a longitudinal axis which is substantially parallel to the longitudinal axis of said load carrying means, said camming means comprising:

1. a housing having an elongated opening therein;

2. a cam positionable within the elongated opening of said housing for movement along the longitudinal axis of said housing; and

3. a pin having said cam operatively connected thereto so that one end portion of said pin extends outwardly from said housing and said cam, the outwardly extending end portion of said pin pivotally secured to the rearward end portion of said first linkage means;



c. second linkage means for connecting the forward gooseneck member to said load carrying means, said second linkage means having a forward end portion and an opposed rearward end portion, the forward end portion of said second linkage means pivotally secured to the lower portion of the rearward end portion of said forward gooseneck member at a position below the pivotal attachment of said forward end portion of said first linkage means, the opposed rearward end portion of the second linkage means pivotally secured to the forwardly extending end portion of said load carrying means at a position below and forward the slidable attachment of said rearward end portion of said first linkage means to said load carrying means; and

d. linkage assembly stabilizing means operatively connected to the rearward end portion of said first linkage means and the forward portion of said load carrying means for securing said first linkage means in a first position when the forward gooseneck member and the linkage assembly are in a first folded position and said linkage assembly stabilizing means is in a first position, said linkage assembly stabilizing means securing said first linkage means in a second position when the forward gooseneck member and the linkage assembly are in a second folded position and said linkage assembly stabilizing means is in a second position, said first and second linkage means cooperating to form a linkage assembly substantially having a parallelogram configuration when the forward gooseneck member and linkage assembly are in one of the first and second folded positions, and said first and second linkage means cooperating to form a linkage assembly having a non-parallelogram configuration when the forward gooseneck member and linkage assembly are in an unfolded position.

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**4,296,942**

**EMERGENCY RELEASE SYSTEMS**

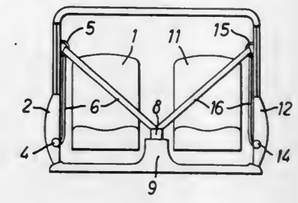
**Roy Clifford, Ampthill, England, assignor to Kangol Magnet Limited, Carlisle, England**

**Continuation of Ser. No. 893,418, Apr. 4, 1978. This application Sep. 26, 1979, Ser. No. 79,235**

**Claims priority, application United Kingdom, Apr. 18, 1975, 16198/75**

**Int. Cl.³ B60R** *21/10*

**U.S. Cl. 280—803** **5 Claims**



1. A vehicle comprising:

two separate vehicle seats located in said vehicle in adjacency,

two passive seat belt systems each associated with a respective one of said vehicle seats, each system being adapted to occupy either a position of use or an out of use position in dependence on a vehicle condition and comprising a seat belt means extending in the position of use across the associated seat,

connector means adapted to releasably connect both said seat belt means together to said vehicle at a position between said seats, said connector means being manually operable by a single operation to effect disconnection of said seat belt means from said vehicle to render both said seat belt systems incapable of restraining the occupants of the seats therein, each of said seat belt systems comprising a retractor having a retractor spring, said seat belt means being withdrawable from said retractor against the pull of said spring, said seats being located between two vehicle doors and the retractor of each of said seat belt systems being mounted on the one of said doors adjacent the associated seat, and a guide means for said seat belt means carried by each of said doors at a position above the associated retractor at about the level of the faces of the occupants of the seats, each of said belts extending upwardly from said retractor to said guide means and diagonally downwards from said guide means to said connector means, whereby said seat belt means extend across and above said seats in front of the faces of the occupants on release of the seat belt means from said connection means.

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**4,296,943**

**DEVICE FOR HOLDING A PASSIVE VEHICLE RESTRAINT BELT AT A RESTRAINING POSITION**

**Juichiro Takada, 3-12-1 Shinmachi Setagayaku, Tokyo, Japan**

**Filed Feb. 28, 1980, Ser. No. 125,541**

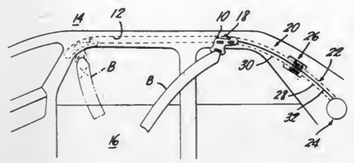
**Claims priority, application Japan, Mar. 2, 1979, 54-023431**

**Int. Cl.³ B60R** *21/10*

**U.S. Cl. 280—804** **6 Claims**

1. In a passive vehicle restraint belt system which includes a moving anchor that is coupled by a sheathed drive wire to a drive device for moving the anchor along a predetermined path in the vehicle between an occupant-restraining location and an occupant-releasing location, the sheath of the drive wire extending from adjacent the drive device to adjacent a stop means at the occupant-restraining location of the moving

anchor, the improvement wherein the sheath of the drive wire is composed of two sections, one of which is affixed to a portion of the vehicle at a location adjacent the occupant-restraining location of the moving anchor, the other of which is affixed to a portion of the vehicle at a location adjacent the drive device and at least one of which is non-rigid and deflectable,



and the two sections are connected to each other by a resilient lost-motion coupling that normally urges the sections axially away from each other to increase the effective length of the sheath by deflecting at least the deflectable section thereof but allows them to move toward each other to shorten the effective length of the sheath.

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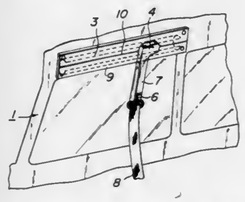
**4,296,944**

## COVERING CONSTRUCTION OF A GUIDE RAIL

**Hideoki Matsuoka, Yokohama, and Yoshinobu Kondo, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Fuji Kiko Co., Ltd.,, Tokyo, both of, Japan**

**Filed Feb. 4, 1980, Ser. No. 118,432**
**Claims priority, application Japan, Feb. 5, 1979, 54-13974[U]**
**Int. Cl.³ B60R *21/10***
**U.S. Cl. 280—804** **3 Claims**



1. A covering construction of a guide rail of a safety seat belt device of a vehicle having a guide rail with an opening and mounted on an inner wall of the vehicle and a sliding member arranged to slide freely in the guide rail and extending beyond the opening and connected to a seat belt, the improvement lies in that a flexible cover sheet, having a slit extending in the middle thereof and along the opening of the guide rail, is arranged to normally close said opening of the guide rail and allowing passage of the sliding member in the slit.

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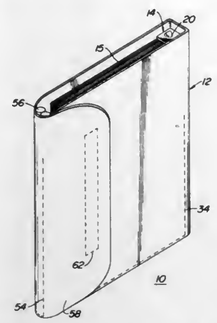
**4,296,945**

## POCKET SECRETARY OR THE LIKE

**Kathleen W. Pavlik, R.D. #1, Box 328A, Rehoboth, Del. 19971**

**Continuation of Ser. No. 874,609, Feb. 2, 1978, abandoned. This application Dec. 5, 1979, Ser. No. 100,596**
**Int. Cl.³ B42D *3/00*; A45C *1/08***
**U.S. Cl. 281—1** **8 Claims**

1. A pocket secretary or the like, comprising:
a flexible foldable member with at least two folding areas;
three pocket means secured to said foldable member, one of said pocket means being narrow, for holding writing implements, and being disposed in a folding area of said foldable member;
means for detachably mounting a separately bound notebook, secured to another folding area of said foldable member;
an envelope means secured to said foldable member together with said detachable mounting means; and
releasable closure means for retaining said foldable member in a folded condition, including an overlapping flap and releasable attachment means, wherein said narrow pocket



means is disposed opposite said detachable mounting means when said member is folded, and said other two pocket means are disposed opposite one another, said mounting means and said writing implements, when held in said narrow pocket means, providing structural support for said flexible member, when folded.

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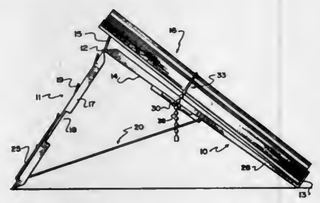
**4,296,946**

## BOOK SUPPORT

**Frank J. Larre, and Jeannine G. Larre, both of Box 452, St. Walburg, Saskatchewan, Canada**

**Filed Aug. 27, 1979, Ser. No. 69,719**
**Int. Cl.³ B42D *9/00***
**U.S. Cl. 281—45** **10 Claims**



1. A book holder and support comprising in combination a front book supporting panel and a rear panel hingedly secured by the upper edge thereof to the upper edge of said front panel to form, when open, an inverted V-shape when viewed in side elevation, means cooperating between said panels to adjust the angularity between same and within limits, and means to detachably retain a book in the open position upon said front panel, said means to adjust the angularity between said front and rear panels including a flexible cord anchored by each end thereof adjacent each side of said front panel, guide means adjacent the side edges of said rear panel, said cord passing freely through said guide means, and a plurality of vertically situated cord anchoring means extending outwardly from the rear surface of said rear panel, the looped center portion of said cord detachably engaging one of said anchoring means in non-sliding relationship.



**4,296,947**

## PRESSURE-SENSITIVE TRANSFER SHEETS USING NOVEL RADIATION CURABLE COATINGS

**Sydney M. Spatz, Circleville; Robert C. Hydell, and Gerald T. Davis, both of Chillicothe, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio**

**Continuation of Ser. No. 697,019, Jun. 17, 1976, Pat. No. 4,138,508. This application Feb. 2, 1979, Ser. No. 9,382**
**The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.**
**Int. Cl.³ B41M *5/22***
**U.S. Cl. 282—27.5** **2 Claims**

1. A pressure-sensitive, carbonless transfer sheet comprising a paper substrate, said paper substrate having coated thereon a barrier layer and a cured resinous film coated on said barrier layer, said cured resinous film comprising:
(a) a carrier oil;
(b) at least one color precursor selected from the group consisting of lactone phthalides, lactone fluorans and mixtures thereof, said color precursor being dissolved in said carrier oil to form a color precursor solution; and
(c) a radiation curable substance, said radiation curable substance being selected from the group consisting of: isocyanate modified acrylic, methacrylic and itaconic acid esters of polyhydric alcohols, acrylic prepolymers derived from partial esterfication of pentaerythritol with acrylic acid and acrylic acid esters and mixtures thereof;
said resinous film being cured by radiation to a frangibility that will permit passage of said color precursor and said carrier oil to the surface of said cured resinous film when said cured resinous film is broken, said color precursor solution being retained as small occlusions within a matrix of closely packed cross-linked molecular chains of cured resin.

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**4,296,948**

## COLOR-DEVELOPING SHEET FOR NO-CARBON COPYING PROCESS

**Tsutomu Satoh; Hideo Ohye; Hirokazu Tsukahara; Hideaki Senoh, and Takahiro Torii, all of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Filed Nov. 28, 1979, Ser. No. 98,176**
**Int. Cl.³ B41M *5/16, 5/22***
**U.S. Cl. 282—27.5** **7 Claims**

1. A color-developing pressure sensitive sheet for use in no-carbon copying system, comprising a support and an electron-accepting color-developing layer thereon of a combination of a phenol-formaldehyde resin with a solid acid which is an active silicic acid, which are capable of developing color upon reacting with an electron-donating colorless dye, characterized in that titanium dioxide is incorporated into the said electron-accepting color-developing layer in an amount of from about 2 to about 4 parts by weight based on one part by weight of the phenol-formaldehyde resin.

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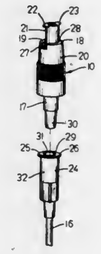
**4,296,949**

## ROTATABLE CONNECTING DEVICE FOR I.V. ADMINISTRATION SET

**Andrew J. Muetterties, Gages Lake; John L. Vcelka, Zion, and Wayne R. Kelsey, Des Plaines, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**Filed Aug. 6, 1979, Ser. No. 64,141**
**Int. Cl.³ F16L *19/02***
**U.S. Cl. 285—18** **20 Claims**

1. A connecting device for an intravenous administration set comprising:
a first member defining a fluid passage means and having a longitudinal axis;
a second member defining a fluid passage means and having a longitudinal axis;
tapering interfitment means constructed and arranged with respect to each said member for fluid-tight engagement;
a length of tubing secured to at least one member opposite said tapering interfitment means;
a flange extending from one of said first or second members adjacent said tapering interfitment means;
a collar member alternately and rotatably mounted on one of said first or second members opposite said flange, said collar member having internal threads for engagement with said flange; and
captive means operatively associated with one of said members and said collar member to permit free movement along the longitudinal axis of said member while retaining said collar on said member yet permitting rotatable engagement with said flange, said captive means including a tapering surface defined by said member mounting said collar for interference therewith, said captive means constructed and arranged to permit said collar member to be positioned a substantial distance away from said tapering interfitment means carried by said member mounting said



collar member for complete exposure for sterilization purposes, said captive means further including cooperating means defined by said member mounting said collar member and said collar member to provide an interlocking mechanism, said cooperating means positioned on said collar member opposite said internal threads and on said mounting member opposite said tapering surface;
so that when said tapering interfitment means is interengaged, said collar member will engage said flange and upon rotation of said collar the interfitment means will be forced into fluid-tight engagement and said collar member will engage said tapering surface without rotation of said first or second members, and upon a reverse rotation of said collar member and movement of said collar member away from said flange, said interlocking mechanism will interengage whereby rotation of said collar will cause rotation of said member mounting said collar without rotation of said member with said flange.

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**4,296,950**

## CORROSION RESISTANT PIPE JOINT

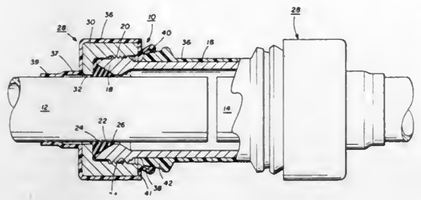
**Richard L. Chamberlin, Bradford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jul. 18, 1979, Ser. No. 58,697**
**Int. Cl.³ F16L *19/06***
**U.S. Cl. 285—45** **8 Claims**

1. In pipe joint forming members including a first metal component having a male thread and a second metal component having a female thread, corrosion protection for the joint adapted to be provided by said components and comprising in combination:
(a) a first polymeric plastic coating formed about the periphery of said male threaded component and terminating behind the thread thereof;
(b) a second polymeric plastic coating formed about the periphery of said female threaded component and terminating in an annular flexible skirt extending beyond the joint forming end thereof, said skirt being adapted when said male and female components are threadedly assem-

bled in joint formation to surroundingly overlap a portion of the coating on said male component; and

(c) at least one polymeric plastic annular lip of locally beaded cross-section integrally formed extending radially inward on an opposing surface of at least one of said overlapped skirt or coating thereat;



(d) said lip being adapted to cooperate with said opposing surface at any longitudinal location along the mutual overlap therebetween in the course of assembling said components to effect a threadlessly compressive sealing engagement enclosing the metal threads of the joint formation.

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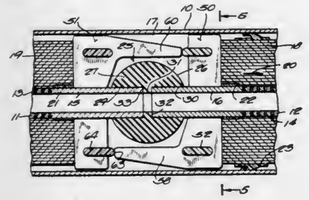
**4,296,951**

## SPHEROIDAL INTERCONNECTOR FOR FILTRATION MODULES

**Robert D. Zimmerly, Kenosha, Wis., assignor to Ladish Co., Cudahy, Wis.**

**Filed Jun. 29, 1979, Ser. No. 53,636**
**Int. Cl.³ F16L *17/00***
**U.S. Cl. 285—95** **7 Claims**



1. A coupling assembly comprising two coaxial conduit members, an interconnector means for coupling and sealing said coaxial members, and wall means defining a pressure chamber around said members adapted to contain a pressurized fluid between said members and said wall means, said interconnector means having a spheroidal body located within said pressure chamber and comprised of elastomeric material, said body having coaxial bores extending into it from opposite sides for receiving the respective ends of said members in a snug fitting relationship, and said body being operative to transmit pressure exerted by the fluid on its outside surface to the surface constituting the interface area between said bores and the members in the bores, the area of said outside surface of the body being substantially larger than said interface area so that the force on a unit area of said interfacing surface is greater than the force exerted by said fluid on a unit area of said outside surface to enhance the seal between said members.

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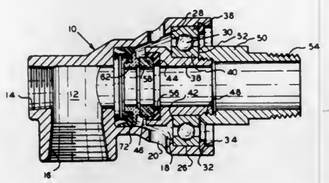
**4,296,952**

## ROTARY JOINT

**Donald G. McCracken, Horton, Mich., assignor to Aeroquip Corporation, Jackson, Mich.**

**Filed Jul. 30, 1979, Ser. No. 61,598**
**Int. Cl.³ F16L *00/00***
**U.S. Cl. 285—98** **5 Claims**

1. A rotary joint comprising, in combination, an annular housing having a first port in communication with a chamber defined therein, a single annular anti-friction bearing mounted upon said housing within said chamber, a tubular sleeve mounted within said bearing for rotation within said chamber about an axis, a second port defined by said sleeve communicating with said chamber, an annular elastic cushion mounted on said sleeve adjacent said second port, an annular rigid seal element supported upon said cushion defining an annular radially disposed sealing surface defined on said sleeve concentric with said axis, an annular seal within said chamber concentric with said axis sealingly and slidably engaging said sealing surface, annular resilient seal support means sealed with respect to said housing flexibly supporting said annular seal and constituting the sole support of said seal whereby said seal is self-aligning with respect to said sealing surface, a cylindrical surface defined in said chamber coaxial to said axis, said seal support means comprising an elastomeric ring having a first lip seal portion sealingly engaging said cylindrical surface, a cylindrical surface defined on said annular seal coaxial to said axis, said ring having a second lip seal portion engaging said seal cylindrical surface wherein said seal is supported within said ring, fluid pressure within said housing biasing said seal into engagement with said sealing surface and said lip seals into sealing relation to their associated cylindrical surface.



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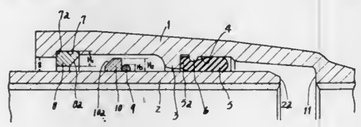
**4,296,953**

## SLIPPING-OFF PREVENTING PIPE JOINT

**Shozo Nagao; Yoshinobu Ohashi; Yuichi Watanabe, and Yoshikazu Wakushima, all of Amagasaki, Japan, assignors to Kubota, Ltd., Osaka, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,613**
**Claims priority, application Japan, Dec. 22, 1978, 53-162499; Dec. 22, 1978, 53-179613[U]; Dec. 22, 1978, 53-179614[U]; Dec. 22, 1978, 53-179615[U]**
**Int. Cl.³ F16L *27/12***
**U.S. Cl. 285—302** **6 Claims**



1. In a pipe joint comprising a socket having a seal accomodating portion in its inner periphery, a spigot insertable into the socket, and an annular seal retained in the accomodating portion and compressively engageable by the outer periphery of the spigot against the accomodating portion for sealing the clearance between the socket and the spigot when the spigot is inserted into the socket, the improvement wherein:

an engaging member comprising a second split lock ring is detachably attached to the inner periphery of the socket and is positioned away from the seal accomodating portion toward the opening of the socket, the second split lock ring being capable of exerting a diametrically expansive force and being engageable from inside the socket axially thereof with a radially inwardly extending face forming a stepped portion on the inner periphery of the socket between the second split lock ring and the socket opening, the second split lock ring providing an engaging portion projecting radially inward from the inner periphery of the socket;

a protrusion is formed on the outer periphery of the spigot and is positioned between the seal accomodating portion and the engaging member on the socket;

a first split lock ring capable of exerting a diametrically contractive force is fitted to the outer periphery of the spigot between the protrusion on the spigot and the engaging member on the socket, the first lock ring being normally spaced from and engageable with the engaging portion of said engaging member and with said protrusion in response to relative axial separating movement between the socket and spigot; and

each of said first and second lock rings has a radial thickness less than the radial clearance between the inner surface of the socket opening and the outer surface of the spigot whereby said lock rings are insertable through said clearance to their respective assembled positions after the spigot has been inserted into the socket and into compressive engagement with said annular seal.



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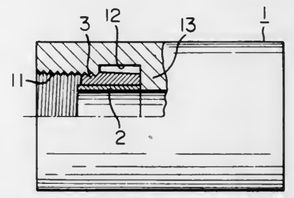
**4,296,954**

## PIPE COUPLING AND PIPE JOINT CONNECTION

**Kiyoshi Fujimaki, Kusatsu; Yoshiaki Bando, Shiga; Takesi Okuyama, Kyoto, and Tutomu Hashimoto, Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 11, 1979, Ser. No. 74,806**
**Claims priority, application Japan, Sep. 14, 1978, 53-126827[U]; Dec. 4, 1978, 53-167386[U]**
**Int. Cl.³ F16L *17/06***
**U.S. Cl. 285—331** **4 Claims**



1. A pipe coupling comprising:

a main annular body having a central axis and an internally threaded portion at the open end thereof for threaded engagement with an inside-coated pipe having an exterior mating threaded end portion, an internal annular groove at the inner end of said internally threaded portion, and an annular projection at the inner side of said annular groove and projecting toward said axis of said annular body;

a short cylindrical body mounted within said main body having an outer cylindrical surface and having one end abutting said annular projection; and

an annular packing mounted within the space defined by said internally threaded portion, said annular groove and the outer cylindrical surface of said cylindrical body, the dimension of the circumferential surface of the annular packing parallel to said axis of said annular body and when said packing is in the uncompressed state being greater than the corresponding dimension of the circumferential surface of the annular groove and less than the corresponding dimension of the cylindrical outer surface of said short cylindrical body, and the end of the annular packing toward the open end of the main body being pressed into the internally threaded portion for being provisionally fixed in position in said pipe coupling.

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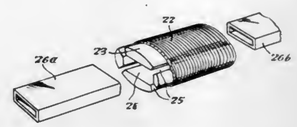
**4,296,955**

## COMPOSITE COUPLING DEVICE WITH HIGH RECOVERY DRIVER

**Charles L. Martin, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Continuation-in-part of Ser. No. 404,724, Oct. 9, 1973, abandoned, and a continuation-in-part of Ser. No. 404,723, Oct. 9, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,207**
**Claims priority, application Sweden, Apr. 9, 1975, 6975040**
**Int. Cl.³ F16L *25/00***
**U.S. Cl. 285—381** **46 Claims**



1. A composite device which comprises:

(a) a hollow, heat-recoverable, helical spring member made from helically wound sheet or wire of memory metal, said heat-recoverable member having a cross-section such that sections perpendicular to the axis of the heat-recoverable member each show a discontinuity; and

(b) a hollow sleeve, open at both ends, disposed coaxially with said heat-recoverable member, and adapted to be deformed to grip a substrate, said deformation resulting from force exerted on the sleeve by the heat-recoverable member when the heat-recoverable member is heated above its transition temperature and recovers in the direction of said sleeve.

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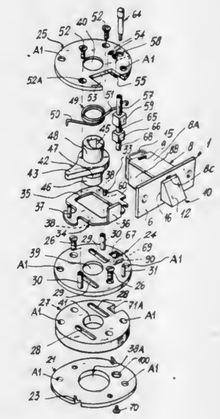
**4,296,956**

## CAM OPERATED LOCK, PARTICULARLY FOR DOORS

**Angelo Colombo, Lazzate, Italy, assignor to Valli & Colombo S.p.A., Italy**

**Filed Jul. 19, 1979, Ser. No. 58,957**
**Claims priority, application Italy, Aug. 8, 1978, 26568 A/78; Oct. 27, 1978, 23159/78[U]**
**Int. Cl.³ E05C *1/16***
**U.S. Cl. 292—169.18** **17 Claims**



1. A door lock comprising:

latch means adapted to be mounted in a door or the like, said latch means including a tubular guide and a latch member mounted for reciprocation therein between a latched position and an unlatched position;

a housing assembly adapted to be mounted in a door;
a slide member mounted for reciprocation in said housing assembly and coupled to said latch member, said slide member including a thrust portion fixed thereto;
a single cam member rotatably mounted in said housing assembly having an eccentric portion and a central hub portion having a bore formed therethrough adapted to receive a shaft therein, the axis of said bore being substantially coincident with the axis of rotation of said cam member;
said slide member thrust portion being situated in the path of said cam member eccentric portion so that when said cam member is rotated, said eccentric portion will engage said thrust portion to move said slide member;
stop means fixed within said housing assembly; and
first spring means for urging said cam member in a direction such that said eccentric portion normally engages said stop means.

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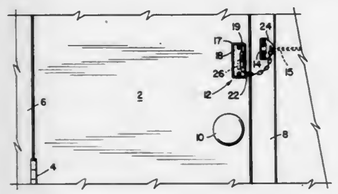
**4,296,957**

## CHAIN-LOCK ACTUATED MAGNETIC SWITCH

**David E. Belles, Pittsford, N.Y., assignor to Lok-A-Wat, Inc., Adamsville, Tenn.**

**Filed Sep. 24, 1979, Ser. No. 78,132**
**Int. Cl.³ E05C** *17/36, 13/10*
**U.S. Cl. 292—264** **3 Claims**



1. A chain-lock actuated magnetic switch for use with a door having a stile, and a frame for the door having a striker jamb comprising:
a magnet-responsive switch adapted to be mounted on a door striker jamb and having a normal circuit-controlling condition and being magnetically actuatable to an abnormal circuit-controlling condition,
a chain-lock keeper adapted to be mounted on a door stile opposite the switch, said keeper having a permanent magnet whose flux is normally capable of actuating the switch to its abnormal condition when the door is closed,
a chain having anchor means on one end thereof for anchoring the same to the striker jamb, and
a bolt on the other end of the chain, said bolt constituting pole piece means for said magnet for shunting the flux thereof when said bolt is seated home in said keeper whereby to prevent the same from actuating said magnet-responsive switch to said abnormal condition.

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**4,296,958**

## HOLDER FOR LIQUID PACKAGING CONTAINERS

**Roelof J. Stranders, Thalwil, Switzerland, assignor to Werner Weber Holding AB, Baar, Switzerland**

**Filed Jan. 24, 1980, Ser. No. 114,788**
**Claims priority, application Switzerland, Feb. 9, 1979, 1310/79; Mar. 12, 1979, 2344/79**
**Int. Cl.³ A47B** *95/02*
**U.S. Cl. 294—27 H** **9 Claims**

1. A detachable container holder for liquid packaging containers having upstanding front and rear walls, side walls extending between said front and rear walls and end margins of said side, front and rear walls defining flaps infolded into overlapping relationship to form an end closure of the container, wherein said holder incorporates a first supporting element arranged to lie at least partly along the rear wall of the container, handle means associated with said first supporting element, a further supporting element integral with said first supporting element and being arranged to engage a further

portion of the container, and retaining means provided on one of said supporting elements and arranged to receive and retain the flap defined by the upper end margin of the container end wall when said flap is pried away from the infolded closed position.

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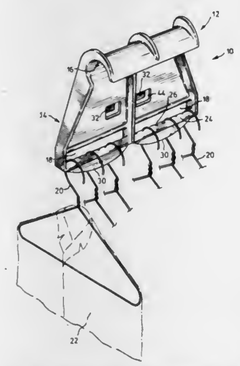
**4,296,959**

## RACK HANGING DEVICE FOR GARMENTS

**Rolf W. Helbig, 24-6679 Shelter Bay Rd., Mississauga, Ontario, Canada (L5N 2A2)**

**Filed Jul. 2, 1979, Ser. No. 53,914**
**Int. Cl.³ A47J** *51/084*
**U.S. Cl. 294—143** **7 Claims**



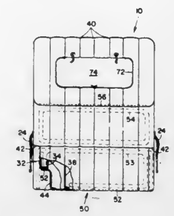
1. A device for supporting a plurality of hangers such as garment hangers or the like, comprising:
a substantially planar lower leg portion having a front side and a rear side;
an upper channel portion for pendently supporting the device, and having a concave surface defining a rearwardly and downwardly facing hook;
said substantially planar leg portion having at least one aperture for a plurality of garment hangers or the like; and
a lifting lug formation on the front side of said substantially planar lower leg portion beneath said rearwardly and downwardly facing hook, comprising at least one forwardly directed lug and at least one downwardly directed flange spaced at a distance from the front face of said substantially planar lower leg portion so as to provide a counter-bearing surface for an operating member to be engaged therewith.



**4,296,960**

## INFLATABLE CAMPER

**Loren R. Winchester, 105 Southwest St., Yorktown, Ind. 47396**
**Continuation-in-part of Ser. No. 52,486, Jun. 7, 1979, abandoned. This application Sep. 21, 1979, Ser. No. 77,857**
**Int. Cl.³ B60P** *3/32*
**U.S. Cl. 296—167** **4 Claims**



1. An inflatable camper for pickup trucks comprising:
four generally rectangular inflatable walls including a front wall, a rear wall, and two side walls;
valve means in at least one of said inflatable walls for inflating or deflating same;
an inflatable top connected to said inflatable walls;
flexible floor means connected to a base of said inflatable walls;
internal wall means of said inflatable walls and top to help form said inflatable camper in a general external configuration similar to a pickup truck camper, said internal walls allowing air flow therethrough for said inflating or deflating;
entrance opening in said rear wall for allowing entry into said inflatable camper;
portholes in said inflatable walls to allow light into said inflatable camper, said portholes being covered by flexible releasable transparent material;
screen means secured at said portholes and said entrance opening to prevent most insects from entering said inflatable camper;
flexible door means removably connected to said rear wall for closing said entrance opening;
zipper means for holding said flexible transparent material in position to cover said portholes and to hold said flexible door means and said screen means at said entrance opening; and
magnetic strips embedded in said flexible floor means to magnetically hold said flexible floor to the contour of the bed of said pickup truck and embedded in portions of said inflatable walls to magnetically attach to contiguous portions of said pickup truck.

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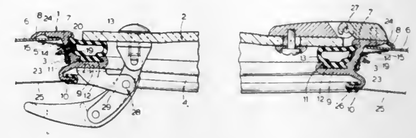
**4,296,961**

## OPENING ROOFS FOR VEHICLES

**Keith R. Hunt, Devon, and Sidney E. Fisher, Birmingham, both of England, assignors to Britax Weathershields Limited, Birmingham, England**

**Filed Oct. 18, 1979, Ser. No. 85,862**
**Claims priority, application United Kingdom, Oct. 18, 1978, 41037/78; Jan. 23, 1979, 02430/79**
**Int. Cl.³ B60J** *7/18*
**U.S. Cl. 296—216** **9 Claims**

1. An opening roof for a vehicle having a roof provided with an opening comprising a frame for surrounding said opening and including spaced side members and spaced end members, and a panel assembly co-operating with said frame and movable with respect to said frame to expose portions of said opening for ventilation purposes, wherein said frame includes a flange adapted to overlie a portion of said roof surrounding said opening, said flange having an inner edge and a web depending from said inner edge of said flange and having an outer face, a lower end, and being provided with openings, and clamping means are provided to clamp said flange against said roof, said clamping means comprising a separate resilient clamping strip extending along each of said side members and along each of said end members of said frame, each of said clamping strips including a generally flat base which is clamped against said outer face of said web and an integral



clamping tongue which is inclined to said base at an obtuse angle and projects from one edge of said base to engage with a face of said roof remote from said flange, and screws which project through said openings in said webs to urge said flat base into engagement with said web and said flange into engagement with said roof.

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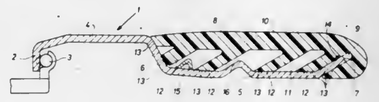
**4,296,962**

## WIND DEFLECTOR FOR SLIDING ROOFS OF MOTOR VEHICLES

**Hans Jardin, Inning, and August Hirschberger, Munich, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany**

**Filed Sep. 28, 1979, Ser. No. 80,022**
**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 7828941[U]**
**Int. Cl.³ B60J** *7/18*
**U.S. Cl. 296—217** **14 Claims**



1. Wind deflector for sliding roofs of motor vehicles, said deflector being mountable near the forward edge of a roof opening so that it is swivelable near its forward edge about an axis which runs at right angles to the lengthwise axis of the vehicle, and being comprised of a sheet metal strip and an overlying plastic strip connected thereto, characterized by the fact that the plastic strip is mounted upon said sheet metal strip with a rear edge of the sheet metal strip retained within a groove formed in said plastic strip.

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**4,296,963**

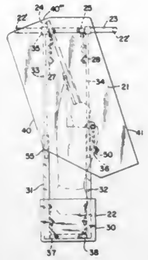
## FIREARM SHOOTING SUPPORT TABLE

**Kenneth G. Blanchard, Rt. 5, Box 484, and Reuben N. Ronne, Rte. 3, Box 470 R, both of Detroit Lakes, Minn. 56501**

**Filed Oct. 16, 1979, Ser. No. 85,213**
**Int. Cl.³ A47B** *83/02, 3/14*
**U.S. Cl. 297—170** **2 Claims**

1. A shooting table device comprising a table for supporting a firearm, a seat for supporting an operator while firing the firearm, with the firearm supported on the table, said table having a pair of front legs pivotally mounted to the front of said table and adapted to extend vertically from said table for supporting said table, at least one telescoping horizontal supporting means, one end of said telescoping means being pivotally mounted to the front legs of said table at a height intermediate the height of said table, the telescoping means having its other end fixed to said seat, said pivotal mounting of said one end of said telescoping means to said front legs of said table serving as front legs for said seat, said seat having a pair of legs

mounted to support said seat at its rearward end, said telescoping means enabling said seat to be adjusted forward and rearward with respect to said table, said table extending in length at an angle across said seat, said table having a leg at its rearward end to support the rearward end of said table.



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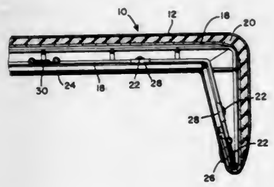
**4,296,964**

## STRUCTURAL COMPONENT FOR UPHOLSTERED FURNITURE AND METHOD OF MAKING

**Dennis A. Haack, Troy, Ohio, assignor to Denack Design Corporation, Troy, Ohio**

**Filed Sep. 14, 1979, Ser. No. 75,449**
**Int. Cl.³ A47C *31/02***
**U.S. Cl. 297—218** **16 Claims**



1. A structural component for upholstered furniture, comprising: a three-dimensional wire frame including a plurality of wires welded together to form a wire mat,

said wire frame including a border wire extending adjacent the outer edge of said frame,

upholstery means including a flexible sheet substrate and an upholstery material cover with padding means disposed between said substrate and said cover,

means securing an outer edge portion of said upholstery material cover to an adjacent outer edge portion of said substrate to confine said padding means and to form an upholstery assembly,

said upholstery assembly covering said wire frame, and

plastic clip means attaching said upholstery assembly to said border wire of said wire frame.

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**4,296,965**

## SEAT WITH ADJUSTABLE LUMBAR SUPPORTER

**Kenichi Sakurada, Yokohama, and Takaichi Nishino, Hachioji, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Tachikawa Spring Company, Limited, Akishima, both of, Japan**

**Filed Jul. 11, 1979, Ser. No. 56,607**
**Claims priority, application Japan, Jul. 31, 1978, 53-93776**
**Int. Cl.³ A47C *7/46***
**U.S. Cl. 297—284** **8 Claims**

1. A seat with a backrest having spaced support portions by which a contourable portion constituted by padding means is supported, and an adjustable lumbar supporter for imparting a curvature to said contourable portion to produce a desired contour, said lumbar supporter comprising:

a first rod member transversely crossing said support portions in a manner so as to be rotatable about the axis thereof relative to said support portions;

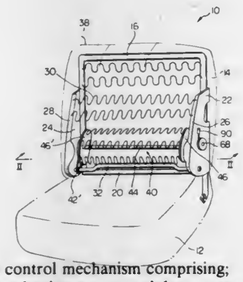
an arm member secured at its one portion to said first rod member to be rotatable therewith;

a second rod member held by said arm member in a manner so as to be rotatable about the axis thereof relative to said arm member;

lumbar pressing means fixedly mounted on said second rod member;

a first control mechanism for forcing a unit of said arm member, said second rod member and said lumbar pressing means to swing about the axis of said first rod member when operated; and

a second control mechanism for forcing a unit of said lumbar pressing means and said second rod member to swing the axis of said second rod member relative to said arm member when operated;



said first control mechanism comprising;

a first cam having a cam periphery operatively contacting said second rod member;

a first axle member connected to said first cam to be rotatable therewith about the axis of said first axle member; and

first stopping means for causing said axle member to assume a predetermined rest position under rotation thereof;

said second control mechanism comprising:

a second cam supported via a pivot by said arm member and having therein an elongated slot;

a stud secured to said lumbar pressing means and movably received in said elongated slot of said second cam;

second stopping means for causing said second cam to assure a predetermined rest position under the swingable rotation of it about said pivot;

a second axle member; and

a linkage operatively interposed between said second axle member and said second cam in such a manner that when said second axle member is rotated about the axis thereof, said second cam is swung about said pivot.

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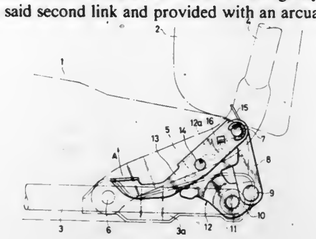
**4,296,966**

## SEAT FOR AN AUTOMOTIVE VEHICLE

**Takami Terada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Shatai Kogyo Kabushiki Kaisha, Yamato, both of, Japan**

**Filed Oct. 3, 1979, Ser. No. 81,459**
**Claims priority, application Japan, Oct. 18, 1978, 53-128944**
**Int. Cl.³ A47C *1/025***
**U.S. Cl. 297—369** **6 Claims**

1. A seat for an automotive vehicle having a back rest disposed tiltably relative to said seat and at least one adjusting mechanism for adjusting the angle of said back rest relative to said seat, said back rest having a pair of parallel side frame portions which extend forwardly and downwardly from the lower end of the back rest and which are pivoted at the free ends thereof to said seat, said adjusting mechanism comprising a first link pivoted at one end thereof to one of said pair of parallel side frame portions at a point spaced from said pivoted free end, a second link rotatably connected at one end thereof to the other end of said first link and further pivoted at the other end thereof to said seat, a latch means integrally extending from said second link and provided with an arcuate series



of teeth concentric to the pivoting axis of said second link to said seat, a manual handle pivoted to a part of said adjusting mechanism and having a pin for engagement with said teeth of said latch means and spring means normally urging said manual handle toward engagement with said teeth of said latch means so that said adjusting mechanism is locked and hence said back rest is locked in a selected position of reclination.

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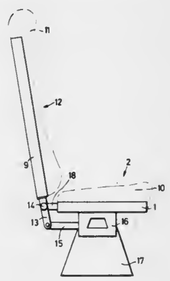
**4,296,967**

## PASSENGER SEAT

**Ignaz Vogel, Kleinsteinbacherstr. 44, Karlsruhe-Stu 41, Fed. Rep. of Germany (7500)**

**Filed Nov. 1, 1979, Ser. No. 90,245**
**Int. Cl.³ A47C *3/12, 5/12***
**U.S. Cl. 297—451** **11 Claims**



1. A passenger seat for people moving vehicles such as buses, railways cars, ships and airplanes, said seat comprising: a base; a seating member supported on said base; a backrest member mounted on said seating member, said seating and backrest members consisting of sandwiched plate structures each having spaced plates with a cellular structured core disposed therebetween and a sleeve fully incorporated into the sandwiched plate structure by being disposed between and firmly connected to each of said spaced plates, a bracket structure having its ends extending into the sleeves of said seating and backrest members and being mounted therein for supporting said backrest member on said seating member, and mounting means disposed at the underside of said seating member and connected to said sleeve incorporated in said seating member for supporting said seating and backrest members on said base.



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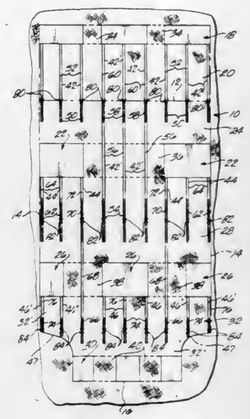
**4,296,968**

## IN SITU OIL SHALE RETORT HAVING HORIZONTALLY OFFSET PILLARS

**Thomas E. Ricketts, Bakersfield, Calif.; Ned M. Hutchins, and Irving G. Studebaker, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.**

**Continuation of Ser. No. 951,527, Oct. 16, 1978. This application Sep. 19, 1979, Ser. No. 77,024**
**Int. Cl.³ E21C *41/10***
**U.S. Cl. 299—2** **58 Claims**



1. A method for recovering liquid and gaseous products from an in situ oil shale retort formed in a retort site within a substerranean formation containing oil shale, such as in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, comprising the steps of:

excavating formation from within the retort site for forming an upper void extending horizontally across the retort site, leaving an upper zone of unfragmented formation above the upper void, and leaving at least a first pillar of unfragmented formation within the upper void for providing temporary support for the upper zone of unfragmented formation;

excavating formation from within the retort site for forming a lower void extending horizontally across the retort site, the lower void being spaced immediately below the upper void, leaving an intermediate zone of unfragmented formation extending horizontally across the retort site between the upper and lower voids, leaving a lower zone of unfragmented formation below the lower void, and leaving at least a second pillar of unfragmented formation within the lower void for providing temporary support for the intermediate zone of unfragmented formation, the second pillar being offset horizontally from the first pillar so that at least a portion of a floor of the upper void lies vertically above at least a portion of the second pillar;

placing explosive in the lower zone of unfragmented formation, at least a portion of such explosive being placed in at least one vertical blast hole extending from said portion of the floor of the upper void through the second pillar and into the lower zone of unfragmented formation below the second pillar;

placing explosive in the upper and intermediate zones of unfragmented formation;

detonating such explosive in the upper, intermediate and lower zones of unfragmented formation for explosively expanding formation within such zones toward the upper and lower voids for forming a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort;

establishing a retorting zone in an upper portion of the fragmented mass;
introducing a retorting gas into the fragmented mass for sustaining the retorting zone and for advancing the retorting zone through the fragmented mass; and
withdrawing liquid and gaseous products of retorting from a lower portion of the fragmented mass on the advancing side of the retorting zone.

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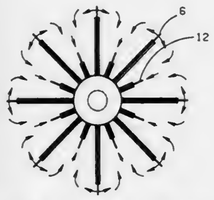
**4,296,969**
**THERMAL RECOVERY OF VISCOUS HYDROCARBONS USING ARRAYS OF RADIALLY SPACED HORIZONTAL WELLS**
**Bertram T. Willman, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.**
**Filed Apr. 11, 1980, Ser. No. 139,618**
**Int. Cl.³ E21C *41/10***
**U.S. Cl. 299—2** **21 Claims**




1. A method for recovering normally immobile mineral values from a subterranean formation, the method comprising:
(a) penetrating said formation with an access shaft;
(b) extending first and second radially-spaced substantially horizontal wells from said shaft into said formation;
(c) extending a third substantially horizontal well from said shaft into said formation, said third well being located between said first and second wells and being substantially shorter than either of said first and second wells;
(d) injecting a mobilizing fluid into said first well and recovering mobilized mineral values via said second well so that a path of high fluid mobility is created in said formation between the ends of said first and second wells;
(e) injecting said mobilizing fluid into said first and second wells to further mobilize and drive mineral values through said formation to said third well, the end of said third well being located a sufficient distance from said high mobility path to provide for good sweep efficiency of the mineral values located between said first and second wells; and
(f) recovering said mobilized mineral values via said third well.

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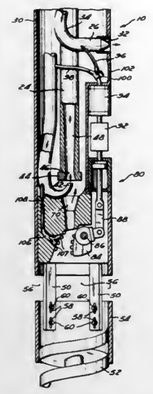
**4,296,970**
**HYDRAULIC MINING TOOL APPARATUS**
**Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660**
**Filed Feb. 15, 1980, Ser. No. 121,712**
**Int. Cl.³ E21C *45/00***
**U.S. Cl. 299—67** **11 Claims**

1. In a hydraulic mining tool for recovering minerals from subterranean formations, including a hydraulic cutting jet for dislodging said minerals from said formations and forming a resultant mineral slurry, and a hydraulic venturi pump for lifting said mineral slurry to ground surface, the improvement comprising:
an Archimedes screw carried on one end of said mining tool and disposed below said hydraulic venturi pump for transporting a continuous quantity of said minerals toward said hydraulic venturi pump; said Archimedes screw including a sleeve rigidly attached about a portion of its diameter to direct said continous quantity of minerals toward said hydraulic venturi pump; said Archimedes screw and said sleeve being axially spaced from said one end of said mining tool with said axial spacing defining a radial inlet for said mineral slurry into said hydraulic venturi pump;



and said Archimedes screw and sleeve being mounted to said one end of said mining tool by means for adjusting said axial spacing to vary the size of said radial inlet.

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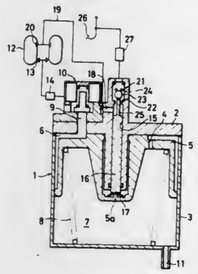
**4,296,971**
**ANTISKID DEVICE**
**Hiroshi Nakazato, Hanyu, Japan, assignor to Akebono Brake Industry Co., Ltd., Saitama, Japan**
**Filed Nov. 27, 1979, Ser. No. 97,891**
**Claims priority, application Japan, Nov. 30, 1978, 53-165254[U]**
**Int. Cl.³ B60T *8/10***
**U.S. Cl. 303—115** **6 Claims**



1. An antiskid pressure reducing device comprising:
a closed casing;
a power piston located within said casing and dividing the interior of said casing into two pressure chambers and said power piston is movable by differential pressure developed between said two pressure chambers by detection of a skidding state of a wheel;
a brake device;
a pressure source;
a braking pressure transmission line arranged between the pressure source and the brake device;
a valve mechanism arranged to close said braking pressure transmission line;
a pressure reducing chamber disposed between said valve mechanism and said brake device;
said casing including a cylinder containing said valve mechanism;
a plunger slidable within said cylinder, said plunger being arranged to receive pressure at one end thereof from said pressure reducing chamber; and
a spring means disposed between the other end of the said plunger and said power piston for spacing them a given distance apart, said spring means being arranged to push said plunger with a force greater than the sliding resistance of said plunger;
said plunger is in operative engagement with said valve mechanism; and said valve mechanism is arranged to be closed when pressure from said pressure reducing chamber causes said plunger to move toward said power piston against the force of spring means even if said power piston does not move.



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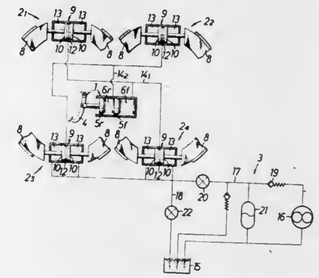
**4,296,972**
**ANTI-SKID BRAKE CONTROL DEVICE**
**Makoto Sato, Kamifukuoka; Hiroshi Takamatsu, Ohimachi; Yoshitaka Miyagawa, Kawagoe, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 871,186, Jan. 20, 1978, which is a division of Ser. No. 762,782, Jan. 25, 1977, Pat. No. 4,129,342. This application Jun. 20, 1979, Ser. No. 50,204**
**Claims priority, application Japan, Jan. 29, 1976, 51/8682; Feb. 2, 1976, 51/10195; Feb. 16, 1976, 51/15607**
**Int. Cl.³ B60T *8/08, 13/68***
**U.S. Cl. 303—119** **1 Claim**



1. An anti-skid brake control system for use with four wheeled vehicles, comprising: a brake fluid pressure producing unit, said unit having a pair of two independent power chambers defined therein; a pair of first front and rear wheel cylinders each having a piston slidable therein with a brake applying element connected thereto and a first hydraulic chamber formed therein on one side of said piston, said first hydraulic chamber being connected to one of said power chambers for applying hydraulic pressure to said piston for brake application; said rear wheel cylinder having a second hydraulic chamber formed therein, on the opposite side of said piston and being hydraulically connected to high and low pressure lines for applying a regulated hydraulic pressure to said piston for counteracting hydraulic pressure applied thereto; a pair of second front and rear wheel cylinders, each having a corresponding piston slidable therein with a brake applying element connected thereto and a third hydraulic chamber formed therein on one side of said last-named piston, said third hydraulic chamber being connected to the other of said power chambers for applying hydraulic pressure to said last-named piston for brake application; said second rear wheel cylinder having a fourth hydraulic chamber formed therein on the opposite side of said last-named piston and being hydraulically connected to said high and low pressure lines for applying a regulated hydraulic pressure to said last-named piston for counteracting hydraulic pressure applied thereto; a first control valve interposed in said high pressure line for selectively establishing and blocking hydraulic communication between said second and fourth hydraulic chambers and a hydraulic pressure source; a second control valve interposed in said low pressure line for selectively establishing and blocking hydraulic communication between said second and fourth hydraulic chambers and a hydraulic reservoir; and means for sensing locking of said rear wheels to properly control said first and second valves such that pressure in said second and fourth hydraulic chambers is reduced when at least one of said rear wheels is being locked.

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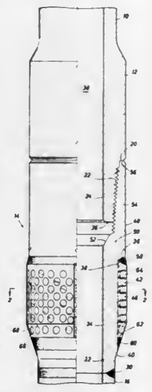
**4,296,973**
**SEGMENTED HARDFACED COLLAR FOR TOOL JOINTS**
**Charles A. Hartwell, P.O. Box 36589, Houston, Tex. 77036**
**Filed Jan. 9, 1980, Ser. No. 110,646**
**Int. Cl.³ F16C *29/02***
**U.S. Cl. 308—4 A** **5 Claims**



1. In a well pipe tool joint formed of a lower threaded tubular body serially affixed to a drill pipe and adapted to be connected with a complementary threaded tubular tool joint body for supporting a drill string, the improvement which comprises wear protector means extending circumferentially about the lower tubular body in an axially extending region wherein said wear protector means comprises an elongate, externally located tubular sleeve terminating at a lower circumferential shoulder located on the lower tubular body at or beyond a specified distance from a weld joining the lower tubular body to a lower pipe and which wear protector means has the form of an encircling cylindrical sleeve supporting hard metal facing thereon wherein said sleeve extends externally upwardly toward a shoulder on the lower tubular body defining a throat area within the lower tubular body which throat area is equal to or exceeds a specified dimensional size from the shoulder to a set of threads formed on the interior of the lower tubular body and wherein said sleeve terminates at a sloping circular shoulder constructed at an angle and extent in accordance with an industry standard and at least one hole drilled therein at said sloping shoulder has a hard metal facing insert therein.

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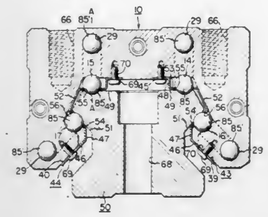
**4,296,974**
**LINEAR BALL BEARING UNIT**
**Hiroshi Teramachi, 2-34-8 Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)**
**Filed Feb. 11, 1980, Ser. No. 120,670**
**Claims priority, application Japan, Feb. 14, 1979, 54-15911**
**Int. Cl.³ F16C *29/06***
**U.S. Cl. 308—6 C** **2 Claims**

1. A linear ball bearing unit, comprising:
a bearing body having a cavity of substantially trapezoidal shape in section and provided with longitudinal ball grooves with the same radius of curvature as the balls along four corners of said cavity and longitudinal ball

recirculating holes extending parallel with the respective ball grooves in radially spaced positions;
end lids to be attached to the opposite ends of said bearing body through aligning bushes and provided with turn grooves of U-shape in section to interconnect the opposing ball grooves and ball recirculating holes of said bearing body, said end lids having square recesses at opposite sides of said U-shaped turn grooves to receive a guide strip across each U-shaped groove, said guide strip having a semi-cylindrical ball guide portion over the entire width of said U-shaped groove;



retainers to be fitted on the inner wall surfaces of said cavity of the bearing body and provided with longitudinal slits in horizontal portions opposing said ball grooves, said slits having a width slightly smaller than the diameter of balls and being provided with round tongues integrally at opposite ends thereof;
a number of balls placed in the bearings constituted by said bearing body and end lids through said retainers; and
an longated track shaft located in said cavity and having longitudinally therealong ball grooves of a radius of of curvature same as the radius of load-carrying balls.

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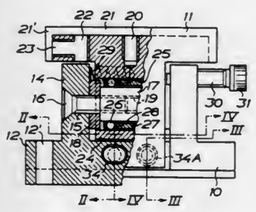
**4,296,975**

## DEVICE FOR TRANSMITTING LINEAR MEASURING MOTION

**Lars Ö. Forsman, Helsingborg, Sweden**

**PCT No. PCT/SE78/00076, § 371 Date Jul. 10, 1979, § 102(e) Date Jul. 10, 1979, PCT Pub. No. WO79/00292, PCT Pub. Date May 31, 1979**
**PCT Filed Nov. 13, 1978, Ser. No. 118,802**
**Claims priority, application Sweden, Nov. 14, 1977, 7712828**
**Int. Cl.³ F16C** *29/04*
**U.S. Cl. 308—6 R** **7 Claims**



1. A device for providing linear measuring motion comprising:
a U-shaped element and a T-shaped element, the stem of the T-shaped element being received between the limbs of the U-shaped element, so that said elements are relatively displaceable with respect to one another, so as to provide said linear measuring motion;
a body fixedly connected to said U-shaped element and received in a cylindrical opening extending through the stem of the T-shaped element;
the T-shaped element being mounted to said body by ball bearing means for allowing relative axial motion of said stem of the T-shaped element between the limbs of said U-shaped element and rotational motion of said T-shaped element about said body; and
means for preventing said rotational motion and ensuring accurate guidance of said elements during relative axial displacement thereof, comprising anti-friction bearing means disposed on at least one axial race between said T-shaped element and said U-shaped element.

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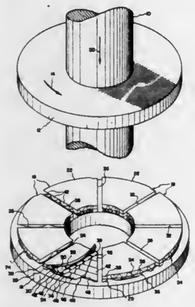
**4,296,976**

## CROSS-PLIES SUPPORT ELEMENT FOR COMPLIANT BEARINGS

**Hooshang Heshmat, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.**

**Filed Apr. 3, 1980, Ser. No. 136,958**
**Int. Cl.³ F16C** *32/06*
**U.S. Cl. 308—9** **10 Claims**



1. A compliant hydrodynamic fluid film bearing, comprising:
first and second relatively movable members having opposing surfaces defining therebetween a gap;
a bearing sheet attached to one of said members and having a bearing surface facing said surface of the other of said members;
a support element lying between said bearing sheet and said one member, and supporting said bearing sheet on said one member;
said support element including a first corrugated foil module lying on said one member and formed as a plurality of strips whose length runs generally perpendicular to the axis of said corrugations;
a second corrugated foil module lying between said bearing sheet and said first corrugated foil module, formed as a plurality of strips whose length runs generally perpendicular to the axis of its corrugations and to the strips of said first corrugated foil module;
said support element thereby forming a matrix of substantially independently compliant support zones including a plurality of zones in orthogonal directions distributed across the area of said support element, each zone of said support element having an angular compliance that is substantially equal about orthogonal axes directions in the plane of said bearing sheet.

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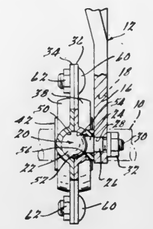
**4,296,977**

## SELF-ALIGNING SHAFT BEARING MOUNTING ASSEMBLY

**Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.**

**Filed Jan. 11, 1980, Ser. No. 111,449**
**Int. Cl.³ F16C** *13/02*
**U.S. Cl. 308—19** **7 Claims**

1. A pivotable shaft bearing mounting assembly comprising a supporting strut, a pair of ball-studs each formed with a ball and a shank affixed in spaced relationship to said strut, a bearing carrier comprised of a pair of overlying plates each formed with an aligned central aperture and an encircling outwardly projecting annular flange defining therebetween a tubular bearing housing, a bearing including an annular outer race disposed with its periphery clamped within said housing, an annular inner race adapted to receive and rotatably support a shaft, and a plurality of anti-friction elements interposed between said outer and inner race, each of said plates formed with a pair of substantially hemispherical opposed cavities



defining a pair of ball sockets disposed at diametrically spaced positions on each side of said central aperture, said carrier formed with access ports for receiving said shank of said ball-studs in radial-spaced clearance relationship, and fastening means for securing said plates together in face-to-face relationship to clamp said bearing in said housing and said balls in said sockets permitting pivoting movement of said carrier about an axis passing through said balls.

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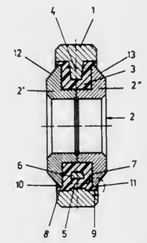
**4,296,978**

## SLIDING BEARING

**Norbert Löser, and Leopold Tilgner, both of Heusweiler, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany**

**Filed Dec. 10, 1979, Ser. No. 101,647**
**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 7837851**
**Int. Cl.³ F16C** *17/10*
**U.S. Cl. 308—37** **6 Claims**



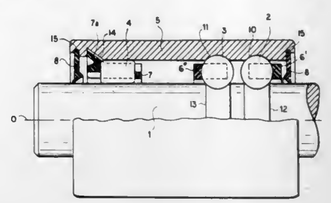
1. A bearing for transmitting radial and axial forces, comprising an inner and an outer bushing, one of said bushings being provided with flanges projecting radially to at least partially embrace the other bushing thus fixing the other bushing therebetween, a sliding annular insert having a U-shaped cross-section of antifriction material being arranged between said bushings, and having annular projections extending axially outward to embrace said flanges of said one of said bushings.

**4,296,979**

## JOURNAL BEARING FOR THE SHAFT OF A WATER PUMP OR THE LIKE

**Heinrich Hofmann, and Günther Markfelder, both of Schweinfurt, Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany**

**Filed Feb. 20, 1980, Ser. No. 123,027**
**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907342**
**Int. Cl.³ F16C** *19/49, 19/18, 33/46*
**U.S. Cl. 308—174** **4 Claims**



1. In an assembly of a rotatable shaft and a journal bearing therefor,
the improvement wherein said journal bearing comprises: a sleeve with a cylindrical inner peripheral surface having a first zone with two closely spaced annular track grooves offset from the axial midpoint of the sleeve adjacent one end thereof and a second zone with an annular retaining groove adjacent the other end thereof, said shaft being provided with two closely spaced peripheral track grooves respectively confronting the annular track grooves of said first zone;
two sets of balls respectively received in said track grooves of said shaft and said sleeve, the balls of each set being respectively engaged by a first and a second cage;
a set of rollers inserted in said second zone between said shaft and said sleeve; and
a third cage engaging said rollers, said third cage being provided with a peripheral rib snap-fitted into said retaining groove.

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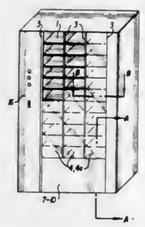
**4,296,980**

## AUTOMATON FOR DEALING OUT FOOD AND DRINK

**Tauno K. Takaniemi, Näsilinnankatu 30 B 31, SF-33200 Tampere 20, Finland**

**Filed Jun. 20, 1979, Ser. No. 50,846**
**Int. Cl.³ A47F** *3/02;* **B65B** *59/00;* **B65D** *83/08*
**U.S. Cl. 312—35** **8 Claims**



1. An apparatus for dispensing products, comprising:
a plurality of product receiving shelf spaces arranged one above the other;
a door comprising a corresponding plurality of interconnected panels each sized to close one of said product receiving shelf spaces, said door being arranged for movement due to the effects of gravity, downward past said shelf spaces; and
means for selectively stopping movement of said door

downwardly past said shelf spaces to permit serial removal of products from said shelf spaces.

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**4,296,981**

## DESK WITH A CHANNEL FOR RECEIVING CABLES, WIRES ETC.

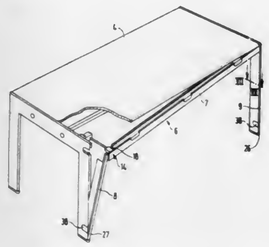
**Norbert Hildebrandt, Grüner Winkel 32, 4782 Erwitte 1; Norbert Becker, Weringhauser Str. 15, 4782 Erwitte 2; Rolf Walter, Jägergasse 1, 6302 Lich 4, and Manfred Hoffman, Bahnhofstrasse 23, 6305 Grossen Buseck I, all of Fed. Rep. of Germany**

**Filed Oct. 22, 1979, Ser. No. 87,179**

**Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 7831436**

**Int. Cl.³ A47B** *13/02, 77/08*

**U.S. Cl. 312—194** **13 Claims**



1. In a desk having a first channel which extends directly below and parallel to the table top of the desk at the back side of the desk, which channel can be pulled out from and is guided in the desk, which channel is of U- or L-shaped cross section for receiving cables and wires, the outer leg of which channel is in alignment, in its retracted condition, with the desk wall and has openings for facilitating an exiting of cables and wires, the improvement comprised in that said first channel opens upwardly and in its retracted condition is closed by said table top, at least on one end of said first channel there is secured a further channel which extends vertically downwardly from the horizontally extending first channel, said further channel being movable with said first channel, said further channel being movable into a recess in a base of the desk, said further channel being open to said horizontally extending first channel, and including webs extending longitudinally in and subdividing both channels.

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**4,296,982**

## KNOCK-DOWN CABINET ASSEMBLY

**Jan O. Kullander, Säffle, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

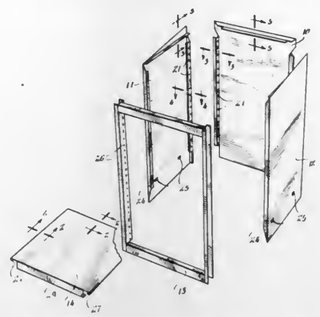
**Filed Nov. 14, 1979, Ser. No. 94,346**

**Claims priority, application Sweden, Apr. 9, 1979, 7903120**

**Int. Cl.³ A47B** *43/00;* **A47F** *5/00*

**U.S. Cl. 312—257 R** **5 Claims**

1. A cabinet having a top work surface comprising: a rear wall and two side walls, the adjacent edges of said rear and side walls having bent portions which upon abutment and pivoting hook one another to form a joint which prevents separatiion of said side walls and rear wall, a frame-shaped front wall having vertical posts adapted to snap over to join said front wall to said side walls to thereby form a box-like structure, the upper portions of both of said side walls and rear wall having inwardly directed horizontal portions, a top part having three edges bent back on itself in a reverse direction and terminating in an oppositely directed bent portion forming outwardly directed grooves between said bent back portion and said oppositely directed bent part, said grooves being adapted to engage with said inwardly directed horizontal portions, and wherein said top part is a flat plate forming a work surface, said upper parts of said side walls each being provided with a horizontal portion upon which the grooves of said top part are slid, and an additional part above said horizontal portion in the form of a triangular surface which forms an edge portion



projecting above the top surface of said top part, and whose height increases in a direction toward the rear wall of said cabinet.

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**4,296,983**

## EDGE JOINT FOR SHEETS

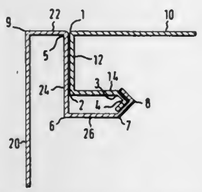
**Stanley J. C. Rogers, Gravesend, and John F. Taplin, Thornton Heath, both of England, assignors to Vickers Limited, London, England**

**Filed Aug. 29, 1979, Ser. No. 70,714**

**Claims priority, application United Kingdom, Aug. 31, 1978, 35230/78**

**Int. Cl.³ A47B** *47/02*

**U.S. Cl. 312—263** **11 Claims**




1. A locking means for joining a pair of sheets together to form a corner comprising:

a first rigid planar portion connected at one end thereof directly to a first sheet of the pair of sheets to form a corner with that first sheet;

a first rigid hook member including a second planar portion connected at one end thereof to another end of said first planar portion and extending in the direction of the first sheet and a hook forming portion connected to said second planar portion to open toward the first sheet;

a second rigid hook member including a first planar segment connected at one end thereof directly to a first edge of the second sheet of the pair of sheets and extending away from that second hook, a hook forming segment connected to said first planar segment to open toward said first planar segment;

said hook forming portion receiving said hook forming segment and interlocking the sheets together with said second sheet first edge being immediately adjacent said first planar portion another end to form a joint between the two sheets which is located at a location spaced from the corner a distance corresponding to the length of said first planar portion and in a manner such that said first planar portion is coplanar with the second sheet, the sheets being interlockable by superposing said first hook member over said second member with said second planar portion behind said first planar segment and with the edges thereof spaced slightly apart and relatively rotating the sheets to a fully interlocked position defined by abutment of such edges.



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**4,296,984**

## CABINET STORAGE CONVEYOR

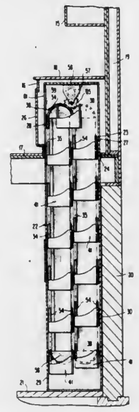
**John C. Lehman, Marietta, Pa., assignor to John C. Lehman, Inc., Lancaster, Pa.**

**Continuation-in-part of Ser. No. 883,294, Mar. 3, 1978. This application Nov. 6, 1979, Ser. No. 91,392**

**The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.**

**Int. Cl.³ B65G** *1/12;* **A47B** *49/00*

**U.S. Cl. 312—268** **7 Claims**



1. A modular preassembled article storage and transport conveyor apparatus comprising a substantially rigid unitized support housing having at least one access opening in a side thereof, a pair of endless conveyor chains forming arcuate curved portions at opposite ends in offset relationship and disposed in laterally spaced parallel planes, each chain having multiple articulated links, plural spaced article storage and transport trays suspended at diagonally opposite corners in level relationship from said chains, said trays adapted to pass in succession adjacent to said at least one access opening of the housing, fixed guide track means for said chains on said housing and defining continuous substantially uninterrupted guidance paths for the endless chains along their entire movement paths, said fixed guide track means including arcuate support and guide portions for said arcuate curved portions of said chains and disposed interiorly of said chains, and power drive means for said chains on said housing including a pair of sprocket gears respectively in operative engagement with the exteriors of said pair of chains away from said arcuate support and guide portions and at a fixed point on the arcuate curved portion of each chain that face each other.

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**4,296,985**

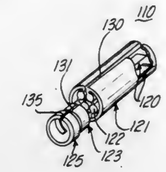
## INTEGRAL ELECTRICAL CONTACT AND METHOD OF MAKING SAME

**James J. Karol, Unadilla; Richard W. Normann, Otego, and Lloyd C. Hotchkiss, Downsville, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Oct. 9, 1979, Ser. No. 82,440**

**Int. Cl.³ H01R** *43/12, 43/14*

**U.S. Cl. 339—48** **20 Claims**




1. An integral electrical contact comprising:

an elongated electrical and conducting base portion having first and second ends;

a plurality of electrical conducting wires integrally formed with the base portion; and

a like plurality of axially aligned raised design portions integrally formed with the base portion,

each of said wires being axially aligned with one of said raised design portions, each of said wires extending beyond the first end of said base portion and each including an end portion that terminates in an acutely angled surface,

said end portions being spreadable to receive a second plurality of electrical conducting wires.

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**4,296,986**

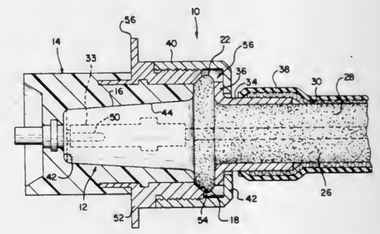
## HIGH VOLTAGE HERMETICALLY SEALED CONNECTOR

**Henry O. Herrmann, Jr., Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jun. 18, 1979, Ser. No. 49,770**

**Int. Cl.³ H01R** *13/62, 14/648*

**U.S. Cl. 339—89 C** **7 Claims**




1. In a high voltage connector for terminating coaxial cable, of the connector type including an elastomeric plug member having a frustoconical profiled forward portion having first contact means therein connected to a cable center conductor; a receptacle member having a blind bore of complementarily tapered profile in a forward face for receiving the plug forward portion therein and second contact means in said bore mateable with said first contact means; and means for pressuring the plug member against a rearward wall within the receptacle bore, the improvement comprising:

said plug member having a rearward portion connected to a metallic outer shield of the cable, and an integral annular flange portion between said forward and rearward plug

portions having frontwardly, rearwardly, and outwardly facing surfaces, and said plug member having conductive coating means over said plug rearward portion and over said flange rearwardly and outwardly facing surfaces;

conductive collar means peripherally secured to a forward end of said receptacle member and having a flared portion diverging outwardly from said forward receptacle face, said plug flange being normally displaced from said receptacle forward face and said flared collar portion upon insertion of said plug forward portion into said receptacle bore; said pressuring means engaging against said plug flange rearward surface and axially pressing said plug member against said receptacle rearward wall, whereby,

said forward plug portion flexes outwardly to conform to the interior dimension and profile of said receptacle bore, and, upon continued application of said pressuring means, said plug flange is compressed against said receptacle forward face, and influences said outward plug flange surface progressively into engagement against said flared collar portion.

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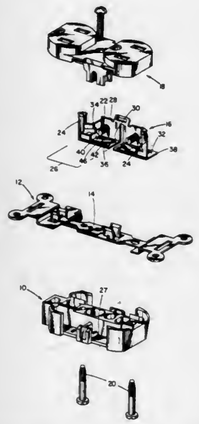
**4,296,987**

## PRESSURE LOCK TERMINAL

**Bhartoor Lingaraju, Allentown, Pa., assignor to Square D Company, Palatine, Ill.**

**Filed Oct. 23, 1979, Ser. No. 87,369**
**Int. Cl.³ H01R *4/26***
**U.S. Cl. 339—95 D** **2 Claims**



1. An improved electrical conductive double action pressure lock terminal assembly for use with an electrical wiring device capable of holding various diameter sized conductors, said pressure lock terminal assembly comprising:

an electrically non-conductive base;

an electrically conductive contact strip supported by said base, said contact strip having a main section with at least one jaw section extending from the end of said main section;

an electrically conductive double action pressure lock attached to and extending at a right angle from said main section such that said double action pressure lock is positioned a predetermined distance beneath said jaw section of said contact strip, said double action pressure lock comprising;

a spring support having a first and second end and an elongated interior opening, said spring support being attached to said contact strip along a predetermined portion of a first side of said spring support,

a spring arm having a first and second end, said first end of said spring arm being attached to said first end of said spring support, said spring arm lying within said interior opening of said spring support, and said second end being free,

a cavity stop means in said base, said stop means being positioned a predetermined distance beneath said first end of said spring support of said double action pressure lock;

whereby, when a conductor is inserted in said pressure lock assembly the conductor contacts said second end of said spring arm, causing said second end of said spring arm to deflect upward and in turn causing said first end of said spring arm and a portion of said spring support near said first end of said spring arm to contact said jaw section of said contact strip,

thereafter, as the conductor is inserted further into said pressure lock terminal assembly, said second end of said spring arm continues to deflect upward and said first end of said spring support rotates downward about said jaw section and eventually contacts said cavity stop in said base, thereby resulting in said second free end of said spring arm deflecting a greater amount than said first end of said spring arm, said deflections of said first and second ends of said spring arm resulting in a double action.

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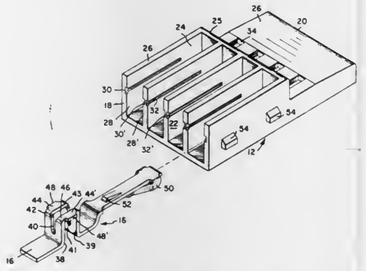
**4,296,988**

## CONNECTOR WITH IMPROVED TERMINAL SUPPORT

**Gary N. Warner, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Feb. 20, 1980, Ser. No. 122,932**
**Int. Cl.³ H01R *11/20***
**U.S. Cl. 339—97 R** **5 Claims**



1. A pre-loaded electrical connector of the type comprising an insulating housing having a wire-receiving face and a cavity extending inwardly from said wire-receiving face, a wire admitting opening in said housing communicating with said cavity, said opening extending from said wire-receiving face partially along one external sidewall of said housing, said cavity having opposed internal endwalls extending normally of said one external sidewall, and an electrical contact terminal in said cavity, said terminal having wire-receiving means proximate to said wire-receiving face, said connector being characterized in that:

said wire-receiving means comprises at least one plate-like member disposed in said cavity at a location proximate to said wire-receiving face, said plate-like member being in a plane which extends substantially normally of said opposed internal endwalls and having an outer end which is proximate to said one external sidewall of said housing, a wire-receiving slot in said plate-like member extending inwardly from said outer end,

each of said opposed internal endwalls of said cavity having a supporting shoulder which is in a plane generally parallel to the plane of said one external sidewall, each said shoulder extending from said wire-receiving face into said cavity to said plate-like member,

said wire-receiving means having integral supporting projections extending laterally outwardly therefrom proximate said external sidewall and overlapping said shoulders,

said terminal having been axially inserted into

said cavity from said wire-receiving face whereby, upon locating a wire with its axis beside said one external sidewall in alignment with said wire admitting opening, and upon movement of said wire laterally of its axis, into said wire admitting opening and into said wire-receiving slot, said plate-like member is supported by said integral supporting projections and said member is stressed in tension.



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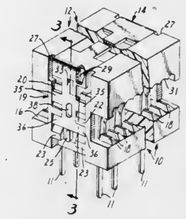
**4,296,989**

## MULTI-CONDUCTOR FLAT CABLE CONNECTOR

**Roderick W. Larson, Hudson, Wis., and Ralph D. Whaley, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation-in-part of Ser. No. 44,909, Jun. 4, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 128,527**
**Int. Cl.³ H01R *11/20***
**U.S. Cl. 339—99 R** **8 Claims**



1. A multi-conductor flat cable connector comprising:

a base carrying a plurality of insulation stripping contact elements which extend from one surface of said base for making electrical connection to conductors of a said flat cable, said base being formed centrally at each end with a generally rectangular cover guide extending perpendicularly from said one surface,

a cover on said base formed at its ends to slidably mate with said cover guides on said base,

latching means on said cover including a pair of resilient metal latching legs, one extending from each end of said cover,

means for latching said latching legs to said base in an open position permitting a said flat cable to be inserted between said cover and said contact elements and for latching said latching legs to said base in a closed position whereat conductors of a said cable are connected by said contact elements, and

a pair of shearable latch stops, one at each end of said base, positioned to be contacted by portions of said latching legs when said connector is in an open position and shearable by said latching legs when said base and cover are forced together to move them to their closed position carrying the conductors of a said cable into said contact elements.

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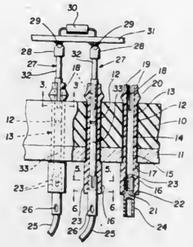
**4,296,990**

## ELECTRICAL CONNECTOR HAVING INSULATED LOCKING SHELL FOR USE ON PANEL HAVING METAL GROUND PLANE

**Jeffery P. Stowers, Mt. Sidney, and Kimball E. Stowers, Ft. Defiance, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.**

**Filed Feb. 22, 1980, Ser. No. 123,894**
**Int. Cl.³ H01R *13/627***
**U.S. Cl. 339—128** **4 Claims**

1. An electrical connector for making a connection through a support panel having a metallic layer thereon and having an aperture formed entirely therethrough, said connection being between a conductor spaced from one side of the panel and a circuit element spaced from the other side thereof, said connector comprising a holding shell formed of insulating material and adapted for placement through said aperture of the panel and metallic layer with opposite end portions of the shell projecting beyond the opposite faces of the panel and metallic layer, said shell having a cross slot in one end thereof forming two yielding jaws, camming enlargements on said jaws including oppositely tapering faces engageable with the entrances of the aperture to collapse the jaws toward each other to enable inserting the shell through said aperture and withdrawing the shell therefrom, said shell being hollow, a spring contact probe snugly engaged within the shell and including a spring-biased



stem projecting beyond the slotted end of the shell and adapted for electrical engagement with said circuit element, an electrical terminal element for said conductor anchored to the end portion of said shell remote from its slotted end portion, and said spring contact probe including a sleeve body substantially filling the hollow shell and resisting collapse of said jaws while the spring contact probe is within the shell, the shell having an external shoulder near its end away from said camming enlargements adapted to abut one entrance of the aperture while the camming enlargements are abutting the other entrance with both oppositely tapering faces then disposed outside of the aperture to lock the shell within the aperture.

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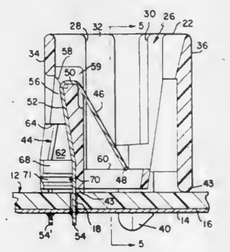
**4,296,991**

## ELECTRICAL CONNECTOR RECEPTACLE

**Donald W. K. Hughes, Mechanicsburg, and Ronald W. Myers, Landisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Continuation-in-part of Ser. No. 940,536, Sep. 8, 1978, Pat. No. 4,221,458. This application Dec. 10, 1979, Ser. No. 101,676**
**Int. Cl.³ H01R *13/50***
**U.S. Cl. 339—176 MP** **4 Claims**



1. An electrical connector receptacle of the type comprising an insulating housing having a plug-receiving end and a rearward end, a plug-receiving opening extending into said plug-receiving end, said opening having opposed first and second internal sidewalls and opposed internal endwalls, said housing having oppositely directed first and second external sidewalls, which are proximate to said first and second internal sidewalls respectively, and opposed external endwalls, a plurality of

spaced-apart side-by-side conductors, each of said conductors having a contact spring portion which extends from said first internal sidewall at a location adjacent to said plug-receiving end diagonally into said opening and towards said rearward end, said connector receptacle being characterized in that:

each of said conductors comprises a one-piece stamped and formed sheet metal member,

said first external sidewall has a plurality of side-by-side conductor-receiving channel means therein extending from said location adjacent to said plug-receiving end to said rearward end, every other said channel means being of increasing depth along its length from said location to said rearward end, the remaining channel means being of decreasing depth along their length whereby said channel means are alternately deep and shallow at said rearward end,

intermediate portions of said conductors being in said channel means, said conductors having reverse bends at said location and extending diagonally toward first end portions in said opening, second end portions of said conductors extending normally of, and beyond, said rearward end whereby,

said contact springs are formed between said reverse bends and said first end portions, and said second end portions of adjacent conductors are offset from each other and can be inserted into holes in a circuit board which are on staggered centers.

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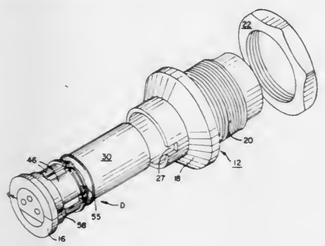
## ELECTRICAL CONNECTOR ASSEMBLY

**David A. Gallagher, Romeoville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Continuation-in-part of Ser. No. 836,325, Sep. 26, 1977, Pat. No. 4,154,496. This application Apr. 9, 1979, Ser. No. 28,156**

**Int. Cl.³ H01R** *13/506*

**U.S. Cl. 339—186 M** **16 Claims**



1. A connector assembly comprising:

a shell;

an elastomeric insert member for supporting at least one electrical contact;

a retaining ring comprising at least two portions which may be opened to receive said insert and closed to permit insertion of said ring and insert member into said shell, said ring including retention means for engaging and maintaining said insert member in fixed position within said ring and a plurality of radially movable axially extending arms for engaging said shell to maintain said ring and insert member in fixed axial position within said shell; and

a passageway providing access to said axially extending arms to permit disengagement of said ring and insert member from said shell.

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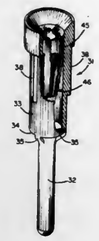
## ELECTRICAL CONTACT WITH IMPROVED MEANS FOR SOLDER WICKING AND DEGASSING

**Roger D. Wellington, Cumberland, R.I., assignor to Augat Inc., Attleboro, Mass.**

**Continuation of Ser. No. 936,485, Aug. 24, 1978, Pat. No. 4,236,776. This application Jan. 7, 1980, Ser. No. 109,850**

**Int. Cl.³ H01R** *9/06*

**U.S. Cl. 339—275 B** **6 Claims**



1. A contact adapted to be soldered in a cylindrical plated-through hole in an interconnection board so as to facilitate solder wicking and degassing when so soldered, said contact comprising:

a cylindrical body, larger in diameter than said plated-through hole;

an elongated pin axially projecting from one end of and being substantially smaller in cross section than said cylindrical body;

a conical transitional surface connecting said cylindrical body and said pin; and

a plurality of ribs substantially parallel to and projecting outwardly from said transitional surface;

whereby when said contact is mounted in said plated-through hole with said pin projecting thereinto, said ribs make surface contact with the rim of said plated-through hole thereby spacing said transitional surface from said rim and providing escape paths for gases between said ribs and between said transitional surface and said rim.

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## METHOD AND APPARATUS FOR HOLOGRAPHIC PROCESSING

**William H. Quick, La Habra Heights; Kenneth A. James, Corona Del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jan. 22, 1979, Ser. No. 5,619**

**Int. Cl.³ G02B** *5/32*

**U.S. Cl. 350—3.73** **22 Claims**

1. A method of reporting the status of a physical parameter to a receiving station, the method comprising the steps of:

sensing said physical parameter;

supplying a first beam of light and varying the spectral wavelength distribution of said light beam as a function of the status of said parameter being sensed;

applying said spectrally-varied beam of light to a hologram for focusing responsive beams of light on an image plane at predetermined points, the locations of said points being responsive to an encoded signal that is dependent upon the spectral distribution of said beam of light; and



transferring said encoded signal to said receiving station by inputing said responsive beams of light to a light transmission means having one end at said image plane and having another end at said receiving station.

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**4,296,995**

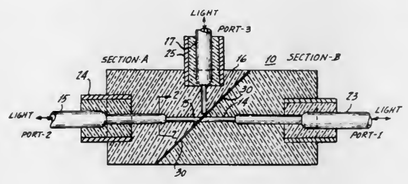
## OPTICAL FIBER BEAM SPLITTER COUPLERS EMPLOYING COATINGS WITH DICHROIC PROPERTIES

**Gary W. Bickel, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Feb. 1, 1980, Ser. No. 117,425**

**Int. Cl.³ G02B** *5/172*

**U.S. Cl. 350—96.15** **10 Claims**




1. An optical coupling device comprising:

a first optical layer having a front surface at a given angle, and having deposited directly thereon by an evaporation technique a plurality of relatively thin layers in excess of ten such layers of a material with dichroic properties capable of reflecting a first beam of light of a first frequency propagating in said fiber, and transmitting a second beam of light of a second frequency propagating in said first optical fiber,

a second optical fiber having a front surface at said given angle and adjacent said front surface of said first fiber to form an interface between said first and second surfaces to enable transmitted light at said second frequency to propagate within said second fiber with said second fiber receiving at least 80% of said light at said second frequency, and

optical means positioned relatively transverse to said interface and adapted to solely receive reflected light at said first frequency from said interface as reflected by said thin layer with said optical means receiving at least 70% of said reflected light at said first frequency.

**4,296,996**

## FEEDTHROUGH FOR OPTICAL FIBER

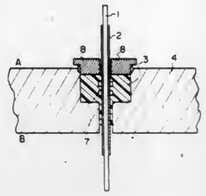
**Yasuhiko Niiro, Yokohama; Kahei Furusawa, Kamifukuoka, and Akira Okada, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 17, 1979, Ser. No. 58,251**

**Claims priority, application Japan, Jul. 18, 1978, 53-86734**

**Int. Cl.³ G02B** *7/26*

**U.S. Cl. 350—96.20** **3 Claims**



1. In a submarine repeater, a pressure-resisting solid container having a feed-through opening for receiving an optical fiber, an optical fiber extending longitudinally through said opening, a sealing thermoplastic material filling space between the fiber and inner surfaces of said through opening in said pressure-resisting solid container, said optical fiber having a metallic film coating circumferentially and longitudinally thereon in close contact with said sealing thermoplastic material to ensure a seal having resistance to high fluid pressure and airtightness between the optical fiber and said thermoplastic material, said metallic film coating having an oxide film thereon to provide enhanced sealing close contact between the metallic film coating and the thermoplastic material.

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**4,296,997**

## DEVICE FOR CENTERING AN OPTICAL FIBER WITHIN A TERMINAL, AND A TERMINAL CONSTRUCTED BY MEANS OF SAID DEVICE

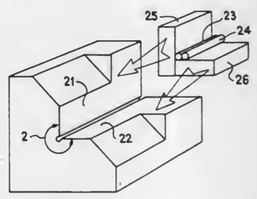
**Christian Maisot, and Jean Bouygues, both of Suresnes, France, assignors to Socapex, Suresnes, France**

**Filed Oct. 25, 1979, Ser. No. 88,458**

**Claims priority, application France, Oct. 31, 1978, 78 30849**

**Int. Cl.³ G02B** *7/26*

**U.S. Cl. 350—96.20** **7 Claims**



1. A device for centering an optical fiber within a connector terminal comprising:

a reference dihedron block having two faces, fabricated from a rigid material, one end thereof being adapted to receive the terminal;

a centering assembly adapted to be received by the other end of the reference dihedron block, including

two packing blocks of equal thickness, each such block being applied against a face of the reference dihedron block, and

two cylinders, each having a diameter equal to 2.421 times the diameter of the optical fiber in the case of a right dihedron, the cylinders being tangent to each other and

to at least one packing block, one of the cylinders being tangent to both packing blocks;

the centering assembly operating to position the optical fiber in the plane bisecting the dihedral angle defined by the faces of the reference dihedron block in a direction parallel to the edge of the dihedron block.

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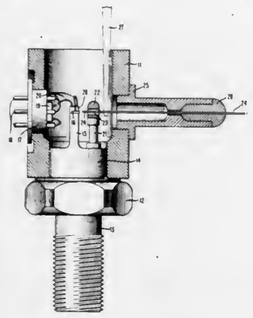
## ENCAPSULATED LIGHT SOURCE WITH COUPLED FIBERGUIDE

**William H. Dufft, Shillington, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 17, 1979, Ser. No. 104,364**
**Int. Cl.³ G02B** *7/26*
**U.S. Cl. 350—96.20** **4 Claims**



**1**. An encapsulated light source comprising a housing having walls, light generating means in the housing comprising a semiconductor light emitting device having a light output face, light transmitting means comprising a fiberguide penetrating a wall of the housing for transmitting light from the light emitting device to the exterior of the housing, a pedestal member within the housing having a top surface adjoining the light output face of the light emitting device, an unhoused body of low melting metal mounted on the top surface of the pedestal, the metal body having a portion of the fiberguide embedded therethrough to lock the fiberguide in position relative to the light output from the light emitting device.

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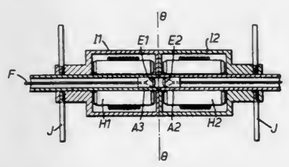
## OPTICAL FIBRE CONNECTORS

**John F. Mead, Princes Risborough, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland**

**Filed Oct. 23, 1979, Ser. No. 87,529**
**Int. Cl.³ G02B** *7/26*
**U.S. Cl. 350—96.21** **12 Claims**




**1**. An optical connector for the end of an optical fibre, comprising:

a hollow cylinder adapted to be secured to the end of said optical fibre;

an elongate housing assembly axially slidably mounted on said hollow cylinder and being intimately in contact therewith;

a main body secured to said hollow cylinder and also surrounding said elongate housing assembly, wherein said elongate housing assembly is axially slidable between said hollow cylinder and said main body; and

actuating means extending from said elongate housing assembly through said main body for enabling movement to be imparted to said elongate housing assembly externally of said main body;

said optical connector being adapted to be mated to a further identical connector secured to the end of a further optical fibre having a hollow cylinder and a main body, with the ends of said hollow cylinders and said main bodies of respective said optical connector and said further optical connector abutting, and said elongate housing assembly moved axially to project within the main body of said further optical connector and to abut the elongate housing assembly thereof and to span the abutting ends of said hollow cylinders and said main bodies.

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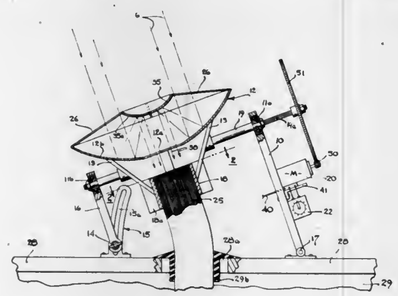
**4,297,000**

## SOLAR LIGHTING SYSTEM

**James E. Fries, 7860 Valley View, Apt. 242, Buena Park, Calif. 90620**

**Filed Jan. 11, 1979, Ser. No. 2,620**
**Int. Cl.³ G02B** *5/16*
**U.S. Cl. 350—96.24** **12 Claims**



**10**. A lighting system employing solar light energy comprising:

a collector device in the form of a dish having an aperture in the center thereof, a parabolic reflective surface on one side thereof,

a fiber optical cable formed from a plurality of optical fiber lines joined together into a bundle,

ring holder means for holding one end of said fiber optical bundle together,

support means for supporting said collector device for rotatable movement about a predetermined axis,

means for supporting said ring holder means on said collector device for movement therewith with said one end of said cable on the opposite side of said collector device and facing directly opposite said aperture, the one end of the fiber optical bundle held by the ring holder means moving along with the collector device to maintain said one end of said cable facing directly opposite said aperture,

a convex mirror,

means for supporting said convex mirror on said collector device on said one side thereof approximately at the parabolic focal distance from said parabolic surface,

light utilization means,

means for coupling the other end of said cable to said light utilization means, and

means for slewing said collector device about said predetermined axis so as to maintain said collector device directed at the sun,

whereby the sun's rays are focused on said convex mirror by said parabolic surface, said convex mirror directing the focused rays onto said one end of said fiber optical cable and transmitted to said light utilization means.



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**4,297,001**

## PROJECTION SCREEN AND METHOD FOR MAKING SAME

**Gregor Antes, Zurich, and David L. Greenaway, Oberwil, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland**

**Continuation of Ser. No. 852,089, Nov. 16, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 95,097**
**Claims priority, application Switzerland, Nov. 16, 1976, 14379/76**
**Int. Cl.³ G03B** *21/60*
**U.S. Cl. 350—129** **22 Claims**

**1**. In a method of producing an optical projection screen on a body,

the steps comprising:

forming a plurality of adjacent randomly distributed and irregularly sized micro-structural bubble-shaped elements on one major curved surface of said body, said bubble-shaped elements having a predetermined range of angles of inclination with respect to at least one direction tangent to said surface, and

limiting said predetermined range of angles of inclination by stretching said body by a first incremental length in said one direction, so that in an operative position of said screen light operatively incident on said screen is scattered therefrom in a predetermined plane at an angle to said surface and including said one direction within a selectable first scattering angle, said first scattering angle being at least partially dependent on said first incremental length.

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**4,297,002**

## ARRANGEMENT OF CYLINDER ELEMENTS FOR A LENS BARREL

**Tsuneyo Meatabi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

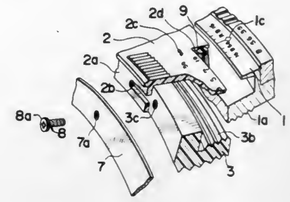
**Continuation of Ser. No. 6,973, Jan. 26, 1979, which is a continuation-in-part of Ser. No. 1,796, Jan. 8, 1979. This application May 13, 1980, Ser. No. 149,359**
**Claims priority, application Japan, Jan. 31, 1978, 53-8881**
**Int. Cl.³ G02B** *7/02;* **G03B** *3/00*
**U.S. Cl. 350—255** **17 Claims**

**1**. An arrangement of cylinder elements for a lens barrel comprising;

an externally accessible outer cylinder element made of plastic material and having a central axis, an annular ridge carried on an inner peripheral surface of said outer cylinder element;

an inner cylinder element carried within said outer cylinder element;

an annular member being separate and independent from said outer and inner cylinder elements and being attachable to said annular ridge with an axis of said annular member being coincident with the central axis of said outer cylinder element, said annular member being made of a material which is stronger than said plastic material; and




means for fixedly attaching said annular member to said annular ridge with the axis of said annular member being coincident with the central axis of said outer cylinder element.

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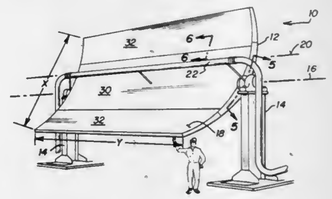
**4,297,003**

## SOLAR COLLECTOR MODULE

**Joseph A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.**

**Filed Oct. 19, 1979, Ser. No. 86,314**
**Int. Cl.³ G02B** *5/10*
**U.S. Cl. 350—292** **21 Claims**




**1**. A parabolic trough solar collector comprising: at least two collector modules, means rigidly connecting said modules together, each of said modules comprising at least two end skin members each having a front surface and a rear surface, said front surface of each of said end skin members being formed in a portion of a parabola; a rear stressed sheet metal skin rigidly affixed to at least a portion of said rear surface of each of said end skin members; a front stressed sheet metal skin rigidly affixed to at least a portion of said front surface of each of said end skin means; and a reflective surface on said front stressed sheet metal skin, said reflective surface being adapted to reflect solar radiation.

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**4,297,004**

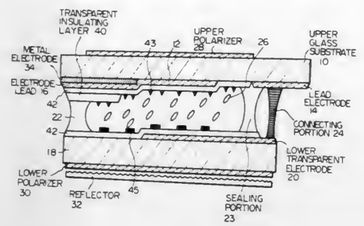
## LIQUID CRYSTAL DISPLAY CELL

**Katsuo Nishimura, and Takanori Nanya, both of Tokorozawa, Japan, assignors to Technical Research of Citizen Watch Co., Ltd., Tokorozawa, Japan**

**Filed Sep. 17, 1979, Ser. No. 76,189**
**Claims priority, application Japan, Sep. 20, 1978, 53-114487; Oct. 26, 1978, 53-132029**
**Int. Cl.³ G02F** *1/133*
**U.S. Cl. 350—336** **10 Claims**

**1**. In a liquid crystal display cell composed of two transparent supporting substrates arranged parallel to one another, sealed together peripherally to form an enclosed chamber containing a liquid crystal material, and having a transparent display electrode formed on an inner face of at least one of said transparent supporting substrates composed of a thin film of an

electrically conductive substance and a lead electrode provided on said inner substrate face for providing electrical connection between said transparent display electrode and external drive means, the improvement comprising a multi-layer construction for said lead electrode for thereby reducing the electrical resistance thereof, said multi-layer lead electrode




construction comprising a metallic electrode layer of a metallic substance formed on said inner substrate face and a lead electrode layer formed over said metallic electrode layer, said lead electrode layer being formed integrally with said display electrode and having a width which is substantially equal to the width of said metallic electrode layer, measured in a direction parallel to the substrate plane.

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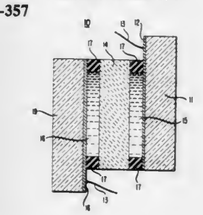
**4,297,005**

## PERSISTENT MEMORY CELL

**David W. Johnson, Jr., Pluckemin; Shobha Singh, Summit; LeGrand G. Van Uitert, Morristown, and George J. Zydzik, Columbia, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Jun. 25, 1979, Ser. No. 51,807**
**Int. Cl.³ G02F *1/17***
**U.S. Cl. 350—357** **45 Claims**



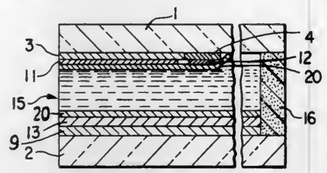
1. An electrochemical display device comprising:
(a) first and second electrodes;
(b) electrochemical solution in contact with the first and the second electrodes;
(c) said electrochemical solution comprising:
i. organic quinone which changes color under the influence of an electrical signal,
ii. electrolyte,
iii. organic solvent capable of dissolving said organic quinone;
(d) characterized in that a solid cation ionic conductor separates the device into two cavities, each with its own electrode, one comprising the first electrode and the other comprising the second electrode and the two cavities are at least partially filled with said electrochemical solution.

**4,297,006**

## PROTECTIVE MEMBRANE FOR ELECTROCHROMIC DISPLAYS

**Saadi J. Bissar, Waterbury, Conn., assignor to Timex Corporation, Waterbury, Conn.**

**Continuation-in-part of Ser. No. 973,833, Dec. 28, 1978, abandoned. This application Sep. 21, 1979, Ser. No. 77,863**
**Int. Cl.³ G02F *1/17***
**U.S. Cl. 350—357** **25 Claims**




1. An electrochromic display having a display electrode with an electrochromic layer thereon, a counter electrode spaced from the display electrode and display electrolyte between the electrochromic layer and counter electrode, characterized in that a protective membrane is interposed between the electrochromic layer and electrolyte for protecting the layer from erosion resulting from contact with the electrolyte, said membrane comprising a mixture of:
(a) a long chain organic acid; and
(b) a compound selected from at least one of amine and amide present in an effective amount to form a salt with the organic acid imparting water repellency and ionic conductivity to said membrane for minimizing contact between said electrochromic layer and electrolyte while maintaining ionic conductivity therebetween for display purposes.

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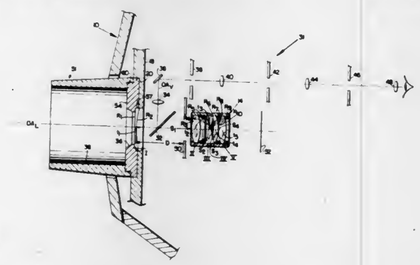
**4,297,007**

## OPTICAL APPARATUS AND METHOD FOR CHANGING A ZOOM CAMERA TO A FIXED FOCUS CAMERA

**R. Calvin Owen, Jr., Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Apr. 24, 1979, Ser. No. 32,969**
**Int. Cl.³ G02B *3/04, 9/60, 15/14***
**U.S. Cl. 350—432** **8 Claims**



1. In combination with a fixed-focus, four-element air spaced lens having the following characteristics

| Lens | $n_d$ | V | Radii (in.) | Thickness (in.) |
|---|---|---|---|---|
| I | 1.6911 | 54.8 | $R_1 = .614$ | $t_1 = .126$ |
| | | | $R_2 = -1.245$ | $s_1 = .133$ |
| II | 1.7508 | 27.8 | $R_3 = -.450$ | $t_2 = .040$ |
| | | | $R_4 = .48$ | $s_2 = .023$ |
| III | 1.6111 | 58.8 | $R_5 = -2.0187$ | $t_3 = .100$ |
| | | | $R_6 = -0.5755$ | $s_3 = .005$ |



-continued

| Lens | $n_d$ | V | Radii (in.) | Thickness (in.) |
|---|---|---|---|---|
| IV | 1.6111 | 58.8 | $R_7 = 0.599$ | $t_4 = .128$ |
| | | | $R_8 = -0.5564$ | |

wherein Roman numerals identify lens elements from front to rear; $n_d$ is the refractive index; V is the Abbe number; $R_1$, $R_2$ . . . represent radii of successive refractive surfaces from front to rear; and t and s represent thickness of lens elements and air spaces respectively, an improvement comprising:
an aspheric corrector plate spaced ahead of element I of the four element lens by a predetermined distance, having an index of refraction, $n_d$, of 1.492, and Abbe V-number of 57.2, a plano front surface, and a concave rotationally symmetric aspheric rear surface facing element I and given by:

$$Z=0.170171y^4+1.47874y^6$$

where Z is the height of the asphere along the optical axis measured from a reference plane tangent to its vertex and perpendicular to the axis and Y is the radial distance of the aspheric surface from the optical axis.

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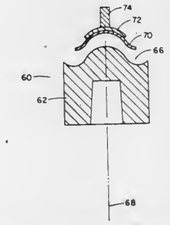
**4,297,008**

## METHOD AND APPARATUS FOR MAKING A NON SPHERICAL BEVELED CONTACT LENS

**Donald L. Woodford, 9925 Broadmoor Dr., Omaha, Nebr. 68114**

**Filed Jan. 16, 1979, Ser. No. 3,833**
**Int. Cl.³ B24B *9/14*; G02C *7/04***
**U.S. Cl. 351—177** **5 Claims**




1. A method of producing a non-spherical bevel on the posterior surface of a contact lens comprising the steps of:
providing a rotatably mounted working surface having a central axis about which said working surface is symmetrical, said working surface further having a smooth three-dimensional curvilinear surface configuration generated by the rotation of an S-shaped curve produced by the circumferential arcs of two tantential conic-section curves about said central axis;
providing an abrasive material on said working surface;
rotating said working surface about said central axis; and
bringing the posterior surface of the contact lens into contact with said working surface to selectively abrade away portions of the posterior peripheral surface thereof.

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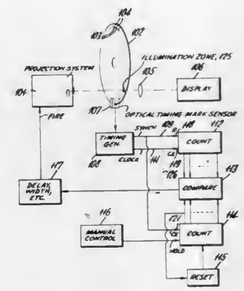
**4,297,009**

## IMAGE STORAGE AND DISPLAY

**Reuben S. Mezrich, Miami, Fla.; Alec Colleoni, New Brunswick, and David J. Lyons, Trenton, both of N.J., assignors to Technicare Corporation, Solon, Ohio**

**Filed Jan. 11, 1980, Ser. No. 111,512**
**Int. Cl.³ G03B *21/32***
**U.S. Cl. 352—86** **9 Claims**

1. In a system employing a rotatable, disk-type phototransparency record of a plurality of sequentially associated images, said disk having said plurality of images sequentially, circumferentially disposed about a center of rotation, each image having a respectively associated reference timing indicium on said disk, a system for displaying said images comprising:
(a) a projection system for selectively, intermittently illuminating a zone of said disk through which said images pass upon disk rotation;
(b) means for displaying images on said disk which are so illuminated;
(c) means for sensing the rate of disk rotation and the position of specific ones of said images thereon by detecting movement of said indicia past a given point;
(d) means, responsive to said means for sensing, for generating a first pulse signal representative of frequency of said




detected movement, and a second pulse signal representative of full disk rotations;
(e) first counter means, incremented by said first pulse signal and reset by said second pulse signal, for developing a first count;
(f) second counter means incremented by select pulses of said second pulse signal, for developing a second count; and
(g) comparator means, responsive to said first and second counter means, for energizing said projection system to illuminate a given number of next occurring images in said zone, after said first count equals said second count.

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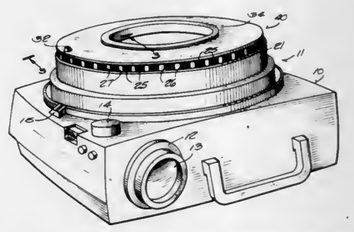
**4,297,010**

## SLIDE TRAY PROTECTOR

**Robert P. Koehler, 653 O'Dell St., Madison, Wis. 53711**

**Filed Dec. 31, 1979, Ser. No. 108,780**
**Int. Cl.³ G03B *23/06, 21/14***
**U.S. Cl. 353—122** **6 Claims**



1. A dirt excluding cover for use with a slide tray that cooperates with a projector which has a cooling air propelling fan in it, the slide tray comprising a generally cylindrical body, a plurality of axially and radially extending circularly arranged spaced apart separator walls on the body defining slide receiving slots in the tray, a locking member having a cylindrical portion selectively engageable and disengageable with said body concentrically with said circular arranged partition walls, said locking member having a radially outwardly ex-

tending flange for overhanging radially inward portions of said partition walls to retain slides in the slots of said tray, said cover comprising:

a disk composed of non-metallic material having a radial dimension from its center to its outer circular edge substantially equal to the radial extent of said partition walls for said disk to overlay the slots in the tray, said disk having a central opening through which said cylindrical portion of said locking member passes to enable it to engage said tray and to dispose said flange of the locking member over a radially extending portion of said disk to thereby retain said disk superimposed over said slots,

said disk material being selected from a class of materials consisting of paper and synthetic resin and the disk being sufficiently thin for it to fit loosely between said flange on the locking member and the separator walls and for it to flex slightly to increase the size of the hot air discharge path between said disk and said slots when said disk is locked by said locking member and said projector is operating.

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**4,297,011**

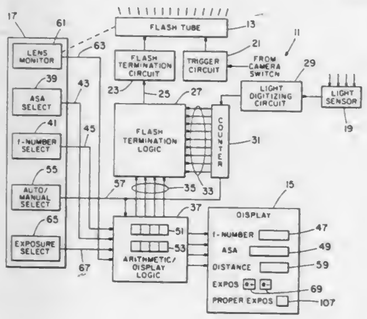
**PHOTOFLASH DEVICE**

**James R. Adams, Jr., Littleton, Colo., assignor to Rollei of America, Inc., Littleton, Colo.**

**Filed May 10, 1979, Ser. No. 37,814**

**Int. Cl.³ G03B** *7/16*

**U.S. Cl. 354—23 D** **45 Claims**




**1**. In a photoflash system having a flash device and means for firing the latter to produce light on a subject to be photographed, a display apparatus for visually displaying, prior to flash of the flash device, a maximum distance value representative of the maximum distance from the subject at which a subsequent flash will properly expose the film of an associated camera, comprising:

memory means having a plurality of memory address locations, each of which storing distance display signals representative of a maximum distance value, said memory means being responsive to memory address signals for outputting distance display signals;

ASA input means manually actuable by the photographer for inputting ASA data representative of one of a plurality of ASA film speeds, each of the film speeds representable being a power of two multiple of an ASA film speed, said input means commanding generation of first binary signals representative of the power of two change in ASA of the represented ASA input from an initiated ASA film speed value;

f-number means manually actuable by the photographer for inputting f-number date representative of a camera f-number, said f-number input means commanding generation of second binary signals representative of a change in f-stop positions of the represented f-number input from an initialized f-number value;

arithmetic means for receiving inputs of said first and said second binary signals, and generating memory address signals for addressing a memory address location in said memory means for commanding output of distance display signals from said memory means, said address location being dependent on the relative change of both the represented ASA and f-number from their respective said initialized values; and

display means responsive to said distance display signals output from said memory means for displaying a maximum distance value representative of the maximum distance at which a subsequent flash will properly expose film of an ASA speed inputted by said ASA input means, of an associated camera set at an f-number inputted by said f-number input means.

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**4,297,012**

**EXPOSURE CONTROL ARRANGEMENT FOR PHOTOGRAPHIC CAMERAS**

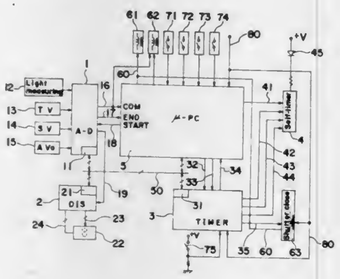
**Masaaki Nakai, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 7, 1979, Ser. No. 101,252**

**Claims priority, application Japan, Dec. 13, 1978, 53-154841; Dec. 25, 1978, 53-163800**

**Int. Cl.³ G03B** *7/097*

**U.S. Cl. 354—23 D** **8 Claims**




**1**. Digital exposure control arrangement for cameras comprising:

means for measuring light intensity and for generating an analog light measuring signal;

an A-D converter, operatively connected to said light intensity measuring means, for converting said analog light measuring signal into a digital light measuring signal;

means for setting exposure information and for producing exposure information signals;

a microprocessor for controlling camera operation, said microprocessor processing said digital light measuring signal and said exposure information signals to generate a diaphragm aperture control signal;

a diaphragm aperture capable of changing its aperture size;

means for generating a changing signal which changes in accordance with the changes in the aperture size of said diaphragm aperture;

means for comparing said changing signal with said diaphragm aperture control signal to generate a detecting signal when said changing signal has a predetermined relationship with said diaphragm aperture control signal, said comparing means being connected to said microprocessor for transmitting said detecting signal thereto, wherein said microprocessor advances into a next step of camera control upon receipt of said detecting signal; and

means directly connected with said comparing means for interrupting said change in aperture size of said diaphragm aperture upon receiving said detecting signal from said comparing means.



**4,297,013**

**COORDINATING CONTROL SYSTEM FOR CAMERA**

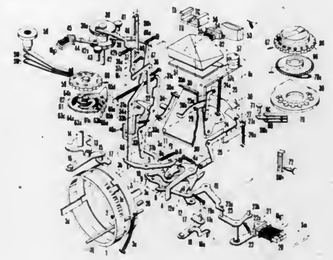
**Masaharu Kawamura, Kawasaki; Masanori Uchidoi, Yokohama; Yoshihiro Shigeta, Tokyo; Yoji Sugiura, and Hiroshi Yamamoto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 28, 1980, Ser. No. 116,314**

**Claims priority, application Japan, Jan. 31, 1979, 54-10195; Jan. 31, 1979, 54-10196; Jan. 31, 1979, 54-10197**

**Int. Cl.³ G03B** *7/093, 9/62, 17/38*

**U.S. Cl. 354—23 D** **3 Claims**



**1**. A camera having changeover positions for automatic exposure and bulb exposure modes including:

(a) a count switch for the automatic exposure mode arranged to be opened when the shutter is opened;

(b) a bulb switch arranged to be closed when set to the bulb exposure mode, said switch being manually operated;

(c) signal forming means for producing a detection signal when said count switch and said bulb switch are both opened;

(d) a timer for producing a signal after a predetermined time from the initiation of an actuation of release; and

(e) changeover means for selecting the automatic exposure mode and bulb exposure mode, said means rendering the automatic exposure mode effective when the detection signal is applied from said signal forming means until elapse of a predetermined time from the initiation of the release actuation, and rendering the bulb mode effective when the detection signal from the signal forming means is not applied but instead when the signal from the timer is applied.

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**4,297,014**

**CAMERA FOCUS DETECTING DEVICE**

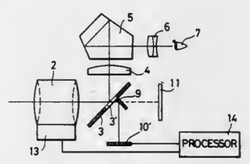
**Kazuo Nakamura, Shiki; Masao Jyojiki, Tsurugashima, and Harumi Aoki, Kiyose, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 4, 1980, Ser. No. 117,921**

**Claims priority, application Japan, Feb. 14, 1979, 54-15904**

**Int. Cl.³ G03B** *3/10, 13/18*

**U.S. Cl. 354—25** **9 Claims**




**6**. An automatic focus detecting device comprising: a self-scanning type photoelectric conversion element array; brightness detecting means; focus detecting means; switch means for coupling outputs of photodiode elements of said array in parallel and to said brightness detecting means for a brightness detection operation and alternately in serial fashion to said focus detecting means; and means for varying a scanning frequency of said array in response to an output of said brightness detecting means.

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**4,297,015**

**CAMERA AUTOMATIC FOCUS APPARATUS**

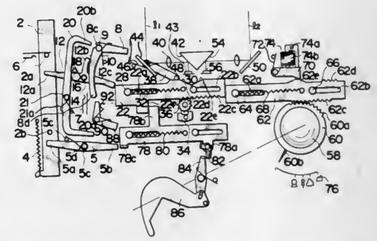
**Toshiaki Matsumoto, Izumisano, and Keisuke Maeda, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 4, 1980, Ser. No. 127,044**

**Claims priority, application Japan, Mar. 5, 1979, 54-25840**

**Int. Cl.³ G03B** *7/083, 3/10*

**U.S. Cl. 354—25** **5 Claims**



**1**. Automatic focus mechanism for a camera enabling sequential automatic focus adjustment and exposure operation in response to a shutter release operation, and automatic focus memory adjustment independently of exposure operation at any time prior to shutter release operation, comprising:

a shutter;

a release member movable by shutter release operation;

a range finding means;

a movable member movable from an initial position to a terminal position for operating said range finding means;

a focus memory operating member movable between a neutral position for normal photography and an operative position for focus memory photography;

a locking member adapted to lock said movable member at said initial position and operatively connected to said release member and said focus memory operating member for releasing said movable member either with said release member moved by a given first stroke or with said focus memory operating member moved to said operative position;

an objective;

an objective setting member for setting said objective and biased to follow said movable member upon movement thereof from said initial position to said terminal position;

arresting means connected to said range finding means for arresting said objective setting member to set said objective at an optimum focus with respect to an object being viewed by said range finding means;

a shutter actuating member biased to follow said movable member for actuation of said shutter with movement of said movable member from said initial position to said terminal position;

a first arresting member for preventing said shutter actuating member from following said movable member, and also adapted to be engaged by said movable member prior to the terminal position thereof being reached to enable said shutter actuating member to follow said movable member; and

a second arresting member for preventing said shutter actuating member from following said movable member upon the movement thereof from said initial position to said terminal position, and also adapted to be engaged by said

release member when said release member is moved by a given second stroke shorter than said first stroke to enable said shutter actuating member to follow said movable member.

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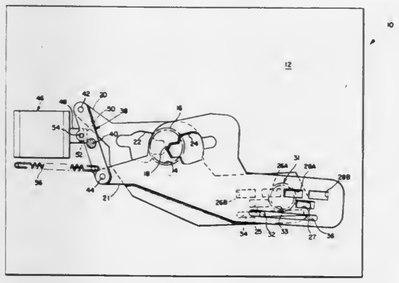
**4,297,016**

## SCANNING SHUTTER BLADE ARRANGEMENT WITH DYNAMIC APERTURES FOR AMBIENT AND FLASH EXPOSURES

**Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Jul. 7, 1980, Ser. No. 166,970**
**Int. Cl.³ G03B** *7/08*
**U.S. Cl. 354—27** **14 Claims**



**1.** A photographic camera apparatus of the type for use with a source of artificial illumination in either a predominantly ambient scene lighted mode or in a predominantly artificial scene lighted mode and which includes means for mounting photographic film material at a given film plane comprises:

a blade mechanism;

means for mounting said blade mechanism for displacement along a predetermined path to define a range of differently sized apertures;

means for providing a flash fire signal to ignite the source of artificial illumination at a time subsequent to the commencement of an exposure interval; and

drive means for displacing said blade mechanism along said predetermined path to define the exposure interval, said blade mechanism and said drive means being cooperatively structured and arranged with respect to each other such that, for the predominantly ambient scene lighted exposures where the ambient scene light is above a select level, said drive means first displaces said blade mechanism from a first closed arrangement wherein it precludes scene light from reaching the film plane toward a second arrangement defining a maximum size aperture in said range of apertures and then displaces said blade mechanism back toward its said first closed arrangement prior to said blade mechanism being displaced beyond a third intermediate arrangement wherein it defines an aperture size substantially less than said maximum aperture size, and such that for the predominantly artificial scene lighted exposures said drive means first displaces said blade mechanism from its said first arrangement to its said second arrangement at said flash fire signal time and then displaces said blade mechanism back to its said closed arrangement wherein the rate at which said aperture sizes increase immediately prior to said blade mechanism being displaced into its said third arrangement from its said first arrangement is substantially less than the rate at which said aperture sizes increase immediately subsequent to said blade mechanism being displaced away from its said third arrangement toward its said second arrangement.

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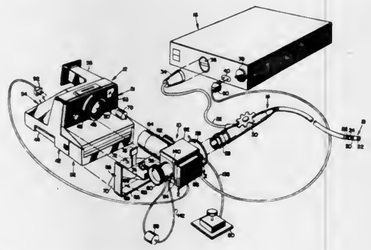
**4,297,017**

## PHOTOGRAPHIC CAMERA APPARATUS

**Zane M. Farmer, Ashburnham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Aug. 2, 1979, Ser. No. 63,043**
**Int. Cl.³ G03B** *7/089, 15/05, 29/00*
**U.S. Cl. 354—34** **11 Claims**



**1.** Photographic apparatus for adapting an exposure control system of a self-contained automatic camera for use in photographing an image formed by an optical viewing device with which the camera is mechanically and optically coupled wherein the camera automatic exposure control system is of the type which upon camera actuation begins a photographic cycle during which film exposure commences upon the opening of a shutter and thereafter is terminated by a light sensing system which measures scene brightness and commands the shutter to close upon detection of a predetermined exposure value related to scene brightness and film speed, said apparatus comprising:

means for sensing the brightness of the image formed by the optical viewing device and storing a signal corresponding to the image brightness prior to actuation of the camera;

means for precluding ambient light from entering the camera light sensing system so that when the camera is actuated its exposure cycle is initiated and exposure of the film commences and continues so long as the camera light sensing system remains in the dark; and

means responsive for sensing said brightness related signal and for providing an exposure parameter related signal and a high intensity light pulse within said light precluding means to cause the camera light sensing system to terminate exposure such that the exposure delivered to the film is appropriate for the film speed and image brightness.

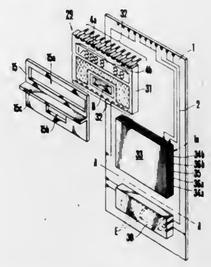


**4,297,018**

## PRINTED CIRCUIT UNIT FOR A CAMERA

**Hiroyashu Murakami, Tokyo; Tadashi Ito, and Fumio Ito, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 920,645, Jun. 30, 1978, abandoned, which is a continuation of Ser. No. 746,297, Dec. 1, 1976, Pat. No. 4,134,654. This application Jul. 9, 1979, Ser. No. 55,964**
**Claims priority, application Japan, Dec. 2, 1975, 50-144159**
**Int. Cl.³ G03B** *7/08, 9/56, 17/20*
**U.S. Cl. 354—50** **12 Claims**



**1.** For a camera which is provided with: P1 a photo-taking lens system,

veiw finder optical means, and

aperture frame means to define a photographing picture frame,

a printed circuit unit comprising:

(A) photo-sensing means to measure the brightness of an object to be photographed by said camera, means to produce an electric signal as corresponding to the object brightness,

(B) exposure operation circuit means to determine a proper exposure value based on the output signal of said photo-sensing means, and to produce an electric signal corresponding to a proper exposure value.

(C) display means to electro-optically display the proper exposure value information based on the output signal from said exposure operation circuit means,

(D) electrically insulating flexible circuit supporting means; said supporting means being adapted to be bent into a configuration to fit in a desired space within said camera and having an opening with a size at least equal to the size of the photographing picture frame defined by said aperture frame means,

(E) electrically conductive means being carried on said flexible supporting means,

said photo-sensing means, said exposure operation circuit means and said display means being carried on said flexible supporting means, and said photo-sensing means and said display means being electrically connected to said exposure operation circuit means through said electrically conductive means, and

said supporting means being constructed so that:

said photo-sensing means is placed at a position to receive a light beam from said object through at least a part of said view finder optical means,

said display means is placed at a position having the display information light beam display said proper exposure value information and impinge into at least a part of said view finder optical means, and

said opening of the supporting means matches with said photographing picture frame defined by said aperture frame means, and is mounted in a camera so at least to utilize a restricted space near said aperture frame means,

electric shutter means of the physico-optical type mounted on said flexible supporting means for covering said opening in said supporting means, and

shutter control circuit means to control said shutter means on the basis of the output signal from said exposure operation circuit means; said control circuit means being mounted on said flexible supporting means and being electrically connected to said shutter means and said exposure operation circuit means.

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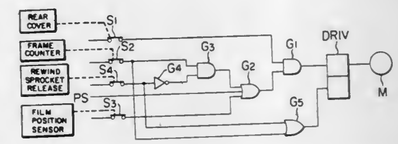
**4,297,019**

## AUTOMATIC FILM FEEDING APPARATUS FOR PHOTOGRAPHIC CAMERA

**Michio Yagi; Kunio Nakajima; Yasutsugu Nakagawa; Sizuo Ishii, and Kazuhisa Aratame, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Aug. 14, 1979, Ser. No. 66,337**
**Claims priority, application Japan, Aug. 22, 1978, 53-102104**
**Int. Cl.³ G03B** *17/36, 19/04*
**U.S. Cl. 354—171** **2 Claims**




**1.** An automatic film feeding apparatus for a photographic camera which utilizes a film strip and which includes a motor drive mechanism for winding the film strip to photographic exposure enabling frame positions therealong, a counter operable for indicating the frame positions of the film strip, and a rear cover of the camera movable between an open position for film loading and removal and a closed position for photographic exposure of the film, said film feeding apparatus comprising:

a first switch operable in response to the position of the rear cover of the camera and switchable between a first state when the rear cover is closed and a second state when the rear cover is open;

a second switch operable in response to the position of the film counter and switchable between a first state until the counter indicates movement of the film strip to a first photographic exposure frame position and a second state when the counter indicates movement of the film strip to at least said first exposure frame position;

a third switch operable in accordance with the position of the film strip and switchable between a first state when the film strip is at a photographic exposure frame position and a second state when the film strip is remote from an exposure frame position; and

electronic control circuit means for operating the motor drive mechanism in response to the states of said first, second and third switches, said circuit means being adapted to operate the motor drive mechanism when said first and second switches are switched to said first states thereof and independently of the state of said third switch so as to automatically wind and feed the film strip substantially to said first photographic exposure frame on loading of the film strip into the camera and movement of the rear cover to its closed position, and said control circuit being further adapted to operate the motor drive mechanism when said first switch is in its first state and said third switch is in its second state and independently of the state of said second switch so as to wind the film strip to the next exposure frame position after photographic exposure at the preceding frame position.

**4,297,020**

## VIEW FINDER FOR SINGLE-LENS REFLEX CAMERA

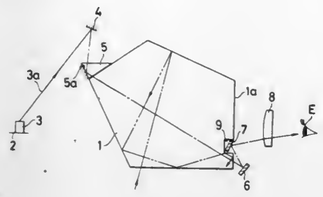
**Yasuyuki Yamada, Tokyo, and Youichi Okuno, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,799**

**Claims priority, application Japan, Feb. 7, 1979, 54-12992**

**Int. Cl.³ G03B** *13/08, 17/20*

**U.S. Cl. 354—225** **5 Claims**




**1**. A viewfinder for a single-lens reflex camera, comprising:

a viewfinder prism having an entrance face for receiving imaging light representing an image of an object to be photographed, an exit face which allows the incident light to exit therethrough and a notch in the lower part of said exit face outside the area thereof through which rays of imaging light pass;

a photographic data source;

an optical system for guiding data coming from said photographic data source to the inside of said viewfinder prism and then allows the data light to pass from said exit face of the viewfinder prism;

a reflection arrangement at least partly disposed in said ghost cut groove, said reflection body being arranged to direct the data light coming from said photographic data source and allowed to pass from said exit face towards an eyepiece.

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**4,297,021**

## POWDER MATERIAL TRANSPORTATION APPARATUS

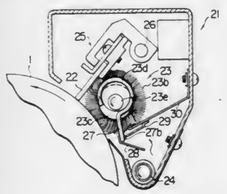
**Tatsuo Tani, Tokyo; Yasumori Nagahara, Yokosuka; Sakae Ohta, Tokyo; Minoru Suzuki, Yokohama, and Kiyozo Hashizume, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan**

**Filed Jun. 6, 1979, Ser. No. 45,964**

**Claims priority, application Japan, Jun. 9, 1978, 53-69431; Jun. 9, 1978, 53-69432**

**Int. Cl.³ G03G** *15/00;* **G01F** *11/20*

**U.S. Cl. 355—3 R** **11 Claims**




**1**. Apparatus for handling powdered material, said apparatus comprising: a housing comprising an upper portion and a bottom portion to receive the powdered material; a rotating member located in the bottom portion of the housing to transport the powdered material; a shaft in the housing to support the member rotatably, the member extending axially relative to the shaft; stirring means movably mounted in the housing between the upper portion of the housing and the rotating member to direct the powdered material to the rotating member; the rotating member comprising a helical structure; a second helical structure located to receive the powdered material from the first-named helical structure and convey the received powdered material in a direction at an angle to the direction the powdered material is conveyed by the first-named helical structure; electrophotographic means for electrophotographic reproduction; the powdered material comprising toner; and means to effect separate rotation of the first-named and second helical structures and to rotate both of the helical structures at a first speed during formation of electrophotographic reproductions and to continue to rotate the second helical structure at a speed less than the first speed for a predetermined period of time after formation of an electrophotographic reproduction.

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**4,297,022**

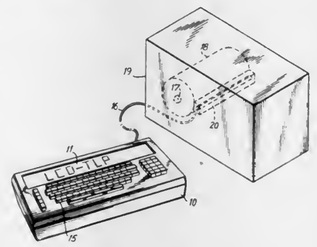
## LIGHT PIPE VALVE LIQUID CRYSTAL TRANSMISSIVE DISPLAY FOR DIRECT IMAGING ON PHOTOSENSITIVE MATERIALS

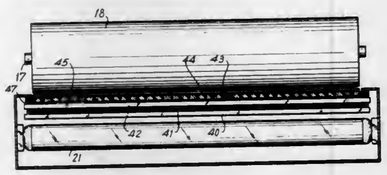
**Robert W. Lester, Manhasset, N.Y., assignor to Static Systems Corporation, New York, N.Y.**

**Filed Dec. 3, 1979, Ser. No. 99,685**

**Int. Cl.³ G03G** *15/00*

**U.S. Cl. 355—3 R** **21 Claims**




**14**. A method for producing a liquid crystal display, the steps comprising:

applying a transparent conductive coating to the inner surface to a transparent, non-conductive, first sheet and to a substantially opaque, non-conductive second sheet, the latter of which has a plurality of discrete transparent channels formed therethrough, said coating being applied to said second sheet so as to separate said coating into discrete character forming segments, each of which overlie one of said transparent channels;

securing to said coatings on each of said sheets, means for electrically coupling said coatings to an external power source;

sealing a normally transparent liquid crystal material between said inner surfaces of said non-conductive sheets; and

securing a linear polarizer sheet to the outer surface of each of said non-conductive sheets.



**4,297,023**

## ELECTROPHOTOGRAPHIC COPYING APPARATUS

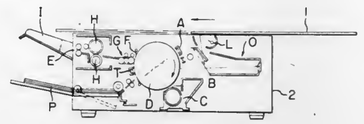
**Mitsuru Nagoshi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

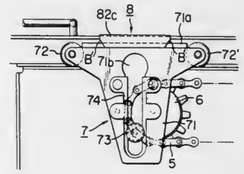
**Filed Jul. 26, 1979, Ser. No. 61,053**

**Claims priority, application Japan, Jul. 31, 1978, 53-93449**

**Int. Cl.³ G03G** *15/28;* **G03B** *27/62*

**U.S. Cl. 355—8** **4 Claims**




**1**. In an electrophotographic copying apparatus including a machine body and a copy board movable thereon along a path,

suspension means on the machine body and comprising a pair of predeterminately spaced apart elements disposed along the path of the copy board, at least one of said elements being driven during operation of the copying apparatus,

an endless power transmitting means suspended between said spaced apart elements of the suspension means for driven movement of the power transmitting means during operation of the copying apparatus,

intermediator means including a closed vertical slot,

engaging means on said power transmitting means for non-releasable engagement in and movement along the vertical slot of said intermediator means such that driven movement of said power transmitting means causes said intermediator means to be carried by said engaging means reciprocatingly between said spaced apart elements of said suspension means, and

coupling means between said intermediator means and the copy board for releasable coupled engagement therebetween so as to normally couple said intermediator means and the copy board for reciprocating movement of the copy board along the path when said suspension means is driven during operation of the copying apparatus.

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**4,297,024**

## EXPOSURE DEVICE OF AN ELECTROGRAPHIC COPYING APPARATUS

**Kiyohito Ebisawa, Tokyo; Satoshi Hisabayashi, Hachioji; Toshio Koike, Hachioji, and Kazuyuki Hashimoto, Hachioji, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan**

**Filed Apr. 23, 1979, Ser. No. 32,345**

**Claims priority, application Japan, Apr. 25, 1978, 53-54166[U]; Apr. 25, 1978, 53-54167[U]; Apr. 25, 1978, 53-54168[U]**

**Int. Cl.³ G03G** *15/00*

**U.S. Cl. 355—14 E** **4 Claims**

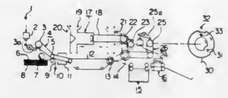
**1**. An exposure device of an electrographic copying apparatus which comprises at least one heat generative exposure lamp for creating an electrostatic latent image on a photosensitive paper corresponding to an original to be copied, wherein the device comprises:

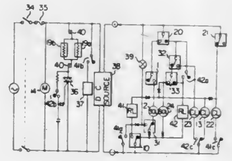
paper detector means for detecting said photosensitive paper when it is fed from a paper case to a paper feed device;

an exposure device disposed above said paper feed device and reciprocally movable with said exposure lamp;

exposure device detector means for detecting said exposure device at its start position;

cam means which is rotated by a drive means through a clutch means when said paper detector means detects the rear end of said paper, said cam means comprising a first





switch which represents an initial condition, second and third switches which represent an exposure start condition; and

exposure lamp control means comprising a relay means which is self-latched when said paper detector means and said exposure device detector means are turned off, and when said second and third switches are turned off and said relay remains latched until said exposure device detector means detects the start position, said exposure lamp being turned on during the time said relay means is operated.

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**4,297,025**

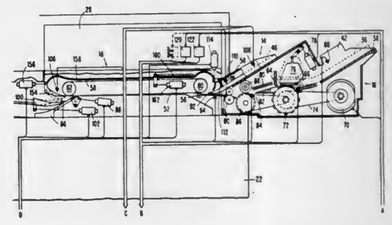
## DOCUMENT FEEDER SYSTEM HAVING A SUSPENDING/COMMENCING MODE

**Paul S. Bach, Boulder, Colo.; Steven R. Harding, Idaho Falls, Id.; Richard A. Lamos, Boulder, Colo.; Harvey R. Markham, Westminster, Colo., and Roger D. Shepherd, Nederland, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 9, 1979, Ser. No. 55,679**

**Int. Cl.³ G03G** *15/00*

**U.S. Cl. 355—14 SH** **8 Claims**




**1**. In a document reproduction system including a document feeder system, an electrophotographic copier system and a copy exit system, configured to suspend processing a prior task, commence processing a subsequent task and then, re-commence processing said prior task, the improvement comprising:

means for entering a suspending/commencing mode;

first document feeder means of said document feeder system

for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof;

second document feeder means of said document feeder system for feeding original documents to a document viewing glass of said electrophotographic copier system for copying thereof; and

logic control means operatively connected and responsive to said means for entering said suspending/commencing mode, and operatively connected to said first document feeder means, said second document feeder means and said electrophotographic copier system for immediately entering said suspending/commencing mode, for suspending operation of either said first or said second document feeder means processing said prior task, and in turn, for immediately thereafter commencing operation of said second or said first document feeder means, respectively, processing said subsequent task, and upon the completion thereof, for immediately re-commencing said prior task.

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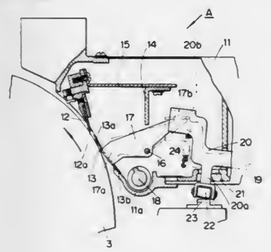
**4,297,026**

## CLEANING APPARATUS FOR COPY MACHINES

**Hiroyuki Honda, and Hiroaki Ura, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Dec. 21, 1979, Ser. No. 106,157**
**Claims priority, application Japan, Dec. 27, 1978, 53-160001**
**Int. Cl.³ G03G *21/10***
**U.S. Cl. 355—15** **2 Claims**




1. In a cleaning apparatus for a copying machine including a photosensitive drum detachably mounted on the machine frame, cleaning means for scraping toner from the drum surface, and a thin plate normally applied to the drum surface for guiding toner scraped therefrom by the cleaning means into a toner recovery box, the improvement comprising:

a pivotally mounted member normally supporting the thin plate in engagement with the drum surface;

a lever operatively engagable with said pivotally mounted member;

biasing means urging said lever into engagement with said pivotally mounted member to rotate the same to move the thin plate to a position withdrawn from the drum surface; and

an action piece associated with the photosensitive drum and disposed for engagement with said lever when the drum is mounted on the machine frame to cause said lever to become disengaged from said member against the action of said biasing means so that the member normally supports the thin plate in contact with the drum surface;

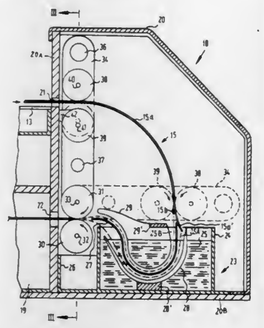
whereby detachment of the drum from the machine frame causes said action piece to disengage said lever which there upon moves into engagement with said member under the action of said biasing means to move the thin plate to a position withdrawn from the drum surface and thereby prevent damage to the thin plate or to the drum surface as the drum is detached from or reattached to the machine frame.

**4,297,027**

## APPARATUS FOR EXPOSING AND DEVELOPING PHOTOSENSITIVE MATERIAL

**Otto Stemme, Munich; Berthold Fergg; Viktor Osegowitsch, both of Taufkirchen, and Wolfgang Viehrig, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 27, 1979, Ser. No. 97,720**
**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851893**
**Int. Cl.³ G03B *27/32, 27/52***
**U.S. Cl. 355—27** **20 Claims**




1. Apparatus for exposing and developing film units wherein two sheets overlap each other, comprising an exposing unit including means for supporting successive film units in a predetermined plane during exposure of such units to light; and a developing unit including advancing means, a carriage mounting at least a portion of said advancing means and including a lever, means for pivoting said lever about a predetermined axis between a first position in which said advancing means can engage a film unit located in said plane and a second position in which the thus engaged film unit is at least partially withdrawn from said plane, and a vessel containing a supply of liquid developing agent and being adjacent to said portion of said advancing means in said second position of said lever, said portion of said advancing means comprising two parallel rolls rotatably mounted on said lever.

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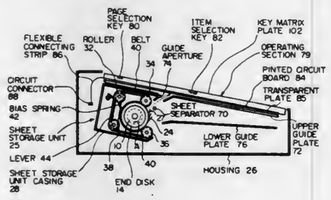
**4,297,028**

## MULTI-ITEM DATA INPUT APPARATUS

**Yashiro Seki; Hideo Kobayashi; Kiyoshi Kimura, and Masayuki Naito, all of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan**

**Filed Apr. 17, 1980, Ser. No. 141,182**
**Claims priority, application Japan, Jun. 21, 1979, 54-78295**
**Int. Cl.³ G03B *27/52, 23/02***
**U.S. Cl. 355—41** **17 Claims**




1. A multi-item data input apparatus for manually actuated generation of data to specify selected ones of a plurality of items, comprising:

a housing;



a sheet holder of substantially cylindrical configuration rotatably mounted in said housing;

a plurality of flexible sheets each having a page of data appearing thereon in visible form, each of said pages comprising a plurality of said items, each of said flexible sheets being attached at one end thereof to said sheet holder, said flexible sheets being axially rolled around said sheet holder such as to successively overlap at equidistant angular intervals;

keyboard means including a plurality of page selection keys coupled to switching means for generating corresponding page selection data when each of said page selection keys is actuated and a plurality of item selection keys coupled to switching means for generating corresponding item selection data when each of said item selections keys is actuated, each of said item selection keys being transparent through at least a portion thereof, said item selection keys being arranged in positions corresponding to positions of said items on each of said pages;

guide means disposed adjacent to said sheet holder; and

drive means coupled to rotate said sheet holder, being responsive to said page selection data for rotating said sheet holder in a first direction of rotation which is opposite to a direction in which said flexible sheets are rolled on said sheet holder, said rotation being continued until a selected one of said flexible sheets corresponding to a page designated by said page selection data is positioned adjacent to said guide means, said drive means then rotating said sheet holder in a second direction of rotation opposite to said first direction through a predetermined angular displacement, whereby said selected flexible sheet is directed by said guide means to be positioned in a substantially flat condition below said item selection keys, such that said items on the selected flexible sheet are visible through corresponding ones of said item selection keys.

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**4,297,029**

## APPARATUS AND METHOD FOR DIAGNOSTIC ENTRY

**Gerald E. Carlson, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 9, 1979, Ser. No. 28,636**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—133** **6 Claims**

processing stations and an operator's console provided with a plurality of machine instruction devices, the electrostatic printing apparatus adapted for operating in a first state for reproducing a predetermined number of copies of an original and adapted for operation in a second state for diagnosing operation of selected processing stations, the method of placing the electrostatic printing apparatus in the second state comprising the steps of:

initiating a malfunction condition,

activating one of the plurality of instruction devices,

again activating one of the plurality of instruction devices,

whereby the apparatus is placed in the second state.

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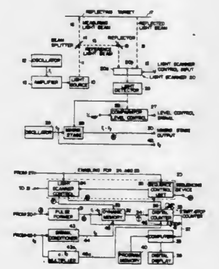
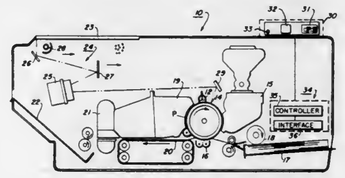
**4,297,030**

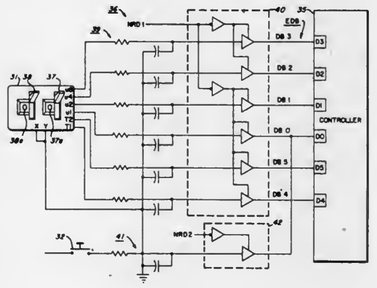
## METHOD AND APPARATUS FOR MEASURING THE DISTANCE AND/OR RELATIVE ELEVATION BETWEEN TWO POINTS

**Hoiko Chaborski, Ottobrunn, Fed. Rep. of Germany, assignor to MITEC-Moderne-Industrietechnik GmbH, Ottobrunn, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 926,099, Jul. 19, 1978, abandoned, which is a continuation of Ser. No. 743,801, Nov. 22, 1976, abandoned. This application May 31, 1979, Ser. No. 44,344**
**Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553591**
**Int. Cl.³ G01C *3/08***
**U.S. Cl. 356—5** **8 Claims**






2. In an electrostatic printing apparatus having a plurality of

1. A method for opto-electronically measuring the distance between a measuring point and a reflecting target, comprising the following steps: pg,22

(a) producing a fixed frequency signal having a given fixed frequency,

(b) modulating the light of a light source with said fixed frequency signal to produce a modulated light beam,

(c) dividing the modulated light beam into a reference light beam and into a measuring light beam, both beams having said fixed frequency modulated thereon,

(d) processing, during a first portion of a complete measuring sequence, said reference light beam through receiver means for producing a first electrical signal representing the reference phase of said reference light beam,

(e) repeatedly producing, in response to said first electrical signal a time raster signal which is phase locked with said reference phase of the first electrical signal even after the reference light beam is not received any more,

(f) processing, during a second portion of said complete measuring sequence, said measuring light beam after reflection from said target through said receiver means, which are the same receiver means which processed said reference light beam in the first portion of the measuring sequence, for producing a second electrical signal representing the phase shift of said reflected, measuring light beam relative to said reference phase, said phase shift representing the distance to be measured, and

(g) measuring in said second portion of said complete measuring sequence said phase shift of said reflected, measuring light beam, whereby said phase shift measuring begins in response to said time raster signal and is terminated in response to said phase shifted second electrical signal.

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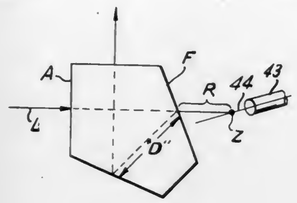
**4,297,031**

## APPARATUS AND PROCESS FOR SWEEPING A FLAT OPTICAL LIGHT PLANE

**Martin R. Hamar, 70 Linden Tree Rd., Wilton, Conn. 06897**

**Filed Sep. 26, 1979, Ser. No. 78,933**
**Int. Cl.³ G07B *11/26*; G02B *7/18***
**U.S. Cl. 356—247** **6 Claims**




1. A process for sweeping a flat optical light plane perpendicular to a primary input laser beam emanating from a laser device comprising the steps of:

providing a spindle having its actual axis of rotation intersecting the primary laser beam at a point;

rotatably mounting a solid penta prism onto said spindle such that the entrance face of the penta prism intersects the primary laser beam and the first reflecting surface of the penta prism is located intermediate the laser device and said point, said primary laser beam centrally intersecting the entrance face of the penta prism, said point being located at a distance from the first reflecting surface according to the following,

$$R = D\left(1.024 - 3.414\left[1 - \frac{1}{N'}\right]\right)$$

where D is the distance that the beam traverses within the penta prism between the first reflecting surface and the second reflecting surface, and N' is the index of refraction of the prism; and

rotating said penta prism about said spindle to sweep a flat optical light plane.

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**4,297,032**

## DARK FIELD SURFACE INSPECTION ILLUMINATION TECHNIQUE

**Paul A. Temple, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 14, 1980, Ser. No. 121,625**
**Int. Cl.³ G01N *21/21, 21/47, 21/88*; G01J *4/00***
**U.S. Cl. 356—366** **17 Claims**

1. A surface inspection method for finding defects contained in or on an optical sample comprising the steps of:

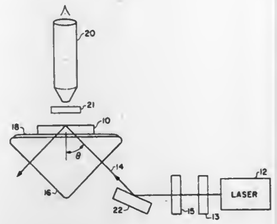
coating one side of a prism whose index of refraction is similar to said optical sample with an index matching fluid;

placing said optical sample on said fluid coated side;

establishing an observation point above said optical sample to view the surface at a normal angle;

directing a beam of monochromatic polarized light into said prism such that said beam reflects off of the upper surface of said optical sample at the critical angle beneath said observation point so as to create a standing wave pattern which scatters light off of imperfections smaller than the wavelength of said standing waves except when said imperfections are located at null points of said standing waves;

varying the standing wave pattern so that the null points of said standing waves occur at different depths within the optical sample, the imperfections appear and disappear as null points pass through it;




comparing the possible depths at which the imperfections appear for a plurality of different standing wave patterns to uniquely identify the depth in the sample of each imperfection; and

moving said optical sample so that all areas of said optical sample are viewed from said observation point to observe said scattered light which has been scattered toward said upper surface at less than the critical angle.

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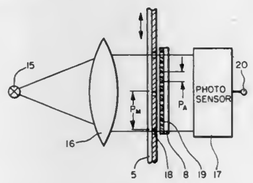
**4,297,033**

## INCREMENTAL PHOTOELECTRIC MEASURING DEVICE

**Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany**

**Filed Jun. 4, 1979, Ser. No. 45,295**
**Claims priority, application Fed. Rep. of Germany, Jun. 15, 1978, 2826213**
**Int. Cl.³ G01B *11/14, 11/04***
**U.S. Cl. 356—374** **2 Claims**




1. A photoelectric incremental measuring device comprising:

a measuring scale having a first line grid with a first grid spacing wherein the ratio of the bright-field width of the scale to the first grid spacing is about 1:(2×n), where n is a positive integer greater than one;

a scanning plate having a second line grid with a second grid spacing, wherein the ratio of the bright-field width of the scanning plate to the second grid spacing is about 1:2 and the first grid spacing is substantially an integral multiple of the second grid spacing;

means for generating a collimated beam of light;

means for measuring light intensity; and

means for mounting the scanning plate adjacent the scale to modulate the intensity of the collimated beam of light generated by the generating means which reaches the measuring means such that the scanning plate is movable substantially parallel to the scale and no focusing elements are mounted between the scale and the scanning plate.

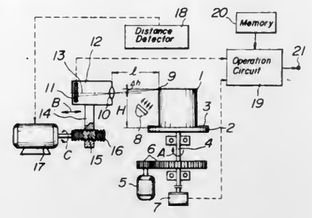


**4,297,034**

## APPARATUS FOR MEASURING CONTOUR CONFIGURATION OF ARTICLES

**Isao Ito, Nagoya, and Seiichi Tunashima, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan**

**Filed Jun. 15, 1979, Ser. No. 48,735**
**Claims priority, application Japan, Sep. 11, 1978, 53-110599**
**Int. Cl.³ G01B *11/24, 11/00***
**U.S. Cl. 356—394** **4 Claims**




1. An apparatus for measuring contour configuration of articles comprising;

a turn table on which the article to be measured is placed;

a detector for detecting a rotational angle of said turn table to produce a rotational angle signal;

a light source for illuminating at least a portion of the article on the turn table, the contour configuration of said portion being to be measured;

a pick-up device including a lens for forming an optical image of said portion of article to be measured and an image detector for receiving said image to produce a video signal;

a memory for storing a standard signal which corresponds to a standard article having given contour configuration;

an operation circuit for receiving said rotational angle signal, the video signal and the standard video signal and producing a signal which represents deviation in the contour configuration of the article to be measured from the standard article;

means for detecting a distance l between the portion of article to be measured and the pick-up device; and

means for driving the pick-up device in a direction of its optical axis in accordance with the detected distance in such a manner that the optical image of article is always focused on the image detector in the pick-up device, wherein an edge of the article is illuminated by said light source and an optical axis of said pick-up device is aligned on a corresponding edge of the standard article whereby said operation circuit detects a deviation of height of article from a standard height and a deviation of the contour dimension of article to be measured from the standard value.

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**4,297,035**

## METHOD AND DEVICE FOR DETECTING A SPECIFIC SPECTRAL FEATURE

**Gary C. Bjorklund, Los Altos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 14, 1979, Ser. No. 75,436**
**Int. Cl.³ G01N *21/27***
**U.S. Cl. 356—402** **10 Claims**

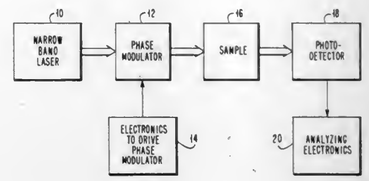
1. A method of detecting a single narrow spectral feature in a sample comprising

providing a beam of light having an optical frequency bandwidth which is narrow compared to the width of the narrow spectral feature and having a center frequency $\omega_C$ which lies near the feature;

phase modulating the beam of light with a single RF frequency to provide a pure FM spectrum having upper and lower sidebands;

exposing the sample containing the narrow spectral feature to the modulated light so that only one of the FM sidebands probes the narrow spectral feature;

photodetecting the light emerging from the sample to detect a beat at the specific RF frequency used for phase modulation; and




electronically monitoring the amplitude of the RF beat signal to indicate the strength of the narrow spectral feature.

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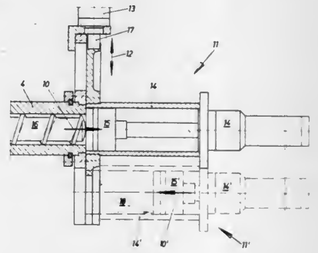
**4,297,036**

## EXTRUDER FOR PREPLASTICIZATION OF THERMOSET MOLDING MATERIALS

**Klaus Schröder, Marienheide, Fed. Rep. of Germany, assignor to Firma C. & W. Berges Maschinenfabrik, Marienheide, Fed. Rep. of Germany**

**Filed Jun. 11, 1979, Ser. No. 47,787**
**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825349**
**Int. Cl.³ B29B *1/06, 5/04***
**U.S. Cl. 366—77** **1 Claim**



1. In an extrusion machine for the preplasticization of thermosetting plastics including a rotating screw and a heated screw cylinder which compresses pulverulent material against a pressure head to impart plasticization, the improvement comprising:

(a) a receiving cylinder positioned adjacent the discharge end and coaxial with the screw cylinder, said receiving cylinder having a hydraulic discharge piston which continually retracts when an adjustable pressure head has been exceeded; and

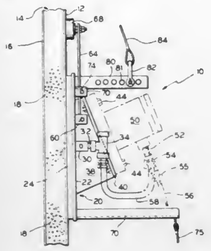
(b) a sliding pressure cylinder for moving said receiving cylinder at right angles to the direction of the longitudinal axis of said screw.

**4,297,037**

## VACUUM ATTACHED VIBRATOR APPARATUS

**David M. O'Meara, Joliet, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.**

**Filed May 8, 1980, Ser. No. 147,857**
**Int. Cl.³ B01F** *11/00*
**U.S. Cl. 366—114** **7 Claims**



1. Apparatus for removable attachment to a rigid surface for vibrating the same comprising:

a vacuum plate having a face with an elastomeric gasket around the face periphery and contactable with said rigid surface;

a vibrator mount on the vacuum plate;

a vibrator joined to the vibrator mount; and

said elastomeric gasket projecting sufficiently forward from the vibrator mount and the vacuum plate to prevent the vibrator mount and the vacuum plate from touching the rigid surface when attached thereto so that all vibrations developed by the vibrator are transmitted to the rigid surface through the elastomeric gasket and the pressure waves in the vacuum plate.

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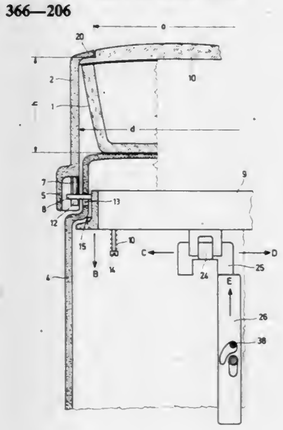
**4,297,038**

## ELECTRIC BLENDER

**Guenther Falkenbach, Eschborn, Fed. Rep. of Germany, assignor to Braun AG, Kronberg, Fed. Rep. of Germany**

**Filed Oct. 29, 1979, Ser. No. 88,917**
**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817044**
**Int. Cl.³ B01F** *7/16*
**U.S. Cl. 366—206** **7 Claims**



1. An electric household blender including a motor base having a housing, an electric operating switch mounted in said motor base to turn on an electric motor, and a removable container which can be mounted on said motor base, comprising:

(a) a container holder (**2**) adapted to be placed on said motor base;

(b) a lock ring (**9**) mounted and guided in said motor base and capable of rotating about the longitudinal axis of said motor base;

(c) lock bolts (**8**) arranged on said lock ring;

(d) lock bolt supports (**12**) arranged on said container holder;

(e) a lock bar (**11**) arranged to extend through an opening in said motor base and operable to engage with said lock ring in order to rotate said lock ring;

(f) a lock rod (**26**) arranged within said motor base so as to be capable of longitudinal movement in the vertical direction of said motor base, said lock rod being operatively engaged with said switch, and cooperating with said lock ring in a manner such that said lock ring, when in a first position, locks said lock bar against longitudinal movement to prevent operation of said electric switch, and when in a second position, allows said electric switch to be selectively operated.

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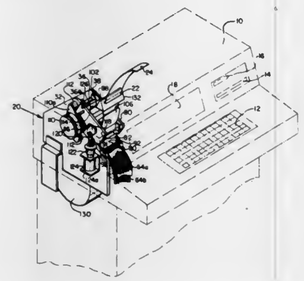
**4,297,039**

## THERMAL PRINTER

**Robert Lees, Newark, Del., assignor to Autotote, Ltd., Newark, Del.**

**Filed Dec. 29, 1978, Ser. No. 974,440**
**Int. Cl.³ B41J** *3/20*
**U.S. Cl. 400—120** **6 Claims**



1. A document printer for printing documents on thermally sensitive paper and driving said paper through cut-off means to cut the paper to predetermined lengths comprising:

a frame having generally parallel spaced apart walls;

a drive motor on the frame having drive engaging means for driving said thermally sensitive paper;

actuator means on the frame for actuating the cut-off means;

a first sub-frame having generally parallel spaced apart walls parallel to the walls of the frame, which first sub-frame is pivotally supported on and within the frame walls by first pivot means generally perpendicular to the parallel walls and has an operational position;

a thermal printing element on a separate removable base supported on the first sub-frame by a pivot pin engaging portion open on one side which enables the base in alternate position of the first sub-frame to be lifted away from the first sub-frame and supported at the opposite end by means which rests against the first sub-frame on the side opposite from a friction drive roller means, the thermal printing element being supported in position to define a portion of a paper path and comprising at least a row of high resistance printing dots;

a second sub-frame having generally parallel spaced apart walls parallel to the walls of the frame, which second sub-frame is pivotally supported on the frame by second pivot means generally perpendicular to the parallel walls and has an operational position adjacent and opposed to the operational position of the first sub-frame;

the friction drive roller means being rotatably supported on the second sub-frame opposite from the thermal printing element and positioned to drive the thermally sensitive paper along a path past the thermal printing element by contacting the paper on the side opposite from the thermal printing element, the friction drive roller means being positioned on the second sub-frame opposite the thermal printing element in such position as to urge through its inherent resiliency the paper to engage the thermal printing element so that the thermal printing element is effective to print on the paper and having drive coupling means positioned to engage the drive engaging means of the drive motor to move said thermally sensitive paper along the paper path past the thermal printing element when the second sub-frame is in operational position, the motor being supported on the frame, said drive coupling means comprising gear means and the gear means being rotatably supported on the second sub-frame so that the gear means are engaged on the second sub-frame in operational position and disengaged as the second sub-frame is moved from operational position;

the cut-off means being positioned on the second sub-frame to cut off the paper at selected lengths to include predetermined ticket information on the selected length and linkage means placed into actuating position with the actuator means when the second sub-frame is in operational position;

separate releasable means for normally maintaining each of the sub-frames in its operational position but permitting pivotal movement to at least an alternate position upon release of the releasable means, such that in the alternate positions the thermal printing element may be reached for cleaning; and

means to selectively heat individual dots to generate patterns on said thermally sensitive paper moved past the thermal printing element.

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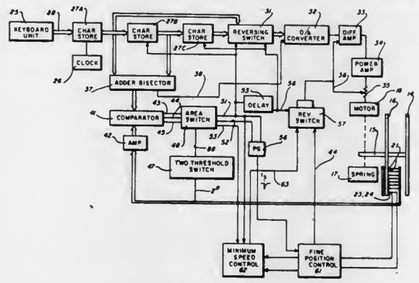
**4,297,040**

## METHOD AND APPARATUS FOR POSITIONING A TYPE DISC IN A BALANCED FORCE SYSTEM

**Diethelm Puch, and Norbert F. Will, both of Nuremberg, Fed. Rep. of Germany, assignors to Triumph-Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany**

**Filed Jun. 13, 1980, Ser. No. 159,117**
**Int. Cl.³ B41J** *1/30, 23/14, 23/16*
**U.S. Cl. 400—144.2** **10 Claims**




1. The method for positioning a type disc in a fixed cycle balanced force system, wherein applied forces to effect angular positioning movement from an old to a new position are brought into equilibrium with opposing spring forces without damping or overshoot, comprising the steps of

applying positioning forces to effect angular positioning movement from an old to a new position according to the natural oscillation of the system about a selected reference position, whereby the new position is reached at the maximum amplitude of the oscillation of the system about the reference position when angular velocity is zero, and

applying a force corresponding to the new position when the new position is reached to maintain the system at the new position.

4. Apparatus for positioning a type disc in a fixed cycle balanced force system, wherein applied forces to effect angular positioning movement from an old to a new position are brought into equilibrium with opposing spring forces without damping or overshoot comprising

means for applying positioning forces to effect angular positioning movement from an old to a new disc position according to the natural oscillation of the system about a selected reference position whereby the new position is reached at the maximum amplitude of the oscillation of the system about the reference position when angular velocity is zero,

and means for applying a force corresponding to the new position when the new position is reached to maintain the system at the new position.

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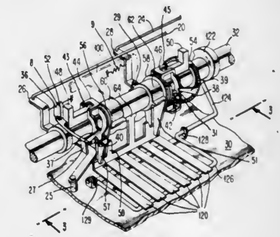
**4,297,041**

## VARIABLE CAM PROFILE SELECTION SYSTEM FOR SINGLE ELEMENT TYPEWRITER

**John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 2, 1979, Ser. No. 25,824**
**Int. Cl.³ B41J** *1/32*
**U.S. Cl. 400—161.4** **22 Claims**



1. A cam controlled selection apparatus, for a single element typewriter, for controlling at least one of two degrees of movement required for selecting a character on a single typing element, comprising:

a rotatable shaft,

a cam means mounted for rotating with said shaft and having a camming surface thereon;

cam follower means abutting said camming surface;

means for altering the angle of inclination of said camming surface upon axial displacement of said cam means;

means for selectively controlling the axial displacement of said cam means, thereby controlling the cam rise of said cam means; and

linkage means interposed between said cam follower means and said typing element for transmitting movement of said cam follower means to said typing element.

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**4,297,042**

## HELICAL PRINT HEAD MECHANISM

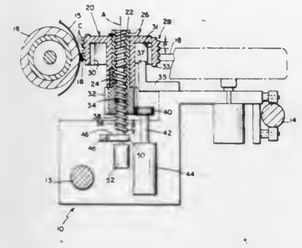
**An Wang, Lincoln, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.**

**Filed May 29, 1980, Ser. No. 154,385**
**Int. Cl.³ B41J** *1/40, 7/52*
**U.S. Cl. 400—163.2** **4 Claims**

1. An impact printer head mechanism for serially printing a line of characters on a print medium comprising

a generally cylindrical print head having its axis generally perpendicular to said print line

said print head having
a matrix of characters formed on its exterior surface parallel to said axis in a multi-turn helical row of predetermined pitch
a screw thread of said predetermined pitch and coaxial with said axis, and
a spline coaxial with said axis and axially spaced from said matrix
print head supporting means for supporting said print head for rotational and axial movement relative to said print medium, said print head supporting means having
a rotatably fixed screw thread coaxial with said axis and of



said predetermined pitch cooperating with said print head screw thread, and
print head drive means for simultaneously rotatably and axially moving said print head to position a desired character relative to said print line, including
gear means cooperating with said spline for rotating said print head,
the relative rotation of said screw threads of said print head and said supporting means producing simultaneous rotational and axial movement of said print head relatively to said print line, and
operating means for operating said mechanism to cause a selected character to be printed on said print medium.

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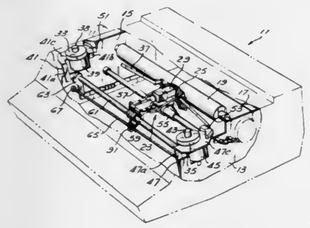
**4,297,043**
**IMPACT PRINTER INCLINED RIBBON SCANNER**
**Dayton O. Dargatz, Anaheim, Calif., assignor to Plessey Peripheral Systems, Irvine, Calif.**
**Filed Nov. 1, 1978, Ser. No. 956,737**
**Int. Cl.³ B41J** *33/56*
**U.S. Cl. 400—224** **8 Claims**



**1**. An impact printer comprising:
a frame;
guide means mounted on said frame, comprising: primary guide means; and secondary guide means obliquely disposed
with respect to said primary guide means;
a carriage supporting a print head, said carriage movably mounted on said guide means for reciprocation along a printing line;
a ribbon supported on said carriage; and
means in communication with said secondary guide means for adjusting the position of said ribbon relative to said print head so that said printing line is not parallel to the longitudinal axis of said ribbon.

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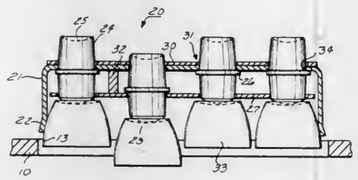
**4,297,044**
**ADDITIONAL ATTACHMENT FOR ALL TYPES OF KEY OPERATED MACHINES**
**Harald Hornberg, Berlin; Günter Trotzek, and Fedor Hahnefeld, both of Unterhaching, all of Fed. Rep. of Germany, assignors to H. Berthold Aktiengesellschaft, Fed. Rep. of Germany**
**Filed May 8, 1979, Ser. No. 37,045**
**Claims priority, application Fed. Rep. of Germany, May 8, 1978, 2820422**
**Int. Cl.³ B41J** *5/08*
**U.S. Cl. 400—473** **6 Claims**



**1**. Additional attachment for machines operated by a first set of keys disposed in a keyboard comprising:
a frame, said frame covering said keyboard;
said frame having the shape of a first plate, said first plate including a plurality of perforations, said perforations being aligned with said keys of said first set of keys in said keyboard, said first plate being a solid plate with side and edge areas, complementary to outer edges of said first set of keys, said side and edge areas abutting the outer edges of the rows of said first set of keys which form the boundaries of said keyboard, to vertically support the attachment solely by said abutment, said side and edge areas aligning said attachment with said first set of keys;
a second set of keys, said second set of keys being disposed in said perforations in said first plate;
and
a second plate disposed in a detachable manner on the surface of said first plate, said second plate including a plurality of perforations in agreement and conformity with said perforations in said first plate, said second plate carrying the symbols associated with each of said keys in said second set of keys.

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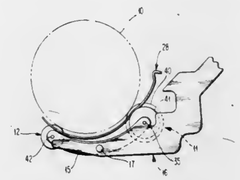
**4,297,045**
**PAPER FEED SYSTEM FOR A TYPEWRITER OR THE LIKE**
**Robert L. Burton, and Thomas P. Finan, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Sep. 21, 1979, Ser. No. 77,884**
**Int. Cl.³ B41J** *13/076, 13/048*
**U.S. Cl. 400—641** **17 Claims**

**1**. In a paper feed system for a typewriter or the like including:
a rotatable platen;
rear feed roller means engageable with said platen when no paper is therebetween so as to be rotatable with said platen when said platen rotates;
and front feed roller means engageable with said platen when no paper is therebetween so as to be rotatable with said platen when said platen rotates;
the improvement comprising:
said rear feed roller means including a plurality of rear feed rollers engageable with said platen when no paper



is therebetween so as to be rotatable with said platen when said platen rotates;
each of said rear feed rollers including an annular outer portion formed of a material sufficiently compressible when a plurality of sheets of paper with adjacent sheets having different coefficients of friction is simultaneously disposed between said platen and said rear feed rollers to have a portion of each of said rear feed rollers not having paper between said rear feed roller and said platen remain in engagement with said platen for driving of each of said rear feed rollers during rotation of said platen while another portion of each of said rear feed rollers has the sheets of paper between said rear feed roller and said platen until the rotation of said rear feed rollers advances the sheets of paper completely



between each of said rear feed rollers and said platen, the material of each of said rear feed rollers having a sufficiently high coefficient of friction with the material of said platen for each of said rear feed rollers to be driven by said platen and a sufficiently high coefficient of friction with the sheets of paper for each of said rear feed rollers to advance the sheets of paper in conjunction with said platen, and the material of each of said rear feed rollers being sufficiently hard to avoid treeing;
said rear feed roller means including support means for each of said annular outer portions;
each of said annular outer portions having its width substantially less than its diameter;
and each of said annular outer portions having its thickness equal to or less than its width.

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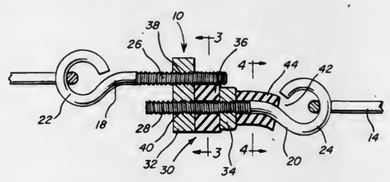
**4,297,046**
**TURNBUCKLE**
**Roy F. McGill, 538 W. Popular St., Gastonia, N.C. 28052**
**Filed Jan. 29, 1980, Ser. No. 117,644**
**Int. Cl.³ F16B** *7/06;* **F16G** *11/12*
**U.S. Cl. 403—46** **7 Claims**



**1**. A turnbuckle construction including a pair of first and second opposite end generally parallel and oppositely threaded shank members having adjacent and remote ends, center nut means defining a pair of oppositely threaded generally parallel bores formed therethrough in which said adjacent ends are threadedly engaged, the remote ends of said first and second shank members including first and second anchor means, respectively, for anchoring relative to associated tension members, said first anchor means including an open throat hook formed on the end of said first shank remote from and opening toward said second shank and with which a closed ring type anchor member may be engaged, said first shank including a throat closing member mounted on said first shank for movement therealong toward and away from position closing and opening said throat, said throat closing member being engageable by said nut means, upon threaded movement of the latter on said first shank toward said throat, to move said throat closing member into position closing said throat to prevent disengagement of said anchor member from said hook, said nut means including a first nut member in which said pair of oppositely threaded bores are formed in side-by-side relation and a second nut member threaded on one of said shank members, and an axially compressible and radially expandable friction member having a friction bore formed therethrough and disposed on said one shank member between said nuts for adjustable axial compression therebetween and radial inward expansion into frictional engagement with the portion of said one shank passing through said friction bore.

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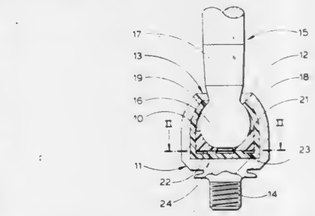
**4,297,047**
**BALL AND SOCKET JOINT**
**David J. R. Farrant, Radford Semele, England, assignor to Automotive Products Limited, Warwichshire, England**
**Filed Jun. 5, 1980, Ser. No. 156,801**
**Claims priority, application United Kingdom, Jun. 9, 1979, 20172/79**
**Int. Cl.³ F16C** *11/06*
**U.S. Cl. 403—138** **5 Claims**



**1**. A ball and socket assembly for the steering and suspension system of a motor vehicle and comprising:
a socket housing having a cavity defined therein;
a ball pin, the head of which is located in the cavity and the shank of which extends through the mouth of said cavity;
a resilient cup shaped lining located in the cavity and the mouth of which provides a bearing surface for the head of the pin adjacent the mouth of the cavity; and
a resilient end cap located in the base of the cup shaped lining to provide a bearing surface for the head of the pin in the base of the cavity, said end cap having a face thereon that is opposed to a co-operating face of the cup shaped lining, said opposed faces being spaced apart by resilient projections held in compression by the assembly of the joint.

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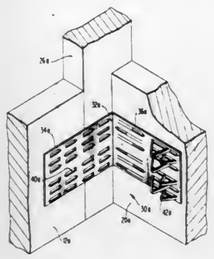
**4,297,048**
**FASTENERS FOR JOINING ANGULARLY RELATED WOODEN MEMBERS**
**John C. Jureit, Coral Gables, and Henry R. Greenley, Fort Lauderdale, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.**
**Continuation of Ser. No. 748,679, Dec. 8, 1976, abandoned. This application Mar. 23, 1979, Ser. No. 23,186**
**Int. Cl.³ F16B** *7/00*
**U.S. Cl. 403—189** **15 Claims**

**1**. A fastener for joining angularly related wooden members comprising: a flat sheet metal plate bent to provide first and second planar plate portions lying in respective first and second planes intersecting one another and forming an included angle; said plate being further bent to provide a third planar plate portion lying in a third plane intersecting said first and

second planes; a first group of elongated nail-like teeth struck from said one plate portion to project to one side thereof for embedment into one of the members; and a second group of elongated teeth struck from said second plate portion to project to one side thereof and leaving a plurality of elongated slots in said second plate portion, the teeth of said second group having angularly related shank and tip portions with said shank portions extending from said second plate portion to



form an included angle therewith, said tip portion extending from said shank portions in a direction toward said second plate portion and poised for insertion through the slots from which the teeth are struck for embedment into the other of the members; and a third group of teeth struck from said third plate portion to project to one side thereof for embedment into a third member and leaving a plurality of slots in said third plate portion.

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**4,297,049**

## DEVICE FOR ATTACHING TWO METAL SHEETS OR BLANKS TOGETHER

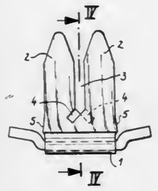
**Günter Smitka, Friedenstr. 9, 5868 Letmathe, Fed. Rep. of Germany**

**Filed May 4, 1979, Ser. No. 36,049**

**Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833801**

**Int. Cl.³ F16B *17/00***

**U.S. Cl. 403—403** **2 Claims**



1. A device for fastening to each other two metal sheets or blanks arranged approximately perpendicular to each other by means of a fastening clamp which has a head and a double-arm slit shank and the shank of which is passed through the one metal sheet so that the head lies at least indirectly on said sheet and the other sheet is clamped between the slots of the arms of the shank which are arranged parallel to each other, wherein the two arms forming the shank are at a distance apart which is greater than the thickness of the metal sheet which is to be clamped and is equal particularly to a multiple of said sheet thickness, the slot of each arm widening upwardly to bevels at the tops of the arms and extending approximately perpendicular to the head and being bent in the vicinity of the head, the width of the slot at the tops of the arms being about two-thirds the width of the slot at the start of the bend, the bend of the slot the two arms being arranged at approximately the same level and extending in opposite directions so that an interlocking of the sheet metal clamped into the slots is effected.

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**4,297,050**

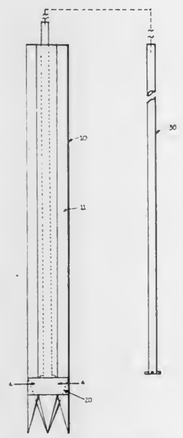
## HIGHWAY GUIDE POST

**John C. Gmelch, 242 Pleasant St., Wakefield, Mass. 01880**

**Filed Aug. 15, 1979, Ser. No. 66,807**

**Int. Cl.³ E01F *9/00***

**U.S. Cl. 404—10** **10 Claims**



6. In combination, apparatus characterized as a post to the lower portion of which is fitted a complimentary foot member for attaching and vertically positioning the post, via use of a rigid elongated member, within the soil for delineation of a section of highway, is capable of flexing in any direction, and then rebounding to substantially its original position which comprises:

a resilient, flexible tubular body of trapezoidal cross-section throughout its length, the four walls which adjoin to form the trapezoidal cross-section including parallel walls and adjoining non-parallel walls, one of the parallel walls forming the trapezoidal cross-section being of greater length than the other walls, and said tubular body is constituted of thermoplastic rubber characterized as an elastomeric blend of mono-olefin polymers with polyolefins which is partially cured while in admixture with a resin, and

a foot member of rigid material provided with an upper portion of cross-section corresponding substantially with, and to which said resilient, flexible thermoplastic rubber body is fitted, and retained, and a lower portion which is provided with vertically downwardly projection serrated edges, the edges being beveled, tapered and sharp for cutting into said soil within which said post is to be erected,

whereby said rigid elongated member can be passed through said resilient, flexible tubular thermoplastic rubber body for contact with said foot member, force being exerted on said elongate member to drive said foot member into the soil, and the elongated member thereafter withdrawn to leave the post in erected position.



**4,297,051**

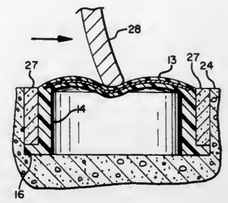
## DEFORMABLE HIGHWAY MARKER

**Jesse L. Robinson, P.O. Box 11544, Tahoe Paradise, Calif. 95708**

**Filed Jun. 1, 1979, Ser. No. 44,501**

**Int. Cl.³ E01F *9/04***

**U.S. Cl. 404—11** **12 Claims**



9. A deformable roadway marker installation, comprising;

a bore in the roadway pavement;

a flexible, reslient plastic skirt portion of a rounded shape, having substantially vertical walls, positioned in the bore below the surface of the roadway, with the top of the walls generally flush with the surface of the roadway;

a rounded dome-shaped deformable top of the same material, integrally molded with the skirt portion to form a unitary marker structure, said top being free of angled corners and sharp breaks, meeting the skirt portion walls at a peripheral edge generally flush with the roadway surface and extending above the roadway surface as a visible marker for traffic on the roadway, the top portion being of resilience and deformability such as to be readily deformable downwardly into the space encompassed by the skirt portion under the weight of a snowplow blade on the road; and

grout means retaining the roadway marker in position and sealing its interior such that air is substantially prevented from escaping the interior;

whereby the marker's top will deflect downwardly when struck by the blade of a snowplow and will quickly return to its original configuration, aided by the compression and re-expansion of the air in the interior.

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**4,297,052**

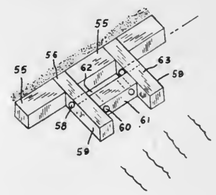
## BANK EROSION CONTROL UNITS

**William J. Rankin, 37811 Lake Shore Blvd., Willoughby, Ohio 44094**

**Continuation-in-part of Ser. No. 574,009, May 2, 1975, abandoned, and Ser. No. 755,499, Dec. 29, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,658**

**Int. Cl.³ E02B *3/06, 3/14***

**U.S. Cl. 405—16** **5 Claims**



1. Units for controlling erosion of a bank adjacent a body of water due to waves of the body of water striking the bank, which bank extends upwardly from a strand and which units are positioned generally parallel to the shoreline of the body of water, said units comprising a retaining wall means located on the strand and extending generally parallel to the shoreline for restricting material of the bank from progressing into the body of water, means defining a sand-gravel collecting area immediately adjacent said retaining wall means and on the side thereof facing the body of water, said means defining said sand-gravel collecting area comprising structure having surfaces which define a chamber open at the top for receiving water and sand and gravel therethrough and passages for directing water and sand and gravel into the sand-gravel collecting area and from the sand-gravel collecting area toward the shoreline and laterally of said retaining wall and generally parallel to the shoreline, said structure including means for breaking the waves before reaching said retaining wall means and said sand-gravel collecting area, said last-recited means comprising a plurality of wave breakers projecting toward said body of water and from said sand-gravel collecting area against which the waves impact, said wave breakers having respective surfaces facing said body of water and against which waves impact, said respective surfaces being spaced different distances from said retaining wall means.

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**4,297,053**

## GUTTERING

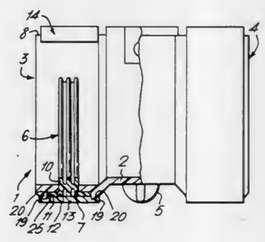
**Terry G. Nicholas, Berkshire, England, assignor to Wavin B.V., Zwolle, Netherlands**

**Filed Dec. 19, 1979, Ser. No. 105,401**

**Claims priority, application United Kingdom, Dec. 20, 1978, 49375/78**

**Int. Cl.³ E02B *9/04***

**U.S. Cl. 405—121** **13 Claims**



1. A gutter fitting comprising a body member defining a channel for receiving therein a gutter length, a sealing member extending through a slot in said body member, said sealing member having a sealing portion protruding inwardly of said channel for sealing against a gutter length therein in use and a retaining portion extending transversely of said slot and located within a passage defined between the body member and a retaining member extending over the outside of said body member to retain said sealing member in said fitting.

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**4,297,054**

## METHOD OF LAYING OFFSHORE PIPELINE FROM A REEL CARRYING VESSEL

**Dennis E. Yenzer, Norco; John H. Cha, Orange, and Dan Abramovich, Mission Viejo, all of Calif., assignors to Santa Fe International Corporation, Orange, Calif.**

**Filed Aug. 8, 1979, Ser. No. 64,826**

**Int. Cl.³ B63B *35/04*; F16L *1/00***

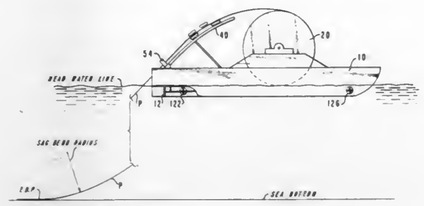
**U.S. Cl. 405—168** **15 Claims**

1. A method of laying pipe offshore from a self-propelled reel pipe laying vessel, said vessel having self-propulsion means, a reel for spooling relatively inflexible pipe thereon, pipe handling means for straightening the pipe as it is unspooled and for guiding the straightened pipe into the water at a presettable adjustable pipe exit angle, and means for maintaining the pipe under a predetermined adjustable tension, said method comprising the steps of:

setting the pipe handling means to establish a desired pipe exit angle at which the pipeline substantially enters its

catenary configuration before exiting the vessel and pipe handling means; and

setting the tensioning means to hold the pipe under a predetermined nominal tension in conjunction with the pipe exit



angle, to establish a minimum radius of curvature of the pipe in the sag bend region which is greater than the minimum radius to which that pipe may be bent without exceeding its elasticity limits as it is unspooled and paid out from the vessel.

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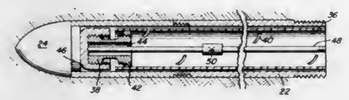
**4,297,055**

## METHOD OF INSTALLING UNDERGROUND PIPE

**Richard C. Peacock, 2726 Waiwai Loop, Honolulu, Hi. 96819**

**Filed Feb. 8, 1980, Ser. No. 119,826**
**Int. Cl.³ E03F *3/06***
**U.S. Cl. 405—184** **5 Claims**



1. A method of installing underground pipe comprising forming a horizontal or lateral hole underneath the ground surface by securing a jacking mechanism to one end of a hollow casing, securing a tapered power head at the opposite end of said casing and moving said jacking mechanism to move said power head and associated casing through the ground, providing an open ended flexible tubing, said tubing including an end cap covering one end thereof, inserting a push rod inside said tubing and in contact with said end cap, and after said power head and associated casing have been moved the desired distance pushing said tubing through said hollow casing by use of force applied to said push rod, said push rod contacting said end cap and pushing the tube through said casing without lateral or vertical displacement of said flexible tubing, and removing said push rod and said casing from said power head after said end cap reaches said power head.

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**4,297,056**

## METHOD AND H-PILE TIP FOR DRIVING PILES IN PERMAFROST

**Dennis Nottingham, 2610 Sorbus Cir., Anchorage, Ak. 99504**

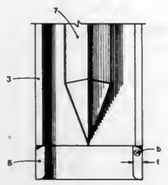
**Filed Aug. 3, 1979, Ser. No. 63,381**
**Int. Cl.³ E02D *5/74***
**U.S. Cl. 405—232** **5 Claims**

1. A method for driving piles in frozen soil comprising the following steps:

a. drilling a pilot hole along the desired pile alignment;

b. inserting water into the pilot hole at a temperature suitably above the freezing point of water; and

c. driving the pile through said pilot hole a predetermined period of time thereafter calculated to permit the transfer of a sufficient amount of heat from the water to the frozen



soil surrounding said pilot hole to reduce the resistance of the frozen soil to the driving of said pile.

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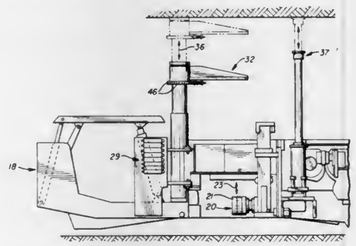
**4,297,057**

## PIVOTAL ROOF BOLTER AND EXTENDABLE ROTATABLE PROTECTIVE CANOPY FOR MINING MACHINE

**John C. O'Neil, deceased, late of Columbus, Ohio (by Jean M. O'Neil, executor), assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Dec. 26, 1978, Ser. No. 972,759**
**Int. Cl.³ E21D *19/04***
**U.S. Cl. 405—303** **5 Claims**



1. A pivotable protective canopy for an underground mining machine which has a work performing apparatus which is pivotable about a vertical axis in order to perform its work at different locations without moving the machine, which canopy is pivotable independent of but associable with the apparatus such that an operator can operate the apparatus while under protection of the canopy, comprising:

a vertically extensible support mast including a first tubular section affixed to the mining machine, and a second tubular section slidably engaged with the first section;

a fluid-pressure operated cylinder disposed interiorally of the tubular sections with one of its ends connected to the first section and its other end connected to the second section; and

a canopy shield pivotably mounted on the second tubular section and cantileveredly extending therefrom;

wherein the mast and cylinder are cooperatively operable to raise and lower the canopy shield with respect to the mine roof, and the sliding fit between the tubular mast sections is such that all the moment loads from the canopy shield are transferred through the mast sections to the mining machine, while the fluid cylinder incurs substantially only axial compressive load.

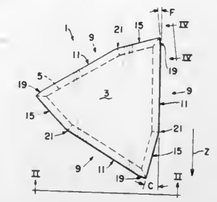


**4,297,058**

## INDEXABLE CUTTING INSERT

**William D. Armbrust, Greensburg, and James F. McCreery, Latrobe, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.**

**Filed Jun. 30, 1980, Ser. No. 164,808**
**Int. Cl.³ B26D *1/00***
**U.S. Cl. 407—113** **11 Claims**



1. An indexable polygonal cutting insert designed to be driven in a forward direction comprising: a top face; a bottom face; a peripheral wall joining said top and bottom faces; said peripheral wall having a plurality of groups of angularly related faces; said angularly related faces within one of said groups having a planar clearance face adjoining said bottom face and obliquely sloping upwardly and outwardly at an acute angle, A; a substantially vertical wiper face, inclined at an acute angle, B, to a vertical plane and having a height, X, interposed between and joining said clearance face to said top face; a planar lead clearance face joining and located forward of said clearance face and inclined at an oblique acute angle, C, forwardly and inwardly from said planar clearance face; said lead clearance face adjoining said bottom face and obliquely sloping upwardly and outwardly at an acute angle, D; a substantially vertical lead wiper face, inclined at an acute angle, E, to a vertical plane and having a height, Y, interposed between and joining said lead clearance face to said top face; said lead wiper face located forward of said wiper face and inclined at an oblique acute angle, C, forwardly and inwardly from said wiper face; a rear relief face joining and located to the rear of said wiper and said clearance faces and joining said top face; and said rear relief face sloping rearwardly and inwardly from said wiper face at an angle, F.

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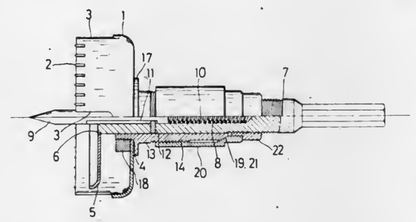
**4,297,059**

## APPARATUS FOR FORMING HOLES IN PLATE GLASS

**Masaaki Miyanaga, 5-15-109 Matsuhamacho, Ashiya, Hyogo, Japan**

**Division of Ser. No. 919,407, Jun. 26, 1978, Pat. No. 4,209,272.**
**This application Aug. 6, 1979, Ser. No. 64,133**
**Int. Cl.³ B23B *51/04***
**U.S. Cl. 408—202** **1 Claim**



1. A core drill for plate glass, comprising:

a driving spindle,

a slide member slidably surrounding said spindle and having an outer thread and a chuck part, a sleeve having an inner thread for engagement with said outer thread and adapted to compress said chuck part against said spindle so that said slide member is fixed to said spindle,

a cup-shaped blade fixed to said slide member and having cutting teeth at its forward end, said blade having an axial wall formed with at least one axial, forwardly open slot,

stopper means secured to said forward end of said spindle within said blade for preventing said blade from cutting beyond a predetermined depth,

said chuck part including an axially divided portion having and outer taper, and said sleeve having an inner taper for engagement with said outer taper, such that when said sleeve is turned relative to said slide member, said chuck part will be fixed to or released from said spindle.

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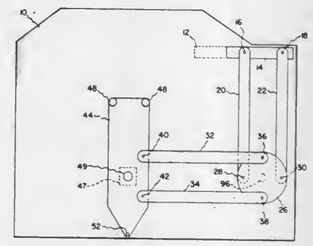
**4,297,060**

## ENGRAVING MACHINE

**Byron W. Ross, 5839 Avenal Ave., Oakland, Calif. 94605**

**Filed Nov. 1, 1979, Ser. No. 90,493**
**Int. Cl.³ B23C *3/00*; B43L *13/10***
**U.S. Cl. 409—86** **11 Claims**



1. A mechanism for duplicating an image which comprises:

a first generally planar surface having a slot therein;

an elongated slide disposed in said slot which is dimensioned and configured to engage said slot to allow movement thereof;

first and second elongated members each having one end pivotally carried on said elongated slide at respectively first and second points spaced a first distance;

a connecting member which is pivotally connected to the other end of said first and second elongated members at third and fourth points thereof, said third and fourth points being spaced said first distance apart;

third and fourth elongated members each having one end pivotally carried on said connecting member at respectively fifth and sixth points which are spaced said first distance apart;

a support pivotally engaging the other end of said third and fourth elongated members at respectively seventh and eighth points which are spaced said first distance;

means for producing an image on an associated member carried on said support; and

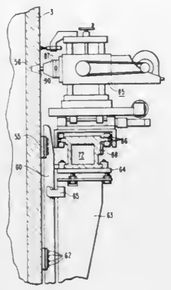
means for following an associated master image carried on said support, said means for following comprising an elongated pointed member which is axially spring biased toward the associated master and which is mounted to allow axial movement of said elongated pointed member toward and away from the associated master.

**4,297,061**

## STEAM GENERATOR SHELL PARTING METHOD AND APPARATUS

**Donald L. Wolfe, Hampton Township, Allegheny County, Pa.; Donald D. Modglin, Nashville, and George J. Merrick, Franklin, both of Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 10, 1978, Ser. No. 904,686**
**Int. Cl.³ B23C** *1/20, 3/02*
**U.S. Cl. 409—131** **4 Claims**



1. Method for effecting horizontal separation of the vertically-extending shell of a steam generator, comprising the steps of:

installing a plurality of hinged-section tension bands at vertical intervals around said shell,

adding vertically extending anchor members clamped to the bands and distributed circumferentially therearound,

hanging and locking track support brackets onto the anchor members,

assembling, locating, and securing a multiple-section rigidized circular track onto the support brackets, and

utilizing a milling machine assembly roller guided and supported by such track to cut through said cylindrical shell around its circumference.

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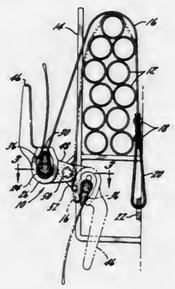
**4,297,062**

## CARGO SECURING APPARATUS

**Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182**

**Filed Feb. 14, 1980, Ser. No. 121,373**
**Int. Cl.³ B62D** *63/08*
**U.S. Cl. 410—37** **4 Claims**



1. A securing apparatus for use with extendable strap means having one of its ends fixed to a support structure and positionable about a cargo to be held, comprising, a generally U-shaped body adapted to be pivotally mounted for rotation about a fixed axis with respect to the support structure, said body defining an opening to receive a looped portion of the free end of said strap means, a shiftable wedge member captively mounted within the body for movement toward and away from said opening to frictionally bind the strap means with respect to said body, and handle means projecting from said body to pivotally rotate said body about said axis so that said strap means when looped about the wedge member through the body opening is pulled tightly to force said wedge member into binding position within said body opening.

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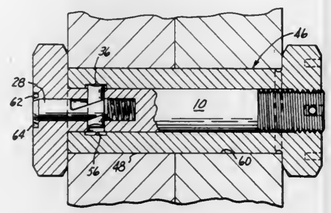
**4,297,063**

## TELESCOPING SELF-RETAINING SAFETY BOLT ASSEMBLY

**Dale H. Hart, Seal Beach, Calif., assignor to Hi Shear Corporation, Torrance, Calif.**

**Filed Jun. 11, 1979, Ser. No. 47,370**
**Int. Cl.³ F16B** *39/02*
**U.S. Cl. 411—199** **9 Claims**



1. A self-retaining safety bolt assembly comprising an element having a head, a cylindrical shank with an axis, and an outer cylindrical wall, the element having a first and a second end, an axial passage opening into one of said ends, and a laterally-extending passage in the cylindrical shank and intersecting the axial passage;

a dog in said laterally-extending passage slidably movable between an extended and a retracted position, whereby the dog extends beyond the maximum diameter of the cylindrical shank in the extended position and retracts entirely within said shank in the retracted position;

a cam member axially movable in said axial passage and reactive with said dog to retract or to extend the same;

said cylindrical shank having threads on one end;

biasing means biasing the cam member in a direction which forces the dog toward its extended position;

an element having a radially enlarged head and a tubular shank, said tubular shank having a cylindrical bore with an interior wall adapted closely to fit said outer cylindrical wall, said element having an internal thread;

said tubular shank having an interior groove in said interior wall being axially spaced from said threads in said last named element;

said tubular shank telescopically fitting over said cylindrical shank with the thread of said element engaging the threads on said cylindrical shank;

said dog being so disposed and arranged as to extend, when in its extended position, into said groove in at least one relative axial telescoped position of said elements, whereby to prevent separation of said elements unless said dog is retracted.

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**4,297,064**

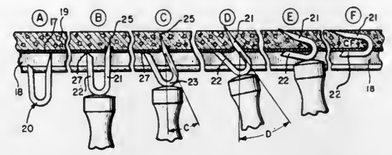
## STAPLE-NAIL FOR SECURING CEILING SUPPORT STRIP TO WALLBOARD

**Gene A. Berndtson, Rte. 2, Box 145, Barrington, Ill. 60010**

**Filed Jan. 4, 1980, Ser. No. 109,546**
**Int. Cl.³ F16B** *15/00*
**U.S. Cl. 411—470** **4 Claims**

1. As an article of manufacture, a staple-nail for nailing a thin strip of soft steel to a panel of wallboard comprising a length of relatively hard steel wire bent into "U" shape to form substantially straight long and short legs approximately parallel to one another joined by a bridging portion, the long leg having a length of substantially one and one-quarter to substantially one and five-eighths inch and which is approximately one-quarter inch to approximately three-eights of an inch longer than the short leg, the long leg being chamfered to an acute point, the short leg providing a tip which is chamfered on its inner surface to a less acute point so that when the staple-nail is hammered into the strip the long leg readily penetrates the strip





while the short leg resists penetration serving as a fulcrum for the long leg to impart broadwise swinging movement and the bridging portion being in the form of a unidirectional curve which merges smoothly with the straight legs to that as the long leg continues its penetrating movement is regionally compresses the wallboard in the direction of the strip until the short leg assumes a final position in which it lies flatly and snugly against the strip.

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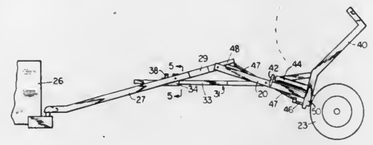
**4,297,065**

## SELF-LOADING APPARATUS FOR TRANSPORTING LARGE BALES OF MATERIAL

**Phillip W. Love, P.O. Box 323, Smithville, Tenn. 37166**

**Filed Apr. 16, 1980, Ser. No. 140,769**
**Int. Cl.³ A01D** *90/02;* **B60P** *1/08*
**U.S. Cl. 414—24.5** **3 Claims**



1. Apparatus for picking up and transporting a large bale of material, such as a bale of hay, comprising:

a main frame;

wheel means supporting the main frame through a first pivot axis transverse to the main frame at the rear end portion of the main frame;

braking means for braking the wheels relative to the main frame;

a hitch frame having one end pivotally connected to the front end portion of the main frame, with the other end of the hitch frame adapted to be connected to a tow vehicle, so that when the braking means are activated and the tow vehicle is backed up, the front end portion of the main frame swings upwardly, and when the braking means are activated and the tow vehicle moves forward, the front end portion of the main frame swings back downwardly;

a pair of load engaging and clamping swing arm members pivotally attached to the respective sides of the main frame, each swing arm member being adapted to pivot about an axis substantially parallel to the corresponding side of said main frame to which it is attached; and

means associated with the main frame and hitch frame for pivotally moving the outward ends of the swing arms away from each other when the forward end of the main frame is swung upwardly and, conversely for pivotally moving the outward ends of the swing arms toward each other when the forward end of the main frame moves back downwardly, p1 whereby a bale of material is picked up for transportation by raising the front end portion of the main frame member and positioning the apparatus adjacent to the bale so that the swing arms extend outwardly adjacent opposite ends of the bale of material, applying the braking means, and moving towing vehicle forward to simultaneously lower the front end portion of the main frame and pivotally move the swing arms into engagement with the ends of the bale of material, whereupon the bale is engaged, lifted up, and supported by the swing arms.

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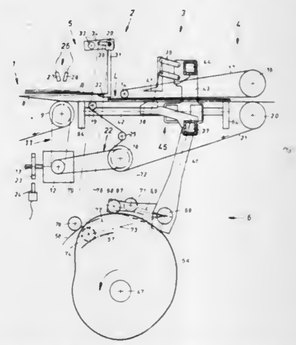
**4,297,066**

## PAPER SHEET LAYER FORMING AND TRANSFERRING ARRANGEMENT

**Bernd Ramcke, Hamburg; Karl-Heinz Schlottke, Tangstedt; Eckhard Brandt, and Klaus Reissmann, both of Hamburg, all of Fed. Rep. of Germany, assignors to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany**

**Filed Aug. 13, 1979, Ser. No. 65,874**
**Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835416**
**Int. Cl.³ B65H** *31/30, 31/32*
**U.S. Cl. 414—43** **8 Claims**



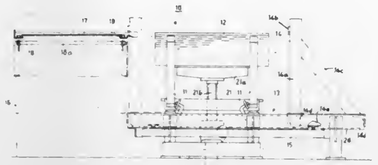
1. An arrangement for forming successive layers of sheets of paper and the like from a stream of individual sheets supplied in succession to a collecting location by a supply conveyor, and for transferring the formed layers to a continuously advancing discharge conveyor, comprising abutment means arranged at the collecting location and movable between a first position in which it extends into, and a second position in which it is spaced from, the stream of the sheets; clamping means including jaws movable together and apart and mounted for movement between the collecting location and the discharge conveyor; and means for moving said abutment means and said clamping means in coordination with one another, including a mechanical transmission interposed between said abutment means and said clamping means, an electric motor kinematically separated from the supply and discharge conveyors and operating said mechanical transmission, and means for controlling the speed of operation of said motor, said controlling means comprising means for effecting acceleration including adjustable counting means, means for effecting deceleration including a first sensor operative to sense a certain position of said clamping means, means for effecting stoppage including a second sensor operative to sense a predetermined initial position of said clamping means, and means for limiting the rotational speed including a signal generator operative to sense the speed of advancement of at least one of said conveyors.

**4,297,067**

## METHOD AND APPARATUS FOR HANDLING PACKED LAYERS OF SUPPORT RODS IN AN ELECTROLYTIC REFINING PLANT

**Leo Uusitalo, Tampere, and Pertti Tuominen, Kaaro, both of Finland, assignors to Outokumpu Oy, Finland**

**Filed Jan. 14, 1980, Ser. No. 111,713**
**Int. Cl.³ B65G** *59/02*
**U.S. Cl. 414—114** **9 Claims**



4. Apparatus for handling a plurality of groups of support rods which have been stacked in layers within a transporting and storage crate in an electrolytic refining plant comprising:

transferring means including a pusher member for pushing the uppermost group of supporting rods of the plurality of stacked layers thereof in a longitudinal direction onto a platform located above the seed plate machine;

a platform located above a seed plate machine adjacent the transferring means adapted to receive the group of support rods pushed by the pusher member of the transferring means;

transporting means for moving the support rod group which has been moved onto the platform onto a rod distribution magazine; and

lifting means for lifting the remaining groups of support rods upwardly until the height of the new uppermost group of support rods in the transporting and storage crate is at the same height as the initially uppermost group of support rods.

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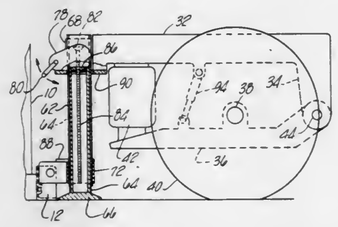
**4,297,068**

## CARGO CONTAINER TRANSPORTER

**Edward Concha, Santa Barbara; Max Jaffe, Pacific Palisades, and Riley Bedford, Torrance, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Sep. 21, 1979, Ser. No. 77,862**
**Int. Cl.³ B60P** *3/40*
**U.S. Cl. 414—458** **1 Claim**



1. A wheeled transporter attachable to one end of a cargo container, said transporter comprising a frame (**32**) have a leading end and a trailing end; said frame having a depending section (**34**) adjacent its leading end; a pair of trailing arms (**36**) swingably connected to the lower end of the frame depending section for movement in vertical planes; a ground-engaged wheel having an axle mounted at an intermediate point on each trailing arm; resilient spring means (**42**) trained between the frame and the rear end of each trailing arm to yieldably resist movement of the wheel in an upward direction relative to the frame; two laterally spaced landing leg mechanisms carried on the frame at corner areas thereof in close adjacency to the cargo container; each landing leg mechanism including inner and outer telescoped tubes bodily adjustable as a unit between a retracted position spaced above ground level and an extended position engaged with the ground, a container lift bracket (**72**) carried by each outer tube at its lower end for connection with a lower corner area of the container, a nut carried on the upper end of each inner tube, a vertical screw carried by each outer tube in meshed engagement with the nut, and means (**78**) carried by each outer tube for rotating the associated screw to produce upward motion of the outer tube and associated lift action on the container when the leg mechanism is in its extended position; each container lift bracket being located to have a lifting line of action in the immediate vicinity of the associated landing leg mechanism whereby the landing leg mechanism effectively absorbs the container load.

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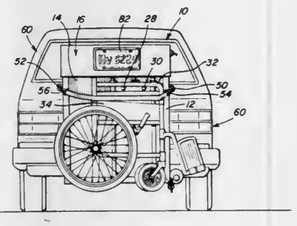
**4,297,069**

## CHAIR CARRIER

**Byron C. Worthington, P.O. Box 434, Gainesville, Fla. 32602**

**Filed Jan. 2, 1980, Ser. No. 109,690**
**Int. Cl.³ B60R** *9/06*
**U.S. Cl. 414—462** **7 Claims**



1. A wheeled vehicle carrier for motor vehicles comprising: a framework, at least one vertical slide rail attached to said framework; a slide disposed on and movable along said one slide rail; mounting means attached to said slide for mounting a wheeled vehicle thereon; power means for causing powered motion of said slide along said one slide rail; and further including a hood disposed atop said frame and extending outwardly therefrom to cover a portion of said slide and cover a portion of a wheeled vehicle mounted upon said slide in a carrying position, said hood being spaced from said mounting means so as to inhibit the removal of a mounted wheeled vehicle from said mounting means when said slide has moved the wheeled vehicle in a vertical position adjacent said hood.

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**4,297,070**

## APPARATUS FOR AUTOMATICALLY DEPOSITING A LOAD IN A PREDETERMINED POSITION

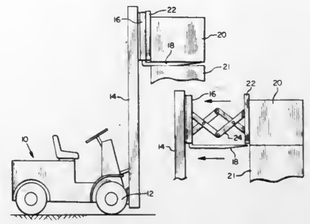
**Stuart R. Didtel, Gresham, Oreg., assignor to Cascade Corporation, Portland, Oreg.**

**Filed Dec. 31, 1979, Ser. No. 108,802**
**Int. Cl.³ B66F** *9/075*
**U.S. Cl. 414—497** **32 Claims**

14. In a lift truck having a prime mover for selectively driving said lift truck rearwardly, a load-carrying member extending forwardly from said lift truck, a selectively extensible and retractable push frame mounted on said lift truck for pushing a load from said load-carrying member in a direction forwardly of said lift truck by extension of said push frame with respect to said lift truck and selectively actuated push frame power means connected to said push frame for extending said push frame at a speed of extension with respect to said lift truck, the



improvement which comprises synchronizing means connecting said prime mover responsively to said push frame power



means for actuating said prime mover to drive said lift truck rearwardly in response to actuation of said push frame power means to extend said push frame.

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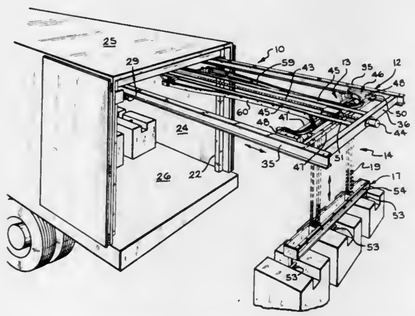
**4,297,071**

## WEIGHT TRANSFER APPARATUS

**Glenn G. Dunbar, 2608 Overbrook Dr., Toledo, Ohio 43614**

**Filed Oct. 1, 1979, Ser. No. 81,026**
**Int. Cl.³ B60P** *1/00*
**U.S. Cl. 414—542** **18 Claims**



1. A weight handling vehicle having a rear cargo compartment, said cargo compartment having a bed and opposed sidewalls, frame means positioned adjacent said sidewalls, said frame means including a plurality of ribs positioned adjacent said opposed sidewalls and opposed parallel tracks positioned on the end of said ribs spaced apart from said bed, a telescoping carriage means moveably positioned on said tracks of said frame means, carriage rollers positioned on said carriage means to engage said opposed tracks, a drive means operatively connected to said frame means and said carriage means, said drive means acting to move said carriage means, a first guide means connected to said carriage means to maintain said carriage means in alignment with said tracks, a trolley means moveably mounted on said telescoping carriage means, said trolley means being movable from a first position adjacent the front of the rear cargo compartment to a second position exterior of and spaced from the rearward end of said cargo compartment, a second drive means operatively connected to said carriage means and said trolley means, said second drive means acting to move said trolley means, a second guide means connected to said trolley means to maintain said trolley in alignment with said carriage means, and a vertical lifting means mounted on said trolley means for lifting one or more weight units.

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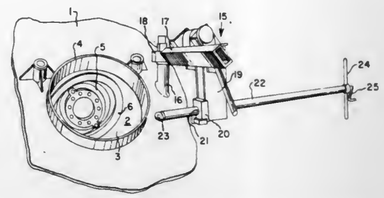
**4,297,072**

## MANWAY HANDLING APPARATUS

**Siddharth A. Shah, South Portland; Sidney J. Woodcock, Scarborough, and Robert D. Fagan, Cape Elizabeth, all of Me., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 10, 1979, Ser. No. 83,280**
**Int. Cl.³ B66C** *23/06*
**U.S. Cl. 414—684.3** **11 Claims**



1. Apparatus for handling elliptical manway covers and the like for sealable tanks and shells and located interior thereof comprising:

(a) a support arm;

(b) means for pivotally mounting one end of said support arm on the exterior of the tank or shell adjacent a manway opening therein adapted to receive an internal cover and whereby said arm may be swung horizontally inwardly inboard of said opening;

(c) a shaft slidably movable and rotatable along its longitudinal axis, and lineary adjustable vertically and horizontally relative to said support arm;

(d) means for pivotally coupling one end of said shaft to the center of a cover interior of said opening;

(e) means for actuating said shaft linearly for inserting said cover into and removing said cover from said opening by motion inwardly of said opening; and

(f) means for rotating said shaft to enable rotation of said cover about the axis of said shaft interior of said opening during insertion and removal operations.

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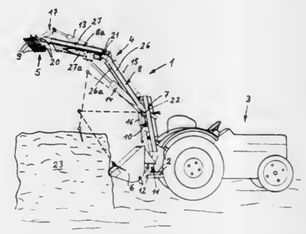
**4,297,073**

## METHOD AND APPARATUS FOR WITHDRAWING AGRICULTURAL MATERIALS FROM STORAGE

**Franz Schmid, Bergstr. 5, and Reinhard Schmid, Vordertal 2, both of D-7612 Fischerbach, Fed. Rep. of Germany**

**Filed Jul. 3, 1979, Ser. No. 54,616**
**Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830068**
**Int. Cl.³ B65G** *65/04;* **A01F** *25/20*
**U.S. Cl. 414—704** **16 Claims**



2. Apparatus for withdrawing pressed agricultural material from a pile of such material, comprising vehicle-mounted supporting means; a mobile material engaging tool having a predetermined width; an arm for said engaging tool, said arm having a first portion articulately connected with said support-

ing means and a second portion articulately connected with said first portion and said tool; means for moving said engaging tool relative to said arm and for moving said portions relative to each other as well as relative to said supporting means so that said tool can be caused to penetrate into the pile of pressed material from above to separate a quantity of material from the pile while leaving the consistency of the remainder of the material of the pile at least substantially unchanged; and a vehicle-mounted receptacle pivotable between a plurality of positions and having an opening whose width at least equals said predetermined width, said receptacle being located in the path of movement of said tool so that the latter can enter the receptacle while advancing the separated quantity of material away from the remainder of the pile, said first portion of said arm being moveable independently of said receptacle.

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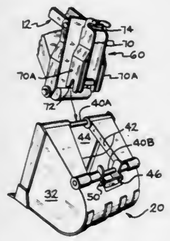
**4,297,074**
**DEMOUNTABLE INTERCONNECTION**
**Paul V. Ballinger, 7630 Westwood, Findlay, Ohio 45840**
**Filed Jan. 7, 1980, Ser. No. 110,238**
**Int. Cl.³ E02F** *3/81*
**U.S. Cl. 414—723** **15 Claims**




1. Apparatus for use with material handling equipment comprising, in combination, a first engageable member for securement to an implement and a second engageable member for securement to said implement, said first and said second members generally defining parallel radially spaced-apart axes, a locking structure rotatably disposed about one of said members and moveable between a first, unlocked position and a second, locked position, and a carriage adapted for securement to a boom of a material handler, said carriage defining at least one first slot for engaging said first member and at least one second slot for engaging said second member, and means for selectively maintaining said locking structure in said second, locked position.

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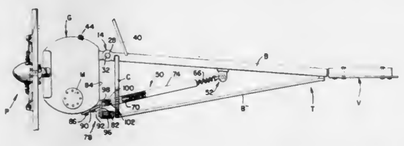
**4,297,075**
**AUTOMATIC STORM PROTECTION CONTROL FOR WIND ENERGY SYSTEM**
**Marcellus L. Jacobs, and Paul R. Jacobs, both of Rte. 13 - Box 722, Fort Myers, Fla. 33908**
**Filed May 14, 1979, Ser. No. 38,885**
**Int. Cl.³ F03D** *7/04*
**U.S. Cl. 416—14** **7 Claims**



1. A means for protecting a wind energy plant against damage thereto caused in high winds comprising:
a propeller assembly pivotally mounted on a wind energy plant support means;
a hypoid gear drive means mounting said propeller assembly on said support means, said gear drive means offsetting the pivot axis of said propeller assembly from the center of that propeller assembly;
a generator driven by said propeller assembly;
a variable pitch speed control governor on said propeller assembly for changing the pitch of propellers of said propeller assembly in response to wind velocity generated pressure against those propellers in a manner such that propeller speed is independent of any electrical load on said generator, said governor controlling propeller speed until the propellers of said propeller assembly reach maximum speed and feather, means for keeping said propellers facing directly into the wind over the entire power producing range of wind speed until said propellers feather;
pivot means pivotally connecting said propeller assembly to a tail assembly of a wind energy plant, said pivot means including pivot control means for actuating said pivot means after said propellers have feathered so that said propeller assembly will pivot with respect to said tail assembly and said plant support means under the influence of wind pressure exerted on said propeller assembly because of the combination of the hypoid gear drive propeller axis offset and the increased wind pressure created against the feathered propellers when the pitch angle of such propellers is no longer changed by the action of said variable pitch speed control governor; and
said pivot control means further including a snubber assembly connected to said propeller assembly for controlling movement of said propeller assembly during a return movement of said assembly from a pivoted position back to a normal operating position, said snubber further including means for bypassing the control of said propeller assembly during movement of said propeller assembly from a normal operating position to said pivoted position.

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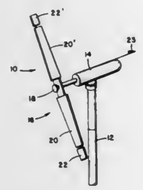
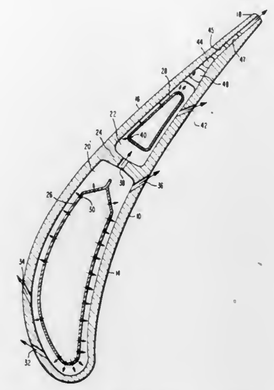
**4,297,076**
**WIND TURBINE**
**Robert E. Donham, Sherman Oaks, and Richard L. Heimbold, Glendale, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.**
**Filed Jun. 8, 1979, Ser. No. 46,771**
**Int. Cl.³ F03D** *7/04*
**U.S. Cl. 416—37** **13 Claims**




1. A wind turbine comprising:
a rotor, said rotor including a plurality of blades, the tip portions of said blades being variable in pitch and adapted to aerodynamically interact with the wind;
support means for supporting said rotor;
load measurement means coupled to said blades for measuring the bending moment on said blades and for providing an output signal representative thereof; and
adjustment means coupled to said load measurement means for varying the pitch of said tip portions in response to said output signal.



**4,297,077**
**COOLED TURBINE VANE**
**George A. Durgin, Schenectady, and Daniel E. Demers, Melrose, both of Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**
**Filed Jul. 9, 1979, Ser. No. 55,833**
**Int. Cl.³ F01D** *5/08*
**U.S. Cl. 416—97 R** **8 Claims**



1. A turbine vane having an airfoil portion providing a leading edge, a suction side, a pressure side and a trailing edge, and wherein said airfoil portion is generally hollow to define an internal chamber to receive cooling air, a slit from said internal chamber through said trailing edge generally throughout the radial extent of said airfoil portions, and wherein the opposed internal walls defining said slit converge from generally a broad inlet area adjacent said chamber to a relatively narrow passage downstream thereof, a plurality of radial rows of pin-like members extending transversely across said slit and integral with the opposed walls defining said slit, and wherein the members of each row are radially offset with respect to the members of any adjacent row to intercept the cooling air flowing through said slit at different levels, a hollow insert disposed within said chamber for initially receiving at least a portion of the cooling air entering said chamber, said insert having a wall member generally adjacent said slit inlet area and apertures in said insert wall for directing cooling air exiting therethrough primarily in a direction to impinge on a selected plurality of junctures of said members and at least one wall of said slit to provide sufficient velocity in said cooling air to cause said juncture to induce turbulence in said cooling air as it flows adjacent said wall and downstream of said juncture to effectively cool said vane.

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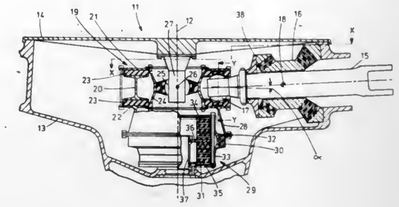
**4,297,078**
**HELICOPTER ROTORS**
**Alfred C. Martin, Shepton Mallet, England, assignor to Westland Aircraft Limited, Yeovil, England**
**Filed May 9, 1979, Ser. No. 39,492**
**Claims priority, application United Kingdom, May 17, 1978, 20226/78**
**Int. Cl.³ B64C** *27/38*
**U.S. Cl. 416—134 A** **25 Claims**

1. A helicopter rotor including a rotor head arranged to support a plurality of rotor blades for rotation about a generally vertical axis, said rotor head including, for each rotor blade, an elastomeric bearing having a geometric center and arranged to permit flap, lead/lag and feathering movements of its associated rotor blade, a lead/lag damper, and resilient support means axially spaced apart from said bearing geometric center and arranged during operation to provide controlled restraint of blade flap movements.



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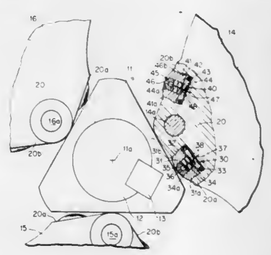
**4,297,079**
**VARIABLE PITCH MARINE PROPELLER**
**Don J. Marshall, Churchton, Md., assignor to Goodall SemiMetallic Hose & Mfg. Co., Chestertown, Md.**
**Filed Jul. 14, 1980, Ser. No. 168,034**
**Int. Cl.³ B63H** *1/22*
**U.S. Cl. 416—140** **10 Claims**



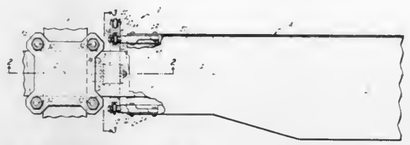
1. A variable pitch marine propeller comprising:
a hub having a central axis of rotation for coaxial mounting on a rotatable shaft;
a plurality of circumferentially spaced apart blades pivotally mounted on axles on said hub through the root portion of said blades to permit independent movement of each of said blades about an axis of rotation substantially parallel to the axis of said hub between a first nested position adjacent said hub and a second extended position;
each of said blades including leading and trailing segments in said root portion of said blades which are hub engageable depending upon the direction of initial rotation of said blades;
cushioning means having at least a portion thereof intermediate said leading and trailing segments of said blades and said hub and mounted in one of said blades and hub for inhibiting the shock of engagement of said blades and said hub;
said cushioning means including water entrance and exit means and means to capture water therein to act as a shock absorber for said blades and hub upon commencement of rotation of said hub.

**4,297,080**

## ROTOR BLADE PITCH CONTROL LINKAGE

**Timothy A. Krauss, Sandy Hook, and Stephan Roman, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 17, 1979, Ser. No. 104,605**
**Int. Cl.³ B64C *27/38***
**U.S. Cl. 416—141** **6 Claims**



1. A helicopter rotor having:
(A) a hub mounted for rotation about an axis,
(B) at least one blade extending radially from said hub and supported therefrom for rotation therewith and including:
(1) a radially extending flexible spar member connected to the hub to be rotatable therewith,
(2) an airfoil section supported from the spar for rotation therewith, and including:
(a) a torque tube enveloping the flexible spar and connected thereto at a radial station therealong and extending inwardly from said radial station to form the inner end of the airfoil sections
(C) pitch control and support means connected to the inner end of the torque tube and forming a parallelogram therewith including:
(1) a bell crank pivotally connected to the hub, and
(2) two side link members of equal length connecting opposite ends of the bell crank to the torque tube to thereby form a substantially vertically oriented parallelogram linkage among said bell crank, side links, and torque tube.

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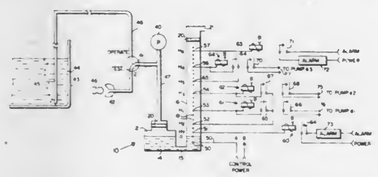
**4,297,081**

## LIQUID LEVEL CONTROL SYSTEM

**William A. Irvin, 2384 Corbett St., Jacksonville, Fla. 32204**

**Filed Nov. 5, 1979, Ser. No. 91,102**
**Int. Cl.³ F04B *41/06, 49/00***
**U.S. Cl. 417—2** **16 Claims**



1. In a system for controlling the level of a liquid in a reservoir, said system having motor driven pumps for filling and emptying the reservoir, the pump control subsystem comprising:
an air pressure line having one end thereof disposed in said liquid;
air pump means for producing pressure in said air pressure line in which said pressure is proportional to the level of said liquid;
a mercury manometer utilizing a U-tube and having a pressure input to a first vertical mercury column connected to said air line and an outlet for a second vertical mercury column open to atmospheric pressure;
a common electrical contact disposed at the base of said U-tube and in conductive contact with said mercury columns;
a plurality of electrical pump-up control contacts disposed along said vertical mercury column below the zero pressure level of said mercury, said contacts adapted to be sequentially contacted as said mercury column rises in response to drops in said pressure and to thereby provide a conductive path from said column contact to each pump-up control contact contacted;
a plurality of electrical pump-down control contacts disposed along said second vertical mercury column above the zero pressure level of said mercury, said contacts to be sequentially contacted as said second mercury column rises in response to increases in said pressure and to thereby provide a conductive path from said common contact to each pump-down control contact contacted; and
pump motor control means connected to selected ones of said pump-up and pump-down control contacts for providing a pump starting function when said mercury columns make contact with specific ones of said control contacts and a pump stopping function when said mercury columns breaks contact with other ones of said control contacts; and
subsystem test means connected to said pump and said input to said first vertical mercury column for controlling said pressure to vary from a zero value to a predetermined maximum value to thereby cause said first mercury column to fall and said second mercury column to rise and to therefore sequentially contact each of said control contacts for testing of said pump starting and said pump stopping functions.

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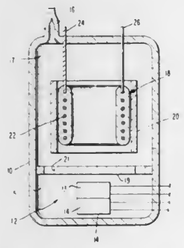
**4,297,082**

## VACUUM GETTERING ARRANGEMENT

**Howard P. Wurtz, and Eugene W. Peterson, both of Santa Barbara, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Nov. 21, 1979, Ser. No. 96,583**
**Int. Cl.³ F04B *37/02***
**U.S. Cl. 417—51** **19 Claims**



1. A vacuum gettering system comprising:
a first getter, said first getter being a bulk getter;
a second getter, said second getter being a bulk getter;
a vacuum enclosure enclosing both said first and second getters in communication with each other; and
means for heating both said first and second getters so that when gas is pumped from said vacuum enclosure, said second getter can be heated to an activation temperature to drive off adsorbed gases on said second getter to activate said second getter without high temperature baking of the entire vacuum enclosure.

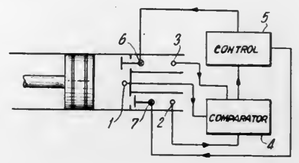


**4,297,083**

## POSITIVE CONTROL SYSTEM FOR PISTON COMPRESSOR VALVES

**Curt von Petery, Denkendorf, Fed. Rep. of Germany, assignor to Gutehoffnungshütte Sterkrade A.G., Oberhausen, Fed. Rep. of Germany**

**Filed Nov. 7, 1979, Ser. No. 91,951**
**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849048**
**Int. Cl.³ F04B *39/08***
**U.S. Cl. 417—53** **2 Claims**




1. Positive control system for opening and closing piston compressor valves comprising a piston compressor including a cylinder forming a suction-compression space, a piston reciprocally mounted in said space for alternately effecting a suction stroke and a compression stroke, a suction line for supplying gas into said space, a delivery line for conveying gas out of said space, a suction valve in said suction line, and a delivery valve in said delivery line, wherein the improvement comprises a rated value comparator unit, a first pressure sensor located in said space and connected to said comparator unit, a second pressure sensor located in said delivery line and separated from said space by said delivery valve, said second pressure sensor being connectible to said comparator unit during the compression stroke of said piston, a third pressure sensor located in said suction line and separated from said space by said suction valve, said third pressure sensor being connectible to said comparator unit during the suction stroke of said piston, a control unit, a conduit connecting said comparator unit and said control unit, a first control line extending between said control unit and said delivery valve, a second control line extending between said control unit and said suction valve, so that during the suction stroke said first and third pressure sensors convey signals to said comparator unit and based on the differential in pressure sensed and rated differential value said comparator unit conveys a signal to said control unit for selectively opening said suction valve when the differential pressure is equal or approximately equal to zero and for selectively closing said suction valve when the differential pressure varies by a specific value, and during the delivery stroke said first and second pressure sensors convey signals to said comparator unit and based on the differential in pressure sensed and a rated differential value said comparator unit conveys a signal to said control unit for selectively opening said delivery valve when the differential pressure is equal or approximately equal to zero and for selectively closing said delivery valve when the differential pressure varies by a specific value.

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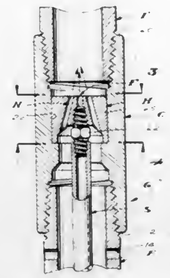
**4,297,084**

## GAS ANCHOR

**Newell E. Wayt, 2272 Dominguez St., Torrance, Calif. 90501**

**Filed Dec. 10, 1979, Ser. No. 101,624**
**Int. Cl.³ F04F *5/46***
**U.S. Cl. 417—179** **5 Claims**

1. A gas anchor comprising an elongate vertical coupling with means at its upper end to connect with the lower end of a production tubing, an elongate vertical pipe with an upper end connected with the lower end of the coupling, said pipe having an upper perforated portion to allow for the flow of gas and liquid radially into and out of the pipe and having a closed lower end defining a liquid catch basin below said upper perforated portion, aspirator means within the coupling including an upwardly opening central liquid conducting means and gas jet nozzle means about the central liquid conducting means and communicating with the pipe below the coupling and directing gas longitudinally upwardly and radially inwardly to converge



above the liquid conducting means in aspiratory relationship therewith and an elongate vertical liquid conducting stinger with an upper end communicating with said liquid conducting means and a lower end communicating with said catch basin.

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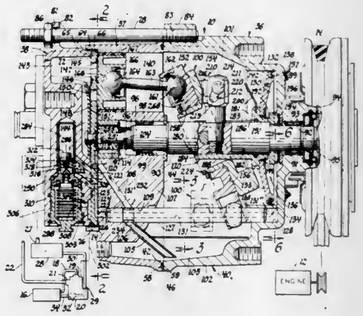
**4,297,085**

## GUIDE MECHANISM FOR COMPRESSOR SOCKET PLATE

**Byron L. Brucken, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 31, 1979, Ser. No. 89,996**
**Int. Cl.³ F04B *1/28***
**U.S. Cl. 417—222** **3 Claims**



1. In a variable stroke wobble plate type compressor having a cylinder block, a drive shaft rotatable in said cylinder block a plurality of cylinder bores in said block substantially parallel to the axis of said shaft, pistons arranged to reciprocate in said cylinder bores, a journal plate operated in response to rotation of said drive shaft and drivingly connected to said pistons, the connection of said journal plate to said pistons including a socket (wobble) plate is relatively slidable interface relation with said journal plate, and means for varying the angle of the journal plate relative to said drive shaft and thus the stroke of the pistons in their bores, the improvement comprising a longitudinally extending guide rod supported in a common plane with said drive shaft, said socket plate provided with a radially extending slot of predetermined size receiving said guide rod therethrough for longitudinal and arcuate travel of said socket plate along said rod as a result of said journal plate movement, said slot having semi-cylindrical radially extending guides on opposing surfaces thereof, a bearing body having a central passage through which said rod extends with said central

passage being defined by an inner surface which conforms to and slidably engages the outer surface of said rod, said bearing body having a convex spherical portion thereon, a pair of semi-cylindrical shaped guide shoe members positioned in said slot on opposite sides of said bearing body, each of said guide shoe members configured to conform with its associated guide for radial sliding contact therewith spread over a substantial area, each of said guide shoe members having a concave semi-spherical recess facing each other for receiving and relatively slidably retaining said bearing body convex spherical portion therebetween for relative swiveling movement with a substantial contact area, each of said guide shoe members at each end of said concave semi-spherical recess having a portion substantially slidably bearing on said guide rod to maintain the guide shoe members in substantially parallel planes, whereby said guide shoe members reciprocate radially in their associated guides and reciprocate longitudinally along said rod together with said bearing body retained by said guide shoe members in relative swiveling relationship during the operation of said journal plate in response to rotation of said drive shaft.

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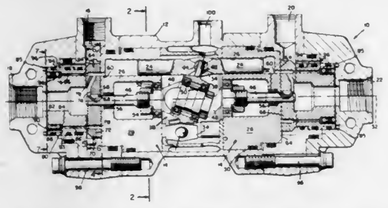
**4,297,086**

## FLUID MOTOR-PUMP UNIT

**Peter T. McGowan, Fort Lauderdale, Fla., assignor to The Garrett Corporation, Los Angeles, Calif.**

**Filed Feb. 16, 1979, Ser. No. 12,913**
**Int. Cl.³ F04B** *1/16, 17/00;* **F01L** *33/02*
**U.S. Cl. 417—271** **22 Claims**



1. A fluid motor-pump assembly for transferring power between first and second hydraulic fluid systems, comprising a housing having first high and low pressure ports coupled to said first hydraulic fluid system and second high and low pressure ports coupled to said second hydraulic fluid system; a first motor-pump unit for moving fluid from said first high pressure port to said first low pressure port, and a second motor-pump unit driven by said first motor-pump unit for pumping fluid from said second low pressure port to said second high pressure port, said first and second motor-pump units each comprising a cylinder block rotatably fixed within said housing having a plurality of axially extending cylinders formed therein each receiving a reciprocal piston and including a cylinder block port for communication with the associated high and low pressure ports, a central rotatable shaft within said housing with said cylinders circumferentially arranged with respect thereto, means coupled between said shaft and said pistons for converting between rotational and reciprocal motion, a valve plate rotatable with the shaft in running alignment with said cylinder block and between the associated high and low pressure ports, said valve plate including valve ports for sequentially communicating said cyclinder block ports respectively with the associated high and low pressure ports upon shaft rotation, and a pressure-balancing member rotatably fixed within said housing in running alignment with said valve plate opposite said cylinder block and including a plurality of means generally aligned axially with respective ones of said cylinder block ports and each responsive to fluid pressure at its associated cylinder block port for urging said member axially against said valve plate for dynamically pressure-balancing axial forces applied to said valve plate regardless of the position of valve plate rotation, said plurality of means of each of said first and second motor-pump units includes a plurality of circumferentially arranged, generally axially extending fluid passages formed in said pressure-balancing member for communicating with said cylinder block ports through said valve ports upon valve plate rotation for receiving fluid under pressure whereby the fluid pressure within each said passage corresponds with the fluid pressure on the opposite side of said valve plate regardless of valve plate rotational position, each of said passages comprising a relatively small orifice passage for communicating with said valve ports, and a relatively enlarged cylinder, said relatively enlarged cylinders formed within said pressure-balancing member being radially staggered with respect to each other, radially inwardly staggered ones of said balancing member cylinders being formed to have a diameter relatively larger than radially outwardly staggered ones of said balancing member cylinders, and including fluid sealing means for sealing said passages and for engaging said housing for pressure-reacting against said housing to urge said member axially toward said valve plate, said fluid sealing means comprising a plurality of sealing pistons respectively received within said passages; said means for converting between rotational and reciprocal motion being common to said first and second motor-pump units whereby said second motor-pump unit is drivingly operated by said first motor-pump unit for power transfer therebetween, said valve plates of said first and second motor-pump units being mounted on their respective shafts generally in phase with each other.

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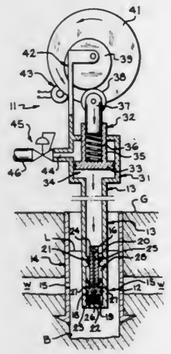
**4,297,087**

## APPARATUS FOR PUMPING FLUID FROM A WELL THROUGH A TUBING STRING

**Neil H. Akkerman, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.**

**Filed Aug. 23, 1979, Ser. No. 69,209**
**Int. Cl.³ F04B** *9/08*
**U.S. Cl. 417—378** **27 Claims**



1. An apparatus for pumping fluid from a subterranean well through a tubing string, comprising: pump means connected to the tubing string and responsive to the cyclic application of pressure to the fluid in the tubing string for pumping fluid from the well into the tubing string; and means for cyclically applying pressure to the fluid in the tubing string to actuate said pump means and to supply energy to the tubing string, said means for cylically applying pressure being responsive to the fluid in the tubing string to capture and substantially reuse said energy within and through the tubing string.



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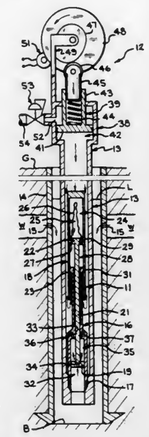
**4,297,088**

## PUMP ASSEMBLY COMPRISING GAS SPRING MEANS

**Neil H. Akkerman, Kingwood, Tex., assignor to Baker International Corporation, Orange, Calif.**

**Filed Sep. 7, 1979, Ser. No. 73,335**
**Int. Cl.³ F04B** *47/08*
**U.S. Cl. 417—378** **28 Claims**



1. In an apparatus for pumping fluid from a source through a conduit, including pump means connected to the conduit and responsive to the cyclic application and withdrawal of pressure to the fluid in the conduit for pumping fluid from the source into the conduit, the pump means comprising: piston means for pumping the fluid and responsive to the application of pressure to the fluid in the conduit for moving in a first direction; gas spring means for moving said piston means in the opposite direction when said pressure is removed from the fluid in the conduit; a fluid filled chamber defined by a cylinder closed at one end by said piston means and at another end by said gas spring means and in fluid communication between said piston means and said gas spring means; and means for connecting said chamber to the conduit to replace any fluid lost from said chamber during the operation of said piston means.

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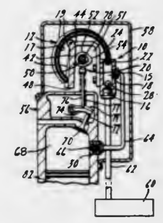
**4,297,089**

## ARCUATE TUBULAR PUMP

**Dante S. Giardini, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 26, 1978, Ser. No. 973,278**
**Int. Cl.³ F01B** *19/00;* **F04B** *45/06*
**U.S. Cl. 417—437** **15 Claims**



1. A fuel pump for pumping noncompressible fuel to a multi-chambered internal combustion engine comprising:
a plurality of C-shaped tubular members being resiliently flexible in a generally radial direction;
each C-shaped tubular member being arced about a common line;
each C-shaped tubular member having a hollow interior;
a housing member anchoring one end of each C-shaped tubular members;
said housing member connected to said engine;
said housing member having a plurality of passageways;
each passageway having an inlet and outlet;
each of said hollow interiors of each respective C-shaped tubular member in fluid communication through said respective anchored end with said passageway between said inlet and outlet;
a one-way check valve means operably connected to said inlet for allowing fuel to pass through said inlet into said passageway;
camming means mounted in proximity to a free opposing end of each C-shaped tubular members and opposing said anchored ends movable to flex said free ends to change the volume of said hollow interiors a predetermined amount and movable to allow said C-shaped tubular members to resiliently flex back to return the volume of said hollow interiors to their initial amounts, whereby fuel passes into each hollow interior and is forced out from each hollow interior through said outlets upon a decrease in volume of said hollow interiors;
said camming means sequentially flexing and releasing each C-shaped tubular member in a pedetermined sequence corresponding to the firing sequence of the respective combustion chambers of said engine;
a cam shaft rotatably mounted about its longitudinal axis through a generally convex shaped area bordered by said C-shaped tubular members;
a plurality of cams on said cam shaft;
a plurality of deflector members pivotably connected about substantially aligned pivot axes to said C-shaped tubular members in proximity of said free end spaced away from said pivot axes;
said respective cams abutting said deflector member at a distance from where said deflectors abut said C-shaped members.

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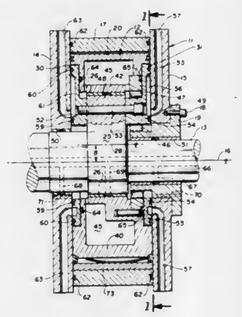
**4,297,090**

## ROTARY EXPANSION POWER UNIT WITH VALVE DISC CONNECTED TO CRANKSHAFT

**Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Trochoid Power Corporation, Eden Prairie, Minn.**

**Filed Oct. 29, 1979, Ser. No. 89,220**
**Int. Cl.³ F01C** *1/22, 19/00, 21/12*
**U.S. Cl. 418—61 A** **13 Claims**



1. A rotary expansion power unit including a housing having opposite end walls spaced apart along a first axis by a peripheral wall shaped to define an epitrochoidal cavity symmetrical about said first axis, a rotor symmetrical about a second axis, parallel to said first axis, and movable in said cavity in sealing

relationship to define a plurality of working chambers, crankshaft means, having an eccentric member on which said rotor rotates on said second axis eccentrically with respect to said first axis, for limiting motion of said rotor in said cavity to planetating movement about said first axis, and means for conducting and controlling expansion fluid flow into and from said working chambers comprising:

at least one valve disc secured to a corresponding side face of said eccentric member and extending between a corresponding said end wall and said rotor, said at least one valve disc defining an annular disc cavity facing said corresponding end wall,

supply passage means for directing a continuous flow of expansion fluid to said disc cavity,

bridging passage means in the inner surface of said corresponding end wall to conduct expansion fluid from said disc cavity to said working chambers during first predetermined portions of rotor movement, and

exhaust passage means for affording egress of expansion fluid from said working chambers during second predetermined portions of rotor movement.

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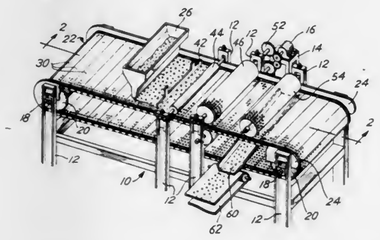
**4,297,091**

## ALFALFA PELLETIZING APPARATUS

**Michael R. Strefling, 425 S. 27th St., South Bend, Ind. 46615**

**Filed Mar. 10, 1980, Ser. No. 129,398**
**Int. Cl.³ A01F *29/00;* B29J *1/00***
**U.S. Cl. 425—84** **8 Claims**



1. Apparatus for pelletizing small alfalfa particles mixed with water comprising a frame, spaced sprockets journaled on said frame, a belt unit trained around said sprockets, means for driving a sprocket, said belt having a plurality of pellet-forming open ended apertures therein and a drain passage located at the central portion of each aperture, opposed pelletizing rollers journaled on said frame and each including a plurality of pelletizing fingers, each finger being adapted to enter an aperture and cooperate with an opposed finger to compress alfalfa particles in the central portion of the aperture and to expel liquid from said compressed particles and through said drain passage of each aperture, and means for releasing pellets from said apertures at a discharge station.

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**4,297,092**

## ACCUMULATOR HEAD USED IN THE FORMATION OF A MULTI-LAYER PARISON

**John Goron, Bridgewater, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Jun. 30, 1980, Ser. No. 164,787**
**Int. Cl.³ B29D *23/03, 23/04;* B29C *17/07***
**U.S. Cl. 425—133.1** **15 Claims**

1. An apparatus used in the formation of an article composed of resinous material, comprising:

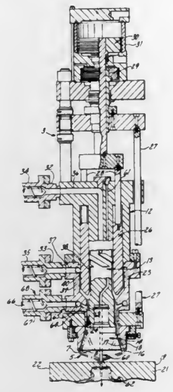
(a) at least one annular accumulation chamber for receiving and holding resinous material, the chamber having a longitudinal axis;

(b) an annular discharge orifice spaced from the chamber;

(c) an annular discharge passageway connecting the orifice and chamber, the portion of the passageway leading from the chamber being cylindrical about a longitudinal axis which coincides with the longitudinal axis of the chamber;

(d) an annular ring-piston disposed in the chamber and movable axially thereof, to force resinous material from the chamber through the discharge passageway and orifice;

(e) an annular compartment with a circular cross-section surrounding the cylindrical portion of the discharge passageway;



(f) an annular entrance opening in the cylindrical portion of the passageway between the chamber and orifice;

(g) an annular entrance passageway connecting the compartment and entrance opening, the entrance passageway converging in the direction of the discharge orifice; and

(h) means communicating with the compartment for moving resinous material into the compartment and through the entrance passageway and opening into the discharge passageway.

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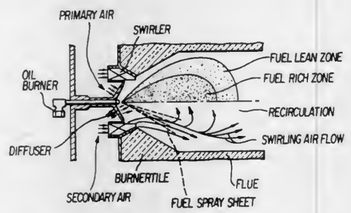
**4,297,093**

## COMBUSTION METHOD FOR REDUCING NOX AND SMOKE EMISSION

**Kotaro Morimoto, and Tomio Suzuki, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan**

**Filed Aug. 31, 1979, Ser. No. 71,487**
**Claims priority, application Japan, Sep. 6, 1978, 53-110003**
**Int. Cl.³ F23M *3/00***
**U.S. Cl. 431—10** **8 Claims**




1. A combustion method for reducing the emission of NOx and smoke in a boiler or furnace having a combustion chamber, a burner and a passage of combustion air around said burner, comprising:

injecting fuel from a fuel injector into a fuel rich zone of said combustion chamber and with a predetermined spread angle;

introducing combustion air with low velocity into said fuel rich zone; and

utilizing a swirler located in said passage for combustion air at a distance of not greater than 200 mm from said fuel injector to swirl combustion air into a fuel lean zone surrounding said fuel rich zone, wherein said swirler is adjusted to provide the swirled air with a mean velocity between 10 m/sec and 30 m/sec, with a swirl number between 0.35 and 1.5 and with a spread angle greater than said spread angle of said fuel, wherein said fuel and said low velocity combustion air in said fuel rich zone are enveloped by said swirled air, whereby the rapid mixing of fuel and air in the initial stage of combustion is suppressed.

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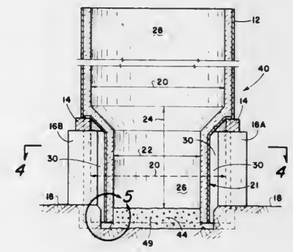
**4,297,094**

## FREE-FLOATING COMBUSTION CHAMBER AND STACK

**Robert D. Reed; Robert E. Schwartz, and Raymond D. Kraft, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.**

**Filed Feb. 19, 1980, Ser. No. 122,274**
**Int. Cl.³ F23D *13/20***
**U.S. Cl. 431—202** **8 Claims**



1. An improved structure for a burner-stack-furnace system comprising:

(a) a horizontal base ring of selected horizontal shape and size;

(b) a vertical stack of selected height, and of horizontal shape and size related to said base ring, attached to and supported on said base ring;

(c) a plurality of circumferentially-spaced support columns of selected height arranged in a ring of shape and size to receive and support said base ring;

(d) a combustion section of substantially the same size and shape in cross-section as said stack, and including a plurality of re-entrant vertical channels in the outer wall of said combustion section, one positioned at each of the positions of said support columns, the dimensions of said channels such as to provide air space between said columns and said outer wall; said combustion section penduously supported from said support ring;

(e) said combustion section having at least one opening through its circumferential wall in the spaces between columns, for the insertion of at least one fuel burner.

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**4,297,095**

## FILAMENT WINDING APPARATUS

**David R. Silcox, Gainesville, and John L. Doster, Oakwood, both of Ga., assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 28, 1980, Ser. No. 116,260**
**Int. Cl.³ F27B *9/28;* B65H *54/20, 54/42***
**U.S. Cl. 432—59** **9 Claims**

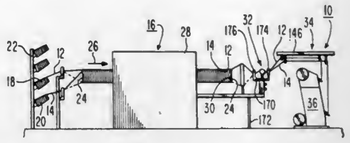
1. A filament winding apparatus comprising:

means for transporting a plurality of filaments wound side by side about a moving core, each filament being in contact with said core,

means for heat setting said filaments during said transporting,

adjustable filament tension control means for simultaneously receiving said plurality of filaments from said means for transporting and for applying substantially identical tension to each of said received filaments during the time the filaments are being wound by the winding means set forth below, said tension control means including a pair of facing members and means for adjustably resiliently urging said members together, the facing surfaces of said members receiving said filaments therebetween, each said facing surface being in contact with each filament, and

winding means including means for receiving a like plurality of filament receiving spools for simultaneously winding



each of said filaments on a different spool, said winding means including a like plurality of friction drive means, each drive means for rotating a corresponding spool by frictional engagement with the outer surface of the windings on the spool, means for urging each friction drive means into continuous engagement with the outer surface of its corresponding spool with negligible slippage between said friction drive means and said outer surface, and timing means for synchronously rotating each of said plurality of, friction drive means.

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**4,297,096**

## ALKYL, ALKENYL, AND ARYL SUBSTITUTED TRIAZENE COMPOUNDS, THEIR SALTS AND PRODUCTION THEREOF

**Keizo Yoshida, Ibaraki; Hirokazu Tanaka, Takarazuka; Masanori Okamoto; Eiko Iguchi, both of Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co. Ltd., Osaka, Japan**

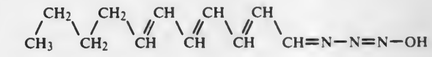
**Continuation-in-part of Ser. No. 18,158, Mar. 7, 1979, abandoned, and a continuation-in-part of Ser. No. 92,476, Nov. 8, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,310**
**Int. Cl.³ A01G *47/08, 51/00;* C07C *107/02;* C12P *13/00***
**U.S. Cl. 435—128** **11 Claims**

1. A compound of the formula:

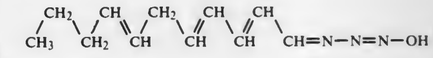
R—CH=N—N=N—OH

wherein R is alkyl, alkenyl or aryl or its pharmaceutically acceptable salts.

10. A process for the production of FR-900184 substance having the formula:



or FR-900190 substance having the formula



or both, which comprises culturing a FR-900184 and/or FR-900190 producing strain belonging to the genus Streptomyces in an aqueous nutrient medium under aerobic condition and recovering FR-900184 or FR-900190 or both substances from the resultant cultured broth.

11. A process for the preparation of the compound of the formula

R—CH=N—N=N—OH

wherein R is alkyl, alkenyl or aryl or its pharmaceutically acceptable salts, which comprises reacting a compound of the formula

RCHO

wherein R is the same as defined above, with hydrazine, reacting the resultant hydrazone derivative with a silylating agent taken from the class consisting of trialkylhalosilane, trialkylsilylamide, dialkyldihalosilane, alkyltrihalosilane, dialkylarylhalosilane, triarylhalosilane, dialkylaralkylhalosilane, dialkoxydihalosilane, and trialkoxyhalosilane and reacting the resultant silylated compound with an n-nitrosating agent.

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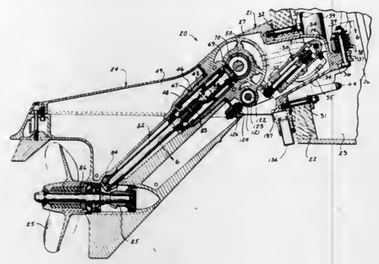
**4,297,097**

## STERN DRIVE MECHANISM

**Elmer C. Kiekhaefer, 2408 Cypress Gardens Rd., Winter Haven, Fla. 33880**

**Filed Feb. 23, 1978, Ser. No. 880,713**
**Int. Cl.³ B60F *3/00***
**U.S. Cl. 440—59** **13 Claims**

1. In a stern drive mechanism for watercraft, a mounting bracket assembly for securement to the transom of a watercraft, said bracket assembly having a horizontal transverse bore therein rearwardly with respect to the transom, a drive unit having an upper housing and a lower housing, said upper housing including a horizontal cylindrical portion with one end of the cylindrical portion being rotatably received in the bore of the bracket assembly, and a bracket assembly addition having a horizontal bore for rotatably receiving the opposite end of the cylindrical portion and being secured to the bracket assembly, said bracket assembly and the addition thereto serving to rotatably support the drive unit and providing for tilt movement of said unit on a horizontal transverse axis relative to the transom, said upper housing further including a downwardly extending portion generally normal to the horizontal



cylindrical portion, said downwardly extending portion of said upper housing and said lower housing being telescoped one within the other and being threadedly engaged to provide a dirigible connection therebetween for support of the lower housing and to provide for pivotal movement of the lower housing relative to the upper housing whereby to provide for steering control of the watercraft.

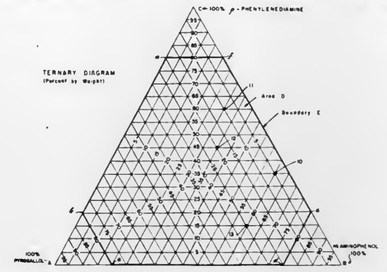


**4,297,098**

## METHOD FOR GRADUAL COLORING OF HAIR TO A LIGHT BROWN SHADE AND PREPARATIONS FOR USE THEREIN

**George F. Dasher, Inverness, and Thomas J. Schamper, Chicago, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.**

**Filed Aug. 26, 1976, Ser. No. 718,019**
**Int. Cl.³ A61K *7/13***
**U.S. Cl. 8—412** **4 Claims**




1. A preparation for gradual coloring of living human hair to a light brown shade by air oxidation, comprising an aqueous carrier containing from 0.1 to 0.6 percent by weight based on the weight of the preparation of an oxidative dye combination, said dye combination consisting essentially of a mixture selected from the group consisting of (a) the mixture of p-phenylenediamine, pyrogallol, and m-aminophenol, and (b) the mixture of (a) in which p-toluenediamine is substituted on a molar equivalent basis for p-phenylenediamine, the said components of (a) being present in said mixture in the relative weight percents defined by the points within Area F of FIG. 2 including the points falling on Boundary G, or as further defined in (b) with respect to the substitution of p-toluendiamine for p-phenylenediamine, said preparation being free of oxygen prior to application to the hair and being capable of undergoing a progressive light brown color forming reaction on contact with atmospheric oxygen.

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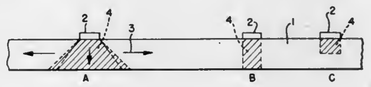
**4,297,099**

## PROCESS FOR THE PRODUCTION OF A SYNTHETIC RESIN SHEET MATERIAL WHICH IS DYED UNICOLORED OR MULTICOLORED IN ACCORDANCE WITH A PATTERN

**Manfred Simon, Nieder-Kassel; Erwin Möschter, Neunkirchen Seelscheid; Karl-Heinz Spiess, Konigswinter, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany**

**Filed Nov. 15, 1978, Ser. No. 961,012**
**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750984**
**Int. Cl.³ D06P *5/02***
**U.S. Cl. 8—484** **27 Claims**




1. A process for the production of a synthetic resin sheet material having a unicolored or multicolored dye coating applied to at least a selective portion of one surface thereof, said dye coating penetrating uniformly into said sheet material, which comprises applying a dye-containing material to at least one selective portion of a surface of a synthetic resin sheet material, said synthetic resin sheet material containing at least one reactive, crosslinkable component that crosslinks with itself or with another crosslinkable component contained in said synthetic resin sheet material, and said dye-containing material being capable of migrating into a non-porous sheet formed of said synthetic resin sheet material; controlling the migration of the dye-containing material into the sheet material to a desired depth of penetration; then initiating crosslinking of said at least one crosslinkable component contained in said sheet material and crosslinking said at least one crosslinkable component to a different degree, within said synthetic resin sheet material, to stop further migration of the dye-containing material into said sheet material.

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**4,297,100**

## AQUEOUS DYE PREPARATIONS

**Zdenek Koci, Binningen, and Hans Mollet, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 896,418, Apr. 14, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,584**
**Claims priority, application Switzerland, Apr. 19, 1977, 4808/77**
**Int. Cl.³ D06P *1/52, 1/16, 1/10, 1/41***
**U.S. Cl. 8—527** **9 Claims**

1. A storage-stable aqueous dye preparation consisting essentially of, relative to the total amount of the preparation:

5 to 50 percent by weight of at least one water-soluble dye;

0.1 to 5 percent by weight of a dispersing agent;

0.1 to 30 percent by weight of at least one further additive, said further additive being an auxiliary selected from the group consisting of:

(a) glycine, 1-aminopropionic acid, 2-aminopropionic acid, betaine hydrate, choline, potassium glutamate, N-methyl glucamine, 2-amino-2-methyl-propanediol-1,3,2-amino-2-ethyl-propanediol-1, 3,tris-(hydroxymethyl)-aminomethane, and hydrolysed proteins having a molecular weight up to 10,000;

(b) ethylenediaminetetraacetic acid, nitrilotriacetic acid, N-hydroxyethyl-ethylenediaminetriacetic acid, diethylenetriaminepentaacetic acid, N,N-(dihydroxyethyl)-glycine, N-(hydroxyethyl)-iminodiacetic acid, amino-tri-(methylenephosphonic acid), 1-hydroxyethane-1,1-diphosphonic acid, α-aminoethanediphosphonic acid, methylenediphosphonic acid, ethylenediphosphonic acid, and the Na, K, $NH_4$, Li, mono-, di- and triethanolammonium salts thereof;

(c) maltose, saccharose-monolaurate, adducts of 1 mol of methyl glucoside with 5 to 20 mols of ethylene oxides, and xanthane gum;

(d) potassium salts, lithium salts, ammonium salts, choline salts, and amine salts optionally substituted by lower alkyl or hydroxy-lower-alkyl, of lactic acid, α-hydroxy-isobutyric acid, gluconic acid, glycolic acid, pyrrolidone-2-carboxylic acid, pyridine-3-carboxylic acid, and pyridine-2,6-dicarboxylic acid;

0.5 to 30 percent by weight of at least one water-soluble anionic polyelectrolyte which is a synthetic polymerisation product containing carboxyl groups, having a molecular weight of 400 to 300,000, and is selected from the group consisting of (a) homopolymers of α, β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or their anhydrides, which have been subsequently saponified, (b) co- and ter-polymers of α, β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or anhydrides thereof, or co- and ter-polymers of α,β-ethylenic unsaturated monocarboxylic acids or polyvalent carboxylic acids or anhydrides thereof with other polymerisable monomers selected from unsaturated aliphatic or aromatic hydrocarbons, vinyl ethers, vinyl esters, methacrylic acid alkyl esters and unsaturated glyceride oils and diene polymers, and (c) homopolymers of (a) or co- and terpolymers of (b) which are substituted by hydroxyl groups, aldehyde groups, or hydroxyl groups and aldehyde groups;

and water to make up the remainder of the preparation.

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**4,297,101**

## PROCESS FOR THE DYEING OF SYNTHETIC POLYAMIDE FIBERS WITH REACTIVE DYES ACCORDING TO THE BATCHWISE EXHAUSTION METHOD

**Hans-Ulrich von der Eltz, Frankfurt am Main; Armand Lehinant, Offenbach; Joachim W. Lehmann, Kelkheim, and Hans-Peter Maier, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation of Ser. No. 64,775, Aug. 8, 1979, abandoned. This application Jun. 13, 1980, Ser. No. 159,443**

**Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2834997**

**Int. Cl.³ D06P *3/82***

**U.S. Cl. 8—531** **4 Claims**

1. In a process for the dyeing of a textile consisting of or containing synthetic polyamide fibers, with reactive dyes according to the batchwise exhaustion method, the improvement which comprises contacting the textile with an aqueous dye liquor containing one or more water-soluble reactive dyes, the initial pH value of said dye liquor being in the slightly acid to neutral range, for a time of from 5 to 30 minutes while maintaining the temperature of said liquor in the range of from 105° to 140° C., without the addition of an alkali or alkali-yielding agent and without the addition of an acid or acid-yielding agent.

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**4,297,102**

## CYCLICAL TENSIO-ACTIVE POLYETHERS

**Guy Vanlerberghe, Claye-Souilly, and Henry Sebag, Paris, both of France, assignors to L'Oreal, Paris, France**

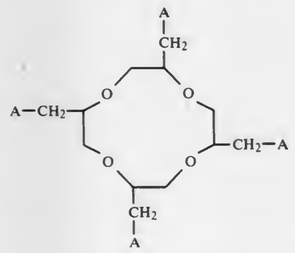
**Filed Mar. 15, 1979, Ser. No. 20,656**

**Claims priority, application France, Mar. 17, 1978, 78 07914**

**Int. Cl.³ C07D *323/00***

**U.S. Cl. 8—406** **28 Claims**

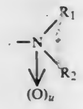
1. Cyclical tensio-active polyethers of the general formula:



(I)

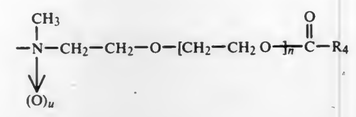
in which A is an amphiphile grouping selected from the group consisting of:

(a) the grouping:



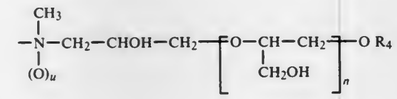
where $R_1$ and $R_2$, identical or different, refer to aliphatic radicals having from 1 to 20 carbon atoms, with one of the radicals including at least 8 carbon atoms, or substituted aliphatic radicals having from 6 to 20 carbon atoms, or alkylaryl radicals having from 6 to 20 carbon atoms, the sum of the carbon atoms of $R_1$ and $R_2$ being less than or equal to 28, or one of the radicals refers to a dimethylamino-ethyl or -propyl radical, diethylamino-ethyl or -propyl radical, piperidino -ethyl or -propyl radical, morpholino-ethyl or -propyl radical or alkyl polyhydroxy propylene radical, and u refers to the number zero or 1;

($a_1$) the grouping:



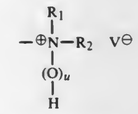
where $R_4$ refers to a non-substituted or substituted aliphatic radical or an alkylaryl radical having from 6 to 20 carbon atoms, n refers to a whole number or a fraction from 1 to 20, and u refers to a number 0 or 1;

($a_2$) the grouping:

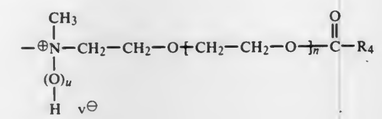


where u, $R_4$ and n having the meaning indicated above;

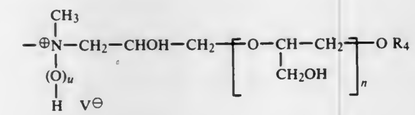
(b) the grouping:



($b_1$) the grouping:

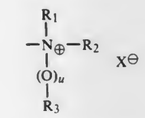


($b_2$) the grouping:



where in the groupings (b), ($b_1$), and ($b_2$) $V^{\ominus}$ refers to a formiate, acetate, citrate or lactate anion, and u, n, $R_1$, $R_2$ and $R_4$ have the meanings indicated for the groupings a and $a_1$;

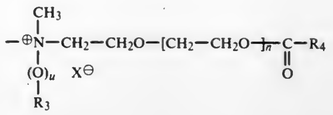
(c) the grouping:



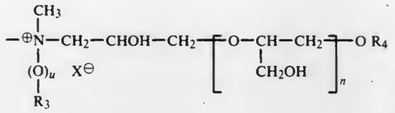
where $R_1$, $R_2$ and u having the meaning indicated for the grouping (a), $R_3$ refers to an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms or to a benzyl radical, and $X^{\ominus}$ refers to a chloride, bromide, iodide, monomethyl sulphate, methyl sulphonate or p.toluene sulphonate anion;

($c_1$) the grouping:





($c_2$) the grouping:



where in these groupings ($c_1$) and ($c_2$) u refers to the number 0 or 1, n refers to a whole number or a fraction from 1 to 20, and $R_4$ has the meanings indicated for the grouping ($a_1$);

(d) the grouping:

where $Q^{\ominus}$ refers to one of the following groupings:

$-(CH_2)_m-COO^{\ominus}$

where m refers to 1, 2, or 3,

$-CH_2-CH_2-CH_2-SO_3^{\ominus}$,

or

$-CH_2-CH_2-O-SO_2^{\ominus}$

and $R_1$ and $R_2$ have the meaning indicated for the grouping (a);

($d_1$) the grouping:



and

($d_2$) the grouping:



where in groupings ($d_1$) and ($d_2$) n refers to a whole number or a fraction from 1 to 20 and $Q^{\ominus}$ has the meaning indicated for grouping (d).

27. A dye composition for the hair containing in an water or water-alcohol solution at least one polyether of claim 1 and one or more dyes selected from the group consisting of anthraquinone dyes, azoic dyes, nitrobenzene dyes, indoaniline dyes, indophenol dyes, and indamine dyes in an amount of 0.001 to 1% by weight of said dye composition.

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**4,297,103**

## PROCESS FOR THE CONTINUOUS ONE-BATH DYEING OF PILE FABRICS MADE OF POLYACRYLONITRILE/COTTON

**Udo-Winfried Hendricks, Odenthal, and Klaus Wollny, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Oct. 26, 1979, Ser. No. 88,680**

**Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849667**

**Int. Cl.³ D06P *3/87***

**U.S. Cl. 8—534** **4 Claims**

1. In the continuous one-bath dyeing of a pile fabric composed of a cotton base and an acrylic pile comprising padding the fabric with a dyebath containing a basic dyestuff and a substantive dyestuff, and thereafter steaming the fabric to effect dyeing, the improvement which comprises including in the dyebath a nitrile which swells the acrylic fiber and a salt of an alkyl sulphate of the formula

$R'-O-SO_3^{\ominus}M^{\oplus}$

in which

R' is alkyl with 10 to 16 carbon atoms, and

M is an alkali metal, alkaline earth metal, ammonium, alkylammonium or hydroxyalkylammonium ion.

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**4,297,104**

## METHOD OF DETECTING OR IDENTIFYING VIRUS ANTIGENS, ERYTHROCYTE OR CELL ANTIGENS OR ANTIBODIES IN A BIOLOGICAL MEDIUM

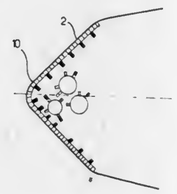
**Matte Claude, Paris, France, assignor to Centre National de Transfusion Sanguine, France**

**Filed Feb. 23, 1979, Ser. No. 14,547**

**Claims priority, application France, Feb. 28, 1978, 78 05758**

**Int. Cl.³ G01N *33/54, 33/80***

**U.S. Cl. 23—230 B** **33 Claims**



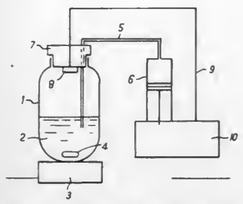
1. A method of analysing a biological medium to detect or identify virus antigens or erythrocyte or cell antigens or antibodies in the medium, the method involving immunological reactions between cells or particles, a serum and an antiglobulin, the reaction of analysis being conducted in a vessel the wall of which has a point of convergence or apex situated on the axis of symmetry of the vessel, wherein molecules of a reactant capable of immunologically reacting with the antiglobulin are fixed on the walls of the vessel, said antiglobulin being chosen for its capacity to immunologically and independently bind the cells or particles characterizing either positive or negative reaction with said molecules of reactant, then subjecting the reaction medium to a centrifugal force substantially parallel to said axis under conditions such that in a first period all the cells or particles, whether they characterize a reaction with a positive result or a negative result, progressively stick to and remain stuck to the wall of the vessel, the centrifugal force in said first period being such as to prevent a collection of said particles at the apex of the vessel, and then in a second period, only the cells or particles characterizing one kind of reaction remain stuck to the wall of the vessel whereas the cells or particles characterizing the other kind of reaction are collected at the apex of the vessel.

**4,297,105**

## AUTOMATIC PHOTOMETRIC TITRATOR

**Ghyslain Dube, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada**

**Filed Jun. 27, 1980, Ser. No. 163,701**
**Int. Cl.³ G01N *21/76, 31/16***
**U.S. Cl. 23—230 R** **12 Claims**



**1**. A method for detection of end-point in acid-base titration reactions to determine acid in an acid-containing material, said method comprising placing a quantity of a chemiluminescent indicator together with a sample of the acid-containing material to be analyzed into a vessel, gradually adding a suitable basic titrant to the vessel whilst monitoring by means of a light detector the intensity of light emission from the indicator, obtaining the first derivative with respect to time of the output signal of the light detector and detecting when the first derivative of the output signal reaches an amplitude level indicative of the acid-base reaction end-point.

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**4,297,106**

## RAPID METHOD FOR THE MEASUREMENT OF IODINE VALUE

**Akira Makino, Yokosuka, Japan, assignor to The Nisshin Oil Mills, Ltd., Tokyo, Japan**

**Filed Aug. 1, 1980, Ser. No. 174,427**
**Claims priority, application Japan, Aug. 2, 1979, 54/98127**
**Int. Cl.³ G01N *31/00***
**U.S. Cl. 23—230 HC** **3 Claims**

**1**. A rapid method for the measurement of iodine value according to the Wijs method wherein reaction is greatly reduced by means of a catalyst selected from the group consisting of magnesium acetate or sodium acetate.

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**4,297,107**

## FUELS AND THEIR USE

**Günther Boehmke, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 30, 1979, Ser. No. 99,122**
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854540**
**Int. Cl.³ C10L *1/18, 1/22***
**U.S. Cl. 44—51** **12 Claims**

**1**. A fuel for a combustion engine consisting essentially of a hydrocarbon, water and a non-ionic emulsifier, said non-ionic emulsifier consisting essentially of the addition product of ethylene oxide or propylene oxide and a carboxylic acid amide with 9 to 21 carbon atoms, said non-ionic emulsifier being present in said fuel in an amount of 0.5 to 6% by weight.

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**4,297,108**

## DESULFURIZATION OF COAL

**Carl Horowitz, and Michael Dichter, both of Brooklyn, N.Y., assignors to Polymer Research Corp. of America, Brooklyn, N.Y.**

**Continuation-in-part of Ser. No. 904,505, May 10, 1978, abandoned. This application Apr. 22, 1980, Ser. No. 142,828**
**Int. Cl.³ C10L *9/02***
**U.S. Cl. 44—1 SR** **10 Claims**

**1**. Method of removing organic sulfur from coal from which the main portion of pyritic sulfur has been removed by froth flotation but which still contains sulfur mainly in the form of organic sulfur and to some extent in the form of pyritic sulfur, which comprises treating such coal containing said organic sulfur with dilute nitric acid, thereby oxidizing any remaining pyritic sulfur and also oxidizing organic sulfur, thereby solubilizing the pyritic sulfur and a substantial portion of the organic sulfur, filtering and washing the thus treated coal, thereby removing the solubilized sulfur and nitric acid therefrom, and treating the thus obtained coal still containing organic sulfur with an unsaturated hydrocarbon which binds remaining organic sulfur thereto thus removing the same from the coal, thereby obtaining substantially completely desulfurized coal.

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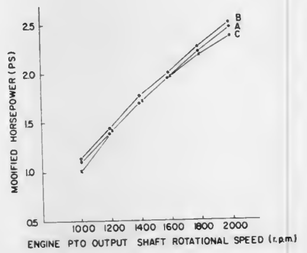
**4,297,109**

## FUEL COMPOSITION

**Kazuo Sugito, Kashihara, and Sakuzo Takeda, Tsu, both of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan**

**Filed Jul. 2, 1980, Ser. No. 165,267**
**Claims priority, application Japan, Jul. 4, 1979, 54/85436**
**Int. Cl.³ C10L *1/18***
**U.S. Cl. 44—56** **11 Claims**




**1**. A composition useful as a fuel, said composition comprising an admixture of gasoline and a vegetable oil containing 1,8-cineole as a major component, said gasoline and said vegetable oil being admixed in amounts effective for forming fuel having a ratio of gasoline to said vegetable oil of 95:5 to 5:95 by volume.

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**4,297,110**

## ZIRCONIUM ADDITIVES FOR RESIDUAL FUEL OIL

**Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Mar. 31, 1980, Ser. No. 135,994**
**Int. Cl.³ C01L *1/18***
**U.S. Cl. 44—66** **15 Claims**

**1**. A process for the combustion of a residual fuel oil comprising the steps of:

(a) dissolving in said fuel oil an effective trace amount of an additive consisting essentially of a zirconium salt of a carboxylic acid selected from the group consisting of $C_4$–$C_{22}$ linear or branched fatty acids, tall oil, naphthenic acid, or mixture thereof, said amount being effective in reducing the amount of particulate matter formed during combustion; and

(b) combusting said resulting fuel oil.

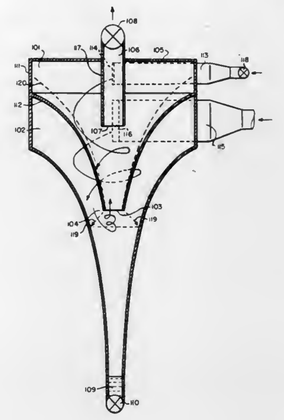


**4,297,111**

## PROCESS AND APPARATUS FOR THE CONTACT AND SEPARATION OF IMMISCIBLE FLUIDS

**Leon I. Ross, Grand Cayman, Cayman Islands, assignor to Caribbean Properties Limited, Grand Cayman, Cayman Islands**

**Continuation of Ser. No. 76,676, Sep. 19, 1979, abandoned, which is a continuation of Ser. No. 878,389, Feb. 16, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,841**
**Int. Cl.³ B01D *47/16, 47/18***
**U.S. Cl. 55—92** **38 Claims**



**26**. A process for the continuous contact of a liquid feed with a less dense fluid feed and the subsequent separation of a resultant fluid product from a less dense immiscible fluid product, the process comprising:

(a) directing a denser liquid feed into and axially through a first conduit, having a generally circular transverse cross-section surrounding a central longitudinal axis, into an overlapping coaxial second conduit, the second conduit also having a generally circular transverse cross-section overlapping the outlet from the first conduit, and defining a generally annular passage between the interlapped walls of the coaxial first and second conduits,

(b) spinning the denser liquid feed emerging from the generally circular outlet of the first conduit around the longitudinal axis thereof fast enough to form the emerging denser liquid into a generally continuous spinning liquid curtain connecting the rim of said first conduit outlet directly with the overlapping wall of the second conduit, thereby curtaining off the annular passage between the interlapped walls of the coaxial conduits,

(c) directing a less dense fluid feed into and through said annular passage axially and into and through the spinning curtain, the liquid and less dense fluid feeds consequently interacting with one another within the second conduit to yield spinning immiscible fluid products differing in density from one another; two immiscible spinning fluid products separating centrifugally from one another, the less dense fluid product flowing relatively radially inwardly towards the longitudinal axis,

(d) withdrawing the less dense fluid product from a location relatively near the longitudinal axis; and

(e) separately withdrawing the denser fluid product from the second conduit.

**32**. An apparatus for the continuous contact of a denser liquid feed with a less dense fluid feed and the subsequent separation of a resultant denser fluid product from a less dense immiscible fluid product, the apparatus comprising:

(a) a first conduit, having a generally circular transverse cross-section and a central longitudinal axis, the conduit being open at one end to provide an outlet having a circular rim, centered upon the longitudinal axis of the conduit and located in a plane generally perpendicular thereto,

(b) a second conduit, coaxial with and overlapping the first conduit, the second conduit also having a generally circular transverse cross-section and extending axially beyond the rim of the first conduit, the first and second conduits defining a generally annular passage between the interlapped portions, the annular passage having an outlet into the second conduit defined by the rim of the first conduit,

(c) means for introducing a denser liquid feed into the first conduit and for directing the flow of the denser liquid feed through the first conduit axially toward and into the overlapping coaxial second conduit,

(d) means for causing the denser liquid feed to spin about the longitudinal axis of the conduit as the liquid emerges from the outlet of the first conduit fast enough to form the emerging denser liquid into a generally continuous spinning fluid curtain connecting the rim of the said first conduit outlet with the overlapping second conduit, thereby curtaining off the outlet from the annular passage between the interlapped coaxial conduits,

(e) means for introducing a less dense fluid feed into and through the annular passage between the interlapped walls of the coaxial conduits and into the second conduit, so as to intercept the spinning denser fluid curtain,

(f) an outlet for the less dense fluid product located relatively near the longitudinal axis; and

(g) separate outlet for the denser fluid product from the second conduit.

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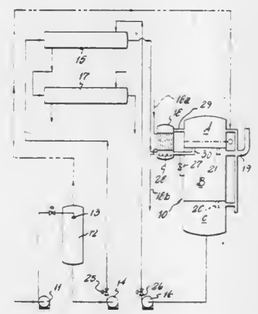
**4,297,112**

## DEODORIZATION OF EDIBLE OILS

**Leonard Naylor, Hull, England, assignor to Simon-Rosedowns Limited, Hull, England**

**Filed Nov. 19, 1979, Ser. No. 95,359**
**Claims priority, application United Kingdom, Dec. 1, 1978, 46896/78**
**Int. Cl.³ B01D *53/00***
**U.S. Cl. 55—195** **9 Claims**



**1**. A semi-continuous deodoriser comprising a vessel divided into three zones, means for collecting oil to be deodorised in the first zone, means for transferring oil from said first zone to said second zone and means for deodorising oil in the second zone and means for receiving and holding deodorised oil from the second zone in the third zone, means for passing oil continuously to the first zone and withdrawing deodorised oil continuously from the third zone, means for pre-heating the oil to be fed to the first zone by heat exchange with oil from the third zone, means for heating said pre-heated oil to full process temperatures in said first zone prior to transferring it to said second zone comprising oil heating means connected to receive said preheated oil, and means for recirculating the oil through said oil heating means and through said first zone

comprising oil flow passages interconnecting said oil heating means and said first zone to provide a recirculation circuit and means for introducing a motive gas effectively under pressure into said circuit.

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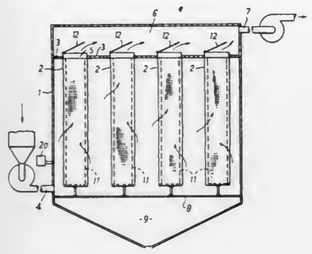
**4,297,113**

## GAS FILTRATION APPARATUS

**Louis Theodore, 51 Maple Dr., New Hyde Park, N.Y. 11040**

**Filed Mar. 3, 1980, Ser. No. 126,553**
**Int. Cl.³ B01D** *46/00*
**U.S. Cl. 55—213** **5 Claims**



1. Apparatus, for removing particulate material from a gas stream, comprising a housing having inlet means and outlet means, a plurality of gas-permeable hollow mesh filter bags supported in said housing and serving to partition the interior of the housing into a first chamber communicating with the inlet means and a second chamber communicating with the outlet means, the interior of all of said filter bags communicating through means defining respective openings with said second chamber, a respective closure for the opening of each filter bag, said closure being a plate hingedly mounted to means defining said opening and responsive to a predetermined increase of gas velocity through the opening, as a result of rupture of the filter bag, to close the opening, a cord attached between the plate and retaining means mounted adjacent to the plate, said retaining means releasably retaining the cord responsive to gas flow and non-rupture of the bag, means on said cord for receiving the retaining means and for releasing the cord upon rupture of the bag, and pressure-sensing means communicating with said first housing chamber and arranged, upon sensing of a predetermined change of pressure in said first chamber as a result of closing of a predetermined proportion of said openings to terminate entry of said gas stream into said housing through said inlet means.

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**4,297,114**

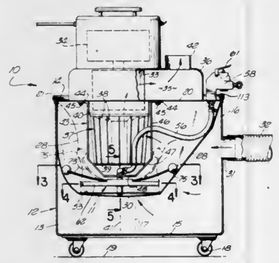
## VACUUM CLEANER HAVING BAG CLEANING APPARATUS

**Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Co., Pasadena, Calif.**

**Continuation of Ser. No. 871,819, Jan. 24, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,595**
**Int. Cl.³ B01D** *46/04*
**U.S. Cl. 55—299** **28 Claims**

1. A vacuum cleaner comprising:
a casing having an air inlet and an air outlet;
a flexible filter bag in said casing;
a motor driven fan for producing a flow of suction air through said casing between said inlet and outlet and through the material of said bag from the exterior of the bag to its interior to collect dust at the outside of the bag;
a bag cleaning rotor mounted within said bag to turn about an axis and against which the bag is constricted inwardly by said flow of suction air when the fan is in operation; and
means for turning said rotor about said axis;
said rotor having at least one arm which projects outwardly away from said axis in an extended position of the arm when the rotor is turned while the fan is not in operation, and which has a radially outer portion acting in said extended position of the arm to contact the inside of the bag as the rotor turns and displace dust from the exterior thereof;
said arm being constructed to flex longitudinally in a relation swinging said outer portion thereof from said extended position inwardly toward said axis to a position substantially reducing the effective diameter of the rotor, under the influence of force exerted inwardly by the bag when constricted by said flow of suction air;
said arm including a coil spring and said outer portion thereof including a bag contacting element received about and movable axially along said coil spring.

2. A vacuum cleaner comprising:
a casing having an air inlet and an air outlet;
a flexible filter bag in said casing;
a motor driven fan for producing a flow of suction air through said casing between said inlet and outlet and through the material of said bag from the exterior of the bag to its interior to collect dust at the outside of the bag;



a bag cleaning rotor mounted within said bag to turn about an essentially vertical axis and against which the bag is constricted inwardly by said flow of suction air when the fan is in operation;
means for turning said rotor about said axis;
said rotor having at least one arm which projects outwardly away from said axis in an extended position of the arm when the rotor is turned while the fan is not in operation, and which has a radially outer portion acting in said extended position of the arm to contact the inside of the bag as the rotor turns and displace dust from the exterior thereof;
said arm being constructed to flex longitudinally in a relation swinging said outer portion thereof from said extended position inwardly toward said axis to a position substantially reducing the effective diameter of the rotor, under the influence of force exerted inwardly by the bag when constricted by said flow of suction air; and
a member within the bag at a location beneath said rotor and acting to limit constriction of the lower portion of the bag.

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**4,297,115**

## BAG-TYPE FILTER WITH AIR DIFFUSER TUBES OF HELICAL CONSTRUCTION

**Allen S. Johnson, Jr., Salisbury, N.C., assignor to Staclean Diffuser Company, Salisbury, N.C.**

**Continuation-in-part of Ser. No. 76,605, Sep. 18, 1979, Pat. No. 4,231,770. This application Aug. 18, 1980, Ser. No. 178,847**
**Int. Cl.³ B01D** *46/04*
**U.S. Cl. 55—302** **10 Claims**

1. In a filter apparatus of the type wherein a particulate-laden gas is directed through a tubular filter bag for filtering and retaining the particulate material on the exterior of the bag, and wherein the filter bag is cleaned by a periodic reverse purge of air into the bag, said filter bag having an outlet end for discharge of the filtered gas and being supported by a tubular supporting cage positioned within said filter bag, the combination therewith of

a hollow air diffuser tube formed from a perforated strip of helically wound sheet metal and extending longitudinally within said tubular supporting cage, and wherein adjacent edges of said strip are interconnected by a seam in which said adjacent edges overlap each other in interlocking relationship and with said seam thus extending helically

around said air diffuser tube, and said tube being in communication with said outlet end of said filter bag for receiving a reverse purge of air therein for diffusing and distributing the air throughout said filter bag when a periodic reverse purge of air is directed into the outlet end of the filter bag so as to more effectively clean the filter bag while also reducing excessive flexing of the filter bag and abrasive wear thereof to thereby provide a substantial increase in the efficiency of the filter apparatus and a significant increase in the life of the filter bag.



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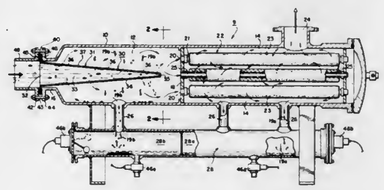
**4,297,116**

## APPARATUS FOR SEPARATING FOREIGN MATTER FROM A GAS STREAM

**Kenneth M. Cusick, Amarillo, Tex., assignor to Aitken, Inc., Houston, Tex.**

**Continuation of Ser. No. 922,904, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 754,366, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 598,566, Jul. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 572,352, Apr. 28, 1975, abandoned. This application Jan. 31, 1980, Ser. No. 117,045**
**Int. Cl.³ B01D** *50/00*
**U.S. Cl. 55—319** **15 Claims**



1. A separator for receiving an incoming contaminated gas stream containing foreign suspended particles therein, comprising:
(a) an elongate vessel defining a chamber having an inlet for receiving said contaminated gas stream and an outlet for discharging gas substantially free of said foreign particles;
(b) an imperforate wall in said chamber between said inlet and said outlet for dividing said chamber into a separate gravity chamber having said inlet and a separate filter chamber having said outlet, said wall having at least one port therethrough;
(c) a conical strainer-diffuser member disposed inside said gravity chamber and connected relative to said inlet to receive contaminated gas flow therefrom, said strainer-diffuser member having:
(1) a conical side wall forming a conical bore tapering inwardly relative to the direction of contaminated gas flow from said inlet, said conical side wall having a plurality of spaced holes extending transversely therethrough, said holes having a diameter ranging between 1/16 inch to ⅛ inch and opening in multiple radial directions from said conical bore within said gravity chamber;
(2) an open front end substantially coextensive with said inlet to said vessel, and connected relative thereto for said front end to receive all of the incoming contaminated gas;
(3) said holes in said conical side wall forming substantially the only exit for said contaminated gas entering said gravity chamber, said holes having a total area greater than the area of said inlet and having inner edge portions protruding inwardly into said conical bore and forming barriers around the inner edges of said holes, damming the flow of liquid particles over the inner surface of said conical side wall and through said holes, causing said liquid particles to form large drops which are subsequently jetted outside of said diffuser member through said holes with said gas and into said gravity chamber, most of the jetted-out large liquid drops falling to the bottom of said gravity chamber; and
(d) at least one filter element disposed in said filter chamber and with said filter element in communication with said port in said chamber dividing wall for receiving the gas stream from said gravity chamber and filtering out fine foreign particles from gas passing through said filter element so that substantially particle free gas will exit from said outlet of said vessel.

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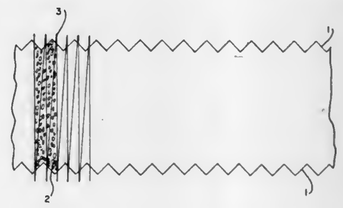
**4,297,117**

## RESPIRATORY DEVICE FOR CATASTROPHIC FIRES AND/OR SMOG WEATHER CONDITIONS

**Heinz Holter, Gladbeck; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbuscher, Gladbeck, all of Fed. Rep. of Germany, assignors to Industrie-Wert Beteiligungsgesellschaft mbH, Mainz, Fed. Rep. of Germany**

**Filed Jun. 19, 1979, Ser. No. 50,277**
**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827115; Aug. 28, 1978, 2837469**
**Int. Cl.³ B01D** *39/14, 53/04, 53/22*
**U.S. Cl. 55—389** **11 Claims**



1. A respiratory filter element for catastrophic fires and/or smog weather conditions characterized by a fleece-like material that is reinforced with adsorption materials comprising soda lime, active carbon dust, and either copper dust or manga-

nese dioxide dust or both copper dust and manganese dioxide dust, and thus characterized in that the adsorption material is deposited on a base material made of expanded calcium-aluminum-silicate and that the base material is embedded in the fleece-like material.

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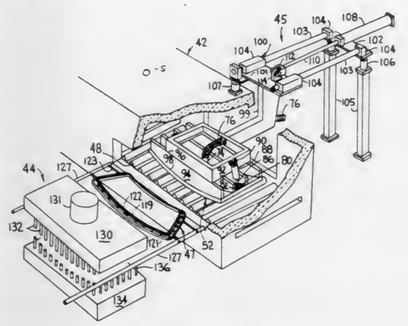
**4,297,118**

## CONTROLLING OVERHEATING OF VACUUM MOLD USED TO SHAPE GLASS SHEETS

**John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Mar. 18, 1980, Ser. No. 131,337**
**Int. Cl.³ C03B *25/035***
**U.S. Cl. 65—104** **10 Claims**



1. A method of shaping a glass sheet, comprising the steps of:
supporting a heated sheet on support means in a shaping chamber having a heated interior, the sheet heated to approximately its shaping temperature;
transferring the heated sheet in the shaping chamber to shaping means to remove the sheet from the support means;
shaping the sheet in the shaping chamber by way of the shaping means;
transferring the shaped sheet from the shaping means to transfer means, said transferring step practiced in the shaping chamber;
advancing the shaped sheet on the transfer means out of the shaping chamber;
cooling the shaped sheet;
removing the shaping means out of the shaping chamber into an environment cooler than the heated interior of the shaping chamber to permit cooling of the shaping means; and
practicing said removing step before practicing said transferring the heated sheet step, shaping step and transferring the shaped sheet step for next subsequent heated sheet on the support means in the shaping chamber.

4. An apparatus for shaping a glass sheet, comprising:
elongated heating means to heat a glass sheet to approximately its shaping temperature, said means including a heated shaping chamber;
first advancing means to advance a sheet from said heating means to said shaping chamber;
means for shaping a sheet;
means for moving said shaping means into and out of said heated shaping chamber;
second advancing means to advance a shaped sheet out of said heated shaping chamber;
first transferring means to transfer a sheet from said first advancing means to said shaping means;
second transferring means to transfer a sheet from said shaping means to said second advancing means;
means responsive to the movement of a said first advancing means for actuating in succession said shaping means, said first transferring means and said second transferring means to move a sheet from said first advancing means to said shaping means, to shape a sheet and to transfer a sheet from said shaping means to said second transferring means;
means for actuating said moving means to move said shaping means out of the shaping chamber after the shaped sheet is transferred to said second advancing means; and
means for activating said second advancing means to move said second advancing means out of said shaping chamber.

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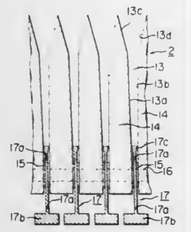
**4,297,119**

## APPARATUS FOR VITRIFYING BLAST FURNACE SLAG

**Ryo Ando, and Kazuyoshi Sato, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 4, 1979, Ser. No. 100,055**
**Int. Cl.³ C03B *5/23***
**U.S. Cl. 65—141** **12 Claims**



1. An apparatus for vitrifying blast furnace slag, comprising:
an endless conveyor belt including a pair of pulleys, said conveyor belt being formed by endlessly connecting a plurality of rectangular cooling metal members, each of said plurality of cooling metal members being of high thermal conductivity and having, on the outer surface thereof, a plurality of elongated narrow and deep cooling grooves, the longitudinal directions of said cooling grooves being substantially in parallel with the travelling direction of said endless conveyor belt, each of said plurality of cooling grooves comprising an outwardly flaring inlet section for receiving a molten blast furnace slag and an inwardly narrowing cooling section, following said inlet section, for rapidly cooling and solidifying the molten blast furnace slag into a vitreous blast furnace slag, said cooling section of each of said cooling grooves having a top end maximum width within the range of from 3 to 10 mm and a depth within the range of from 2 to 20 times said top end maximum width so as to cool the molten blast furnace slag under constraint to thereby produce a large internal strain in the vitrified blast furnace slag, the vitrified blast furnace slag being in the form of elongated sheets having a maximum thickness of 3 to 10 mm;
driving means, connected to at least one of said pair of pulleys, for driving said endless conveyor belt;
a molten slag container arranged above the upstream of the upper forwarding position of said endless conveyor belt, said molten slag container being adapted to receive a molten blast furnace slag discharged from a blast furnace and pour said molten blast furnace slag thus received into said plurality of cooling grooves of said cooling metal member reaching the upstream of the upper forwarding position of said endless conveyor belt along with the travel of said endless conveyor belt;
a stripper arranged, in the upstream of the lower returning position of said endless conveyor belt, at a prescribed position adjacent to the back surface of said endless conveyor belt, said stripper being adapted to take out a cooled and solidified vitreous blast furnace slag in said plurality of cooling grooves of said cooling metal member; and,
a cooling means arranged at a prescribed position in the lower returning position of said endless conveyor belt, said cooling means being adapted to sequentially cool said cooling metal members heated by the high-temperature molten blast furnace slag poured into said cooling grooves after stripping the vitreous blast furnace slag.



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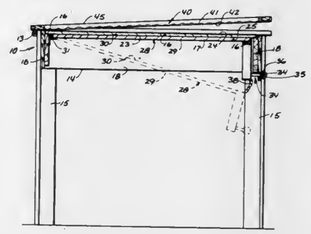
**4,297,120**

## GLASS BENDING TABLE

**Robert J. Smith, S. 1215 Mica Park Dr., Spokane, Wash. 99206; Mark A. Smith; Michael E. Jensen, both of S. 1922 Bannen, Veradale, Wash. 99216, and Robert L. Smith, N. 3950 McGuire Rd., Post Falls, Id. 83854**

**Filed Jul. 28, 1980, Ser. No. 172,994**
**Int. Cl.³ C03B *23/06***
**U.S. Cl. 65—281** **10 Claims**



1. A table for supporting and insulating a flat forming pattern from heated glass tubing to be formed according to the pattern, comprising:
a frame;
a light transmitting plate mounted to the frame, said plate having a flat top surface and a parallel flat bottom surface;
pattern holding means mounted to the frame below the plate for releasably receiving and holding the flat pattern adjacent the flat bottom surface of said plate;
screen means supported on the flat top surface of the plate having a working surface thereon spaced above said flat top plate surface and defining an air space between the working surface and top plate surface;
wherein said screen means is adapted to support heated glass on its working surface for forming purposes according to a flat pattern viewable on said pattern holding means through the plate and screen means.

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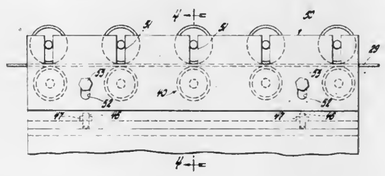
**4,297,121**

## GLASS TEMPERING FURNACES AND SYSTEMS

**Donald E. Rhonehouse, Cecil, Ohio, assignor to TGS Systems, Inc., Antwerp, Ohio**

**Filed May 29, 1979, Ser. No. 43,357**
**Int. Cl.³ C03B *27/00***
**U.S. Cl. 65—348** **20 Claims**



1. A conveyor for a glass-tempering system having a supporting frame section, comprising:
a first elongated glass-supporting conveyor roller;
an upwardly-open roller support;
means mounting said roller support on a frame section;
a second roller rotatably mounted in said roller support with its axis parallel to that of said glass-supporting conveyor roller;
a driving belt extending between said first and second rollers within said roller support and operable to rotate said conveyor roller;
said second roller supporting said driving belt, with said driving belt vertically supporting said first conveyor roller above said second roller;
a roller guide supported upon said roller support;
a vertically-extending upwardly-open guide slot in said roller guide extending in the same vertical plane as the axis of said second roller and being directly above said axis;
said conveyor roller having a projecting axle-like pin received in said guide slot and freely movable vertically therein but restrained horizontally thereby, with said axle-like pin of said conveyor roller being in the same vertical plane as the axle of said second roller;
said roller guide having a portion defining a bottom for said slot;
said second roller being mounted beneath said conveyor roller at a distance with respect to the bottom of said guide slot such that said conveyor roller axle-like pin is maintained above and out of contact with said bottom of said slot;
said conveyor roller being removable by lifting upwardly out of said guide slot whereupon said belt can be removed from said second roller and through said upwardly open roller support; and
drive means for driving said belt.

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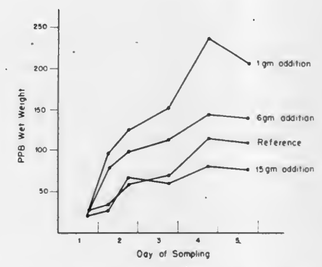
**4,297,122**

## PROCESS FOR THE BIOLOGICAL DEGRADATION OF ORGANIC-CONTAINING WASTE MATTER

**Christopher B. Wallace, Fitchburg, Mass., assignor to Bio-Group, Inc., Va.**

**Filed Apr. 18, 1979, Ser. No. 31,332**
**Int. Cl.³ C05F *7/00*; C02F *3/02***
**U.S. Cl. 71—12** **11 Claims**




1. A biological degradation process for the treatment of organic-containing waste matter for producing a waste matter sludge material, the process containing a step for contacting microorganisms with the organic-containing waste matter, which comprises adding to the organic-containing waste matter a microbial activity and microbial population-enhancing concentration of a mineral composite consisting essentially of a naturally occurring glacial deposit comprising from about 4–48 wt. percent Si, 2–35 wt. percent Ca, 1–20 wt. percent Al, 1–15 wt. percent Fe, 0.5–12 wt. percent Mg, 0.1–8 wt. percent Na, 0.01–5 wt. percent K, 0.001–2 wt. percent Ti, 0.0005–2 wt. percent Mn, 0.0005–2 wt. percent P, 0.0005–1 wt. percent Ba and 0.0005–0.5 wt percent Zn, the mineral composite being in a biologically active size of below about 70% mesh size at 100 mesh, said concentration being below about 1 part by weight mineral composite per 15 parts by weight of organic matter

contained in the waste matter to be treated and above about 1 part by weight mineral composite per 400 parts by weight of organic matter.

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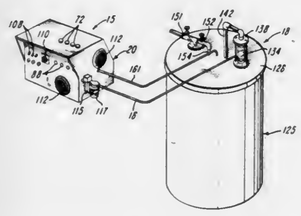
**4,297,123**

## METHOD AND APPARATUS FOR PRODUCING A NITRATE FERTILIZER

**Harold G. Wyse, 3629 N. Dixie Dr., Dayton, Ohio 45414, and Millard S. Smith, 5625 W. Kochville Rd., Saginaw, Mich. 48604**

**Filed Feb. 7, 1980, Ser. No. 119,638**
**The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.**
**Int. Cl.³ B01K *1/00*; C05C *5/00***
**U.S. Cl. 71—58** **21 Claims**



1. A method adapted for efficiently producing a nitrate fertilizer, comprising the steps of forming an air combustion unit including a combustion chamber having a first electrode element defining a circular restriction aperture, arranging a second electrode element concentrically with said aperture, supplying an electrical voltage across said electrode elements to produce an electrical arc therebetween within the aperture, producing a spiral flow of air within the chamber and directing the flow through the restriction aperture at an increased velocity to effect rotation of the arc within the aperture and to assure the air is exposed to the arc for efficiently generating a nitrogen dioxide gas, and introducing the gas from the combustion chamber into a flow of water contained within a tank and being recirculated through an elongated absorption tube having substantial length to produce a nitric acid solution usable as a nitrate fertilizer.

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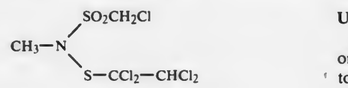
**4,297,124**

## N-TETRACHLORO-ETHYLTHIO-SUBSTITUTED HALOMETHANESULFONAMIDES AS AQUATIC WEED CONTROL AGENTS

**Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Jan. 28, 1980, Ser. No. 115,586**
**Int. Cl.³ A01N *31/02***
**U.S. Cl. 71—66** **2 Claims**

1. A method for controlling the growth of aquatic weeds comprising applying to said aquatic weeds or their growth environment an amount of the compound of the formula



effective to control the growth of said aquatic weeds.

**4,297,125**

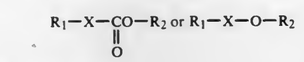
## TREE ROOTING USING SYNTHETIC AUXINS

**Bruce E. Haissig, Rhinelander, Wis.; Jack R. Gaines, Rapid City, S. Dak., and Glen Giacoletto, Richland, Wash., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

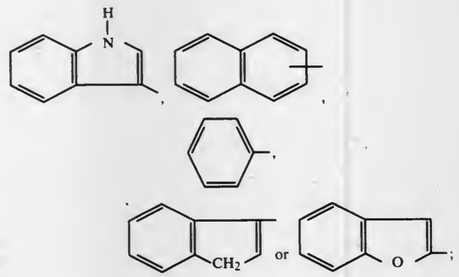
**Filed Jun. 27, 1979, Ser. No. 52,656**
**Int. Cl.³ A01N *21/00***
**U.S. Cl. 71—77** **7 Claims**

1. A composition for stimulating adventitious root formation in difficult-to-root cuttings, comprising:

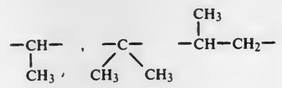
an amount sufficient to stimulate adventitious root formation of a compound of the formula



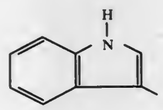
wherein $R_1$ is



X is $(CH_2)_n$ wherein n is 1–3,



or $-O-CH_2-$; and $R_2$ is phenyl or substituted phenyl, with the proviso that n is not 1 when $R_1$ is



and $R_2$ is phenyl; and a volatile or inert non-toxic carrier.

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**4,297,126**

## IMIDAZOLINYL BENZAMIDES AS PLANT GROWTH REGULANTS

**Thomas D. O'Neal, Princeton, N.J., assignor to American Cyanamid Co., Stamford, Conn.**

**Division of Ser. No. 868,090, Jan. 9, 1978, Pat. No. 4,201,565. This application Dec. 17, 1979, Ser. No. 103,898**
**Int. Cl.³ A01N *43/50***
**U.S. Cl. 71—78** **2 Claims**

1. A method for eliminating and/or inhibiting bud growth on tobacco plants comprising, applying to the foliage of topped tobacco plants a bud growth inhibiting amount of the compound o-(5-isopropyl-5-methyl-4-oxo-2-imidazolin-2-yl)-N,N-dimethyl-benzamide.



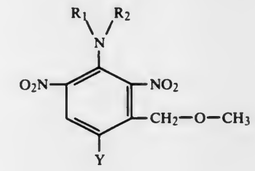
**4,297,127**

## HERBICIDAL USE OF 2,6-DINITROANILINE HERBICIDES

**Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Division of Ser. No. 777,271, Mar. 11, 1977, Pat. No. 4,165,231, which is a continuation-in-part of Ser. No. 639,729, Dec. 11, 1975, abandoned, which is a division of Ser. No. 538,980, Jan. 6, 1975, Pat. No. 4,066,441, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Jan. 8, 1979, Ser. No. 1,660**
**Int. Cl.³ A01N *43/84***
**U.S. Cl. 71—88** **4 Claims**

1. A method for the preemergence control of undesirable plant species comprising applying to soil containing seeds of the undesirable plant species a herbicidally effective amount of a compound of the formula:



wherein:

Y represents $CH_3$, $C_2H_5$, n-$C_3$-$H_7$, i-$C_3$-$H_7$, sec-$C_4H_9$ or i-$C_4H_9$;

$R_1$ and $R_2$ taken together with the nitrogen to which they are attached represent morpholino, or dimethylmorpholino.

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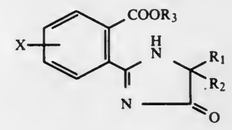
**4,297,128**

## USE OF IMIDAZOLINYL BENZOATES AS HERBICIDAL AGENTS

**Marinus Los, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.**

**Division of Ser. No. 914,244, Jun. 9, 1978, Pat. No. 4,188,487, which is a continuation-in-part of Ser. No. 822,458, Aug. 8, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 74,940**
**Int. Cl.³ A01N *43/50***
**U.S. Cl. 71—92** **25 Claims**

1. A method for the control of undesirable plant species comprising, applying to the foliage of the plants or to soil containing seeds, seedlings or propagating organs of the plants, a herbicidally effective amount of a compound having the structure:



wherein X is hydrogen, alkyl $C_1$–$C_3$, halogen or nitro; $R_1$ is alkyl $C_1$–$C_4$; $R_2$ is alkyl $C_1$–$C_6$, cycloalkyl $C_3$–$C_6$, alkenyl $C_2$–$C_4$, phenyl, halophenyl or benzyl or when $R_1$ and $R_2$ are taken together with the carbon to which they are attached they may represent cycloalkyl $C_3$–$C_6$ optionally substituted with methyl; $R_3$ is hydrogen, alkyl $C_1$–$C_{12}$ optionally substituted with one $C_1$–$C_3$ alkoxy group or one $C_3$–$C_6$ cycloalkyl group or one phenyl group or one furyl group, alkenyl $C_3$–$C_5$ optionally substituted with one or two $C_1$–$C_3$ alkyl group(s) or one phenyl group or with one to two halogen substituent(s) alkynyl $C_3$–$C_5$ optionally substituted with one or two $C_1$–$C_3$ alkyl group(s) or one phenyl group or with one to two halogen substituent(s), benzyl, cyclohexenylmethyl, ethynylcyclohexyl, ethynylallyl or pentadienyl, cycloalkyl $C_3$–$C_6$ optionally substituted with one or two $C_1$–$C_3$ alkyl group(s); or a salt-forming cation of alkali metals, ammonium or $C_1$–$C_{18}$ aliphatic ammonium; and when $R_1$ and $R_2$ are not the same the optical isomer thereof, or an isomeric mixture thereof; or except when $R_3$ is a salt-forming cation, the strong acid addition salt thereof.

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**4,297,129**

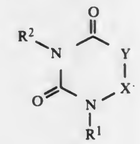
## 3,5-DIOXO-1,2,4-TRIAZINES

**Yuzuru Sanemitsu; Masato Mizutani; Seizo Sumida; Haruhiko Katoh, all of Hyogo; Hiromichi Oshio, Osaka, and Shunichi Hashimoto, Sonehigashimachi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Apr. 25, 1980, Ser. No. 143,549**
**Claims priority, application Japan, Apr. 27, 1979, 54-52968; Aug. 9, 1979, 54-102074; Aug. 17, 1979, 54-105442; Aug. 17, 1979, 54-105443; Aug. 20, 1979, 54-106482; Oct. 30, 1979, 54-140915; Nov. 1, 1979, 54-142539; Nov. 5, 1979, 54-143551; Dec. 7, 1979, 54-159455; Dec. 13, 1979, 54-162305; Dec. 19, 1979, 54-166240; Jan. 14, 1980, 55-2958; Jan. 24, 1980, 55-7544**
**Int. Cl.³ C07D *253/06*; A01N *43/64***
**U.S. Cl. 71—93** **20 Claims**

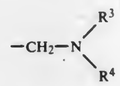
1. A herbicidal composition which comprises as an active ingredient at least one of the 3,5-dioxo-1,2,4-triazine derivatives of the formula:

(I)



wherein

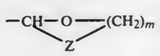
(1) (a) —X—Y— represents —N=CH—, (b) $R^1$ is a hydrogen atom, a hydroxylmethyl group, an aminomethyl group of the formula:



(in which $R^3$ and $R^4$ are each hydrogen, $C_1$–$C_{12}$ alkyl, allyl, propargyl, cyanoethyl, phenyl or $C_3$–$C_{10}$ cycloalkyl or, when taken together with the adjacent nitrogen atom, represent a 3 to 13-membered saturated nitrogen-containing heterocyclic group optionally containing an oxygen atom or an additional nitrogen atom and/or optionally bearing not more than three methyl or ethyl groups), an acyloxymethyl group of the formula:

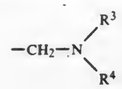
$$-CH_2-OOC-R^5$$

(in which $R^5$ is $C_1$–$C_9$ alkyl, $C_2$–$C_5$ alkenyl, $C_2$–$C_5$ alkynyl or cyclohexyl, these $R^5$ groups being optionally substituted with not more than five halogen, $C_1$–$C_5$ alkoxy, phenyl or phenoxy groups, or phenyl, naphthyl, nicotinyl or isonicotinyl, these being optionally substituted with not more than five methyl, methoxy, halogen, nitro or trihalomethyl groups or with 3,4-methylenedioxy) or a cyclic ether group of the formula:

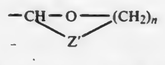


(in which Z is $-CH_2CH_2-$ and m is an integer of 1 or 2

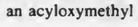
or Z is —CHX'CH$_2$—, —CHX'CHX'— or —CH=CH— (X' being halogen) and m is 1) and (c) $R^2$ is a hydrogen atom, an aminomethyl group of the formula:



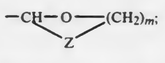
(in which $R^3$ and $R^4$ are each as defined above) or a cyclic ether group of the formula:



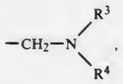
(in which Z' is —CH$_2$CH$_2$— and n is an integer of 1 or 2 or Z is —CHY'CH$_2$— (Y' being halogen) and n is 1), provided that when $R^2$ is a hydrogen atom, $R^1$ is a hydroxymethyl group, an acyloxymethyl group of the formula:



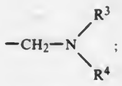
or a cyclic ether group of the formula:



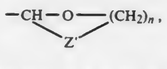
when $R^2$ is an aminomethyl group of the formula:



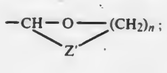
$R^1$ is an aminomethyl group of the formula:



or when $R^2$ is a cyclic ether group of the formula:



$R^1$ is a hydrogen atom or a group of the formula:



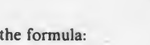
or

(2) (a) —X—Y— represents —NH—CH$_2$—, (b) $R^1$ is a hydrogen atom, an acyloxymethyl group of the formula: —CH$_2$—OOC—R$^6$

(in which $R^6$ is $C_1$-$C_9$ alkyl, cyclohexyl or phenyl, these being optionally substituted with not more than five methyl, methoxy, fluorine, chlorine or trihalomethyl groups or with 3,4-methylenedioxy) or a cyclic ether group of the formula:



(in which p is an integer of 3 or 4) and (c) $R^2$ is a hydrogen atom or a cyclic ether group of the formula:



(in which p is as defined above), provided that when $R^2$ is a cyclic ether group of the formula:



$R^1$ is a hydrogen atom or a cyclic ether group of the formula:



in the free or salt form in a herbicidally effective amount, and at least one inert carrier or diluent.

**11**. A method for exterminating wild oats, which comprises applying a herbicidally effective amount of at least one of the 3,5-dioxo-1,2,4-triazine derivatives as defined in claim 1 in the free or salt form to the area where it is desired to exterminate or control the wild oats.

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**4,297,130**

## METHOD FOR INCREASING THE NUMBER OF PODS IN LEGUMES BY FOLIAR FEEDING

**William P. Moore, Jr., P.O. Box 943, Hopewell, Va. 23860**

**Continuation-in-part of Ser. No. 829,140, Aug. 30, 1977, abandoned. This application Jun. 19, 1979, Ser. No. 50,047**

**Int. Cl.**$^3$ **A01N** *47/28;* **C05C** *9/00*

**U.S. Cl. 71—119** **6 Claims**

**1**. A method for increasing the conversion of flowers of a leguminous plant to seed pods consisting of applying to the foliage of the plant during the flowering period an aqueous spray of a non-burning plant food comprising the condensation product of urea and formaldehyde composed of from 25-50% water-soluble nitrogenous compounds involving unreacted urea and correspondingly from 75-50% water-insoluble nitrogenous compounds capable of progressively degrading to water-soluble compounds under the influence of the urease and other enzymes and microbes present on the foliage.

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**4,297,131**

## PROCESSING OF TITANIFEROUS MATERIALS

**John G. Miller, Philadelphia, Pa., and Thomas C. Schwab, Plainfield, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.**

**Filed Aug. 30, 1979, Ser. No. 71,018**

**Int. Cl.**$^3$ **C22B** *1/08, 3/00*

**U.S. Cl. 75—1 T** **16 Claims**

**1**. A process for extracting titanium from a titaniferous material selected from the group consisting of minerals containing titanium, titaniferous concentrates or tailings arising from beneficiation of minerals containing titanium and titaniferous waste products or by-products of the processing of minerals containing titanium or mixtures thereof, said titaniferous material containing alumina, silica or combinations thereof, which comprises contacting said titaniferous material at a temperature in the range of about 200° to 500° C. with a chlorinating agent consisting essentially of vaporous thionyl chloride to react at least a part of the titanium contained in said titaniferous material to form titanium tetrachloride without substantially consuming silica and alumina components of said titaniferous material, and separating said titanium tetrachloride from the remainder of said titaniferous material.

**11**. A process for extracting titanium from a titaniferous material selected from the group consisting of minerals containing titanium, titaniferous concentrates or tailings arising from beneficiation of minerals containing titanium and titaniferous waste products or by-products of the processing of minerals containing titanium or mixtures thereof which comprises contacting said titaniferous material with vaporous thionyl chloride and elevated temperature to react at least a part of the titanium contained in said titaniferous material to form titanium tetrachloride, and separating said titanium tetrachloride from the remainder of said titaniferous material by extraction with a solvent.

**12**. A process for extracting titanium from a hydrated clay containing a colored titanium oxide as a minor impurity which comprises reacting said clay with vaporous thionyl chloride at elevated temperature to convert at least a part of the titanium contained in said hydrated clay to titanium tetrachloride, the temperature of reaction being insufficient to permanently dehydrate said clay, and separating said titanium tetrachloride from the remainder of said hydrated clay.



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**4,297,132**

## ELECTROSLAG REMELTING METHOD AND FLUX COMPOSITION

**Balaji V. Patil, and Joseph W. Tommaney, both of Sarver, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.**

**Filed Feb. 25, 1980, Ser. No. 124,002**

**Int. Cl.**$^3$ **C22B** *4/00;* **B22D** *27/02*

**U.S. Cl. 75—10 V** **24 Claims**

**1**: A method for electroslag remelting an electrode of an alloy containing oxide forming ingredients, comprising the steps of:

preparing a mixture consisting essentially of at least one compound selected from the group consisting of barium fluoride, calcium fluoride, magnesium fluoride, magnesium oxide, calcium oxide, aluminum oxide, and mixtures thereof,

providing about 1 to 5% boron oxide, by weight, in the mixture,

fusing the mixture to form a flux composition,

bringing the electrode of the alloy to be remelted into contact with the flux composition,

generating sufficient heat in the flux composition to melt the electrode by passing electric current through the flux composition to the electrode, so that the molten alloy passes through the flux composition,

collecting the molten alloy, and

cooling the collected molten alloy to a temperature below the melting point of the alloy.

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**4,297,133**

## METHOD AND MEANS FOR ADDING TREATING AGENT FOR MOLTEN METAL

**Kenji Fujii, Nishinomiya, Japan, assignor to Yoshida Iron Works Co., Ltd., Hyogo, Japan**

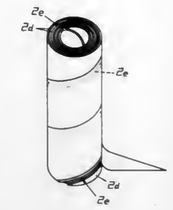
**Continuation of Ser. No. 907,587, May 19, 1978, Pat. No. 4,200,456, which is a continuation-in-part of Ser. No. 799,000, May 20, 1977, abandoned. This application Mar. 4, 1980, Ser. No. 127,203**

**Claims priority, application Japan, Jul. 15, 1976, 51/84806; Jul. 22, 1976, 51/87983; Jul. 23, 1976, 51/88373; Sep. 16, 1976, 51/111521; Sep. 16, 1976, 51/111522; Sep. 16, 1976, 51/111523**

**Int. Cl.**$^3$ **C22B** *9/00*

**U.S. Cl. 75—53** **13 Claims**

**1**. A member for adding a treating agent for molten metal, comprising a paper tube formed of kraft paper wound in layers, an air layer being formed between adjacent paper layers, a lid and a weight which are made of a metal for tightly closing




opposite ends of said paper tube, and a treating agent packed in said paper tube.

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**4,297,134**

## METHOD OF RECOVERING GOLD

**Keita Yamada, Asaka Riken Kohyo Co., Ltd., 47 Aza Maseguchi, Tamura-cho, Kanaya, Koriyama, Fukushima-ken, Japan**

**Filed Jul. 3, 1980, Ser. No. 165,716**

**Claims priority, application Japan, Dec. 27, 1979, 54-173793**

**Int. Cl.**$^3$ **C22B** *11/06*

**U.S. Cl. 75—118 R** **3 Claims**

**1**. A process for recovering gold from a raw material containing gold comprising the steps of treating the raw material with either aqua regia or 6.0 to 6.5 normal hydrochloric acid to form chloroauric acid; extracting the chloroauric acid with an organic solvent selected from the group consisting of ethyl ether, methyl isobutyl ketone and a mixture of methyl isobutyl ketone and isoamyl acetate; separating and washing the organic solvent; stripping the gold contained in the organic solvent into an aqueous phase as gold hydroxide by adding a 30 to 50% solution of NaOH or NH$_4$OH to the organic solvent and agitating the resulting mixture; separating the aqueous layer; reacting the gold hydroxide in the aqueous layer with 3 to 5 normal hydrochloric acid to form chloroauric acid; reducing the chloroauric acid to precipitate the gold; and separating and recovering the gold.

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**4,297,135**

## HIGH STRENGTH IRON, NICKEL AND COBALT BASE CRYSTALLINE ALLOYS WITH ULTRAFINE DISPERSION OF BORIDES AND CARBIDES

**Bill C. Giessen, Cambridge, Mass.; Donald E. Polk, Washington, D.C., and Ranjan Ray, Waltham, Mass., assignors to Marko Materials, Inc., North Billerica, Mass.**

**Filed Nov. 19, 1979, Ser. No. 95,383**

**Int. Cl.**$^3$ **C22C** *19/05, 38/22*

**U.S. Cl. 75—123 B** **10 Claims**

**1**. A crystalline metal alloy of the formula $M_aR_bX_c$ where M is at least one element selected from the group consisting of iron, nickel, cobalt and chromium and mixtures thereof, R is at least one element selected from the group consisting of zirconium, tantalum, niobium, molybdenum, tungsten, titanium and vanadium and mixtures thereof and X is at least one element selected from the group consisting of boron, silicon and carbon and mixtures thereof, wherein a, b and c are atomic percentages ranging from 85 to 95, 1 to 12 and 3 to 12, respectively, and boron is present at the level of at least 3 at %, said alloy having been prepared from the melt thereof by a rapid solidification process characterized by cooling rates in the range of about $10^5$°to $10^7$ ° C./sec, said alloy subsequently subjected to the application of heat thereto and characterized by a fine grained microstructure with primary grains having an average grain size of less than about 10 microns with a substantially uniform dispersion of ultra fine particles of borides in the fine primary metallic grains, said ultra fine particles having a characteristic particle size of less than 0.5 micron and being dis-

persed throughout the inside of the primary grains and along the grain boundaries.

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**4,297,136**

## HIGH STRENGTH ALUMINUM ALLOY AND PROCESS

**Joseph R. Pickens, Ringwood, N.J.; Robert D. Schelleng, Suffern; Stephen J. Donachie, New Windsor, both of N.Y., and Thomas J. Nichol, Cheshire, Conn., assignors to The International Nickel Co., Inc., New York, N.Y.**

**Filed Oct. 16, 1978, Ser. No. 951,590**
**Int. Cl.³ B22F *3/14, 3/00***
**U.S. Cl. 75—206** **22 Claims**

1. In a process for treating a dispersion-strengthened mechanically alloyed aluminum consisting essentially, by weight, of a small but effective amount for increased strength up to about 7% magnesium, up to about 2½% carbon, up to about 4% oxygen, and the balance essentially aluminum and said dispersoid content being a small but effective amount of dispersoid for improved strength up to about 8½ volume %, comprising working said aluminum at an elevated temperature to form a hot worked product having a required strength, the improvement comprising:

(a) selecting as the initial charge material a dispersion-strengthened mechanically alloyed aluminum material having in compacted form prior to working, a room temperature strength at least equal to the room temperature strength of the hot worked product, said charge material having the property in a temperature range up to incipient melting of increased workability with increasing working temperature;

(b) determining the working temperature-strength profile of the selected charge material, said profile being charterized by an overall decrease in strength relative to the working temperature; and

(c) working the charge material at a temperature selected with reference to the working temperature-strength profile to optimize the workability of the charge material and the strength of the hot worked product.

11. A process for treating a dispersion-strenghthened mechanically alloyed aluminum consisting essentially, by weight, of a small but effective amount for increased strength up to about 7% magnesium, up to about 2½% carbon, about 0.3% up to about 4% oxygen, and the balance essentially aluminum, the improvement comprising working said aluminum at an elevated temperature to form a worked product of required strength, wherein said aluminum is characterized by increased workability as temperature increases within a temperature range up to incipient melting of said aluminum, and wherein said aluminum is characterized by a working temperature-strength profile for extrusion equivalent to the pattern of FIG. 1 and an extrusion ratio strength pattern equivalent to FIG. 2 Curve A, which comprises:

(a) selecting as the initial charge material a dispersion-strengthened mechanically alloy aluminum having in compacted form prior to working a room temperature tensile strength at least equal to the room temperature strength of the how worked product; and

(b) extruding the charge material at a temperature selected with reference to the working-strength profile equivalent to the pattern shown in FIG. 1 to optimize the workability of the charge material and strength of the worked product.

**4,297,137**

## ANTI-FOULING PAINT

**Jean-Pierre Sachetto, Saint-Julien-en-Genevois, France, and Sergio Cuccolo, Geneva, Switzerland, assignors to Centre National pour l'Exploitation des Oceans, Paris, France**

**Continuation of Ser. No. 885,850, Mar. 13, 1978, abandoned. This application Jun. 20, 1980, Ser. No. 161,242**
**Claims priority, application France, Mar. 15, 1977, 77 07626**
**Int. Cl.³ C09D *5/14***
**U.S. Cl. 106—15.05** **5 Claims**

1. In an anti-fouling paint for application to structures immersed in sea water to inhibit attachment of marine organisms to the structures, the paint containing a vehicle comprising a film-forming resin, solvent and a toxic substance; the improvement comprising, as said toxic substance, cuprous oxide or an organic tin compound uniformly dispersed in a discontinuous solid matrix selected from the group consisting of coagulated albumin and regenerated cellulose in the form of a gel, said matrix being insoluble in sea water having no marine organisms or bacterial film, and which becomes soluble in sea water only after being contacted by enzymes produced by the marine organisms and/or the bacterial film,

whereby said matrix dissolves and releases said toxic substance only in the presence of the marine organisms and/or the bacterial film.

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**4,297,138**

## COPOLYCONDENSATION PRODUCTS OF β-HALOALKYL PHOSPHATES AND DIALKYL PHOSPHONATES

**Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Division of Ser. No. 858,316, Dec. 7, 1977, Pat. No. 4,152,371, which is a division of Ser. No. 811,972, Aug. 5, 1977, Pat. No. 4,086,303, and a continuation-in-part of Ser. No. 783,995, Apr. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 558,862, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,583, Nov. 12, 1973, abandoned. This application Jan. 2, 1979, Ser. No. 231**
**Int. Cl.³ C08K *5/53;* C09D *5/18;* D21H *5/00***
**U.S. Cl. 106—18.18** **10 Claims**

1. A flame retardant composition comprising in admixture a polymer and, as a flame retardant, a copolycondensation product of a beta-haloalkyl phosphate having from 2 to 4 carbon atoms in the alkyl moiety and a dialkyl phosphonate of the formula

where R′ is alkyl of from 1 to 20 carbon atoms, alkenyl of from 3 to 20 carbon atoms, or phenyl optionally substituted with alkyl of from 1 to 4 carbon atoms and/or halogen, and R is alkyl of from 1 to 4 carbon atoms, said product being obtained by heating the phosphate with the dialkyl phosphonate until at least about one molar equivalent of alkyl halide is evolved.

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**4,297,139**

## INORGANIC GELS AND CERAMIC PAPERS, FILMS, FIBERS, BOARDS, AND COATINGS MADE THEREFROM

**George H. Beall, Big Flats; David G. Grossman, Corning; Syed N. Hoda, Horseheads, and Karen R. Kubinski, Elmira Heights, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 23,907, Mar. 26, 1979, Pat. No. 4,239,519. This application Jun. 25, 1980, Ser. No. 162,764**
**Int. Cl.³ C03C *3/22***
**U.S. Cl. 501—2** **9 Claims**

1. Inorganic gels containing a polar liquid and relatively uniformly-sized crystals consisting essentially of a lithium and/or sodium water-swelling mica selected from the group of fluorhectorite, hydroxyl hectorite, boron fluorphlogopite, hydroxyl boron fluorphlogopite, and solid solutions among those and between those and other structurally-compatible species selected from the group of talc, fluortalc, polylithionite, fluorpolylithionite, phlogopite, and fluorphlogopite, at least a substantial portion of said crystals exhibiting a morphology of a continuum of flakes, rectangular-like strips, and interwoven ribbons in parallel or sub-parallel zones or sheaths with said strips and ribbons being about 0.5–10 microns long, about 500 A–5000 A wide, and less than about 100 A thick, and said flakes being irregularly shaped with diameters between about 0.5–10 microns and cross sections of less than about 100 A.



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**4,297,140**

## CERAMIC FOAM CEMENT

**Robert J. Paisley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed Jul. 3, 1980, Ser. No. 165,647**
**Int. Cl.³ C04B *33/00***
**U.S. Cl. 428—310** **15 Claims**

1. A foamable particulate ceramic cement capable of forming a sintered cordierite foamed ceramic mass and consisting essentially, by weight, of:

1–40% cordierite grog,

99–60% ceramic base material and an effective amount of a foaming agent to effect foaming of the cement upon firing to produce the foamed ceramic mass,

the base material being raw ceramic material that has an analytical molar composition consisting essentially of:

1.7–2.4 MO·1.2–2.4 $Al_2O_3$ ·4.5–5.4 $SiO_2$ wherein MO comprises, as mole % of MO, about 0–55% MgO and at least 45% MnO, and

the grog being ceramic material that has been previously fired and comminuted, and that has an analytical molar composition consisting essentially of about:

1.7–2.4 RO·1.9–2.4 $Al_2O_3$ ·4.5–5.2 $SiO_2$ wherein RO comprises, as mole % of RO, MnO in an amount of 0% up to a mole % that is about 20 mole % lower than the mole % of MO that is MnO and the balance is substantially MgO.

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**4,297,141**

## OPTICAL GLASS FOR OPTICAL PATHS

**Shinobu Tokunaga, Yono, and Yuichi Shiina, Warabi, both of Japan, assignors to Sumita Optical Glass Manufacturing Co., Ltd., Japan**

**Continuation-in-part of Ser. No. 69,107, Aug. 21, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,481**
**Claims priority, application Japan, Sep. 5, 1978, 53-108882; Apr. 9, 1979, 54-42921**
**Int. Cl.³ C03C *3/04, 3/08***
**U.S. Cl. 501—67** **1 Claim**

1. An optical glass for an optical path having a refractive index of at least 1.55, an Abbe number of at least 48 and a specific gravity of at most 2.90, which consists essentially of

| | |
|---|---|
| $SiO_2$ | 55 to 65% by weight |
| $B_2O_3$ | 0 to 10 |
| $TiO_2 + ZrO_2$ | 1 to 5 |
| $TiO_2$ | 0 to 5 |
| $ZrO_2$ | 0 to 5 |
| $CaO + ZnO$ | 20 to 33 |
| CaO | 5 to 20 |
| ZnO | 3 to 20 |
| $Al_2O_3$ | 0 to 4 |
| at least one of | |
| $R_2O$ ($Li_2O$, $Na_2O$, $K_2O$) | 5 to 9 |
| $As_2O_3$ | 0 to 1 |

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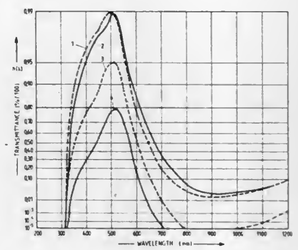
**4,297,142**

## OPTICAL COLORED AND FILTER GLASS

**Willy Ritze, Mainz, Fed. Rep. of Germany, assignor to Jenaer Glaswerk, Schott & Gen., Mainz, Fed. Rep. of Germany**

**Filed Jun. 16, 1980, Ser. No. 159,700**
**Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926721**
**Int. Cl.³ C03C *3/16, 3/24***
**U.S. Cl. 501—77** **7 Claims**



1. A low alkali, high phosphate and high $Al_2O_3$ content glass suitable for optical colored and filter glasses characterized by having a glass transformation temperature Tg>450° C. and consisting essentially of the following composition, in percent by weight:

| | |
|---|---|
| $P_2O_5$ | 71.0–76.0 |
| $SiO_2$ | 0.25–2.5 |
| $B_2O_3$ | 2.4–3.75 |
| $Al_2O_3$ | 8.6–11.6 |
| $R_2O$ (alkali oxide) | 1.25–6.5 |
| CaO | 0.5–1.65 |
| MgO | 2.0–3.5 |
| Refining Agent | 0.2–0.6 |
| $CeO_2$ | 0.1–0.4 |
| F′ | 0.2–0.4 and |
| CuO | 1.0–10.0. |

7. The composition according to any one of claims 1 thru 6 in the form of an optical filter glass.

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**4,297,143**

## TEMPERATURE STABILIZED SILICON DIOXIDE-MIXED OXIDE, THE PROCESS FOR ITS PRODUCTION AND USE

**Peter Kleinschmit, Hanau, and Rudolf Schwarz, Alzenau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Jul. 31, 1980, Ser. No. 174,341**
**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1979, 2931810**
**Int. Cl.³ C04B *35/14;* C01B *33/12***
**U.S. Cl. 501—103** **26 Claims**

1. Pyrogenically produced, temperature stabilized silicon dioxide-mixed oxide having a BET surface of 50 to 400 $m^2/g$, the other component of the mixed oxide being

0.01 to 10 weight % zirconium dioxide or

0.01 to 10 weight % ferric oxide or

0.1 to 9.9 weight % titanium dioxide.

19. A process of preparing a stabilized silicon dioxide-mixed oxide having a BET surface of 50 to 400 $m^2/g$, the other component of the mixed oxide being

0.01 to 10 weight % zirconium dioxide or

0.01 to 10 weight % ferric oxide or

0.1 to 9.9 weight % titanium dioxide and

wherein the silicon dioxide is stabilized up to a temperature of 1150° C. against reduction in surface area to below 50 $m^2/g$, comprising vaporizing silicon tetrachloride, diluting it with

preheated air in the ratio of 0.5 to 1.2 kg of silicon-tetrachloride to 0.8 to 1.2 $Nm^3$ of air, supplying it to a burner having a mixing chamber, mixing the diluted silicon tetrachloride in the mixing chamber with hydrogen and vapor form ferric chloride, zirconium tetrachloride or titanium tetrachloride in the ratio as to give an silicon dioxide-other component mixed oxide containing

0.01 to 10% zirconium dioxide or
0.1 to 10% ferric oxide or

0.1 to 9.9% titanium dioxide,

and wherein the ratio of hydrogen to the total of silicon tetrachloride and the chloride of the other element is 0.8 to 1.5 $Nm^3$ of hydrogen to 2.8 to 3.3 kg of total chlorides, buring the 4-component mixture in a reaction chamber, separating the solid silicon dioxide-mixed from the gaseous reaction products and freeing the solid silicon dioxide-mixed oxide from adhering hydrogen chloride by heating in moist air.

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**4,297,144**

## HIGH SPEED CORRUGATING ADHESIVES

**Gary H. Klein, LaGrange; Howard L. Arons, LaGange Park; Joseph F. Stejskal, Brookfield; Donald G. Stevens, Clarendon Hills, and Henry F. Zobel, Darien, all of Ill., assignors to CPC International Inc., Inglewood Cliffs, N.J.**

**Continuation of Ser. No. 795,253, May 9, 1977, abandoned, which is a division of Ser. No. 598,095, Jul. 22, 1975, abandoned.**
**This application Aug. 13, 1979, Ser. No. 66,269**
**Int. Cl.³ C08L** *1/26, 3/06;* **C09J** *3/06*
**U.S. Cl. 106—197 C** **15 Claims**

1. In a process for the preparation of a corrugating adhesive composition of the no-carrier type, comprising the steps of preparing a heated reaction mixture of ungelatinized starch material, water and alkali, allowing the reaction to proceed until a Stein-Hall viscosity of about 20 to about 90 seconds is reached, and adding a reaction stopper to the mixture, the improvement which consists of replacing at least a portion of the starch material with a saponifiable starch ester derived from a non-waxy grain source characterized as having at least about 30% greater area under an Instron force-time heating curve, and at least about 30% greater area under an Instron force-time cooling curve compared with unmodified corn starch under the same test conditions and having a saponifiable D.S. of at least about 0.015.

4. An adhesive composition for use in a high speed corrugating process which comprises an aqueous dispersion of the reaction product of:

(1) a starch material formed by saponfication of a starch ester derived from a non-waxy grain source having a saponifiable degree of substitution of at least about 0.015 and characterized as having at least about 30% greater area under an Instron force-time heating curve and at least about 30% greater area under an Instron force-time cooling curve than unmodified corn starch under the same test conditions; and
(2) an amount of alkali sufficient to substantially completely saponify said ester and to render said composition effective in said process.

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**4,297,145**

## SILANE/FILLER PREPARATIONS, PROCESS FOR THEIR PRODUCTION AND THEIR USE

**Siegfried Wolff, Bornheim-Merten; Lothar Rothbühr, Hürth-Hermülheim, and Heinz Grewatta, Cologne, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Aug. 14, 1980, Ser. No. 178,159**
**Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933346**
**Int. Cl.³ C09C** *1/28*
**U.S. Cl. 106—308 Q** **23 Claims**

1. A silane/filler preparation, consisting essentially of from 5 to 70% by weight of at least one silane corresponding to the following formula

$$X_p—C_mH_{2m+1-p}SiR_n^1(OR)_{3-n}, \qquad I$$

in which

X=a halogen atom
p=1 or 2,
m=1 to 5,
$R^1$=a $C_1$- to $C_5$-alkyl group, a $C_5$- to $C_8$-cycloalkyl group or the phenyl group,
R=a $C_1$- to $C_5$-alkyl group, a $C_5$- to $C_8$-cycloalkyl group, the phenyl group, the benzyl group or a $C_1$- to $C_5$-alkoxy-$C_1$- to $C_5$-alkyl group, and
n=0, 1 or 2,

and—respectively balanced to 100%—from 95 to 30% by weight of at least one inorganic filler based on the two components.

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**4,297,146**

## METHOD FOR THE PRODUCTION OF POWDERED DEXTROSE

**Yoshinari Mise, Inagi, and Eijiro Tomimura, Tokyo, both of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.**

**Filed Oct. 4, 1976, Ser. No. 729,325**
**Int. Cl.³ C13F** *1/02, 3/00*
**U.S. Cl. 127—60** **8 Claims**

1. A method for the production of powdered dextrose containing a substantial portion of anhydrous β-dextrose from an aqueous solution containing dextrose comprising the steps of:

(a) concentrating said solution containing dextrose to a concentration of within the range of about 90% and about 98%, by weight dry substance;
(b) introducing into said concentrated solution at least about 0.2%, by weight of sugar, of seed crystals containing β-dextrose at a temperature above about 80° C.; and
(c) vacuum dehydrating said concentrated solution with stirring while maintaining said temperature above about 80° C. to remove free water.

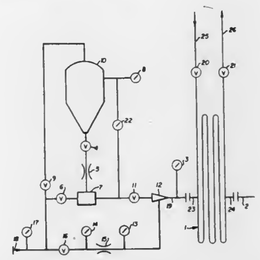


**4,297,147**

## METHOD FOR DECOKING FIRED HEATER TUBES

**David J. Nunciato, Missouri City, Tex.; Norman H. White, Huntington Beach, Calif., and William A. Woodburn, Kingwood, Tex., assignors to Union Carbide Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 906,748, May 17, 1978, Pat. No. 4,203,778. This application Apr. 24, 1980, Ser. No. 143,333**
**The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.**
**Int. Cl.³ B08B** *9/02*
**U.S. Cl. 134—7** **12 Claims**



1. A method for decoking fired heater tubes used in hydrocarbon or chemical processing, while maintaining the integrity of the straight sections of tube walls and the return bends of said fired heater tubes, or of said tubes having equivalent continuous helical tube configurations, comprising:

(a) establishing a gas inlet to and a gas outlet from said fired heater tubes having straight sections of tube walls and return bends, or equivalent continuous helical tube configurations;
(b) injecting a purge gas stream into the inlet while the outlet is open to the atmosphere to purge the tubes of loose debris until the effluent is essentially clear;
(c) entraining impact resistant, non-angular, non-abrasive particles into a propelling gas stream at a concentration of from about 0.1 to about 10.0 pounds of particles per pound of propellant;
(d) introducing the impact resistant, non-angular, non-abrasive particle entrained gas stream into the inlet of said fired heater tubes having straight sections and return bends, or equivalent continuous helical tube configurations, while the outlet remains open to the atmosphere at a gas flow rate corresponding to an outlet gas velocity of from about 5,000 feet per minute up to the sonic velocity of said propelling gas;
(e) maintaining the flow of the gas stream in step (d) for a sufficient time to effect decoking of said tubes;
(f) discontinuing the entraining of impact resistant, non-angular, non-abrasive particles into said propelling gas stream;
(g) continuing the flow of propelling gas into said tubes to clear such tubes of loose coke debris; and
(h) repeating steps (c), (d), (e) and (f) until the tubes are clean, as evidenced by an essentially coke-free clear effluent from the outlet, whereby grinding—type abrasion of the straight sections of tube walls and gouging—type abrasion of the return bends, or of equivalent continuous helical tube configurations, are eliminated.

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**4,297,148**

## MASONRY CLEANING PROCESS AND COMPOSITION

**Panagiotis Zervopoulos, 514 Pape Ave., Toronto, Canada (M4K 3R2)**

**Filed Apr. 14, 1980, Ser. No. 139,942**
**Claims priority, application Canada, Apr. 17, 1979, 325783**
**Int. Cl.³ B08B** *3/08*
**U.S. Cl. 134—3** **5 Claims**

4. A method of cleaning masonry surfaces comprising: applying to said surface, for a predetermined time sufficient to loosen deposits therefrom, a composition comprising, by weight, about 8 to 30% sulphuric acid; about 23 to 30% hydrogen fluoride; about 0.1 to 0.2% chromic acid; about 0.9 to 1.8% water miscible wetting agent, and the balance water, and then washing said surface with water.

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**4,297,149**

## METHOD OF TREATING SIPOS PASSIVATED HIGH VOLTAGE SEMICONDUCTOR DEVICE

**Patrick R. Koons, Round Rock, Tex., and John M. S. Neilson, Mountaintop, Pa., assignors to RCA Corporation, New York, N.Y.**

**Filed May 5, 1980, Ser. No. 146,380**
**Int. Cl.³ H01L** *21/265, 21/205;* **G06F** *15/46*
**U.S. Cl. 148—1.5** **6 Claims**

1. In a process of fabricating a semiconductor device having oxygenated polycrystalline silicon passivation layers the improvement comprising:

annealing the devices at at least 525° C. prior to metallization;
cooling the devices rapidly through the 500° C. to 450° C. temperature range at the end of said annealing;
preventing the devices from subsequently being heated to any temperature higher than 425° C.; and
preventing the devices from being exposed to any temperature above 400° C. for longer than a total of ten minutes subsequent to the annealing whereby the devices will have near the maximum breakdown voltage of which their structure is capable.

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**4,297,150**

## PROTECTIVE METAL OXIDE FILMS ON METAL OR ALLOY SUBSTRATE SURFACES SUSCEPTIBLE TO COKING, CORROSION OR CATALYTIC ACTIVITY

**Alan I. Foster, Ashford; Malcolm L. Sims, Hersham, and Dennis Young, Staines, all of England, assignors to The British Petroleum Company Limited, London, England**

**Filed Jun. 27, 1980, Ser. No. 163,866**
**Claims priority, application United Kingdom, Jul. 7, 1979, 23787/79**
**Int. Cl.³ C23C** *7/02*
**U.S. Cl. 148—6.3** **14 Claims**

1. A process for forming protective films on a structural metal or alloy substrate surface which comprises first pre-oxidising the surface at an elevated temperature in an oxidixing atmosphere and then depositing on the preoxidised substrate surface a film of a high temperature stable, non-volatile oxide of a metal selected from calcium, magnesium, aluminium, gallium, titanium, zirconium, hafnium, tantalum, niobium and chromium by thermal decomposition from the vapour phase of a volatile compound of the metal having at least one metal-oxygen bond in admixture with an inert or oxygenated carrier gas in contact with the pre-oxidised surface.

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**4,297,151**

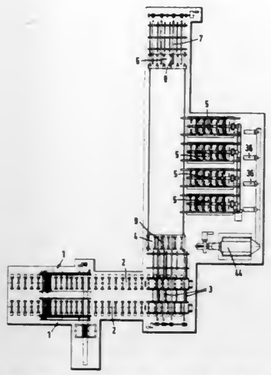
## METHOD FOR DIVIDING A STRAND INTO SLABS

**Erich Höffken, Dinslaken; Werner Kleine-Kleffmann; Rolf Bertram, both of Duisburg; Karl-Heinz Abele, Dinslaken, and Günter Michalski, Kamp-Lintfort, all of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vormals August Thyssen-Hutte, Duisburg, Fed. Rep. of Germany**

**Division of Ser. No. 884,788, Mar. 9, 1978, Pat. No. 4,208,039.**
**This application Dec. 18, 1979, Ser. No. 104,991**
**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1977, 2710564; Mar. 11, 1977, 2710574**
**Int. Cl.³ B23K** *7/00*
**U.S. Cl. 148—9 R** **3 Claims**

1. A method of cutting a cast strand into longitudinal sections which comprises initially severing said strand transversely to form a slab, transporting said slab to a first longitudi-

nal cutting means, longitudinally cutting said slab in said first longitudinal cutting means, cutting said strand transversely a second time to form a second slab, transporting said second



slab to a second longitudinal cutting means, longitudinally cutting said second slab in said second longitudinal cutting means and recovering longitudinally cut slabs from said first and second longitudinal cutting means.

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**4,297,152**

## ENERGETIC MONOPROPELLANT

**Milton B. Frankel, Tarzana; Harry A. Arbit, Encino; Glen D. Artz, Canoga Park, and John C. Gray, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jan. 10, 1980, Ser. No. 110,888**
**Int. Cl.³ C06B *25/00***
**U.S. Cl. 149—88** **4 Claims**

1. A liquid monopropellant composition comprising a mixture of bis (2,2-dinitropropyl) acetal, bis (2,2-dinitropropyl) formal and bis (2,2,2-fluorodinitroethyl) formal.

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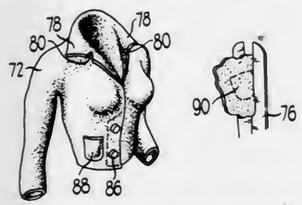
**4,297,153**

## METHOD AND APPARATUS FOR MAKING DOLL CLOTHING AND DOLL HOUSE ACCESSORIES

**Erick E. Erickson; Allison W. Katzman, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.**

**Continuation-in-part of Ser. No. 10,806, Feb. 9, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 160,917**
**Int. Cl.³ B44C *3/02*; B29C *13/04*; A41D *1/00***
**U.S. Cl. 156—63** **15 Claims**



1. A method for making doll house accessories which comprises the steps of:

providing a mold having physical dimensions similar to a portion of the accessory to be formed;

applying a water soluble resinous film forming liquid to the surfaces of said mold;

forming a plastic film on said surfaces by allowing said liquid to dry;

removing the finished accessory from the mold; and

attaching decorative elements to said plastic film by moistening the contact surface of said film to which said element is to be attached.

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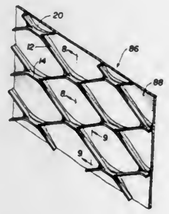
**4,297,154**

## METHOD OF MANUFACTURING EXPANDED REINFORCING SHEET MATERIAL

**Robert N. Keller, Utica, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.**

**Division of Ser. No. 10,791, Feb. 9, 1979, Pat. No. 4,259,385. This application Nov. 3, 1980, Ser. No. 203,382**
**Int. Cl.³ B32B *31/16, 3/24***
**U.S. Cl. 156—79** **41 Claims**



1. A method of reinforcing an article, the method comprising,

bonding a layer of a foamable adhesive material to at least one surface of a flat sheet of structural material capable of being formed into an expanded sheet,

forming a series of laterally spaced lines of slits through the sheet of structural material and the adhesive material bonded thereto with the slits in each line being spaced from one another and being offset longitudinally with respect to the slits in adjacent lines of slits,

simultaneously expanding the sheet of structural material and the foamable adhesive bonded thereto by spreading said slits to form a uniform pattern of generally diamond-shaped openings in the sheet of structural material and foamable adhesive,

positioning the expanded structural sheet having the foamable adhesive thereon in contact with the article to be reinforced, and

activating the foamable adhesive material to enlarge its volume and form a bond between the expanded structural sheet and the article.

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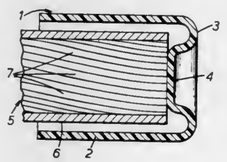
**4,297,155**

## HEAT-SHRINKABLE HOLLOW ARTICLE

**James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Filed Feb. 3, 1978, Ser. No. 875,110**
**Int. Cl.³ B29C *27/00*; H02G *15/02*; F10L *57/00*; B65D *59/06***
**U.S. Cl. 156—86** **3 Claims**



1. A process for covering the end of a cable comprising



positioning over the end of the cable a heat-recoverable cap having a closed end and an open end and a dimensionally heat-unstable boss projecting into the internal cavity of the cap from said closed end of the cap so that the end of the cable abuts the boss, and heating the cap including the boss to cause the cap to shrink about the cable end and to cause the boss to retract to a dimensionally heat-stable form to leave a gap between the end of the cable and the closed end of the cap, wherein the boss in its dimensionally heat-stable form does not project into said gap.

2. A heat-recoverable hollow cap having a wall defining a closed end and an open end, at least a portion of the wall being heat-unstable, the open end of the cap affording access to a relatively large internal cavity of relatively large circumference, the heat-unstable wall of the cap defining the shape of the relatively large internal cavity and being shaped to provide a boss which projects into said relatively large internal cavity from said closed end, at least part of the boss being in a dimensionally heat-unstable form, wherein upon heating of the cap to cause recovery thereof, the heat-unstable wall of the cap recovers to form a relatively small internal cavity of relatively small circumference compared to the circumference of the relatively large internal cavity, such recovery resulting in the boss being in a dimensionally heat-stable form that projects less into the relatively small internal cavity than the boss projects into the relatively large internal cavity.

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**4,297,156**

## PROCESS FOR MANUFACTURE OF WALL COVERINGS AND WALL COVERINGS THUS OBTAINED

**Joël Dalle, Bondues, France, assignor to Dalle & Cie, S.A., Wervicq, France**

**Filed Feb. 1, 1979, Ser. No. 8,581**
**Claims priority, application France, Feb. 24, 1978, 78 06257**
**Int. Cl.³ B32B *7/08***
**U.S. Cl. 156—93** **1 Claim**

1. Process of manufacture of a complex providing a wall covering and composed of an element of textile nature associated with a support of dimensionally indeformable material on which support the textile element is fixed by fusion of a film of thermoplastic material interposed between the textile element and the support, the steps of forming the textile element on a crocheting machine for the deposit of at least one warp band of threads or meshes in zigzags the peaks of which are substantially perpendicular to the direction of advance of the work, prefixing the warp in position by chain stitching parallel to the direction of advance of the work, forming the textile element in at least one layer exactly to the width of the final covering, stabilizing the textile element in width and straightness by supplying the machine with a support and fusible film of greater width than that of the said element, prefixing the warp to the support and film by the chain stitching which also positions the sections of the warp, locating certain of said chain stitching on the warp along each edge of the warp to prevent the marginal portions of the warp from moving before fixing by fusion of the film and in such a way that each edge stitching of the warp provides a line of precutting of the support and of its film to facilitate the ultimate tearing away of the excessive width of the support, and then heating the warp fiber and support to fuse the film and positively fix the textile element on the support.

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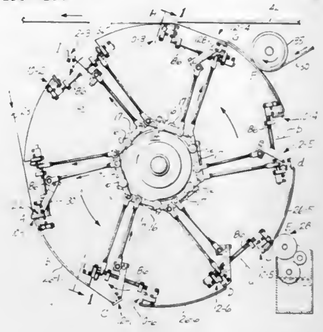
**4,297,157**

## METHOD FOR APPLICATION OF ELASTIC TO ARTICLES

**Raymond A. Van Vliet, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jun. 23, 1980, Ser. No. 161,722**
**Int. Cl.³ B32B *31/08***
**U.S. Cl. 156—164** **17 Claims**



1. A method of applying units of an elastic material to a predetermined area of an article comprising:

a. providing a continuous source of the elastic material;

b. tensioning the elastic material;

c. grasping the leading end of the elastic material in a first clamping means;

d. grasping the tensioned elastic material in a second clamping means at a predetermined distance from the first clamping means, said distance being greater than the length of the elastic unit applied to the article;

e. severing the portion of elastic held between the clamping means from the main body of elastic material at a location adjacent to the second clamping means;

f. moving the clamping means closer together to a separation which defines the length of the elastic unit applied to the article;

g. bonding the elastic unit to the desired area of at least one component of the article; and

h. releasing the elastic from the clamps after the bond has been established.

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**4,297,158**

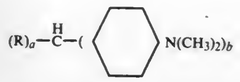
## NON-TOXIC ACTIVATORS FOR ADHESIVE COMPOSITIONS

**Leon E. Wolinski, Cheektowaga, and Peter D. Berezuk, Kenmore, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.**

**Division of Ser. No. 858,702, Dec. 8, 1977, Pat. No. 4,155,950, and a continuation-in-part of Ser. No. 763,145, Jan. 27, 1977, Pat. No. 4,126,504, and Ser. No. 705,333, Jul. 14, 1976, Pat. No. 4,080,238. This application Apr. 2, 1979, Ser. No. 26,015**
**Int. Cl.³ C09J *5/04***
**U.S. Cl. 156—305** **7 Claims**

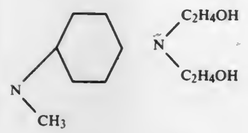
1. In the method of adhesively joining a pair of mating surfaces comprising applying to at least one of said mating surfaces an activatable, curable adhesive comprising a non-reactive thermoplastic polyurethan resin or a non-reactive elastomer dissolved in a non-acid methacrylic or acrylic monomer and a methacrylic or acrylic acid monomer, said monomers being essentially devoid of peroxy catalyst activation capability, said solution containing an effective amount of peroxy catalyst, the said adhesive being activatable by contact with a peroxy catalyst activator; the improvement comprising, in any order, the steps of joining said pair of mating surfaces together in a contact relationship and activating the adhesive

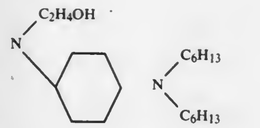
by contacting it with an activator compound selected from the group consisting of:

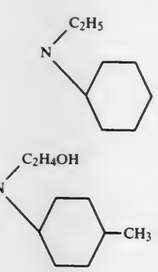


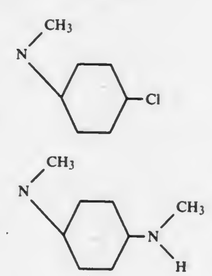
(a) R=H or phenyl, a=0 or 1, a+b=3 and when R is phenyl, a is 1,

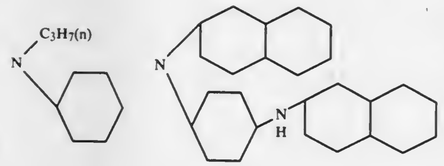
(b) $CH_2$=$CH(CH_3)COOCH_2CH(OH)CH_2A$, which is different from the other acrylic or methacrylic monomers in the adhesive, wherein A is one of:



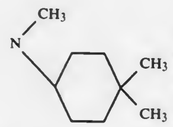








or



(c) homopolymers of the compounds of (b),

(d) a copolymer of at least 25% by weight of a compound of (b) with a member selected from the group consisting of methyl methacrylate, methyl acrylate, 2-ethyl hexyl acrylate, or butyl acrylate, the reaction products of epoxy polymers with secondary amines selected from the group consisting of N-methyl aniline, N-methyl-p-toluidine, N-$\beta$-hydroxy ethyl aniline, N-ethyl aniline, N-n-propyl aniline, N-$\beta$-hydroxy ethyl-p-toluidine, diethanol amine, dihexyl amine, p-chloro-N-methylaniline, N,N'-dimethyl-p-phenylene diamine, N,N'-di-2-naphthyl-p-phenylene diamine and N-methyl-3,5-xylidene wherein from 0.25 to one amino equivalent weight is reacted with one oxirane equivalent weight, and then maintaining the contact relationship of the surfaces until the adhesive cures to a set.

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**4,297,159**

## METHOD TO DIRECTLY BOND RUBBER TO METAL

**Bohuslav Dobias, Regensburg, Fed. Rep. of Germany, and Klaus Heckmann, Zum Aichahof 20, D-8400, Regensburg, Fed. Rep. of Germany, assignors to Klaus Heckmann, Regensburg, Fed. Rep. of Germany**

**Filed Jul. 11, 1979, Ser. No. 56,732**

**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832235**

**Int. Cl.³ C09J** *5/00*

**U.S. Cl. 156—307.7** **11 Claims**

1. A process for directly bonding a rubber composition to metal surfaces comprises:

(a) contacting the surface of a metal selected from the group consisting of iron, copper, brass, zinc, aluminum, bronze and brass-plated steel with a composition comprising a vulcanizable rubber and conventional rubber-sulfur vulcanization compounding ingredients, a bonding aid selected from the group consisting of elemental tellurium and organotellurium compounds being used to improve the bond between said metal surface and said composition by incorporation thereof in said composition or by application thereof directly to said metal surface; and

(b) subjecting the product of step (a) to pressure and temperature conditions sufficient to effect the vulcanization of said composition.

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**4,297,160**

## LOCKING AND SEALING COMPOSITIONS AND METHODS FOR THEIR APPLICATION

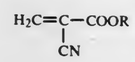
**Senji Kusayama, Toyonaka; Eijiro Nishi, Otsu, both of Japan, and Hugh J. Stock, Saratoga, Calif., assignors to Pacer Technology and Resources, Inc., Campbell, Calif. and Sumitomo Chemical Company, Ltd., Osaka, Japan**

**Filed Jul. 16, 1979, Ser. No. 57,666**

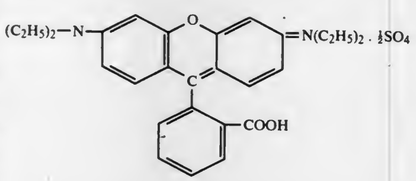
**Int. Cl.³ C09J** *5/00*

**U.S. Cl. 156—331.1** **11 Claims**

1. A method of bonding threaded parts and analogous structures while sealing them from extraneous injurious substances which comprises adding to a rapidly polymerizable monomer of an alpha cyanoacrylate ester of general formula,



wherein R is a radical containing a total of 1 to 16 carbon atoms, said radical being selected from the group which consists of alkyl, alkenyl (with 2 to 6 carbon atoms), alkoxyalkyl (with 2 to 6 carbon atoms), cyclohexyl, and phenyl, a coloring agent in proportions of 100 to 5000 parts per million parts by weight of the monomer, selected from the group which consists of modified dyestuffs, red, blue or yellow in color, and mixtures thereof, having respectively the formulas,



(i)



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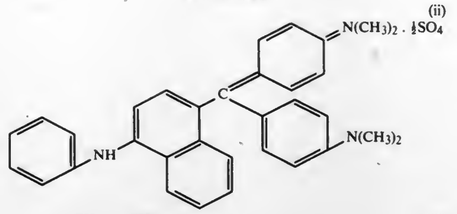
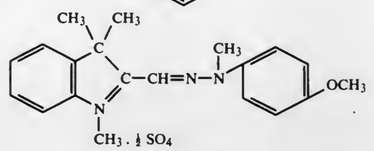


(ii)



(iii)

applying said monomer as a coating film to the surfaces to be joined and protected, contacting the coated surfaces, and polymerizing said monomer in situ to form a visibly colored bonding film on said surface while limiting the ultimate strength of said film by reason of strength modifying properties of said coloring agent, without retarding the rapid curing properties of the monomer.

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**4,297,161**

## METHOD AND APPARATUS FOR HEAT-SEALING LIDS ON GLASS CONTAINERS

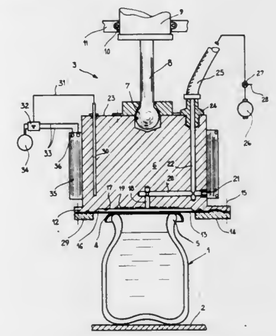
**Andre J. Graffin, La Ferte Bernard, France, assignor to Serac, France**

**Continuation of Ser. No. 952,227, Oct. 17, 1978, abandoned. This application Jul. 22, 1980, Ser. No. 171,182**

**Claims priority, application France, Nov. 3, 1977, 77 33046**

**Int. Cl.³ B30B** *5/02, 15/34;* **B65B** *7/28*

**U.S. Cl. 156—583.3** **4 Claims**



1. A device for sealing a heat-sealable composite lid onto a glass container, said lid comprising a foil of a ductile light alloy coated on one side with a layer of heat sealable thermoplastic material, said device comprising:

means for supporting said container;

a hingedly and movably supported applying head, having a supporting frame, a flexible membrane supported by its outer periphery on said supporting frame, so as to extend in rest position substantially in a plane, said membrane having an outer contacting surface and an inner face, a heat transfer mass arranged on the side of said inner face of said membrane and means for controllably heating said heat transfer mass;

means for selectively and controllably displacing toward and away from each other said applying head and said container supporting means; and,

said applying head further comprising a metallic body on one end of which is mounted said membrane supporting frame, said body being provided with at least one inner chamber closed by at least a portion of said inner face of said membrane, said membrane consisting of a simple metal sheet which is not self-heating, said metallic body forming said heat transfer mass, said inner chamber having a relatively small thickness and being limited, on the side opposite said membrane, by a substantially flat face of said metallic body, said inner face of said membrane being adapted for coming into contact engagement with said flat face as a result of a distortion of said membrane caused by said container during relative displacement one toward the other of said container supporting means and of said applying head.

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**4,297,162**

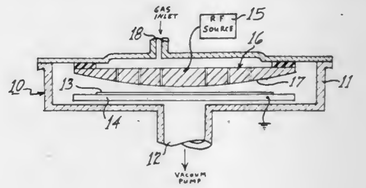
## PLASMA ETCHING USING IMPROVED ELECTRODE

**Randall S. Mundt, Houston; Timothy A. Wooldridge, Missouri City, and Thomas O. Blasingame, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 17, 1979, Ser. No. 85,564**

**Int. Cl.³ H01L** *21/306;* **C23F** *1/00*

**U.S. Cl. 156—643** **14 Claims**




12. A method of etching a coating on a generally circular silicon slice comprising

(a) positioning the slice symmetrically in a chamber on a conductive holder,

(b) positioning an electrode facing the slice in the chamber, the electrode being of generally symmetrical shape with respect to the slice and having a central part closer to the slice than peripheral parts,

(c) admitting reaction gas to the chamber while vacuum-pumping the chamber,

(d) applying radio frequency voltage between the holder and the electrode.

13. A method according to claim 12 wherein said central part is shaped in a convex manner generally symmetrical with respect to the slice.

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**4,297,163**

## DRYING OF POTASSIUM SILICATE

**Jeffrey R. Thomas, Aston, Pa., assignor to PQ Corporation, Valley Forge, Pa.**

**Filed Jan. 7, 1980, Ser. No. 110,276**

**Int. Cl.³ B01D** *1/18*

**U.S. Cl. 159—48 R** **2 Claims**

1. In the process of spray drying potassium silicate solution to obtain powders, comprising the steps of atomizing said potassium silicate solution in a spray drying tower and subjecting the resulting droplets to elevated temperatures in said spray tower thereby removing water from the droplets and drying them: the improvement consisting of dispersing a hydrophilic silane in said potassium silicate before atomizing the solution, wherein 0.05 to 2.5 parts by weight of the hydrophilic silane are added for each 100 parts by weight of potassium silicate solids contained in said potassium silicate solution.

**4,297,164**

## PROCESS FOR DISPLACEMENT WASHING OF POROUS MEDIA

**Peter F. Lee, Auburn, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Mar. 10, 1980, Ser. No. 129,009**
**Int. Cl.³ D21C *9/06***
**U.S. Cl. 162—60** **23 Claims**

1. In a process for separating a liquid from an insoluble material which includes the steps of thickening said insoluble material by draining excess liquid therefrom while retaining the material in a porous formation on a porous support means and displacing a substantial portion of the liquid remaining in the insoluble porous material after thickening from said material by injecting a wash liquid into said material, without substantially disturbing said porous formation of the retained material, the improvement, comprising:

reducing the mobility of said wash liquid in the porous formation of the insoluble material with respect to the mobility of said liquid originally retained in the porous insoluble material,

wherein the mobility of a liquid with respect to a porous formation is proportional to the permeability of the porous formation to a liquid and inversely proportional to the viscosity of said liquid,

such that the ratio of wash liquid mobility to the mobility of the liquid to be displaced is about 0.05–2.0.

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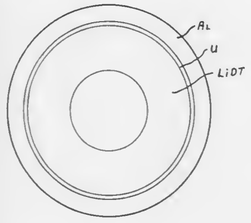
**4,297,165**

## FUEL PELLETS FOR CONTROLLED NUCLEAR FUSION

**Keith A. Breuckner, San Diego, Calif., assignor to KMS Fusion, Inc., Ann Arbor, Mich.**

**Filed Jul. 13, 1970, Ser. No. 65,756**
**Int. Cl.³ G21B *1/00***
**U.S. Cl. 376—103** **7 Claims**




1. A method of increasing the efficiency of a fusion burn of a small quantity of fusion fuel which comprises:

(a) surrounding the fusion fuel with a contiguous envelope of uranium,

(b) encasing the fuel and the uranium envelope in a contiguous layer of a relatively light material selected from aluminum and beryllium,

(c) directing a laser beam toward said fuel to cause a transfer of fast neutrons from said fuel to said uranium and a fission reaction in said uranium to heat said fuel and maintain a high pressure on said fuel to retard the disassembly of the fusion fuel.

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**4,297,166**

## THALLIUM-CARRYING TARGET MATERIAL AND ITS PRODUCTION

**Makoto Kato, Kobe; Nobuo Ueda, Takarazuka, and Hiroaki Matsushima, Nishinomiya, all of Japan, assignors to Nihon Medi-Physics, Co., Ltd., Hyogo, Japan**

**Filed Feb. 16, 1979, Ser. No. 12,809**
**Claims priority, application Japan, Feb. 20, 1978, 53-18678**
**Int. Cl.³ C25D *3/02, 3/54;* G21G *1/10***
**U.S. Cl. 376—194** **10 Claims**

1. A method for production of a thallium-carrying target material comprising a thermo-conductive support and metallic thallium electro-plated thereon, which comprises applying a DC-AC overlapped electric current between an anode made of a metal or its alloy having a lower ionization tendency than hydrogen and the electro-conductive support as a cathode, both electrodes being immersed in a bath of an electro-plating solution comprising monovalent thallium ions in the presence of at least one of aromatic amines and phenols, so as to deposit the thallium metal on the surface of the thermo-conductive support.

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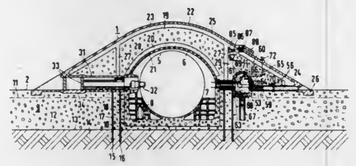
**4,297,167**

## NUCLEAR REACTOR INSTALLATION

**Hans-Peter Schabert, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Filed Jul. 29, 1977, Ser. No. 820,117**
**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634295**
**Int. Cl.³ G21C *9/00***
**U.S. Cl. 376—273** **25 Claims**



16. Nuclear reactor installation having a concrete cell disposed beneath the earth and having a hill of fill-earth directly covering the top of the concrete cell for enclosing activity-carrying components comprising at least one additional self-enclosed concrete cell disposed in the earth and being isolated and separated from the first-mentioned concrete cell by a given distance forming a space between said cells, said additional concrete cell having at most one-fortieth the volume of the first-mentioned concrete cell and being at least predominantly of shell-like construction, and including equipment of use for the nuclear reactor installation received in said additional concrete cell and a conical attachment located in said additional concrete cell for a valve mounted thereat, said valve being in at least one of a live steam and a feedwater line for closing said line, said line extending to said first-mentioned concrete cell and being formed as a double-wall pipe.

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**4,297,168**

## NUCLEAR FUEL ASSEMBLY AND PROCESS

**Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 29, 1976, Ser. No. 700,735**
**Int. Cl.³ G21C *3/18***
**U.S. Cl. 376—418** **10 Claims**

1. For use in a nuclear reactor, an oxide composition nuclear fuel material in compacted pellet form containing at least one fissionable isotope and an amount of an oxide selected from the group consisting of $V_2O_4$ and $V_2O_5$ and mixtures thereof effective to immobilize cadmium resulting from nuclear fission chain reactions of the nuclear fuel material through a reaction between the said cadmium and the said oxide and thereby prevent cadmium embrittlement of nuclear fuel cladding at reactor operating temperatures.



**4,297,169**

## NUCLEAR FUEL ASSEMBLY AND PROCESS

**Willard T. Grubb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 29, 1976, Ser. No. 700,737**
**Int. Cl.³ G21C *3/18***
**U.S. Cl. 376—418** **11 Claims**

1. For use in a nuclear reactor, an oxide composition nuclear fuel material in compacted pellet form containing at least one fissionable isotope and an amount of a chemical displacement compound selected from the group consisting of $CuFe_2O_4$ and $CuTiO_3$ and mixtures thereof effective to immobilize cadmium resulting from nuclear fission chain reactions of the nuclear fuel material through a reaction between the said cadmium and the said chemical displacement compound and thereby prevent cadmium embrittlement of nuclear fuel cladding at reactor operating temperatures.

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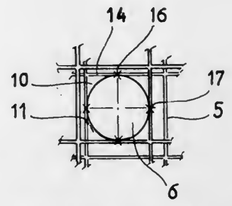
**4,297,170**

## DEVICES FOR TRANSVERSELY HOLDING THE FUEL RODS OF A NUCLEAR REACTOR ASSEMBLY

**Joseph Leclercq, Le Vesinet, France, assignor to Framatome, Courbevoie, France**

**Filed May 9, 1979, Ser. No. 37,483**
**Int. Cl.³ G21C *3/30***
**U.S. Cl. 376—442** **8 Claims**




1. A device for transversely holding the fuel rods of a bundle of fuel rods for a nuclear reactor assembly, which rods are arranged parallel to one another, in a uniform arrangement, having a plurality of support means for exerting forces on the rods in transverse directions to restrict vibrations thereof, while permitting axial lengthening of the rods, each of said support means comprising three sub-units comprising grids arranged adjacent one another in the longitudinal direction of the assembly, said sub-units comprising:

two end grids each formed by small metal plates which are assembled in a uniform network delimiting cells inside which the rods pass, and whose side walls, parallel to the longitudinal axis of the assembly, are formed by said small metal plates arranged transversely, relative to the assembly, so that their width constitutes the thickness of said grid in the longitudinal direction, said end grids being identical and each grid having the same network as the other, each wall of each cell of one grid being located in the same longitudinal plane as the corresponding wall of the other grid, said grids being made integral with one another with a longitudinal spacing along the fuel rods, and

an intermediate grid comprising small, elastic metal plates, the width of which is less than the width of said plates of said end grids, and which are assembled in a uniform network delimiting cells inside which the rods pass and arranged between said end grids in said longitudinal space provided therebetween, in a staggered manner in a transverse direction relative to said end grids, so that two adjacent elastic walls of the cells of said intermediate grid exert on each fuel rods transverse forces which press the rods against two walls of said cells of each end grid, said intermediate grid resting on at least one of said end grids.

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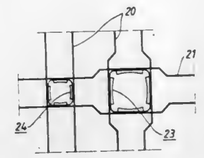
**4,297,171**

## NUCLEAR REACTOR FUEL ASSEMBLY

**Torsten Olsson, Vesteras, Sweden, assignor to AB ASEA-ATOM, Sweden**

**Filed Oct. 10, 1979, Ser. No. 83,488**
**Claims priority, application Sweden, Oct. 13, 1978, 7810686**
**Int. Cl.³ G21C *3/30***
**U.S. Cl. 376—440** **6 Claims**




1. A nuclear reactor fuel assembly, comprising:

an elongated box;

a plurality of fuel rods vertically disposed within said box, said fuel rods each comprising an upper and lower end plug; and

upper and lower grid means disposed within said box for supporting said fuel rods, at least one of said grid means comprising a plurality of prismatic, vertical channels, each one of a first portion of said channels being occupied by an end plug of one said fuel rods, the minimum width of the channels of said first portion being less than the maximum thickness of the associated fuel rod, and a second portion of said channels being open in order to function as coolant channels and further being distributed among the first portion so that each channel of said first portion is surrounded by at least eight adjacent coolant channels of said second portion.

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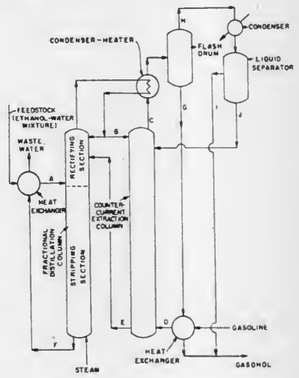
**4,297,172**

## LOW ENERGY PROCESS OF PRODUCING GASOLINE-ETHANOL MIXTURES

**Benjamin G. Kyle, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.**

**Filed Jan. 23, 1980, Ser. No. 114,699**
**Int. Cl.³ B01D *3/14;* C07C *29/26, 31/08***
**U.S. Cl. 203—19** **9 Claims**




5. The energy saving process of producing gasoline-ethanol mixtures from aqueous ethanol for motor fuel use, comprising:

(a) subjecting aqueous ethanol of 1 to 15 weight percent ethanol to fractional distillation and producing an overhead distillate in vapor form containing 75 to 90 weight

percent ethanol together with at least 10 weight percent water;
(b) condensing said distillate to provide reflux for said distillation column and a feed for a countercurrent multiple stage liquid-liquid extraction column; and without employing an azeotropic ethanol distillation;
(c) thereafter in a separate step subjecting said condensed distillate containing at least said 10% water in said extraction column to extraction with gasoline at a temperature of from 30° to 60° C. and producing a gasoline phase extract and a water phase raffinate, said gasoline extract containing from 8 to 14% ethanol by weight.

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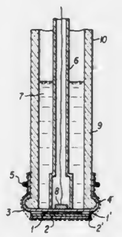
**4,297,173**
**METHOD FOR DETERMINING AMMONIA AND SENSOR THEREFOR**

**Motohiko Hikuma; Tatsuru Kubo; Takeo Yasuda, all of Yokohama; Isao Karube, Tachikawa, and Shuichi Suzuki, Tokyo, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan**

**Filed May 22, 1980, Ser. No. 152,177**
**Int. Cl.³ C12Q *1/00*; G01N *27/30***
**U.S. Cl. 204—1 T** **15 Claims**



1. A method for determining ammonia concentration in an aqueous liquid which contains dissolved oxygen, which comprises:
(a) Contacting a sample of said liquid with a microbial electrode comprising:
an oxygen-sensitive electrode having a diaphragm,
bacteria capable of oxidizing ammonium ion and thereby consuming oxygen in direct or close contact with the diaphragm of said oxygen sensitive electrode, said bacteria being confined or immobilized by a porous membrane permeable to ammonia and to oxygen and impermeable to microbial cells; and
(b) electrochemically sensing the rate of consumption or their decrease in steady state concentration of said oxygen caused by said microorganisms, and thereby
(c) detecting the concentration of ammonia from said rate or said decrease of the oxygen.
9. An ammonia-detecting electrode which comprises:
an oxygen-sensitive electrode having a diaphragm;
bacteria capable of oxidizing ammonium ion and thereby consuming oxygen in direct or close contact with the diaphragm of said oxygen sensitive electrode;
said bacteria being confined or immobilized by a porous membrane permeable to ammonia or ammonium ions and to oxygen, and impermeable to microbial cells.

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**4,297,174**
**PYROELECTROCHEMICAL PROCESS FOR REPROCESSING IRRADIATED NUCLEAR FUELS**

**Giovanni Brambilla, Stagno, and Adelmo Sartorelli, Forli', both of Italy, assignors to Agip Nucleare, S.p.A., Rome, Italy**

**Filed Mar. 8, 1979, Ser. No. 18,730**
**Int. Cl.³ C25C *1/22***
**U.S. Cl. 204—1.5** **7 Claims**

1. A pyroelectrochemical method for the reprocessing of irradiated nuclear fuels coming preferably from fast reactors, characterized in that it comprises the steps of:
(a) dissolving the nuclear fuel, containing fission products, in a bath comprising molten alkali metal sulfates,
(b) thermally decomposing the plutonium sulfate, $Pu(SO_4)_2$, formed in said molten bath to plutonium oxide, $PuO_2$,
(c) electrodepositing uranium oxide on the cathode of an electrolytic cell provided in said molten bath,
(d) recycling the melted sulfates of said molten bath to the start of the process, and
(e) conditioning said fission products and said melted sulfates.

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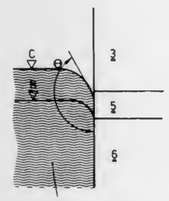
**4,297,175**
**PROCESS FOR PARTIALLY ELECTROPLATING FLAT SILVER**

**Hans Schlegel, Ulm, and Theodor Nowotny, Geislingen, both of Fed. Rep. of Germany, assignors to Wurttembergische Metallwarenfabrik, Geislingen, Fed. Rep. of Germany**

**Filed Dec. 8, 1980, Ser. No. 214,252**
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006569**
**Int. Cl.³ C25D *5/00, 5/02*; B21K *11/02***
**U.S. Cl. 204—15** **8 Claims**



1. a process for partially silver electroplating a flat silver part, the part including two metal components to be joined lengthwise, the first component to be covered with a plating-resistant dipping enamel and the second component to be electroplated with silver, the process comprising the steps of:
(a) joining lengthwise the said two metal components;
(b) providing a thin separation surface between exposed surfaces of said two components, said separation surface consisting of a material which is more difficult to wet with the dipping enamel than the metal of the first component to be covered;
(c) dipping said first component into said enamel until contact is achieved between said enamel and said separation surface; and
(d) silver electroplating said second component.

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**4,297,176**
**SURFACE PASSIVATION OF COMPOUND SEMICONDUCTORS**

**Stephen J. Hannah, Cockermouth, and Bryan Livingstone, Felling, both of England, assignors to National Research Development Corporation, London, England**

**Filed Feb. 27, 1980, Ser. No. 125,048**
**Claims priority, application United Kingdom, Mar. 9, 1979, 08453/79**
**Int. Cl.³ C25D *11/32***
**U.S. Cl. 204—37 R** **17 Claims**

1. A method of surface-passivating a compound semiconductor whose elements are differently volatile, comprising the steps of (a) anodising a compound semiconductor to produce a layer thereon of native semiconductor oxide, (b) reducing all of the layer of oxide at elevated temperature and allowing the more volatile element of the reduced oxide to evaporate away, to leave predominantly the less volatile element overlying the compound semiconductor, (c) depositing an anodisable metal on the surface of the less volatile element, (d) re-anodising the resulting structure until oxidation has proceeded to beyond the layer containing predominantly the less volatile element and from 10 A to 50 A into the compound semiconductor, and optionally at any suitable stage (e) applying an ohmic contact to the back surface of the compound semiconductor or selectively to the top surface as required.

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**4,297,177**
**METHOD AND COMPOSITION FOR ELECTRODEPOSITING PALLADIUM/NICKEL ALLOYS**

**Augustus Fletcher, Bristol, and William L. Moriarty, South Meriden, both of Conn., assignors to American Chemical & Refining Company Incorporated, Waterbury, Conn.**

**Filed Sep. 19, 1980, Ser. No. 188,977**
**Int. Cl.³ C25D *3/56***
**U.S. Cl. 204—43 N** **8 Claims**

1. In an aqueous bath for producing bright and relatively stress-free electroplate of palladium/nickel alloy, the combination, expressed as gram moles per liter, comprising: 0.01 to 0.25 of palladium ion; 0.015 to 0.85 of nickel ion; 0.15 to 1.5 of a soluble electrolyte selected from the group consisting of alkali metal and ammonium sulfates, sulfamates, phosphates, nitrates, nitrites, and mixtures thereof; 0.005 to 0.15 of a saccharin or soluble saccharate stress reducer; $1.5\times10^{-4}$ to $10\times10^{-4}$ of 3-butyne-2-ol brightener; up to $6\times10^{-4}$ of cetyltrimethylammonium bromide; up to an effective amount of ammonium hydroxide; and water to volume, said palladium and nickel ions being substantially in the form of ammino complexes, and said bath having a pH of 7 to 11, with said amount of ammonium hydroxide being effective to insure said complexed state of said ions and said pH value of said bath.

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**4,297,178**
**RUTHENIUM ELECTROPLATING AND BATHS AND COMPOSITIONS THEREFOR**

**Jeffrey N. Crosby, Worcester, England, assignor to The International Nickel Company, Inc., New York, N.Y.**

**Filed Apr. 9, 1980, Ser. No. 138,786**
**Claims priority, application United Kingdom, Apr. 10, 1979, 12648/79**
**Int. Cl.³ G01N *3/52*; C07F *17/02***
**U.S. Cl. 204—47** **34 Claims**

22. A composition of matter adapted to be used in aqueous solution as an electroplating bath comprising as components:
(a) a ruthenium-containing material having two ruthenium atoms linked by a nitrogen bridge atom, and
(b) a water-soluble compound from the group oxalic acid, alkali metal salts of oxalic acid and alkali metal acid salts of oxalic acid.

24. An aqueous bath for electrodepositing ruthenium consisting essentially of as components:
a. a ruthenium-containing material having two ruthenium atoms linked by a nitrogen bridge atom, and
b. a water-soluble compound selected from the group consisting of a dibasic carboxylic acid, alkali metal salts of such acid, and alkali metal acid salts of such acid;
said bath having a pH in the range of above 4 up to about 10.

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**4,297,179**
**PALLADIUM ELECTROPLATING BATH AND PROCESS**

**Robert M. Skomoroski, Paterson, N.J., assignor to American Chemical & Refining Company Incorporated, Waterbury, Conn.**

**Filed Sep. 2, 1980, Ser. No. 183,318**
**Int. Cl.³ C25D *3/52***
**U.S. Cl. 204—47** **11 Claims**

1. An aqueous alkaline bath for the electrodeposition of palladium, comprising:
(a) about 0.035 to 0.4 gram mole per liter of palladium ion;
(b) at least about 1.5 gram moles per liter of ammonium radical;
(c) about $1.25\times10^{-5}$ to $125\times10^{-5}$ gram mole per liter of 3-butyne-2-ol as a brightener; and
(d) at least 0.1 gram mole of electrolyte per liter;
said bath having a pH of about 9 to 11.5, and being free of cyanide radical.

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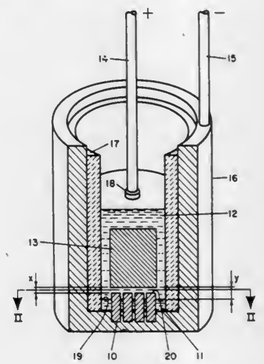
**4,297,180**
**ELECTROLYTIC PRODUCTION OF METAL**

**Perry A. Foster, Jr., New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Division of Ser. No. 717,700, Aug. 25, 1976, Pat. No. 4,219,391, which is a continuation-in-part of Ser. No. 645,533, Dec. 21, 1975, abandoned. This application Sep. 26, 1979, Ser. No. 79,025**
**Int. Cl.³ C25C *3/06, 3/00***
**U.S. Cl. 204—67** **13 Claims**



1. A method for the electrolytic production of metal, including electrolyzing, between anodic and cathodic surface areas, a compound of the metal dissolved in a molten solvent, the electrolyzing being performed at a temperature such that the metal is formed in the molten state, the metal collecting in a molten metal pad, the anodic surface area being formed by at least one anode block, wherein the improvement comprises the provision of cathodic surface area in the form of an array of islands protruding out of the pad into the solvent toward said block for establishing a series of locations at which the anode-cathode distance is up to $1\frac{1}{4}$ inches, whereby anode-cathode distances less than the distance separating the metal pad from the anode block are achieved without hindrance from magnetic turbulence in the metal pad, the voltage drop experienced in the solvent becomes less than it would be in the absence of the islands, and replenishment of the dissolved compound is improved over what it would be with a planar cathode.

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**4,297,181**
**PROCESS FOR PREPARING KETONES**

**Tatsuya Shono, 13, Ichikawacho 1-chome, Kamitakano, Sakyo-ku, Kyoto-shi, Kyoto 606, Japan**

**PCT No. PCT/JP79/00257, § 371 Date Jun. 11, 1980, § 102(e) Date Jun. 11, 1980, PCT Pub. No. WO80/00714, PCT Pub. Date Apr. 17, 1980**
**PCT Filed Oct. 11, 1979, Ser. No. 198,958**
**Claims priority, application Japan, Oct. 11, 1978, 53-125406**
**Int. Cl.³ C25B *3/02***
**U.S. Cl. 204—78** **6 Claims**

1. Process for preparing a ketone, characterized in that a secondary alcohol is subjected to a catalytic electrode oxidation in the presence of iodine or/and an iodine compound.

4,297,182

## PRODUCTION OF ALKALI METAL HYDROXIDE

Yoshio Oda; Takeshi Morimoto, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,401
Claims priority, application Japan, May 4, 1979, 54-54040
Int. Cl.[3] C25B *1/34, 11/03, 11/06, 13/08*
U.S. Cl. 204—98 7 Claims

1. In a process for producing an alkali metal hydroxide by electrolyzing an aqueous solution of an alkali metal chloride by using a gas and liquid-permeable cathode bonded on an ion-exchange membrane, the improvement wherein said gas and liquid permeable cathode consists essentially of a nickel containing powder selected from the group consisting of a thermally decomposed nickel obtained from a nickel salt of fatty acid; Raney nickel; stabilized Raney nickel; and carbonyl nickel and a polytetrafluoroethylene.

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4,297,183

## PROCESS FOR THE TREATMENT OF SOLUTIONS OF LEAD CHLORIDE

André Georgeaux, Rambouillet, France, assignor to Societe Miniere et Metallurgique de Penarroya, Paris, France

Filed Aug. 12, 1980, Ser. No. 177,434
Claims priority, application France, Aug. 24, 1979, 79 21325
Int. Cl.[3] C25L *1/18*
U.S. Cl. 204—117 13 Claims

1. A process for the treatment of solutions of lead chloride containing as impurities at least one metal selected from the group consisting of silver, copper and bismuth, comprising the following steps:

(a) contacting the solution with a cation exchange resin whose active group is a sulfhydryl group to separate impurities from the solution by absorption on the resin; and

(b) recovering the lead from the solution after the solution has contacted the resin in step (a).

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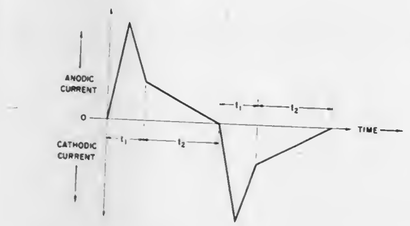
4,297,184

## METHOD OF ETCHING ALUMINUM

Christopher K. Dyer, Summit, N.J., assignor to United Chemi-Con, Inc., Rosemont, Ill.

Filed Feb. 19, 1980, Ser. No. 122,460
Int. Cl.[3] C25F *3/04*
U.S. Cl. 204—129.4 7 Claims




1. In a method of etching aluminum by applying an alternating electric current to aluminum which is in contact with an electrolyte containing hydrochloric acid, the improvement in which the alternating current has a wave form wherein the current rises rapidly from zero to a maximum, then subsequently decreases rapidly in a first stage to an intermediate value which is about one-third to about one-half of the maximum, and thereafter decreases more slowly to zero in a second stage, the ratio of time of the second stage to time of the first stage being in the range from 1 to 6, whereby higher capacitance values of the etched aluminum are obtained.

4,297,185

## PHOTOSETTING ADHESIVE FROM UNSATURATED OLIGOMER, PHOTOINITIATOR, AND BETAINE-FORMING MIXTURE OF UNSATURATED TERT.AMINE AND UNSATURATED ACID

Pierre Chevreux, St Jean De Gonv, France; Van-Tao Nguyen, Petit-Lancy, Switzerland; Alain Roman, Bossey, France, and Daniel Turpin, Nyon, Switzerland, assignors to Techinter S.A., Geneva, Switzerland

Filed Sep. 18, 1979, Ser. No. 76,780
Claims priority, application Switzerland, Sep. 20, 1978, 9815/78
Int. Cl.[3] C08F *2/50, 220/28;* C08L *75/04;* B32B *27/16*
U.S. Cl. 204—159.15 16 Claims

1. A photohardenable composition polymerizable by irradiation under u.v. light to provide an adhesive and including:

(A) at least one olefinic photopolymerizable prepolymer having an olefinic double bond activated by an electrophilic substituent, and

(B) a polymerization photoinitiator, characterised in that the composition also includes

(C) a substituted or unsubstituted aliphatic or cycloaliphatic N,N-dialkylamino alcohol ester of an $\alpha,\beta$-ethylenically unsaturated carboxylic acid, said alcohol having an alkylene moiety of up to six carbon atoms between the hydroxy and the amino functions, and

(D) an $\alpha,\beta$-ethylenically unsaturated carboxylic acid in an amount equal to one mole per mole of C, (C) and (D) being capable of reacting together to form a betaine, and said oligomer or prepolymer (A) is an ester of an $\alpha,\beta$-ethylenically unsaturated acid and a hydroxylated product containing urethane and/or urea links in the molecule thereof and having a molecular weight from about 500 to 10,000.

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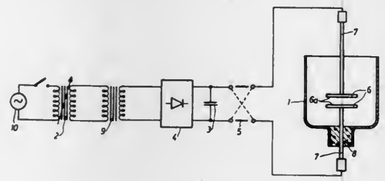
4,297,186

## METHOD AND APPARATUS FOR REDUCING THE ACTIVATION ENERGY OF CHEMICAL REACTIONS

Walter HP Killer, Burghalde 10, Lenzburg, Switzerland

Continuation of Ser. No. 775,229, Mar. 7, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,100
Claims priority, application Switzerland, Mar. 16, 1976, 3292/76
Int. Cl.[3] C08F *2/52*
U.S. Cl. 204—165 9 Claims



1. A method of reducing the activation energy of polymerization reactions between organic molecules selected from the group consisting of olefins, dienes, O-vinyl compounds, halogenated hydrocarbons and aldehydes; and of polymerization reactions or aldol condensation reactions between molecules of benzaldehyde and acetophenone, comprising the steps of:



producing an electrically non-conducting, liquid phase containing an educt; generating an electrostatic field by means of a capacitor arrangement in said phase with electrodes of which at least one comprises an electrically insulating surface layer consisting of an insulating metal oxide or metal chloride compound; and polymerizing or condensing said molecules.

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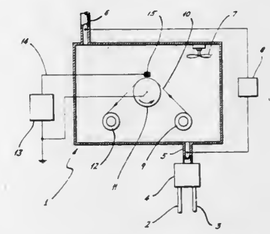
4,297,187

## SURFACE TREATMENT OF PLASTIC MATERIAL

Yukichi Deguchi; Hideki Yamagishi, and Shunichiro Kirimura, all of Tokyo, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,271
Claims priority, application Japan, Oct. 5, 1978, 53-123013
Int. Cl.[3] C08F *2/52*
U.S. Cl. 204—165 8 Claims



1. In a process for treating the surface of a plastic material, the step which comprises subjecting the surface of the material to corona discharge in contact with a mixed gas which substantially consists of nitrogen and carbon dioxide, the volume of nitrogen to carbon dioxide in said mixed gas being in the range of 99.5:0.5 to 50:50.

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4,297,188

## PROCESS FOR THE ELECTROLYTIC COATING OF CONDUCTIVE SUBSTRATES WITH PROTECTIVE FILMS OF PHENOLIC RESINS

Sergio Daolio, Luzzara; Guiliano Mengoli, Padua; Carlo Folonari, Turin, and Marco Musiani, Casalecchio di Reno, all of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano and Consiglio Nazionale Delle Richerche, Rome, both of, Italy

Filed Sep. 23, 1980, Ser. No. 189,989
Claims priority, application Italy, Sep. 24, 1979, 68853 A/79
Int. Cl.[3] C25D *13/08*
U.S. Cl. 204—181 R 13 Claims

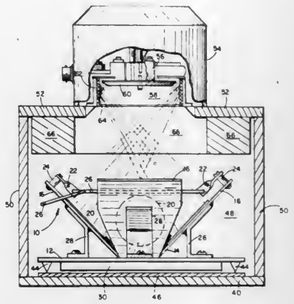
1. A process for coating a conductive substrate used as the anode in an electrochemical cell in which a direct electric current is passed from a cathode to the said anode through an electrolytic liquid containing one or more phenolic monomers to form a polymeric film of phenolic resin on the substrate, which comprises using an electrolyte which includes from 10 to 200 g/l of phenolic monomer consisting of allylphenol or a mixture thereof with one or more other phenols, and from 5 to 200 g/l of an aliphatic amine, in solution in a mixture of water and alcohol in a volume ratio of from 20:1 to 0.05:1, forming the polymeric film by using an electric current of density not greater than 50 mA/cm$^2$ of substrate, and heating the polymeric film thus deposited at a temperature of from 100° to 200° C. to induce hardening of the said resin.

4,297,189

## DEPOSITION OF ORDERED CRYSTALLINE FILMS

Elroy C. Smith, Jr., La Habra, and Shi K. Yao, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 27, 1980, Ser. No. 163,532
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—192 SP 29 Claims



13. A method of forming a film of ordered polycrystalline material on a selected object in a cross-field radio frequency magnetron sputtering chamber having sputtering elements in the ceiling thereof, said method comprising the steps of:

orienting a line normal to the deposition surface of said selected object at an angle of about sixty degrees away from the vertical; and

deflecting charged particles away from said selected object by means of a positively charged electrode disposed in the vicinity of said selected object and spaced a significant distance away from said sputtering elements, wherein said electrode is electrically isolated from said sputtering elements.

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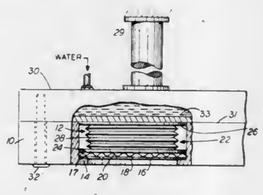
4,297,190

## METHOD FOR REMOVING HEAT FROM A WORKPIECE DURING PROCESSING IN A VACUUM CHAMBER

Robert W. Garrett, Reading, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 38,741, May 14, 1979. This application Dec. 1, 1980, Ser. No. 211,603
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—192 E 5 Claims



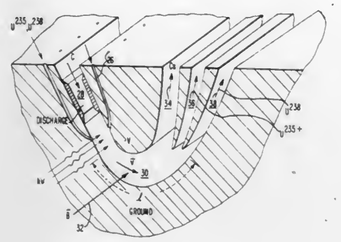

1. In a sputter etch process performed on a workpiece in an RF sputtering chamber wherein a highly conductive thermal path is provided between the workpiece and a cold plate and the workpiece is held securely in place during the sputtering operation, the improvement comprising using an expandable heat pipe for providing a highly conductive thermal path from the workpiece to a cold plate.

**4,297,191**

## ISOTOPIC SEPARATION

**Cheng-Lin Chen, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Division of Ser. No. 864,344, Dec. 27, 1977. This application Aug. 30, 1979, Ser. No. 70,939**
**Int. Cl.³ B01D** *59/00*
**U.S. Cl. 204—193** **2 Claims**




1. Apparatus for separating isotopes in an isotopic mixture having a first species including a first isotope of a particular element and a second species including a second isotope of said element, said apparatus comprising:

structure defining a flow passage, said passage serially including means for inletting a flowing gas, means for passing said inletted flowing gas through a curved centrifuge section having an inner radius of curvature and an outer radius of curvature, and means for segmenting said passage into a plurality of outlets including an inner segment disposed toward said inner radius and an outer segment disposed toward said outer radius;

means for creating a magnetic field within said centrifuge section;

means for creating a discharge zone between said gas inlet means and said centrifuge section;

means for injecting said mixture in a gaseous phase into said flow passage downstream of said discharge means; and

means for irradiating said injected mixture between said injecting means and at least a portion of said centrifuge section so as to selectively excite said first species.

2. Apparatus for separating isotopes in an isotopic mixture having a first species including a first isotope of a particular element and a second species including a second isotope of said element, said apparatus comprising:

means for creating an electrical discharge zone;

means for flowing a selected gas through said zone;

means for injecting said mixture into said flowing gas a preselected distance downstream of said discharge zone such that said mixture flows in a direction substantially similar to the flow of said gas;

means for irradiating said mixture subsequent to said injection so as to selectively excite said first species and cause a predetermined release of reaction products, some of said products being of differing mass and including a species of said first isotope in a form different than its initial form prior to said irradiation;

curved means for deflecting said products of differing mass along differing flow paths;

means for creating a magnetic field in the region of said curved deflecting means; and

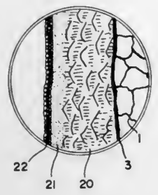
means for collecting said deflected products including a segment for collecting said species of said first isotope in a different form.

**4,297,192**

## CATALYST SUPPORTED OXYGEN SENSOR ELEMENT AND A METHOD OF MANUFACTURING SAME

**Hiroshi Shinohara, Okazaki; Yasuhiro Otsuka, Toyota; Shinichi Matsumoto, Toyota; Hiroshi Wakisaka, Toyota, and Toshinobu Furutani, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,966**
**Int. Cl.³ B05D** *1/08;* **G01N** *27/58*
**U.S. Cl. 204—195 S** **12 Claims**




1. In an oxygen sensor element detecting the oxygen concentration in exhaust gas from vehicle engines comprising a tubular container of a solid electrolyte conductive of ions with one end portion closed, an inner electrode positioned on the inner circumference of the tubular container and an outer electrode positioned on the outer circumference thereof, the improvement which comprises a protective layer of $MgO.Al_2O_3$ formed on the outer circumference of the outer electrode and a catalyst layer formed on the outer circumference of the protective layer, said catalyst layer comprising an alumina carrier and one or more oxidation catalysts.

9. A method of manufacturing an oxygen sensor element which comprises the steps of; forming an inner electrode on the inner circumference of a tubular container of a solid electrolyte conductive of ion with one terminal portion closed and an outer electrode on the outer circumference thereof; forming a protective layer of $MgO.Al_2O_3$ on the outer circumference of the outer electrode by flame spraying; and thereafter forming a catalyst layer on the outer circumference of the protective layer by applying an aqueous slurry comprising an alumina carrier, an oxidation catalyst and binder, followed by drying and burning.

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**4,297,193**

## PH ELECTRODE GLASS COMPOSITIONS

**Donald P. Brezinski, Corning, and Leroy R. Morse, Campbell, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed May 22, 1980, Ser. No. 152,358**
**Int. Cl.³ G01N** *27/36;* **C03C** *3/04*
**U.S. Cl. 204—195 G** **22 Claims**

1. A glass composition for use in pH-responsive glass electrodes consisting essentially of (in mole percent on the oxide basis):

a. from about 30 to about 37 mole percent $Li_2O$;

b. from 0 to about 4 mole percent of at least one oxide selected from the group consisting of $Cs_2O$ and $Rb_2O$;

c. from about 2 to about 12 mole percent of at least one oxide selected from the group consisting of $La_2O_3$ and $Pr_2O_3$;

d. from about 2 to about 10 mole percent of at least one oxide selected from the group consisting of $Ta_2O_5$ and $Nb_2O_5$;

e. from 0 to about 4 mole percent $UO_2$; and

f. the balance $SiO_2$;

with the proviso that there is present in the composition at least about 2 mole percent of at least one oxide selected from the group consisting of $Pr_2O_3$ and $Nb_2O_5$.

12. A glass electrode having a pH-responsive membrane of glass having a composition consisting essentially of (in mole percent on the oxide basis):

a. from about 30 to about 37 mole percent $Li_2O$;



b. from 0 to about 4 mole percent of at least one oxide selected from the group consisting of $Cs_2O$ and $Rb_2O$;

c. from about 2 to about 12 mole percent of at least one oxide selected from the group consisting of $La_2O_3$ and $Pr_2O_3$;

d. from about 2 to about 10 mole percent of at least one oxide selected from the group consisting of $Ta_2O_5$ and $Nb_2O_5$;

e. from 0 to about 4 mole percent $UO_2$; and

f. the balance $SiO_2$;

with the proviso that there is present in the composition at least about 2 mole percent of at least one oxide selected from the group consisting of $Pr_2O_3$ and $Nb_2O_5$.

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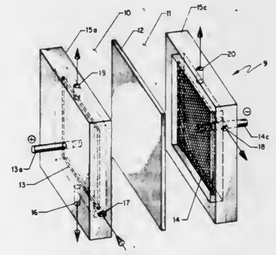
**4,297,194**

## ELECTROLYTIC PRODUCTION OF HIGH PURITY ALKALI METAL HYDROXIDE

**Ronald L. Dotson, Mentor, and Kevin J. O'Leary, Cleveland Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Division of Ser. No. 191,424, Oct. 21, 1971, Pat. No. 4,025,405. This application Feb. 16, 1977, Ser. No. 769,098**
**Int. Cl.³ C25B** *9/00*
**U.S. Cl. 204—257** **5 Claims**

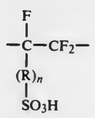


1. An electrolytic cell for the production of aqueous alkali metal hydroxide solution substantially free of alkali metal halide and other impurities comprising

(1) a first hollow cell section having disposed therein a dimensionally stable anode, an electrolyte inlet, a spent electrolyte outlet, a halogen gas outlet and electrical connection means for supplying current to said anode;

(2) a second hollow cell section having disposed therein a metal cathode, an outlet for the aqueous solution of alkali metal hydroxide product, an outlet for hydrogen gas and electrical connection means for conducting current from said cathode; and

(3) a hydrated fluorinated copolymer cationic exchange resin film membrane having pendant sulfonic acid groups or derivatives thereof arranged between said hollow cell sections closely spaced between a surface of each said anode and said cathode and held in fixed juxtaposed position by said hollow cell sections, said film membrane having the structural formula:



(1)

and

(2) $-CXX'-CF_2-$

wherein R represents the group

$$-CF-CF_2-O-CFY-CF_2O)_m$$

in which R′ is fluorine or perfluoralkyl of 1 to 10 carbon atoms, Y is fluorine or trifluoromethyl, and m is 1, 2 or 3, n is 0 or 1; X is fluorine, chlorine, hydrogen or trifluoromethyl; and X′ is X or $CF_3-(CF_2)_z$ wherein z is 0 or an integer from 1 to 50; the units of formula (1) being present in an amount from 3 to 20 mole percent.

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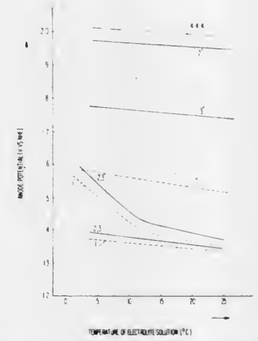
**4,297,195**

## ELECTRODE FOR USE IN ELECTROLYSIS AND PROCESS FOR PRODUCTION THEREOF

**Hideo Sato, Chiba, and Takayuki Shimamune, Ichihara, both of Japan, assignors to Permelec Electrode Ltd., Tokyo, Japan**

**Filed Sep. 20, 1979, Ser. No. 77,224**
**Claims priority, application Japan, Sep. 22, 1978, 53-115894**
**Int. Cl.³ C25B** *11/08*
**U.S. Cl. 204—290 F** **2 Claims**



1. An electrode for use in the electrolysis of an aqueous solution of a metal halide, said electrode comprising an electrically conductive substrate and, formed thereon, a coating comprising

(1) 50 to 95 mole % of the platinum and

(2) (a) 5 to 50 mole % of tin oxide, or

(b) 5 to 50 mole % of tin oxide and cobalt oxide wherein the tin oxide is present in an amount of at least 5 mole % and the cobalt oxide is present in an amount up to 20 mole %, the total of (1) and (2) being 100 mole %.

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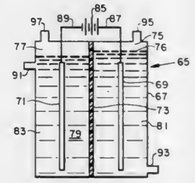
**4,297,196**

## STABLE LOW VOLTAGE MICROPOROUS DIAPHRAGM FOR ELECTROLYTIC CELLS

**Christine A. Lazarz, and Edward H. Cook, Jr., both of Niagara Falls, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.**

**Filed Mar. 17, 1980, Ser. No. 130,766**
**Int. Cl.³ C25B** *13/04, 13/08*
**U.S. Cl. 204—296** **8 Claims**




1. A microporous synthetic organic polymeric sheet, useful for the manufacture of a stable low voltage separator for an electrolytic cell, of a thickness in the range of about 0.2 to 2 mm., a porosity in the range of about 70 to 90% and of pore sizes substantially all within the range of 1 millimicron to 1 millimeter in diameter, with over 90% of the volume of the

pores, by porosimeter analysis, being of pores in the range of 0.1 to 100 microns in diameter and with over 80% of the volume of the pores being in pores in the range of 0.12 to 33 microns in diameter, and with the ratio of the number of pores in the 0.09 to 0.3 micron diameter range to the number of pores in the 0.8 to 20 micron diameter range being less than about 50.

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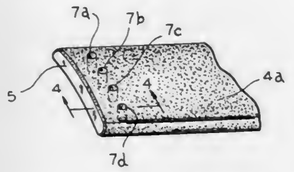
**4,297,197**

## ELECTROPLATING RACK

**Syed Salman, Sterling Heights, Mich., assignor to International Telephone and Telegraph Corp., New York, N.Y.**

**Filed Nov. 13, 1980, Ser. No. 206,400**
**Int. Cl.³ C25D *17/08***
**U.S. Cl. 204—297 W** **6 Claims**




1. In an electroplating rack composed of an electrically conductive metal coated with an insulating coating, said rack having tips at extremities thereof, said tips being uncoated to provide electrical contact for a part being plated,

the improvement in which the portion of the rack adjacent the tip has at least one opening therein through said rack, said opening being coated with said insulating coating, such that a continuous coating is formed with the coating on the opposite surfaces of said portion of the rack.

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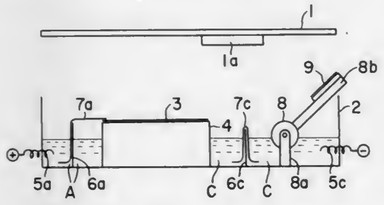
**4,297,198**

## CONCENTRATING ELECTROPHORESIS APPARATUS

**Mochihiko Ohashi, 2-33-16-507, Tokiwadai, Itabashi-ku, Tokyo, and Tosifusa Toda, 2-6-4, Shinpo-cho, Higashikurume-shi, Tokyo, both of Japan**

**PCT No. PCT/JP79/00137, § 371 Date Jan. 8, 1980, § 102(e) Date Jan. 8, 1980, PCT Pub. No. WO79/01141, PCT Pub. Date Dec. 27, 1979**
**PCT Filed May 29, 1979, Ser. No. 190,869**
**Claims priority, application Japan, May 29, 1978, 53-64307**
**Int. Cl.³ G01N *27/26*; C25B *7/00***
**U.S. Cl. 204—299 R** **11 Claims**




1. A concentrating electrophoresis apparatus comprising: supply means for a buffer solution containing terminating ions and electrically connected to one electrode of a direct-current or alternating-current superposed direct-current electric power source; a supporting medium for separation electrically connected to the other electrode of the power source and comprising a water-retentive membrane or sheet material wetted with a buffer solution containing leading ions; a supporting medium for concentration comprising a water-retentive membrane material wetted with a buffer solution containing leading ions and having a pH different from that of the buffer solution wetting the supporting medium for separation; and a movable mechanism for causing the supporting medium for concentration at its one end to contact the supply means and at its other end to contact the supporting medium for separation and imparting electrical connection through these supply means, supporting medium for concentration, and supporting medium for separation.

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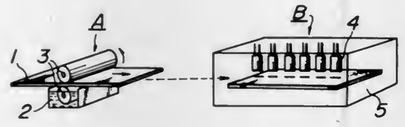
**4,297,199**

## SPECIMEN APPLICATOR

**Kazuo Hijikata, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Nov. 12, 1980, Ser. No. 210,512**
**Claims priority, application Japan, Nov. 14, 1979, 54-146386**
**Int. Cl.³ G01N *27/26***
**U.S. Cl. 204—299 R** **5 Claims**




1. A specimen applicator comprising a wetting means to wet a carrier with a certain electrolytic solution, an applying means to apply a specimen onto the thus wetted carrier, a detector to detect electric resistivity of the carrier so as to generate an electric signal representing wetness of the carrier as determined by the thus detected electric resistivity, and a control means to control the application of the specimen onto the carrier based on said electric signal from said detector so as to always apply a certain amount of the specimen onto said carrier in a uniform fashion.

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**4,297,200**

## METHOD FOR HYDROCONVERSION OF SOLID CARBONACEOUS MATERIALS

**Patrick B. Briley, 131 Lee La., Bolingbrook, Ill. 60439**

**Filed Jan. 18, 1980, Ser. No. 113,222**
**Int. Cl.³ C10G *1/06, 1/00***
**U.S. Cl. 208—10** **42 Claims**

1. A process for hydroconversion of solid carbonaceous materials comprising the steps of:

contacting in a dissolution zone particulate solid carbonaceous material with a hydrocarbon solvent;

removing from said dissolution zone a first stream containing hydrocarbon liquids, hydrocarbon gases, and particulate carbonaceous material;

separating said first stream into a second stream and a third stream, said second stream consisting substantially of gas phase material;

separating with a solids separation device said third stream into a fourth stream and a fifth stream, said fourth stream having an average solid size smaller than the average solid size in said fifth stream;

introducing at least a portion of said fifth stream into said dissolution zone;

separating said fourth stream into a sixth stream and a seventh stream;

introducing at least a portion of said seventh stream into said third stream;

adding molecular hydrogen to said sixth stream;

heating said sixth stream;

introducing said sixth stream into a catalytic hydrogenation zone;

removing from said catalytic hydrogenation zone an eighth stream;

separating said eighth stream into a ninth stream and a tenth stream, said ninth stream consisting substantially of gas phase materials;

introducing at least a portion of said tenth stream into said fourth stream; and

repeating the above steps until the desired amount of hydroconversion is achieved.

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**4,297,201**

## PROCESS FOR OIL SHALE RETORTING

**John B. Jones, and S. Kumar Kunchal, both of 300 Enterprise Bldg., Grand Junction, Colo. 80501**

**Filed Jan. 3, 1978, Ser. No. 866,358**
**Int. Cl.³ C10G *1/00*; C10B *21/18, 47/20, 57/12***
**U.S. Cl. 208—11 R** **6 Claims**

1. A continuous process for the recovery of energy containing products from oil shale consisting essentially of:

(a) retorting a particulate oil shale in a separated retort vessel by injecting a heated, generally non-oxygenous recycle gas, from retorting oil shale, into a bed of such oil shale in the retort vessel;

(b) withdrawing gas and products of retorting from said retort vessel, and withdrawing hot retorted shale containing carbon residue from said separated retort vessel;

(c) passing said gas and products of retorting to a separation process to remove liquid products from gas, and withdrawing a portion of the gas as a high Btu product gas, and recycling the remainder of the gas to a second heat exchanger;

(d) passing the hot, retorted shale into a separated combustion vessel;

(e) injecting oxygen containing gas into said hot retorted shale to burn at least some of the carbon residue to produce hot gases of combustion and retorted and spent shale as waste;

(f) passing said hot gases of combustion to a first heat exchanger to produce high temperature steam, and

(g) passing hot gases of combustion from said first heat exchanger to said second heat exchanger to heat recycle gas passing into said retort vessel.

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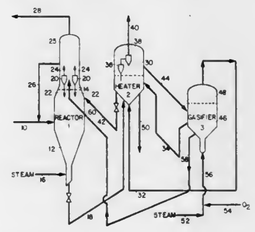
**4,297,202**

## TWO-STAGE INTEGRATED COKING FOR CHEMICALS AND COKE GASIFICATION PROCESS

**Don E. Blaser, Randolph, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.**

**Continuation-in-part of Ser. No. 789,569, Apr. 21, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 922,044**
**Int. Cl.³ C10G *9/28, 37/06***
**U.S. Cl. 208—54** **10 Claims**




1. In an integrated coking and gasification process comprising the steps of:

(a) reacting a carbonaceous material having a Conradson carbon content of at least 10 weight percent in a coking zone containing a bed of fluidized solids maintained at fluid coking conditions including a temperature ranging from about 850° F. to about 1195° F., to form a vaporous coking zone conversion product and coke, said coke depositing on said fluidized solids;

(b) introducing a portion of said solids with the coke deposition thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;

(c) recycling a first portion of heated solids from said heating zone to said coking zone and introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature greater than the temperature of said heating zone, and

(d) passing said vaporous coking zone conversion product with entrained solids to a gas-solids separation zone, the improvement which comprises withdrawing a portion of solids from the gasification zone and introducing said portion of solids into said gas-solids separation zone in an amount sufficient to maintain said gas-solids separation zone at a temperature in the range of about 1200 to about 1700 degrees Fahrenheit to convert at least 20 weight percent of the coking zone vaporous product to unsaturated hydrocarbons having less than 6 carbon atoms.

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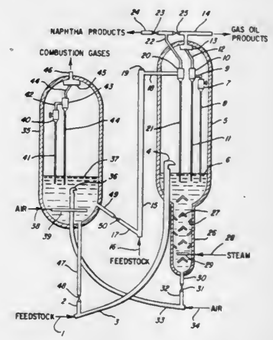
**4,297,203**

## APPARATUS FOR THE CATALYTIC CRACKING OF HYDROCARBONS

**William D. Ford, Downers Grove, Ill., and Michael J. Clark, Chesterton, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Apr. 14, 1980, Ser. No. 139,894**
**Int. Cl.³ C10G *11/18, 51/06***
**U.S. Cl. 208—74** **14 Claims**




1. In a fluidized catalytic cracking system comprising in combination a spent catalyst stripper, a spent catalyst regenerator, and multiple reactors, apparatus for the fluidized catalytic cracking of hydrocarbon feedstocks in multiple reactors comprising:

(a) a first elongated transfer line reactor which is adapted for the fluid catalytic cracking of hydrocarbon feedstock, having an upper and lower end, said lower end having both a regenerated catalyst inlet means and a hydrocarbon feedstock inlet means;

(b) a reactor vessel communicating with and enclosing the upper end of said first transfer line reactor;

(c) an outlet means for removing spent catalyst from the lower portions of said vessel;

(d) a first cyclone separation system located within said vessel and adapted to separate catalyst particles from vapors, which comprises at least one cyclone gas-solids separation means having a dip-leg depending therefrom;

(e) a vapor outlet means connected to said first cyclone separation system;

(f) a second elongated transfer line reactor which is adapted for the fluidized catalytic cracking of hydrocarbon feedstock, having an upper and lower end, said lower end having both a regenerated catalyst inlet means and a hydrocarbon feedstock inlet means;

(g) a separate conduit leading to each hydrocarbon feedstock inlet means, whereby the same or different feedstocks can be conveyed to each transfer line reactor;
(h) a second cyclone separation system located within said vessel, directly connected by an inlet means to the upper end of said second transfer line reactor, and adapted to separate the mixture of catalyst particles and vapors which is discharged from said second transfer line reactor, wherein said second cyclone separation system comprises at least one cyclone gas-solids separation means having a dip-leg depending therefrom, and whereby the vapors from said second transfer line reactor are substantially separated and prevented from entering said vessel and catalyst from the second transfer line reactor is separated and passed into said vessel;
(i) a vapor outlet means connected to the second cyclone separation system; and
(j) a separate conduit leading from the vapor outlet means associated with each cyclone separation system, whereby the vapors from each vapor outlet means can be conveyed to a separate product recovery system.

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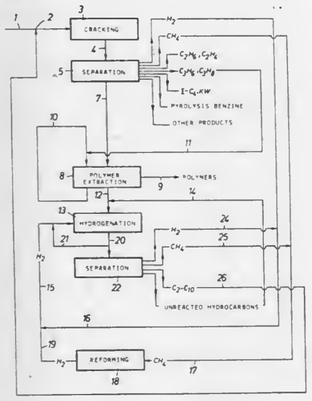
**4,297,204**

## THERMAL CRACKING WITH POST HYDROGENATION AND RECYCLE OF HEAVY FRACTIONS

**Claus Schliebener, Strasslach, and Hans J. Wernicke, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegeiskreuth, United Kingdom**

**Filed Feb. 21, 1979, Ser. No. 13,110**
**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806854**
**Int. Cl.³ C10G *9/16, 53/04, 69/06***
**U.S. Cl. 208—95** **9 Claims**



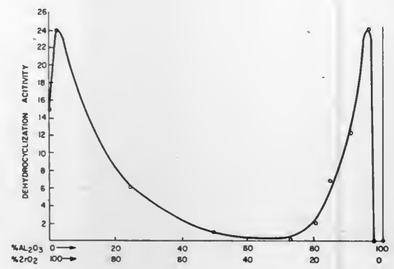

1. In a process for the thermal cracking of unhydrogenated hydrocarbon feedstock to produce normally gaseous olefins, the improvement which comprises fractionating the hydrocarbons from the thermal cracking stage into a pyrolysis fuel oil cut boiling above 200° C. and a cut boiling below 200° C., separating polymeric compounds, which have been produced in the thermal cracking stage, from said pyrolysis fuel oil cut boiling above 200° C., thereby producing a substantially polymeric-compounds-free cut boiling above 200° C., catalytically hydrogenating only said substantially polymeric-compounds-free cut boiling above 200° C., and recycling resultant hydrogenated polymeric-compounds-free cut boiling above 200° C. to the thermal cracking stage where said cut is mixed and thermally cracked with the unhydrogenated hydrocarbon feedstock.

**4,297,205**

## REFORMING WITH A CATALYST COMPRISING IRIDIUM, ZIRCONIA, AND ALUMINA

**Rodney L. Mieville, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Division of Ser. No. 946,500, Sep. 28, 1978, Pat. No. 4,240,934.**
**This application Mar. 26, 1980, Ser. No. 134,125**
**Int. Cl.³ C10G *35/085***
**U.S. Cl. 208—138** **10 Claims**




1. A process for the reforming of a hydrocarbon stream, which process comprises contacting said stream in a reaction zone under hydroforming conditions and in the presence of hydrogen with a catalyst comprising iridium as a hydrogenation component on a support of zirconia and alumina, said support comprising about 3 wt.% to about 15 wt.% zirconia or at least 60 wt.% zirconia.

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**4,297,206**

## SOLVENT EXTRACTION OF SYNFUEL LIQUIDS

**Edward G. Scheibel, Media, Pa., assignor to Suntech, Inc., Philadelphia, Pa.**

**Filed Feb. 1, 1980, Ser. No. 117,591**
**Int. Cl.³ C10G *45/02, 67/04***
**U.S. Cl. 208—254 R** **14 Claims**

1. In the process of separating nonhydrocarbons from synfuel liquid by extraction using an extractor wherein a selective solvent contacts the synfuel liquid, a solvent-extract mixture is separated from a raffinate, the mixture is separated into the solvent and an extract, and the extract is returned to the extractor, the improvement which comprises hydrotreating all or a portion of the extract prior to return to the extractor, whereby nitrogen in the extract is eliminated as ammonia and the production of jet fuel is maximized.

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**4,297,207**

## PROCESS AND APPARATUS FOR THE ELECTROSTATIC DRESSING OF CARNALLITE-CONTAINING CRUDE POTASSIUM SALTS

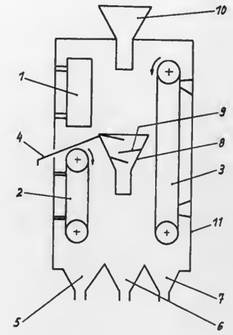
**Arno Singewald, Kassel; Irving Geisler; Günter Fricke, both of Heringen, and Rudolf Knappe, Kassel, all of Fed. Rep. of Germany, assignors to Kali and Salz AG, Kessel, Fed. Rep. of Germany**

**Continuation of Ser. No. 813,845, Jul. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 775,047, Mar. 7, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,521**
**Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609048**
**Int. Cl.³ B03B *1/00***
**U.S. Cl. 209—9** **25 Claims**

1. In a process for the electrostatic dressing of a carnallite and sylvite-containing crude potassium salt, wherein the crude salt is ground, conditioned with an organic acid or a metal sulfate or sulfonate, and treated with air of 5 to 25% relative humidity prior to being subjected to an electric high voltage field, the improvement which comprises:



passing the crude salt downwardly by gravity through a vertical zone of first electric field having a voltage of about 4 kV/cm and a field length of 0.4 to 1.2 m to divide said crude salt into a carnallite fraction and a middlings fraction deficient in carnallite, and performing said passing the crude salt step in a manner wherein the initial entrance velocity of the crude salt into said first electric field is negligible relative to the average velocity imparted to the crude salt in said first field;
recovering said carnallitic fraction;



passing said middlings-fraction downwardly by gravity through a vertical zone of second electric field having a voltage of about 4 kV/cm and a field length of 1.5 to 2.5 m to divide said middlings fraction into a sylvite preconcentrate, a second middlings fraction, and a residue deficient in valuable substances, and performing said passing said middling-fraction step in a manner wherein the initial entrance velocity of said middlings-fraction into said second electric field is negligible relative to the average velocity imparted to the middlings-fraction in said second field; and recovering said sylvite preconcentrate.

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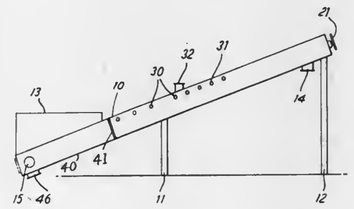
**4,297,208**

## INCLINED HELICAL FLIGHT CONVEYOR

**Robert F. Christian, San Francisco, Calif., assignor to Jude Engineering, Inc., San Francisco, Calif.**

**Filed Nov. 14, 1980, Ser. No. 207,204**
**Int. Cl.³ B01D *21/06***
**U.S. Cl. 210—94** **8 Claims**



1. A helical conveyer comprising a container having an inlet for mixture at one end, an outlet for liquid at the same end, and an outlet for particulate material at the other end, a shaft rotatably mounted in the casing coaxially therewith, a helical flight fixed to the shaft between the shaft and the casing, said flight comprising a series of circular rings cut radially and pressed into helical shape, each ring being welded to the shaft at a plurality of arcs on the inner edge of the ring, said ring having openings therein between the arcs, the diameter of the shaft being 0.3 to 0.55 of the outer diameter of the ring, the radius of the openings from the centre of the ring being 1.2 to 1.6 times the radius of the shaft, said rings being unconnected with the shaft at said openings.

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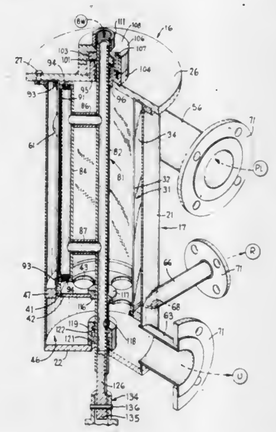
**4,297,209**

## HIGH SOLIDS FILTER

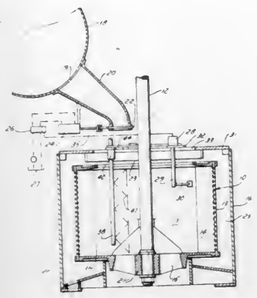
**Richard B. DeVisser, Schoolcraft; John W. Rishel, Vicksburg, and Joe A. Kuiper, Mattawan, all of Mich., assignors to Dover Corporation, Portage, Mich.**

**Filed Apr. 4, 1980, Ser. No. 137,221**
**Int. Cl.³ B01D *29/40***
**U.S. Cl. 210—107** **24 Claims**



3. A self-cleaning filter assembly for removing solids from an incoming liquid to be filtered, of the kind including
a housing;
a cylindrical filter element within said housing;
inlet means for introducing said liquid to be filtered under pressure into said housing on one side of said filter element;
filtrate outlet means communicating with the other side of said filter element for withdrawing filtered liquid from said housing, and solids outlet means for withdrawing solids from said housing, wherein the improvement comprises:
means mounting said filter element within said housing adjacent said inlet means and with a solids collection space between said inlet means and the filtering surface of said filter element and connected with said solids outlet means;
backwash means for backwashing said filter and thereby for moving solids from the filtering surface of said filter element into said solids collection space;
said solids outlet means including a solids outlet valve adjustable between a normal operating position and an open position; and
control means responsive to a preselected drop in liquid pressure at said filtrate outlet means with respect to the liquid pressure at said inlet means indicative of an excessive increase in solids concentration in said solids collection space for shifting said solids outlet valve to its open position and thereby for reducing such solids concentration by venting said solids collection space through said solids outlet valve at a high flow rate.

**4,297,210**
## CENTRIFUGAL SEPARATOR
**Claude Delfosse, Hellemes, France, assignor to Fives-Cail Babcock, Paris, France**
**Filed Jul. 31, 1980, Ser. No. 173,961**
**Int. Cl.³ B01D** *33/02, 33/34*
**U.S. Cl. 210—107** **5 Claims**



1. An apparatus for the centrifugal separation of solids from a liquid, which comprises
(a) a cylindrical basket having a perforate side wall defining an interior chamber, the basket being mounted for rotation about a vertical axis,
(b) means for charging a solids-liquid mixture into the interior chamber of the basket, rotation of the basket causing a cake of the solids to be built up on the side wall while the liquid is centrifugally removed therethrough,
(c) a control for the charging means, the control including
(1) a sensing element for sensing the thickness of the cake built up on the side wall,
(d) a vertically extending manifold delivering a wash fluid adjustably positioned in the interior chamber,
(e) a mobile support for the manifold, movement of the support causing the position of the manifold to be adjusted, and
(f) means movably connecting the mobile support to the control whereby the position of the manifold is a function of the thickness of the cake sensed by the sensing element of the control.

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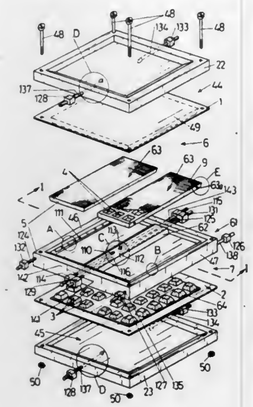
**4,297,211**
## FILTERING APPARATUS
**Edwin Hiesinger, Jenbach; Klaus Keplinger, and Hermann Nessler, both of Innsbruck, all of Austria, assignors to Inkomag, Basel, Switzerland**
**Continuation-in-part of Ser. No. 907,628, May 19, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 70,799**
**Claims priority, application Austria, May 20, 1977, 3609/77**
**Int. Cl.³ B01D** *37/02*
**U.S. Cl. 210—136** **45 Claims**

1. A filtering apparatus comprising:
a housing defining a filter chamber;
a rigid partition extending through said chamber and subdividing same into an upstream compartment and a downstream compartment communicating with said upstream compartment via throughgoing openings formed in said partition;
a support fabric overlying said partition and permeable to a fluid, said support fabric lying along a side of said partition turned toward said upstream compartment;
means including a closable inlet opening communicating with said upstream compartment and a closable outlet opening communicating with said downstream compartment for passing through said chamber from said upstream compartment to said downstream compartment a carrier medium entraining a particulate filter-aid layer onto said fabric in said upstream compartment;
means including a closable inlet opening communicating with said upstream compartment and a closable outlet opening communicating with said downstream compartment for passing a filterable medium through said chamber from said upstream compartment to said downstream compartment whereby said filterable medium traverses said layer and said fabric;
washing means including a closable inlet opening connectable with said chamber on the downstream side of said fabric and a closable outlet opening communicating with said upstream compartment at an upstream side of said fabric for passing a washing medium through said chamber from said inlet to said outlet opening and thereby backwashing said layer from said fabric and entraining material of said layer out of said chamber through said outlet opening;
means to close each of said inlet and outlet openings; and
displacement means for downstream removing media residues completely from each of said compartments.



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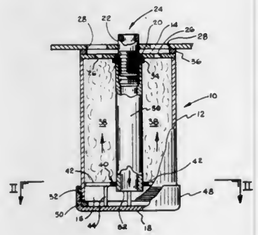
**4,297,212**
## OIL FILTER UNIT
**Henry A. Padgett, Sr., Rte. 1, Monetta, S.C. 29105**
**Filed Jun. 9, 1980, Ser. No. 157,875**
**Int. Cl.³ B01D** *27/08;* **F01M** *1/00*
**U.S. Cl. 210—168** **9 Claims**



1. An improved oil filter unit for use with an oil lubricating system of an engine having a filter-receiving fitting which includes a central, threaded oil flow pipe and oil flow passageway means radially disposed thereabout for circulating engine oil from the engine through the filter unit attached thereto; said filter unit comprising a generally cylindrical filter housing having an end wall and an initially open opposite end for receiving a disposable filter medium therein, said end wall having a central opening therethrough for receiving the oil pipe of the engine fitting, and a plurality of openings radially disposed about said central opening for communicating with the oil flow passageway means of the engine fitting to permit circulation of oil into and out of the housing, elongate tube means in said housing extending from said end wall opening along the central axis of the housing and terminating in an open end adjacent the initially open end of the housing, a generally cylindrical disposable filter medium with central opening therethrough supportably received in said housing around and along the length of said tube means in engagement with the outer surface of the tube means and inner surface of the cylindrical wall of the housing, a closure cap threadably received on the open end of said cylindrical housing in fluid-tight relationship therewith, said tube means, filter housing, and closure cap defining an elongate oil flow path between the central opening of the housing end wall and the radially disposed openings of the end wall for circulating oil through the length of said filter medium for filtration thereby, gasket means on the outside of the housing end wall disposed radially outwardly of said end wall openings to sealingly engage the housing with the engine, filter medium support means adjacent the open end portion of said elongate tube means to supportably position the filter medium within the housing above the open end of the tube and in spaced relation from the closure cap, and means for securing the filter housing to the engine fitting flow pipe to maintain it thereon during removal of the closure cap for replacement of a filter medium in the housing.



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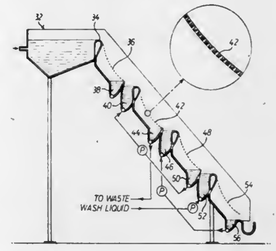
**4,297,213**
## APPARATUS FOR SEPARATING AND CONTACTING FRIABLE PARTICULATE ORGANIC MATTER FROM AND WITH LIQUIDS
**Frederick K. Airey, "Swanlands", Hilltop La., Chinnor Hill, Chinnor, Oxon, and Arthur R. Evans, Well House, Hopton, Nesscliffe, both of England**
**Filed Dec. 6, 1979, Ser. No. 100,988**
**Claims priority, application United Kingdom, Dec. 6, 1978, 47413/78**
**Int. Cl.³ B01D** *25/04*
**U.S. Cl. 210—195.1** **6 Claims**




1. An apparatus comprising a series of troughs or retention tanks positioned on different levels to operate in a cascade fashion provided with peforate screens, supply means for supplying a mixture of carrier liquid and friable particulate matter to a first trough, collecting means for receiving separated friable matter from the last perforate screen in the series; said perforate screens being concave and disposed with a generally downward slope immediately downstream of each trough to separate liquid from a mixture of liquid and friable matter overflowing from the immediately preceding trough, a trough receiving means associated with each perforate screen for receiving liquid passing through its associated perforate screen, the outlet of each perforation in each perforate screen being larger than the inlet thereof and a recycling supply means for supplying liquid to each of said troughs after the first trough, said recycling supply means being associated with each trough receiving means and connecting its associated trough receiving means with the trough next but one upstream of said associated receiving means.

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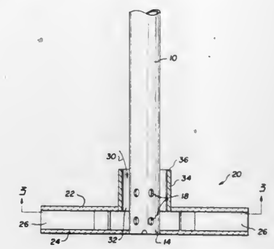
**4,297,214**
## AERATOR
**Claudio Guarnaschelli, 5583 Spruce St., Burnaby, British Columbia, Canada (V5G 1Y7)**
**Filed Nov. 2, 1979, Ser. No. 90,525**
**Claims priority, application Canada, Feb. 5, 1979, 320978**
**Int. Cl.³ C02F** *1/74*
**U.S. Cl. 210—219** **5 Claims**



1. An apparatus for mixing gases with a body of liquid having a surface, the apparatus comprising:
a hollow rotatable surface for extending downwardly from near the surface, the shaft having a top and a bottom end, said bottom end having apertures formed therethrough;
an intake for gas near the top end of the shaft for positioning above the surface;
an impeller connected to the shaft near the outlet for gas, the impeller comprising two spaced-apart discs with a plurality of vane elements therebetween;
an annular opening in a top said disc about the shaft;
a tube connected to the top disc and extending towards the top end of the shaft, above the annular opening;
a mixing zone for the gas and the liquid defined adjacent the exterior of the apertured bottom end of the shaft, the interior of the tube and a central portion of the impeller, surrounding the shaft;
an outlet for gas near the bottom end of the shaft within the mixing zone defined by said apertures formed through said shaft bottom end;
the impeller drawing liquid through the tube, through the opening past the gas outlet, for mixing the liquid with the gas in the mixing zone, and expelling the liquid outwardly from the vane elements as the impeller rotates.

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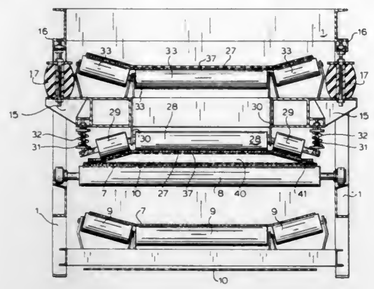
**4,297,215**
## BELT FILTER PRESS
**Hans J. Altmeyer, and Josef Gebel, both of Schwalbach, Fed. Rep. of Germany, assignors to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany**
**Filed Mar. 31, 1980, Ser. No. 135,839**
**Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911760**
**Int. Cl.³ B01D** *33/02*
**U.S. Cl. 210—386** **16 Claims**

1. In a belt filter press of the type having a lower and an upper endless filter belt and a lower and an upper support belt which respectively suport said lower and upper filter belts against an upper and a lower row of rollers for transport along a press path, which rows of rollers define a press slot therebetween, the improvement comprising:
means for laterally sealing said press slot including two additional rows of rollers, each additional row of rollers being disposed laterally adjacent to, and on opposite sides

of, one of said upper and lower rows of rollers for cooperative engagement with the support belt and filter belt associated with said one of said rows, said additional rows of rollers being disposed at an angle with respect to said one of said rows so that it bends and presses an edge



portion of said belts associated therewith against the associated edge portion of the other belts associated with the other of said upper and lower rows of rollers, so as to thereby prevent a lateral discharge between the edges of said belts of material fed along said press slot.

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**4,297,216**

## METHOD FOR TREATMENT OF BIOCHEMICAL WASTE

**Masahiko Ishida; Ryooichi Haga, and Youji Odawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

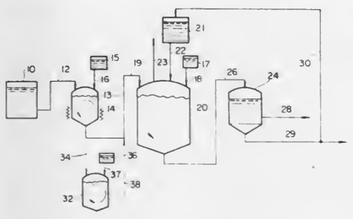
**Continuation of Ser. No. 651,586, Jan. 22, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,361**

**Claims priority, application Japan, Jan. 22, 1975, 50/8729**

**The portion of the term of this patent subsequent to Jan. 10, 1997, has been disclaimed.**

**Int. Cl.³ C02F *11/04***

**U.S. Cl. 210—613** **8 Claims**



1. A method for the treatment of a biochemical waste slurry, with the biochemical waste selected from the group of sewage sludge and garbage, comprising the steps of:

providing a slurry of the biochemical waste with a solid density greater than 3% by weight;

adding acid to the slurry to adjust its pH to a value below 3.5;

heating the slurry having its pH below 3.5 within a temperature range of 60° to 200° C. for a period of 1 to 10 minutes to reduce the viscosity of the slurry;

thereafter substantially neutralizing the acidity of the slurry to a pH of 5 to 8;

anaerobically digesting the substantially neutralized slurry at a temperature within the range of 20° to 50° C. for 20 to 40 days with mechanical agitation through the action of methane producing bacteria to convert the slurry to methane and a digested sludge; and

separating the methane from the digested sludge.

**4,297,217**

## TREATMENT OF WASTEWATER

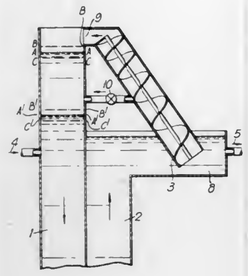
**David A. Hines, Bishopton, and David H. Bolton, Linthorpe, both of England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed May 12, 1980, Ser. No. 149,622**

**Claims priority, application United Kingdom, May 23, 1979, 17971/79**

**Int. Cl.³ C02F *3/22***

**U.S. Cl. 210—621** **7 Claims**



1. A method for treating wastewater utilizing a downcomer-riser system, the downcomer and riser communicating directly only at their lower ends and indirectly, through a pump means, only at their upper ends, with the level of wastewater in the downcomer being maintained above the level of wastewater in the riser to provide a hydrostatic pressure head which causes circulation of the wastewater around the system at a pre-selected rate, the level of wastewater in the downcomer fluctuating between a maximum and minimum level for which self-rectification of the flow rate will occur, said method comprising the steps of:

supplying a gas containing free oxygen to the wastewater in the downcomer as it circulates down the downcomer;

effecting disengagement of gas bubbles from the wastewater prior to recirculation from the riser to the downcomer;

pumping the wastewater from an upper portion of the riser back into the downcomer so that the wastewater is discharged into the downcomer at an area above said level of wastewater, and varying the position at which the wastewater is discharged into said downcomer in response to said level of wastewater.

4. Apparatus for treating wastewater, comprising:

a downcomer;

a riser communicating directly with said downcomer only at the bottom ends of said riser and downcomer, and communicating indirectly only at the upper ends thereof;

a level of wastewater being maintained in said downcomer above the uppermost part of said riser so that a hydrostatic head is provided effecting circulation of wastewater down said downcomer and up said riser, at a pre-selected rate, and the level of wastewater in said downcomer fluctuating between maximum and minimum levels for which self-rectification of the flow rate around the system will occur;

oxygen-containing gas introducing means disposed in said downcomer for introducing oxygen-containing gas into the wastewater circulating down said downcomer;

pumping means for pumping wastewater from an upper portion of said riser back into said downcomer so that the wastewater is discharged into the downcomer at an area above said level of wastewater, and means for varying the position at which the wastewater is discharged into said downcomer in response to said level of wastewater.



**4,297,218**

## PROCESS AND APPARATUS FOR EXTRACTING A SUBSTANCE FROM A BODY OF WATER

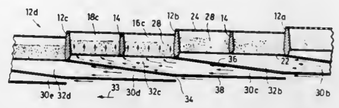
**Hans G. Bals, Blümgesgrund 44, 6460 Gelnhausen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 882,447, Mar. 1, 1978, which is a continuation of Ser. No. 741,130, Nov. 11, 1976, abandoned. This application Sep. 26, 1979, Ser. No. 79,059**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842058**

**Int. Cl.³ C02F *1/28***

**U.S. Cl. 210—661** **22 Claims**



2. In a process for obtaining a dissolved, suspended or chemically bonded substance from a body of water, wherein water is taken from a substantially horizontal relative flow of said body of water and directed substantially into a vertical direction and through a fluidized bed of adsorber particles to bond said substance for extraction thereof from the water, the improvement that said water which is to be passed through the fluidized bed is passed through a diffuser means at least before being deflected into the vertical direction, thereby to increase the static pressure of said water wherein at least a low-energy boundary layer of said water, which is produced by surface friction before said flow of water reaches said diffuser means, is prevented from passing into the diffuser means by being directed therefrom by a diversion passage.

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**4,297,219**

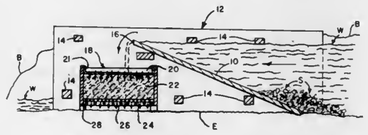
## TEMPORARY STREAM FILTRATION SYSTEM

**Joseph R. Kirk, Findlay, and Edward C. Campbell, Forest, both of Ohio, assignors to The KBI Corp., Findlay, Ohio**

**Filed Jan. 28, 1980, Ser. No. 115,991**

**Int. Cl.³ B01D *35/02***

**U.S. Cl. 210—669** **19 Claims**



1. A temporary method of purifying a contaminated and polluted water stream comprising:

(A) inserting a temporary ramp weir in the stream,

(B) forming an earth dam across said stream on each side of said ramp weir to form a dam so that all the water in said stream is caused to flow down over the weir edge of said ramp to form a falling path,

(C) positioning replaceable frames of sorbent filter material in said falling path of water from said weir whereby said ramp catches the sediment in said stream at its lower end and said filter material removes chemical contaminants and pollutants from said stream that flows over said weir edge, and

(D) removing said frame and said ramp weir from the stream after the stream water is purified.

**4,297,220**

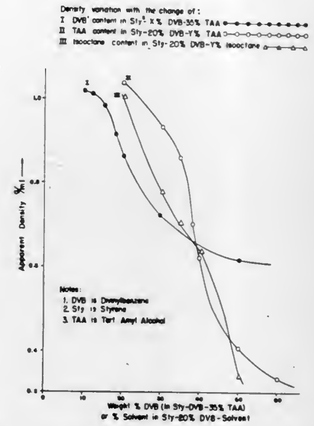
## MACRORETICULATED COPOLYMER ADSORPTION PROCESS

**Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 749,526, Jul. 18, 1958, Pat. No. 4,224,415. This application May 23, 1980, Ser. No. 152,941**

**Int. Cl.³ C02F *1/28***

**U.S. Cl. 210—690** **3 Claims**



1. Method for adsorbing an organic material from a fluid or fluid mixture containing the same which comprises contacting the fluid or fluid mixture containing organic material with a macroreticulated crosslinked copolymer having a plurality of microscopic channels resulting from liquid explusion of a precipitating agent during polymerization of a monomer mixture under suspension polymerization conditions in an aqueous media of (1) a polyvinylidene monomer containing a plurality of ethylenically unsaturated groups in a non-conjugated relationship and (2) at least one monoethylenically unsaturated monomer, said copolymerization taking place in the pressure of a liquid which is a solvent for the monomer mixture and which does not swell the copolymer resulting from said copolymerization, said liquid being present in an amount sufficient to cause separation of the copolymer from the monomer phase, whereby the organic material is adsorbed by the macroreticulated crosslinked copolymer.

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**4,297,221**

## PROCESS AND APPARATUS FOR THE TREATMENT OF UNTREATED WATER

**Hans-Georg Moll, Görzallee 49a, 1000 Berlin 45; Ulrich Hässelbarth, Adolfstrasse 3, 1000 Berlin 37; Andreas Grohmann, Drakestrasse 52a, 1000 Berlin 45, and Helmüt Marks, Maulbeerallee 34, 1000 Berlin 20, all of Fed. Rep. of Germany**

**Filed Sep. 12, 1979, Ser. No. 74,665**

**Int. Cl.³ B01D *21/01, 21/02***

**U.S. Cl. 210—702** **6 Claims**

1. An apparatus for the treatment of untreated water containing substances causing turbidity in a cylindrical tank by sedimentation using a flocculating agent added to the water causing said substance in the water to form into flakes, in which the water flows through the tank and after an adequate residence time is removed from the water surface of the tank at a rising speed which is less than the sinking speed of the flakes, said apparatus comprising:

a cylindrical tank;

one feed connection in the tank directed tangentially at the lower portion of the circumferential wall of the tank;

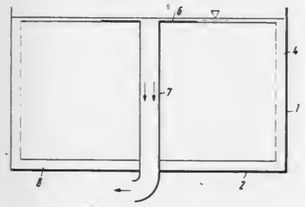
a cylindrical partition disposed in the tank, the circumferential wall of the partition forming an annular clearance with the circumferential wall of the tank;

a bottom wall of the tank and a lower end of the partition spaced apart placing the lower end of the annular clearance in free communication with the center of the tank;

the partition having perforations distributed over the circumference thereof such that the water mixed with the flocculating agent is introduced tangentially into the circumferential area of the tank and the circumferential speed of the inflowing water is reduced to such an extent by braking as it passes radially through the partition that the occurrence of upwardly directed secondary flows is prevented; and

a pipe disposed in the tank including an inlet near the top of said tank, the pipe passing axially through the tank bottom and carrying a circular overflow disc at its upper end disposed at substantially the same level as the upper end of said partition of the tank such that clean water is led off downwards through the center of the tank.

6. A process for the treatment of water containing substances causing turbidity in a cylindrical tank comprising the steps of:



(1) adding flocculent to the water in order to form said substances causing turbidity into flakes;

(2) passing the flocculent containing water tangentially into the lower periphery of the tank into an annular clearance formed by a perforated cylindrical partition and the circumferential wall of the tank, the lower end of said partition being spaced apart from the bottom wall of said tank placing the lower end of said annular clearance in free communication with the center of the tank;

(3) directing the water radially inward through said perforated cylindrical partition to reduce the circumferential speed of the inflowing water sufficiently to prevent the occurrence of upwardly directed secondary flows;

(4) maintaining the flocculent containing water in the tank for an adequate time for said flakes to form;

(5) allowing said flakes to be deposited at the bottom of said tank;

(6) drawing clean water through a centrally disposed overflow in said tank beneath the water surface in the tank, said overflow being at substantially the same level as the upper end of said partition.

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**4,297,222**

## METHOD OF PURIFYING WATER IN FISH KEEPING WATER TANK

**Masanobu Takeguchi, and Isao Oyobe, both of Fujisawa, Japan, assignors to Marui Industry Co., Ltd., Tokyo, Japan**

**Filed Apr. 4, 1980, Ser. No. 137,269**

**Claims priority, application Japan, Apr. 10, 1979, 54-42474**

**Int. Cl.³ C02B** *1/38*

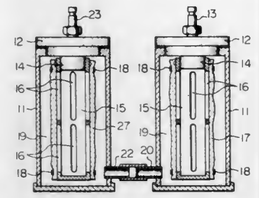
**U.S. Cl. 210—748** **5 Claims**

1. A method of purifying water in a fish keeping water tank comprising:

(A) circulating water at a rate such that at least half the volume of water in the tank is circulated per hour;

(B) passing the water through a UV irradiation vessel providing UV radiation having a predominant wavelength of less than 280 nm, wherein the water is exposed to at least 170 $\mu$W·min/cm$^2$ of UV radiation at one pass through said vessel, or a given volume of water is exposed to a total of at least 1000 $\mu$W·min/cm$^2$ of UV radiation during a one-hour circulation of the water;

(C) introducing the water into a first purifying tank having an inlet and an outlet and which includes a support cylinder wrapped with a first microorganism-growing bed of free-permeable nonwoven fabric made of synthetic resin and having a predetermined mesh size no smaller than 100$\mu$, passing all of said water through said growing bed,



to thereby bring the introduced water into contact with microorganisms and to separate some of said microorganisms from said growing bed, introducing said water into a space in said first purifying tank downstream from said first microorganism growing bed, where microorganisms separated from said first growing bed are suspended and grow, to thereby bring the water into contact with such microorganisms in said space; and

introducing the water into at least one second purifying tank located downstream from said first purifying tank, each said second purifying tank having a free-permeable synthetic resin microorganism-growing bed.

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**4,297,223**

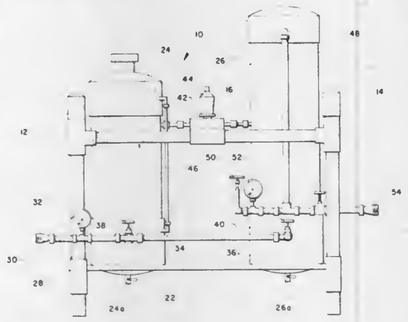
## METHOD AND APPARATUS FOR FORMING A CHLORINE-WATER SOLUTION AND FOR UTILIZING THE SAME TO DISINFECT WATER LINES AND THE LIKE

**Morrison Rivenbark, Kinston, N.C., assignor to Douglas R. Smith, Kinston, N.C.**

**Filed Jul. 28, 1980, Ser. No. 172,679**

**Int. Cl.³ C02B** *3/06*

**U.S. Cl. 210—754** **9 Claims**



1. A chlorinator design for such use as sterilizing water lines and the like comprising: a chlorine tank having chlorine therein and adapted to receive water therein and to form a concentrated chlorine water solution; mixing tank means for receiving both water and the concentrated chlorine-water solution from said chlorine tank and mixing the two together to form a mixed chlorine solution; line means communicatively connected between said chlorine tank and said mixing tank for transferring the concentrated chlorine-water solution from said chlorine tank to said mixing tank; inlet water line means operatively connected to both said chlorine tank and said mixing tank for simultaneously directing water to both said chlorine tank and said mixing tank wherein the circulation of water through said chlorine tank forms the concentrated chlorine-water solution and wherein the water directed to said mixing tank acts to combine with said concentrated chlorine-water solution to form a final mixed chlorine solution; valve means operatively associated with said chlorine tank for adjusting the flow of water directed through said chlorine tank from said inlet water line means; and outlet line means communicatively connected to said mixing tank and extending therefrom for directing the mixed chlorine solution from said mixing tank, whereby the formed chlorine solution can be directed through water lines or the like for sterilizing the same.



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**4,297,224**

## METHOD FOR THE CONTROL OF BIOFOULING IN RECIRCULATING WATER SYSTEMS

**Nick T. Macchiarolo; Billy G. McGuire, and John M. Scalise, all of El Dorado, Ark., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.**

**Filed Jun. 4, 1980, Ser. No. 156,508**

**Int. Cl.³ C02F** *1/76, 1/50*

**U.S. Cl. 210—755** **6 Claims**

1. A method of controlling biofouling in recirculating water systems for heat exchange systems without disinfecting the bulk recirculating water comprising the steps of:

introducing a biocidally effective amount of 1-bromo-3-chloro-5,5-dimethylhydantoin into the water in order to kill biofouling microorganisms at film-forming surfaces of the system; and

thereafter maintaining the concentration of 1-bromo-3-chloro-5,5-dimethylhydantoin at a level effective to inhibit regrowth of such microorganisms at such surfaces without maintaining a continuous measurable halogen residual in the recirculating water and without disinfecting the bulk recirculating water.

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**4,297,225**

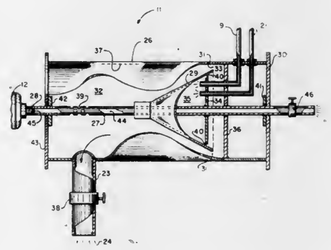
## RECYCLING CENTRIFUGE FOR THE REDUCTION OF VISCOSITY AND GEL STRENGTH OF DRILLING FLUIDS

**Bobby G. Hartley, 1011 Iberville St., Donaldsonville, La. 70346**

**Continuation-in-part of Ser. No. 838,388, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 755,973, Dec. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,078, Oct. 14, 1975, abandoned. This application Aug. 10, 1978, Ser. No. 932,536**

**Int. Cl.³ B04B** *5/00*

**U.S. Cl. 210—779** **8 Claims**



1. A process for reducing the viscosity and gel strength of a hydratable clay containing drilling mud which comprises contacting said mud with the inner surface of a revolving cone, the total included angle of the cone ranging from about 40° to about 120°, the cone revolving at a speed ranging from about 400 to about 6000 revolutions per minute, sufficient to impart adequate compression force to dewater the hydrated clay constituent and thereby reduce the viscosity and gel strength of said mud.

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**4,297,226**

## PROCESS FOR SECONDARY RECOVERY

**Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 917,056, Jun. 19, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,141**

**Int. Cl.³ E21B** *43/22*

**U.S. Cl. 252—8.55 D** **17 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of an N-substituted polyacrylamide bearing N-substituents of the formula:

$$-(CH_2CH_2O)_mSO_3M$$

wherein m is an integer of from 1 to 5 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well, and wherein the number average molecular weight of the said N-substituted polyacrylamide is about 10,000 to about 2,000,000.

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**4,297,227**

## METHOD FOR CONTINUOUS GREASE MANUFACTURE

**Arnold C. Witte, Port Neches, and Richard L. Coleman, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 16,597, Mar. 2, 1979, abandoned. This application Jan. 18, 1980, Ser. No. 113,162**

**Int. Cl.³ C10M** *5/16, 5/14, 5/02, 7/22*

**U.S. Cl. 252—18** **8 Claims**

1. In a continuous grease manufacturing process wherein a saponifiable material is reacted with an aqueous solution of a metal base in a saponification zone at saponification conditions of elevated temperature and superatmospheric pressure to produce a soap containing saponification reaction product, wherein said saponification reaction product is passed through a pressure reducing means to effect pressure reduction and to flash vaporize substantially all the water present in said saponification reaction product and the said flashed vaporized water as well as any remaining water is removed from said saponification reaction product by flash vaporization in a dehydration zone to produce a dehydrated saponification product, and wherein said dehydrated saponification product in said dehydration zone is recycled through a shear valve for conditioning said soap contained therein, and wherein lubricating oil is added to said recycled dehydrated saponification product for producing a grease product; the improvement which comprises:

(a) admixing an aqueous solution of at least one water soluble additive compound, which improves properties of said grease product, with said saponification reaction product under conditions of superatmospheric pressure sufficient to maintain water present in the liquid phase and at an elevated temperature sufficiently high for flash vaporizing substantially all water present in the resulting admixture upon subsequent substantial pressure reduction, thereby forming a hot combined mixture of saponification reaction product and aqueous additive solution; and

(b) passing said formed hot combined mixture through a

pressure reducing means that is maintained at a pressure not greater than about atmospheric and sufficient for flash vaporizing substantially all water present in said hot formed mixture and passing the resulting substantially dehydrated mixture and vaporized water into said dehydration zone to flash vaporize any remaining water in said mixture and for producing additive particles of a size not greater than about 10 microns distributed within said dehydrated mixture.

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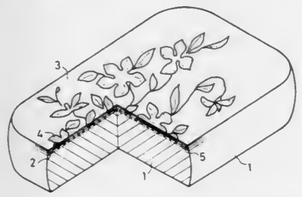
**4,297,228**

## DECORATED SOAP AND METHOD FOR PRODUCING THE SAME

**Masataka Kamada, 94-4071banchi, Haishima-cho, Akishima-city, Tokyo, and Seiji Satoh, 6-140banchi, Segasaki, Urawa-city, Saitama-district, both of Japan**

**Filed Jul. 14, 1980, Ser. No. 168,674**
**Claims priority, application Japan, Apr. 19, 1980, 55-51119**
**Int. Cl.³ B44C *1/16;* C11D *17/00, 17/04***
**U.S. Cl. 252—92** **4 Claims**



1. Decorated soap which comprises, in combination, a cake of soap, a synthetic resin layer formed on one side surface of said soap, said synthetic resin layer being formed by applying a composition of 30% acrylic resin, 15% nitrocellulose and 55% solvents, a release layer having a printed layer representing a pattern consisting of designs and/or characters, said release layer being formed by applying a composition of 15 to 25% cellulose ester plus plasticizer and 75 to 85% solvents, and an adhesive layer which joins said synthetic resin layer with said release layer, said adhesive layer being formed by applying a composition of 23 to 50% adhesive base materials and 50 to 77% solvents.

3. A method for producing decorated soap which comprises the steps of:

a. forming a synthetic resin layer on one side surface of soap to be treated by applying a composition of 30% acrylic resin, 15% nitrocellulose and 55% solvents;

b. forming a release layer on a backing film by applying a composition of 15 to 25% cellulose ester plus plasticizer and 75 to 85% solvents, reversely printing a desired pattern on said release layer, and forming an adhesive layer on said printed release layer by applying a composition of 23 to 50% adhesive base materials and 50 to 77% solvents, thereby forming a transfer sheet;

c. bringing said adhesive layer of transfer sheet into contact with said synthetic resin layer on said soap by moving said transfer sheet in front of a rotary rubber roller which is heated at a temperature between about 180° C. and about 250° C., with said synthetic resin layer on said soap being opposed to said adhesive layer of said transfer sheet, and then pressing said soap together with said transfer sheet to said rotary rubber roller under a pressure between about 200 g/cm² and 1000 g/cm²; and

d. peeling only said backing film of transfer sheet from said joined product.

**4,297,229**

## PARTICULATE BORATE-SOAP COMPOSITIONS

**Richard C. Speak, and Donald J. Ferm, both of Fullerton, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.**

**Filed Oct. 23, 1979, Ser. No. 87,377**
**Int. Cl.³ C11D *9/16, 11/00, 17/06***
**U.S. Cl. 252—109** **20 Claims**

1. The method of producing a particulate borate soap composition comprising heating $C_8$–$C_{18}$ fatty acid at a temperature of from about 40° to 100° C. at which temperature said fatty acid is a liquid and intimately mixing said liquid fatty acid with a mixture of finely divided alkali metal carbonate and hydrated sodium tetraborate to form the alkali metal salt of said fatty acid and thereby produce a particulate hydrated sodium tetraborate-soap-alkali metal bicarbonate composition containing about 25 to 50% as anhydrous sodium tetraborate, wherein the mole ratio of said fatty acid to alkali metal carbonate is in the range of from 1:1 to about 1:2, said finely divided alkali metal carbonate is substantially of a particle size smaller than 100 mesh, and the soap content of the resultant particulate product is in the range of about 5 to 35% by weight.

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**4,297,230**

## NON-CRYSTALLIZING TRANSPARENT SOAP BARS

**Jacobus C. Rasser, Grimbergen, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jan. 31, 1980, Ser. No. 117,320**
**Claims priority, application United Kingdom, Feb. 6, 1979, 04197/79; Nov. 1, 1979, 37809/79**
**Int. Cl.³ C11D *9/30, 3/10***
**U.S. Cl. 252—117** **10 Claims**

1. A transparent soap bar, consisting essentially of from about 4% to about 20% potassium soap, the balance of the soap component of said soap bar comprising sodium, ammonium or alkanolamine soap, at least about 0.2% chloride anions, from about 4% to about 25% moisture and from about 0.2% to about 5% of an electrolyte selected from the group consisting of potassium carbonate, sodium formate, potassium formate, sodium tartrate, potassium tartrate, sodium citrate, potassium citrate, sodium acetate, potassium acetate, potassium ammonium tartrate, ammonium acetate, ammonium carbonate, ammonium formate, ammonium citrate, ammonium lactate, ammonium bisulfate, and mixtures thereof.

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**4,297,231**

## PROCESS FOR PRODUCING A POSITIVE ELECTRODE FOR A NON-AQUEOUS ELECTROLYTIC CELL

**Toshiki Kahara; Kohki Tamura; Noboru Ebata; Fumio Sato, and Tomio Yoshida, all of Ibaraki, Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan**

**Filed Dec. 28, 1979, Ser. No. 107,926**
**Claims priority, application Japan, Jan. 6, 1979, 54-865**
**Int. Cl.³ H01M *4/50, 4/04***
**U.S. Cl. 252—182.1** **9 Claims**

1. A process for producing a positive electrode for a non-aqueous electrolytic cell comprising the steps of:

(a) heat-treating manganese dioxide;

(b) adding the thus heat-treated manganese dioxide with a conducting agent and a binder to be mixed together;

(c) heat-treating the resultant mixture; and

(d) molding the thus heat-treated mixture to form a positive electrode.

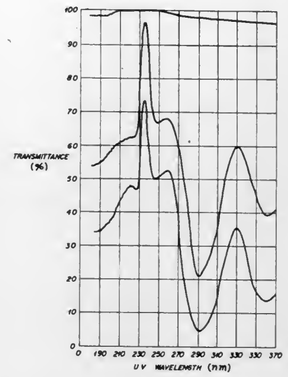


**4,297,232**

## GLYCOL-IODINE COMPOSITION AND METHOD OF PREPARATION

**Samuel Ruben, 271 North Ave., New Rochelle, N.Y. 10801**

**Continuation-in-part of Ser. No. 868,769, Jan. 12, 1978, abandoned, which is a continuation of Ser. No. 714,760, Aug. 16, 1976, abandoned. This application Jan. 25, 1979, Ser. No. 6,946**
**Int. Cl.³ A61K *33/18;* A01N *59/12***
**U.S. Cl. 252—187 R** **29 Claims**




1. A composition consisting essentially of a glycol component selected from the group consisting of ethylene glycol, the polymers thereof and mixtures thereof, and iodine, said iodine present in an amount up to the saturation point of said iodine in said glycol component,

said composition characterized by the absence of a spectroscopically identifiable complex between said glycol component and said iodine, and the absence of free iodine therein.

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**4,297,233**

## DEODORIZING COMPOSITION FOR ASH TRAYS

**Paolo Gualandi, 16/A, Via Rosario, Bologna, Italy**

**Filed May 14, 1979, Ser. No. 38,751**
**Claims priority, application Italy, Jun. 27, 1978, 12684 A/78**
**Int. Cl.³ C09K *3/00;* A61K *7/46;* C11B *9/00***
**U.S. Cl. 252—259.5** **8 Claims**

1. A deodorizing composition comprising, in combination;

(a) A solid absorbent granular material, of a grain size in the range of 20 to 65 mesh per cm², composed in weight % of:

$SiO_2$: from 90 to 95%,

$Al_2O_3$: from 4 to 7%,

$Fe_2O_3$: from 1 to 2%,

CaO: from 0 to 0.5%,

MgO: from 0 to 0.5%,

the remainder comprising water and traces of alkalies or other metallic oxides;

(b) An oily essence absorbed in said absorbent material, the ratio of oily essence to absorbent material being, in parts by weight, in the range of 1:1.5 to 1:1; and

(c) A vapor diffusion fixation agent selected from the class consisting of silicone oils, higher alcohols, plastifiers, and mixtures thereof.

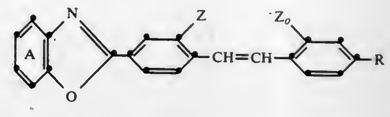
**4,297,234**

## BENZOXAZOLYL-STILBENES

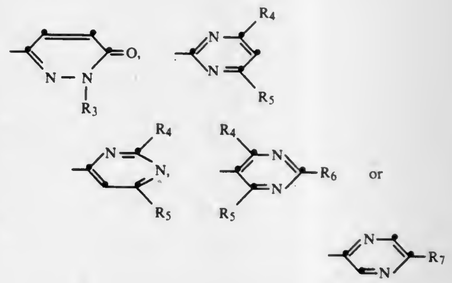
**Kurt Burdeska, Basel, and Guglielmo Kabas, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed May 5, 1980, Ser. No. 146,960**
**Claims priority, application Switzerland, May 17, 1979, 4596/79**
**Int. Cl.³ C07D *413/10, 413/14***
**U.S. Cl. 252—301.24** **14 Claims**

1. A benzoxazolyl-stilbene of the formula



in which R is one of the ring systems of the formulae



in which $R_3$ is hydrogen, alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl, $R_4$ and $R_5$ independently of one another are hydrogen, alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl, alkoxy having 1 to 4 C atoms, alkoxyalkoxy having a total of 3 to 8 C atoms, unsubstituted phenoxy or phenoxy substituted by chlorine or methyl, chlorine, alkylthio having 1 to 4 C atoms, phenylthio, alkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 8 C atoms, morpholino, piperidino, piperazino, pyrrolidino or anilino, $R_6$ is alkyl having 1 to 4 C atoms, unsubstituted phenyl or phenyl substituted by chlorine or methyl and $R_7$ is alkoxy having 1 to 4 C atoms, alkoxyalkoxy having a total of 2 to 8 C atoms, alkylthio having 1 to 4 C atoms, unsubstituted phenoxy or phenoxy substituted by chlorine or methyl, cycloalkyloxy, alkylthio having 1 to 4 C atoms, unsubstituted phenylthio or phenylthio substituted by chlorine or methyl, alkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 8 C atoms, morpholino, piperidino, piperazino, pyrrolidino or anilino, one of Z and $Z_o$ is hydrogen and the other is hydrogen or chlorine and the benzene nucleus A is unsubstituted or substituted by non-chromophoric substituents selected from alkyl, halogenalkyl, cyanoalkyl, hydroxyalkyl, alkoxyalkyl, phenoxyalkyl, carboxyalkyl, salts, esters and amides of carboxylalkyl, aralkyl, cycloalkyl, alkenyl, alkoxy, hydroxyalkoxy, alkoxyalkoxy, aralkoxy, phenoxyalkoxy, cyanoalkoxy, alkenyloxy, carboxy, sulfo, carboxylic and sulfonic acid salts, esters and amides, alkylsulfonyl, phenylsulfonyl, aryl, aryloxy and two adjacent radicals forming together the remaining members of an aromatic carbocyclic ring system.

4,297,235

## METHOD OF PREPARING A MICROCAPSULE DISPERSION

Yoshiyuki Hoshi; Takayuki Hayashi, and Fujio Kakimi, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 5, 1979, Ser. No. 91,309
Claims priority, application Japan, Nov. 7, 1978, 53-136964
Int. Cl.³ B01J *13/02*
U.S. Cl. 252—316 9 Claims

1. In a method of preparing a dispersion of microcapsules whose walls comprise formaldehyde as one of the wall components, the improvement which comprises

preparing a dispersion containing microcapsules with microcapsule walls of an amino-formaldehyde condensation resin,

adding urea to the capsule dispersion in the range from about 1/10 to 5 times greater on a molar basis than the formaldehyde contained in the dispersion,

heating the capsule dispersion with stirring, and adding a solution of sulfite, hydrogensulfite or a mixture thereof to the capsule dispersion in the range from about 0.02 to 1 mol per mol of formaldehyde.

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4,297,236

## WATER MISCIBLE CORROSION INHIBITORS

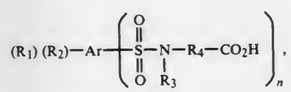
Helmut Diery, Kelkheim; Rainer Helwerth, Eschborn; Horst Fröhlich, Eppstein, and Horst Lorke, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,337
Claims priority, application Switzerland, Sep. 19, 1977, 11419/77
Int. Cl.³ C23F *11/14, 11/16, 11/18*
U.S. Cl. 252—389 R 3 Claims

1. Corrosion inhibitors consisting essentially of a mixture of

(A) reaction products of boric acid and diethanolamine, and

(B) arylsulfonamidocarboxylic acids of the formula I



I

in which

$R_1$ and $R_2$ each represent hydrogen, fluorine, chlorine, bromine, an alkyl or alkoxy radical having from 1 to 4 carbon atoms, with the proviso that the sum of the carbon atoms of $R_1$ and $R_2$ does not exceed 7;

Ar is a benzene, naphthalene or anthracene radical;

$R_3$ is hydrogen, an aryl radical having up to 4 carbon atoms, a $\beta$-cyanoethyl or hydroxyalkyl radical having from 2 to 4 carbon atoms;

$R_4$ is an alkylene radical having more than 3 carbon atoms, optionally substituted by one or more methyl or ethyl radicals; and

n is 1 or 2; or

alkyl- and/or cycloalkylsulfonamidocarboxylic acids obtained by sulfochlorination of a saturated aliphatic and/or cycloaliphatic hydrocarbon having from 12 to 22 carbon atoms and a boiling temperature range of from about 200° to 350° C., subsequent reaction with ammonia and final condensation with chloroacetic acid.

4,297,237

## POLYPHOSPHATE AND POLYMALEIC ANHYDRIDE COMBINATION FOR TREATING CORROSION

Bennett P. Boffardi, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

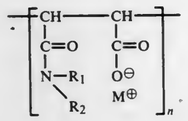
Filed Mar. 6, 1980, Ser. No. 127,675
Int. Cl.³ C23F *11/18, 11/14, 11/16*
U.S. Cl. 252—389 A 11 Claims

1. A method of inhibiting corrosion in an aqueous system comprising the step of treating said system with from 1.0 to 300 parts per million by weight of the total aqueous content of said system, of a corrosion inhibiting composition comprising

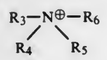
(1) polyphosphate; and

(2) one or more polymers selected from the group consisting of polymaleic anhydride and amine adducts of polymaleic anhydride selected from the group consisting of:

(a) polymers having recurring units of the formula:



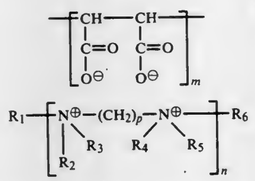
wherein $M^{\oplus}$ may be $H^{\oplus}$, alkali metal cation, or quaternary ammonium cation of the formula:



wherein for all of the above formulas, $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, and $R_6$ are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof; and

wherein n is an integer of from 2 to 100; and

(b) polymers having recurring units of the formula:



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, and $R_6$ are each independently selected from the group consisting of hydrogen, alkyl of from one to ten carbon atoms, and substituted alkyl of from one to ten carbon atoms, where the substituent is hydroxyl; carbonyl; and carboxylic acid groups, and alkali metal ion and ammonium salts thereof;

wherein p is an integer of from 1 to 6;

wherein m is an integer of from 2 to 100; and

wherein n is an integer of from 2 to about 100, provided that, n not equal to m, the lesser of m or n is multiplied by a factor such that n=m;

wherein the polymaleic anhydride and amine adducts of polymaleic anhydride have a weight average molecular weight of from about 200 to about 10,000; and

wherein the weight ratio of polyphosphate to polymer is from 10:1 to 1:10.



4,297,238

## HEMOLYSING SOLUTION PREPARING HEMOLYSED BLOOD HAVING A STABILIZED GLUCOSE CONTENT

Rolf Vormbrock, and Roland Helger, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,347
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850603
Int. Cl.³ G01N *33/48;* C09K *3/00*
U.S. Cl. 252—408 7 Claims

1. In a hemolysing solution used in the determination of glucose in a whole blood sample, consisting essentially of a lysing reagent and a glycolysis inhibitor which inhibits glycolysis in the hemolysate obtained by contacting the blood sample with the hemolysing solution, the improvement wherein the hemolysing solution consists essentially of

(a) a buffer providing a pH of about 6–8;

(b) 0.8–3.0 moles/liter of sodium chloride;

(c) 1–4 g/l of a surface active agent;

(d) 0.5–2 g/l of a chelating agent which in the presence of component (c) serves as a stabilizer against glycolysis in the hemolysate; and, optionally,

(e) an effective amount of an antimicrobial agent.

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4,297,239

## HYDROFORMYLATION CATALYST REACTIVATION

David R. Bryant, and Richard A. Galley, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 58,123, Jul. 16, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 120,101
Int. Cl.³ B01J *31/40, 31/24;* C07C *45/50;* B01J *31/20*
U.S. Cl. 252—412 54 Claims

1. A process for preparing a hydroformylation medium, said medium comprising a rhodium complex and triarylphosphine, which comprises mixing a rhodium complex concentrate with a sufficient amount of triarylphosphine so that there is at least about 10 moles of free triarylphosphine per mole of rhodium present in said medium; said rhodium complex concentrate having been produced by a process which comprises concentrating a spent hydroformylation reaction medium that contains a partially deactivated rhodium complex catalyst, free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products, into at least two separate material streams so as to remove free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products from said spent hydroformylation reaction medium by means of distillation at temperatures of about 20° C. to about 350° C. and at pressures of about 1000 mm Hg. to about $1\times10^{-6}$ mm Hg., wherein one stream is said rhodium complex concentrate distillation residue containing a major amount of the rhodium of said catalyst and which has been concentrated to about 0.1 to about 30 percent by weight of said spent hydroformylation reaction medium, and the other material stream or streams consist essentially of one or more of the distilled volatile components of said spent hydroformylation reaction medium.

28. A hydroformylation medium comprising a rhodium complex and at least about 10 moles of free triarylphosphine per mole of rhodium present in said medium, said rhodium complex having been derived from a rhodium complex concentrate which has been produced by a process which comprises concentrating a spent hydroformylation reaction medium that contains a partially deactivated rhodium complex catalyst, free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products, into at least two separate material streams so as to remove free triarylphosphine, aldehyde products and higher boiling aldehyde condensation by-products from said spent hydroformylation reaction medium by means of distillation at temperatures of about 20° C. to about 350° C. and at pressures of about 1000 mm Hg. to about $1\times10^{-6}$ mm Hg., wherein one stream is said rhodium complex concentrate distillation residue containing a major amount of the rhodium of said catalyst and which has been concentrated to about 0.1 to about 30 percent by weight of said spent hydroformylation reaction medium, and the other material stream or streams consist essentially of one or more of the distilled volatile components of said spent hydroformylation reaction medium.

31. A hydroformylation medium as defined in claim 28, wherein the distillation takes place in two stages and wherein the second distillation stage is distilled at a lower pressure than the first distillation stage.

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4,297,240

## SOLUTION POLYMERIZATION

Robert E. Bingham, Cuyahoga Falls; Richard R. Durst, Stow; Hubert J. Fabris, Akron; Ivan G. Hargis, Tallmadge; Russell A. Livigni, and Sundar L. Aggarwal, both of Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 124,373, Feb. 25, 1980. This application Aug. 15, 1980, Ser. No. 178,248
Int. Cl.³ C08F *4/10*
U.S. Cl. 252—431 R 8 Claims

1. A composition of matter useful as an anionic polymerization catalyst comprising (1) an alcoholate selected from the group consisting of barium alcoholate, calcium alcoholate and strontium alcoholate and mixtures thereof, (2) an organoaluminum compound selected from the group consisting of alkyl and cycloalkyl aluminum compounds and mixtures of the same and (3) an organomagnesium compound selected from the group consisting of alkyl and cycloalkyl magnesium compounds and mixtures of the same, where the mol ratio computed as metal of barium, calcium and/or strontium to magnesium is from about 1:10 to 1:2 and where the mol ratio computed as metal of magnesium to aluminum is from about 105:1 to 1.5:1.

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4,297,241

## METHOD OF PREPARING AN OLEFIN HYDRATION CATALYST

Percy R. Kavasmaneck; David B. Stanton, and Paul D. Sherman, Jr., all of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,496
Int. Cl.³ B01J *21/08, 21/12, 27/16*
U.S. Cl. 252—435 2 Claims

1. Method of preparing an olefin hydration catalyst which comprises the steps of:

(1) blending a mixture of about 30 to about 70 parts by weight of diatomaceous earth, about 15 to about 30 parts by weight of bentonite, about 15 to about 30 parts by weight of a synthetic silica having a surface area of about 150 to about 200 meters² per gram, about 5 to about 25 parts by weight of cornmeal and about 5 to about 25 parts by weight of cellulose with sufficient water to form a paste;

(2) extruding the paste from step 1 into pellets;

(3) drying said pellets;

(4) calcining said dried pellets at a temperature of about 650° to about 730° C.;

(5) leaching the calcined pellets with aqueous 85 percent phosphoric acid until metallic impurities are reduced to a minimum;

(6) washing the leached pellets with water until the wash water is approximately neutral;

(7) drying the pellets;

(8) impregnating the dried pellets with 65 percent phosphoric acid at room temperature;

(9) draining off excess phosphoric acid; and

(10) drying the pellets at a temperature of about 100° to about 400° C.

**4,297,242**

## PROCESS FOR DEMETALLATION AND DESULFURIZATION OF HEAVY HYDROCARBONS

**Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana)**

**Division of Ser. No. 928,141, Jul. 26, 1978, Pat. No. 4,212,729. This application Jul. 14, 1980, Ser. No. 168,297**

**Int. Cl.³ B01J** *27/02, 23/16*

**U.S. Cl. 252—439** **15 Claims**

1. A hydrodesulfurization catalyst consisting essentially of at least one active original hydrogenation metal selected from Group VIB deposed on a catalytically active support comprising alumina, said Group VIB metal being in at least one form selected from the group consisting of the elemental form, the oxide, and the sulfide, said catalyst having a surface area within the range of about 150 $m^2$/gm to about 300 $m^2$/gm, having a majority of its pore volume in pore diameters within the range of about 80 Å to about 130 Å, and a pore volume within the range of about 0.4 cc/gm to about 0.9 cc/gm.

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**4,297,243**

## MOLYBDENUM-EXCHANGED CRYSTALLINE ALUMINOSILICATE ZEOLITE

**Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.**

**Filed Oct. 2, 1979, Ser. No. 81,105**

**Int. Cl.³ B01J** *29/16, 29/26, 29/36*

**U.S. Cl. 252—455 Z** **26 Claims**

1. A crystalline aluminosilicate zeolite having a composition expressed in molar ratios of oxides as:

$$\left(cM\,\frac{2}{n}\,O + bMoO_3\right) : Al_2O_3 : xSiO_2 : yH_2O$$

where $cM_{2/n}O$ represents the sum of all components, on a per mole of $Al_2O_3$ in the crystal framework basis, required to balance that portion of the charge on the crystal framework not balanced by molybdenum constituents, with the valence of M being represented by n, and where $MoO_3$ represents all molybdenum constituents balancing a charge on the crystal framework, and c, b, x, and y represent the moles of $M_{2/n}O$, $MoO_3$, $SiO_2$, and the water of hydration, $H_2O$, respectively, present in the zeolite to each mole of $Al_2O_3$ in the crystal framework, x being between 2 and 100, y being a non-negative number, c being 0 or a positive number less than 1, and b being a positive number no greater than 1, with c+b being a positive number no greater than 1.0, said zeolite being characterized by the ion exchange of molybdenum-containing cations from the zeolite when the zeolite is immersed for at least one hour in an aqueous sodium salt solution having a temperature in the range of 20° to 80° C. and an initial pH between 6.0 and 8.5, said solution containing sodium ions in a concentration between 1.0 and 15.0% by weight, calculated as Na, and said immersion being such that the weight ratio of zeolite to solution is between about 1:4 and 1:12.

14. A catalyst composition comprising a molybdenum-containing crystalline aluminosilicate zeolite having an ordered crystalline structure prepared by the method comprising (1) contacting a crystalline aluminosilicate zeolite having a substantially ordered crystalline structure with an aqueous solution containing a precursor of $MoO_2{}^{+2}$ cations, said solution having sufficient of an organic base added thereto to maintain the pH of the solution below 7.0 but higher than that which would substantially affect the crystalline structure of the zeolite, said contacting being under conditions sufficient to replace at least some of the cations in the zeolite with molybdenum-containing cations and increase the molybdenum-containing cation content of the zeolite, and (2) subsequently calcining the zeolite containing the molybdenum-containing cations in an oxygen-containing oxidizing atmosphere.

21. A method for ion-exchanging molybdenum-containing cations into a crystalline aluminosilicate zeolite having an ordered crystalline structure comprising contacting a crystalline aluminosilicate zeolite having an ordered crystalline structure with an aqueous solution containing a precursor of $MoO_2{}^{+2}$ cations, said solution having sufficient of an organic base added thereto to maintain the pH of the solution during said contacting below 7.0 but higher than that which would substantially affect the crystal structure of the zeolite, said contacting being under conditions sufficient to replace at least some of the cations in said zeolite with molybdenum-containing cations, and recovering the zeolite containing the molybdenum-containing cations from said solution.

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**4,297,244**

## CATALYST AND PROCESS FOR CONVERSION OF HYDROCARBONS

**John Mooi, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.**

**Continuation of Ser. No. 846,046, Oct. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,657, Apr. 29, 1976, Pat. No. 4,252,632. This application Apr. 21, 1980, Ser. No. 142,484**

**Int. Cl.³ B01J** *29/06, 23/56*

**U.S. Cl. 252—455 Z** **34 Claims**

1. Combined particles comprising (A) a major amount of solid particles capable of promoting the cracking of hydrocarbon feedstock at hydrocarbon cracking conditions to produce at least one hydrocarbon product and to cause deactivating carbonaceous material to be formed on said combined particles and (B) a minor amount of discrete entities comprising (1) a major amount by weight of substantially accessible alumina, (2) a minor, catalytically effective amount of at least one platinum group metal component deposited on said alumina, said platinum group metal component deposited on said alumina, said platinum group metal component being capable of promoting the oxidation of carbon monoxide to carbon dioxide at carbon monoxide oxidation conditions, and (3) minor, catalytically effective amount of at least one crystalline aluminosilicate zeolite capable of promoting hydrocarbon cracking at the conditions in said reaction zone.

8. A composition of matter suitable for use in a chemical reaction zone-regeneration zone system comprising in intimate admixture (A) a major amount of solid particles capable of promoting the cracking of sulfur-containing hydrocarbon feedstock at hydrocarbon cracking conditions to produce at least one hydrocarbon product and to cause sulfur-containing carbonaceous material to be formed on said solid particles and (B) a minor amount of discrete entities comprising a major amount of alumina capable of associating with sulfur trioxide at the conditions in said regeneration zone and disassociating with sulfur trioxide at the conditions of said reaction zone and a minor, catalytically effective amount of at least one crystalline aluminosilicate zeolite capable of promoting hydrocarbon cracking.

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**4,297,245**

## CATALYST FOR THE PREPARATION OF METHANE

**Burton H. Bartley, Fishkill, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 636,237, Nov. 28, 1975, Pat. No. 4,065,514, which is a continuation-in-part of Ser. No. 272,528, Jul. 17, 1972, abandoned. This application Nov. 21, 1977, Ser. No. 853,079**

**Int. Cl.³ B01J** *21/08, 23/56, 23/74*

**U.S. Cl. 252—460** **7 Claims**

1. A finely-divided, high surface area supported catalyst, particularly characterized by its ability to catalyze the production of methane by the reaction of hydrogen and a hydrocarbon containing at least two carbon atoms at a temperature of 300° C.–800° C. which consists essentially of a support, a metal of the platinum-palladium group and a metal of the iron group, each of said platinum-palladium group metal and said iron group metal being substantially distributed throughout the body of the catalyst.



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**4,297,246**

## METHOD OF PRODUCING DENSE REFRACTORY OXIDE COATINGS ON METALLIC SUBSTRATES AND THE PRODUCTION OF CATALYSTS FROM THE COATED SUBSTRATES

**James A. Cairns, Wantage; Robert L. Nelson, Kingston Bagpuize, and James L. Woodhead, Didcot, all of England, assignors to United Kingdom Atomic Energy Authority, England**

**Filed Oct. 25, 1978, Ser. No. 954,532**

**Claims priority, application United Kingdom, Nov. 1, 1977, 45471/77**

**Int. Cl.³ B01J** *21/08, 23/10, 23/56;* **B32B** *15/18*

**U.S. Cl. 252—465** **10 Claims**

1. A method of coating a substrate with a refractory oxide selected from the group consisting of ceria, zirconia and titania which comprises the steps of

(i) contacting the substrate with a sol of said refractory oxide comprising a dispersion, in a liquid medium, of substantially unaggregated colloidal primary particles of the refractory oxide or of aggregated colloidal primary particles of the refractory oxide and ions which occupy gaps in said aggregated particles, said sol being capable of being converted to a gel of the refractory oxide, the bulk density of the gel being at least 40% of the theoretical density of the refractory material;

(ii) converting the sol to a gel to provide the substrate with a gel coating; and

(iii) firing to convert the gel coating to said refractory oxide coating.

3. A method according to claim 1 wherein catalytically active material is applied to the coated substrate.

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**4,297,247**

## PREPARATION OF COATED CATALYSTS

**Richard Krabetz, Kirchheim; Walter Herrmann, Mannheim; Heinz Engelbach, Limburgerhof; Peter Palm, Gerolsheim; Karl Sommer, Ludwigshafen, and Heinrich Spahn, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,385**

**Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909671**

**Int. Cl.³ B01J** *23/22, 23/28, 23/30, 23/72*

**U.S. Cl. 252—468** **6 Claims**

1. In a process for the preparation of a coated catalyst comprising

(a) an inert carrier having a particle diameter of not less than 100 $\mu$m and a surface area of up to 20 $m^2$/g and

(b) a coating which firmly adheres to the outer surface and in the edge zone, near the surface, of the carrier particles, and which contains the catalytic material, by applying the catalytic material, in the form of a powder of particle size not more than 300 $\mu$m, in the presence of water, to the vigorously agitated carrier, the improvement wherein catalytically active material in an amount of from 1 to 40 g/minute/liter of carrier, and water in a weight ratio of catalytic material to water of from 1:1 to 30:1, are applied continuously and spatially separate from one another, each at a constant speed, onto the carrier particles, which may or may not have been pre-moistened with water in the amount of up to 95% of the particle absorbency, in such a way that the water content of the coating which forms is less than the maximum degree of saturation of the coating of catalytic material.

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**4,297,248**

## METHOD FOR PACKING CATALYSTS

**Kazunobu Abe, Izumi; Tadao Nakatsuji, Matsubara, and Toshikatsu Umaba, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Japan**

**Continuation of Ser. No. 27,440, Apr. 5, 1979, abandoned. This application Jul. 8, 1980, Ser. No. 167,099**

**Claims priority, application Japan, Apr. 15, 1978, 53-40738**

**Int. Cl.³ B01J** *35/04*

**U.S. Cl. 252—477 R** **3 Claims**

1. A method of horizontally and vertically packaging a plurality of individual honeycomb catalyst units having through holes in the direction of an intended gas flow to form a composite catalyst structure having a plurality of through holes in the direction of an intended gas flow through the structure, which method comprises arranging the individual catalyst units in a manner such that the interface in the path of intended gas flow between two such catalyst units does not lie on the same plane as the interface in the path of intended gas flow between at least one vertically or horizontally adjacent pair of said catalyst units.

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**4,297,249**

## METHOD OF TREATING SILVER OXIDE POWDER AND THE PRODUCT FORMED THEREFROM

**Franciszek J. Przybyla, Mississauga, and Eleanor J. Rossler, Lorne Park, both of Canada, assignors to Duracell International Inc., Bethel, Conn.**

**Filed Nov. 3, 1978, Ser. No. 957,597**

**Int. Cl.³ H01B** *1/06*

**U.S. Cl. 252—518** **13 Claims**

1. The process of producing a silver oxide powder mixture for use in the cathode of an alkaline silver oxide galvanic cell, including the steps of partially reducing a mixture having at least 10% divalent silver oxide powder, the remainder including at least a minor amount of monovalent silver oxide powder, by reacting said silver oxide powder mixture with a reagent which is a fatty acid or a fatty acid salt where the fatty acid has a chain length of at least twelve carbon atoms, and removing the reagent from the reacted silver oxide powder mixture.

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**4,297,250**

## METHOD OF PRODUCING HOMOGENEOUS ZNO NON-LINEAR POWDER COMPOSITIONS

**Tapan K. Gupta, Monroeville, Pa., and Herbert E. Pietsch, Mukwonago, Wis., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 7, 1980, Ser. No. 110,278**

**Int. Cl.³ H01B** *1/08*

**U.S. Cl. 252—518** **9 Claims**

1. A method of making a ZnO powder composition, which can exhibit non-linear V-I characteristics, comprising the steps of:

(1) mixing:

(a) 75 mole % to 98 mole % of finely divided, ZnO particles and 2 mole % to 25 mole % of finely divided, additive particles effective to produce non-linear V-I characteristics, with

(b) an aqueous binder solution comprising an organic,

water soluble binder that will decompose at temperatures of between about 150° C. and 600° C., to provide a mixed particle-binder slurry, and then

(2) simultaneously dry, mix, agglomerating the slurry to form a mass of larger spherical particles, said particles containing binder, ZnO and additive compound distributed therethrough, and then

(3) pressing a mass of the agglomerated particles to provide a consolidated body, and then (4) heating the pressed body;

(a) first at a temperature rate increase effective to slowly decompose and remove the binder, and then,

(b) between about 1,050° C. and 1,400° C., for a time effective to sinter together the particles of the pressed body, forming additive doped ZnO grains within a body exhibiting non-linear V-I characteristics, and then

(5) crushing the sintered body to provide finely divided powder particle fragments, and then

(6) passing the finely divided particle fragments from the crushed sintered body through a means to measure particle size, in a manner effective to provide a powder fraction where substantially all of the particles in the powder fraction contain at least two attached additive doped ZnO grain fragments, providing a powder exhibiting non-linear V-I characteristics, where said fragments contain microfractures after crushing, and then

(7) heating the non-linear particles at a temperature of between 500° C. and 1,050° C., to eliminate any microfractures without re-sintering the particles.

3. The method of claim 1, where, as a last step, the non-linear ZnO powder is dispersed in a resinous medium, to provide a ZnO stress grading paint composition.

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**4,297,251**

## PROCESS FOR REMOVING HARD-TO-REMOVE SOILS FROM HARDWARE

**Lowell W. Bernardino, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed May 2, 1977, Ser. No. 792,966**

**Int. Cl.³ C11D *1/12, 7/44***

**U.S. Cl. 252—545** **2 Claims**

1. The process of removing hard-to-remove soils from housewares including pots, pans, dishes, glasses and utensils using aqueous solutions containing from about 0.1% to about 0.5% of a stable, single-phase light duty liquid detergent composition consisting essentially of:

(a) from about 5% to about 35% of a synthetic anionic surfactant having the formula $R—(Y)_n—(O)_nSO_3M$ wherein R is a group containing from 8 to about 24 carbon atoms which can be either straight or branched chain, saturated or unsaturated and attached either at the terminal position, a secondary position, or random attachment or mixtures thereof; Y is a group selected from the group consisting of $(OC_2H_4)_x$ where x is a number from 1 to 30; $(O—CH_2—CHOH—CH_2)_m$ wherein m is a number from 1 to 3; or a benzene ring, each n is either 0 or 1; and M is selected from the group consisting essentially of sodium; potassium; mono-, di-, or trialkanolammonium wherein the alkanol groups contain from 2 to 4 carbon atoms; mono-, di-, or trialkylammonium wherein the alkyl groups contain from 2 to 4 carbon atoms; ammonium; magnesium, calcium; or mixtures thereof;

(b) from 0% to about 15% of a suds boosting ingredient selected from the group consisting of amine oxide surfactants and amide surfactants;

(c) from 0.8% to about 5% of a detergency boosting ingredient which is a vegetable lecithin; and,

(d) water, the pH of the composition being above about 7.5 and less than about 8.5.

**4,297,252**

## AGING-RESISTANT FIREPROOFING MATERIAL

**Arndt C. Caesar, Frankenthal; Wolfram Koegel, Manneheim; Ludwig Zuern, Bad Durkheim, and Friedheim Gaertner, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed May 22, 1979, Ser. No. 41,521**

**Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827828**

**Int. Cl.³ C09D *5/18;* C09K *3/28***

**U.S. Cl. 252—606** **1 Claim**

1. A fireproofing material which retains excellent foaming properties on aging and which comprises

(A) 99–90 percent by weight of an alkali metal silicate containing 20–60 percent by weight of water;

(B) 1–10 percent by weight of an aluminate; and

(C) 2–20 percent by weight, based on the sum of A+B, of glass fibers.

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**4,297,253**

## METHOD OF MAKING MOLDABLE PRODUCT

**Pierre Sorbier, Place de la Mairie, 84210 Pernes Les Fontaines, France**

**Filed Aug. 20, 1979, Ser. No. 68,144**

**Claims priority, application France, Sep. 1, 1978, 78 25291**

**Int. Cl.³ C08L *97/00;* B05D *7/00, 3/02***

**U.S. Cl. 260—17.3** **8 Claims**

1. A process for manufacturing a moldable product composed of minute fibers of a ligneous material, said fibers having a length greater than their width, comprising the steps of: impregnating thin elongated slivers of the ligneous material with a polymerizable resin, then drying the slivers, then again impregnating the slivers with polymerizable resin, then again drying the slivers, and then homogenizing the slivers to reduce their size and form said minute fibers.

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**4,297,254**

## LOW TEMPERATURE CURING EPOXY RESIN

**Martin P. Seidel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 28, 1979, Ser. No. 98,108**

**Int. Cl.³ C08G *59/50***

**U.S. Cl. 260—18 EP** **11 Claims**

1. A solventless anhydride-free liquid composition comprising:

(A) an oil-modified epoxy resin having an EEW of about 300 to about 600 which comprises the reaction product of:

(1) about 5 to about 50% of a triglyceride of a $C_{10}$ to $C_{20}$ fatty acid;

(2) about 50 to about 95% of an epoxy resin averaging at least one aliphatic hydroxyl group per molecule, an ash content of less than 0.1%, and an acid content of less than 0.01%; and

(3) about 0.01 to about 0.3 phr of a catalyst;

(B) up to about 80% of a glycidyl ether of a phenol;

(C) about 1 equivalent ±20%, per equivalent of epoxy resin, of menthane diamine; and

(D) about 0.02 to about 3% of an accelerator for said menthane diamine.

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**4,297,255**

## ADDUCT AND ITS USE

**Hans-Uwe Schenck, Wachenheim, and Erich Gulbins, Heidelberg-Neuenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Mar. 24, 1980, Ser. No. 133,437**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914085**

**Int. Cl.³ C08L *63/00;* C09D *3/58, 5/40***

**U.S. Cl. 260—18 PF** **12 Claims**

1. An adduct which has been obtained by reacting

(a) an epoxide compound selected from the group consisting of glycidyl ether of a polyhydric alcohol or phenol, epoxidized oils and reaction products of aliphatic or aromatic polyepoxy resins with polyols or polyphenols with

(b) guanidine or a guanidine derivative using not less than 1 mole of guanidine or alkylguanidine or a guanidinium salt (b) per epoxide equivalent of the epoxide compound (a), and which may or may not have been partially or completely neutralized by adding an acid.



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**4,297,256**

## PREPARATION OF WATER-IMMISCIBLE, ACID-SOLUBLE N-(AMINOMETHYL)-α,β-ETHYLENICALLY UNSATURATED CARBOXAMIDES, QUATERNARY DERIVATIVES AND POLYMERS THEREOF

**Charles J. McDonald, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Dec. 26, 1979, Ser. No. 106,823**

**Int. Cl.³ C08L *33/24***

**U.S. Cl. 260—29.4 UA** **15 Claims**

1. A process for preparing an acid soluble water-immiscible N-(aminomethyl)carboxamide (cationic carboxamide) which comprises (1) contacting a reaction mixture comprising an aqueous phase and a carboxamide reactant represented by the formula:

wherein $R_1$ is hydrogen or alkyl and $R_2$ is hydrogen or an inert substituent with an aldehyde having 1 to 3 carbons and a moderately water-soluble amine under conditions including a pH of less than about 7 sufficient to cause reaction of the carboxamide reactant, aldehyde and amine to form at least 5 mole percent of the water-immiscible cationic carboxamide based on moles of the carboxamide reactant and (2) thereafter increasing the pH of the resulting reaction mixture to a value of at least 7, thereby causing the water-immiscible cationic carboxamide to separate from the aqueous phase of the reaction mixture.

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**4,297,257**

## METAL STRIPPING COMPOSITION AND METHOD

**Moenes L. Elias, Canfield, and Narendra K. Shah, Youngstown, both of Ohio, assignors to Dart Industries Inc., Los Angeles, Calif.**

**Filed Apr. 17, 1980, Ser. No. 141,013**

**Int. Cl.³ C08L *33/26;* C09K *13/08***

**U.S. Cl. 260—29.6 H** **12 Claims**

1. An aqueous stripping solution which contains in solution from about 0.5% to about 35% of hydrogen peroxide, from about 5% to about 50% of a reactive composition of ammonia and hydrofluoric acid or a salt thereof, and from about 0.01% to about 10% of a polyacrylamide.

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**4,297,258**

## NON-YELLOWING PAINT FORMULATIONS CONTAINING IODO SUBSTITUTED ALKYNYL URETHANES AS FUNGICIDES

**William P. Long, Jr., Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.**

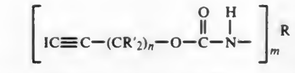
**Filed Apr. 28, 1980, Ser. No. 144,313**

**Int. Cl.³ C08K *5/16***

**U.S. Cl. 260—29.6 MN** **11 Claims**

1. A water-dispersible solvent solution concentrate for use as a fungicide in water-base coating systems having an aqueous phase and a binder resin phase which comprises:

(a) an iodo substituted low molecular weight alkyne urethane having the general formula:



wherein R is selected from the group consisting of substituted or unsubstituted alkyl, aryl or alkylaryl groups having from 1 to 20 carbon atoms and having from one to three linkages corresponding to m, and m and n are whole integers of from 1–3 and may be the same or different, and R′ is —H, methyl or alkyl radical which may be the same or different;

(b) a substantially water immiscible organic solvent;

(c) a surfactant selected from the group consisting of ionic and nonionic surfactants having an HLB in the range of 10–17.1 whereby said concentrate can be dispersed such that said iodo compound is not partitioned into said aqueous phase of said water-base coating systems.

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**4,297,259**

## SYNTHETIC POLYMER EMULSIFIER

**John G. Papalos, Ledgewood, and Ronald W. Kavchok, Belle Mead, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.**

**Division of Ser. No. 31,113, Apr. 18, 1979, Pat. No. 4,256,871. This application May 7, 1980, Ser. No. 147,383**

**Int. Cl.³ C08L *61/00***

**U.S. Cl. 260—29.6 NR** **8 Claims**

1. In the process of manufacturing a synthetic latex, using a recipe containing a diluent, a primary emulsifier, an initiator, at least one polymer monomer and a secondary emulsifier or co-emulsifier, with optionally, a chelating agent, an electrolyte and a chain transfer agent, the improvement comprising having present in the recipe an effective amount of a secondary emulsifier or co-emulsifier which is

a condensation product of 1 mole of naphthalenesulfonic acid, from about 0.1 to about 5 moles of linear alkylbenzenesulfonic acid having an alkyl moiety of from about 4 to about 20 carbon atoms, and from about 0.26 to about 3.1 moles of formaldehyde and salts thereof

thereby reducing secondary emulsifier or co-emulsifier pollution in polymer plant effluent.

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**4,297,260**

## ERASABLE WRITING MEDIUM COMPOSITION

**William I. Ferree, Jr., and Giao V. Nguyen, both of Dallas, Tex., assignors to Liquid Paper Corporation, Dallas, Tex.**

**Filed Nov. 19, 1979, Ser. No. 95,574**

**Int. Cl.³ C08K *5/17***

**U.S. Cl. 260—29.7 H** **11 Claims**

1. A writing medium composition that is erasable by an ordinary pencil eraser and suitable for use in ballpoint or porous tip pens comprising:

(a) a carboxylated styrene-butadiene latex emulsion, said emulsion having a styrene-butadiene ratio of from about 40:60 to about 55:45, a viscosity of from about 50 to about 300 cps, a pH of from about 6 to about 10, a surface tension of from about 45 dynes per cm to about 72 dynes per cm and containing from about 40% to about 60% water by weight of said emulsion, said emulsion being further characterized by its ability to rapidly form a cohesive film at ambient temperature on a dry writing surface and having a low adhesion to paper to permit removal therefrom with an ordinary pencil eraser; and

(b) a basic dye that is a salt of a triarylmethyl cation which is dissolvable in said emulsion but which dye, when combined with said emulsion, does not, when said emulsion is applied to paper, penetrate into the paper fibers or paper voids sufficiently to form visible images on the paper.

**4,297,261**

## CATIONIC POLYMERS AND THEIR USE IN ELECTRODEPOSITION

**Edward L. Jozwiak, Jr., Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 23, 1980, Ser. No. 162,225**
**Int. Cl.³ C08L *63/10***
**U.S. Cl. 260—29.7 RP** **34 Claims**

1. A stable, aqueous dispersion of a cationic polymeric product prepared by polymerizing in aqueous medium under free radical initiated addition polymerization conditions:

(A) an aqueous dispersed phase of a polymerizable, ethylenically unsaturated monomer composition, in the presence of

(B) an at least partially acid neutralized polyepoxide-primary and/or secondary amine adduct which contains pendent unsaturation.

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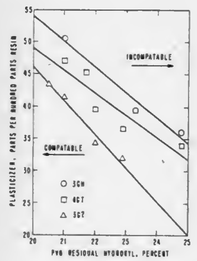
**4,297,262**

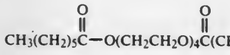
## POLYVINYL BUTYRAL PLASTICIZED WITH TETRAETHYLENEGLYCOL DI-N-HEPTANOATE

**Thomas R. Phillips, Belpre, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 31, 1979, Ser. No. 71,537**
**The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.**
**Int. Cl.³ C08K *5/10***
**U.S. Cl. 260—31.6** **5 Claims**




1. A plastic composition comprising polyvinyl butyral and, in compatible admixture therewith, about from 20 to 55 parts per hundred of polyvinyl butyral of a plasticizer consisting essentially of tetraethyleneglycol di-n-heptanoate of the general formula:



$$CH_3(CH_2)_5C(=O)-O(CH_2CH_2O)_4C(=O)(CH_2)_5CH_3.$$

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**4,297,263**

## METHOD OF MAKING POLYPROPYLENE PRINTING PLATE USING PAPER MATRIX

**Kinzo Miyamoto, Mitaka; Takayasu Tanaka, Tokyo, and Yoshimi Inoue, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo and Kabushikikaisha Asahi Shinbunsha, Osaka, both of, Japan**

**Filed Mar. 24, 1976, Ser. No. 669,817**
**Claims priority, application Japan, Apr. 2, 1975, 50-39262**
**Int. Cl.³ C08K *5/20***
**U.S. Cl. 260—32.6 PQ** **2 Claims**

1. A reproducing printing plate made by using a paper matrix, comprising a crystalline ethylene-propylene copolymer whose melt flow index is selected in a range of 3~10, which contains ethylene less than 20 weight % and which has the tensile yield strength of 220~330 kg/cm².

**4,297,264**

## PROCESS FOR PREPARING ALKOXYLATED CROSS LINKING AGENTS BY PREPARING (A) AN AQUEOUS ALKANOLIC ALKOXYLATED AMINO RESIN (B) AZEOTROPIC DISTILLATION AND (C) DISTILLING EXCESS ALCOHOL

**Robert S. De Ruiter, Downsview, and Stamatis M. Kambanis, Toronto, both of Canada, assignors to Reichhold Limited, Islington, Canada**

**Filed Jun. 6, 1980, Ser. No. 157,174**
**Claims priority, application Canada, Jun. 4, 1980, 353359**
**Int. Cl.³ C08L *61/24;* C08G *12/06, 12/12, 12/32***
**U.S. Cl. 260—33.4 R** **13 Claims**

1. A process for the preparation of an alkoxylated amino resin comprising:

(1) preparing an aqueous-alkanolic solution of an alkoxylated amino resin by either:

(a) converting an aqueous formaldehyde solution into an alcoholic formaldehyde-amino compound concentrate by admixing an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine, and an alkanol, and removing the water by azeotropic distillation, the alkanol having up to 8 carbon atoms inclusive and

(b) reacting the thus formed formaldehyde-amino compound concentrate with an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine, to provide an alkoxylated amino resin;

or:

(c) converting an aqueous formaldehyde solution into a formaldehyde-amino compound concentrate by admixing aqueous formaldehyde and an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine and removing the water by distillation; and

(d) reacting the thus formed formaldehyde-amino compound concentrate with an amino compound chosen from the group consisting of urea, thiourea, guanidine, and melamine and an alkanol having up to 8 carbon atoms to provide an alkoxylated amino resin;

(2) removing the water remaining in the alkoxylated amino resin by azeotropic distillation with the alkanol; and

(3) removing excess remaining alkanol by distillation to provide a desired resin solids content.

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**4,297,265**

## SILICONE RUBBER COATING MATERIAL HAVING REDUCED SURFACE TENSION

**Thomas O. Olsen, Wichita, Kans., assignor to Otto Fabric, Inc., Sedgwick County, Kans.**

**Filed Nov. 23, 1979, Ser. No. 96,940**
**Int. Cl.³ C08K *5/01***
**U.S. Cl. 260—33.6 SB** **8 Claims**

1. A composition for coating a substrate comprising:

a first component comprising silicone rubber and a solvent therefor, said silicone rubber comprising between 50% and 70% by weight of said first component; and

a second component comprising particulate $SiO_2$ having a particle size of less than 45 microns, said second component comprising 90 to 110% by weight of said first component.

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**4,297,266**

## MICROFILLED DENTAL COMPOSITE AND METHOD USING THE SAME

**Robert L. Ibsen, and William R. Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.**

**Filed Feb. 8, 1980, Ser. No. 120,119**
**Int. Cl.³ A61K *6/08;* C08K *3/26, 3/40, 9/06***
**U.S. Cl. 260—42.14** **11 Claims**

1. A filled-resin dental composite consisting essentially of



| Component | Parts by Weight |
|---|---|
| Ethoxylated bisphenol A dimethacrylate | 53–17.5 |
| Triethylene glycol dimethacrylate | 4–13.5 |
| Cure accelerator | 0.25–1.0 |
| Antioxidant | 0.15–0.5 |
| Curing agent | 0.25–1.0 |
| Ultra violet light absorbent | 0.4–1.4 |
| Sub-micron hydrophobic silica particles | 10–30 |
| Glass particles | 20–67, |

the silica particles ranging from about 0.1 micron to 0.04 micron in diameter and the glass particles ranging from about two to about thirty microns in diameter.

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**4,297,267**

## HEXAVALENT CHROMIUM INTERNAL COLORANTS FOR DIOL BIS (ALLYL CARBONATE) POLYMERIZATES

**Ivan R. Leatherman, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Feb. 4, 1980, Ser. No. 118,357**
**Int. Cl.³ C08K *3/10, 3/18***
**U.S. Cl. 260—42.53** **9 Claims**

1. A liquid composition comprising diol bis(allyl carbonate) monomer and chlorochromate ion.

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**4,297,268**

## 1,4-DIHYDRO-2,6 DIMETHYLYRIDINE-3,5-DICARBOXYLIC ACID ESTER COMPOSITIONS

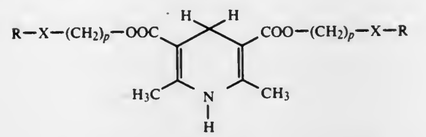
**Gerd Abeler, Griesheim über Darmstadt, and Rudolf Maul, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 958,760, Nov. 8, 1978, Pat. No. 4,214,088. This application Dec. 20, 1979, Ser. No. 105,796**
**Claims priority, application Switzerland, Nov. 11, 1977, 13799/77**
**Int. Cl.³ C08K *5/34***
**U.S. Cl. 260—45.8 N** **13 Claims**

1. A stabilized composition which comprises

(a) a chlorine-containing thermoplastic polymer, and

(b) from 0.5 to 2.5 percent by weight, relative to the total composition, of a compound of formula I



$$R{-}X{-}(CH_2)_p{-}OOC \qquad COO{-}(CH_2)_p{-}X{-}R \qquad (I)$$

in which R is branched-chain or straight-chain $C_1$–$C_{20}$ alkyl, X is sulfur, and p denotes the numbers 1–8 inclusive.

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**4,297,269**

## N,N'-BIS(1-CYCLOHEXYL-1-ETHYL)-P-PHENYLENEDIAMINE, AND RUBBER COMPOUNDS CONTAINING THE SAME

**Helmut L. Merten, Hudson, and Gene R. Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 16, 1980, Ser. No. 197,400**
**Int. Cl.³ C08K *5/18;* C07C *87/38***
**U.S. Cl. 260—45.9 QB** **8 Claims**

1. N,N'-bis(1-cyclohexyl-1-ethyl)-p-phenylenediamine.

2. A vulcanizable rubber compound containing a stabilizing amount of N,N'-bis(1-cyclohexyl-1-ethyl)-p-phenylenediamine.

**4,297,270**

## MANUFACTURE AND USE OF NON-IONOGENIC INTERFACE-ACTIVE AGENTS BASED ON MODIFIED ROSINS

**Heinz Uhrig, Steinbach, and Reinhold Deubel, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 13, 1979, Ser. No. 75,034**
**Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840113; Jun. 16, 1979, 2924354**
**Int. Cl.³ C09F *1/04;* D06M *15/02***
**U.S. Cl. 260—104** **8 Claims**

1. A compound of the formula

$$A[(X{-}O)_n{-}H]_m$$

wherein

A is a cycloalkyl-, aralkyl- or aryl-modified rosin acid radical or a radical of an ester of a polyhydric alcohol with such an acid,

X stands for the same or different group or groups of, the formulae

$$-CH_2-CH_2-$$

or

$$-CH_2-CH(CH_3)-,$$

n is a number of from 1 to 100 and

m is an integer of from 1 to 5.

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**4,297,271**

## GUAIACONIC ACID A FROM GUAIAC RESIN

**Werner Guthlein, Mannheim-Neckarau; Hans Wielinger; Walter Rittersdorf, both of Mannheim-Waldhof, and Wolfgang Werner, Mannheim-Vogelstang, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany**

**Division of Ser. No. 892,359, Mar. 31, 1978, Pat. No. 4,219,336. This application Jan. 25, 1980, Ser. No. 115,533**
**Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716061**
**Int. Cl.³ C08L *93/00;* C08K *5/24;* C09F *1/02***
**U.S. Cl. 260—107** **3 Claims**

1. Guaiaconic acid A, having a specific extinction $E_{1\,cm}^{1\%}$ at 600 nm of at least 200, determined by the reaction with peroxidase and hydrogen peroxide, having infra-red bands at

1600 $cm^{-1}$ (m);
1505 $cm^{-1}$ (v.s.);
1206 $cm^{-1}$ (s;b);
1115 $cm^{-1}$ (m);
1025 $cm^{-1}$ (m); and
1200 $cm^{-1}$ (s;b)

and having an $R_F$ value of 0.45 (toluene/dioxan/glacial acetic acid; 90:25:10 v/v/v).

3. Process for the preparation of guaiaconic acid A which comprises dissolving natural guaiac resin in acetone, removing the residue obtained by the addition of toluene, evaporating the remaining solution to dryness, dissolving the evaporation residue in n-heptane/ethyl acetate or toluene/acetone, separating the solution chromatographically over a column containing neutral silica gel, which has been pretreated with acid, using n-heptane/ethyl acetate or toluene/acetone, collecting and evaporating the fractions with $R_F$=0.45 (toluene/dioxan/glacial acetic acid; 90:25:10 v/v/v) and recrystallizing the evaporation residue from xylene.

4,297,272

## PROCESS FOR THE PREPARATION OF PURIFIED BACTERIAL MEMBRANAL PROTEOGLYCANS

**Lucien D. D'Hinterland; Gerard Normier; Anne-Marie Pinel, and Jacques Durand, all of Castres, France, assignors to Pierre Fabre S.A., France**

**Filed Dec. 13, 1979, Ser. No. 103,202**
**Claims priority, application France, Dec. 19, 1978, 78 35649**
**Int. Cl.³ C07G *7/00;* A61K *39/108, 39/02***
**U.S. Cl. 260—112 R** **8 Claims**

1. A process for the preparation of purified water soluble bacterial membranal proteoglycans which comprises at least one step in which crude proteoglycans are treated in an aqueous medium with a reactant selected from the group consisting of bases and hypobromites, followed by removal of the excess reactant and the insoluble residue, the purified proteoglycans being present in aqueous solution.

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4,297,273

## CHEMILUMINESCENT PHTHALHYDRAZIDE-LABELED PROTEIN AND POLYPEPTIDE CONJUGATES

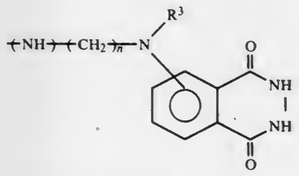
**Robert T. Buckler, Edwardsburg, Mich., and Hartmut R. Schroeder, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.**

**Division of Ser. No. 927,621, Jul. 24, 1978. This application Jan. 14, 1980, Ser. No. 111,809**
**Int. Cl.³ C07G *7/00***
**U.S. Cl. 260—112 B** **10 Claims**

1. In a chemiluminescent-labeled conjugate for use in specific binding assays of the general formula:

L(CO—NH) labeling substance

wherein L(CO)— is an antigenic protein or polypeptide bound to said labeling substance through an amide bond, characterized in that said —NH) labeling substance has the formula:



wherein $R^3$ is hydrogen or straight chain alkyl containing 1–4 carbon atoms and n=2–8.

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4,297,274

## PROTEIN FROM RED BLOOD CELLS AND PROCESS FOR ISOLATING IT

**Hans Bohn, and Heinz Haupt, both of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany**

**Continuation of Ser. No. 898,519, Apr. 20, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,253**
**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1977, 2718326**
**Int. Cl.³ C07G *7/00***
**U.S. Cl. 260—112 B** **8 Claims**

1. A process for isolating a protein characterized by

(a) a protein content of 99%±1% and a content of carbohydrates of 0.9%±0.5%, and a compositional analysis including the following major amino-acid and carbohydrate fractions:

| Amino Acids | Mol % | Variation Coefficient % |
|---|---|---|
| Aspartic acid | 11.39 | 1.21 |
| Glutamic acid | 8.44 | 4.35 |

-continued

| Amino Acids | Mol % | Variation Coefficient % |
|---|---|---|
| Glycine | 9.13 | 2.22 |
| Alanine | 7.35 | 1.68 |
| Valine | 8.96 | 1.36 |
| Leucine | 8.79 | 3.83 |

| Carbohydrates | % by weight |
|---|---|
| Hexoses (Gal/Man 1:1) | 0.9 ± 0.2 |
| Acetylhexoseamine | 0.3 ± 0.1; |

(b) a sedimentation coefficient $S_{20w}^{C=O}$ of 6.88±0.5S;
(c) a molecular weight of 160,000±15,000;
(d) an iso-electric point of 5.5±0.2;
(e) an electrophoretic mobility in the range of the $\beta_1$-globulins of human serum; and
(f) a specific immunological reaction with an antibody specifically directed against the protein,

which process comprises extracting the protein from red blood cells or from an aqueous solution having an electrical conductivity of from 1 to 10 μS/cm and containing the protein; adsorbing said protein from the aqueous solution on an anion exchanger at a pH value of between 6.5 and 7.5, thereby separating the protein from the supernatant of said aqueous solution; treating the anion exchanger and adsorbed protein with a series of salt solutions of varying concentration to elute that which was adsorbed on the exchanger in various fractions; identifying each fraction containing the protein; concentrating the protein by ultra-filtration; fractionating the concentrate by gel-filtration and elution; identifying each resultant fraction containing the protein, and concentrating the protein by ultrafiltration.

5. An isolated, concentrated, protein obtained by fractionating an extract of blood or of a blood-rich organ, said protein having

(a) a protein content of 99%±1% and a content of carbohydrates of 0.9%±0.5%, and a compositional analysis as follows:

| Amino Acids | Mol % | Variation Coefficient % |
|---|---|---|
| Lysine | 6.68 | 2.67 |
| Histidine | 1.61 | 5.08 |
| Arginine | 5.05 | 3.97 |
| Aspartic acid | 11.39 | 1.21 |
| Threonine | 5.05 | 2.23 |
| Serine | 4.98 | 4.12 |
| Glutamic acid | 8.44 | 4.35 |
| Proline | 5.66 | 6.95 |
| Glycine | 9.13 | 2.22 |
| Alanine | 7.35 | 1.68 |
| ½ Cystine | 1.65 | 2.04 |
| Valine | 8.96 | 1.36 |
| Methionine | 0.32 | 28.87 |
| Isoleucine | 4.84 | 1.17 |
| Leucine | 8.79 | 3.83 |
| Tyrosine | 3.34 | 4.24 |
| Phenylalanine | 5.92 | 3.81 |
| Tryptophan | 1.01 | 10.30 |

| Carbohydrates | % by weight |
|---|---|
| Hexoses (Gal/Man 1:1) | 0.9 ± 0.2 |
| Acetylhexoseamine | 0.3 ± 0.1 |
| Acetyl-neuraminic acid | 0 |
| Fucose | 0 |

(b) a sedimentation coefficient $S_{20w}^{C=O}$ of 6.88±0.5S;
(c) a molecular weight of 160,000±15,000;
(d) an iso-electric point of 5.5±0.2;



(e) an electrophoretic mobility in the range of the $\beta_1$-globulins of human serum; and
(f) a specific immunological reaction with an antibody specifically directed against the protein.

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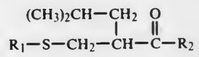
4,297,275

## INHIBITORS OF MAMMALIAN COLLAGENASE

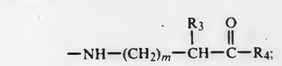
**Joseph E. Sundeen, Yardley, Pa., and Tamara Dejneka, Skillman, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Division of Ser. No. 51,195, Jun. 25, 1979, Pat. No. 4,235,885. This application Feb. 14, 1980, Ser. No. 121,352**
**Int. Cl.³ C07C *103/52;* C07G *7/00;* C07C *147/02***
**U.S. Cl. 260—112.5 R** **22 Claims**

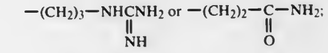
1. A compound having the formula



or a salt thereof wherein
$R_1$ is hydrogen or alkanoyl of 2 to 10 carbon atoms;
$R_2$ is hydroxy, or



$R_3$ is hydrogen, alkyl of 1 to 4 carbon atoms,



$R_4$ is hydroxy, amino, arginine, leucine, glutamine, alanine or glycine; and
m is 0 or an integer of 1 to 9.

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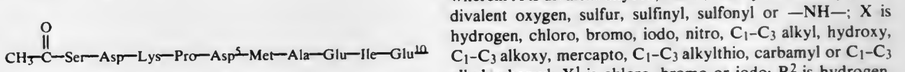
4,297,276

## THYMOSIN BETA 3 AND BETA 4

**Allan L. Goldstein, Washington, D.C., and Teresa L. K. Low, Annandale, Va., assignors to Hoffman-La Roche Inc., Nutley, N.J.**

**Continuation-in-part of Ser. No. 23,115, Mar. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 967,675, Dec. 8, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,430**
**Int. Cl.³ C07C *103/52;* A61K *37/00***
**U.S. Cl. 260—112.5 R** **2 Claims**

1. Thymosin $\beta_3$ being a polypeptide essentially free of other thymic polypeptides and having the following amino acid sequence:



-Lys-Phe-Asp-Lys-Ser[15]-Lys-
-Leu-Lys-Lys-Thr[20]-Glu-Thr-Gln-Glu-Lys[25]-Asn-
Pro-Leu-Pro-Ser[30]-Lys-Glu-Thr-Ile-Glu[35]-Gln-Glu
-Lys-Gln-Ala[40]-Gly-Glu-Ser-(Asx, Glx, Ile, Thr)Ala-Lys-Thr[50]-OH

and the pharmaceutically acceptable acid addition salts or base salts thereof.

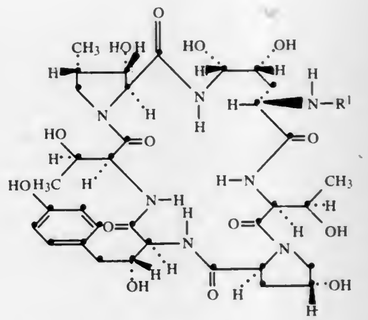
4,297,277

## DERIVATIVES OF A-30912B NUCLEUS

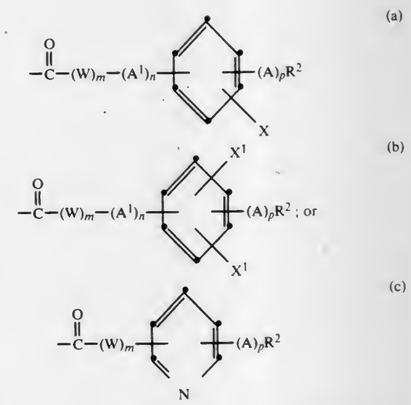
**Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 103,018, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,434**
**Int. Cl.³ C07C *103/52;* A61K *37/00;* C12P *21/04***
**U.S. Cl. 260—112.5 R** **40 Claims**

1. A compound of the formula:



wherein $R^1$ is a group of the formula:



wherein A is divalent oxyben, sulfur, sulfinyl, or sulfonyl; $A^1$ is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, $C_1$–$C_3$ alkyl, hydroxy, $C_1$–$C_3$ alkoxy, mercapto, $C_1$–$C_3$ alkylthio, carbamyl or $C_1$–$C_3$ alkylcarbamyl; $X^1$ is chloro, bromo or iodo; $R^2$ is hydrogen, $C_1$–$C_{18}$ alkyl or $C_2$–$C_{18}$ alkenyl; W is $C_1$–$C_{10}$ alkylene or $C_2$–$C_{10}$ alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the $R^2$ and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and $A^1$ are sulfinyl or sulfonyl, they must be in equal oxidation states.

**4,297,278**

## PENTAKIS-AND HEPTAKIS-AZOXY DYESTUFFS

**Horst Nickel, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Mar. 7, 1980, Ser. No. 128,201**

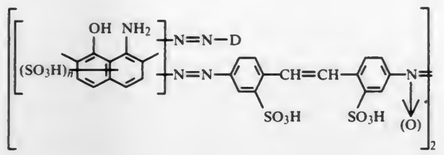
**Claims priority, application Fed. Rep. of Germany, Mar. 16, 1979, 2910458**

**Int. Cl.**[3] **C09B** *57/00;* **C07C** *105/00;* **D06P** *3/24, 3/32*

**U.S. Cl. 260—143** **4 Claims**

1. A polyazo dyestuff of the formula

(I)



wherein

D denotes the radical of a diazo component and

n denotes 1 or 2.

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**4,297,279**

## IMIDAZOLEDICARBOXYLIC ACID DERIVATIVE

**Naohiko Yasuda, Yokosuka, and Eiji Nakanishi, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan**

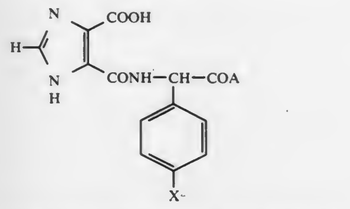
**Filed Mar. 27, 1980, Ser. No. 134,681**

**Claims priority, application Japan, Mar. 27, 1979, 54-36133**

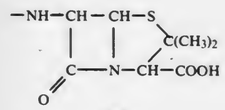
**Int. Cl.**[3] **C07D** *499/04, 501/02, 487/04*

**U.S. Cl. 260—239.1** **5 Claims**

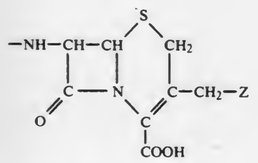
2. A process for producing a compound having the formula:



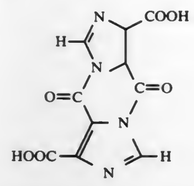
wherein A is an organic radical selected from the group consisting of



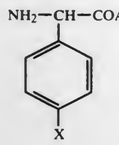
and



wherein Z is a radical selected from the group consisting of hydrogen, acyloxy, carbamoyloxy, heteroaromaticthio and quaternary ammonium, and X is a radical selected from the group consisting of hydrogen and hydroxyl, which comprises reacting an imidazoledicarboxylic acid derivative having the following formula:



with a compound having the following formula:



wherein A and X are as defined above.

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**4,297,280**

## 4,1-BENZOXAZEPINES

**Kentaro Hirai, Kyoto; Shigeru Matsutani, Sakai; Teruyuki Ishiba, Takatsuki, and Itsuo Makino, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

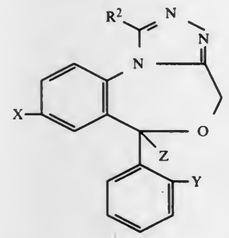
**Filed Nov. 6, 1979, Ser. No. 91,814**

**Claims priority, application Japan, Nov. 27, 1978, 53-146949**

**Int. Cl.**[3] **C07D** *498/04*

**U.S. Cl. 260—245.5** **11 Claims**

1. A compound of the formula:



wherein

$R^2$ is $C_1$ to $C_3$ alkyl or $C_1$ to $C_3$ α-aminoalkyl,

X is halogen or nitro,

Y is hydrogen or halogen, and

Z is hydrogen, $C_1$ to $C_3$ alkoxy or $C_3$ to $C_9$ dialkylaminoalkoxy;

or a pharmaceutically acceptable acid addition salt thereof.

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**4,297,281**

## PROCESS FOR HALOGENATING COPPER PHTHALOCYANINE

**Diether Wessling, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 31, 1979, Ser. No. 108,935**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901859**

**Int. Cl.**[3] **C09B** *47/04*

**U.S. Cl. 260—314.5** **2 Claims**

1. A process for halogenating copper phthalocyanine to a halogen content of about 14 to about 15.5 halogen atoms per CuPc molecule, in an aluminium chloride/sulphuryl chloride mixture which contains 8 to 25% by weight, relative to the amount of $AlCl_3$, of an anhydrous alkali metal halide, characterised in that the $AlCl_3/SO_2Cl_2$ mixture contains 70 to 150% by weight, relative to the amount of $AlCl_3$, of sulphuryl chloride and the halogenation is carried out under an excess pressure of 1 to 20 bars.



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**4,297,282**

## RESOLUTION OF MERCAPTOPROPIONIC ACIDS

**Naohito Ohashi, Nishinomiya; Shoji Nagata, and Junki Katsube, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

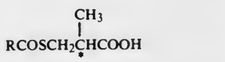
**Filed Nov. 2, 1979, Ser. No. 90,857**

**Claims priority, application Japan, Mar. 2, 1979, 54-24820; Mar. 2, 1979, 54-24821; Mar. 13, 1979, 54-29548; Jun. 28, 1979, 54-82412; Jul. 25, 1979, 54-95228**

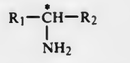
**Int. Cl.**[3] **C07D** *207/16;* **C07C** *153/017*

**U.S. Cl. 260—326.2** **9 Claims**

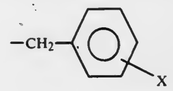
1. A process for the optical resolution of DL-α-methyl-β-acylthiopropionic acid, which comprises contacting a DL-α-methyl-β-acylthiopropionic acid of the formula,



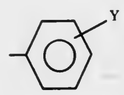
wherein R is a lower alkyl, phenyl or substituted phenyl bearing a methyl or chloro radical, with an optically active amine of the formula,



wherein $R_1$ is methyl and $R_2$ is α-naphthyl or $R_1$ is

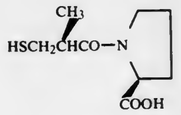


and $R_2$ is

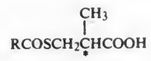


(wherein X and Y are each hydrogen, methyl or halogen) to form diastereoisomeric salts, subjecting the formed diastereoisomeric salts to fractional crystallization in an organic solvent to separate the D-acid salt from the L-acid salt, and then contacting the individual diastereoisomeric salts with acid to give D-α-methyl-β-acylthiopropionic acid and L-α-methyl-β-acylthiopropionic acid.

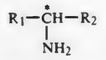
9. A process for producing captopril of the formula,



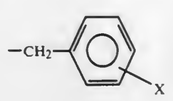
which comprises (A) contacting DL-α-methyl-β-acylthiopropionic acid of the formula,



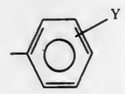
wherein R is lower alkyl, phenyl or substituted phenyl bearing methyl or chloro radical with an optically active amine of the formula,



wherein $R_1$ is methyl and $R_2$ is α-naphthyl or $R_1$ is



and $R_2$ is



(wherein X and Y are each hydrogen, methyl or halogen) to form diastereoisomeric salts, subjecting the product to fractional crystallization to separate the D-acid salt from the L-acid salt, and then contacting the thus obtained D-acid salt with an acid to give D-α-methyl-β-acylthiopropionic acid, (B) reacting the resulting D-α-methyl-β-acylthiopropionic acid with thionyl chloride to form its acid chloride, subjecting the resulting acid chloride to condensing reaction with L-proline in the presence of a base to give N-(D-α-methyl-β-acylthiopropionyl)-L-proline, and (C) deacylating of the resulting N-(D-α-methyl-β-acylthiopropionyl)-L-proline with a base to give N-(D-α-methyl-β-thiopropionyl)-L-proline.

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**4,297,283**

## CHLORINATION OF PHTHALIC ANHYDRIDE

**John W. Verbicky, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 9, 1980, Ser. No. 195,669**

**Int. Cl.**[3] **C07D** *307/89*

**U.S. Cl. 260—346.3** **7 Claims**

1. The process for chlorinating phthalic anhydride to produce a predominantly monochlorinated compound containing a single chlorine in the 4-position so that the molar ratio of chlorine in the 4-position as contrasted to chlorine in the 3-position ranges from 5 to 11 molar equivalents of the former per molar equivalent of the 3-position compound, which process comprises passing chlorine and phthalic anhydride in the vapor phase with an inert gas, in the absence of a chlorination catalyst, through a reaction chamber maintained at a temperature above 350° C., but below 600° C., and thereafter isolating the 4-substituted phthalic anhydride.

**4,297,284**

## PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-HYDROXYBENZOFURAN

**Daniel Michelet, Tassin la Demi-Lune, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France**

**Continuation of Ser. No. 170,977, Jul. 18, 1980, abandoned. This application Jul. 22, 1980, Ser. No. 171,087**
**Claims priority, application France, Jul. 18, 1979, 79 19127**
**Int. Cl.³ C07D *307/86***
**U.S. Cl. 260—346.22** **14 Claims**

1. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran, comprising heating a member selected from the group consisting of 3-isobutenyl-1,2-dihydroxybenzene, and admixture of at least 10% by weight of 3-isobutenyl-1,2-dihydroxybenzene with 3-methallyl-1,2-dihydroxybenzene, at cyclization/isomerization temperatures, in the presence of a catalytic amount of an organic sulfonic acid.

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**4,297,285**

## 2,3-DIHYDRO-2,3-DIMETHYL-7-BENZOFURYL N-[(PHOSPHINYL)AMINO]THIO- AND N-[(PHOSPHINOTHIOYL)AMINO]THIO-METHYLCARBAMATES

**Stephen J. Nelson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 115,474, Jan. 25, 1980, which is a continuation-in-part of Ser. No. 962,266, Nov. 20, 1978, Pat. No. 4,208,409, which is a continuation-in-part of Ser. No. 874,959, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 765,807, Feb. 4, 1977, Pat. No. 4,081,536. This application Jul. 31, 1980, Ser. No. 174,049**
**The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.**
**Int. Cl.³ C07D *307/86***
**U.S. Cl. 260—346.73** **34 Claims**

1. 2,3-dihydro-2,2-dimethyl-7-benzofuranyl methyl[[(methyl)(5,5-dimethyl-2-thioxo-1,3,2-dioxaphosphorinan-2-yl)-amino]thio]carbamate.

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**4,297,286**

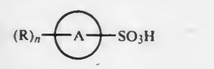
## PROCESS FOR SELECTIVELY PRODUCING ISOSORBIDE-5-NITRATE

**Klaus Sandrock, Langenfeld, and Günter Cordes, Leichlingen, both of Fed. Rep. of Germany, assignors to Sanol Schwarz-Monhein GmbH, Monhein, Fed. Rep. of Germany**

**Filed Jan. 24, 1980, Ser. No. 114,906**
**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903927**
**Int. Cl.³ C07D *307/00***
**U.S. Cl. 260—347.8** **6 Claims**

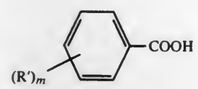
1. A process for preparing isosorbide-5-nitrate comprising
(a) reacting isomannide in an organic solvent or in an aqueous-organic reaction medium with an equivalent amount of a compound selected from the group consisting of:
(1) the acid halogenides of an aromatic sulfonic acid of the general formula I

I



wherein A is a benzene or a naphthalene ring, R is a lower alkyl group with 1 to 4 carbon atoms, a lower alkoxy group with 1 to 4 carbon atoms or a halogen, and n is a numeral from 0 to 3,
(2) a perfluoroalkanesulfonic acid with 1 to 4 carbon atoms or anhydride thereof,
(3) an alkanesulfonic acid with 1 to 4 carbon atoms or anhydride thereof,
(4) a perfluoroalkanoic acid with 1 to 4 carbon atoms or anhydride thereof,
(5) a carbamic acid, and
(6) sulphurous acid;
(b) reacting the resulting isomannide-2-ester in the presence of a solvent with a compound selected from the group consisting of:
(1) the alkali metal and ammonium salts of a benzoic acid of the general formula II

II



wherein R' is a lower alkyl group with 1 to 4 carbon atoms, a lower alkoxy group with 1 to 4 carbon atoms or a halogen, and m is a numeral from 0 to 3, and
(2) a lower alkanoic acid with 1 to 4 carbon atoms in the alkane group, at a temperature sufficient to produce an isosorbide-2-ester,
(c) converting the hydroxy group in the 5-position of the resulting isosorbide-2-ester into the nitrate group by subjecting the ester to reaction with nitric acid, and
(d) splitting off the 2-ester group from the resulting isosorbide-2-ester-5-nitrate to yield the isosorbide-5-nitrate by hydrolysis in an aqueous organic solvent with an alkali metal hydroxide or by alcoholysis in an organic solvent comprising an alcohol with an alkali metal hydroxide.

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**4,297,287**

## PRODUCTION OF EPOXIDES FROM LOWER ALKANE-1,2-DIOLS

**Michel Costantini, Lyons, and Michel Jouffret, Francheville-le-Bas, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Continuation of Ser. No. 942,361, Sep. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 889,732, Mar. 24, 1978, abandoned. This application Jun. 10, 1980, Ser. No. 158,317**
**Claims priority, application France, Mar. 24, 1977, 77 10140**
**Int. Cl.³ C07D *301/02***
**U.S. Cl. 260—348.16** **21 Claims**

1. A process for the preparation of a lower alkylene oxide, which comprises dehydrating a lower alkane-1,2-diol selected from the group consisting of ethylene glycol and propylene glycol, in liquid phase, under a pressure of at least atmospheric, at a temperature of from 200° to 400° C., and in the presence of a mixture comprising at least one heavy carboxylic acid and at least one alkali metal or alkaline earth metal carboxylate, wherein the amount of heavy carboxylic acid present per mole of carboxylate ranges from 0.01 to 100 mols and the concentration of the heavy carboxylic acid/carboxylate admixture in the reaction mixture being at least 0.1% by weight, wherein the dehydration is conducted in the presence of a solvent for the heavy carboxylic acid/carboxylate admixture, selected from the group consisting of poly (oxyalkylene) glycols, ethers, alkylbenzenes and polyphenyls, and wherein the product epoxide is continuously removed as it is formed.



**4,297,288**

## 5-AMINO-1,2,3,4-TETRAHYDROANTHRAQUINONE AND ITS PREPARATION

**Serge Y. Delavarenne, Francheville Le Haut; Bernard Dubreux, Francheville Le Bas, and Pierre Tellier, Sainte Foy Les Lyon, all of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France**

**Filed Jan. 14, 1980, Ser. No. 112,002**
**Claims priority, application France, Jan. 19, 1979, 79 01326**
**Int. Cl.³ C07C *97/24***
**U.S. Cl. 260—378** **10 Claims**

1: 5-amino-1,2,3,4-tetrahydroanthraquinone, as a new industrial product.

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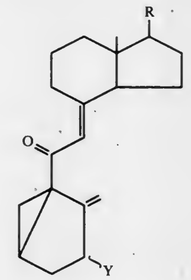
**4,297,289**

## VITAMIN D COMPOUNDS ISOTOPICALLY SUBSTITUTED AT CARBON 6 AND PROCESS FOR THEIR PREPARATION

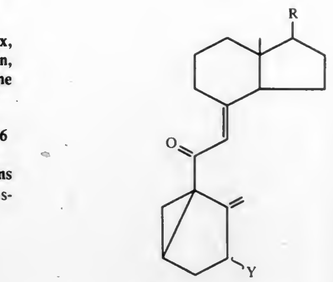
**Hector F. DeLuca; Heinrich K. Schnoes, both of Madison; Herbert E. Paaren, Verona, and Mary A. Fivizzani, Madison, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Jul. 17, 1980, Ser. No. 169,567**
**Int. Cl.³ C07J *9/00***
**U.S. Cl. 260—397.2** **28 Claims**

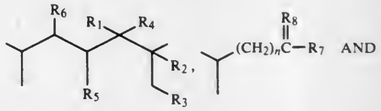
1. A method for preparing vitamin D- and 5,6-trans vitamin D-compounds which are isotopically labeled at carbon 6 of the molecule with deuterium or tritium which comprises,
reducing, a compound having the general formula



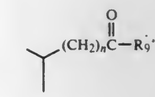
where R represents the sidechain as desired in the labeled product and Y is hydrogen, hydroxy or protected-hydroxy
with a tritio-or deutero-borohydride reducing reagent, whereby the corresponding 6-deutero- or 6-tritio-substituted-6-hydroxy product is obtained
subjecting said reduction product to acid catalyzed solvolysis, whereby the 6-deutero- or 6-tritio-vitamin D and 5,6-trans vitamin D compound is obtained, and
recovering the desired labeled product.
7. Compounds having the formula



wherein Y is hydrogen, hydroxy or protected-hydroxy, and R is selected from the group consisting of hydrogen, alkyl



AND



wherein each of $R_1$, $R_2$ and $R_3$ is selected from the group consisting of hydrogen, hydroxy, protected-hydroxy, alkyl and fluoro, and where $R_1$ and $R_2$ or $R_2$ and $R_3$, when taken together, form an epoxide, acetonide, or cyclic-O-boronate grouping, $R_4$ is hydrogen or alkyl, $R_5$ and $R_6$ are hydrogen or, when taken together, form a double bond, except that $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ may not all be hydrogen when Y is hydrogen, $R_7$ is selected from the group consisting of hydrogen and alkyl, $R_8$ represents a carbonyl or protected-carbonyl group, $R_9$ is selected from the group consisting of hydroxy and O-alkyl, and n is 1, 2 or 3.

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**4,297,290**

## PROCESS FOR PREPARING SORBITAN ESTERS

**George J. Stockburger, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.**

**Filed Jul. 17, 1980, Ser. No. 169,768**
**Int. Cl.³ C09F *5/08***
**U.S. Cl. 260—410.6** **8 Claims**

1. A process for preparing a sorbitan fatty acid ester or mixture thereof which comprises reacting an anhydro sorbitol containing a preponderance of sorbitans with a fatty acid in the presence of an alkaline catalyst at a temperature from about 180° to about 215° C., the amount of said catalyst not exceeding the equivalent of about 1% of NaOH, based on product weight, thereby producing said sorbitan fatty acid ester or mixture thereof.

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**4,297,291**

## METHOD OF PREPARING THE METHYL ESTER OF α-ELEOSTEARIC ACID

**Joseph E. Lionelle, and Jeffrey A. Staffa, both of Salida, Colo., assignors to Bio Systems Research, Inc., Salida, Colo.**

**Filed Jun. 30, 1980, Ser. No. 164,567**
**Int. Cl.³ C09F *5/02*; C11C *3/02***
**U.S. Cl. 260—410.9 R** **13 Claims**

1. A method of preparing the methyl ester of α-eleostearic acid which comprises:
providing a reaction mixture comprising tung oil, methanol, water and a saponification agent;

maintaining the temperature of said reaction mixture at a temperature of not more than about 35° C. for a time sufficient to effect saponification of said tung oil;

acidifying the saponification reaction mixture while cooling to maintain temperature of the reaction mixture at not more than 35° C. to form an aqueous phase and a non-aqueous phase comprising α-eleostearic acid;

separating said aqueous and non-aqueous phases;

admixing said separated non-aqueous phase and methanol to form an esterification reaction mixture;

heating said esterification reaction mixture in the presence of an acidic esterification catalyst to form an aqueous phase and a non-aqueous phase comprising the methyl ester of α-eleostearic acid; and

separating said aqueous and non-aqueous phases of said esterification reaction mixture to provide a non-aqueous product phase comprising the methyl ester of α-eleostearic acid.

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**4,297,292**

## FRACTIONATION OF TRIGLYCERIDE MIXTURES

**Ted J. Logan, Cincinnati, and Timothy A. Lubsen, Worthington, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 43,394, May 25, 1979, abandoned. This application Mar. 26, 1980, Ser. No. 134,029**

**Int. Cl.³ C09F *5/10***

**U.S. Cl. 260—428.5** **17 Claims**

1. A process for separating a mixture of triglycerides with different Iodine Values and having their carboxylic acid moieties containing from 6 to 26 carbon atoms, to produce fractions of higher Iodine Value and lower Iodine Value, said process comprising the steps of

(a) contacting a solution of said mixture in solvent with macroreticular strong acid cation exchange resin to selectively adsorb triglyceride of higher Iodine Value and to leave in solution a fraction of said mixture enriched in content of triglyceride of lower Iodine Value,

(b) removing solution of fraction enriched in content of triglyceride of lower Iodine Value from contact with resin which has selectively adsorbed triglyceride of higher Iodine Value,

(c) contacting resin which has selectively adsorbed triglyceride of higher Iodine Value with solvent to cause desorption of adsorbed triglyceride and provide a solution in solvent of fraction enriched in content of trigylceride of higher Iodine Value,

(d) removing solution of fraction enriched in content of triglyceride of higher Iodine Value from contact with resin;

the solvent in step (a) and the solvent in step (c) being of the same or of different composition and being characterized by a solubility parameter (on a 25° C. basis) ranging from about 7.0 to about 15.0, a solubility parameter dispersion component (on a 25° C. basis) ranging from about 7.0 to about 9.0, a solubility parameter polar component (on a 25° C. basis) ranging from 0 to about 6.0 and a solubility parameter hydrogen bonding component (on a 25° C. basis) ranging from 0 to about 11.5; said resin having its exchangeable cation substituents consisting essentially of from about 3% to 100% of metal cation substituents capable of forming π complexes, the balance being metal ions incapable of forming π compexes; the solvent in step (a) and the solvent in step (c) and the percentage of metal cation substituents capable of forming π complexes being selected to provide selectivity in step (a) and desorption in step (c).

**4,297,293**

## SODIUM ALUMOGLUCOHEPTONATE AND A PROCESS FOR ITS PREPARATION

**Peter Suhac; Natasa Hafner-Milac, and Bozidar Dolenc, all of Ljubljana, Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov. n.sol.o., Ljubljana, Yugoslavia**

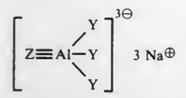
**Filed Feb. 6, 1980, Ser. No. 118,952**

**Claims priority, application Yugoslavia, Feb. 14, 1979, 354/79**

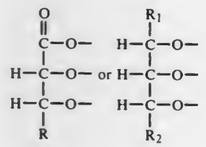
**Int. Cl.³ C07F *5/06***

**U.S. Cl. 260—448 B** **11 Claims**

1. Sodium alumoglucoheptonate of the general formula



wherein Z represents a residue of the formula



wherein

R represents a residue of a molecule of sodium D-glycero-D-gulo-heptonate or of sodium D-glycero-D-ido-heptonate and

$R_1$ and $R_2$ represent moieties of a molecule of sodium D-glycero-D-gulo-heptonate or of sodium D-glycero-D-ido-heptonate,

Y represents a hydroxy group or three Y are joined to represent the residue Z.

2. A process for the preparation of sodium alumoglucoheptonate characterized in that a solution of sodium aluminate is added to the solution of sodium glucoheptonate in such a quantity that the ratio between the number of aluminum atoms and the number of sodium glucoheptonate molecules amounts to from 0.50:1 to 1.50:1.

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**4,297,294**

## PROCESS FOR MAKING 4,4'-METHYLENE DIPHENYL DIISOCYANATE

**Frank D. Mango, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Sep. 29, 1980, Ser. No. 191,889**

**Int. Cl.³ C07C *118/02, 119/048***

**U.S. Cl. 260—453 PH** **9 Claims**

1. A process for the selective production of 4,4'-methylene diphenyl diisocyanate and corresponding oligomers, consisting essentially of the steps of:

(a) condensing formaldehyde with aniline under neutral or basic conditions to yield an anil condensate;

(b) reacting said anil condensate with aniline and a protonic salt of aniline under acidic conditions to yield an intermediate product selected from the group consisting of 4,4'-methylene dianiline, its corresponding oligomers and mixtures thereof; and

(c) reacting said intermediate product with phosgene to yield the corresponding diisocyanate or polysiocyanate.



**4,297,295**

## N-(BENZENESULFONYL) THIOCARBAMATES-HERBICIDAL ANTIDOTES

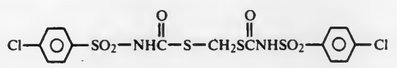
**Edmund J. Gaughan, Berkeley, and Charles Kezerian, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.**

**Division of Ser. No. 723,251, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 619,115, Oct. 2, 1975, abandoned. This application Dec. 31, 1979, Ser. No. 108,890**

**Int. Cl.³ C07C *155/02***

**U.S. Cl. 260—455 A** **1 Claim**

1. The compound having the formula



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**4,297,296**

## QUATERNIZED POLYAMINES

**Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland**

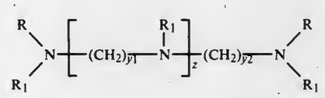
**Filed Jun. 21, 1979, Ser. No. 50,881**

**Claims priority, application Switzerland, Jun. 26, 1978, 6933/78**

**Int. Cl.³ C07C *87/28, 87/29***

**U.S. Cl. 260—459 A** **8 Claims**

1. A quaternized polyamine having the basic structure of formula I



I

in which

each R, independently, is ($C_{10-22}$)alkyl, ($C_{10-22}$)alkenyl, phenyl($C_{1-3}$)alkyl or naphthyl($C_{1-3}$)alkyl,

each $R_1$, independently, is phenyl($C_{1-3}$)alkyl or naphthyl ($C_{1-3}$)alkyl,

z is 1 to 5,

each $y_1$, independently, is an integer from 2 to 8,

$y_2$ is an integer from 2 to 8, with the proviso that when $z=1$ $y_1 \neq y_2$ and when $z>1$ and the $y_1$'s are the same $y_2 \neq y_1$

and wherein an average of 0.5 to 2.0 nitrogen atoms are quaternized with alkyl radicals containing from 1 to 6 carbon atoms.

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**4,297,297**

## α-CYANO-β-(SUBSTITUTED-ANILINO)-N-ETHOXYCARBONYLACRYLAMIDE INTERMEDIATES

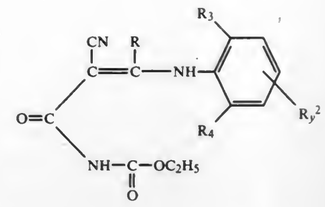
**Clive A. Henrick; Jeffrey N. Labovitz, both of Palo Alto, Calif.; Roland T. V. Fox, Crowthorne, England; William G. Rathmell, Wokingham, England, and Margaret C. Shephard, Maidenhead, England, assignors to Zoecon Corp., Palo Alto, Calif. and Imperial Chemical Industries Limited, England**

**Division of Ser. No. 23,517, Mar. 23, 1979, Pat. No. 4,266,056, which is a continuation-in-part of Ser. No. 894,307, Apr. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,560, Apr. 3, 1978, abandoned. This application Jul. 18, 1980, Ser. No. 170,243**

**Int. Cl.³ C07C *121/78***

**U.S. Cl. 260—465 D** **19 Claims**

1. A compound of the following formula (III):



(III)

wherein,

R is hydrogen, methyl or ethyl;

$R^2$ is lower alkyl, lower alkoxy, bromo, chloro, fluoro, lower haloalkyl, cyano, nitro, lower alkylthio, hydroxy, lower alkylcarbonyl, lower alkoxycarbonyl, lower haloalkoxy, cycloalkyl, clycloalkalkyl, lower haloalkylthio, lower alkenyl or lower alkynyl;

$R^3$ is hydrogen or independently selected from the values of $R^2$;

$R^4$ is hydrogen or independently selected from the values of $R^2$; and

y is zero, one, two or three, provided that:

(a) when R is hydrogen, $R^2$ is bromo, and y is one—then either $R^3$ or $R^4$ is other than hydrogen and

(b) when R is hydrogen—then either $R^3$ or $R^4$ is other than hydrogen or y is one, two or three.

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**4,297,298**

## METHOD OF PREPARING STABLE DILUTE SOLUTIONS OF ALIPHATIC CARBOXYLIC PERACIDS, AND THE RESULTING SOLUTIONS

**Francois Crommelynck, Saint Martin Le Vinoux; Michel Granger, Chalon-sur-Saone; Michel Rio, Elancourt, and Jacques Tourdot, Paris, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude, Paris, France**

**Filed Jul. 22, 1980, Ser. No. 171,047**

**Claims priority, application France, Aug. 1, 1979, 79 19761**

**Int. Cl.³ C07C *279/10***

**U.S. Cl. 260—502 R** **14 Claims**

1. A method of preparing a dilute solution, containing a rated concentration between 1 and 20% by weight, of an aliphatic carboxylic peracid with a stable concentration titer in time, notwithstanding the possible presence of trace amounts of decomposition catalysts, comprising the steps of:

preparing a concentrated solution of aliphatic peracid from the corresponding carboxylic acid or anhydride and hydrogen peroxide in a concentration of between 60 and 90% in the presence of the substantially minimal amount of a strong acid catalyst necessary to obtain equilibrium of the system in a maximum period of 48 hours; and

diluting the concentrated solution of aliphatic peracid, prepared in said preparing step, with a solution containing at least one of the reagents used in said preparing step in an amount and concentration sufficient to bring the concentration of aliphatic peracid at least to the rated concentration of the mixture and such that (a) the maximum concentration of peracid during storage at ambient temperature is at most 10% above the rated concentration of peracid and (b) the concentration after storage for 12 months is at least equal to the rated concentration of aliphatic peracid.

**4,297,299**

## NOVEL N-(ALKYL)-N-(2-HALOETHYL)-AMINOMETHYLPHOSPHONIC ACIDS, A METHOD FOR THE PREPARATION THEREOF AND THEIR USE IN THE PREPARATION OF STARCH ETHER DERIVATIVES

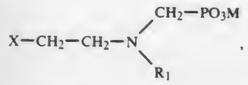
**Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.**

**Division of Ser. No. 110,926, Jan. 10, 1980, Pat. No. 4,260,738, which is a continuation-in-part of Ser. No. 66,526, Aug. 15, 1979, Pat. No. 4,243,479. This application Aug. 29, 1980, Ser. No. 182,547**

**Int. Cl.³ C07F *9/38***

**U.S. Cl. 260—502.5** **3 Claims**

1. As a composition of matter, a compound of the general structure



wherein X is a halogen, M is a cation, and $R_1$ is a $C_1$-$C_6$ group or a $C_3$-$C_6$ cycloalkyl group.

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**4,297,300**

## NOVEL α-HALOALKYLCARBAMIC ACID HALIDES, AND A PROCESS FOR THE PREPARATION OF α-HALOALKYLCARBAMIC ACID HALIDES

**Karl-Heinz Koenig, Frankenthal, and Karl-Heinz Feuerherd, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

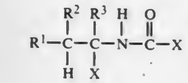
**Filed Jun. 25, 1979, Ser. No. 51,744**

**Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830969**

**Int. Cl.³ C07C *53/50***

**U.S. Cl. 260—544 C** **1 Claim**

1. An α-haloalkylcarbamic acid halide of the formula



I

where $R^1$, $R^2$ and $R^3$ may be identical or different and each is cycloalkyl of 5 or 6 carbon atoms, $R^1$ and $R^2$ together with the adjoining carbon or $R^2$ and $R^3$ together with the two adjoining carbons may also be members of a monocyclic or bicyclic alicyclic ring of 5 to 9 carbon atoms, one or two of $R^1$, $R^2$ and $R^3$ may also be hydrogen, and X is halogen.

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**4,297,301**

## PROCESS FOR THE MANUFACTURE OF ORGANIC ACID CHLORIDES

**Serge L. Lecolier, Janville sur Juine, and Jean-Pierre G. Senet, La Chapelle la Reine, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France**

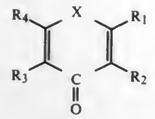
**Filed Nov. 23, 1979, Ser. No. 96,657**

**Claims priority, application France, Nov. 29, 1978, 78 33670; Aug. 30, 1979, 79 21730**

**Int. Cl.³ C07C *51/60***

**U.S. Cl. 260—544 K** **15 Claims**

1. Process for the manufacture of a carboxylic acid chloride which consists of phosgenating at a temperature of 90°-150° C., the corresponding acid or acid anhydride in the presence of a catalyst, wherein the catalyst is at least one member selected from the grop consisting of compounds of formula (I)



in which X is oxygen or nitrogen which is monosubstituted by $R_5$, which is an alkyl containing from 1 to 6 carbon atoms, and in which formula $R_1$, $R_2$, $R_3$ and $R_4$ are all different, or at least two of them are the same, and are hydrogen or an organic radical which contains at most 20 carbon atoms and wherein the proportion of the catalyst relative to said acid or anhydride, is between 0.01 and 10% by weight.

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**4,297,302**

## BUTTERFLY THROTTLE VALVE WITH A RAISED UPPER LIP

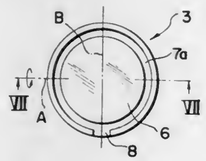
**Ken Nakamura, Kawasaki; Hiromichi Ofuji, Yokohama, and Junichi Yokoyama, Ebina, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Oct. 3, 1979, Ser. No. 81,432**

**Claims priority, application Japan, Oct. 7, 1978, 53-137328[U]**

**Int. Cl.³ F02M *3/08***

**U.S. Cl. 261—65** **1 Claim**




1. In an air-fuel mixture supply device for an internal combustion engine having an intake passage into which fuel is supplied: a disk-shaped butterfly throttle valve rotatably mounted on a valve shaft in the intake passage below the position where fuel is supplied thereinto, said throttle valve having an essentially flat upstream face which has an upstream part and a downstream part, a groove formed in said essentially flat upstream face and extending adjacent the entire outer periphery of said throttle valve essentially parallel to said outer periphery of the throttle valve; and

an outlet passage formed on said downstream part of said upstream face and extending from said groove to the outer periphery,

whereby fuel trickling onto the upstream face of said throttle is directed into said groove and guided to the downstream part of said upstream face and discharged to air flow passing through a clearance formed between the inner periphery of said intake passage and the downstream part of said throttle valve to be effectively atomized.

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**4,297,303**

## PREPARATION AND REACTION OF ENERGY PRODUCING WASTE MATERIAL COMPOSITION

**Paul A. Deardorff, 1128 Dix, Lincoln Park, Mich. 48146; Robert C. Wood, 36002 Huron River Dr., New Boston, Mich. 48164, and Sante M. Cundari, 530 Woodcrest, Dearborn, Mich. 48124**

**Division of Ser. No. 901,492, May 1, 1978, Pat. No. 4,208,226. This application Jan. 14, 1980, Ser. No. 111,724**

**Int. Cl.³ C06B *21/00***

**U.S. Cl. 264—3 R** **16 Claims**

16. A method for preparing a composition for the production of heat comprising the steps of:



(a) mixing an iron-containing waste by-product with a mineral acid, said iron containing waste by-product including an iron oxide,

(b) adding any water required to make the substance pliable,

(c) adding a reducing metal,

(d) then molding the composition and letting it stand.

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**4,297,304**

## METHOD FOR SOLIDIFYING AQUEOUS RADIOACTIVE WASTES FOR NON-CONTAMINATING STORAGE

**Knut Scheffler, Eggenstein-Leopoldshafen, and Ulrich Riege, Linkenheim-Hochstetten, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe, GmbH, Karlsruhe, Fed. Rep. of Germany**

**Filed Jun. 9, 1978, Ser. No. 914,152**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726087**

**Int. Cl.³ G21C *21/00***

**U.S. Cl. 264—0.5** **24 Claims**

1. Method for solidifying high radioactivity aqueous waste concentrates, medium radioactivity aqueous waste concentrates, actinide containing aqueous waste concentrates, or suspensions of fine-grained solid wastes suspended in water, which concentrates or suspensions contain a metal ion and/or metal oxide, for final noncontaminating storage in which the waste concentrates or the suspensions are subjected together with an absorbing and/or hydraulically binding inorganic material, to a ceramic firing process so as to produce a solid sintered body, comprising the steps of:

(a) treating the waste concentrates or suspensions by evaporation, to form an evaporate, to a water content in the range between 40 and 80 percent by weight and a solid content whose metal ion and/or metal oxide concentration lies between 10 and 30 percent by weight of the evaporate being formed, and adjusting the pH of the evaporate to between 5 and 10;

(b) kneading the evaporate obtained from step (a) with a clay-like substance containing a small quantity of cement or mixture of a clay-like substance with a small quantity of cement containing an additive for suppressing the volatility of alkali metals or alkaline earth metals which may be present in the evaporate and/or an additive for suppressing the volatility of any decomposable anions which may be present in the evaporate selected from the group consisting of sulfate, phosphate, molybdate and uranate ions, at a weight ratio range of evaporate to clay-like substance of 1:1 to 2:1, said clay-like substance being at least one substance selected from the group consisting of pottery clays, stoneware clays, porcelain clay mixtures and kaolins;

(c) producing molded bodies from the kneaded mass obtained from step (b);

(d) heat treating the molded bodies, including drying at temperatures between room temperature and 150° C., calcining at temperatures of about 150° to 800° C., and subsequently firing at temperatures between 800° and 1400° C. to form practically undissolvable mineral phases having a chemical composition corresponding approximately to that of natural, stable minerals or rocks; and

(e) enclosing the molded bodies containing the fired mineral phases on all sides in a dense, continuous ceramic or metallic matrix.

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**4,297,305**

## NUCLEAR FUEL RECYCLING SYSTEM

**Harvey R. Lee, Omemee; Arnold K. Koch, Etobicoke, and Adam Krawczyk, Mississauga, all of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada**

**Filed Jul. 26, 1979, Ser. No. 60,884**

**Int. Cl.³ G01C *21/00***

**U.S. Cl. 264—0.5** **6 Claims**

1. The method of producing nuclear fuel comprising retrieved nuclear fuel material selected from the group comprising substantially uncontaminated grinding swarf, sintered pellets and green pellet forms, including the steps of:

(1) crushing pelleted material to fine powder in a substantially inert atmosphere;

(2) mixing with grinding swarf and liquid to form a slurry having a content between about 70 to 85 weight percent solids;

(3) adding sintered $UO_2$ pellets as grinding media to the slurry within a wet mill and

(4) wet grinding the slurry with the pellets in the wet mill, to a predetermined consistency.

2. The method as claimed in claim 1 including the steps of drying said ground slurry to a powder, and recycling the powder for manufacture to pellet form.

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**4,297,306**

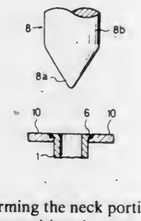
## NECK ORIENTING METHOD OF BOTTLES OF SATURATED POLYESTER RESINS

**Yataro Yoshino; Sadao Suzuki, and Takuzo Takada, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan**

**Filed Nov. 7, 1979, Ser. No. 92,428**

**Int. Cl.³ B29C *17/02, 17/07***

**U.S. Cl. 264—23** **8 Claims**




1. A method of forming the neck portion of a synthetic resin bottle, the method comprising the steps of:

(a) forming a parison of synthetic resin, the parison having a neck portion and an outwardly projecting lip at the upper outer circumferential end of the neck portion;

(b) heating the neck portion of the parison to an orientable temperature;

(c) holding the parison so that the outwardly projecting lip is retained by a plurality of radially extending arms, said arms being movable back and forth on a horizontal plane;

(d) inserting an orienting rod into the neck portion of the parison, the orienting rod having a converging tapered head and a straight body portion, the straight body portion being of a diameter greater than the diameter of the neck portion prior to insertion of the orienting rod, the neck portion being radially stretched thereby; and

(e) moving the arms radially outwardly as the tapered portion of the orienting rod is inserted into the neck portion of the parison whereby said arms continue to hold the parison as the neck portion thereof is radially stretched.

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**4,297,307**

## PROCESS FOR PRODUCING CARBON-CARBON FIBER COMPOSITES SUITABLE FOR USE AS AIRCRAFT BRAKE DISCS

**Gordon J. Taylor, Hinckley, Ohio, assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Jun. 29, 1979, Ser. No. 53,535**

**Int. Cl.³ B29C *25/00*; B29D *3/02***

**U.S. Cl. 264—29.5** **16 Claims**

1. A process for producing carbon-carbon fiber composites of high strength which comprises forming an aqueous gelled mixture containing between about 5 and 15% by weight chopped carbonaceous fibers and a water-soluble binder-thickening agent selected from the group consisting of polyethylene

oxide, ethyl methyl cellulose, hydroxyethyl cellulose, hydroxyethyl methyl cellulose, hydroxyproply methyl cellulose, methyl cellulose, polyacrylamid, polyvinyl alcohol, polyvinyl methyl ether, starch and gelatin, said binder-thickening agent having a viscosity of at least about 10,000 centipoises at 25° C., extruding the gelled mixture into the form of a continuous elongated ribbon wherein the individual carbon fibers are aligned substantially in the direction of fluid flow, arranging said elongated ribbon in a spiral pattern to form a flat disc shaped article, drying said article to remove water, heating the dried article to a temperature of at least about 300° C. and then impregnating said article with a liquid thermosetting resin binder followed by heating said article under pressure in a mold to a temperature of at least about 1200° C.

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**4,297,308**

## METHOD OF MANUFACTURING GAMES RACKETS

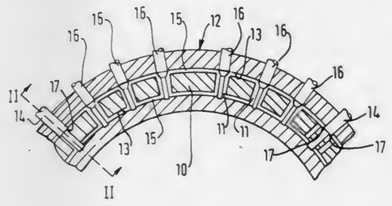
**Frank W. Popplewell, Essex, England, assignor to Dunlop Limited, London, England**

**Filed Feb. 28, 1979, Ser. No. 15,912**

**Claims priority, application United Kingdom, Mar. 7, 1978, 8925/78**

**Int. Cl.³ B29C** *1/14;* **B29D** *23/02, 27/00*

**U.S. Cl. 264—46.6** **7 Claims**



1. A method of making a frame for a games racket, said frame comprising a head and a shaft, in which at least said head is a molding formed by the steps of placing a fusible core material in a mold, said fusible core material containing holes oriented in a radial direction from the center of said mold, placing a plurality of pins in said injection mold, said pins passing centrally through at least some of the holes in said core material, said pins having a smaller diameter than said holes, injecting a thermoplastics material into said mold around said fusible core, said core having a melting point below the injection temperature, the holes of said core causing the injected thermoplastics material to form internal support means between the wall of said molding that is to lie at the outer circumference of said head and that wall of said molding that is to lie at the inner circumference of said head, at least some of said support means being hollow due to the presence of said pins, allowing said molding to set, removing said pins from the core, raising the temperature of said molding to an amount sufficient to melt said core but insufficient to melt or deform said molding, and, removing the molten core from said molding.

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**4,297,309**

## PROCESS OF USING AND PRODUCTS FROM FUME AMORPHOUS SILICA PARTICULATES

**John W. North, 1520 Farnell Ct., Apt. 533, Decatur, Ga. 30033**

**Continuation-in-part of Ser. No. 965,233, Dec. 1, 1978, abandoned. This application Jun. 25, 1980, Ser. No. 162,802**

**Int. Cl.³ C04B** *35/14*

**U.S. Cl. 264—56** **45 Claims**

1. Process of producing an amorphous silica product comprising:

(a) mixing fume amorphous silica material and water to produce a plastic mixture wherein said silica material consists essentially of stack gas particulate issueing from an electric furace producing silicon metal by the reduction of silica with carbon;

(b) shaping said plastic mixture into a prescribed shape; and

(c) drying the shaped plastic mixture.

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**4,297,310**

## PROCESS FOR PRODUCING ELECTRIC CONDUCTORS COATED WITH CROSSLINKED POLYETHYLENE RESIN

**Susumu Akutsu; Tsutomu Isaka, and Mitsugu Ishioka, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan**

**Filed Nov. 13, 1979, Ser. No. 93,126**

**Claims priority, application Japan, Nov. 13, 1978, 53/139707**

**Int. Cl.³ B29F** *3/10;* **C08G** *77/20*

**U.S. Cl. 264—83** **8 Claims**

1. A process for producing electric conductors coated with a crosslinked polyethylene resin which comprises fabricating a coated electric conductor having an extrusion-coated layer of a polyethylene resin comprising a random copolymer on a conductor, the copolymer comprising predominantly units of ethylene monomer and an unsaturated silane monomer represented by the formula $RSiR'_nY_{3-n}$, wherein: R is a member selected from the group consisting of ethylenically unsaturated hydrocarbyl and hydrocarbyloxy groups; R' is an aliphatic saturated hydrocarbyl group; Y is a hydrolyzable organic group; and n is zero, 1, or 2, and subjecting the coated conductor to a crosslinking process step comprising causing the coated conductor to contact water in the presence of a silanol condensation catalyst, said random copolymer having been produced by the polymerization of said monomers in the presence of a radical initiator under elevated pressure.

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**4,297,311**

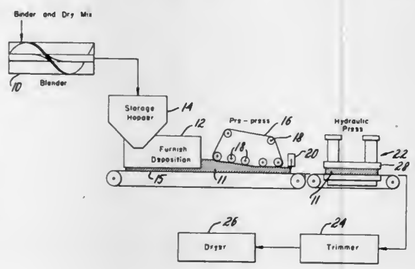
## METHOD OF MANUFACTURING IMPROVED MINERAL BOARD

**Norman Sherman, Ramsey, and John H. Cameron, St. Paul, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.**

**Continuation of Ser. No. 967,217, Dec. 7, 1978, abandoned. This application Oct. 17, 1979, Ser. No. 85,501**

**Int. Cl.³ B29J** *1/00*

**U.S. Cl. 264—109** **33 Claims**




1. A method of manufacturing a mineral product comprising the sequential steps of:

(a) forming an admixture comprising perlite and a resin binder therefor, at least 75% by weight of the solids content of said admixture being composed of the perlite/resin binder combination, the perlite being in the expanded form and having an initial average bulk density no greater than about 10 pounds per cubic foot, the said perlite/resin binder combination containing by weight from about 50% to about 95% perlite and from about 5% to about 50% resin binder where the expanded perlite is derived from an active perlite, and the said perlite/resin binder combination containing by weight from about 60% to about 95% perlite and from about 5% to about 40% resin binder where the expanded perlite is derived from an inactive perlite;

(b) mixing said admixture;

(c) forming a shaped product from said admixture;

(d) subjecting said shaped product to pressure to form it into its final shape, said pressure being sufficient to reduce the bulk volume of the perlite by a crushing factor of at least about;

(i) where the expanded perlite has been derived from an active perlite:

(1) $y=6.5-0.26x$ where x is from about 5 to about 15

(2) $y=3.1-0.035x$ where x is from about 15 to about 50

(ii) where the expanded perlite has been derived from an inactive perlite:

(3) $y=2.3-0.03x$ where x is from about 5 to about 40

wherein in each of formulas (1), (2) and (3): y is the crushing factor and x is the percent by weight of binder in the perlite/resin binder combination; and, thereafter,

(e) curing the resin binder.



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**4,297,312**

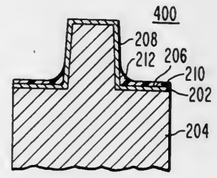
## METHOD FOR PREPARING STYLUS LAPPING DISCS

**Charles B. Carroll, Trenton, and Howard G. Scheible, Livingston, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Feb. 4, 1980, Ser. No. 118,088**

**Int. Cl.³ B32B** *3/26;* **B29C** *1/02;* **B28B** *19/00*

**U.S. Cl. 264—134** **4 Claims**




1. In a method of replicating a groove pattern in the formation of a lapping disc comprising the steps of:

1. recording the pattern in a photoresist layer,

2. developing the photoresist layer to form a photoresist master,

3. transferring the pattern of the photoresist master to a metal matrix master pattern by coating the photoresist master with a metal to form an electroform, and separating the electroform from the photoresist master to produce the said metal matrix master pattern, and

4. replicating the metal matrix master pattern in the surface of a plastic article;

the improvement which comprises the step of forming concave junctions on the metal matrix master by filling in material at the intersections of the walls and base portions of the metal matrix master.

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**4,297,313**

## METHOD FOR MANUFACTURING A PACIFIER

**Stuart S. Duckstein, 111 Tall Oaks Dr., Wayne, N.J. 07470**

**Division of Ser. No. 934,673, Aug. 18, 1978, Pat. No. 4,195,638. This application Jul. 30, 1979, Ser. No. 62,114**

**Int. Cl.³ B29C** *6/02*

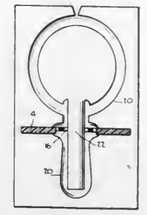
**U.S. Cl. 264—273** **2 Claims**

1. A process for making a pacifier comprising the steps of:

(a) forming a rigid shield having a centrally disposed hole and an array of holes concentrically arranged around the centrally disposed hole;

(b) locating the rigid shield member in an injection molding cavity configured in the form of a pacifier which has a ring, nipple, and shield, said shield being located in a section of the cavity between the ring and nipple section with the holes in the shield arranged to provide communication between the ring and nipple sections of the cavity;

(c) locating an interference member within the cavity spaced apart from the edge of the centrally disposed hole in the



rigid shield and extending axially from the rigid shield through the ring section and into the nipple section; and

(d) injecting material from the group comprising thermosetting and thermoplastic material into the cavity to fill the ring and nipple section and to pass through the holes of the shield to retain the shield captive.

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**4,297,314**

## METHOD FOR PERMANENT DEFORMATION OF AN ELASTIC MEMBER

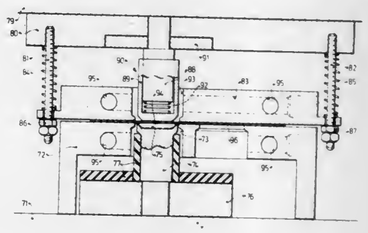
**Waldemar Schmidt, Waiblingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Nov. 27, 1978, Ser. No. 963,710**

**Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753541**

**Int. Cl.³ B29C** *17/03;* **B29D** *23/10;* **B29H** *5/01, 5/16*

**U.S. Cl. 264—320** **1 Claim**



1. A method for producing a permanently deformed flexible diaphragm, comprising the steps of:

applying to a permanently deformable flexible diaphragm essentially consisting of a coated rubberized web intended for use as a valve closing member, distending forces to selected parts of a diaphagm which parts are to be displaced out-of-plane thereof to produce a dish-shaped depression in the diaphragm;

applying heat to only said selected parts of the diaphragm which are subjected to the out-of-plane distending forces and while cooling only parts, other than said selected parts, of the diaphragm which are free from distending forces including passing of a cooling medium through channels in a base plate and in a cover plate confining the diaphram therebetween.

**4,297,315**

## METHOD OF MAKING WIG ARCHETYPE

**Goro Kasai, Ichikawa; Sanjuro Takechi, and Hiroshi Harima, both of Hasaki, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan**

**Filed Dec. 27, 1979, Ser. No. 107,564**
**Claims priority, application Japan, Dec. 29, 1978, 53/161914**
**Int. Cl.³ B29C** *17/00*
**U.S. Cl. 264—322** **8 Claims**

1. A method for making a wig archetype to the shape of the human head, comprising:

a. softening a sheet of a thermoplastic composition comprising polyisoprene, said polyisoprene having at least 90% of the isoprene monomer units in the trans-1,4 configuration and an intrinsic viscosity of 1.2 to 3 when measured in toluene at 30° C., said sheet having a thickness from 0.5 to 4.0 millimeters and said thermoplastic composition being sufficiently transparent when held to the head to allow registering of the hair distribution;

b. applying the sheet to the scalp of a human head, shaping said sheet to the shape of said human head and registering the distribution of the hair thereon by marking the location of the hair while said sheet is in contact with said human head;

c. hardening the sheet whereby the thermoplastic composition clearly shows the registered hair density distribution after hardening; and

d. removing the sheet from the scalp.

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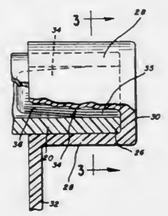
**4,297,316**

## MAINTAINING THE DIMENSIONAL INTEGRITY OF THERMOPLASTIC TUBING ENDS FOR RECEIVING A LUER

**Joel Cunningham, Del Mar, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Jan. 7, 1980, Ser. No. 110,261**
**Int. Cl.³ A61L** *2/04*
**U.S. Cl. 422—1** **3 Claims**



1. A method of maintaining the dimensional integrity of an end of thermoplastic tubing having a normal uniform interior diameter which undergoes dimensional distortion at a temperature sufficient to effect heat sterilization treatment thereof, said method comprising the steps of

rigidly supporting with a thermosetting member the interior portion of the tubing end at a diameter which is generally equal to the normal interior diameter thereof,

compressing with a thermosetting member the exterior portion of the tubing end inwardly toward the rigidly supported interior portion thereof, and

exposing the tubing to the temperature sufficient to effect heat sterilization treatment thereof.

**4,297,317**

## LOW LEVEL CHROMATE-BASED CORROSION INHIBITION IN AQUEOUS MEDIUMS

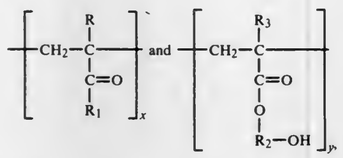
**Frederick G. Vogt, deceased, late of Philadelphia, Pa. (by Mary J. Vogt, executrix), and Patricia T. Sparrell, Freehold, N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.**

**Filed Mar. 28, 1980, Ser. No. 134,812**
**Int. Cl.³ C23F** *11/12, 11/14, 11/18*
**U.S. Cl. 422—16** **20 Claims**

1. A method for reducing the amount of corrosion of metal surfaces in contact with an aqueous medium comprising adding to said aqueous medium an effective amount for the purpose of a zinc-free and phosphate-free treatment consisting essentially of effective:

(i) water-soluble chromate, and

(ii) water-soluble polymer comprising moieties derived from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



where R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; $R_1$ is OH, $NH_2$ or OM where M is a water-soluble cation; $R_2$ is a lower alkyl of from about 2 to 6 carbon atoms, $R_3$ is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1, wherein said water soluble chromate is added in an amount of from about 0.5 to about 150 parts of active chromate per million parts of said aqueous medium.

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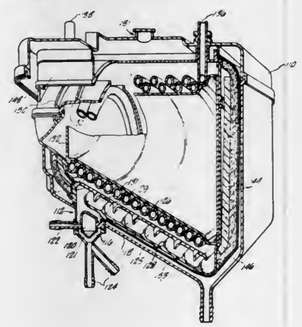
**4,297,318**

## BLOOD OXYGENATOR

**Donald A. Raible, Santa Ana, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.**

**Continuation-in-part of Ser. No. 823,149, Aug. 9, 1977, which is a continuation-in-part of Ser. No. 689,971, May 26, 1976, Pat. No. 4,268,476, which is a continuation-in-part of Ser. No. 584,464, Jun. 6, 1975, abandoned, and a continuation-in-part of Ser. No. 689,971,. This application Jul. 2, 1979, Ser. No. 54,268**
**The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.**
**Int. Cl.³ A61M** *1/03*
**U.S. Cl. 422—46** **18 Claims**



1. Apparatus for oxygenating blood comprising: means for combining oxygen-containing gas with liquid blood to form a mixture of blood and gas, a substantial portion of said mixture being in the form of bubbles; means defining a flow path for the mixture; means in the flow path defining a passageway configured in a manner capable of imparting rotational movement to at least a portion of the bubbles, said passageway having a transverse dimension large enough to permit rotation of the bubbles; and defoaming means downstream of said passageway.



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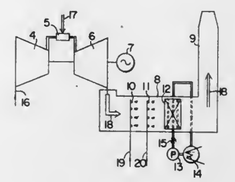
**4,297,319**

## APPARATUS FOR REMOVING NITROGEN OXIDES FROM FLUE GAS

**Yoji Ishibashi; Yoshihiro Uchiyama, both of Hitachi; Hidetoshi Akimoto, Tokaimura, and Makoto Sasaki, Morioka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 6, 1978, Ser. No. 967,052**
**Claims priority, application Japan, Dec. 7, 1977, 52-146021**
**Int. Cl.³ B01J** *8/02;* **F01N** *3/08, 3/28*
**U.S. Cl. 422—114** **7 Claims**



1. An apparatus for removing nitrogen oxides from a combustion flue gas, which comprises a flue gas duct for passing a combustion flue gas containing nitrogen oxides therethrough, means for adding ammonia and hydrogen peroxide into the flue gas passing through the flue gas duct, thereby reducing the nitrogen oxides in the flue gas in a gas phase, catalyst means comprised of a metallic oxide system for further reducing the remainder of nitrogen oxides, by directly contacting the flue gas, provided in the flue gas duct downstream of said means for adding ammonia and hydrogen peroxide to the flue gas duct and cooling means for cooling the catalyst means being provided within the catalyst means; the means for adding ammonia and hydrogen peroxide into the flue gas comprising one injector means for the ammonia and another injector means for the hydrogen peroxide.

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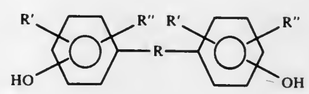
**4,297,320**

## COATING POLYMERIZATION REACTORS WITH THE REACTION PRODUCTS OF THIODIPHENOLS AND A BLEACH

**Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Continuation-in-part of Ser. No. 34,106, Apr. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,711**
**Int. Cl.³ B01J** *19/00;* **B05D** *7/22;* **C08F** *2/00*
**U.S. Cl. 422—131** **16 Claims**

1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces an aqueous coating solution having a pH in the range of about 7.5 to about 13.0 and containing the reaction product of a thiodiphenol and and a chlorine containing bleaching agent, said thiodiphenol having the general structure

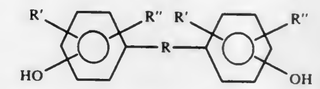


wherein R is selected from the group consisting of —S—, and



R′ is selected from the group consisting of —H, —OH, and an alkyl group containing from 1 to 4 carbon atoms, and R″ is —H or —Cl, and conducting the polymerization of monomer(s) while in contact with the coated internal surfaces of said vessel.

14. A polymerization reaction vessel having on all the internal surfaces thereof a coating comprised of the reaction product of a thiodiphenol and a chlorine containing bleaching agent, said thiodiphenol having the general structure



wherein R is selected from the group consisting of —S—, and

R′ is selected from the group consisting of —H, —OH, and an alkyl group containing from 1 to 4 carbon atoms, and R″ is —H, or —Cl, and wherein the coated surfaces are characterized by having a critical surface tension of at least 72 dynes/-centimeter and a contact angle with water of about zero.

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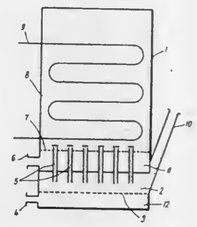
**4,297,321**

## APPARATUS HAVING MAIN AND AUXILIARY FLUIDIZED BEDS THEREIN

**Jaroslav Beranek, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia**

**Filed Apr. 8, 1980, Ser. No. 138,323**
**Claims priority, application Czechoslovakia, Apr. 10, 1979, 2441-79**
**Int. Cl.³ B01J** *8/28, 8/44;* **F27B** *15/08*
**U.S. Cl. 422—143** **4 Claims**



1. Apparatus for feeding solid particles at multiple points of a fluidized bed, comprising:

a housing means having a main chamber for formation of a main fluidized bed of solid particles therein,

the bottom of said main chamber comprising a main grid for the distribution of a fluidization fluid to said main fluidized bed;

said housing means having a first space below and communicating with said main grid for receiving a fluidization fluid;

an inlet to said first space for introduction of a fluidization fluid thereto;

said housing means having an auxiliary chamber below said first space for formation of an auxiliary fluidized bed of solid particles therein,

the bottom of said auxiliary chamber comprising an auxiliary grid for the distribution of a fluidization fluid to said auxiliary fluidized bed;

an inlet to said auxiliary chamber for introduction of solid particles thereto;

said housing means having a second space below and communicating with said auxiliary grid for receiving a fluidization fluid;

an inlet to said second space for introduction of a fluidization fluid thereto; and

a system of inlet pipes extending between said auxiliary chamber and the lower portion of said main chamber for transporting said solid particles from the auxiliary fluidized bed to the main fluidized bed.

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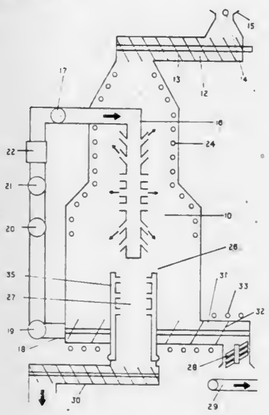
**4,297,322**

## EQUIPMENT FOR TREATING AND RESOURCE RECOVERY FROM SOLID WASTE

**Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373**

**Division of Ser. No. 827,693, Aug. 25, 1977, Pat. No. 4,204,906.**
**This application Mar. 11, 1980, Ser. No. 129,609**
**Int. Cl.³ B01D** *9/00, 11/00;* **B01F** *9/08, 15/02*
**U.S. Cl. 422—184** **18 Claims**



1. An equipment for treating a solid waste containing fibrous combustible matters and fusible plastics comprising:

means for heating said equipment to provide therein a vertically elongated, heating zone;

means for feeding said solid waste to a top portion of said heating zone and dropping said solid waste into said heating zone, said solid waste falling freely under gravity inside said zone;

during the free gravitational fall through said heating zone said solid waste being heated to a treatment temperature sufficiently high to fuse said fusible plastics and also to exceed the combustion temperature of said fibrous combustion matters in air;

means for establishing in said heating zone a gaseous atmosphere which will not support combustion of said fibrous combustible matters at said treatment temperature; and

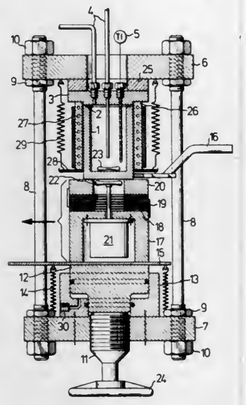
means for providing a separating force having at least a horizontal component to separate said falling and fusing plastics from said falling fibrous combustible matters.

**4,297,323**

## PRESSURE VESSEL HAVING QUICK-ACTION LOCKING MEANS

**Karl-Heinz Tetzlaff, Kelkheim; Wilhelm Riemenschneider, Frankfurt am Main, and Günter Leuschner, Schwalbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Aug. 27, 1980, Ser. No. 181,807**
**Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934789**
**Int. Cl.³ B01J** *3/03, 3/04*
**U.S. Cl. 422—208** **9 Claims**



1. A pressure vessel having quick-action locking means therefor which comprises a holder to which the top of the pressure vessel containing connections and/or measuring equipment is rigidly mounted, a presser, and a sliding spacer device positioned between the detachable lower part of the pressure vessel and the presser; the top of the pressure vessel and the lower part thereof positioned on the spacer device being tightly compressed by the presser.

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**4,297,324**

## APPARATUS FOR THE CONTINUOUS PROCESSING OF COMPOUNDS IN A LIQUID

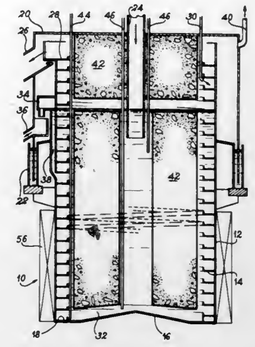
**Henri Sauvage, and Maurice Tarnero, both of Bagnols sur Ceze, France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Nov. 24, 1980, Ser. No. 209,601**
**Claims priority, application France, Dec. 18, 1979, 79 30951**
**Int. Cl.³ B01D** *11/02*
**U.S. Cl. 422—268** **10 Claims**

1. An apparatus for processing compounds in a liquid, wherein it is constituted by a helical vibrating elevator having a cylindrical tank with a vertical axis, a fixed cover, an annular helical ramp fixed to the tank wall, means for imparting a reciprocating movement about its axis and in a vertical plane to the ramp, said movement being such that the rotation speed of the ramp in one direction exceeds the rotation speed thereof in the opposite direction, at least one liquid supply pipe in the cover, at least one lateral discharge opening for the liquid in



the tank, a supply chute for supplying the compounds carried by the cover and whose axis coincides with that of the tank and



a discharge chute for discharging the compounds located at the top of the helical ramp and in an extension of the latter.

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**4,297,325**

## METHOD OF PRODUCING PSEUDOBOEHMITE FROM ALUMINUM SALT SOLUTIONS

**Julius Scherzer, Anaheim; Anh-Thu Liu, Santa Ana, and Yih-Yau Sun, Montebello, all of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.**

**Filed Dec. 8, 1980, Ser. No. 214,215**
**Int. Cl.³ C01F** *7/34*
**U.S. Cl. 423—122** **7 Claims**

1. A method for producing pseudoboehmite from aluminum sulfate solutions containing $Fe^{+++}$, and alkaline earth ions which comprises adding a reducing agent and reducing $Fe^{+++}$ to $Fe^{++}$ without precipitating compounds of the Fe, or alkaline earth ions and then adjusting the pH in the range of about 4 to about 5 to form alumina hydrate gel without precipitating any substantial quantities of Fe or alkaline earth compounds, separating the gel from the leach solution aging the gel at a pH in excess of about 9 and forming pseudoboehmite substantially free of Fe and of alkaline earth cations.

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**4,297,326**

## METHOD OF PRODUCING A PURE ALUMINIUMOXIDE FROM SOLUTIONS CONTAINING DISSOLVED IONS OF ALUMINIUM AND IRON

**Norvald Gjelsvik, Oslo, and Ingleif Hundere, Frogner, both of Norway, assignors to Elkem-Spigerverket a/s, Oslo, Norway**

**Filed Feb. 4, 1980, Ser. No. 118,601**
**Claims priority, application Norway, Feb. 13, 1979, 790460**
**Int. Cl.³ C01F** *7/22*
**U.S. Cl. 423—126** **1 Claim**

1. A method of continuously producing hexahydrated aluminium chloride which on calcining forms an aluminium oxide with a ferric oxide content of less than 0.05% from an ore containing aluminium and iron constituents comprising:

(a) treating a first quantity of said ore with sulfuric or hydrochloric acid or a mixture thereof to form a solution comprising aluminium and iron ions;

(b) treating the solution of step (a) with hydrochloric acid gas to form a precipitate of hexahydrated aluminium chloride and to form a mother liquor containing iron ions;

(c) treating a further quantity of said ore with said mother liquor to form a further solution comprising aluminium and iron ions, the iron ions being present in approximately the cumulative of their presence in the first and the further quantity of ore;

(d) treating said further solution with hydrochloric acid gas to form a precipitate of hexahydrated aluminium chloride and to form a mother liquor containing iron ions;

(e) continuing the treatment of further quantities of said ore in the manner of steps (c) and (d) and and with the amount of iron ions in said mother liquor being between 8 and 28 grams per liter; and

(f) calcining the hexahydrated aluminium chloride to aluminium oxide with a ferric oxide content of less than 0.05%.

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**4,297,327**

## METHOD OF PRECIPITATION OF PURE ALUMINIUMCHLORIDE FROM SOLUTIONS WHICH CONTAIN IONS OF ALUMINIUM AND MAGNESIUM

**Norvald Gjelsvik, Oslo; Gunnar Hannestad, Skedsmo; Ingleif Hundere, Frogner, and Jan H. Torgersen, Skjetten, all of Norway, assignors to Elkem-Spigerverket A/S, Oslo, Norway**

**Filed Feb. 4, 1980, Ser. No. 118,602**
**Claims priority, application Norway, Feb. 13, 1979, 790458**
**Int. Cl.³ C01F** *7/22, 7/30*
**U.S. Cl. 423—126** **4 Claims**

1. A method of producing aluminium chloride hexahydrate with a low content of magnesium from hydrochloric acid solutions containing aluminium and magnesium comprising:

(a) in a first step treating said solution with hydrochloric acid gas whereby aluminium chloride hexahydrate crystals are precipitated while the mother liquor solution maintains a ratio between aluminium and magnesium at a ratio above 0.5 for grams of $Al^{+3}$: grams of $Mg^{+2}$; and

(b) separating the precipitated aluminium chloride hexahydrate crystals from the mother liquor;

(c) in at least one second step transferring said mother liquor solution to a separate container, adding additional hydrochloric acid gas, and continuing to maintaining the ratio between said $Al^{+3}$ and said $Mg^{+2}$ above said 0.5 ratio, while continuing to precipitate further aluminium chloride hexahydrate crystals;

(d) separating the further precipitated aluminium chloride hexahydrate crystals from the mother liquor; and

(e) in a subsequent step precipitating substantially all remaining aluminium as aluminium chloride with additional hydrochloric acid gas and returning the precipitated aluminium chloride to solution and renewed precipitation.

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**4,297,328**

## THREE-WAY CATALYTIC PROCESS FOR GASEOUS STREAMS

**James S. Ritscher, Ossining, and Michael R. Sandner, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Sep. 28, 1979, Ser. No. 80,132**
**Int. Cl.³ B01D** *53/36*
**U.S. Cl. 423—213.2** **12 Claims**

1. A process for the concurrent catalytic reduction of oxides of nitrogen and the oxidation of carbon monoxide and hydrocarbons contained in a gas stream wherein said process consists essentially of contacting the gas stream with a high-silica zeolite containing copper metal or ions, said zeolite having a silica to alumina ratio of at least 20, and wherein said gas stream contains a stoichiometric excess of oxidant.

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**4,297,329**

## VAPOR-LIQUID CONTACTING SYSTEM

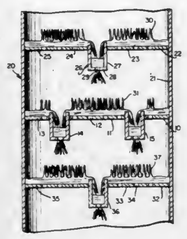
**Paul W. Sigmund, Tarrytown, and Kenneth F. Butwell, Newburgh, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

**Division of Ser. No. 863,350, Dec. 22, 1977, abandoned. This application May 14, 1980, Ser. No. 149,733**
**Int. Cl.³ B01D** *53/34*
**U.S. Cl. 423—228** **3 Claims**

1. In a process for absorbing hydrogen sulfide from a gas mixture containing hydrogen sulfide and carbon dioxide by an

amine liquid solvent in an absorption zone containing a plurality of generally horizontally aligned, vertically spaced-apart perforated trays on which liquid solvent, flowing generally downwardly through the absorption zone from tray to tray, is contacted with upwardly flowing gas mixture, the improvement comprising:

(a) providing an open area of from 3 to 5% on each of said trays, formed by fixed size perforation openings of from 1/16 to 3/32 inch diameter;



(b) flowing said gas mixture through said open area perforation openings at a velocity of from 50 to 133 ft/sec; and

(c) maintaining the liquid height of said amine solvent on said trays in the range of from $\frac{1}{8}$ to $\frac{3}{8}$ inch, whereby upwardly directed laminar jetting of liquid is obtained over said tray perforation openings for solvent-gas mixture contacting and selective hydrogen sulfide absorption.

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**4,297,330**

## PROCESS OF SELECTIVELY DESULFURIZING GASES

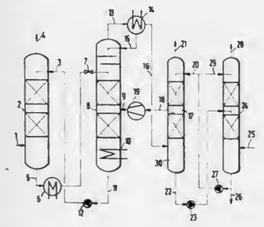
**Johann Schlauer, Frankfurt am Main; Georg Kempf, Schöneck, and Alexander Doerges, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 27, 1980, Ser. No. 134,360**

**Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2912115**

**Int. Cl.³ B01D** *53/34*

**U.S. Cl. 423—232** **7 Claims**



1. A process for selectively desulfurizing gases which contain hydrogen sulfide and carbon dioxide which comprises scrubbing said gases with an aqueous potassium carbonate solution under a superatmospheric pressure at a temperature of about 100° C., said aqueous potassium carbonate solution having a mass ratio of 1.0 to 3.0 vals (gram equivalent) of alkali in the solution per mole of $CO_2$ and $H_2S$ in the gases to be purified, regenerating the laden scrubbing solution by stripping the same with a gas in which the $CO_2$ partial pressure is above 0.2 bar and recycling the so regenerating scrubbing solution.

**4,297,331**

## CATALYSIS

**Paul A. Sermon, Cowley, England, assignor to Johnson, Matthey & Co., Limited, London, England**

**Continuation of Ser. No. 948,508, Oct. 4, 1978, which is a continuation of Ser. No. 826,831, Aug. 22, 1977, abandoned. This application Jun. 11, 1980, Ser. No. 158,492**

**Claims priority, application United Kingdom, Aug. 24, 1976, 35202/76**

**Int. Cl.³ B01D** *53/36*

**U.S. Cl. 423—239** **7 Claims**

1. A method for the decomposition of NO present in a gas stream which comprises contacting the gas with a catalyst consisting essentially of a compound selected from the group consisting of $TiB_2$, $ZrB_2$, MoB, WB, $Ta_2N$, BN, $MoSi_2$ and $WSi_2$.

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**4,297,332**

## METHOD FOR TREATMENT OF A DISCHARGE LIQUID PRODUCED IN TREATMENT OF AN EXHAUST GAS

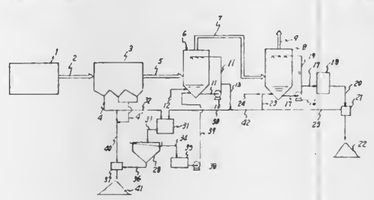
**Atsushi Tatani, Hiroshima, and Susumu Okino, Yamaguchi, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 16, 1980, Ser. No. 112,444**

**Claims priority, application Japan, Jan. 18, 1979, 54-4132**

**Int. Cl.³ C01B** *7/00*

**U.S. Cl. 423—240** **6 Claims**



4. In a method for treatment of an exhaust gas which comprises the steps of treating an exhaust gas discharged from a coal combustion apparatus in a dry type dust collecting device to remove fly ash from said exhaust gas, treating the resultant exhaust gas from said dry type dust collecting device in an absorption tower where halogen gas and $SO_2$ in said exhaust gas are absorbed to produce a slurry containing calcium sulfite, oxidizing said slurry containing calcium sulfite into a gypsum slurry, and separating said gypsum slurry into solid and liquid to recover gypsum and at the same time to obtain filtrate separated from said gypsum, the improvement wherein:

(1) said dry type dust collecting device is divided into at least two sections along the direction of gas flow to separate the collected fly ash into at least two parts, one part being fly ash collected on the most upstream side of said gas flow, and a second part being fly ash collected on the downstream side of said gas flow;

(2) said filtrate separated from said gypsum is mixed with a part of said fly ash collected at said most upstream side of said gas flow in said dry type dust collecting device to form a mixed slurry; and

(3) said mixed slurry is separated into clear water and sludge, said clear water is supplied to said absorption tower, and said sludge is mixed with a part of said fly ash collected in said dry type dust collecting device.



**4,297,333**

## METHOD OF DECOMPOSING HYPOCHLORITE ION IN A BASIC SOLUTION

**Roger A. Crawford, Wadsworth, and Robert B. Simmons, Norton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jul. 7, 1980, Ser. No. 166,020**

**Int. Cl.³ B01D** *53/34;* **C01D** *3/08;* **C01B** *13/02;* **C02F** *1/72*

**U.S. Cl. 423—241** **24 Claims**

18. In a method of removing chlorine from a gas stream comprising scrubbing the gas stream with an aqueous alkaline solution, and thereafter contacting the resulting solution with a solid hypochlorite decomposition catalyst, whereby to form oxygen molecules and chloride ion, the improvement wherein said hypochlorite decomposition catalyst is a solid comprising nickel (II) oxide and bimetal $NiCo_2O_4$ spinel.

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**4,297,334**

## PROCESS FOR REMOVING COLOR BODIES FROM BROWN PHOSPHORIC ACID

**Thomas A. McConomy, Coraopolis, and Bruce D. Wells, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 93,347, Nov. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 13,495, Feb. 21, 1979, abandoned. This application Aug. 4, 1980, Ser. No. 174,979**

**Int. Cl.³ C01B** *25/16*

**U.S. Cl. 423—321 R** **2 Claims**

1. In a process for purifying brown phosphoric acid by means of filtration through activated carbon and recovering the phosphoric acid wherein the improvement consists of filtering the brown phosphoric acid through a bed of activated carbon having a total pore volume of 1.0 cc/g or greater with about half of the total pore volume located in pores 35 Å or less in radius.

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**4,297,335**

## ALUMINUM DEFICIENT ZEOLITE COMPOSITIONS AND PROCESS FOR PREPARING SAME

**Brent M. T. Lok, New City, N.Y., and Thomas J. P. Izod, Holliston, Mass., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Mar. 25, 1980, Ser. No. 133,848**

**Int. Cl.³ C01B** *33/28*

**U.S. Cl. 423—328** **10 Claims**

1. Process for enhancing the hydrophobicity of crystalline zeolites which comprises;

(a) providing an activated crystalline zeolitic aluminosilicate having a $SiO_2/Al_2O_3$ molar ratio of at least 2, and having at least 60 percent, of the framework aluminum atoms not associated with metal cations;

(b) contacting said activated aluminosilicate with a gas mixture comprising

(i) from 0.1 to 20 volume percent fluorine

(ii) from zero to 21 volume percent oxygen

(iii) and as the remainder, one or a mixture of two or more inert gases,

said contact being at a temperature of from about 50° F. to 400° F. for a period of at least 1 minute.

**4,297,336**

## PREPARATION OF SOLUTIONS OF BASIC ALUMINIUM NITRATE

**Robert S. Marsden, Kelsall, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Jun. 19, 1980, Ser. No. 160,841**

**Claims priority, application United Kingdom, Jun. 26, 1979, 22209/79**

**Int. Cl.³ C01F** *7/66*

**U.S. Cl. 423—395** **21 Claims**

1. A process for the preparation of a stable, liquid aqueous solution of basic aluminium nitrate which comprises:

(i) reacting an aluminium oxide with nitric acid solution at a temperature of below 25° C. to form aluminium hydroxide,

(ii) separating the resulting aluminium hydroxide precipitate,

(iii) if necessary removing alkali metal ions and other undesirable ions from the precipitate, and

(iv) digesting the aluminium hydroxide precipitate in nitric acid or aluminium nitrate.

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**4,297,337**

## SOLID-PHASE IMMUNOASSAYS USING MAGNETIC GLASS

**Gerald R. Mansfield, Painted Post; Karen L. Travis, Corning, and William P. Vann, Beaver Dams, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Apr. 13, 1979, Ser. No. 29,576**

**Int. Cl.³ G01N** *33/48;* **G01T** *1/00*

**U.S. Cl. 424—1** **34 Claims**

1. In a process for carrying out a solid-phase immunoassay wherein a biological material is complexed with a water-insoluble, inert particulate carrier and, during the assay, the particulate carrier is separated from a fluid, the improvement which comprises utilizing, as said particulate carrier, water-insoluble, inert, magnetically-dilute particles of a glass and/or crystal-containing material having iron-containing, magnetic crystals incorporated therein with dimensions of less than about 1000 Å which are essentially enveloped within the glass and/or crystal structure, and magnetically separating said particulate carrier from said fluid.

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**4,297,338**

## MALIGNANT TUMOR IMMUNITY LEVEL DETECTION

**Jack G. Makari, 88 Everett Rd., Demarest, N.J. 07627**

**Continuation-in-part of Ser. No. 14,827, Feb. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,258, Jun. 29, 1978, abandoned, which is a continuation of Ser. No. 679,926, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 342,097, Mar. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 37,406, May 11, 1970, abandoned, which is a continuation of Ser. No. 421,683, Dec. 28, 1964, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 26, 1959, abandoned, and a continuation-in-part of Ser. No. 31,855, May 1, 1970, abandoned, which is a continuation of Ser. No. 530,774, Mar. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 127,849, Jul. 31, 1961, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 26, 1959, abandoned, and a continuation-in-part of Ser. No. 159,473, Jul. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 535,364, Mar. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 421,683, Dec. 28, 1964, abandoned. This application Sep. 12, 1980, Ser. No. 186,781**

**Int. Cl.³ A61K** *49/00, 39/00*

**U.S. Cl. 424—9** **6 Claims**

1. The method of detecting the level of immunity to the development of a malignant tumor in a human subject, which method comprises the combination of steps of

(a) intradermally injecting into the subject to be tested a level of immunity to malignant tumor development detecting effective dosage of a diagnostic isotonic aqueous

sodium or potassium chloride solution containing essentially a glycoprotein-polysaccharide-like antigenic substance derived from malignant tumor tissue and which readily disperses in cold to boiling water and in aqueous sodium or potassium chloride solutions to a stable, non-dialyzable solution, is stable to boiling in water and in aqueous sodium or potassium chloride solutions, is non-dialyzable at a cutoff point of 3500 from water, inert to alkali and to phosphate buffered isotonic aqueous sodium or potassium chloride solutions, precipitated from aqueous media by isopropanol and insoluble in it, ether, chloroform, and butanol, withstands autoclaving at 250° F. and 16 lbs. per square inch pressure for at least 30 minutes and retains its activity after autoclaving even up to 6 hours, gives a positive Molisch test and a negative Dische test, and on acid hydrolysis as by heating it in a 2 N aqueous solution of trifluoroacetic acid or in contact with the acid form of polystyrene nuclear-sulfonic acid cation exchange resin, in a sealed tube in a boiling water bath for 24 hours, yields a hydrolysate containing identifiable sugars and on finite analysis shows also trace amounts of various amino acids typical of N-glycoprotein; and which glycoprotein-polysaccharide-like antigenic substance when dispersed in an isotonic aqueous sodium or potassium chloride solution in an amount for it to contain about 0.25 micrograms of said antigenic substance per milliliter and thereafter one-tenth milliliter of the resulting solution is injected intradermally into a human subject to be tested, produces an erythema about the injection site;

(b) measuring separately the two longest diameters perpendicular to one another of the resulting injection-produced bleb and any erythema encircling it, and

(c) calculating the mean of those two diameters and from the magnitude of the mean determining the level of immunity from a scale, on which a mean of 10 mm. or less indicates no immunity and a mean of at least from over 10 to 15 mm. indicates minimum immunity and a mean of 30 to 50 mm. or more indicates best immunity.

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**4,297,339**

## CONTROLLED RELEASE CYCLOHEXIMIDE COMPOSITIONS

**Richard L. Craven, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 49,823, Jun. 18, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,732**

**Int. Cl.³ A01N** *25/26, 25/34, 43/40*

**U.S. Cl. 424—19** **6 Claims**

1. A composition useful for the controlled release of cycleheximide, which consisting essentially of a hardened, substantially uniform mixture of:

(a) from about 0.03 to 30 percent, by weight, of cycloheximide;

(b) from about 0.01 to 25 percent, by weight, of an emulsifier having an HLB number within the range of from about 5 and 18; and

(c) from about 45 to 99 percent, by weight, of an oxidized wax which contains about 5 to about 17 pounds of oxygen per 100 pounds of wax, prepared by adding the cycloheximide

(a) and emulsifier,

(b) to the melted wax,

(c) making a homogeneous mixture thhereof, and then cooling the resulting mixture to a solid form.

**4,297,340**

## COSMETIC COMPOSITION FOR SKIN AND HAIR TREATMENT

**Yoshiaki Abe, Tokyo; Shigeo Inoue, Ichikai, and Atsuo Ishida, Chiba, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan**

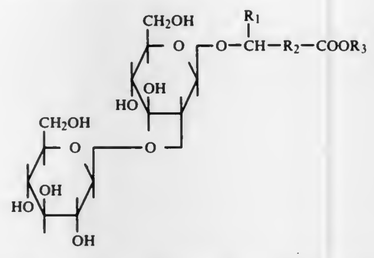
**Filed Sep. 13, 1979, Ser. No. 75,009**

**Claims priority, application Japan, Sep. 26, 1978, 53/118413**

**Int. Cl.³ A61K** *7/06, 7/08, 7/025, 7/027*

**U.S. Cl. 424—70** **3 Claims**

1. In a cosmetic composition for the treatment of skin and hair, the improvement comprising the addition, as a moisturizer, of from 0.1 to 50% by weight of the composition of a glycolipid ester represented by the formula,



wherein $R_1$ represents a methyl group or a hydrogen atom; $R_2$ represents a saturated or unsaturated hydrocarbon group having 11 to 15 carbon atoms when $R_1$ is a methyl group, or a saturated or unsaturated hydrocarbon group having 12 to 16 carbon atoms when $R_1$ is a hydrogen atom; and $R_3$ represents a saturated or unsaturated hydrocarbon group having 1 to 20 carbon atoms.

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**4,297,341**

## SPERMICIDAL COMPOSITION

**Donald P. Waller, Elmhurst; Lourens J. D. Zaneveld, Forest Park, and Harry H. S. Fong, Glen Ellyn, all of Ill., assignors to University of Illinois Foundation, Urbana, Ill.**

**Filed May 9, 1980, Ser. No. 148,567**

**Int. Cl.³ A61K** *31/11, 31/79*

**U.S. Cl. 424—80** **4 Claims**

1. A spermicidal composition for vaginal application comprising the complex formed from about 90 to about 50% by weight of polyvinylpyrrolidone and from about 10 to about 50% by weight of gossypol.

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**4,297,342**

## 3-PYRIDYLMETHYLTHIOCARBAMATES

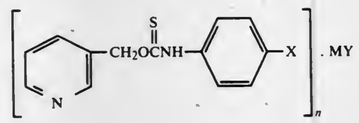
**Edward E. Kilbourn, Chalfont; Ernest D. Weiler, Ambler, and William D. Weir, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 8,296, Jan. 31, 1979, Pat. No. 4,233,289, which is a division of Ser. No. 591,581, Jun. 30, 1975, Pat. No. 4,156,780. This application Jan. 17, 1980, Ser. No. 114,026**

**Int. Cl.³ C07D** *213/59;* **A61K** *31/44*

**U.S. Cl. 424—84** **14 Claims**

1. A metal salt complex of the formula



wherein



X is cyano, nitro, mercapto, $(C_1-C_6)$alkylthio, $(C_1-C_6)$alkylsulfinyl, $(C_1-C_6)$alkylsulfonyl or $(C_1-C_6)$alkylsulfamyl;

M is calcium, copper, manganese, nickel or zinc;

Y is an anion which satisfies the valence of the cation M which is selected from the group consisting of bromide, chloride, nitrate, sulfate or oxalate;

n is the integer one.

2. A rodenticidal composition which comprises a carrier and as the active ingredient a rodenticidally effective amount of a complex according to claim 1.

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**4,297,343**

## CONTRACEPTIVE AGENT

**Hans Bohn, and Ernst Weinmann, both of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 949,633, Oct. 10, 1978, abandoned. This application May 16, 1980, Ser. No. 150,572**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 2745680**

**Int. Cl.³ A61K** *39/00;* **C07G** *7/00;* **A61K** *37/00*

**U.S. Cl. 424—85** **2 Claims**

1. A method for the passive immunization of a pregnant female primate to induce abortion, which method comprises parenterally administering to said primate an amount, effective for inducing abortion, of antibodies against the placenta-specific glycoprotein $PP_5$.

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**4,297,344**

## BLOOD COAGULATION FACTORS AND PROCESS FOR THEIR MANUFACTURE

**Horst Schwinn; Norbert Heimburger, both of Marburg an der Lahn; Gerhardt Kumpe, Wetter, and Bernd Herchenhan, Kirchhain, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany**

**Filed Apr. 23, 1980, Ser. No. 142,962**

**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916711**

**Int. Cl.³ A61K** *35/14, 31/00, 37/00*

**U.S. Cl. 424—101** **4 Claims**

1. A method for stabilizing against heat an aqueous solution containing at least one member selected from the group consisting of coagulation factors II, VIII, XIII, antithrombin III, and plasminogen, which method comprises adding to said solution from 1.0 to 3.0 mols per liter of at least one amino acid selected from the group consisting of glycine, $\alpha$- and $\beta$-alanine, hydroxyproline, glutamine, and $\alpha$-, $\beta$-, and $\gamma$-aminobutyric acid and from 20 to 60 w/w percent of a carbohydrate selected from the group consisting of monosaccharides, oligosaccharides, and sugar alcohols.

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**4,297,345**

## ANTIBACTERIAL AGENTS

**Thomas T. Howarth, Ewhurst, England, assignor to Beecham Group Limited, England**

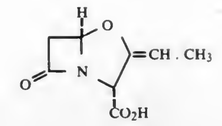
**Division of Ser. No. 857,112, Dec. 5, 1977, which is a division of Ser. No. 669,697, Mar. 23, 1976. This application Oct. 22, 1979, Ser. No. 87,030**

**Claims priority, application United Kingdom, Apr. 14, 1975, 15209/75; Sep. 27, 1975, 39663/75**

**Int. Cl.³ A61K** *35/00*

**U.S. Cl. 424—114** **17 Claims**

10. A method of treating bacterial infection in humans and animals which comprises administering to humans or animals in need thereof synergistically effective amount of a compound of the formula (III):



(III)

or a pharmaceutically acceptable salt thereof, and an antibacterially effective amount of benzylpenicillin or the acetoxymethyl ester thereof, the weight ratio of said compound or pharmaceutically acceptable salt thereof and said benzylpenicillin or ester thereof being 20:1 to 1:5.

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**4,297,346**

## PSEUDOPEPTIDES USED AS MEDICAMENTS

**Richard Rips, and Elisabeth Morier, both of Paris, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France**

**Continuation of Ser. No. 14,314, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 858,479, Dec. 8, 1977, abandoned. This application Dec. 7, 1979, Ser. No. 101,555**

**Claims priority, application United Kingdom, Dec. 10, 1976, 51632/76**

**Int. Cl.³ A61K** *37/00;* **C07C** *103/52;* **C07G** *7/00*

**U.S. Cl. 424—177** **15 Claims**

1. Pseudopeptide formed by at least one peptide radical originated from a neuropeptide by removal of one of more of the terminal sequences, connected by a peptide bond to a molecule or to a derivative of a therapeutically active molecule acting on the central nervous system, said neuropeptide being selected from the group consisting of endorphine and neuropeptides having from 2 to 11 amino acid sequences and said therapeutically active molecular being selected from the group consisting of amphetamine (Amph), 4-nitro-amphetamine (Amph-$NO_2$), 4-amino-amphetamine (Amph-$NH_2$), 4-chloroamphetamine (Amph-Cl), N-phthaloyl-4-amino-amphetamine, 3,4-dibenzoxyphenyl ethylamine, phenyl ethylamine (PEA), dopamine, 5-(3-aminopropyliden dibenzo-(a,d)-cycloheptadi-1,4-ene (PDD), 1,3-dihydroxy-7-amino 5-phenyl-1H-benzodiazepine-(1,4)-one-(2) (BD), 20-(3-aminopropyl) 3-phenothiazine (PP), 1,5-dimethyl-2-phenyl-4-amino-3-pyrazolone (AP), 4-ethoxyaniline (PT), 4-phenyl-4-ethoxycarbonyl piperidine (NP), tryptamine (Try-$NH_2$) and 4-amino-barbituric acid (AB).

7. As a novel medicament for asthenia, an effective amount of a pseudopeptide of the class consisting of pGlu-His-Amph and Pro-Leu-Amph together with a pharmaceutically acceptable carrier therefor.

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**4,297,347**

## NUCLEOSIDE DERIVATIVES AND AN ANTILEUKEMIAL AGENT CONTAINING THE SAME AS AN ACTIVE INGREDIENT

**Nobuhiko Katsunuma, No. 1-78, Shomachi, Tokushima-shi, Tokushima-ken, Japan**

**Filed Oct. 31, 1979, Ser. No. 89,887**

**Claims priority, application Japan, Oct. 31, 1978, 53-134708; Jan. 11, 1979, 54-2564; Jan. 11, 1979, 54-2565**

**Int. Cl.³ A61K** *31/70;* **C07H** *19/20, 19/10*

**U.S. Cl. 424—180** **8 Claims**

1. A compound selected from the group consisting of guanosine-3'-diphosphate, guanosine-3'-triphosphate, uridine-3'-diphosphate, uridine-3'-triphosphate, cytidine-3'-diphosphate, cytidine-3'-triphosphate, and a pharmaceutically acceptable salt thereof.

8. An agent effective against L5178Y lymphatic leukemia in mice containing a pharmaceutically acceptable carrier and a pharmaceutically acceptable amount of a compound in accordance with claim 1.

**4,297,348**

## COMPOSITION AND METHOD FOR THE TREATMENT OF ACNE

**Stephen E. Frazier, Orlando, Fla., assignor to Rush-Hampton Industries, Inc., Longwood, Fla.**

**Filed Apr. 11, 1980, Ser. No. 139,208**
**Int. Cl.³ A61K *31/70***
**U.S. Cl. 424—180** **8 Claims**

1. A therapeutic composition for the treatment of acne comprising:

a. from about 0.1% to about 5% by weight naringin;
b. from about 0.1% to about 10% by weight naringenin;
c. from about 0.05% to about 5% by weight of an antimicrobially active partially hydrolyzed naringin; and
d. from about 80% to about 98% by weight of a suitable solvent.

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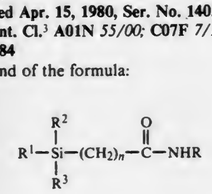
**4,297,349**

## SILICON-BEARING CARBOXYLIC ACIDS AND AMIDES

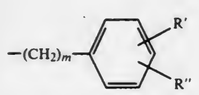
**Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.**

**Filed Apr. 15, 1980, Ser. No. 140,562**
**Int. Cl.³ A01N *55/00*; C07F *7/10***
**U.S. Cl. 424—184** **22 Claims**

1. A compound of the formula:

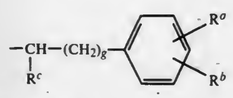


wherein n is a whole integer of from 3 to 20, each of $R^1$, $R^2$ and $R^3$ is, independently, either (a) alkyl having from 1 to 22 carbon atoms; or (b) a radical of the formula



in which m is 0, 1 or 2, and each of R′ and R″ is, independently, a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 127; provided that the sum of n and the number of carbon atoms in any one of $R^1$, $R^2$ or $R^3$ is not greater than 34 when any of $R^1$, $R^2$ or $R^3$ is of type (a); and R is of type (a) an aralkyl-type radical of the structure:

(a)



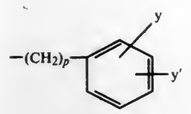
wherein g is 0, 1 or 2;

$R^a$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms, or trifluoromethyl;

$R^b$ is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

$R^c$ is subtype (i) a hydrogen atom; subtype (ii) a radical of the structure

(ii)



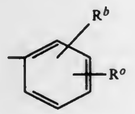
in which p is 0, 1 or 2, and

y is a hydrogen atom, halo having an atomic weight of from about 19 to 127, alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or

subtype (iii) alkyl having from 1 to 8 carbon atoms; or R is of type (b) a phenyl-type radical of the structure

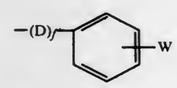
(b)



in which $R^b$ is as defined above, and

$R^o$ is a hydrogen atom, halo having an atomic weight of from about 19 to 127, ie. alkoxy having from 1 to 4 carbon atoms, or alkyl having from 1 to 4 carbon atoms; or

$R^o$ is a radical of the structure R′:

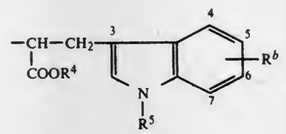


in which D is —$CH_2$— or —O—;

f is 0 or 1; and

W is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; or R is of type (c) an indolyl radical of the structure:

(c)



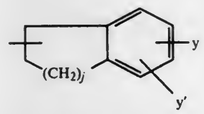
wherein $R^b$ is as defined above;

$R^4$ is alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted); and

$R^5$ is a hydrogen atom, alkyl having from 1 to 8 carbon atoms or benzyl (unsubstituted); or

R is (d) a benzocycloalkyl radical of the structure:

(d)



wherein y and y′ are as defined above; and

j is a whole integer of from 1 to 4.

14. A pharmaceutical composition suitable for reducing the cholesterol ester content of an arterial wall of a mammal comprising a cholesterol ester-reducing effective amount of a compound of claim 1 and a non-toxic pharmaceutically-acceptable carrier.

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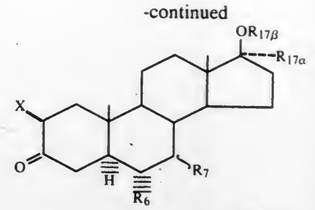
VI



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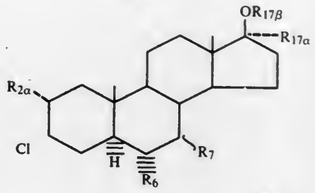

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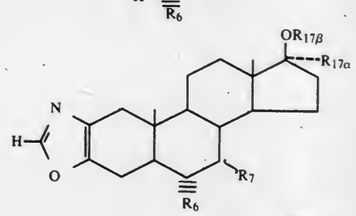

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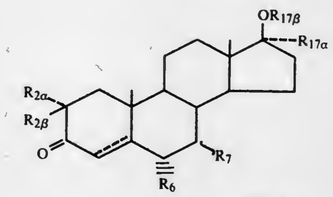

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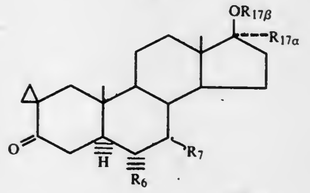
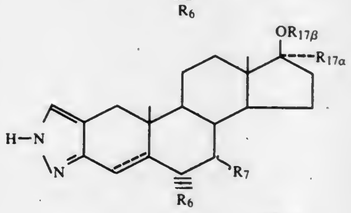


IX



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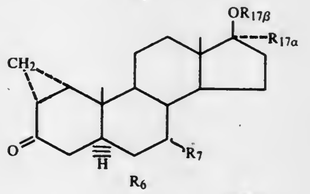

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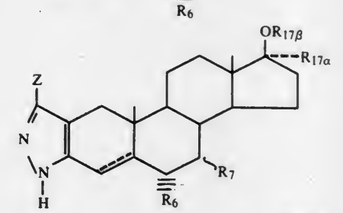

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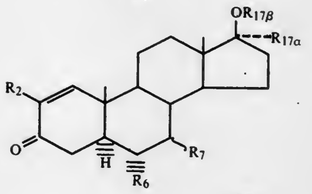

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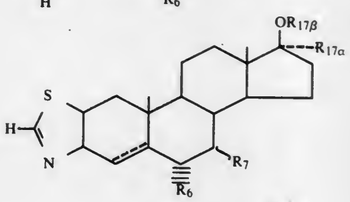

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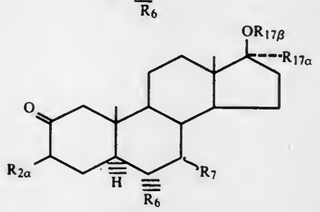

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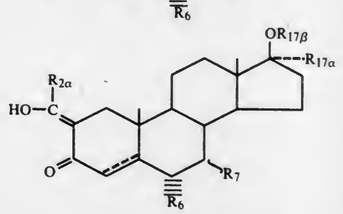

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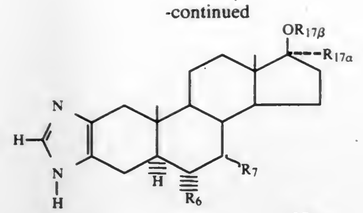

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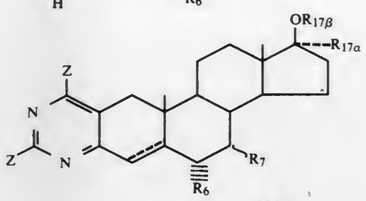

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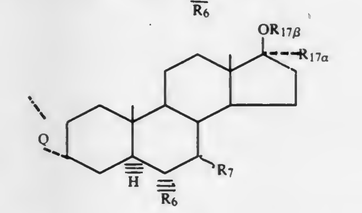
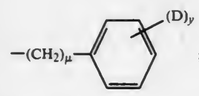
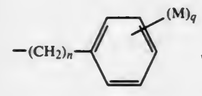


XV

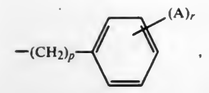
where A is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where D is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where M is a methyl, methoxy, trifluoromethyl, hydroxyl or nitro group or a hydrogen, fluorine, chlorine or bromine atom; where $R_2$ is a hydrogen atom or methyl group; where $R_{2\alpha}$ is a hydrogen atom, alkyl 1 thru 4 carbon atoms or benzyl; where $R_{2\beta}$ is a hydrogen atom or methyl group with the proviso that when $R_{2\beta}$ is methyl, $R_{2\alpha}$ is also methyl; where $R_{2\alpha}$ is alkyl of 1 thru 3 carbon atoms or



where $R_3$ is alkyl of 1 thru 4 carbon atoms or phenyl; where $R_6$ is a hydrogen atom or methyl group; where $R_7$ is a hydrogen atom or methyl group; where $R_{17\alpha}$ is a hydrogen atom, alkyl of 1 thru 4 carbon atoms, alkenyl of 2 thru 4 carbon atoms or alkynyl of 2 thru 4 carbon atoms; where $R_{17\beta}$ is alkyl of 1 thru 16 carbon atoms,



$-(CH_2)_n-CH(CH_2)_m$, $-CH_2-$alkenyl where alkenyl is 2 thru 15 carbon atoms or $-CH_2-C{=}CH$, and $R_{17\alpha}$ and $R_{17\beta}$ can be connected to form a cyclic ether containing 4 or 5 carbon atoms; where Q is an oxygen atom; where X is a fluorine, chlorine or bromine atom; where Z is a hydrogen atom, alkyl of 1 thru 4 carbon atoms or



that for the compounds of formula (XIV) the Z's may be the same or different; where m is 4 thru 6; where n is 0 thru 4; where p is 0 thru 4; where q is 1 or 2, when q is 2 the M's can be the same or different; where r is 1 or 2, when r is 2 the A's can be the same or different; where y is 1 or 2, when y is 2 the D's can be the same or different; where $\mu$ is 0 thru 4; where ~ indicates the attached group can be in either the $\alpha$ or $\beta$ configuration; and where  is a single or double bond, if a single bond the hydrogen atom at $C_5$ is $\alpha$; including the oximers and O-substituted oximes of compounds I thru IV and VI made with $NH_2-OR_3$ to a male mammal post-puberty selected from the group consisting of man, male dog, tom, bull, stallion, ram, boar, male rat, and male mouse.

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**4,297,351**

## METHOD OF MANUFACTURE AND USE OF IMPROVED 2β, 16β-PIPERIDINO ANDROSTANES

**Ian C. Carlyle, Hamilton; Thomas Sleigh, Wishaw, and David S. Savage, Glasgow, all of Scotland, assignors to Akzona Incorporated, Asheville, N.C.**

**Continuation of Ser. No. 67,878, Aug. 20, 1979, Pat. No. 4,237,126. This application Oct. 7, 1980, Ser. No. 194,942**
**Claims priority, application United Kingdom, Sep. 5, 1978, 35667/78**

**Int. Cl.³ A61K** *31/58*

**U.S. Cl. 424—241** **44 Claims**

1. A method for the preparation of a pharmaceutically acceptable acid addition salt of the 16β-mono-quaternary ammonium derivative of either a 3α,17β-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane comprising

adding a pharmaceutically acceptable acid to the 16β-mono-quaternary ammonium derivative of either a 3α,17β-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane in a suitable solvent.

2. In the method for the administration of a neuromuscular blocking agent by injection to a surgical patient, the improvement which comprises

using as said neuromuscular blocking agent an effective amount of a pharmaceutically acceptable acid addition salt of the 16β-mono-quaternary ammonium derivative of either a 3α,17α-di-lower aliphatic ester of 2β,16β-dipiperidino-3α,17β-dihydroxy-5α-androstane or a 3α-lower aliphatic ester of 2β,16β-dipiperidino-3α-hydroxy-5α-androstane.

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**4,297,352**

## NOVEL OXIMES

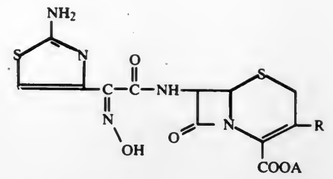
**Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France**

**Division of Ser. No. 964,517, Nov. 29, 1978, Pat. No. 4,260,747. This application Nov. 29, 1979, Ser. No. 98,636**
**Claims priority, application France, Dec. 5, 1977, 77 36513**
**Int. Cl.³ A61K** *31/545*

**U.S. Cl. 424—246** **7 Claims**

1. The syn isomers of 3-substituted 7-amino-thiazolyl-acetamido-cephalosporanic acid compounds of the formula





wherein R is selected from the group consisting of cycloalkyl of 3 to 5 carbon atoms and $-CH_2-S-R_1$, $R_1$ is acyl of an organic carboxylic acid of 2 to 4 carbon atoms and A is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, magnesium and a non-toxic, pharmaceutically acceptable organic amine.

4. An antibacterial composition comprising an antibacterially effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

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**4,297,353**

## NON-IRRITATING INJECTABLE DOSAGE FORMS

**Hawkins V. Maulding, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.**

**Filed Aug. 4, 1980, Ser. No. 175,817**
**Int. Cl.³ A61K** *31/23, 31/54, 47/00*

**U.S. Cl. 424—247** **10 Claims**

1. Method of administering without irritation an injectable dosage form of a tissue irritating medicament, which comprises administering to a patient in need of the medicament, a therapeutically effective amount of thioridazine, in base form in association with a sufficient amount of a pharmaceutically acceptable glyceride vehicle comprising a glycerol ester of a saturated or unsaturated fatty acid which fatty acid has from 6 to 20 carbon atoms or mixtures thereof to form an injectable dosage form.

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**4,297,354**

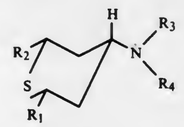
## SUBSTITUTED 4-AMINO-2,6-DIARYL-TETRAHYDROTHIOPYRANS AND SALTS THEREOF, AND USE AS ANTIDEPRESSANTS

**Karl-Heinz Weber, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen am Rhein; Karl-Heinz Pook; Karin Böke, both of Ingelheim am Rhein, and Wolf D. Bechtel, Appenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany**

**Filed Dec. 15, 1980, Ser. No. 216,423**
**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951634**
**Int. Cl.³ A61K** *31/38, 31/445;* **C07D** *335/02*

**U.S. Cl. 424—248.51** **13 Claims**

1. A compound of the formula



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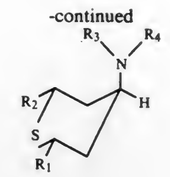

wherein

$R_1$ and $R_2$ are each phenyl; mono-, di- or tri-substituted phenyl, where the substituents are halogen, methyl or methoxy; thienyl; or furyl;

$R_3$ is hydrogen or alkyl of 1 to 3 carbon atoms; and

$R_4$ is alkyl of 1 to 3 carbon atoms; or

$R_3$ and $R_4$, together with each other and the nitrogen atoms to which they are attached, form a piperidino, 4-amino-piperidino, 4-(lower alkyl-amino)-piperidino, piperazino, 4-(alkyl of 1 to 2 carbon atoms)-piperazino or morpholino radical; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

13. The method of preventing or relieving depression in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antidepressant amount of a compound of claim 1.

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**4,297,355**

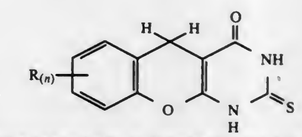
## (1H,3H,5H)-(1)-BENZOPYRANO-(2,3-D)-PYRIMIDINE-4-ONE-2-THIONES AND THEIR USE AS ANTI-ALLERGY AGENTS

**David J. Blythin, North Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.**

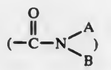
**Filed Nov. 15, 1979, Ser. No. 94,407**
**The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.**
**Int. Cl.³ A61K** *31/505;* **C07D** *491/052*

**U.S. Cl. 424—248.54** **13 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein R represents hydrogen, lower alkyl, lower cyclo alkyl, acyloxy-lower alkyl, hdyroxylower alkyl, lower alkoxyloweralkyl, nitro, halogeno, hydroxy, lower alkoxy, carboxyl, carboxamido, lower alkoxycarbonyl, tetrazolyl or cyano, and n is one or two, wherein said carboxamido has the partial structural formula



wherein A is straight or branched chain alkyl with up to 12 carbon atoms, lowercycloalkyl, lowercycloalkylloweralkyl, loweralkoxyloweralkyl, hydroxyloweralkyl, fluoroloweralkyl, loweralkenyl, loweralkylthioloweralkyl, loweralkylsulfoxy-loweralkyl, loweralkylsulfonylloweralkyl, thiazolyl, oxazolyl, thiadiazolyl, methylthiadizaolyl, furyl, pyrazolyl, tetrazolyl, methyltetrazolyl, phenyl, or the grouping $ER_4$ wherein E is a straight or branched chain or cyclic loweralkylene optionally substituted with hydroxy or phenyl radicals, $R_4$ is phenyl, thiazolyl, oxazolyl, thiadiazolyl, methylthiadiazolyl, tetrazolyl, methyltetrazolyl, furyl, pyridyl, methylpyridyl or piperidinyl; and B is hydrogen, loweralkyl, lowercycloalkyl, lowercycloal-

kylloweralkyl, or loweralkenyl; or A and B, when taken together with the nitrogen atom to which they are attached, represent imidazolyl, morpholinyl, pyrrolidinyl, piperidinyl or piperazinyl, said heterocyclic rings being optionally substituted by hydroxy, loweralkyl or hydroxyloweralkyl.

**10.** A method for effecting an anti-allergic reaction useful in the prophylactic treatment of animals for allergic and anaphylactic reactions which comprises administering to an animal in need of such therapy a therapeutically useful quantity of a compound of claim **1**.

**11.** An anti-allergy pharmaceutical composition comprising an effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

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**4,297,356**

## MEMORY ENHANCER CONTAINING 2-(7-INDENYLOXYMETHYL-MORPHOLINE

**Minoru Yamamoto, Kanagawa; Shiro Tachikawa, Omiya, and Hiroo Maeno, Shiki, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan**

**Filed Aug. 25, 1980, Ser. No. 181,068**

**Claims priority, application Japan, Mar. 5, 1980, 55/26742**

**Int. Cl.³ A61K** *27/00*

**U.S. Cl. 424—248.57** **4 Claims**

**1.** A method of enhancing memory in an adult requiring enhancement of said memory comprising administering to said adult on effective amount of a composition administering an effective amount of 2-(7-indenyloxymethyl)morpholine or an acid addition salt thereof and a pharmaceutically acceptable carrier therefor.

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**4,297,357**

## N-PHENETHYLACETAMIDE COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

**Tosaku Miki, and Masahide Asano, both of Minamifunabori, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan**

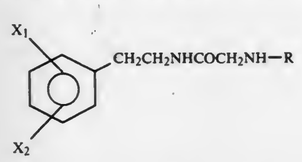
**Filed Aug. 27, 1979, Ser. No. 70,085**

**Claims priority, application Japan, Aug. 25, 1978, 53-103652; Jul. 25, 1979, 54-94597**

**Int. Cl.³ A61K** *31/505, 31/44, 31/165*

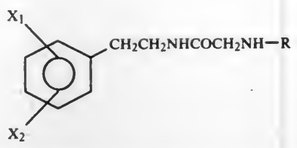
**U.S. Cl. 424—251** **9 Claims**

**1.** N-phenethylacetamide compounds of the formula:



wherein $X_1$ represents a lower alkoxy group, $X_2$ represents a hydrogen atom or a lower alkoxy group and R represents a phenyl group, a pyridyl group or a pyrimidinyl group, each of which may have one or more substituents selected from a halogen atom, a carbamoyl group, a lower alkoxy group, a sulfamoyl group, an amino group, a lower alkylamino group, a lower alkylthio group, a hydroxy group and a lower alkoxycarbonyl group; or the pharmaceutically acceptable acid addition salts and hydrates thereof.

**6.** A therapeutic agent for treating peptic ulcer comprising in an amount effective for treating pepetic ulcer at least one N-phenethylacetamide compound of the formula:



wherein $X_1$ represents a lower alkoxy group, $X_2$ represents a hydrogen atom or a lower alkoxy group, and R represents a phenyl group, a pyridyl group or a pyrimidinyl group, each of which may have one or more substituents selected from a halogen atom, a carbamoyl group, a lower alkoxy group, a sulfamoyl group, an amino group, a lower alkylamino group, a lower alkylthio group, a hydroxy group and a lower alkoxycarbonyl group; or the pharmaceutically acceptable acid addition salts and hydrates thereof, and a pharmaceutically acceptable carrier.

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**4,297,358**

## NOVEL 4,7-PHENANTHROLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE

**Georges Haas, Binningen; Knut A. Jaeggi, Basel; Alberto Rossi, Oberwil, and Alex Sele, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

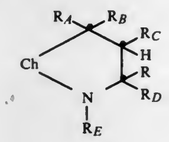
**Filed Jan. 4, 1980, Ser. No. 109,715**

**Claims priority, application Switzerland, Jan. 16, 1979, 402/79**

**Int. Cl.³ C07D** *487/04;* **A61K** *31/435*

**U.S. Cl. 424—256** **13 Claims**

**1.** A 4,7-phenanthroline derivative of the formula



(I)

in which

Ch represents 5,6-quinolinylene which is unsubstituted or c-substituted by one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy and/or halogen,

R represents carboxy, lower alkoxycarbonyl, hydroxylower alkoxycarbonyl, lower alkoxy-lower alkoxycarbonyl, di-lower alkylamino-lower alkoxycarbonyl, and in which either

$R_A$ and $R_B$ together represent oxo,

$R_C$ and $R_D$ together represent an additional link and $R_E$ represents hydrogen, or

$R_A$ represents hydroxy, lower alkoxy or lower alkenyloxy and

$R_B$ together with $R_C$ and $R_D$ together with $R_E$ in each case represents an additional link,

or a pharmaceutically acceptable salt of a salt-forming compound of the formula (I).

**13.** A pharmaceutical composition useful as inhibitors of allergic reactions containing an effective amount of a compound as claimed in claim **1**, together with customary pharmaceutical auxiliaries and carriers.



**4,297,359**

## ANTI-ULCER COMPOSITIONS CONTAINING CERTAIN PYRIDYL OXIME ETHERS

**Jacob A. van Zorge, Ameide, Netherlands, assignor to ACF Chemiefarma NV, Netherlands**

**Filed Jul. 11, 1979, Ser. No. 56,543**

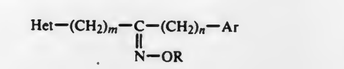
**Claims priority, application United Kingdom, Jul. 25, 1978, 30951/78**

**Int. Cl.³ C07D** *405/06, 409/06;* **A61K** *31/44*

**U.S. Cl. 424—263** **14 Claims**

**1.** A compound selected from the group consisting of

(a) a pyridine compound of the formula:

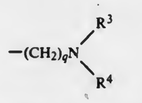


wherein

Het is pyridin-2-yl, pyridin-3-yl, or pyridin-4-yl, unsubstituted or substituted with halo, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;

Ar is thien-2-yl, thien-3-yl, fur-2-yl or fur-3-yl unsubstituted or substituted with halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, trifluoromethyl or hydroxymethyl;

R is alkyl of 1 to 3 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms, or



wherein q has a value of 2 or 3 and each of $R^3$ and $R^4$ independently of the other is hydrogen or alkyl of 1 to 3 carbon atoms; and

each of m and n is 0 or 1, the sum of m and n being less than 2;

(b) the N-oxides thereof and (c) the pharmaceutically acceptable acid addition and quaternary addition salts of said pyridine compounds or said N-oxides thereof.

**14.** The method of treating gastric ulcers in humans which comprises administering thereto an effective amount of a compound according to claim **1**.

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**4,297,360**

## 5-(PYRIDINYL)PYRIDINE-2,3-DIAMINES, PREPARATION THEREOF AND THEIR CARDIOTONIC USE

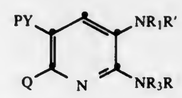
**George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Filed Mar. 28, 1980, Ser. No. 135,100**

**Int. Cl.³ C07D** *401/04;* **A61K** *31/44;* **C07D** *413/14;* **A61K** *31/535*

**U.S. Cl. 424—263** **14 Claims**

**1.** A 2-$R_3$RN-3-$R_1$RN-5-PY-6-Q-pyridine having the formula



or pharmaceutically-acceptable acid-addition salt thereof, where Q, R and R′ are each hydrogen or lower-alkyl, PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and, $R_1$ and $R_3$ are each hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkgages and NB is di-(lower-alkyl)amino or 4-morpholinyl.

**12.** The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 2-NRR-3-NR′R′-5-PY-6-Q-pyridine or pharmaceutically-acceptable acid-addition salt thereof, where Q is hydrogen or lower-alkyl, PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, and NRR and NR′R′ are each amino, lower-alkylamino or di-(lower-alkyl)amino.

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**4,297,361**

## THIAZOLYLIDENE-OXO-PROPIONITRILES, INSECTICIDAL COMPOSITION CONTAINING THESE COMPOUNDS

**Reinhold Puttner; Ulrich Böhmann, and Harmut Joppien, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

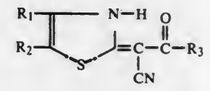
**Filed May 19, 1980, Ser. No. 151,109**

**Claims priority, application Fed. Rep. of Germany, May 17, 1979, 2920183**

**Int. Cl.³ C07D** *417/04, 277/38;* **A01N** *43/40, 43/78*

**U.S. Cl. 424—263** **21 Claims**

**1.** Thiazolylidene-oxo-propionitriles of the formula



wherein

$R_1$ is phenyl, methylphenyl, halogenophenyl, tert.-butyl, pyridyl or thienyl,

$R_2$ is hydrogen, bromine or methyl, and

$R_3$ is phenyl substituted in one or two positions by the same or different radicals selected from the group consisting of methyl, fluoro, chloro, bromo, iodo, trifluoromethyl, nitro or methoxy.

**21.** An insecticidal composition comprising about 5 to 95% by weight of a compound as defined in claim **1** and about 95 to 5% by weight of liquid or solid carrier materials to which there may be added, upon corresponding reduction of the carrier materials, up to 20% by weight of surface active agents.

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**4,297,362**

## 4-(3,4-DIAMINOPHENYL)PYRIDINE OR SALTS, AND USE THEREOF AS CARDIOTONIC

**George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 40,210, May 18, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 173,003**

**Int. Cl.³ C07D** *213/38;* **A61K** *31/44*

**U.S. Cl. 424—263** **5 Claims**

**1.** 4-(3,4-Diaminophenyl)pyridine or pharmaceutically-acceptable acid-addition salt thereof.

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**4,297,363**

## 2-AMINO-3(4 OR 5)-(PYRIDINYL)PHENOLS AND THEIR USE AS CARDIOTONICS

**George Y. Lesher, Shodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Filed Jul. 21, 1980, Ser. No. 170,896**

**Int. Cl.³ C07D** *213/30;* **A61K** *31/44*

**U.S. Cl. 424—263** **12 Claims**

**1.** 2-Amino-3(4 or 5)-PY-phenol or pharmaceutically-acceptable acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

**9.** The method for increasing cardiac contractility in a pa-

tient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically-effective amount of 2-amino-3(4 or 5)-PY-phenol or pharmaceutically-acceptable acid-addition salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

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**4,297,364**

## α-AZOLYL-α-PHENYLACETIC ACID DERIVATIVES

**Hubert Sauter; Bernd Zeeh, both of Ludwigshafen; Costin Rentzea, Heidelberg, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Oct. 10, 1979, Ser. No. 83,243**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845293**

**Int. Cl.**[3] **A01N** *43/64, 43/84;* **C07D** *249/08, 401/06*

**U.S. Cl. 424—267** **4 Claims**

1. A compound selected from the group consisting of α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-t-butyl ester, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N,N-diisopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-cyclohexyl-N-methyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-t-butyl-N-cyclohexyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-[t]n-butyl-N-isopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-4-chlorophenyl-N-methyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-phenyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-2,6-dimethylpiperidide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-t-butyl-N-methyl amide, α-phenyl-α-(1,2,4-triazol-1-yl)-acetic acid-N,N-diisopropyl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-but-1-yn-3-yl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-diisobutyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-isopropyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-isobutyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-isopentyl ester, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-propenyl-N-cyclohexyl amide, α-(2,4-dichlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-benzyl amide, α-phenyl-α-(1,2,4-triazol-1-yl)-acetic acid-N-methyl-N-t-butyl amide, α-(4-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-n-butyl-N-t-butyl amide, α-(4-chlorophenyl)-α-(imidazol-1-yl)-acetic acid-N-n-butyl-N-t-butyl amide, and α-(2-chlorophenyl)-α-(1,2,4-triazol-1-yl)-acetic acid-N-isopropyl-N-phenyl amide.

4. A fungicidal agent for combating powdery mildew consisting essentially of from 0.1 to 95% by weight of a compound selected from the group as claimed in claim 1 and a solid or liquid carrier.

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**4,297,365**

## BENZIMIDAZOLES AND PHARMACEUTICAL PREPARATIONS CONTAINING SUCH COMPOUNDS

**Srinivasachari Rajappa, and Vasudevan Sudarsanam, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

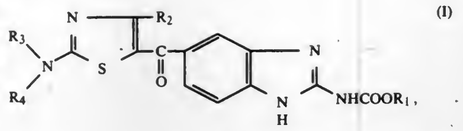
**Filed Jul. 26, 1979, Ser. No. 61,097**

**Claims priority, application Switzerland, Aug. 4, 1978, 8359/78**

**Int. Cl.**[3] **C07D** *277/28*

**U.S. Cl. 424—270** **10 Claims**

1. A benzimidazole carbamate of the formula I,



(I)

in which $R_1$ is lower alkyl, $R_2$ is a member selected from the group consisting of hydrogen or lower alkyl and $R_3$ and $R_4$ are each a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, cycloalkyl and phenyl and $R_3$ and $R_4$ taken together with adjacent nitrogen atom are lower alkylene-amino, a tautomeric compound thereof or a salt thereof.

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**4,297,366**

## COMBATING ARTHROPODS WITH 2,2-DIMETHYL-3-(2-FLUOROALKYL-2-OXY-VINYL)-CYCLOPROPANE-CARBOXYLIC ACID ESTERS

**Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

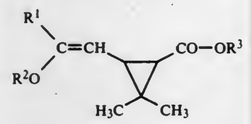
**Filed Apr. 23, 1980, Ser. No. 142,928**

**Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919820**

**Int. Cl.**[3] **A01N** *53/00;* **C07C** *69/743, 121/75;* **C07D** *209/34*

**U.S. Cl. 424—274** **10 Claims**

1. A 2,2-dimethyl-3-(2-fluoroalkyl-2-oxy-vinyl)-cyclopropanecarboxylic acid ester of the formula

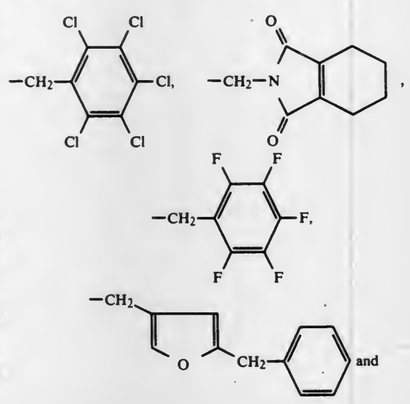


in which

$R^1$ is $C_1$–$C_4$-fluoroalkyl or $C_1$–$C_4$-chlorofluoroalkyl,

$R^2$ is $C_1$–$C_4$-alkyl, $C_1$–$C_4$-halogenoalkyl, $C_5$–$C_6$-cycloalkyl or benzyl,

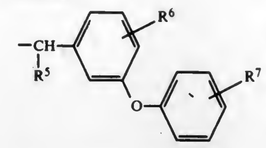
$R^3$ is



and



-continued



$R^5$ is hydrogen, cyano, ethynyl, methyl or ethyl, and $R^6$ and $R^7$ each independently is hydrogen or halogen.

7. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

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**4,297,367**

## 2-PHENYL-4-PYRONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS FUNGICIDES

**Francois Guigues, Rillieux, and Stephane Trinh, Champagne au Mont d'Or, both of France, assignors to Rhone Poulenc Agrochemie, Lyons, France**

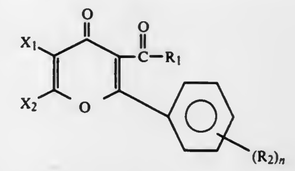
**Filed Mar. 24, 1980, Ser. No. 133,480**

**Claims priority, application France, Mar. 28, 1979, 79 08569**

**Int. Cl.**[3] **A61K** *31/35;* **C07D** *309/32*

**U.S. Cl. 424—283** **7 Claims**

1. A 2-phenyl-4-pyrone derivative of the formula



in which $X_1$ and $X_2$, which are identical or different, each represent a hydrogen or halogen atom, with the proviso that at least one of these substituents represents a halogen atom, $R_1$ represents an alkoxy radical containing from 1 to 4 carbon atoms, an alkenyloxy radical containing from 2 to 4 carbon atoms, the propargyloxy radical, a halogenoalkoxy radical containing from 1 to 4 carbon atoms, an amino radical, an alkylamino radical containing from 1 to 4 carbon atoms or a dialkylamino radical in which the alkyl groups containing from 1 to 4 carbon atoms are identical or different, $R_2$ represents a halogen atom, an alkyl radical containing from 1 to 5 carbon atoms, an alkoxy radical containing from 1 to 4 carbon atoms, an alkenyloxy radical containing from 3 to 4 carbon atoms, an alkynyloxy radical containing from 3 to 4 carbon atoms, an alkylthio radical containing from 1 to 4 carbon atoms, a halogenoalkyl radical containing from 1 to 4 carbon atoms, a halogenoalkoxy radical containing from 1 to 4 carbon atoms, a halogenoalkylthio radical containing from 1 to 4 carbon atoms or a nitro, hydroxyl, cyano or benzyloxy radical and n is an integer which can be equal to 0, 1, 2, 3, 4 or 5, it being understood that, if n is greater than or equal to 2, the substituents $R_2$ can be identical or different.

5. A composition for protecting plants against fungal diseases, which contains an effective amount of at least one compound according to claim 1, in association with a carrier and/or a surface-active agent which can be used in agriculture and are compatible with the said active ingredient.

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**4,297,368**

## PHARMACEUTICALLY USEFUL 5,6-SATURATED PGI COMPOUNDS

**Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy**

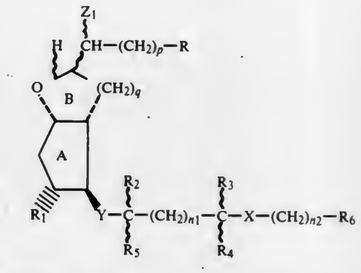
**Division of Ser. No. 859,703, Dec. 12, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,166**

**Claims priority, application Italy, Dec. 31, 1976, 31041 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77**

**Int. Cl.**[3] **C07D** *307/935*

**U.S. Cl. 424—285** **50 Claims**

1. A compound of the formula (I)



(I)

wherein

R is a free carboxy group or an esterified carboxy group of the formula —$COOR_c$, wherein $R_c$ is a $C_1$–$C_{12}$alkyl radical or a $C_2$–$C_{12}$ alkenyl radical;

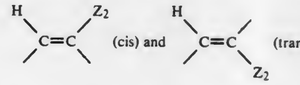
$Z_1$ is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

$R_1$ is hydrogen, hydroxy, $C_1$–$C_6$ alkoxy, benzyloxy $C_2$–$C_{12}$ alkanoyloxy or benzoyloxy;

Y is a member selected from the group consisting of —C≡C—,



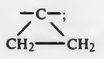
wherein

$Z_2$ is halogen or —CH=CH—(cis);

one of $R_2$ and $R_5$ is hydrogen, $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl, $C_2$–$C_6$ alkynyl or phenyl, α-naphthyl or β-naphthyl, and the other is hydroxy, $C_1$–$C_6$ alkoxy, benzyloxy, or $R_2$ and $R_5$, taken together form an oxo group;

each of $R_3$ and $R_4$, which are the same or different, may be hydrogen $C_1$–$C_6$ alkyl or fluorine or $R_3$ and $R_4$, taken together with the carbon atom to which they are linked, form the radical

or the radical



each of $n_1$ and $n_2$, which are the same or different, is zero or an integer of 1 to 6;

X is $-(CH_2)_m-$, wherein m is zero or 1;

$R_6$ is a $C_3$–$C_9$ cycloalkyl or $C_3$–$C_9$ cycloalkenyl, unsubstituted or substituted by one or more substituents selected from the group consisting of $C_1$–$C_6$ alkyl and $C_1$–$C_6$ alkoxy;

and the pharmaceutically or veterinarily acceptable salts thereof.

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**4,297,369**

## CERTAIN MUSCLE RELAXANT 3-METHYL-2-BENZOFURAN ACETAMIDES

**Hiroshi Takizawa, Shizuoka; Yutaka Enomoto, Sakai; Yoshimasa Oiji, Shizuoka; Tatsuyuki Hirayama, Shizuoka, and Tamotu Hashimoto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

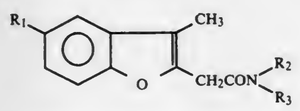
**Filed Jul. 28, 1980, Ser. No. 172,949**

**Claims priority, application Japan, Jul. 26, 1979, 54-94180; Mar. 12, 1980, 55-30312**

**Int. Cl.³ A61K *31/34*; C07D *307/54***

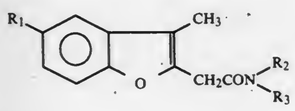
**U.S. Cl. 424—285** **8 Claims**

1. A benzofuran derivative represented by the formula:



wherein $R_1$ represents an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a phenyl group or a halogen atom, and $R_2$ and $R_3$ may be the same or different and represent a hydrogen atom or an alkyl group having 1–4 carbon atoms wherein, when one of $R_2$ and $R_3$ represents a hydrogen atom, the other represents an alkyl group.

5. A muscle relaxant pharmaceutical composition containing, as the active ingredient, a muscle relaxant amount of the benzofuran derivative represented by the formula:



wherein $R_1$ represents an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a phenyl group or a halogen atom, and $R_2$ and $R_3$ may be the same or different and represent a hydrogen atom or an alkyl group having 1–4 carbon atoms wherein, when one of $R_2$ and $R_3$ represents a hydrogen atom, the other represents an alkyl group, and at least one pharmaceutically acceptable carrier.

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**4,297,370**

## INSECTICIDAL COMPOSITIONS

**Edward J. Soboczenski, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 963,949, Nov. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 804,358, Jun. 7, 1977, abandoned. This application Feb. 6, 1980, Ser. No. 119,295**

**Int. Cl.³ A01N *37/00, 37/08, 37/34***

**U.S. Cl. 424—298** **8 Claims**

1. An insecticidal composition consisting essentially of

(A) N,N'-[thiobis(methylaminocarbonyloxy]bis[ethanimidothioic acid], dimethyl ester; and

(B) cyano-(3-phenoxyphenyl)-methyl 4-chloro-α-(1-methylethyl)benzeneacetate, or (3-phenoxybenzyl) cis-trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate, wherein a ratio of (A) to (B) is in a range of from 20:1 to 3:1 by weight.

**4,297,371**

## COMBATING PESTS WITH (±)-TRANS-3-(E/Z-2-CHLORO-2-(4-CHLOROPHENYL)-VINYL)-2,2-DIMETHYL-CYCLOPROPANECARBOXYLIC ACID (±)-(α-CYANO-3-PHENOXY-4-FLUORO-BENZYL) ESTER AND THE INDIVIDUAL E- AND Z-ISOMERS

**Rainer Fuchs; Bernd Gallenkamp, and Wilhelm Stendel, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

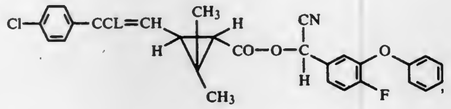
**Filed Aug. 29, 1980, Ser. No. 182,356**

**Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936864**

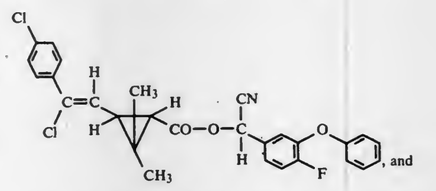
**Int. Cl.³ A01N *53/00*; C07C *61/35, 69/743, 121/75***

**U.S. Cl. 424—304** **10 Claims**

1. A substantially pure isomer mixture selected from the group consisting of (±)-trans-3-(E/Z-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-2-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula

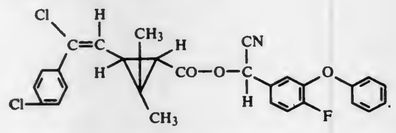


(±)-trans-3-(Z-2-chloro-2-(4-chloro-phenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-α-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula



, and

(±)-trans-3-(E-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-α-cyano-3-phenoxy-4-fluoro-benzyl ester of the formula



6. A method of combating ectoparasites which comprises applying to such ectoparasites or to a habitat thereof an ectoparasiticidally effective amount of an isomer mixture according to claim 1.

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**4,297,372**

## UREIDE INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

**Seymour Bernstein, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Division of Ser. No. 971,174, Dec. 20, 1978, Pat. No. 4,216,164, which is a continuation-in-part of Ser. No. 833,319, Sep. 14, 1977, Pat. No. 4,131,684, which is a division of Ser. No. 684,601, May 10, 1976, abandoned. This application Feb. 4, 1980, Ser. No. 118,046**

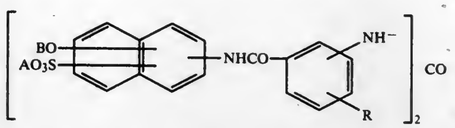
**Int. Cl.³ A61K *31/185***

**U.S. Cl. 424—315** **4 Claims**

1. A method of inhibiting connective tissues destruction in a warm-blooded animal suffering from said connective tissue



destruction which comprises administering to said animal an effective connective tissue destruction inhibiting amount of a compound selected from those of the formula:



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower ($C_1$–$C_6$) alkanoyl or alkali metal; and R is hydrogen.

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**4,297,373**

## METHOD OF SUPPRESSING CARDIAC ARRHYTHMIAS

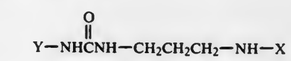
**Theodore S. Sulkowski, Wayne; James L. Bergey, Lansdale, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.**

**Filed Oct. 9, 1980, Ser. No. 195,568**

**Int. Cl.³ A61K *31/17*; C07C *127/00***

**U.S. Cl. 424—322** **6 Claims**

1. A method of suppressing cardiac arrhythmias in warm-blooded animals comiprising administering to an animal in need thereof an amount effective to suppress such arrhythmia of a compound of the formula:



wherein:

Y is 2,6-dimethylphenyl, 2,5-dimethylphenyl, 5-bromo-2-methylphenyl, or 5-chloro-2-methylphenyl; and

X is propenyl, propynyl, or cyclopropyl;

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

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**4,297,374**

## SKIN MOISTURIZING AND CLEANSING CREAM

**Beatrice M. Wess, 3590 Fenley Rd., Cleveland Heights, Ohio 44121**

**Filed Oct. 11, 1979, Ser. No. 83,597**

**Int. Cl.³ A61K *47/00***

**U.S. Cl. 424—364** **13 Claims**

1. A skin moisturizing and cleansing cream comprising by volume of mixture a predominant amount of fresh fruit selected from the group consisting of bananas and avocados, the remainder being orange juice, vegetable shortening and baking powder, and said orange juice and shortening together constituting the larger proportion of said remainder.

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**4,297,375**

## SALT SUBSTITUTES HAVING REDUCED BITTERNESS

**John R. Shackelford, LaGrange, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Sep. 21, 1979, Ser. No. 77,562**

**Int. Cl.³ A23L *1/237***

**U.S. Cl. 426—62** **7 Claims**

1. A sodium-free salt substitute comprising potassium chloride and an amount of autolyzed yeast effective to reduce the bitterness caused by the potassium chloride.

**4,297,376**

## CORN-BASED SNACK PRODUCT OF NUT-LIKE CONSISTENCY

**Richard L. Nelson, 699 Riverside Dr., Battle Creek, Mich. 49015, and Walter P. Nelson, 4045 Gull Lake Dr. West, Richland, Mich. 49083**

**Filed Mar. 17, 1980, Ser. No. 130,749**

**Int. Cl.³ A21D *2/36***

**U.S. Cl. 426—94** **11 Claims**

1. A method of making an edible food product having a binder of ground corn dough comprising the steps of: preparing a ground corn dough; adding about one to ten percent by weight of uncooked, unhulled sesame seeds and about 0.5 to 2 percent by weight of algin to form a firm doughy mixture having about forty to fifty percent by weight water; molding said mixture to form a relatively three-dimensional raw article having a thickness which is at least about twenty-five percent of the width of the molded mixture forming a raw article; frying said raw article in oil, at about 325°–375° F., for a period of about six to ten minutes to thoroughly cook said article to a crunchy nut-like consistency.

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**4,297,377**

## METHOD OF MAKING FRENCH FRYABLE FROZEN POTATO STRIPS

**David L. Harney, and Harlow S. Young, both of Othello, Wash., assignors to Chef-Reddy Foods Corporation, Othello, Wash.**

**Continuation of Ser. No. 6,099, Jan. 24, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,708**

**Int. Cl.³ A23B *7/03*; A23L *1/216***

**U.S. Cl. 426—438** **5 Claims**

1. The method of producing French fried potatoes which comprises dividing raw, unblanched potatoes into strips, heating the strips, thereby partially gelatinizing the strips substantially throughout, partially dehydrating the strips until the partially gelatinized and partially dehydrated strips weigh about 75% to 80% of their weight when raw and the cell structure is finely granular, parfrying the partially gelatinized and partially dehydrated strips, freezing the parfried strips, and thereafter finish frying the strips without the strips having been blanched.

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**4,297,378**

## REFRIGERATED SHELF STABLE PIE CRUST DOUGH

**Michael J. Haasl, Minneapolis; Paul D. Pratt, New Brighton; Rocky W. Chen, Brooklyn Park, and Helen M. Fett, Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.**

**Filed Jan. 31, 1980, Ser. No. 117,311**

**Int. Cl.³ A21D *13/08***

**U.S. Cl. 426—532** **14 Claims**

1. A dough composition adapted for making pie crust which exhibits reduced Maillard browning, said composition including:

a flour blend present in the dough in an amount in the range of between about 38% and about 50% by weight, said proportion of flour blend being calculated on the basis of dry flour blend in the dough, said flour blend having an enzyme activity based on peroxidase of less than about 0.2 absorption units with said flour blend including (a) starch in an amount such that the dough contains starch in the range of between about 37% and 47% by weight of dough based on weight of dry starch, said starch having a damage level of less than about 10%; and (b) protein in an amount such that the dough contains protein in the range of between about 1.5% and about 6% by weight of dough;

shortening having an SFI value in the range of between about 29 and about 36 and a Wiley Melting Point in the range of between about 108° F. and about 118° F., said shortening being present in the dough in an amount in the range of between about 24% and about 35% by weight of dough; and

water in an amount in the range of between about 19% and about 25% by weight of dough.

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**4,297,379**

## FROZEN AERATED READY-TO-EAT GELATIN COMPOSITION

**Harry H. Topalian, Dover; Clement R. Wyss, Lewes; Ralph E. Kenyon, and Anthony F. Dec, both of Dover, all of Del., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Mar. 27, 1980, Ser. No. 134,609**
**Int. Cl.³ A23L *1/04***
**U.S. Cl. 426—565** **20 Claims**

1. Process for preparing a frozen aerated starch-free gelatin composition with smooth, creamy, continuous and uniform characteristics and which is ready-to-eat at freezer temperatures comprising:

dissolving a gelatin mix in water at a temperature sufficient to dissolve the mix, said mix comprising an amount of gelatin effective to stabilize the composition and provide a smooth and creamy texture without gummy or icy characteristics, said amount being within the range of from 0.6% to less than 5% of gelatin by weight of the composition, from 5% to 50% soluble solids by weight of the composition, and acid in an amount effective to impart a pH within the range of 2.5 to 7 to the composition.

cooling the dissolved mix to a temperature of from 10° to 32° F. to at least partially freeze the mix while simultaneously aerating and agitating the dissolved mix, the aeration creating an overrun of from 3 to 200% by volume of the composition;

shaping said aerated mix; and

freezing said shaped mix to a temperature less than 10° F., said frozen mix having ice crystals of a size within the range of 20 to 200 microns.

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**4,297,380**

## TEA FLAVORING PROCESS AND PRODUCT

**Ian Horman, Corseaux, and Paul Cazenave, Chavornay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland**

**Continuation of Ser. No. 519,627, Oct. 31, 1974, abandoned. This application Feb. 23, 1977, Ser. No. 771,075**
**Int. Cl.³ A23F *3/40;* A23L *1/226***
**U.S. Cl. 426—597** **30 Claims**

5. A tea composition, comprising soluble tea solids and from about 0.25 to about 3 ppm methyl anthranilate as an aromatizing agent, based on the weight of the soluble tea solids.

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**4,297,381**

## METHOD OF FREEZING TOMATOES

**Antonio Tenuta, Mongrassano Scalo, Cosenza, Italy**

**Continuation-in-part of Ser. No. 796,398, May 12, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 54,823**
**Int. Cl.³ A23L *1/212, 3/36;* A23N *7/00***
**U.S. Cl. 426—615** **8 Claims**

1. A method of freezing tomatoes and forming them into solid members free of preservatives and adapted for cutting, shaping and placement into plastic bags, comprising the steps of:

reducing the ambient temperature of the tomatoes to a freezing temperature of −30° C. for solidification,

cracking the external membrane of the solidified tomatoes by subjecting them to a temperature between 30° C. to 35° C. for a total temperature gradient of ΔT between 60° C. to 65° C. above said freezing temperature,

said cracking step includes the step of dipping said tomatoes into heated water having said temperature between 30° C. and 35° C.,

peeling the external membrance from the solidified tomatoes after cracking the external membrane, and reducing the temperature of the peeled tomatoes again to the freezing temperature of −30° C. for storage of peeled tomatoes free of preservatives.

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**4,297,382**

## PROCESS FOR DRYING COMPOSITIONS CONTAINING DERIVED PROTEIN-CONTAINING COMPOSITIONS AND ADDITIVES

**Dennis B. Hosaka, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.**

**Filed Apr. 17, 1980, Ser. No. 141,221**
**Int. Cl.³ A23J *3/02***
**U.S. Cl. 426—656** **15 Claims**

1. A process for preparing a dried egg albumin extender from an aqueous solution of an egg albumen extender comprising at least 65% of a low molecular weight protein-containing composition derived from plant or animal sources wherein the molecular weight of said derived protein-containing composition is less than 30,000, said composition having a total Kjeldahl nitrogen content of from about 0.45% to about 2.1% of which at least 60% of the nitrogen is non-protein nitrogen and a member selected from the group consisting of from about 1% to about 15% gelatin; from about 1% to about 15% gelatin and from about 5% to about 25% of a water soluble polyphosphate, the additive total of gelatin and phosphate not to exceed about 35%, from about 0.5% to about 5% of a gum, and mixtures thereof; and from 0% to about 30% of a whipping aid, all percentages being by weight based on the total dry solids weight of the egg albumen extender exclusive of starch which comprises preparing a blend of said egg extender solution and a starch which is water soluble or swellable under conditions of drying and which is used at a level sufficient to allow effective drying of said egg extender solution, adjusting the total solids of said blend to an amount between about 15% and about 35% by weight, and drying said solution.

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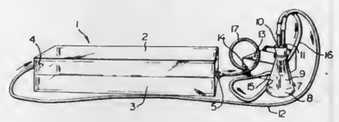
**4,297,383**

## APPARATUS AND METHOD FOR OBTAINING FINGERPRINTS

**Louis P. Bourdon, R.R. #3, Hwy. 17, East Twin Lakes, North Bay, Ontario, Canada (P1B 8G4)**

**Filed Sep. 12, 1980, Ser. No. 186,624**
**Claims priority, application Canada, Jul. 15, 1980, 356161**
**Int. Cl.³ A61B *5/10;* C23C *13/06***
**U.S. Cl. 427—1** **8 Claims**



1. An apparatus for developing latent fingerprints on an object comprising a first chamber adapted to contain an object being tested for fingerprints, and to close to form an air tight seal, said first chamber having an inlet and an outlet, a second chamber adapted to contain a pool of and the vapors of the chemical cyanoacrylate, said second chamber having an inlet and an outlet, the outlet of said second chamber being connected by suitable tubing to the inlet of said first chamber, a recirculating pump means having an intake and an exhaust, said exhaust being connected to the inlet of said second chamber, said intake being connected to the outlet of said first chamber by suitable tubing, said recirculating pump means being adapted to circulate the vapors and air between said first and second chambers so as to expose said latent fingerprints to said vapors thereby developing visible fingerprints.

6. A method for developing latent fingerprints on an object comprising placing the object to be tested in a first chamber, sealing said first chamber, exposing the interior of said first chamber and the object therein to the vapors of the chemical cyanoacrylate until said latent fingerprints become visible.

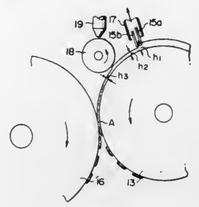


**4,297,384**

## METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGE

**Yoshio Kudo; Masakazu Iwasa, and Hisashi Kato, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Continuation of Ser. No. 886,446, Mar. 14, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 162,021**
**Claims priority, application Japan, Mar. 15, 1977, 52-28363**
**Int. Cl.³ G03G *13/08***
**U.S. Cl. 427—14.1** **3 Claims**



1. A method of developing an electrostatic latent image by use of an apparatus comprising an electrostatic latent image carrying member, a developing roller member for applying a toner layer on the electrostatic latent image carrying member, and a doctor blade associated with the developing roller member for scraping off a part of the toner layer for controlling the thickness of the toner layer wherein said doctor blade is applied with a voltage in the same polarity as that in which the toner is charged, said doctor blade having an edge located close to the surface of the developing member to scrape off a part of the toner layer on the developing member to obtain a predetermined thickness of the toner layer, and the toner scraped off by said doctor blade is sucked and exhausted by a suction means connected with said doctor blade, whereby the toner is prevented from sticking to the doctor blade.

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**4,297,385**

## PARTICULATED POLYETHERIMIDE AND METHOD FOR MAKING

**Eugene G. Banucci, Scotia, and Edith M. Boldebuck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 37,437, May 9, 1979, abandoned. This application Apr. 7, 1980, Ser. No. 137,832**
**Int. Cl.³ B05D *3/02, 5/12;* C08G *12/00, 69/26***
**U.S. Cl. 427—27** **7 Claims**

1. A method of coating a substrate with a continuous polyetherimide film which comprises,

(1) applying an organic solvent-free particulated polyetherimide having at least 50 mole percent of imide radicals based on the total moles of imide radicals and amide acid radicals onto the substrate, and

(2) fusing the particulated polyetherimide film at a temperature of at least 225° C.

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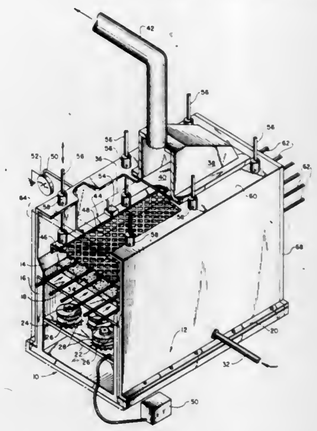
**4,297,386**

## CONTROL GRID IN ELECTROSTATIC FLUIDIZED BED COATER

**Donald J. Gillette, Guilford, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.**

**Filed Jan. 23, 1980, Ser. No. 114,656**
**Int. Cl.³ B05D *1/06***
**U.S. Cl. 427—27** **19 Claims**

1. Electrostatic fluidized bed coating apparatus comprising, in combination: a housing having a generally planar substantially horizontal porous support member mounted therein to define within said housing a fluidization chamber thereabove and a plenum therebelow; means for introducing gas into said plenum for passage upwardly through said support member to effect fluidization of particulate coating material supplied to said chamber; means to effect electrostatic charging of such particulate material; and an electrically conductive, generally planar mesh-like control grid disposed within and substantially spanning the cross-sectional area of said chamber above said support member, said grid being substantially free of horizontal flat surfaces and being adapted for control of its electrical potential, and said housing being adapted for the passage of a workpiece therethrough at a location between and spaced from each of said support member and said grid, whereby the cooperative effects of fluidization and electrostatic charging may produce a cloud of electrostatically charged particulate



material above said support member, and whereby said control grid may be used to densify and regulate such cloud, for improved coating.

16. A method for depositing of particulate material upon a workpiece comprising the steps of: forming within a fluidized bed of particles an electrostatically charged cloud thereof; increasing the density and uniformity of said cloud with an electrically conducting grid at a potential different from that of said charged particles; and passing through said cloud, at a level below and out of contact with said grid, a workpiece maintained substantially at the potential of said grid, whereby said article may acquire upon all of its exposed surfaces a substantially uniform deposit of said particles.

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**4,297,387**

## CUBIC BORON NITRIDE PREPARATION

**Harry A. Beale, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio**

**Filed Jun. 4, 1980, Ser. No. 156,433**
**Int. Cl.³ C23C *11/00***
**U.S. Cl. 427—38** **9 Claims**

1. A method for deposition of cubic boron nitride on a substrate, which method comprises the steps of:

(a) supporting a substrate in a vacuum and heating the substrate;

(b) supplying metal vapors into a zone between the substrate and a metals alloy source, said source consisting essentially of at least 60 percent by weight to a balance of boron with from 2 to 12 percent by weight of aluminum and at least 0.2 to 24 percent by weight of at least one of cobalt, nickel, manganese or other aluminide-forming metal;

(c) introducing ammonia gas into said zone; and

(d) generating electrical field in said zone ionizing the metal vapors and gas atoms in the zone;

whereby a deposit comprised of cubic boron nitride is placed on the surface of said substrate.

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**4,297,388**

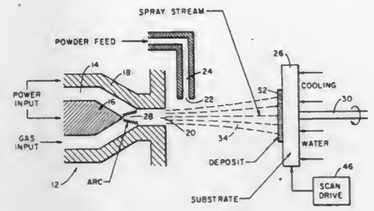
**PROCESS OF MAKING PERMANENT MAGNETS**

**Kaplesh Kumar, Wellesley; Dilip K. Das, Bedford, and Ernest C. Wettstein, Acton, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.**

**Continuation of Ser. No. 957,756, Nov. 6, 1978, abandoned. This application Apr. 8, 1980, Ser. No. 138,650**

**Int. Cl.³ B05D** *3/14*

**U.S. Cl. 427—47** **3 Claims**




3. A process for producing aligned permanent magnets comprising the steps of:

depositing molten particulate rare earth-cobalt alloy magnet material on a substrate in a crystalline state.

controlling the temperature of said substrate during deposition to provide a unidirectional heat flow across the deposit of magnet material; and

magnetically aligning said material.

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**4,297,389**

**ANTIFOAMING RESIN COMPOSITIONS**

**Robert W. Smearing, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.**

**Continuation of Ser. No. 744,915, Nov. 26, 1976, abandoned, which is a division of Ser. No. 604,368, Aug. 13, 1975, abandoned, which is a continuation of Ser. No. 212,700, Dec. 23, 1971, abandoned. This application May 27, 1980, Ser. No. 153,306**

**Int. Cl.³ B05D** *5/12*

**U.S. Cl. 427—58** **1 Claim**

1. In a method of providing electrical insulation for conductor bars which comprises vacuum-pressure impregnating electrical insulation with a polyester resin suitable for impregnating insulation, the improvement which consists of mixing with said resin from about 0.05 to 10 percent, based on the resin weight, of polybutadiene in which polybutadiene at least 80 percent of the olefinic unsaturation consists of pendant vinyl groups, said polybutadiene having no other functional groups, whereby foaming is substantially eliminated from the vacuum-pressure impregnating process.

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**4,297,390**

**PROCESS FOR THE PREPARATION OF A RED EMITTING PHOSPHOR COATED WITH RED IRON OXIDE AND ITS APPLICATION**

**Karl Franz, Barsinghausen, and Bernd Schönfeld, Bad Nenndorf, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany**

**Filed Dec. 31, 1979, Ser. No. 108,638**

**Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900209**

**Int. Cl.³ C09K** *11/46, 11/477, 11/465, 11/22*

**U.S. Cl. 427—64** **11 Claims**

1. A method for the preparation of a red emitting phosphor coated with red iron oxide which comprises mixing an aqueous suspension of red emitting phosphor with a polysulfide solution and a solution containing iron (II) ions to form a mixture containing said phosphor with a coating of black iron sulfide precipitate, heating the mixture to a temperature in the range of 80° C. to 100° C. to form a grey pyrite coating on the phosphor, separating the grey pyrite coated phosphor from the aqueous phase of the mixture and heating and drying said coated phosphor at a temperature in excess of 250° C. in an oxidizing atmosphere to form a red iron oxide coating on said phosphor.

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**4,297,391**

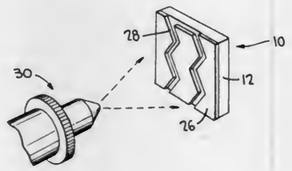
**METHOD OF APPLYING ELECTRICAL CONTACTS TO A PHOTOVOLTAIC CELL**

**Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.**

**Filed Jan. 16, 1979, Ser. No. 3,945**

**Int. Cl.³ H01L** *31/04, 21/283*

**U.S. Cl. 136—256** **4 Claims**




1. A method of applying an electrically conductive contact to the back surface of a photovoltaic cell, said back surface having a p-n junction located beneath and closely adjacent thereto, comprising forming particles of a metallic material at a temperature in excess of the alloying temperature of said material and silicon, and spraying said particles toward said back surface from a distance and at a temperature such that said particles penetrate said back surface and overcome said back surface p-n junction to form a high-low junction at said back surface as well as a back contact by a single process step.

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**4,297,392**

**HIGH FREQUENCY SPUTTERING PRODUCES THIN FILM AMORPHOUS SILICON PHOTOCONDUCTOR**

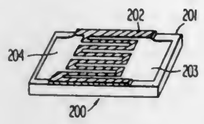
**Akio Higashi; Kazuhiro Kawaziri, and Yosuke Nakajima, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Nov. 2, 1979, Ser. No. 90,721**

**Claims priority, application Japan, Nov. 2, 1978, 53-135179**

**Int. Cl.³ B05P** *5/12;* **G03G** *5/08*

**U.S. Cl. 427—75** **6 Claims**




1. A photoconductor cell comprising

a base plate;

a light-sensitive layer on said base plate; and

electrodes ohmically contacting said light-sensitive layer, wherein said light-sensitive layer comprises a thin film of amorphous silicon prepared by high frequency sputtering of elemental silicon under an atmosphere containing at least hydrogen onto said base plate, while maintaining the temperature of said base plate at about 50° C. to 150° C.

2. An electrophotographic element comprising

a base plate with an electrically conductive surface;



a light-sensitive layer on the electrically conductive surface of said base plate; and

an electrically insulating layer on said light-sensitive layer, wherein said light-sensitive layer comprises a thin film of amorphous silicon prepared by high frequenty sputtering of elemental silicon under an atmosphere containing at least hydrogen onto said base plate, while maintaining the temperature of said base plate at about 50° C. to 150° C.

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**4,297,393**

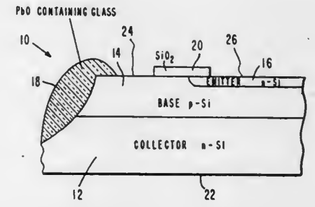
**METHOD OF APPLYING THIN METAL DEPOSITS TO A SUBSTRATE**

**Richard Denning, Springfield; Mark A. Spak, Edison, and Barry Polhemus, Hampton, all of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Feb. 28, 1980, Ser. No. 125,639**

**Int. Cl.³ C23C** *3/02;* **H01L** *21/288*

**U.S. Cl. 427—88** **20 Claims**




1. A method of applying thin metal sensitizing deposits from aqueous solution to the exposed silicon areas of a silicon substrate having exposed areas of silicon and silicon oxide, which comprises,

immersing the silicon substrate in a basic, aqueous solution containing a metal salt of the metal to be deposited, not containing a reducing agent and

reducing the metal ion by use of the exposed silicon as the reducing agent to the elemental metal.

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**4,297,394**

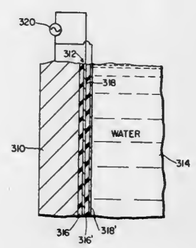
**PIEZOELECTRIC POLYMER ANTIFOULING COATING AND METHOD OF USE AND APPLICATION**

**Bruce J. Wooden, Dickerson, and Seymour Edelman, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Continuation-in-part of Ser. No. 44,130, May 31, 1979. This application Mar. 18, 1980, Ser. No. 132,607**

**Int. Cl.³ B05D** *5/12;* **H01L** *41/22*

**U.S. Cl. 427—100** **12 Claims**




1. A method of coating the outer surface of an electrically conductive marine structure with a plural layer continuous film for reducing fouling thereon comprising the steps of:

preparing the surface of the structure to insure maximum electrical conductivity;

applying a layer of electrically conductive cement to substantially the entire outer surface to be contacted by water containing fouling organisms;

applying a continuous layer of piezoelectric polymer over the cement;

applying another layer of electrically conductive cement to the polymer layer; and

applying another continuous layer of piezoelectric polymer for interfacing with water.

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**4,297,395**

**PRODUCTION OF COBALT-DOPED FERRIMAGNETIC IRON OXIDES**

**Gunter Buxbaum; Heinrich-Christian Schopper; Lutz Leitner, and Volker Hahnkamm, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 10, 1980, Ser. No. 110,876**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1979, 2903593**

**Int. Cl.³ C01G** *49/02*

**U.S. Cl. 427—127** **2 Claims**

1. A process for the production of a cobalt-doped iron oxide acicular pigment protected at least partly against sintering comprising forming a suspension of FeOOH seeds in water containing zinc, phosphate and ferrous ions, introducing cobalt ions, adding alkali and air to precipitate ferric and cobalt ions onto the seeds, adding a phosphate solution in quantity of from about 0.2 to 1% by weight of $P_2O_5$ into the water containing the seeds which are now pigment, separating the pigment from the suspension, reducing the pigment to $Fe_3O_4$, oxidizing the $Fe_3O_4$ pigment in an oxygen-containing gas to bring the FeO content in the pigment to about 16 to 24% by weight, and heat treating the oxidized pigment under inert conditions at a temperature of about 600° to 800° C., the amount of zinc, cobalt and phosphate ions present being such as to impart to the end product a content by weight of about 0.7 to 2.4% of cobalt, about 0.1 to 2% of zinc, and about 0.1 to 2% of phosphorus expressed as $P_2O_5$, the coercive force of the resulting pigment amounting to at least about 425 Oe+175 Oe/%, by weight, of Co.

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**4,297,396**

**COATING METHOD**

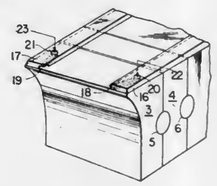
**Nobumitsu Takehara, and Shogo Isayama, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Dec. 7, 1979, Ser. No. 101,383**

**Claims priority, application Japan, Dec. 19, 1978, 53-158762**

**Int. Cl.³ B05D** *5/00*

**U.S. Cl. 427—284** **8 Claims**




1. A slide bead coating method comprising the steps of: supplying a first coating liquid over at least a portion of a slide surface between guide plates disposed on both sides of said slide surface and supplying a second coating liquid lower in viscosity than said first coating liquid at a flow rate lower than that of said first coating liquid to both sides of said slide surface through an aperture in each of said guide plates.

**4,297,397**

## CATALYTIC PROMOTERS IN ELECTROLESS PLATING CATALYSTS IN TRUE SOLUTIONS

**Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540**

**Continuation of Ser. No. 940,355, Sep. 7, 1978, abandoned, which is a division of Ser. No. 833,905, Sep. 16, 1977, Pat. No. 4,151,311, which is a continuation-in-part of Ser. No. 651,507, Jan. 22, 1976, abandoned. This application Apr. 28, 1980, Ser. No. 144,428**

**Int. Cl.³ C23C** *3/02*

**U.S. Cl. 427—304** **14 Claims**

1. A process for the electroless metal deposition onto a non-conductor comprising:

(1) contacting said non-conductor with a catalytic solution comprising the admixture of a principal catalytic agent wherein said principal catalytic agent is a compound of a metal selected from the group of metals consisting of copper, nickel, cobalt, and iron and mixtures thereof and a catalytic promoter agent wherein said catalytic promoter agent is a compound of a metal selected from the group of metals consisting of Mg, Ca, Sr, Sc, Y, La, Ti, Zr, Hf, Nb, Ta, Cr, Mn, Tc and Re and mixtures thereof and further wherein the concentrations for the principal catalytic agent and the catalytic promoter agent are so adjusted as to yield a catalytic solution having a greater catalytic activity for electroless metal deposition in comparison to the same catalytic solution in the absence of said catalytic promoter agent, and

(2) contacting the treated non-conductor with an electroless metal deposition bath.

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**4,297,398**

## MANUFACTURING COATED STEEL STRIP

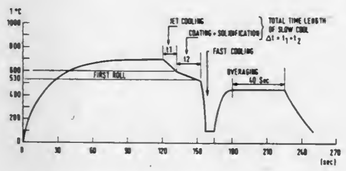
**Philippe Paulus, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie**

**Filed Mar. 3, 1980, Ser. No. 126,387**

**Claims priority, application Belgium, Nov. 2, 1979, 874599**

**Int. Cl.³ C23C** *1/02, 1/08*

**U.S. Cl. 427—320** **9 Claims**




1. A method of manufacturing coated steel strips comprising the sequential steps of:

heating the strip to a temperature higher than its recrystallization temperature,

holding the strip at this temperature,

cooling the strip to a temperature now lower than that of a subsequent bath in a preliminary cooling stage,

immersing the strip in a molten metal bath maintained at a temperature higher than 500° C., the molten metal having a melting point lower than 800° C.,

cooling the strip until the metal coating has solidified in a first cooling stage, and

subjecting the strip immediately thereafter to a more intense and more rapid second cooling stage which does not impair the flatness of the strips to a temperature lower than 475° C. by quenching the strip in an aqueous bath held at a temperature higher than 75° C.,

followed by more slowly cooling the strip to ambient temperature;

with the proviso that the period of time between the beginning of the preliminary cooling stage and the beginning of the second cooling stage is not shorter than 20 seconds and not longer than 100 seconds.

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**4,297,399**

## METHOD FOR CURING CONCRETE

**John S. Perz, Mentor, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.**

**Filed Jan. 8, 1980, Ser. No. 110,294**

**Int. Cl.³ B05D** *1/00*

**U.S. Cl. 427—385.5** **9 Claims**

1. A method for curing concrete comprising applying to the surface of the concrete, as a curing compound, a composition comprising Singapore dammar resin and an organic solvent for said resin.

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**4,297,400**

## PROCESS FOR IMPARTING TO TEXTILE MATERIALS A SOFT HANDLE USING UNSATURATED ALIPHATIC ACID AMIDES

**Jörg Kern, Waldkraiburg, Fed. Rep. of Germany, and Christian Guth, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Aug. 8, 1979, Ser. No. 64,659**

**Claims priority, application Switzerland, Aug. 18, 1978, 8788/78**

**Int. Cl.³ B05D** *3/02*

**U.S. Cl. 427—389** **12 Claims**

1. A process for imparting to a textile material a soft handle, which process comprises immersing the material at 20° to 100° C. for 5 to 120 minutes in an aqueous preparation containing an acid amide of the formula

$$CH_2=C(X)—CO—NH—R_1$$

or a reaction product from acrylic or methacrylic acid, or an alkyl ester thereof, and an amine of the formula

$$R_1—NH_2$$

wherein $R_1$ is alkyl or alkenyl of 14 to 22 carbon atoms and X is hydrogen or methyl, and subsequently drying the material at 50° to 150° C.

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**4,297,401**

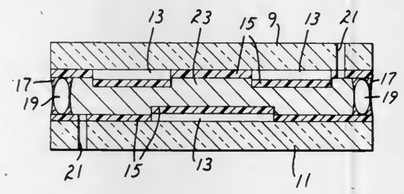
## LIQUID CRYSTAL DISPLAY AND PHOTOPOLYMERIZABLE SEALANT THEREFOR

**Mao-Jin Chern, Woodbury, and Robert D. Lowrey, White Bear Lake, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.**

**Filed Dec. 26, 1978, Ser. No. 973,149**

**Int. Cl.³ B32B** *17/10;* **C09K** *3/34*

**U.S. Cl. 428—1** **11 Claims**




1. An improved liquid crystal display cell comprising a pair of half-cells having portions thereof bonded together by organic seal means wherein the improvement comprises an organic seal means comprising a photopolymerized sealant comprising a polymerized mixture of:



(a) cationically polymerizable epoxide with a functionality of at least 1, and;

(b) an organic aromatic onium catalyst comprising an aromatic adduct of

(1) a diaromatic, triaromatic, or tetraaromatic organoatomic cation of a Group Va, VIa, or VIIa atom and

(2) an anion; said onium catalyst being represented by the formula:

$$(R^2)_n—A^+C^-_{(R^1)_a}$$

wherein

$R^2$ is an aromatic group at least as electron withdrawing as benzene,

$R^1$ is an alkyl or alkenyl group,

A is a Group Va, VIa, or VIIa atom,

X is an anion,

n is a positive whole integer of at least 2 up to the valence of A plus one,

a is 0 or a positive whole integer up to the valence of A minus one, and

n plus a is equal to the valence of A plus one and wherein at let two of said $R^2$ groups are bonded to A;

said photopolymerized sealant being chemically resistant to liquid crystal materials.

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**4,297,402**

## PACKAGING BAG

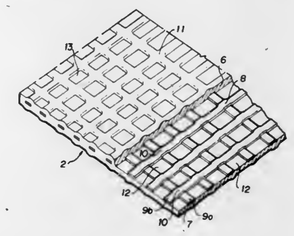
**Koichi Kinbara; Norimaro Sugimoto, both of Kawasaki, and Toshitaka Nakazawa, Kure, all of Japan, assignors to Meito Co. Ltd. and Toyo Pulp Co. Ltd., both of Tokyo, Japan**

**Filed Apr. 18, 1980, Ser. No. 141,580**

**Claims priority, application Japan, Apr. 21, 1979, 54-53536[U];** May 8, 1979, 54-60911[U]

**Int. Cl.³ B65D** *33/02;* **B32B** *3/30, 5/12, 7/04*

**U.S. Cl. 428—35** **5 Claims**




1. A packaging bag fabricated by a reinforced sheet in which a non-woven cross-linked plastic sheet of split films with narrow width crossing each other is inserted between combination cellulose papers in a manner that the intersections of the split films of the non-woven plastic sheet are presented at least on one side surface of the sheet in protruded pattern.

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**4,297,403**

## CORELESS PRESSURE SENSITIVE LABEL SUPPLY ROLL

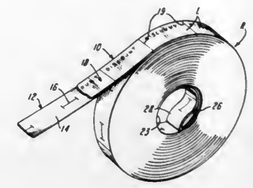
**Thomas M. Smith, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio**

**Filed Feb. 6, 1980, Ser. No. 119,123**

**Int. Cl.³ B32B** *3/16, 7/06*

**U.S. Cl. 428—42** **9 Claims**

1. A coreless pressure sensitive label supply roll comprising a series of pressure sensitive labels releasably bonded by pressure sensitive adhesive to a releasable surface of an elongated carrier web, the assembly of the carrier web and labels being wound into a supply roll adapted to be used in a label printing and applicating device where the labels are successively printed and then successively peeled from the carrier web, the carrier web having an inner convolution defining a center opening, the inner convolution of the carrier web having a folded end portion forming a first end section extending from



and folded back over a radially underlying second end section, and means connecting the first end section of the carrier web to a radially overlying portion of the carrier web to provide the carrier web with a connected loop forming the inner end of the carrier web.

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**4,297,404**

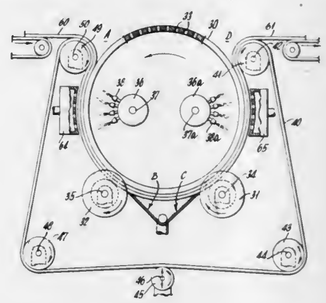
## NON-WOVEN FABRIC COMPRISING BUDS AND BUNDLES CONNECTED BY HIGHLY ENTANGLED FIBROUS AREAS AND METHODS OF MANUFACTURING THE SAME

**Hien V. Nguyen, East Windsor, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Continuation-in-part of Ser. No. 31,086, Apr. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 806,033, Jun. 13, 1977, abandoned. This application Jan. 9, 1980, Ser. No. 110,719**

**Int. Cl.³ D04H** *1/46, 1/70*

**U.S. Cl. 428—85** **11 Claims**



1. A non-woven fabric with a plurality of patterns of groups of fiber segments that alternate and extend throughout the fabric which comprises: groups of fiber segments in discontinuous portions of the fabric, said discontinuous portions forming a first pattern, each of said groups including at least one nub of fiber segments interentangled in helter-skelter arrangement, said nub protruding out of the plane of the fabric, each of said groups also including at least one yarn-like bundle of fiber segments wherein the fiber segments are in close proximity and substantial parallelism to one another, said first discontinuous portions of the fabric being bound and interconnected by a continuous highly entangled, interlaced fibrous area, said continuous portion forming a second pattern and the fibers in said continuous portion being entangled in substantially all directions including the thickness of the fabric, said fabric having a bulk density of from 0.04 grams per cubic centimeter to 0.084 grams per cubic centimeter and a tenacity of at least 0.5 pounds per inch per 100 grains per square yard.

4,297,405

## CORROSION RESISTANT METALLIC ARTICLE HAVING A MATT NACREOUS APPEARANCE

**Nobuyoshi Kasahara, Sayama, and Koutaro Nonomura, Kunitachi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan**

**Filed Jan. 5, 1979, Ser. No. 1,347**

**Claims priority, application Japan, Jan. 9, 1978, 53-537; Jan. 9, 1978, 53-538; Jan. 9, 1978, 53-539**

**Int. Cl.³ B32B** *19/02;* **B05D** *5/02*

**U.S. Cl. 428—141** **9 Claims**

1. A process for the production of a metallic article having a matt nacreous appearance and improved corrosion resistance, comprising the steps of:

subjecting to chemical treatment a metallic substrate made of a metal selected from the group consisting of zinc, aluminum, magnesium and alloys thereof as white-silvery metals to form a substantially colorless transparent film having improved corrosion resistance on the surface of the metallic substrate,

coating the corrosion resistant film-covered metallic substrate with a clear paint comprising a nacreous pigment in fine flaky form having a colorless and transparent appearance by spraying the paint to the corrosion resistant film at a lower feeding rate than that necessary for arranging the flaky pigment in substantially lamellate form and a spraying air pressure generally higher than that necessary therefor, the nacreous pigment being a nacreous compound selected from the group consisting of (1) oxides and salts of elements of Groups IV and V of the Periodic Table and (2) composite composed of mica and said nacreous compound coated thereon, to form a coating having a finely undulated surface on said corrosion resistant film and then

drying the thus formed clear paint coating having the finely undulated surface on the film-covered metallic substrate to produce the metallic article.

9. A metallic article having a light reflectivity of 30–60% produced by the process of claim 1 or 2.

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4,297,406

## PRODUCT FOR TREATING FABRIC

**John L. Metcalfe, Wirral, and Douglas Wraige, Newton, both of England, assignors to Lever Brothers Company, New York, N.Y.**

**Continuation of Ser. No. 842,827, Oct. 17, 1977, abandoned, which is a continuation of Ser. No. 782,191, Mar. 28, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,650**

**Claims priority, application United Kingdom, Mar. 30, 1976, 12832/76**

**Int. Cl.³ B32B** *7/02, 3/26*

**U.S. Cl. 428—215** **9 Claims**

1. A fabric treating product comprising:

(a) a first and second outer layer of resiliently flexible foamed polymer substrate having a relatively dense structure; laminated to;

(b) an inner layer of resiliently flexible foamed polymer substrate having a relatively less dense structure and being positioned between said first and second outer layers; and

(c) a fabric conditioning agent impregnated into said inner layer and said first and second outer layers.

2. A fabric treatment product according to claim 1, wherein said first and second outer layers and said inner layer are in sheet form, said first and second outer layers each have a thickness of from about 0.5 mm to about 4 mm and the overall thickness of the product is from about 0.2 cm to about 2.5 cm.

4,297,407

## FINISH COMPOSITION FOR THE SPINNING OF HIGHLY CRIMPED CELLULOSE FIBERS USING A COMPOSITION CONT. FATTY ACID ESTER, ORGANIC PHOSPHORIC ACID ESTER, FATTY ACID ETHYLENE OXIDE COND. PROD. AND FATTY ACID SALT

**Francesco Manca, Milan, Italy, assignor to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy**

**Filed May 31, 1979, Ser. No. 44,103**

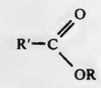
**Claims priority, application Italy, Jun. 5, 1978, 24224 A/78**

**Int. Cl.³ D06M** *13/26, 13/32, 13/18;* **D03D** *3/00*

**U.S. Cl. 428—224** **30 Claims**

1. A composition adapted to facilitate the cotton type spinning of highly crimped cellulosic fibers comprising the following components:

(A) from 10 to 30%, by weight of at least one compound having the formula:



wherein R and R', equal to or different from one another are straight or branched chain alkyl radicals, comprising all together 8 to 40 carbon atoms;

(B) from 8 to 15%, by weight of at least an organic ester of phosphoric acid, wherein only a part of the acid groups have been esterified, the remaining acid groups being free or salified, said ester being in the form of a monomer or a polymer;

(C) from 50 to 70%, by weight of at least one product obtained by the condensation of fatty acids with alkylene oxide or polyalkyleneglycols, wherein the alkylene moiety contains 2 or 3 carbon atoms;

(D) up to 0.5% by weight of organic or inorganic alkali metal salts having a high solubility in water;

and

(E) the amount required to make up 100% of an composition, of at least one alkali metal salt of a fatty acid containing from 6 to 20, preferably 18 carbon atoms.

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4,297,408

## LAMINATES OF CLOTH AND FILLED CRYSTALLINE POLYPROPYLENE AND A METHOD FOR MAKING THEM

**John C. Stead, Knebworth, and Peter E. Waghorn, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England**

**Filed Dec. 17, 1979, Ser. No. 104,058**

**Claims priority, application United Kingdom, Dec. 29, 1978, 50242/78**

**Int. Cl.³ B32B** *27/12, 27/20, 27/32, 31/08*

**U.S. Cl. 428—240** **5 Claims**

1. A laminate comprising cloth or other sheet material and a layer of a filled crystalline polypropylene composition containing 20 to 80% by weight of a particulate filler wherein the cloth or other sheet material is adhered to a surface of the layer of filled polypropylene composition by means of a layer of unfilled random copolymer of propylene with up to 10% (by weight of the copolymer) of ethylene interposed between the cloth or other sheet material and said surface.

3. A method for making a laminate as claimed in claim 1 wherein the method comprises:

(a) heating the filled and unfilled polypropylene compositions to temperatures above the crystalline melting points of their polypropylenes,

(b) contacting a surface of the filled composition with a surface of the unfilled composition before, during or after heating,

(c) contacting the cloth or other sheet material with another surface of the unfilled composition under conditions of temperature and pressure such that some unfilled composition flows into the cloth or into intimate contact with the other sheet material and then

(d) cooling the filled and unfilled compositions to below their crystalline melting points whereupon the unfilled composition bonds the cloth or other sheet material to the filled composition to form the laminate.



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4,297,409

## MANUFACTURE OF ARTICLES FROM AN ORGANIC MATERIAL AND A WATER-HARDENABLE MASS

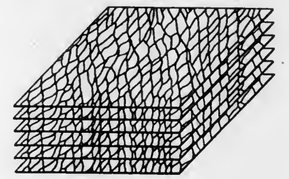
**David J. Hannaht, Great Bookham, England, assignor to University of Surrey, Surrey, England, a part interest**

**Continuation-in-part of Ser. No. 30,428, Apr. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 809,394, Jun. 23, 1977, abandoned. This application Nov. 6, 1979, Ser. No. 92,416**

**Claims priority, application United Kingdom, Jul. 1, 1976, 27371/76**

**Int. Cl.³ B32B** *7/00*

**U.S. Cl. 428—247** **33 Claims**



1. An article comprising a water-hardened mass and a continuous network of fabrillated film in the form of a plurality of layers embedded in the water-hardened mass, the volume of film amounting to more than 1½% by volume of the overall volume of the article and the fibrils of said film providing continuous mechanical and frictional bonding to reinforce the water-hardened mass so that under excess loading the article exhibits multiple fine cracks without rupture.

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4,297,410

## ABSORBENT MATERIAL

**Yoshimi Tsuchiya, Utsunomiya; Masayuki Sagae, Tochigi, and Hiroshi Mizutani, Yachiyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan**

**Filed Oct. 2, 1979, Ser. No. 81,234**

**Claims priority, application Japan, Oct. 12, 1978, 53-140165**

**Int. Cl.³ B32B** *5/16*

**U.S. Cl. 428—283** **7 Claims**

1. An absorbent material consisting essentially of: a first, non-woven fabric, absorbent sheet consisting essentially of absorbent fibers capable of absorbing exudations from the human body and from 10 to 50% by weight of thermoplastic polyolefin fibers; a multitude of particles deposited on one surface of said first sheet so as to form a discrete layer of said particles on said one surface of said first sheet wherein said particles project upwardly above said one surface of said first sheet, said particles consisting essentially of hydrophilic polymeric substance capable of absorbing water in an amount at least 30 times the weight of said hydrophilic polymeric substance, said particles being meltadhered to said thermoplastic polyolefin fibers of said first sheet at the locations where said particles contact said thermoplastic polyolefin fibers, said absorbent material having been prepared by depositing said particles on said sheet and then heating said sheet to melt thermoplastic polyolefin fibers therein whereby to cause said particles to adhere to said thermoplastic polyolefin fibers.

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4,297,411

## HEAT SEALABLE PACKAGING FILM COMPRISING PROPYLENE POLYMER SUBSTRATE AND A SURFACE LAYER OF AN ETHYLENE COPOLYMER AND A DIFFERENT OLEFIN COPOLYMER

**Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Oct. 5, 1979, Ser. No. 82,360**

**Int. Cl.³ C09J** *7/02;* **B32B** *27/08*

**U.S. Cl. 428—347** **9 Claims**

1. A multiple-layer, heat-sealable film comprising

(a) a substrate layer consisting essentially of a homopolymer of polypropylene, a copolymer of polypropylene, or a blend of said homopolymer or copolymer containing up to 40% by weight of a different compatible polyolefin or polyolefin blend; and

(b) on at least one of the surfaces of the substrate layer, a surface layer comprising a blend of 5–95 weight percent of a copolymer of ethylene (10–75 mole percent) and a higher olefin having 4 or more carbon atoms (90–25 mole percent), and 95–5 weight percent of a different copolymer of an alpha olefin having 2 or more carbon atoms (2–98 mole percent) and a different higher olefin having 3 or more carbon atoms (98–2 mole percent);

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4,297,412

## TWO-COMPONENT MIXED ACRYLIC FIBRES WHEREIN ACRYLIC COMPONENTS HAVE DIFFERENT AMOUNTS OF NON-IONIZABLE PLASTICIZING COMONOMER

**Georges Achard, Decines; Pierre Chion, Bron, and Jacques Menault, Charbonnieres-les-Bains, all of France, assignors to Rhone-Poulenc-Textile, Paris, France**

**Filed Nov. 28, 1979, Ser. No. 97,954**

**Claims priority, application France, Nov. 30, 1978, 78 34054**

**Int. Cl.³ B32B** *27/02;* **D01F** *8/08;* **D02G** *1/18, 3/00*

**U.S. Cl. 428—370** **6 Claims**

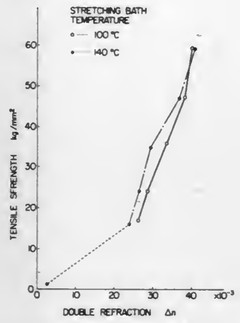
1. Two-component mixed acrylic composite fibres and yarns with a natural crimp, suitable for carding, stretch breaking and converting said fibers consisting of a mixture of monolaminar, bilaminar and multilaminar strands and made of two polymers A and B, polymer A comprising at least 83% by weight of acrylonitrile, 4 to 15% by weight of a non-ionisable plasticising comonomer, and up to 2% by weight of an acid comonomer which is copolymerisable with acrylonitrile, and polymer B comprising at least 94% by weight of acrylonitrile, 0 to 4% by weight of a non-ionisable plasticising comonomer and up to 2% by weight of an acid comonomer which is copolymerisable with acrylonitrile, the difference in the proportion of plasticising comonomer in the polymers A and B being between 4 and 15% by weight and the total number of milliequivalents of acid in the two polymers being at least 50 per kg of polymer, the said composite fibres and yarns possessing a three-dimensional crimp, the direction of which depends on the heat and/or mechanical treatments to which the composite fibres or yarns have been subjected, polymer B being located on the inside of the helix formed by strands which have been subjected, without tension, to a temperature below about 110° C. and at least equal to ambient temperatures (crimp C 1), and being located on the outside of the helix formed by strands which have been subjected to tension and/or heat treatment at a temperature above about 110° C. (crimp C 2), the contraction and frequency of the two types of crimp varying from one strand to the next and along the length of one strand.

**4,297,413**

## CONCENTRIC COMPOSITE CONJUGATE YARNS AND A PROCESS FOR MANUFACTURING SAME

**Tohru Sasaki; Hiroyuki Endoh, and Hiroshi Ohhira, all of Iwaki, Japan, assignors to Kureha Kugaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 928,301, Jul. 26, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 143,145**
**Claims priority, application Japan, Jul. 27, 1977, 52-89197**
**Int. Cl.³ D02G *3/00***
**U.S. Cl. 428—394** **8 Claims**




1. A concentric stretched conjugated yarn having

(A) A polyefin core component which is initially pre-stretched to have a double refraction index of from $10\times25^{-3}$ to $25\times10^{-3}$, and

(B) A concentric sheath component which is a polyamide or polyester fused resin and which is initially unoriented,

with the proviso that the conjugated yarn is stretched until the double refraction index of the polyolefin core component is at least $30\times10^{-3}$.

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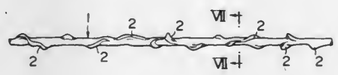
**4,297,414**

## REINFORCING MATERIAL FOR HYDRAULIC SUBSTANCES AND METHOD FOR THE PRODUCTION THEREOF

**Hisashi Matsumoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**

**Filed Jun. 25, 1979, Ser. No. 51,387**
**Claims priority, application Japan, Jul. 7, 1978, 53-81917; Jul. 17, 1978, 53-86182; Dec. 20, 1978, 53-160804**
**Int. Cl.³ D02G *3/00***
**U.S. Cl. 428—400** **15 Claims**



1. Reinforcing material for hydraulic substances, which consists essentially of an elongated, stretched product of a synthetic resin, the product having a thickness of 3000 denier to 12,000 denier and having discontinuous protrusions over its entire length, the height of the protrusions being not less than 0.1 mm.

**4,297,415**

## HEAT-SEALABLE POLYPROPYLENE FILMS

**Herbert J. Ward, Bristol; Derek J. Dobbie, and Brian Lyall, both of Bridgwater, all of England, assignors to British Cellophane Limited, Somerset, England**

**Filed Aug. 23, 1979, Ser. No. 69,091**
**Claims priority, application United Kingdom, Sep. 6, 1978, 35846/78**
**Int. Cl.³ B32B *27/32, 31/14***
**U.S. Cl. 428—516** **9 Claims**

1. A heat-sealable oriented polypropylene film comprising a base film of oriented polypropylene film having on one surface a layer of a random propylene/ethylene copolymer in which the ethylene content lies in the range between 2% and 6% by weight and on the other surface a predominantly linear random copolymer of ethylene and between 6% and 40% by weight of the random copolymer of at least one further alpha olefin having at least three carbon atoms per molecule.

5. A method of the manufacture of a heat-sealable oriented polypropylene film comprising applying to one surface of a base polypropylene film a layer of a random propylene/ethylene copolymer in which the ethylene content lies in the range between 2% and 6% by weight and to the other surface a predominantly linear random copolymer of ethylene and between 6% and 40% by weight of the random copolymer of at least one further alpha olefin having at least three carbon atoms per molecule, bringing the combination to a stretch orientatable condition and stretching in at least one direction.

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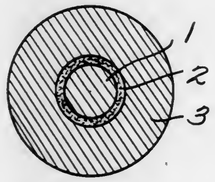
**4,297,416**

## GOLD ALLOY WIRE FOR JEWELRY CHAINS

**Hans Krug, Pforzheim, and Kurt Heilmann, Eisingen, both of Fed. Rep. of Germany, assignors to Ferd. Wagner, Pforzheim, Fed. Rep. of Germany**

**Filed Jun. 13, 1979, Ser. No. 48,586**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829284**
**Int. Cl.³ B23K *35/22, 35/30, 35/00***
**U.S. Cl. 428—576** **6 Claims**




1. In a gold alloy wire suitable for the production of jewelry, especially jewelry chains consisting essentially of a gold solder containing nucleus and a jacket of gold alloy the improvement comprising said solder containing nucleus having a core of fine gold surrounded by an ajacent layer of ductile, lower melting gold solder alloy.

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**4,297,417**

## PHOTOSENSITIVE COLORED GLASSES EXHIBITING ALTERABLE PHOTO-ANISOTROPIC EFFECTS

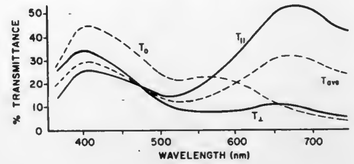
**Che-Kuang Wu, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 924,508, Jul. 14, 1978, Pat. No. 4,191,547. This application Oct. 19, 1979, Ser. No. 86,589**
**Int. Cl.³ B32B *17/00*; G02F *3/00***
**U.S. Cl. 428—410** **2 Claims**

2. A photosensitive optical information storage medium for storing optical information utilizing photo-anisotropic effects comprising a photosensitive colored glass article exhibiting alterable photo-anisotropic effects consisting of a body portion



and an integral hydrated surface layer of a thickness of about 1–500 microns having Ag-AgCl-containing crystals therein, at least a portion of which exhibits photo-dichroic and birefringent properties when exposed to colored, linearly polarized bleaching light, said body portion consisting essentially, in mole percent on the oxide basis, of about 70–82% $SiO_2$,




10–17% $Na_2O$ and/or $K_2O$, 5–15% ZnO, 0.5–5% $Al_2O_3$, and 0.1–3% Cl, said surface layer containing about 1–8% by weight $H_2O$ and about 2–20% by weight Ag, the proportion of $Na^+$ and/or $K^+$ ions in said surface layer being less with a corresponding increase in $Ag^+$ ions, and the Ag portion of said crystals is present as a layer on the surface of the crystals and/or is contained within said crystals.

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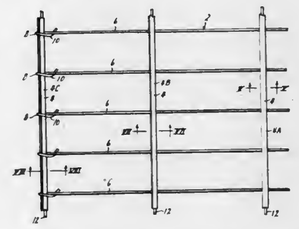
**4,297,418**

## COMPONENT STRAND FOR WIRE FABRICS

**Harmon W. Arnold, and Galen B. Erwin, both of Carthage, Mo., assignors to Flex-o-lators, Inc., Carthage, Mo.**

**Filed May 29, 1979, Ser. No. 43,112**
**Int. Cl.³ B21F *33/00***
**U.S. Cl. 428—595** **5 Claims**



1. A wire fabric formed of a plurality of component strands extending in generally parallel, spaced apart relation, and a plurality of cross wires extending transversely to said component strands in generally parallel, spaced apart relation, each of said cross wires being attached to each of said component strands at its point of intersection therewith by piercing said strand, at least one of said component strands comprising:

a. a longitudinally extending core wire, and

b. a longitudinally extending sheath in which said core wire is embedded, said sheath being formed of a relatively soft, flexible and piercable material, and having its external surface formed to present at least a pair of diametrically opposite, longitudinally extending grooves to configurate said strand cross-sectionally to form a pair of enlarged heads connected by a neck of reduced thickness, said cross wires piercing said neck, said core wire being embedded in one of the heads of said sheath, offset from the neck thereof, whereby not to interfere with the piercing of said neck by said cross wires.

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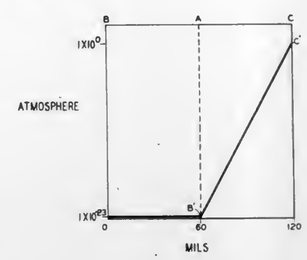
**4,297,419**

## ANODE-MATRIX COMPOSITE FOR MOLTEN CARBONATE FUEL CELL

**Richard C. Nickols, Jr.; John C. Trocciola, both of Glastonbury, Conn., and James E. Rourke, East Windsor, N.J., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Sep. 24, 1980, Ser. No. 189,888**
**Int. Cl.³ H01M *4/86***
**U.S. Cl. 429—44** **10 Claims**




1. A molten carbonate fuel cell anode-matrix composite comprising an alkali metal carbonate impregnated cerium oxide substrate having adjacent sections of greater and lesser pore sizes, the section of greater pore size being electron conductive and anode catalytic under molten carbonate fuel cell operating conditions, and the section of lesser pore size being substantially non-catalytic and non-electron-conductive under molten carbonate fuel cell operating conditions.

6. A molten carbonate fuel cell comprising an anode matrix composite comprising an alkali metal carbonate impregnated cerium oxide substrate having adjacent sections of greater and lesser pore sizes, the section of greater pore size being electron conductive and anode catalytic under molten carbonate fuel cell operating conditions and the section of lesser porosity being substantially non-catalytic and non-conductive under molten carbonate fuel cell operating conditions, and a cathode electrode in contact with the anode-matrix composite on the matrix side of the composite.

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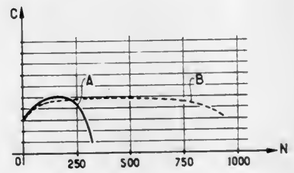
**4,297,420**

## ELECTRODE FOR A LEAD ACCUMULATOR

**Bernard Chenaux, Paris, and Alain Leroux, St-Cheron, both of France, assignors to Compagnie Generale d'Electricite, Paris, France**

**Continuation of Ser. No. 86,447, Oct. 19, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,401**
**Claims priority, application France, Oct. 27, 1978, 78 30591**
**Int. Cl.³ H01M *4/62***
**U.S. Cl. 429—217** **3 Claims**




1. An electrode for a lead accumulator of the type which includes an electronically conductive core coated with an active material which contains grains of lead monoxide, lead sulphate and a binding agent which is suitable for forming a three-dimensional network of fibres, wherein said electrode further includes a material which is insoluble in sulphuric acid, is permeable to conductivity ions and forming a film over said

grains, the material being chosen from the group which includes polyacrylic acid and hydroxyethylmethacrylate and being used in a proportion by weight of 0.25 to 2% with respect to said lead monoxide.

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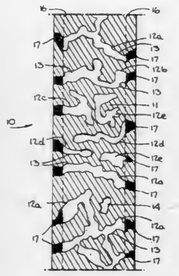
**4,297,421**

## BATTERY AND ELECTROLYTIC CELL ELECTRODES

**Pierre P. Turillon, Ramsey, N.J.; Michael N. Hull, and George F. Nordblom, both of Yardley, Pa., assignors to The International Nickel Co., Inc., New York, N.Y.**

**Filed Nov. 10, 1977, Ser. No. 850,290**
**Int. Cl.³ H01M 4/56**
**U.S. Cl. 429—225** **62 Claims**



1. An article of manufacture, adapted to be used with an electrolyte such that when in use at least part of one surface of said article is exposed to said electrolyte and, at least part of the time, is at an oxidizing potential comprising, at least adjacent said at least part of one surface, a matrix of a metal anodically passivated in said electrolyte at said oxidizing potential containing a maze of tortuous paths essentially filled adjacent said at least part of one surface with an electroconductive oxide essentially insoluble in said electrolyte and the remainder of said maze paths of said maze is filled with metal in direct contact with said electroconductive oxide, said oxide being confined by the walls of said paths, essentially blocking entry of said electrolyte to the interior of said matrix thereby maintaining the electrolyte-article interface at the external surface of the article and providing a means of electrical conductivity at said oxidizing potential between said electrolyte and the interior of said article.

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**4,297,422**

## ELECTROPHOTOGRAPHIC PROCESS FOR PRINTING A PLURALITY OF COPIES

**Eiichi Sato, Tama, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Jul. 18, 1978, Ser. No. 925,693**
**Claims priority, application Japan, Jul. 21, 1977, 52-87556**
**Int. Cl.³ G03G 13/16, 13/22, 13/24**
**U.S. Cl. 430—54** **14 Claims**

1. An electrophotosensitive process for printing a plurality of copies with a single imagewise exposure of a document to be duplicated comprising

(a) a step for effecting a uniform primary electrification with one polarity for a photosensitive member;

(b) a step for forming on the uniformly charged photosensitive member a primary electrostatic latent image corresponding to an image of the document by effecting the imagewise exposure;

(c) a step for developing the primary latent image with toner developer having charged in the other polarity to form on the photosensitive member a toner image;

(d) a step for placing a transparent or translucent transfer member over a surface of the photosensitive member on which surface the toned image has been formed;

(e) a step for effecting a secondary electrification with the one polarity by applying a transferring electric field from the side of the transfer member in such a manner that a potential at an imagewise dark portion on the photosensitive member on which portion the toner has been applied will assume a substantially same potential as that of the primary electrostatic latent image after a transfer and for effecting a secondary exposure with light having a wavelength which is substantially absorbed by the toner developer also from the side of the transfer member in such a manner that undesired charge applied at an imagewise bright portion on the photosensitive member is decayed, but the charge on the imagewise dark portion is not decayed due to the presence of the light impermeable toner so as to be able to form on the photosensitive member a secondary electrostatic latent image having an image information substantially corresponding to the primary latent image after the transfer, said secondary electrification and secondary exposure being simultaneously or successively effected, while the transfer member is placed over the photosensitive member; and

(f) a step for separating the transfer member from the photosensitive member to transfer the toner image onto the transfer member;

whereby the steps (c) to (f) are repeated successively for the secondary latent image repeatedly formed on the photosensitive member to form a number of duplicated copies.

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**4,297,423**

## ELECTROPHOTOGRAPHIC PROCESS FOR MULTIPLE IMAGES

**Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Nov. 24, 1978, Ser. No. 963,358**
**Claims priority, application Japan, Nov. 30, 1977, 52-142691**
**Int. Cl.³ G03G 13/16, 13/22**
**U.S. Cl. 430—54** **3 Claims**

1. An electrophotographic process using a composite photosensitive body which has an electrically conductive substrate, an inorganic photoconductive semiconductor layer and an organic photoconductive semiconductor layer, said inorganic and organic photoconductive semiconductor layers being applied on said substrate in this order comprises the following successive steps:

(a) a step of uniformly charging the composite photosensitive body in one polarity for which the composite photosensitive body exhibits a high response to visible light;

(b) a step of exposing the uniformly charged composite photosensitive body to an optical image of an original to be duplicated with the visible light for forming a first electrostatic latent image of one polarity;

(c) a step of developing the first electrostatic latent image with toners which have been charged in the opposite polarity and are impermeable to ultraviolet rays to form a primary toner image;

(d) a step of uniformly charging the composite photosensitive body in the opposite polarity for which the composite photosensitive body exhibits a small dark decay;

(e) a step of exposing the composite photosensitive body to ultraviolet rays from the side of the primary toner image, to form a second electrostatic latent image of opposite polarity;

(f) a step of cleaning the primary toner image out of the composite photosensitive body;

(g) a step of developing the second electrostatic latent image of opposite polarity with toners charged in one polarity to form a secondary toner image;

(h) a step of transferring the secondary toner image onto a record sheet to form a duplicated copy; and

(i) a step of repeating successively said steps (h) and (i) to form a plurality of duplicated copies.



**4,297,424**

## OVERCOATED PHOTORECEPTOR CONTAINING GOLD INJECTING LAYER

**Harvey J. Hewitt, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Mar. 5, 1980, Ser. No. 127,174**
**Int. Cl.³ G03G 5/085, 5/14**
**U.S. Cl. 430—58** **1 Claim**

1. A layered inorganic photosensitive device which consists of

(a) a substrate;

(b) a layer of hole injecting material capable of injecting holes into a layer on its surface, this layer being comprised of gold, and having a thickness of from about 0.02 microns to about 10 microns;

(c) a hole transport layer in operative contact with the hole injecting layer, this layer being comprised of a halogen doped selenium-arsenic alloy wherein the percentage of selenium present by weight is from about 99.5 percent to about 99.9 percent, the percentage of arsenic present by weight is from about 0.5 percent to about 0.1 percent, and the halogen is present in an amount of from about 10 parts per million, to about 200 parts per million;

(d) a charge generating layer overcoated on the hole transport layer, consisting of an inorganic photoconductive material, the charge generating layer having a thickness of from about 0.1 micron to about 5 microns;

(e) an electrically insulating organic resin overlaying the charge generating layer; and

(f) a hole trapping layer situated between the generating layer and the overcoating layer, said trapping layer having a thickness of from about 0.05 microns to about 5 microns and being comprised of inorganic materials selected from selenium, selenium alloys, and halogen doped selenium arsenic alloys.

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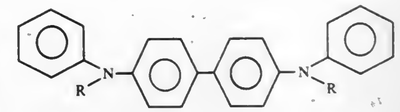
**4,297,425**

## IMAGING MEMBER

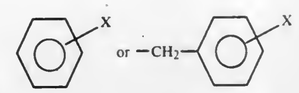
**Damodar M. Pai, Fairport; John M. Pochan, and Darlyn F. Pochan, both of Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation-in-part of Ser. No. 78,264, Sep. 24, 1979, abandoned. This application Jun. 26, 1980, Ser. No. 163,256**
**Int. Cl.³ G03G 5/04, 5/14**
**U.S. Cl. 430—58** **5 Claims**

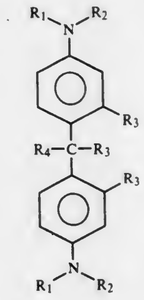
1. In an imaging member comprising a hole generation layer and a contiguous hole transport layer, said generation layer comprising a photoconductive material exhibiting the capability of photogeneration of holes and injection of said holes, said hole transport layer comprising a transparent electrically inactive polycarbonate resinous material having a residual amount within the range of from about 0.01 to about 1.0 percent by weight of said transport layer in said layer of a halogen-containing organic solvent therein, and dispersed in said layer from about 25 to about 75 percent by weight based on said transport layer composition of a charge transport compound within the scope of the following structural formula:



wherein R is



and wherein X is independently selected from the group consisting of an alkyl group having from 1 to about 4 carbon atoms and chlorine in the ortho, meta or para position, said charge transport layer being substantially nonabsorbing in the spectral region at which the photoconductive material generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said photoconductive material and transporting said holes through said charge transport layer, the improvement consisting of the inclusion in said transport layer of a stabilizing compound within the scope of the following structural formula:



wherein $R_1$ and $R_2$ are independently selected from the group consisting of a $C_1$–$C_8$ alkyl, aryl, alkaryl and aralkyl, where said aryl is a phenyl group or a condensed ring group, where the alkyl group of said alkaryl and aralkyl is a $C_1$–$C_4$ group, $R_3$ is independently selected from the group consisting of hydrogen and $CH_3$; and $R_4$ is the same as $R_1$ and $R_2$ or a disubstituted aminophenyl group wherein the substituents are independently selected from the group consisting of a $C_1$–$C_8$ alkyl, aryl, alkaryl and aralkyl as defined supra, said stabilizing compound being present in an amount sufficient to at least minimize the deleterious effects of ultraviolet radiation.

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**4,297,426**

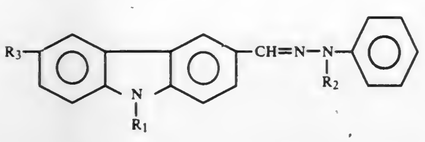
## ELECTROPHOTOGRAPHIC ELEMENT WITH CARBAZOLE HYDRAZONE OR ANILE CHARGE TRANSPORT COMPOUNDS

**Kiyoshi Sakai; Mitsuru Hashimoto, both of Numazu, and Tomiko Kawakami, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan**

**Filed May 21, 1980, Ser. No. 152,069**
**Claims priority, application Japan, May 28, 1979, 54-65741; May 28, 1979, 54-65742**
**Int. Cl.³ G03G 5/06, 5/14**
**U.S. Cl. 430—59** **17 Claims**

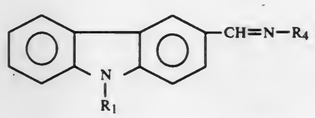
1. An electrophotographic element comprising: an electrically conductive substrate, a charge generation layer, a charge transport layer adjacent the charge generation layer, the

charge transport layer comprising at least one charge transport compound selected from the group consisting of hydrazone compounds having the following formula (I) and anile compounds having the following formula (II):



(I)

wherein $R_1$ is methyl, ethyl, 2-hydroxyethyl or 2-chloroethyl; $R_2$ is methyl, ethyl, benzyl or phenyl; and $R_3$ is chlorine, bromine, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, dialkylamino in which the alkyl has 1 to 4 carbon atoms or nitro,



(II)

wherein $R_1$ has the same meaning as defined above, and $R_4$ is substituted phenyl, non-substituted phenyl, naphthyl, a heterocyclic group or $C_1$–$C_{10}$ alkyl;
and a binder agent.

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**4,297,427**

## POLYBLEND COATED CARRIER MATERIALS

**Meurig W. Williams, and Christopher J. AuClair, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 26, 1978, Ser. No. 872,518**
**Int. Cl.³ G03G *9/10***
**U.S. Cl. 430—108** **9 Claims**

**1.** A carrier particle for electrostatographic developer mixtures, said carrier particle comprising a core having an average diameter of from between about 30 microns and about 1,000 microns, said core having an outer coating comprising a polyblend of a first polymer possessing negative triboelectric charging characteristics with respect to toner particles and a second polymer possessing strong adhesive properties with respect to said core, said first polymer comprising a fluoropolymer selected from the group consisting of polymers of vinylidene fluoride, tetrafluoroethylene, and fluorinated acrylates and methacrylates, and said second polymer being selected from the group consisting of polycaprolactone, polysulfones, polycarbonates, polyesters, polyamides, and polymers of styrene, alkyl acrylates, alkyl methacrylates, organosilanes, and acrylonitriles.

**8.** An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles, each of said carrier particles comprising a core having an average diameter of from between about 30 microns and about 1,000 microns, said core having an outer coating comprising a polyblend of a first polymer which comprises a halogenated polymer possessing negative triboelectric charging characteristics with respect to said toner particles and a second polymer which comprises an acrylic polymer possesssing strong adhesive properties with respect to said core, said first polymer comprising a fluoropolymer selected from the group consisting of polymers of vinylidene fluoride, tetrafluoroethylene, and fluorinated acrylates and methacrylates, and said second polymer being selected from the group consisting of polycarpolactone, polysulfones, polycarbonates, polyesters, polyamides, and polymers of styrene, alkyl acrylates, alkyl methacrylates, organosilanes, and acrylonitriles.

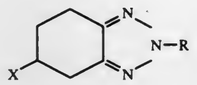
**4,297,428**

## PROCESS FOR MAKING DIAZO PHOTOSENSITIVE PAPER

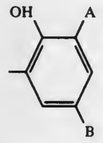
**Kaneo Yamamoto, 4-1, Hirata-Kita-machi, Ashiya-shi, Hyogo-ken, Japan**

**Filed Mar. 26, 1980, Ser. No. 134,139**
**Claims priority, application Japan, Nov. 5, 1979, 54-141997**
**Int. Cl.³ G03C *1/86, 1/60***
**U.S. Cl. 430—169** **6 Claims**

**1.** In a process for making an acid stabilized diazo photosensitive paper which comprises adding an ultraviolet absorber to an acid stabilized diazo photosensitve layer on a paper substrate, said layer consisting essentially of a diazonium salt and a coupler, the improvement wherein said ultraviolet absorber is a benzotriazole derivative represented by the general formula (1)



wherein R denotes



wherein each of A and B denotes H or an alkyl group having 1–5 carbon atoms and X denotes H or Cl, (a) mixing said ultraviolet absorber represented by the general formula (I) with a solvent selected from the group consisting of ethyl acetate, methyl acetate and methylethyl ketone, so as to prepare a 3–10% by weight solution of the ultraviolet absorber in the solvent, dispersing 10 parts of said solution in 15–20 parts of an aqueous solution containing 1–3% of sulfosuccinate and 0.1–1% of polyvinyl alcohol and evaporating the ethylacetate, methyl acetate or methylethyl ketone, therefrom, (b) mixing the thus-prepared solution with a photosensitive liquid consisting of diazonium compound and a coupler so that the amount of said ultraviolet absorber represented by said formula (I) contained therein is 15–50% of the amount of the coupler contained in the photosensitive liquid, and, (c) applying the photosensitive liquid containing the ultraviolet absorber to a paper substrate to prevent discoloration of the texture of a copy of said paper.

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**4,297,429**

## PHOTOGRAPHIC MATERIAL AND DIFFUSION TRANSFER PROCESSING SOLUTION FOR MAKING PRINTING PLATES AND METHOD FOR MAKING PRINTING PLATES

**Eiji Kanada; Shoji Yamada, and Yasuo Tsubai, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Filed Jun. 11, 1980, Ser. No. 158,580**
**Claims priority, application Japan, Jun. 18, 1979, 54-76581; Jun. 28, 1979, 54-81831; Jul. 2, 1979, 54-83834; Jul. 4, 1979, 54-85743**
**Int. Cl.³ G03C *5/54***
**U.S. Cl. 430—204** **26 Claims**

**1.** Method for making a lithographic printing plate which utilizes the transfer silver as ink receptive portions which is formed by silver complex diffusion transfer process from a lithographic printing plate material which comprises a support having thereon at least both silver halide emulsion layer and physical development nuclei layer by imagewise-exposure of



the silver halide emulsion layer and diffusion transfer development thereof with an alkaline processing solution, characterized in that diffusion transfer development processing is carried out in the presence of 2-mercaptobenzoic acid derivative.

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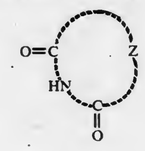
**4,297,430**

## PHOTOGRAPHIC MATERIAL FOR PRODUCTION OF PRINTING PLATES AND METHOD FOR PRODUCTION OF PRINTING PLATES

**Eiji Kanada; Shoji Yamada, and Yasuo Tsubai, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 142,822, Apr. 22, 1980, abandoned. This application Aug. 1, 1980, Ser. No. 174,696**
**Claims priority, application Japan, May 2, 1979, 54/54363**
**Int. Cl.³ G03C *5/54***
**U.S. Cl. 430—204** **11 Claims**

**1.** A method for producing a lithographic printing plate which comprises developing a photographic material exposed to light comprising a support having thereon at least both silver halide emulsion layer and surface physical development nuclei layer and having a thickness of 0.5μ or less by silver complex diffusion transfer process and utilizing transfer silver as ink receptive portions of printing plate, characterized in that the development is carried out in the presence of a cyclic imide compound having the general formula:



(wherein Z represents atoms of a series of completing a 5- or 6-membered cyclic imide nucleus which comprises from 1 to 3 nitrogen atoms and the remainder being carbon atoms and said atoms of Z may have substituent).

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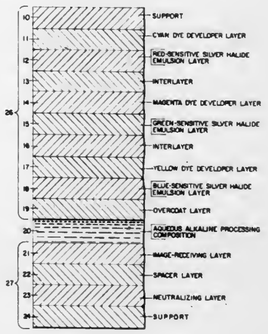
**4,297,431**

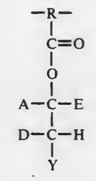
## DIFFUSION CONTROL LAYERS IN DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS

**Charles I. Sullivan, Melrose, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 942,490, Sep. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 774,599, Mar. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,140, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 487,228, Jul. 10, 1974, abandoned. This application Mar. 14, 1980, Ser. No. 130,532**
**Int. Cl.³ G03C *1/40, 1/76, 5/54, 1/48***
**U.S. Cl. 430—215** **78 Claims**




**1.** A photographic diffusion transfer film unit comprising:
a. a photosensitive element comprising at least a photosensitive silver halide emulsion layer having associated therewith a processing composition soluble and diffusible image-forming material;
b. an image-receiving element;
c. means for discharging an alkaline processing composition within said film unit; and
d. a diffusion control layer in at least one of said photosensitive element or said image-receiving element;
said diffusion control layer comprising a polymerization product of a monomer capable of undergoing β-elimination in an alkaline environment, said diffusion control layer being substantially impermeable to alkali or material soluble in or solubilized by said alkaline processing composition until said β-elimination, said polymerization product comprising recurring units of the formula



wherein
R is the addition polymerization product of an ethylenically unsaturated alkyl group of two or three carbon atoms;
A, D and E are selected from the group consisting of hydrogen, methyl and phenyl provided that no more than one of A, E, or D may be methyl or phenyl; and
Y is an activating group.

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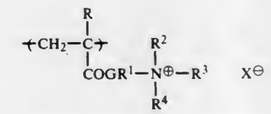
**4,297,432**

## TWO-SHEET DIFFUSION TRANSFER ASSEMBLAGES AND PHOTOGRAPHIC ELEMENTS

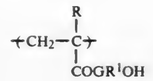
**Wayne A. Bowman; John F. Bishop, and John M. Noonan, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 1, 1980, Ser. No. 174,405**
**Int. Cl.³ G03C *5/54, 7/00, 1/40***
**U.S. Cl. 430—215** **21 Claims**

**1.** In a photographic element comprising a support having thereon, in order, a neutralizing layer, a timing layer and at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material,
the improvement wherein a layer of a vinylidene chloride polymer is present between said timing layer and said emulsion layer, and a co-extensive polymeric primer layer is present between said vinylidene chloride polymeric layer and said silver halide emulsion layer, said primer layer comprising:
(A) an ionic vinyl polymer comprising 10 to 30 weight percent of recurring units which conform to the structure:



and 70 to 90 weight percent of recurring units which conform to the structure:



wherein:
each R is independently hydrogen or methyl;
each $R^1$ is independently a straight or branched chain alkylene group of 1 to about 6 carbon atoms;
$R^2$, $R^3$ and $R^4$ are each an alkyl group of 1 to about 4 carbon atoms;
each G is independently oxygen or NH; and
$X^-$ is an acid anion; or

(B) a ionic polyester comprising recurring units of:

(I) a diol component which comprises:

(a) at least 50 mole percent of units derived from diols having the structures:

(i)

wherein n is an integer of from 1 to 4; and

(ii) $O—R^6O—_m$, wherein m is an integer of from 2 to 4, and $R^6$ is an alkylene group of 2 to about 4 carbon atoms; and

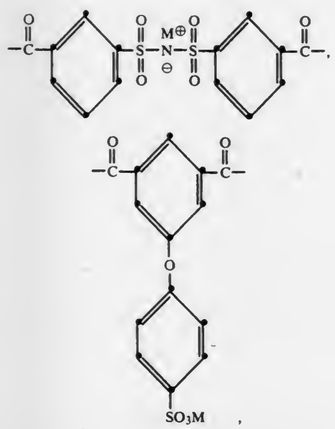
(b) 0 to 50 mole percent of units derived from one or more diols having the structure:

$—O—R^7—O—$

wherein $R^7$ is an alkylene group of up to about 16 carbon atoms, a cycloalkylene group of 6 to about 20 carbon atoms, a cycloalkylenebisalkylene group of 8 to about 20 carbon atoms, an arylenebisalkylene group of 8 to about 20 carbon atoms, or an arylene group of 6 to about 12 carbon atoms; and

(II) an acid component which comprises:

(a) 8 to 30 mole percent of units derived from one or more ionic dicarboxylic acids, said units having the structures:



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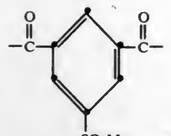
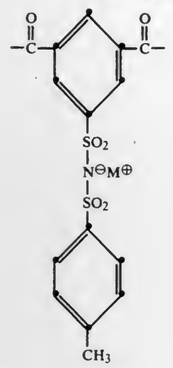


, and



wherein M is ammonium or a monovalent metal; and

(b) 70 to 92 mole percent of recurring units derived from other diacids.

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**4,297,433**

**LIGHT SENSITIVE COMPOSITIONS OF POLYMETHYL ISOPROPENYL KETONE**

**Minoru Tsuda, Isehara, and Yoichi Nakamura, Samukawa, both of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan**

**Continuation of Ser. No. 957,836, Nov. 6, 1978. This application Nov. 16, 1978, Ser. No. 961,120**

**Claims priority, application Japan, Nov. 4, 1977, 52-132234**

**Int. Cl.³ G03C** *1/68, 5/00*

**U.S. Cl. 430—270** **1 Claim**

1. An ultraviolet ray-sensitive composition comprising polymethyl isopropenyl ketone having a molecular weight of 10,000–1,000,000 and a dispersity index of below 3 and 4,4'-dibromobenzophenone, the amount of the benzophenone being 1–25 parts by weight per 100 parts by weight of the polymethyl isopropenyl ketone.

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**4,297,434**

**PHOTODEFORMABLE ARTICLE HAVING PHOTOIONIZABLE GROUPS ON A POLYMER BACKBONE**

**Ari Aviram, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 50,931, Jun. 21, 1979, Pat. No. 4,247,622. This application Jun. 13, 1980, Ser. No. 159,098**

**Int. Cl.³ G03C** *1/68*

**U.S. Cl. 430—270** **2 Claims**

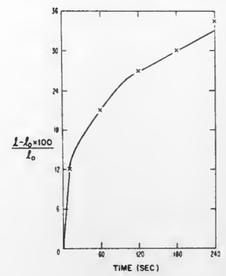
1. A photodeformable article comprising

(a) a substrate, and

(b) a film disposed on said substrate, said film being composed of a polymer backbone having at least one photoionizable group attached thereto, a halogenated hydrocarbon and a crosslinking agent, wherein said polymeric backbone is selected from the group consisting of polyacrylics, polyglutamate, polyvinyl amines, polyvinyl alcohols and polystyrenes, and wherein said photoionizable



group is selected from the group consisting of N,N-dimethyl-p-phenylenediamine, tetrathiafulvalene, tetraselenafulvalenes, ferrocene, tetrathiatetracene and leuco dyes.

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**4,297,435**

**CONTRAST COLORANT FOR PHOTOPOLYMERIZABLE COMPOSITIONS**

**Jennings L. Jolly, Santa Clara, and Leo Roos, San Jose, both of Calif., assignors to Hercules Incorporated, Wilmington, Del.**

**Continuation-in-part of Ser. No. 15,980, Feb. 26, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,310**

**Int. Cl.³ G03C** *1/52, 1/68*

**U.S. Cl. 430—270** **11 Claims**

1. A contrast colorant for photopolymerizable compositions comprising in combination a leuco triarylmethane dye in combination with a sufficient amount for formation of the colored form of said dye upon irradiation with actinic light of a bromine-substituted cyclohexane wherein said substituents comprise at least five bromine atoms and from 0 to 1 chlorine atoms.

5. A photopolymerizable composition comprising:

(1) an addition polymerizable photoinitiator;

(2) a polymeric binder;

(3) a polymerizable monomer capable of photopolymerization initiated by said photoinitiator; and

(4) a contrast colorant composition comprising in combination a leuco triarylmethane dye in combination with a sufficient amount for formation of the colored form of said dye upon irradiation with actinic light of a bromine-substituted cyclohexane, wherein said substituents are other than geminally substituted and comprise at least five bromine atoms and from 0 to 1 chlorine atoms.

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**4,297,436**

**METHOD FOR PRODUCING A MULTILAYER PRINTING PLATE**

**Kikuo Kubotera; Masamichi Sato; Akira Kashiwabara, and Kotaro Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

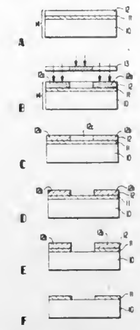
**Continuation of Ser. No. 645,049, Dec. 29, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,704**

**Claims priority, application Japan, Dec. 26, 1974, 49/443**

**Int. Cl.³ G03F** *7/02;* **G03C** *5/00*

**U.S. Cl. 430—310** **55 Claims**

1. A method for producing a multi-layer printing plate consisting essentially of image-wise exposing and tanning developing a light-sensitive printing plate material which comprises a support with an oleophilic surface having thereon a hydrophilic metal layer having thereon at least one silver halide emulsion layer comprising a silver halide and a water-soluble binder, either directly or on at least one subbing layer on the hydrophilic metal layer to thereby form hardened silver image areas and unhardened non-silver image areas; removing the unhardened areas by washing with water; baking the hardened silver image areas to render them a water impermeable resist



image, removing said hydrophilic metal layer at the non-resist image areas by etching and then removing the resist image.

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**4,297,437**

**PROCESSING METHOD OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**

**Yutaka Kaneko; Shigeto Hirabayashi; Satoshi Kawakatsu, and Hidetaka Ninomiya, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Nov. 24, 1980, Ser. No. 209,582**

**Claims priority, application Japan, Nov. 22, 1979, 54-151511**

**Int. Cl.³ G03C** *7/00*

**U.S. Cl. 430—376** **4 Claims**

1. A method for processing an exposed color photographic material which comprises on a support

(1) at least one of hydrophilic coloidal layer one of which layer containing a silver halide emulsion and a coupler, and

(2) a color developing agent or a precursor thereof in the hydrophilic layer, wherein the exposed color photographic material is developed in a color developer containing a color developing agent which color developer is replenished with a replenisher containing 0 to 0.016 mol/l of a color developing agent.

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**4,297,438**

**COLOR-PHOTOGRAPHIC DEVELOPMENT PROCESS**

**Helmut Häseler, Leverkusen; Heinz Meckl, Bergisch-Gladbach; Karl Lohmer, Leverkusen, and Willibald Pelz, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jul. 27, 1979, Ser. No. 61,472**

**Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833655**

**Int. Cl.³ G03C** *7/00*

**U.S. Cl. 430—377** **2 Claims**

1. In the process for the chromogenic development of an exposed color photographic material having at least three silver halide emulsion layers of differing spectral sensitivities and non-diffusible color couplers associated therewith, including a diphasic system comprised of a hydrophilic binder and hydrophobic oil former and at least one of said color couplers being hydrophobic and incorporated in the hydrophilic binder by means of the hydrophobic oil former, wherein the improvement comprises

at least one cyan coupler is hydrophobic and has been incorporated in the hydrophilic binder by means of the hydrophobic oil former and

at least one yellow coupler is hydrophilic and has been incorporated in the hydrophilic binder without the aid of an oil former or is hydrophobic and has been incorporated in the hydrophilic binder by means of a second oil former

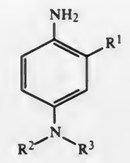
having increased hydrophilic character as compared to the hydrophobic oil former

and the chromogenic development of the exposed material is carried out with a developer composition comprising

a first hydrophobic developer compound which in its oxidized form is penetratable into said oil former in an amount to react preferentially with the hydrophobic cyan coupler, and

a second hydrophilic developer compound which in its oxidized form is present mainly in the aqueous phase in an amount to react predominantly with the hydrophilic yellow coupler

and in which the first and the second color developer compound, each corresponds to the following formula:



wherein

$R^1$ represents hydrogen or methyl,

$R^2$ represents alkyl and

$R^3$ represents sulfoalkyl in the second developer compound when

$R^3$ represents alkoxy alkyl in the first developer compound,

$R^3$ represents hydroxy alkyl in second developer compound when

$R^3$ represents methylsulfonylaminoalkyl in said first compond,

or

the second hydrophilic developer compound is selected from N-butyl-N- -sulfobutyl-p-phenylenediamine and 2-amino-5-(N-isopropyl-N- -sulfobutylamino)-toluene

and

the first developer compound is 2-amino-5-(N-ethyl-N-methylsulfonamido-ethylamino)-toluene.

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**4,297,439**

## PRODUCTION OF PHOTOGRAPHIC SILVER HALIDE EMULSION

**Peter Bergthaller, Cologne; Wilhelm Saleck, Bergisch-Gladbach; Otto Lapp, Leverkusen, and Bruno Mücke, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

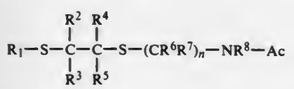
**Filed May 29, 1979, Ser. No. 42,974**

**Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824249**

**Int. Cl.³ G03C** *1/02, 1/28*

**U.S. Cl. 430—434** **8 Claims**

1. A process for the production of photographic materials containing at least one silver halide emulsion layer, characterised in that the silver halide emulsion is produced in the presence of at least one thioether corresponding to the following formula:



in which

$R^1$ represents an aliphatic or a cycloaliphatic or an aryl or an aralkyl radical;

$R^2$, $R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ are the same of different and represent hydrogen or alkyl;

$R^8$ represents hydrogen;

Ac represents an acyl radical;

n=an integer with a value of at least 1.

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**4,297,440**

## COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

**Kozo Aoki; Satoru Sawada; Yoshiharu Yabuki, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

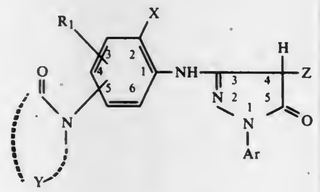
**Filed Nov. 25, 1980, Ser. No. 210,184**

**Claims priority, application Japan, Nov. 26, 1979, 54-153359**

**Int. Cl.³ G03C** *1/76, 1/40*

**U.S. Cl. 430—505** **12 Claims**

1. A color photographic light-sensitive element comprising a support having thereon a silver halide emulsion layer containing therein a 3-anilino-5-pyrazolone magenta color forming coupler represented by formula (I)



(I)

wherein the

is present at the 4- or 5-position of the anilino group; X represents a halogen atom or an alkoxy group; Ar represents an aryl group; $R_1$ represents hydrogen, a halogen atom, an alkyl group, an alkoxy group, or an alkylthio group; Y represents a non-metallic atomic group forming a 5-membered or 6-membered ring together with the

group, except that Y does not include a carbonyl group; and Z represents hydrogen or a coupling-off group.

12. A color photographic light-sensitive element as in claim 1, wherein said silver halide emulsion layer containing said magenta color-forming coupler represented by formula (I) is a green-sensitive silver halide emulsion layer, and said color photographic light-sensitive element additionally includes a red-sensitive silver halide emulsion layer containing a phenolic or naphtholic cyan color-forming coupler, and a blue-sensitive silver halide emulsion layer containing a benzoylacetanilide or pivaloylacetanilide yellow color-forming coupler.

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**4,297,441**

## PHOTOGRAPHIC MATERIAL

**Yutaka Kaneko; Satoshi Kawakatsu; Shigeto Hirabayashi, and Hidetaka Ninomiya, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Jun. 26, 1980, Ser. No. 163,347**

**Claims priority, application Japan, Jun. 28, 1979, 54/82175**

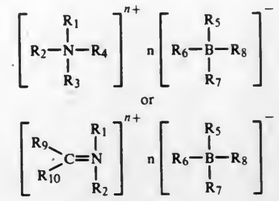
**Int. Cl.³ G03C** *1/06*

**U.S. Cl. 430—543** **8 Claims**

1. A photographic material having a silver halide emulsion layer coated on a support, which material contains an ion compound which is composed from a compound having a quaternary nitrogen atom as a cation and a boron compound as



an anion wherein the ion pair compound is represented by the following formula:



or



wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_9$ and $R_{10}$ individually represent a hydrogen atom or hydroxyl, alkyl, alkenyl, cycloalkyl, aryl, phenyl, acyl, amino, carbamoyl, sulfonyl or heterocyclic groups, $R_1$ and $R_2$, or $R_1$, $R_2$, and $R_3$ may form a hetero nitrogen-containing ring by bonding to each other, $R_5$, $R_6$, $R_7$ and $R_8$ individually represent an alkyl, alkenyl, cycloalkyl, aryl, phenyl, heterocyclic or cyano group, an n is an integer from 1 to 5.

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**4,297,442**

## CELLULAR ELASTOMERIC FOAMS AND METHOD OF PRODUCTION USING AN EXPANDING AGENT CONTAINING A COMPONENT REACTIVE WITH THE POLYAMINE CHAIN-LENGTHENING AGENT

**Johannes Blahak, Gauting-Buchendorf, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany**

**Filed Jun. 27, 1980, Ser. No. 163,732**

**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928357**

**Int. Cl.³ C08G** *18/14*

**U.S. Cl. 521—107** **12 Claims**

1. Cellular elastomeric foams produced by foaming a polyurethane or a polyurethane prepolymer and cross-linked with a polyamine-chain lengthening agent in the presence of an organic expanding agent containing at least in part a gas-forming component, which reacts with the polyamine chain-lengthening agent or with the products of reaction thereof with polyisocyanates.

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**4,297,443**

## METHOD FOR POLYURETHANE FOAM USING A TRI-TERTIARY AMINE CATALYST

**Paul E. Eckler; William A. Summers, both of Terre Haute, Ind., and Ollie W. Chandler, Kildeer, Ill., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.**

**Continuation-in-part of Ser. No. 79,845, Sep. 8, 1979, abandoned. This application Aug. 28, 1980, Ser. No. 182,243**

**Int. Cl.³ C08G** *18/14, 18/18;* **C07C** *87/18, 87/20*

**U.S. Cl. 521—129** **4 Claims**

1. In the method of preparing a polyurethane foam by reacting a polyisocyanate with polyol in the presence of a blowing agent and a catalyst to promote the reaction, the improvement consisting of conducting the reaction in the presence of 2-heptamethyl-N,N,N', N',N'',N''-1,2,3-propanetriamine.

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**4,297,444**

## PROCESS FOR RIM ELASTOMERS WITH SUPERIOR HIGH TEMPERATURE DIMENSIONAL STABILITY

**Richard J. G. Dominguez, and Doris M. Rice, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.**

**Filed Feb. 11, 1980, Ser. No. 120,238**

**Int. Cl.³ C08G** *18/14, 18/76, 18/10, 18/82*

**U.S. Cl. 521—160** **17 Claims**

1. In a method for making a polyurethane elastomer wherein an aromatic polyisocyanate, a polyether polyol based on trihydric initiators of about 4000 molecular weight and above and a chain extending agent comprising a low molecular weight active hydrogen containing compound of at least 2 functionality is injected via a RIM machine into a mold cavity of the desired configuration the improvement which comprises

mixing at least 30% of said polyether polyol with the entire amount of polyisocyanate and allowing them to react, adding the remaining polyether polyol and low molecular weight active hydrogen containing compound to the polyol and polyisocyanate reacted mixture and injecting this entire mixture into the mold cavity where it is allowed to react.

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**4,297,445**

## CONTINUOUS PRODUCTION OF OLEFIN BLOCK COPOLYMERS

**James N. Short, and Donald D. Norwood, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Sep. 28, 1979, Ser. No. 79,745**

**Int. Cl.³ C08F** *255/02, 255/04*

**U.S. Cl. 525—52** **6 Claims**

1. A method for the continuous production of block copolymer comprising:

(a) producing in a first zone a first reaction mixture comprising an ethylene homopolymer by reacting ethylene monomer in the presence of a catalyst system comprising $TiCl_4$, $MgCl_2$, and an organo metallic compound at a temperature in the range of about 90° to about 200° F. and a pressure above about 500 psig sufficient to maintain non-boiling liquid conditions in said first zone for a time in the range of about 5 to about 20 minutes;

(b) continuously introducing a portion of said first reaction mixture, propylene monomer, and a catalyst modifier to a second zone; and

(c) producing in said second zone block copolymer comprising blocks of propylene homopolymer and random ethylene-propylene copolymer by reaction in the presence of a catalyst system comprising $TiCl_4$, $MgCl_2$, and an organo metallic compound at a temperature in the range of about 100° to about 180° F. and a pressure above about 500 psig sufficient to maintain non-boiling liquid conditions in said second zone for a time in the range of about 30 to about 110 minutes to provide a total copolymer composition of about 10 to about 30 percent by weight of polymers of ethylene and about 70 to about 90 percent by weight of propylene homopolymer.

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**4,297,446**

## ABS-MOULDING COMPOSITIONS HAVING HIGH NOTCHED IMPACT STRENGTH

**Christian Lindner, Cologne; Karl-Heinz Ott, Leverkusen; Bernhard Arnold, Pulheim; Friedrich Kowitz, Dormagen; Harald Oertel, Odenthal, and Dieter Kuhlmann, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Aug. 24, 1979, Ser. No. 69,597**

**Claims priority, application Fed. Rep. of Germany, Aug. 29, 1978, 2837597**

**Int. Cl.³ C08L** *51/04, 51/00*

**U.S. Cl. 525—66** **2 Claims**

1. A molding composition comprising

(a) 5 to 70% by weight of at least one graft product made by graft polymerizing styrene, a mixture of styrene and acrylonitrile, a mixture of styrene and methylmethacrylate, or a mixture of styrene, acrylonitrile and methylmethacrylate onto a polybutadiene, a butadiene/styrene, or a butadiene/acrylonitrile rubber,

(b) 95 to 30% by weight of a thermoplastic resin selected from the group consisting of polystyrene, polymerized styrene and methylmethacrylate and polymerized styrene, acrylonitrile and methylmethacrylate, and 0.05-2% by weight based on the total mixture of a silico urethane

derivative which is the reaction product of an organofunctional silicone with a polyisocyanate.

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**4,297,447**

## COMPOUND FOR COATING CONTAINING FLUOROCARBONPOLYMER AND METHOD FOR ITS MANUFACTURE

**Toshio Yasuda, Naka, Japan, assignor to Elastoflon Inc., Woodmere, N.Y.**

**Continuation of Ser. No. 930,580, Aug. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 684,639, May 12, 1976, abandoned. This application May 28, 1980, Ser. No. 153,967**

**Int. Cl.³ C08L** *63/00, 75/04, 61/04, 27/18*

**U.S. Cl. 525—133** **24 Claims**

1. An improved flexible coating for a flexible heat-degradable substrate having the following essential components present together simultaneously in a percent by weight ratio based on the total weight of said coating, said essential components are (A) fluorocarbon present in said coating in an amount between 20 percent and 80 percent by weight, and (B) a thermosetting resin present in said coating in an amount between 4 percent and 14 percent by weight, said thermosetting resin selected from the group consisting of an epoxy resin, an alkylphenol resin, and a polyurethane resin which is entirely thermosetting, and (C) a rubbery elastomer present in said coating in an amount between 76 percent and 6 percent by weight, said rubbery elastomer selected from the group consisting of a nitrile rubber, a chloroprene rubber, and a rubbery polyurethane elastomer which is entirely thermoplastic, all three essential components defined as said fluorocarbon, said thermosetting resin, and said rubbery elastomer being present simultaneously together for flexibility of said coating on said heat-degradable substrate.

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**4,297,448**

## COATING COMPOSITION OF AMINOPLAST, HYDROXY POLYMERS AND VINYLIC MONOMERS

**Yun-Feng Chang, Plymouth; Henk V. Oene, Detroit, and Elaine C. Beckwith, Riverview, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Oct. 17, 1979, Ser. No. 85,570**

**Int. Cl.³ C08L** *71/02, 29/00, 33/20, 51/06*

**U.S. Cl. 525—162** **15 Claims**

1. A thermosetting coating composition comprising organic solvent, binder composition, and aminoplast crosslinking agent, wherein said binder composition comprises:

(A) between about 30 and about 75 weight percent of one or more low viscosity resins, each of which (1) is substantially soluble in the solvent of the composition, (2) has a number average molecular weight of between about 500 and about 3500 and (3) is selected from the group consisting of hydroxy functional acrylic polymers, hydroxy functional polyethers and hydroxy functional polyesters and bears no additional functionality which would interfere with the crosslinking reaction between the hydroxy functionality of the resin and the crosslinking agent of the composition; and

(B) between about 70 and about 25 weight percent of one or more crosslinked dispersion polymers, each of which is substantially insoluble in the solvent of the composition, said dispersion polymers being formed by free radical polymerization of 0.5 to 3.5 weight percent of di-, tri-, or tetravinyl monomers and 99.5 to 96.5 weight percent of at least one other copolymerizable monoethylenically unsaturated monomer, in the presence of a (i) hydrocarbon dispersing liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resulting crosslinked polymer, and (ii) polymeric dispersion stabilizer which is solvated by said dispersing liquid and associated with said crosslinked polymer so as to maintain a separation between particles thereof, thereby inhibiting coagulation of said particles, wherein polymerization is carried out at elevated temperature such that the dispersion polymer first forms and then is crosslinked.

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**4,297,449**

## PRODUCTION OF CROSSLINKED POLYMERS USING AN OXAZOLINE DERIVATIVE

**Jugo Goto, Kawanishi, and Takeo Saegusa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

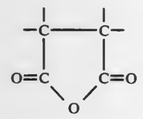
**Filed May 7, 1980, Ser. No. 147,543**

**Claims priority, application Japan, May 15, 1979, 54-60067**

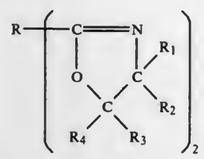
**Int. Cl.³ C08F** *8/00, 222/04, 222/06, 222/08*

**U.S. Cl. 525—329** **11 Claims**

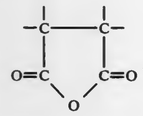
1. A process for producing a polymer having a crosslinked structure, which comprises reacting a polymer having in its molecule a partial structure of the formula:



with an oxazoline derivative of the formula:



wherein R is a di-valent aromatic hydrocarbon radical, and $R_1$, $R_2$, $R_3$ and $R_4$, which may be the same or different, are hydrogen or alkyl having not more than 3 carbon atoms, the ratio of the number of the oxazoline rings in the oxazoline derivative relative to each one of the partial structures of the formula:



in the polymer being within the range of about 1.5 to 3.0.

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**4,297,450**

## HOT MELT TYPE TRAFFIC PAINT COMPOSITIONS

**Hisatake Sato; Masaharu Makino, and Hideo Hayashi, all of Yokohama, Japan, assignors to Nippon Oil Co. Ltd., Japan**

**Filed Jun. 2, 1980, Ser. No. 155,209**

**Claims priority, application Japan, Jun. 8, 1979, 54-72060**

**Int. Cl.³ C08F** *8/04*

**U.S. Cl. 525—333** **13 Claims**

1. A hot melt type traffic paint composition characterized by containing as a binder a partially ring-hydrogenated resin obtained by hydrogenating from 20 to 70% of the aromatic rings of an aromatic hydrocarbon resin having a softening point between 60° and 120° C. and a bromine value of not greater than 15 obtained by polymerization in the presence of a Friedel-Crafts catalyst of a fraction prepared so as to have a conjugated diolefin content of not more than 1.0 wt % and in a ratio of not more than 3.0% with respect to the total amount of polymerizable ingredients and a total content of indene and its alkyl derivatives of not more than 4.0 wt % and in a ratio of not more than 12.0% with respect to the total amount of polymerizable ingredients, said fraction being obtained by distillation of cracked oil fractions which have boiling points in the range of 140° to 220° C. and which are prepared by cracking of petroleum.



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**4,297,451**

## DIENYLLITHIUM INITIATED POLYMERS

**Carl A. Uraneck; John E. Burleigh, and Paul W. Solomon, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 10, 1979, Ser. No. 55,868**

**Int. Cl.³ C08L** *49/00*

**U.S. Cl. 525—366** **57 Claims**

1. A process which comprises the steps of

(A) polymerizing to substantially complete conversion at least one first polymerizable olefinically unsaturated monomer under anionic solution polymerization conditions employing a dienyllithium initiator, thereby resulting in a polymerization admixture containing polymer terminated at least in part with a conjugated dienyl functional group, wherein said dienyllithium initiator is a product prepared by contacting at least one hydrocarbon lithium compound $R(Li)_x$ with at least one hydrocarbon 1,4-diolefin in a mixed solvent of saturated hydrocarbon/polar compound, under dienyllithium initiator forming temperature conditions, wherein R is a hydrocarbyl radical of valence x, and x is an integer of 1 to 4;

(B) treating said polymerization admixture containing polymer terminated at least in part with a conjugated dienyl functional group by a treating mode to produce a polymer selected from the group consisting of:

(a) a polymer produced by treating with an effective amount of at least one polyfunctional coupling agent of at least difunctionality, thereby preparing at least in part a coupled conjugated dienyl terminated polymer if increased molecular weight characterized by conjugated dienyl groups on the extending terminal ends of the coupled polymer;

(b) a polymer produced by treating with at least one unsaturated compound selected from the group consisting of alicyclic conjugated trienes and tetraenes, and linear conjugated dienes, thereby providing a polymer containing at least in part terminal conjugated unsaturation at both ends of the polymer chain;

(c) a polymer produced by treating with an active hydrogen-containing compound sufficient to terminate active lithium, and thereafter reinitiating polymerization with a hydrocarbon lithium initiator $R(Li)_x$, with or without the further addition of a second polymerizable monomer the same or different from said first polymerizable monomer, thereby forming a branched polymer with broadened molecular weight;

(d) a polymer produced by maintaining said conjugated dienyl terminated polymer at substantially polymerization temperatures for a time sufficient to effect at least partial self-coupling, and thereafter adding a second polymerization monomer and polymerizing thereonto, thereby resulting in a branched polymer at least in part;

(e) a polymer produced by treating as defined by substep (a) above followed by reinitiating polymerization with a further addition of a hydrocarbon lithium initiator $R(Li)_x$, with or without the further addition of a second polymerizable monomer the same or different from said first polymerizable monomer, thereby resulting at least in part in a branched polymer;

(C) wherein when any polymer resulting from any of said (a) through (e) inclusive retains active lithium, thereafter treating with an active hydrogen-containing compound effective to terminate said active lithium.

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**4,297,452**

## PROCESS FOR THE MANUFACTURE OF OXAZOLINE AND/OR OXAZINE-MODIFIED ADSORBENT POLYMER RESINS

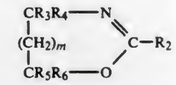
**Robert J. De Koch, Wausau, Wis.; Gerald C. Kolb, Bay City, and James W. Lalk, Shepherd, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jan. 4, 1980, Ser. No. 109,729**

**Int. Cl.³ C08F** *8/20, 8/24*

**U.S. Cl. 525—367** **8 Claims**

1. In a process for graft polymerizing (i) an oxazoline or oxazine monomer corresponding to the formula



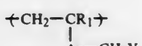
wherein:

$R_2$ is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms;

$R_3$–$R_6$ are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, with the proviso that at least two of $R_3$–$R_6$ are hydrogen;

m is 0 or 1;

with (ii) a cross-linked, vinyl-addition polymer the backbone of which contains a plurality of units corresponding to the formula



wherein:

$R_1$ is hydrogen or methyl,

Ar is a carbocyclic aromatic nucleus, and

Y is chloro or bromo;

in an inert liquid reaction medium which dissolves the oxazoline or oxazine reactant, the improvement comprising the sequential steps of:

(A) contacting at reactive conditions the vinyl-addition polymer with a source of iodide ions, so as to introduce sufficient iodo moieties into the polymer to catalyze reaction of the polymer with the oxazoline or oxazine moiety; and

(B) contacting at reactive conditions the iodized crosslinked, vinyl-addition polymer of step (A) with from about 8 to about 24 equivalents of the oxazoline or oxazine monomer for each equivalent of halomethyl moieties borne by the polymer, so as to react up to about 50 percent of the total oxazoline or oxazine monomer present.

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**4,297,453**

## COMPOSITIONS OF EPICHLOROHYDRIN RUBBER AND NYLON

**Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mich.**

**Filed May 12, 1980, Ser. No. 149,075**

**Int. Cl.³ C08L** *71/02, 77/00*

**U.S. Cl. 525—408** **22 Claims**

1. A composition comprising a blend of about 20–55 parts by weight of nylon, and, correspondingly, about 80–45 parts by weight of cured epichlorohydrin rubber.

**4,297,454**

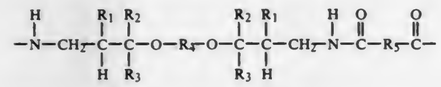
## MANUFACTURE OF A BLOCK COPOLYMER CONTAINING A POLYETHERAMIDE AND A POLYLACTAM

**Robert M. Thompson, Wilmington, Del., assignor to Suntech, Inc., Philadelphia, Pa.**

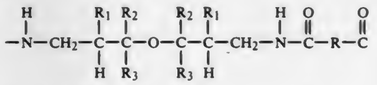
**Filed Nov. 14, 1979, Ser. No. 133,370**
**Int. Cl.³ C08L 77/02**
**U.S. Cl. 525—432** **9 Claims**

1. Method for preparing a block copolymide comprising polymerizing a lactam in contact with a polyetheramide to form polylactam in situ to form block copolyamide by reaction of said polylactam and said polyetheramide,

wherein at least one of the lactam and polyetheramide are molten during said lactam polymerization and block copolymer formation, the lactam is present in the mixture of lactam and polyetheramide in an amount of about 5 wt.% to about 70 wt.% of said mixture, and the polyetheramide is selected from polymers of the structures:



AND



wherein $R_1$, $R_2$ and $R_3$ each are H, $C_1$–$C_{10}$ alkyl or $C_3$–$C_{10}$ isoalkyl, $R_4$ is $C_1$–$C_{10}$ alkylene or $C_3$–$C_{10}$ isolkylene, and $R_5$ is $C_0$–$C_{10}$ alkylene, $C_3$–$C_{10}$ isoalkylene or $C_6$–$C_{20}$ arylene.

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**4,297,455**

## PROCESS FOR THE PREPARATION OF CARBONIC ACID ARYL ESTERS OF POLYESTER-DIOLS LENGTHENED VIA CARBONATE GROUPS AND THEIR USE FOR THE PREPARATION OF POLYESTER-DIOL BIS-DIPHENOL CARBONATES AND POLYESTER/POLYCARBONATES

**Christian Lindner, Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal; Manfred Schreckenberg; Dieter Freitag, both of Krefeld, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 886,212, Mar. 13, 1978, Pat. No. 4,217,297. This application May 30, 1978, Ser. No. 910,986**
**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712435; Jun. 11, 1977, 2726417**
**Int. Cl.³ C08G 63/64, 63/76, 63/00**
**U.S. Cl. 525—439** **42 Claims**

1. A process for the preparation of a polyesterdiol bis-diphenol carbonate, lengthened via carbonate groups, comprising:

(i) heating a polyester-diol having a molecular weight $\overline{M}n$ (number-averrage) of over 250 with a carbonic acid bis-aryl ester

(a) at a temperature between about 100° C. and about 200° C.,

(b) in vacuo below about 35 mm Hg, and

(c) in the presence of a catalyst, characterized in that less than 1 mol of carbonic acid bis-aryl ester is employed per mol of OH-groups of the polyester diol, and

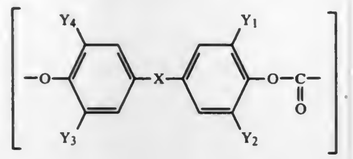
(ii) heating the resulting polyester-diol bis-carbonic acid aryl ester, lengthened via carbonate groups, with a diphenol

(a) at a temperature between about 100° C. and about 200° C.,

(b) in vacuo below about 35 mm Hg, and

(c) in the presence of a catalyst, characterized in that more than 1 mol of diphenol is employed per mol of carbonic acid aryl ester groups of the polyester-diol bis-carbonic acid aryl ester, lengthened via carbonate groups.

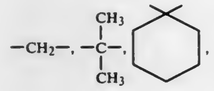
16. A polyester/polycarbonate the molecular chain of which is terminated by residues of chain stoppers comprising from about 30 to about 95% by weight of aromatic polycarbonate structural units of the formula



(III(a))

wherein

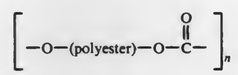
X denotes



O, S or $SO_2$ and

$Y_1$ to $Y_4$ are identical or different and denote hydrogen or halogen

and from about 70 to about 5% by weight of polyester-diolate block units, lengthened via carbonate groups, of the simplified formula



(VI)

wherein

-(polyester)-represents the bivalent radical of a polyester-diol, and n denotes an integer from 2 to 20.

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**4,297,456**

## PROCESS FOR WORKING UP ISOCYANATE DISTILLATION RESIDUES

**Artur Reischl, and Kuno Wagner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 88,800, Oct. 29, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,589**
**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846815**
**Int. Cl.³ C08G 18/70**
**U.S. Cl. 525—452** **13 Claims**

1. A process for working up tolylene diisocyanate distillation residues into useable starting products for the production of plastics, wherein such distillation residue is a substantially monomer-free, crosslinked distillation residue which is insoluble in inert organic solvents and which cannot be melted without decomposing, of the type accumulating as slag in the removal of monomeric tolylene diisocyanates by distillation from the crude phosgenation product of tolylene diamines, comprising grinding said distillation residues to a mean particle size of less than 800 mμ.



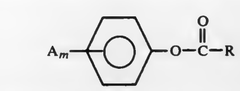
**4,297,457**

## CURABLE EPOXY RESIN COMPOSITION

**Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 11, 1980, Ser. No. 168,635**
**Int. Cl.³ C08G 59/68**
**U.S. Cl. 525—507** **33 Claims**

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where R is independently selected from the class consisting of hydrogen, monovalent alkyl, aryl, alkaryl, aralkyl, vinyl and allyl radicals; A is independently selected from the class consisting of hydrogen, monovalent alkyl, alkoxy, halogen, cyano and amino radicals, and m is a whole number from 1 to 2, inclusive.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

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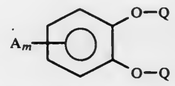
**4,297,458**

## CURABLE EPOXY RESINS

**Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jul. 14, 1980, Ser. No. 168,037**
**Int. Cl.³ C08G 59/68**
**U.S. Cl. 525—507** **33 Claims**

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where Q is independently selected from the class consisting of Si—$R_3$ or hydrogen and, R is independently selected from the class consisting of hydrogen, monovalent alkyl (including aralkyl) groups of from 1 to 8 carbon atoms; aryl, alkaryl, vinyl, and allyl radicals, A is independently selected from alkyl radicals the same as R above, halogen and the nitro radical, where A can be ortho-, meta-, or para- to either of the —OQ radicals, and m is an integer from 1 to 2, inclusive, with the proviso, that only one Q can be hydrogen, and only one R can be hydrogen on one silicon atom.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

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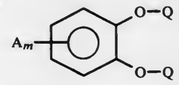
**4,297,459**

## CURABLE EPOXY RESINS

**Charles J. Stark, Jr., Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 8, 1980, Ser. No. 176,467**
**Int. Cl.³ C08G 59/68**
**U.S. Cl. 525—507** **25 Claims**

1. A composition of matter comprising an epoxy resin, a cure initiator, and an accelerator of the general formula



where Q is independently selected from the class consisting of allyl radicals having from 3 to 15 carbon atoms, or hydrogen radicals and A is independently selected from the class consisting of monovalent alkyl (including aralkyl) groups of from 1 to 8 carbon atoms, halogen and the nitro radical, where A can be ortho-, meta-, or para- to either of the —OQ radicals, and m is an integer from 0 to 2, inclusive, with the proviso that only one Q can be hydrogen.

2. A composition of matter as in claim 1, wherein the cure initiator is a titanium or zirconium ester.

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**4,297,460**

## TREATMENT OF SILICA

**Max P. McDaniel, and Melvin B. Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.**

**Division of Ser. No. 44,809, Jun. 1, 1979, Pat. No. 4,248,735, which is a continuation-in-part of Ser. No. 857,552, Dec. 5, 1977, abandoned. This application Jul. 30, 1980, Ser. No. 173,525**
**Int. Cl.³ C08F 4/02, 4/24, 4/78**
**U.S. Cl. 526—98** **23 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin having 2 to 8 carbon atoms with a catalyst prepared by subjecting a silica-containing support at an elevated temperature to a treating ambient selected from (1) carbon monoxide, (2) a halogen-containing component selected from bromine, iodine, HBr, HI, organic bromides, and organic iodides, which halogen-containing component also either contains air or is followed by air or (3) a carbon, oxygen and sulfur-containing composition, thereafter incorporating a chromium compound under anhydrous conditions to thus form said catalyst and thereafter activating said catalyst in an oxygen ambient.

22. A method according to claim 1 wherein said support is preoxidized by being subjected to oxidation conditions after being subjected to said ambient and prior to incorporation of said chromium compound.

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**4,297,461**

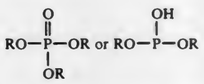
## OLEFIN POLYMERIZATION CATALYST

**Anthony N. Speca, Cincinnati, Ohio, assignor to National Petro Chemicals Corp., New York, N.Y.**

**Division of Ser. No. 46,985, Jun. 8, 1979, Pat. No. 4,238,353, which is a continuation-in-part of Ser. No. 924,470, Jul. 14, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 141,095**
**Int. Cl.³ C08F 4/78**
**U.S. Cl. 526—100** **7 Claims**

1. A process for polymerizing an olefin which comprises contacting the olefin with a catalyst system produced by a process which comprises:

(a) depositing an organophosphoryl chromium reaction product of chromium trioxide and phosphorus compound having the formula



wherein R is alkyl, aralkyl, aryl, cycloalkyl, or hydrogen but at least one R is other than hydrogen, upon a solid inorganic support material;

(b) depositing the non-volatile aluminum-containing product obtained from the reaction of an aluminum alkoxide and an aluminum carboxylic acid salt upon said support material; and,

(c) heat-activating said supported organophosphoryl chromium reaction product and non-volatile aluminum-containing reaction product in a non-reducing atmosphere at a temperature above about 300° C. up to the decomposition temperature of the support material.

**4,297,462**

## POLYMERIZATION OF MONOOLEFINS USING AN ALUMINUM-TITANIUM CATALYST SYSTEM

**Margherita Corbellini, Milan; Alberto Greco, Dresano, and Mirko Osellame, Ombriano, all of Italy, assignors to Snamprogetti S.p.A, Milan and Anic S.p.A, Palermo, both of, Italy**

**Division of Ser. No. 915,998, Jun. 16, 1978, Pat. No. 4,203,866.**
**This application Sep. 25, 1979, Ser. No. 78,899**
**Claims priority, application Italy, Jun. 30, 1977, 25232 A/77**
**Int. Cl.³ C08F *4/64***
**U.S. Cl. 526—125** **14 Claims**

1. A method for the polymerization or copolymerization of monoolefins which comprises contacting said monolefin with a catalyst system composed of an aluminum derivative of the formula $AlR_pX_{3-p}$ in which R is a hydrocarbonaceous radical, X is a halogen radical and p is a number from 1 to 3; in combination with a composition based on a titanium halide in which said titanium has a valence of three or greater and a halide of a metal, said metal selected from zirconium, molybdenum, zinc or calcium, said composition prepared by reacting a titanium compound with the vapors of one or more of said metals in the presence of a halogen donor, and wherein the metal:titanium molar ratio is greater than 1:n, n being the valency of the metal with the greatest valency.

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**4,297,463**

## METHOD FOR POLYMERIZING α-OLEFIN

**Haruo Ueno, Chiba; Takefumi Yano, Ichihara; Tokuji Inoue, Ichihara; Shigeru Ikai, Ichihara; Yoshiyuki Kai, Ichihara, and Michimasa Shimizu, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Chiba, Japan**

**Filed May 6, 1980, Ser. No. 147,279**
**Claims priority, application Japan, Sep. 21, 1979, 54-120726**
**Int. Cl.³ C08F *4/02, 10/06***
**U.S. Cl. 526—128** **25 Claims**

1. A method for polymerizing an α-olefin which comprises bringing, in the presence of an organic acid ester, a feed containing at least one α-olefin having 3 or more carbon atoms into contact with a catalyst comprising (A) a solid catalytic ingredient prepared by (a) reacting an aluminium halide with a tetraalkoxysilane to form a first reaction product, (b) reacting a Grignard compound with said first reaction product to form a second solid reaction product, (c) contacting said second solid reaction product with a titanium tetrahalide, (d) treating the resultant titanium-containing solid product with an organic acid ester and, finally, (e) contacting the treated solid product with a titanium tetrahalide; and (B) another catalytic ingredient consisting of at least one trialkyl aluminium.

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**4,297,464**

## ORTHOESTERS AS COUPLING AGENTS FOR PRODUCING MONOVINYLARENE HOMOPOLYMERS

**William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

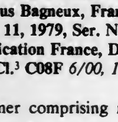
**Division of Ser. No. 5,625, Jan. 22, 1979, Pat. No. 4,238,576.**
**This application Aug. 15, 1980, Ser. No. 178,402**
**Int. Cl.³ C08F *4/46, 8/06, 8/14***
**U.S. Cl. 526—181** **4 Claims**

1. A method of producing coupled monovinylarene homopolymers, said method comprising:

(a) forming a polymerization mixture comprising (1) at least one monomer selected from the group consisting of monovinylarenes and (2) an organo alkali metal initiator;

(b) polymerizing said at least one monomer so as to form living homopolymer molecules;

(c) coupling said living homopolymer molecules with an orthoester, said orthoester having the formula



wherein R, R′, and R″ are the same or different and are individually selected from alkyl groups.

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**4,297,465**

## CATALYSTS FOR POLYMERIZING PROPYLENE IN A HIGH TEMPERATURE SOLUTION PROCESS

**Thomas W. Smith, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 29, 1980, Ser. No. 201,955**
**Int. Cl.³ C08F *2/06, 10/06***
**U.S. Cl. 526—141** **15 Claims**

1. The process for polymerizing an α-mono-olefin containing at least 3 carbon atoms to solid, high molecular weight polymer having a crystallinity of at least 72% which comprises contacting said α-mono-olefins, at a temperature in the range of about 120° to about 300° C. and a pressure in the range of about atmospheric to about 2,000 atmospheres, with a catalyst mixture comprising (1) an aluminum trialkyl, (2) a halide of a transition metal selected from the group consisting of titanium and vanadium, the valence of the metal in said halide being at least one less than maximum and (3) a 2-amino alkyl carboxylate wherein the molar ratio of catalyst components is 0.5–10/1/0.05–1.

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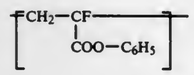
**4,297,466**

## NOVEL ACRYLIC POLYMERS AND METHOD OF MAKING SAME

**Bertrand Bloch, Paris; Chantal Cavalli born Meyer, Voisins le Bretonneux, and Denis Charrier, Antony, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon sous Bagneux, France**

**Filed Dec. 11, 1979, Ser. No. 102,427**
**Claims priority, application France, Dec. 15, 1978, 78 35459**
**Int. Cl.³ C08F *6/00, 14/18***
**U.S. Cl. 526—218** **15 Claims**

1. An acrylic polymer comprising recurring units of the formula:



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**4,297,467**

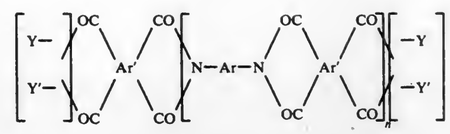
## POLYMERIZATION PRODUCTS OF POLYIMIDE DERIVATIVES HAVING UNSATURATED TERMINAL AMIDE GROUPS

**Phillip A. Waitkus, Sheboygan, Wis., and Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), assignors to Plastics Engineering Company, Sheboygan, Wis.**

**Filed Jan. 25, 1980, Ser. No. 115,483**
**Int. Cl.³ C08F *26/06***
**U.S. Cl. 526—259** **21 Claims**

1. A cured polymerization product of the unsaturated amide of the formula:





wherein:

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical except that in the case of the Ar′ being a naphthalene radical one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

Ar is a divalent aromatic organic radical;

n is zero or an integer of at least one;

Y is —NRR′;

R is an organic moiety containing 1 to 18 carbon atoms;

R′ is an organic moiety containing 2 to 14 carbon atoms and having a terminal $CH_2$=CH— structure;

Y′ is —NRR, —OR, —OH or —X;

X is a halogen.

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**4,297,468**

## ALLYL AMIDO PHOSPHOROUS COPOLYMERS

**Miroslav Chmelir, Krefeld, and Kurt Dahmen, Monchengladbach, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Fed. Rep. of Germany**

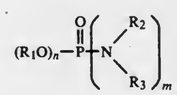
**Filed May 16, 1979, Ser. No. 39,614**
**Claims priority, application Fed. Rep. of Germany, May 23, 1978, 2822423**
**Int. Cl.³ C08F *230/02***
**U.S. Cl. 526—276** **9 Claims**

1. A cross-linked copolymer consisting of polymerized units of

(A) at least one olefinically unsaturated carboxylic acid,

(B) at least one mono-olefinically unsaturated monomer in up to four times the weight of (A), and

(C) 0.1 to 4% by weight of (A) plus (B) of at least one allyl monomer of the formula



in which

n=0, 1 or 2,

m=1, 2 or 3,

n+m=3,

$R_1$=hydrogen, or an alkyl, alkoxyalkyl, haloalkyl, cycloalkyl, aryl, alkaryl, or alkenyl radical, and

$R_2$ and $R_3$ each independently is hydrogen or an allyl, alkyl, cycloalkyl, aryl, aralkyl or alkaryl radical,

at least two of the radicals $R_1$, $R_2$ and $R_3$ being an allyl radical or a substituted allyl radical.

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**4,297,469**

## BIPOLYMER OF VINYL SULFONIC ACID-GLYCIDOL ADDUCT AND ACRYLAMIDE

**Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.**

**Division of Ser. No. 916,984, Jun. 19, 1978, Pat. No. 4,228,017.**
**This application Apr. 4, 1980, Ser. No. 137,183**
**Int. Cl.³ C08F *228/02***
**U.S. Cl. 526—287** **3 Claims**

1. A water-soluble copolymer consisting of repeating units of (a) vinyl sulfonic acid alkoxylated with 2,3-epoxy-1-propanol, and (b) acrylamide having a number average molecular weight of about 10,000 to about 2,000,000.

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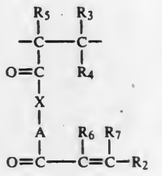
**4,297,470**

## IMAGE FORMING PROCESS

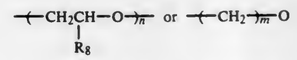
**Chiaki Osada; Masato Satomura, and Hisatake Ono, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 212,530, Dec. 27, 1971, abandoned.**
**This application Feb. 4, 1974, Ser. No. 439,685**
**Claims priority, application Japan, Dec. 26, 1970, 45/118984**
**Int. Cl.³ C08F *20/26, 20/58***
**U.S. Cl. 526—304** **4 Claims**

1. A process for producing photosensitive homopolymers containing the recurring unit:



wherein A is:



wherein $R_8$ is a hydrogen atom or an alkyl group having 1 to about 6 carbon atoms, n is the integer of 1, m is an integer or from 1 to 6;

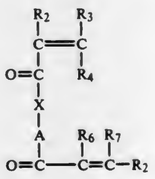
$R_2$ is:

$R_3$ and $R_4$ are each hydrogen:

$R_5$ is a hydrogen atom or an alkyl group having from 1 to about 6 carbon atoms:

$R_6$ is a hydrogen atom: X is —O— or —NH—

$R_7$ is hydrogen, which process comprises preparing a mixture containing a monomer represented by the general formula:



wherein A, X, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$ and $R_7$ are as defined above, and a polymerization initiator under an inert atmosphere; and holding said mixture under an inert atmosphere for time sufficient for the polymer to form.

**4,297,471**

## ODORLESS OR LOW-ODOR CROSSLINKABLE COMPOUND AND RESIN COMPOSITION CONTAINING THE SAME

**Tohru Koyama, Hitachi; Toshikazu Narahara, Tokaimura, and Yuji Aimono, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan**

**Filed Apr. 10, 1980, Ser. No. 139,025**

**Claims priority, application Japan, Apr. 13, 1979, 54-45596; Apr. 17, 1979, 54-47677**

**Int. Cl.³ C08G *10/04*; C07C *69/54***

**U.S. Cl. 526—328** **10 Claims**

1. A crosslinkable compound obtained by reacting an aromatic hydrocarbon-formaldehyde resin with an $\alpha,\beta$-unsaturated monocarboxylic acid or an ester thereof in the presence of an esterification or ester interchange catalyst.

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**4,297,472**

## METHOD OF PRODUCING COLOR STABLE THERMOPLASTIC POLYMETHANES AND PRODUCTS MADE THEREBY

**Herbert L. Heiss, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.**

**Filed Aug. 26, 1977, Ser. No. 828,121**

**Int. Cl.³ C08G *18/32, 18/42***

**U.S. Cl. 528—84** **6 Claims**

1. A method of improving the color stability of thermoplastic polyurethanes prepared from a reaction mixture comprising

(a) an aromatic polyisocyanate,

(b) a polyester polyol, and

(c) an active hydrogen containing chain extender, said method comprising

(A) adding to said reaction mixture

(d) from 0.05 to 2 percent by weight based on the total weight of said reaction mixture of a hydroxyl group containing additive, said additive characterized as

(i) having a molecular weight of 400 or less, and

(ii) containing 2 to 4 aliphatic hydroxyl groups with at least 2 of said hydroxyl groups being vicinal and with the vicinal hydroxyl groups being primary and/or secondary, said additive (d) not being present in component (b) or (c), and

(B) reacting said components (a), (b), (c) and (d).

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**4,297,473**

## QUICK-CURING PHENOLIC RESIN AND PROCESS FOR PREPARING SAME

**Shigeru Koshibe, Toride, and Motoyuki Nanjo, Yokohama, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan**

**Filed May 9, 1980, Ser. No. 148,104**

**Claims priority, application Japan, May 21, 1979, 54-61478**

**Int. Cl.³ C08G *8/10***

**U.S. Cl. 528—144** **5 Claims**

1. A process for producing a quick-curing phenolic resin having an ortho linkage to para linkage ratio ranging from 0.85 to 2.5 and a number-average molecular weight of the resin exclusive of free phenol of 500 to 1,200, which comprises

reacting phenol (P) with formaldehyde (F) in a F/P molar ratio ranging from 0.6 to 1.0 using only as a catalyst at least one acid selected from the group consisting of formic acid, oxalic acid, malonic acid, and succinic acid, said reaction being effected at a temperature of 105°–130° in at least the first stage for 3–5 hours.

**4,297,474**

## POLYETHERIMIDES PREPARED BY SELF-CONDENSATION OF HYDROXYARYL PHTHALIMIDE SALTS

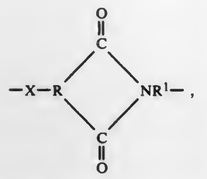
**Frank J. Williams, III, Scotia, and Howard M. Relles, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 29, 1980, Ser. No. 125,796**

**Int. Cl.³ C08G *73/10***

**U.S. Cl. 528—170** **7 Claims**

1. Polyetherimides comprising chemically combined units of the formula,



where R is a trivalent $C_{(6-13)}$ aromatic organic radical, $R^1$ is a divalent $C_{(6-30)}$ aromatic organic radical and X is selected from —O—, or —S—.

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**4,297,475**

## FLAME RETARDANT INTUMESCENT POLYAMIDE FROM HALOAMIDE

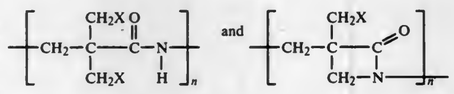
**Linnea E. Nelson, and Charles E. Reineke, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.**

**Division of Ser. No. 870,312, Jan. 18, 1978. This application Apr. 24, 1978, Ser. No. 899,185**

**Int. Cl.³ C08G *69/00, 69/22***

**U.S. Cl. 528—271** **10 Claims**

1. A solid polyamide composition consisting essentially of repeating structural units of the formulas



wherein

X is independently chloro or bromo, and n and n′ are each independently a positive integer.

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**4,297,476**

## ESTER DIOL ALKOXYLATE BASED ALKYD RESINS

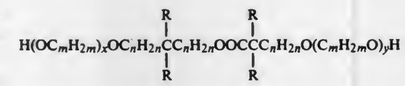
**Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed May 27, 1980, Ser. No. 153,457**

**Int. Cl.³ C08G *63/66***

**U.S. Cl. 528—300** **21 Claims**

1. An alkyd resin comprising the reaction product of (A) an ester diol alkoxylate of the formula



II

wherein m is an integer having a value of from 2 to 4, n is an integer having a value of from 1 to 5, x and y are integers each having a value of from 1 to 20, and R is an unsubstituted or substituted alkyl group having from 1 to 8 carbon atoms with (B) a polyol and (C) a polycarboxylic acid or anhydride thereof.



**4,297,477**

## POLYAMIDE HAVING —NH—$(CH_2)_4$—CH(NRR′)—CO— UNITS

**Minoru Nakata, Suzuka; Haruyo Sato, and Shinzo Imamura, both of Nagoya, all of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan**

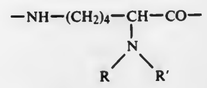
**Filed Dec. 31, 1979, Ser. No. 108,941**

**Claims priority, application Japan, Jan. 5, 1979, 54-856; Jan. 5, 1979, 54-857; Jan. 5, 1979, 54-858**

**Int. Cl.³ C08G *69/14***

**U.S. Cl. 528—323** **7 Claims**

1. A basic polyamide having a repeating unit represented by the formula:



wherein R and R′ each is a lower alkyl group having 1 to 4 carbon atoms, and having a relative viscosity of at least 1.5 measured at 25° C. in a solution of said basic polyamide at a concentration of 1 gr/100 ml. in a 98% sulfuric acid solvent.

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**4,297,478**

## PROCESS FOR THE DISCONTINUOUS PRODUCTION OF AROMATIC IN MIXTURE OF POLYAMIDES CALCIUM CHLORIDE AND N-METHYLPYRROLIDONE-2

**Vincent Rochina, L'Arbresle, and Jean Sacco, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France**

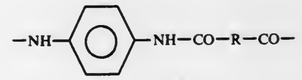
**Filed Apr. 18, 1978, Ser. No. 897,499**

**Claims priority, application France, Apr. 27, 1977, 77 13620**

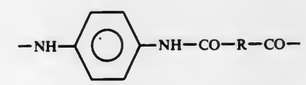
**Int. Cl.³ C08G *69/28***

**U.S. Cl. 528—336** **6 Claims**

1. A process for the discontinuous production of a spinnable polyamide consisting of repeating units of the generic formula:



in which 50 to 100% of the radicals R are p-phenylene radicals and the remaining 0 to 50% of the radicals R consist essentially of n-butylene radicals, which polyamide has a fiber-forming viscosity, measured at 25° C. on a solution in 100% strength sulphuric acid which has a concentration of 0.5 g of polymer in 100 ml of solvent, characterized in that terephthaloyl chloride, or terephthaloyl chloride and adipoyl chloride, is reacted with a solution selected from the group consisting of para-phenylenediamine, 4,4′-diaminoadipanilide, and a mixture of the same, in a mixture of N-methylpyrrodlidone-2 and calcium chloride, under conditions such that: the acid chloride or chlorides and the diamine or diamines are in essentially stoichiometric proportions; the solution of diamine or diamines in the mixture of N-methylpyrrolidone-2 and $CaCl_2$ is homogeneous and substantially anhydrous; with the $CaCl_2$ initially being in and remaining in solution at the time of its use; the calcium chloride content is such that the ratio $C_m$ of the number of mols of calcium chloride to the number of units:



is between 0.70 and 2.90; and the relative amounts of reactants and solvents are chosen such that, at the end of the reaction, the polymer content of the resulting polymer-containing composition obtained is between 5 and 16% by weight, relative to the N-methylpyrrolidone-2.

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**4,297,479**

## PROCESS FOR THE CONTINUOUS PRODUCTION OF AROMATIC POLYAMIDES IN A MIXTURE OF CALCIUM CHLORIDE AND N-METHYLPYRROLIDONE-2

**Vincent Rochina, L'Arbresle, and Jean Sacco, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France**

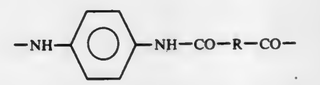
**Filed Apr. 18, 1978, Ser. No. 897,500**

**Claims priority, application France, Apr. 27, 1977, 77 13619; Feb. 20, 1978, 78 05000**

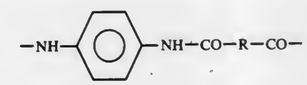
**Int. Cl.³ C08G *69/28***

**U.S. Cl. 528—336** **8 Claims**

1. A process for the continuous production of a spinnable polyamide-containing composition consisting of repeating units of the generic formula:



in which 50 to 100% of the radicals R are p-phenylene radicals and the remaining 0 to 50% of the radicals R consist essentially of n-butylene radicals, which polyamide has a fiber-forming viscosity, measured at 25° C. on a solution in 100% strength sulphuric acid which has a concentration of 0.5 g of polymer in 100 ml of solvent, characterized in that (a) molten terephthaloyl chloride, or (b) molten terephthaloyl chloride in admixture with adipoyl chloride, is reacted continuously with a solution of (c) para-phenylenediamine, or (d) 4,4′-diaminoadipanilide, or (e) a mixture of (c) and (d), or (f) a mixture of (c) and (g) a prepolymer formed from at least one chloride and at least one diamine from amongst those mentioned above, or (d) in admixture with (g), or (e) in admixture with (g), in a mixture of N-methylpyrrolidone-2 and calcium chloride, under conditions such that: the acid chloride or chlorides and the diamine or diamines are in essentially stoichiometric proportions; the solution of diamine or diamines, and when present the prepolymer, in the mixture of N-methylpyrrolidone-2 and calcium chloride, is homogeneous and substantially anhydrous; with the $CaCl_2$ being in and remaining in solution at the time of its use; the molar ratio of calcium chloride to the number of units:



is at least 1; and the relative amounts of reactants and solvents are chosen such that, at the end of the reaction, the resulting polymer-containing composition contains at least 5% by weight of polyamide, relative to the N-methylpyrrolidone-2.

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**4,297,480**

## TRANSPARENT POLYAMIDE FROM BRANCHED CHAIN $C_{11}$ DIAMINE

**Josef Pfeifer, Therwil, Switzerland, and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Giba-Geigy Corporation, Ardsley, N.Y.**

**Filed Oct. 9, 1979, Ser. No. 83,142**

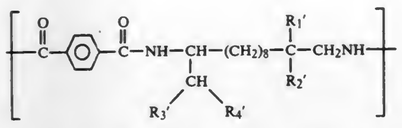
**Claims priority, application Switzerland, Oct. 18, 1978, 10771/78**

**Int. Cl.³ C08G *69/26***

**U.S. Cl. 528—346** **5 Claims**

1. A transparent polyamide having a reduced specific viscosity of at least0.5 dl/g, measured on a 0.5% solution in m-cresol

at 25° C., which polyamide consists of recurring structural elements of formula Ia



(Ia)

wherein $R_1'$ and $R_2'$ are each methyl or ethyl, or together are alkylene having 4–7 C atoms, $R_3'$ is methyl or ethyl, and $R_4'$ is alkyl having 1–4 C atoms, or $R_3'$ and $R_4'$ together are alkylene having 4–7 C atoms.

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**4,297,481**

**PROCESS OF FORMING POLYMERIC POLYAMINE/AMIDE**

**Felek Jachimowicz, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.**

**Filed Feb. 22, 1980, Ser. No. 123,739**

**Int. Cl.³ C08G *67/02***

**U.S. Cl. 528—392** **8 Claims**

1. A process for forming polymeric polyamine/amide wherein said amino/amido nitrogens are positioned in the polymer backbone comprising contacting, in a reaction zone containing an inert solvent, and, as reactants, a hydrocarbon compound containing at least two olefinic groups therein, water, carbon monoxide and a nitrogen containing compound having at least 2 labile hydrogens, at a temperature of from about 50° to 250° C. and at a pressure of from about 30 to about 300 atmospheres in the presence of a catalyst consisting essentially of a rhodium atom containing compound selected from metallic rhodium, rhodium salts, rhodium carbonyls, rhodium oxides or ligands thereof.

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**4,297,482**

**CHAIN-EXTENDED POLYOL COMPOSITIONS AND METHOD**

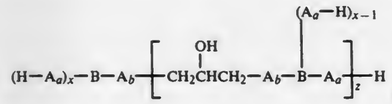
**Louis L. Wood, Rockville, and Donald W. Larsen, Marriotsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.**

**Division of Ser. No. 103,248, Dec. 13, 1979, which is a continuation-in-part of Ser. No. 23,912, Mar. 26, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,114**

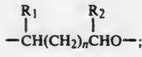
**Int. Cl.³ C08G *59/00***

**U.S. Cl. 528—405** **4 Claims**

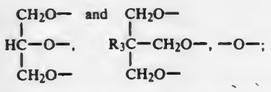
1. A polyol composition containing at least three OH groups of the general formula:



wherein A is



B is selected from the group consisting of



at least one of $R_1$ and $R_2$ is H and the other is independently selected from the group consisting of H, $CH_3$ and phenyl; $R_3$ is H, $CH_3$, $CH_2CH_3$ or $—OCH_{2—n\ is\ O\ or\ 2}$; x is 1–3; z is 1–10 and a and b are independently selected from 1 to 1000.

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**4,297,483**

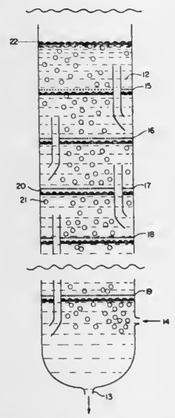
**PROCESS FOR REDUCING THE VINYL CHLORIDE CONTENT OF AQUEOUS DISPERSIONS OF VINYL CHLORIDE POLYMERS**

**Glor T. Mejdell; Odd E. Palmgren; Arne Talmoen, and Bjarne Vik, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Norway**

**Continuation-in-part of Ser. No. 891,116, Mar. 28, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,740**

**Int. Cl.³ C08F *6/00, 14/06***

**U.S. Cl. 528—500** **2 Claims**



1. In a process for the reduction of the vinyl chloride content of aqueous dispersions of vinyl chloride polymers and copolymers after completion of polymerization and after pressure release and preceding removal of thereby released vinyl chloride, by counter-current stripping with steam in a perforated plate column, the plates of which are equipped with downcomers, the improvement wherein the amount of steam introduced at the bottom of the column is adjusted in such relation to the hole area of an individual plate that the pressure drop across one plate gives a steam space between two adjacent perforated plates of not more than 50 mm in height such that the steam space is established just underneath the upper perforated plate and whereby the liquid layer is maintained above the lower perforated plate, and the liquid by bubbling steam therethrough, flushes the wall surfaces of the column in the steam space and said perforated plates to become clear of polymer particles, and further that the amount of dispersion fed to the top of the column and the amount of outgoing, stripped dispersion and adjusted in such relation to each other, that at any time, the liquid layer is maintained substantially above the downcomer of the uppermost perforated plate, and that above the liquid level and the level at which the dispersion is fed, a liquid is introduced which continuously or discontinuously flushes the wall of the column.

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**4,297,484**

**QUATERNIZED DERIVATIVES OF POLYMERIZED PYRIDINES AND QUINOLINES**

**Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.**

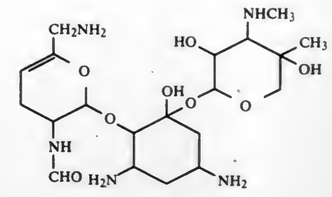
**Filed Apr. 23, 1979, Ser. No. 32,044**

**Int. Cl.³ C08G *73/06;* C07D *213/04, 215/04, 221/06***

**U.S. Cl. 528—423** **4 Claims**

1. A quaternized derivative of polymerized pyridine or quinoline compounds, which compounds prior to polymerization are selected from the group consisting of pyridine, 2-methyl pyridine, 4-methyl pyridine, 4-phenyl pyridine, 4-ethyl pyridine, 2-hydroxypyridine, 2,4-lutidine, quinoline, 2-methyl quinoline and 4-methyl quinoline, the nitrogen atoms of which are quaternized by treating said polymerized compounds with a quaternizing agent selected from the group consisting of methyl iodide, ethyl iodide, propyl iodide, ethyl bromide, benzyl bromide, butyl bromide, dodecyl bromide, benzyl chloride, dodecyl benzyl chloride, ethyl bromoacetate, dimethyl sulfate, tetradecyl bromide and octyl bromide at a temperature of at least about 100° C.





and the non-toxic acid addition salts thereof.

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**4,297,485**

**PRODUCTION OF A SELECTIVELY PROTECTED N-ACYLATED DERIVATIVE OF AN AMINOGLYCOSIDIC ANTIBIOTIC**

**Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya; Yasushi Takagi, both of Yokohama, and Tomo Jikihara, Kawasaki, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan**

**Filed Nov. 2, 1979, Ser. No. 90,591**

**Claims priority, application Japan, Nov. 11, 1978, 53-138402; Jun. 12, 1979, 54-73064**

**Int. Cl.³ C07H *15/22***

**U.S. Cl. 536—10** **20 Claims**

1. A process for the production of a selectively acylated N-protected derivative of an aminoglycosidic antibiotic, this aminoglycosidic antibiotic consisting essentially of a 6-0 (3''-amino- or 3''-alkylamino-3''-deoxyglycosyl)-2-deoxystreptamine having or not having a 4-0-(aminoglycosyl) group, and the selectively acylated N-protected derivative having all amino groups other than 1-amino and 3''-amino groups thereof selectively protected with an acyl group, which comprises the steps of:

(a) reacting an acylation reagent having an acyl group to be introduced as the amino-protecting group, with an aminoglycosidic antibiotic-zinc cation complex which has been formed by reaction of the aminoglycosidic antibiotic with a zinc salt in an inert organic solvent, to produce a complex of zinc cations with the selectively N-acylated derivative of the aminoglycosidic antibiotic having the initially non-complexed amino groups acylated,

(b) and reacting the complex of zinc cations with the selectively N-acylated derivative of the aminoglycosidic antibiotic, with a reagent which removes zinc cations from said complex, to produce the desired selectively acylated N-protected derivative of the aminoglycosidic antibiotic.

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**4,297,486**

**AMINOGLYCOSIDE ANTIBIOTIC G-367-1 AND METHOD FOR THE PRODUCTION THEREOF**

**Tadashiro Fujii, Mishima; Shuzo Satoi, Shizuoka; Naoki Muto, Shizuoka; Mitsuo Hayashi, Shizuoka; Akira Kodama, Shizuoka, and Masaru Otani, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan**

**Filed Apr. 3, 1980, Ser. No. 137,292**

**Claims priority, application Japan, Apr. 4, 1979, 54-41274; Aug. 16, 1979, 54-104770**

**Int. Cl.³ C07H *15/22***

**U.S. Cl. 536—17 R** **1 Claim**

1. Aminoglycoside antibiotic of the formula

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**4,297,487**

**PHOSPHONIUM SALTS**

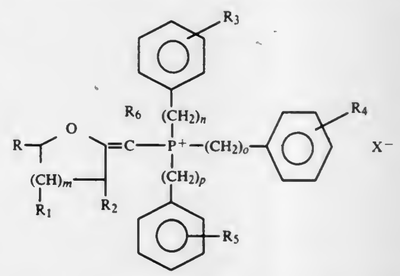
**Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.**

**Filed Aug. 6, 1980, Ser. No. 175,791**

**Int. Cl.³ C07F *9/54***

**U.S. Cl. 542—412** **16 Claims**

1. A phosphonium salt represented by the formula:



wherein: R is selected from the group consisting of phenyl, substituted phenyl, benzyl and substituted benzyl; $R_1$ is hydrogen or lower alkyl; $R_2$ is hydrogen or loweralkyl; or $R_1$ and $R_2$ taken together form a 5 or 6 membered saturated or unsaturated carbocyclic ring with the limitation that $R_1$ is on the carbon atom adjacent the carbon atom bearing $R_2$, m is 1,2 or 3; n is 0 or 1; o is 0 or 1; p is 0 or 1; $R_3$, $R_4$ and $R_5$ are the same or different members of the group consisting of hydrogen, lower alkyl, lower alkoxy and halo; $R_6$ is hydrogen or $C_1$–$C_3$ straight or branched chain alkyl; and X is a pharmaceutically acceptable anion.

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**4,297,488**

**7-α-METHOXY CEPHALOSPORINS**

**Burton G. Christensen, Scotch Plains; Lovji D. Cama, Edison; Sandor Karady, Elizabeth, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Jun. 2, 1971, Ser. No. 149,364**

**Claims priority, application United Kingdom, Jun. 16, 1970, 29158/70; Jul. 9, 1970, 33415/70; Sep. 30, 1970, 46556/70; Dec. 10, 1970, 58731/70; Jan. 27, 1971, 3296/71; Jan. 27, 1971, 3297/71; Jan. 27, 1971, 3298/71; Feb. 8, 1971, 4179/71; Feb. 11, 1971, 4479/71; Feb. 11, 1971, 4480/71; Feb. 26, 1971, 5588/71; Apr. 30, 1981, 29158/81**

**Int. Cl.³ C07D *501/57;* A61K *31/545***

**U.S. Cl. 544—21** **11 Claims**

1. The compound 3-A-7-methoxy-7-acylamido-3-cephem-4-carboxylic acid wherein A is methyl, hydroxymethyl, chloromethyl, bromomethyl, or fluoromethyl, mercaptomethyl, methoxymethyl, n-propoxymethyl, methylthiomethyl, acetoxymethyl, propionyloxymethyl, benzoyloxymethyl, (p-chlorobenzoyl)oxymethyl, (p-methylbenzoyl)oxymethyl,

pivaloyloxymethyl, (1-adamantyl)carboxymethyl, butanoyloxymethyl, carbamoyloxymethyl, (N-methylcarbamoyl)oxymethyl, (N-ethylcarbamoyl)oxymethyl, [N-(2-chloroethyl)-carbamoyl]oxymethyl, (N-phenylcarbamoyl)oxymethyl, (N-p-sulfophenylcarbamoyl)oxymethyl, p-carboxymethylphenylcarbamoyloxymethyl, methoxycarbonyloxymethyl, isobutanoyloxymethyl, cyclobutylcarbonyloxymethyl, carbamoylthiomethyl, (ethoxythiocarbonyl)thiomethyl, (n-propoxythiocarbonyl)thiomethyl, (cyclopentanoxythiocarbonyl)thiomethyl, N,N-diethylthiocarbamoylthiomethyl, N-methylpiperazinium-1-thiocarbonylthiomethyl, N,N-dimethylpiperzinium-1-thiocarbonylthiomethyl, 2-furoylthiomethyl, isothiouroniummethyl, (5-methyl-1,3,4-thiadiazol-2-yl)thiomethyl, p-tolylsulfonylthiomethyl, mesyloxymethyl, 1-methyl-1,2,3,4-tetrazolyl-5-thiomethyl, tosyloxymethyl, sulfamoyloxymethyl, 1-naphthoyloxymethyl, 2-furylacetoxymethyl, cinnamoyloxymethyl, p-hydroxycinnamoyloxymethyl, p-sulfocinnamoyloxymethyl and 1R:2S-epoxypropylphosphonyloxymethyl, or pyridinium methyl; and acylamido is

wherein n is 0–4, Z is oxygen or sulfur, and R″ is benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl, methyl, cyanomethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenylethyl, methyldiphenylmethyl, triphenylmethyl, 2-methoxyphenyl, 2,6-dimethoxyphenyl, 2,4,6-trimethoxyphenyl, 3,5-dimethyl-4-isoxazolyl, 3-butyl-5-methyl-4-isoxazolyl, 5-methyl-3-phenyl-4-isoxazolyl, 3-(2-chlorophenyl)-5-methyl-4-isoxazolyl, 3-(2,6-dichlorophenyl)-5-methyl-4-isoxazolyl, D-4-amino-4-carboxybutyl, D-4-N-benzoylamino-4-carboxy-n-butyl, p-aminobenzyl, o-aminobenzyl, m-aminobenzyl, (3-pyridyl)methyl, 2-ethoxy-1-naphthyl, 3-carboxy-2-quinoxalinyl, 3-(2,6-dichlorophenyl)-5-(2-furyl)-4-isoxazolyl, 3-phenyl-4-isoxazolyl, 5-methyl-3-(4-guanidinophenyl)-4-isoxazolyl, 4-guanidinomethylphenyl, 4-guanidinomethylbenzyl, 4-guanidinobenzyl, 4-guanidinophenyl, 2,6-dimethoxy-4-guanidinophenyl, o-sulfobenzyl, p-carboxymethylbenzyl, p-carbamoylmethylbenzyl, m-fluorobenzyl, m-bromobenzyl, p-chlorobenzyl, p-methoxybenzyl, 1-naphthylmethyl, 3-isothiazolylmethyl, 4-isothiazolylmethyl, 5-isothiazolylmethyl, 4-pyridylmethyl, 5-isoxazolylmethyl, 4-methoxy-5-isoxazolylmethyl, 4-methyl-5-isoxazolylmethyl, 1-imidazolylmethyl, 2-benzofuranylmethyl, 2-indolylmethyl, 2-phenylvinyl, 2-phenylethynyl, 2-(5-nitrofuranyl)vinyl, phenyl, o-methoxyphenyl, o-chlorophenyl, o-phenylphenyl, p-aminomethylbenzyl, 1-(5-cyanotriazolyl)methyl), difluoromethyl, dichloromethyl, dibromomethyl, 1-(3-methylimidazolyl)methyl, 2- or 3-(5-carboxymethylthienyl)-methyl, 2- or 3-(4-carbamoylthienyl)methyl, 2- or 3-(5-methylthienyl)methyl, 2- or 3-(5-methoxythienyl)methyl, 2- or 3-(4-chlorothienyl)methyl, 2- or 3-(sulfothienyl)methyl, 2- or 3-(5-carboxythienyl)methyl, 3-(1,2,5-thiadiazolyl)methyl, 3-(4-methoxy-1,2,5-thiadiazolyl)methyl, 2-furylmethyl, 2-(5-nitrofuryl)methyl, 3-furylmethyl, 2-thienylmethyl, 3-thienylmethyl, and tetrazolylmethyl; and the pharmaceutically acceptable salts thereof, or the carboxylic acid protecting derivatives thereof wherein the derivative group is methyl, t-butyl, trichloroethyl, allyl, propargyl, benzyl, diphenylmethyl, o-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, acetoxymethyl, pivaloyloxymethyl, phenacyl, trichloroethoxy carbonyl, trimethylsilyl or tributyltin.

**4,297,489**

## 7-α-AMINO-SUBSTITUTED ACYLAMINO-3-(1-CARBOXYMETHYLTETRAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

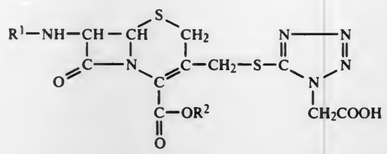
**William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.**

**Continuation-in-part of Ser. No. 502,991, Sep. 3, 1974, abandoned. This application Jun. 27, 1975, Ser. No. 590,971**

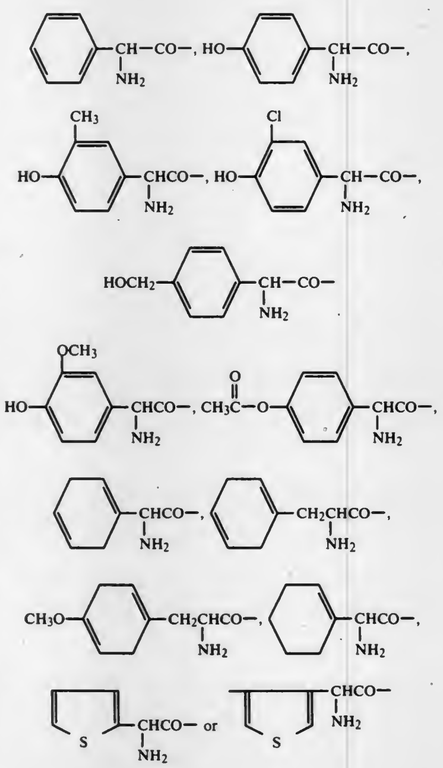
**Int. Cl.³ C07D** *501/54, 501/56;* **A61K** *31/545*

**U.S. Cl. 544—27** **15 Claims**

1. A compound of the formula



wherein $R^2$ is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl and having the D configuration in the 7-side chain wherein $R^1$ has the structure





**4,297,490**

## BICYCLIC HETEROCYCLIC AMINO DERIVATIVES

**Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland**

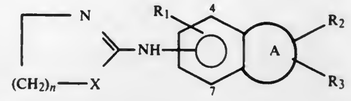
**Continuation of Ser. No. 869,209, Jan. 13, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 14,213**

**Claims priority, application Switzerland, Jan. 14, 1977, 463/77**

**Int. Cl.³ C07D** *277/08, 268/08*

**U.S. Cl. 544—55** **24 Claims**

1. A compound having the formula



wherein

X is oxygen or sulfur, the heterocyclic amino moiety is bonded to the benzene ring of the bicyclic moiety,

n is an integer 1 or 2,

$R_1$, which is bonded to the benzene ring of the bicyclic moiety, is hydrogen, halo, $C_{1-4}$alkyl, $C_{1-4}$alkylthio, $C_{1-4}$alkoxy, trifluoromethyl or hydroxy,

A is a five-membered heterocyclic ring selected from the group consisting of [b]pyrrole, [c]pyrrole, [d]triazole, [b]furan, [c]furan, [c]furazan, [d](1,2,3)-thiadiazole, [b]pyrroline, [c]pyrroline, [b]dihydrofuran, [c]dihydrofuran, [b]dihydrothiophene, [c]isoxazole and [d]isoxazole,

$R_2$, which is bonded to the A ring of the bicyclic moiety and attached to a carbon atom of said ring, is hydrogen, halo, $C_{1-4}$alkyl, $C_{1-4}$alkoxy, $C_{1-4}$alkylthio, trifluoromethyl or hydroxy, and

$R_3$, which is bonded to the A ring of the bicyclic moiety and attached to a nitrogen atom of said ring, is hydrogen or $C_{1-4}$alkyl, with the provisos that:

(i) when A is [c]pyrrole, the nitrogen atom is $C_{1-4}$alkyl-substituted, and

(ii) when A is [b]furan, X is oxygen and n is 1, the oxazolinylamino group is attached to either the 4- or 7-position of the bicyclic moiety,

said compound being in free base or in pharmaceutically acceptable acid addition salt form.

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**4,297,491**

## PREPARATION OF 2,3-DIOXO-1,4-BENZOXAZINE DERIVATIVES

**Gernot Reissenweber, Ludwigshafen, and Dietrich Mangold, Neckargemuend, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

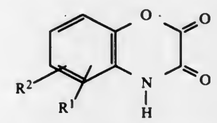
**Filed Nov. 3, 1980, Ser. No. 203,447**

**Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944696**

**Int. Cl.³ C07D** *265/32*

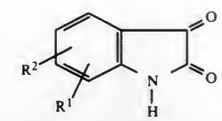
**U.S. Cl. 544—105** **3 Claims**

1. A process for the preparation of a 2,3-dioxo1,4-benzoxazine derivative of the formula I



(I)

where $R^1$ and $R^2$ are identical or different and each is hydrogen, alkyl, halogen, haloalkyl, alkoxy, haloalkoxy or nitro, wherein an isatin of the formula II



(II)

where $R^1$ and $R^2$ have the above meanings, is oxidized with a peroxydisulfate, dissolved or suspended in 30–98% strength sulfuric acid.

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**4,297,492**

## PHENOLIC-1,3,5-TRIAZINES

**Michael Rasberger; Siegfried Rosenberger, and Samuel Evans, all of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

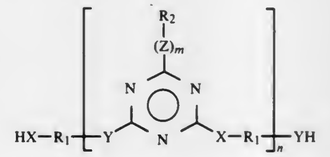
**Filed Mar. 10, 1980, Ser. No. 128,987**

**Claims priority, application Switzerland, Mar. 23, 1979, 2739/79**

**Int. Cl.³ C07D** *251/46, 251/48, 251/70, 251/26*

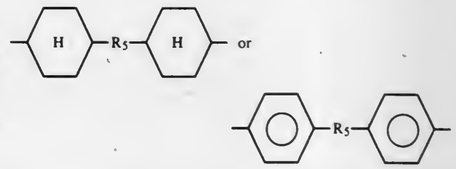
**U.S. Cl. 544—211** **8 Claims**

1. A compound of the general formula I



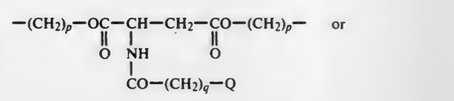
(I)

in which X, Y and Z independently of one another are —O—, —S— or —N($R_3$)—, in which $R_3$ can be hydrogen, —$NH_2$, $C_1$–$C_{18}$ alkyl, $C_2$–$C_{18}$ oxaalkyl, $C_2$–$C_{18}$ thiaalkyl, $C_3$–$C_6$ alkenyl, $C_3$–$C_4$ alkynyl, $C_5$–$C_{12}$ cycloalkyl, $C_6$–$C_{14}$ aryl, which is unsubstituted or substituted by $C_1$–$C_8$ alkyl, or $C_7$–$C_{18}$ aralkyl, which can be substituted in the aryl moiety by —OH and $C_1$–$C_8$ alkyl, $R_1$ is $C_2$–$C_{18}$ alkylene which can be interrupted by one or two —O—. —S— or —COO— or by one —O—P($R_4$)—O—, in which $R_4$ is $C_1$–$C_{18}$ alkyl, allyl, cyclohexyl or phenyl, or $C_5$–$C_{12}$ cycloalkylene, $C_3$–$C_4$ alkenylene, phenylene, biphenylene, 1,4-cyclohexylenedimethylene, 1,3,3-trimethylcyclohexylene or one of the two groups of the formulae



or

in which $R_5$ is —O—, —S—, —NH— or —($R_6$)C($R_7$)—, in which $R_6$ and $R_7$ are hydrogen or $C_1$–$C_8$ alkyl, or $R_6$ and $R_7$ together with the C atom to which they are bonded form $C_5$–$C_{12}$ cycloalkylene, or, furthermore, if X and Y are —N($R_3$)—, $R_1$ is a direct bond or, together with the two radicals —N($R_3$)—, forms a piperazine ring which can be substituted by $C_1$–$C_4$-alkyl, and if X and Y are —N($R_3$)— or —S—, $R_1$ can be one of the three bivalent groups of the formulae



or

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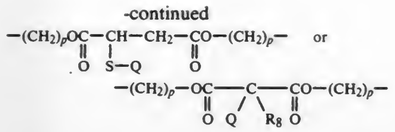
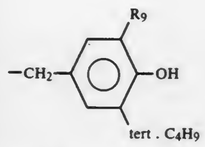


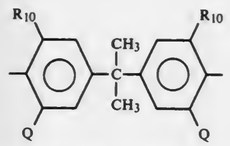
or



in which $R_8$ is $C_1$–$C_{18}$ alkyl, $C_3$–$C_6$ alkenyl, $C_5$–$C_{12}$ cycloalkyl, phenyl, benzyl or Q, and Q is a group of the formula

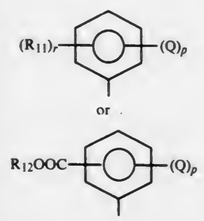


in which $R_9$ is $C_1$–$C_8$ alkyl, and p is the numbers 1–3 and q is the number 1 or 2, or, furthermore, if X and Y are —O—, $R_1$ is a group of the formula II

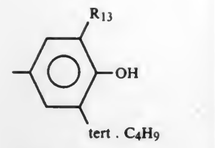


II

in which Q is as defined above and $R_{10}$ is $C_1$–$C_{18}$alkyl, $C_3$–$C_6$ alkenyl, $C_5$–$C_{12}$ cycloalkyl, phenyl, benzyl, Q or $\alpha,\alpha$-dimethylbenzyl, and $R_2$ is hydrogen, $C_1$–$C_{18}$ alkyl, $C_2$–$C_{18}$ oxaalkyl, $C_2$–$C_{18}$ thiaalkyl, $C_3$–$C_{19}$ alkoxycarbonylalkyl, $C_3$–$C_6$ alkenyl, $C_3$–$C_4$ alkynyl, $C_5$–$C_{12}$ cycloalkyl, $C_6$–$C_{14}$ aryl, which is unsubstituted or substituted by $C_1$–$C_8$ alkyl, $C_7$–$C_{23}$ alkaryl, which can be substituted in the aryl moiety by —OH, or $C_7$–$C_{18}$ aralkyl which can be interrupted in the alkylene moiety by —S— or —COO— and can be substituted in the aryl moiety by —OH and $C_1$–$C_8$ alkyl, or, if Z is —O—, $R_2$ can be one of the two groups of the formulae



in which Q, p and q are as defined above, $R_{11}$ is $C_1$–$C_8$ alkyl, $R_{12}$ is $C_1$–$C_{18}$ alkyl or phenyl and r is the number nought, 1 or 2 and, furthermore, if Z is —N($R_3$)—, $R_2$ is one of the two groups of the formulae —NH—CO—$CH_2$—Q or NH—Q, or p-anilinophenyl, in which Q is as defined above, or, furthermore, if Z is —N($R_3$)— or —O—, $R_2$ can be a group $Q_1$ of the formula



in which $R_{13}$ is $C_1$–$C_4$ alkyl and, if m is nought, $R_2$ can also be halogen, and m is nought or 1 and n is the numbers 2–200, it being possible for the recurring structural units to be identical or different, with the proviso that, in formula I, at least one of the radicals —X—$R_1$—Y— and —$(Z)_m$—$R_2$ is a phenol radical hindered by at least one hydrocarbon radical.

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**4,297,493**

## MANUFACTURE OF 4-AMINO-5-CHLORO-1-PHENYLPYRIDAZ-6-ONE USING AQUEOUS PHENOL-4-SULFONIC ACID

**Winfried Richarz; Helmut Froehlich, and Harald Schroeder, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Sep. 8, 1980, Ser. No. 185,403**

**Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937421**

**Int. Cl.³ C07D *237/14***

**U.S. Cl. 544—241** **2 Claims**

1. A process for the manufacture of substantially pure 4-amino-5-chloro-1-phenylpyridaz-6-one by reaction of 4,5-dichloro-1-phenylpyridaz-6-one with ammonia, wherein the reaction is carried out with an aqueous solution of ammonia, at from 20° to 200° C. and from 1 to 20 bars, in the presence of phenol-4-sulfonic acid.

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**4,297,494**

## XANTHINE TRACERS

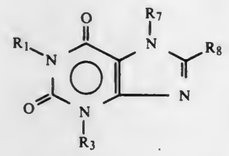
**Ernest V. Groman, Somerville, and Michael D. Cabelli, Waltham, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Aug. 9, 1978, Ser. No. 932,146**

**Int. Cl.³ C07D *473/08, 473/12***

**U.S. Cl. 544—267** **12 Claims**

1. Radioiodinatable xanthine derivatives having the formula:



wherein

(a) $R_1$ is an imidazole, pyrrole, thiophene, indole or polyunsaturated alkenyl radical;

(b) $R_3$ is a hydroxy-substituted, unsaturated cyclic hydrocarbon radical;

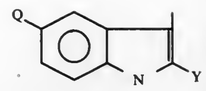
(c) $R_7$ is a pyrrole, furan, thiophene, polyunsaturated alkenyl, imidazole or indole radical, with the proviso that

(1) the imidazole radical has the structure —$L(X)_n$ wherein

L is a linking group containing at least one ester, ether, amide or amino bond, X is imidazole and n ranges from 1 to about 10; and

(2) the indole radical has the structure:





wherein Q is hydrogen or hydroxyl and Y is hydrogen, halo or lower alkyl up to about 7 carbon atoms; and

(d) $R^8$ is a pyrrole, furan or imidazole radical wherein the imidazole radical is set forth in part (c) (1);

with the further proviso that no more than two of $R_1$, $R_3$, $R_7$ or $R_8$ are the above radicals and that if $R_1$, $R_3$, $R_7$ or $R_8$ are not one of the above radicals then $R_1$ is hydrogen, acetate or methyl; $R_3$ is methyl; $R_7$ is hydrogen, acetate or methyl; and $R_8$ is hydrogen.

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**4,297,495**

## PREPARATION OF 2-ISOPROPYLAMINO PYRIMIDINE

**Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France**

**Filed Jun. 30, 1980, Ser. No. 164,889**

**Claims priority, application United Kingdom, Aug. 9, 1979, 27811/79**

**Int. Cl.³ C07D *239/42***

**U.S. Cl. 544—330** **1 Claim**

1. Process for the preparation of 2-isopropylamino pyrimidine comprising reacting bis (isopropylguanidine) sulphate with 1,1,3,3-tetraethoxy-propane in stoichiometric proportions at 40°–60° C., in acidic aqueous solution.

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**4,297,496**

## NITRIMINE DERIVATIVES

**Royston H. Davis, Sittingbourne, and John H. Davies, Canterbury, both of England, assignors to Shell Oil Company, Houston, Tex.**

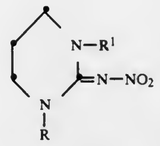
**Filed Jun. 23, 1980, Ser. No. 162,340**

**Claims priority, application United Kingdom, Jul. 30, 1979, 26479/79**

**Int. Cl.³ C07D *239/18***

**U.S. Cl. 544—332** **4 Claims**

1. A nitriminoheterocyclic compound of the general formula:



wherein R is hydrogen, alkyl of from one to six carbon atoms or alkanoyl of up to seven carbon atoms, and $R^1$ is hydrogen or alkyl of from one to six carbon atoms.

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**4,297,497**

## SYNTHESIS OF 2-KETO-1,4-DIAZACYCLOALKANES

**John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company**

**Continuation-in-part of Ser. No. 916,640, Jun. 19, 1978, Pat. No. 4,167,512, which is a continuation-in-part of Ser. No. 835,066, Sep. 21, 1977, abandoned. This application Jul. 13, 1979, Ser. No. 57,238**

**Int. Cl.³ C07D *241/08***

**U.S. Cl. 544—384** **5 Claims**

1. A method which is directive for preparing symmetrical polysubstituted 2-keto-1,4-diazacycloalkanes, said method comprising:

contacting a 1,2-diamine, a saturated monoketone and haloform in the presence of aqueous or solid alkali and a catalytic effective amount of a phase transfer catalyst of the formula

R—O—R′

wherein R and R′ are independently selected from the group consisting of alkyl having 1 to 16 carbon atoms and substituted alkyl wherein said substituents can be hydroxy, sulfur, amine or ether.

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**4,297,498**

## 4-TERTIARY-AMINO-2,6-DIAMINOPYRIDINE 1-OXIDES

**John E. Lawson, and Ronald D. Dennis, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.**

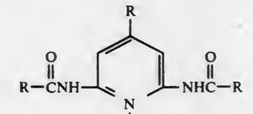
**Division of Ser. No. 873,294, Jan. 30, 1978, Pat. No. 4,182,888, which is a division of Ser. No. 773,041, Feb. 28, 1977, Pat. No. 4,080,500, which is a division of Ser. No. 638,473, Dec. 8, 1975, Pat. No. 4,021,562. This application Aug. 23, 1979, Ser. No. 68,983**

**Int. Cl.³ C07D *411/12, 498/04, 401/12***

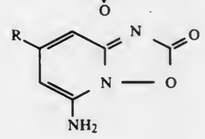
**U.S. Cl. 546—116** **3 Claims**

1. A compound having Formula IV or Formula V

Formula IV



Formula V



wherein R is selected from the group consisting of diethylamino, pyrrolidino, piperidino, morpholino, thiomorpholino, and N-methylpiperazino.

3. The compound according to claim 1 which is 5-amino-7-(piperidinyl)-2H-[1,2,4]oxadiazolo[2,3-a]pyridin-2-one.

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**4,297,499**

## NOVEL DISUBSTITUTED DICHLOROSILANE AND METHOD FOR PRODUCING SAME

**Isao Koga, Yokohamashi; Yohji Terui, Chibashi; Masuhito Ohgushi, and Tohru Kitahara, both of Minamatashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan**

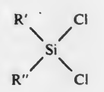
**Filed Apr. 11, 1978, Ser. No. 895,332**

**Claims priority, application Japan, Apr. 12, 1977, 52-41686; Jun. 30, 1977, 52-78186; Jan. 24, 1978, 53-6584**

**Int. Cl.³ C07F *7/08***

**U.S. Cl. 556—465** **11 Claims**

1. A disubstituted dichlorosilane having the general formula



(I)

wherein R′ is an alkyl group having 2～3 carbon atoms and R″ is an alkyl group having 8～20 carbon atoms, or R′ is an alkyl group having 4～20 carbon atoms and R″ is an alkyl group having 5～20 carbon atoms which is different from R′, or R′ is phenethyl group and R″ is cyclohexyl group.

**4,297,500**

## CONVERSION OF LOW-BOILING CONSTITUENTS FROM ALKYL-CHLOROSILANE SYNTHESIS

**Ulrich Finke, Ettlingen, and Hans-Heinrich Moretto, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Nov. 24, 1980, Ser. No. 209,932**

**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950402**

**Int. Cl.³ C07F *7/08***

**U.S. Cl. 556—466** **4 Claims**

1. A process for converting the low-boiling constituents formed in the preparation of methylchlorosilane in the Müller-Rochow process and which consist essentially of tetramethylsilane, dimethylmonochlorosilane and 2-methylbut-2-ene into a product mixture consisting essentially of trimethylchlorosilane, dimethylchlorosilane and $C_{2-20}$ alkyldimethylchlorosilanes or $C_{6-10}$-aryldimethylchlorosilanes, comprising contacting the low-boiling product mixture with $AlCl_3$, AlOCl and/or $AlBr_3$, together with hydrogen chloride, in the liquid phase at about 40° to +25° C.

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**4,297,501**

## PROCESS FOR THE PREPARATION OF URETHANES

**Robert Becker; Johann Grolig, both of Leverkusen, and Christian Rasp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Feb. 27, 1980, Ser. No. 125,394**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908251**

**Int. Cl.³ C07C *125/065***

**U.S. Cl. 560—24** **9 Claims**

1. A heat efficient process for the preparation of urethanes comprising reacting primary amines with carbon monoxide and organic compounds having at least one hydroxyl group in the presence of

(a) molecular oxygen as oxidizing agent,

(b) a noble metal and/or a compound of a noble metal of the 8th subgroup of the Periodic System of Elements, and

(c) a compound of an element of the 3rd to 5th main group and/or 1st to 8th subgroup of the Periodic System of Elements, said compound being capable of undergoing Redox reactions under the reaction conditions.

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**4,297,502**

## AROMATIC BISAZOMETHINES, A METHOD FOR THEIR PREPARATION, AND THEIR USE AS REACTIVE PIGMENTS

**Hans-Joachim Herrmann; Günther Meyer, both of Troisdorf, and Klaus-Dieter Steffen, Hennef, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany**

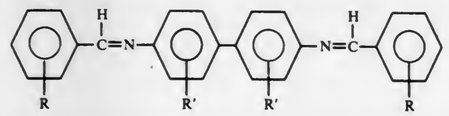
**Filed Jun. 19, 1980, Ser. No. 161,182**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924964**

**Int. Cl.³ C07C *101/68, 119/10***

**U.S. Cl. 560—35** **12 Claims**

1. An aromatic bisazomethine prepared from disubstituted benzidines and aromatic aldehydes, characterized by the general formula



wherein

each R = $COOCH_3$, $COOC_2H_5$, COOH, $CH_2Cl$, $CHCl_2$, $CH_2Br$, $CCl_3$, Cl or Br and

each R′ = Cl, $OCH_3$ or $CH_3$.

**4,297,503**

## NOVEL BENZAMIDE DERIVATIVE AND METHOD OF PREPARING METOCLOPRAMIDE USING SAME

**Joji Nishikido, Fuji; Nobuhiro Tamura, Chigasaki; Yohei Fukuoka, Kurashiki, and Hiroyuki Yamane, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan**

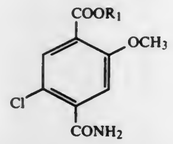
**Division of Ser. No. 58,809, Jul. 19, 1979, Pat. No. 4,250,110. This application Sep. 26, 1980, Ser. No. 190,994**

**Claims priority, application Japan, Jul. 31, 1978, 53/92564**

**Int. Cl.³ C07C *101/74***

**U.S. Cl. 560—42** **2 Claims**

1. 2-Chloro-4-carboalkoxy-5-methoxybenzamide of the formula (II),



(II)

wherein $R_1$ is a $C_{1-7}$ alkyl group, a $C_{1-7}$ haloalkyl group or a phenyl group.

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**4,297,504**

## 19-HYDROXY-6A-CARBA-PGI$_2$ COMPOUNDS

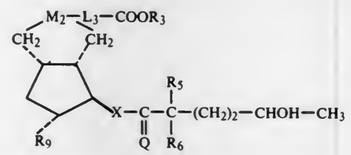
**John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,471**

**Int. Cl.³ C07C *177/00***

**U.S. Cl. 560—119** **1 Claim**

1. A prostacyclin-type compound of the formula



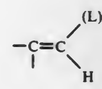
wherein $L_3$ is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,

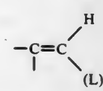
(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or

(3) $-CH_2-CH=CH-$;

wherein $M_2$ is



(1)



(2)

wherein Q is oxo, α-H:β-H, α-OH:β-$R_4$, or α-$R_4$:β-OH,

wherein $R_4$ is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein $R_3$ is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,



(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;

(g) —(Ph)—CO—$CH_3$,

(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—$CH_3$,

(i) —(p-Ph)—NH—CO—(p-Ph),

(j) —(p-Ph)—NH—CO—$CH_3$,

(k) —(p-Ph)—NH—CO—$NH_2$,

(l) —(p-Ph)—CH—N—NH—CO—$NH_2$,

(m) β-naphthyl,

(n) $-CH_2-CO-R_{16}$,

wherein —(Ph)—is inter-phenylene and —(p-Ph)—is inter-para-phenylene or para-phenyl;

wherein $R_{16}$ is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein $R_5$ and $R_6$ are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of $R_5$ and $R_6$ is fluoro only when the other is hydrogen or fluoro;

wherein $R_9$ is hydrogen or hydroxyl; and

wherein X is

(1) trans-CH=CH—,

(2) cis-CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$.

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**4,297,505**

## PROCESS FOR THE PREPARATION OF PENTACHLORO-3-BUTENOIC ACID ESTERS

**Günther Maahs, and Konrad Rombusch, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, Aktiengesellschaft, Marl, Fed. Rep. of Germany**

**Filed Jun. 20, 1980, Ser. No. 161,617**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925012**

**Int. Cl.³ C07C *69/65***

**U.S. Cl. 560—219** **11 Claims**

1. A process for preparing a pentachloro-3-butenoic acid alkyl ester which comprises reacting the corresponding 1-alkoxyheptachloro-3-butene with an aqueous solution of an alkali metal carbonate.

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**4,297,506**

## SYNTHESIS OF ESTERS

**Kiplin D. Cowan, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.**

**Filed Jan. 8, 1980, Ser. No. 110,302**

**Int. Cl.³ C07C *67/04, 31/20***

**U.S. Cl. 560—246** **4 Claims**

1. In a process for producing a diacetoxyalkene from a conjugated diene, a halogen, an alkali metal acetate, and an acid wherein there is obtained in a reaction zone a reaction mass comprising alkali metal acetate, alkali metal halide, acid, and diacetoxyalkene occluded in said mass in the salts therein which cannot be separated by distillation of the non-occluded diacetoxyalkene from said mass, the steps of (1) distilling non-occluded diacetoxyalkene, and (2) recycling to the reaction zone at least a portion of said mass containing said occluded diacetoxyalkene whereby the yield of diacetoxyalkene from said reaction zone and said distillation is increased.

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**4,297,507**

## PROCESS AND APPARATUS FOR PRODUCING TEREPHTHALIC ACID WITH HIGH PURITY

**Makoto Komatsu; Yuji Takamizawa, and Tazuo Ohta, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Co. Inc., Tokyo, Japan**

**Continuation of Ser. No. 9,963, Feb. 6, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 133,106**

**Claims priority, application Japan, Feb. 20, 1978, 53-17649**

**Int. Cl.³ C07C *51/16***

**U.S. Cl. 562—416** **13 Claims**

1. A process for producing terephthalic acid of high purity suitable for direct polymerization by oxidizing p-tolualdehyde at 180°–280° C. with a gas containing molecular oxygen in a solvent consisting of water in the presence of bromine ions, the concentration of the bromine ions being 0.5–12% by weight on the basis of the solvent, in a reactor using zirconium or a zirconium alloy as a reactor material.

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**4,297,508**

## PROCESS FOR PRODUCING 2 HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACID

**Yuzo Maegawa, Oita; Fujio Masuko, Oita, and Makoto Nakamura, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

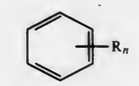
**Filed Dec. 22, 1980, Ser. No. 218,973**

**Claims priority, application Japan, Dec. 25, 1979, 54-170056; Sep. 22, 1980, 55-132033**

**Int. Cl.³ C07C *51/15***

**U.S. Cl. 562—425** **14 Claims**

1. A process for producing 2-hydroxynaphthalene-3-carboxylic acid comprising reacting carbon dioxide with a homogeneous liquid mixture comprising an alkali metal salt of β-naphthol, β-naphthol and an alkylbenzene of the formula (I):



(I)

wherein R is the same or different and is a straight or branched alkyl group having 1 to 4 carbon atoms and n is an integer of 1 to 6.

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**4,297,509**

## PROCESS FOR PREPARING ALKALI METAL SALTS 3-AMINO-2, 5-DICHLOROBENZOIC ACID

**Bertrand A. Chiasson, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Mar. 25, 1980, Ser. No. 133,787**

**Int. Cl.³ C07C *51/347***

**U.S. Cl. 562—456** **8 Claims**

1. A process for producing alkali metal salt of 3-amino-2,5-dichlorobenzoic acid in high yield comprising reacting alkali metal salt of 3-nitro-2,5-dichlorobenzoic acid with hydrogen under pressure at an elevated temperature in the presence of a molybdenum-promoted Raney nickel catalyst, said reaction being effected at a pH between about 6 and 12, and said reaction being effected in the presence of a water solvent.

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**4,297,510**

## UNSYMMETRICAL DIPHOSPHATETRAAZACYCLOOCTATETRAENES

**Kazimiera J. L. Paciorek, Corona Del Mar; Reinhold H. Kratzer, Irvine; Thomas I. Ito, Fountain Valley, and James H. Nakahara, Irvine, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jun. 26, 1980, Ser. No. 163,135**

**Int. Cl.³ C07F *9/22*; C10M *1/44***

**U.S. Cl. 564—13** **2 Claims**

1. The compound 1,3-bis(diphenylphospha)-5,7-bis[CF(CF$_3$)OC$_3$F$_7$]-2,4,6,8-tetraazacyclooctatetraene.

2. The compound 1,3-bis(diphenylphospha)-5,7-bis [CF(CF$_3$)OCF$_2$CF(CF$_3$)OC$_3$F$_7$]-2,4,6,8-tetraazacyclooctatetraene.

**4,297,511**

## METHOD FOR THE MANUFACTURE OF POLYARYLAMINES HAVING METHYLENE BRIDGES

**Efim Biller, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Sep. 4, 1979, Ser. No. 72,313**

**Claims priority, application Switzerland, Sep. 12, 1978, 9537/78**

**Int. Cl.³ C07C *87/28***

**U.S. Cl. 564—331** **16 Claims**

1. A method of making simultaneously monomeric 4,4'-methylene diarylamine and polyamines which comprises the steps of

condensing formaldehyde with a highly protonized aniline salt solution containing at least perfluoro-carbonic acid to obtain a homogeneous aqueous solution; and

cooling the homogeneous solution in a given temperature range to crystallize and precipitate 4,4'-methylene diarylamine as a salt and to leave substantially the other condensed arylamines as salts in the residual liquid.

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**4,297,512**

## PROCESS FOR THE PREPARATION OF TRIETHYLAMINE

**Klaus Mainusch; Bernhard Schleppinghoff, and Klaus Munter, all of Dormagen, Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany**

**Filed Aug. 22, 1979, Ser. No. 68,849**

**Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839135**

**Int. Cl.³ C07C *85/12***

**U.S. Cl. 564—490** **14 Claims**

1. In a process for the continuous preparation of triethylamine by catalytic hydrogenation of acetonitrile in the gas phase, the improvement which comprises employing as the catalyst a catalyst comprising a noble metal of Group VIII of the periodic system disposed on a lithium aluminum spinel catalyst, employing a temperature of 80° to 115° C. and a pressure of 1 to 60 bars gauge and carrying out the process in the presence of up to 3% by weight of monoethylamine and/or diethylamine relative to acetonitrile.

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**4,297,513**

## PROCESS FOR THE PREPARATION OF BENZOPHENONE THIOETHERS

**Louis Felder, Basel, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 39,465, May 16, 1979, abandoned. This application May 28, 1980, Ser. No. 153,985**

**Int. Cl.³ C07C *148/00, 149/32***

**U.S. Cl. 568—43** **1 Claim**

1. A process for the preparation of 4-(2-hydroxyethyl-mercapto)-benzophenone by reacting 4-chlorobenzopheone with 2-hydroxyethyl mercaptan in dimethylacetamide or dimethylformamide at 80° to 140° C. in the presence of an alkali metal carbonate or alkali metal hydroxide in an amount equivalent to the amount of 4-chlorobenzophenone.

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**4,297,514**

## METHOD OF OXIDIZING COMPOUNDS HAVING ACTIVATED METHYLENE RADICALS

**King W. Ma, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 972,850, Dec. 26, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,325**

**Int. Cl.³ C07C *45/36, 45/28***

**U.S. Cl. 568—321** **14 Claims**

1. In a method for oxidizing fluorene to fluorenone comprising contacting fluorene with an oxidizing agent and an aqueous solution of a base of sufficient strength to deprotonate hydrogen from a $-CH_2-$ radical of the fluorene in the presence of a catalyst, the improvement comprising using as the catalyst a synergistic combination of:

(1) a member from the group consisting of charcoal, graphite, carbon black, coke, activated carbon and mixtures thereof; and

(2) a phase transfer catalyst.

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**4,297,515**

## DIKETONES USEFUL AS LIQUID CRYSTALS

**Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany**

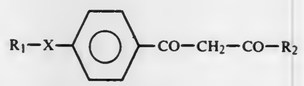
**Filed May 9, 1980, Ser. No. 148,353**

**Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918775**

**Int. Cl.³ C07C *49/813, 49/792***

**U.S. Cl. 568—329** **7 Claims**

1. A diketone of the formula



wherein $R_1$ is alkyl, perfluoroalkyl or alkoxy, each of 1–18 carbon atoms; $R_2$ is alkyl of 1–12 carbon atoms; and X is 1,4-trans-cyclohexylene, 1,4-phenylene or 4,4'-cyclohexylphenyl.

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**4,297,516**

## 1-SUBSTITUTED-1-OXO-PROSTANE-DERIVATIVES OF THE E, A AND F SERIES

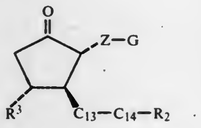
**Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Continuation-in-part of Ser. No. 3,953, Jan. 16, 1979, Pat. No. 4,254,285, which is a continuation-in-part of Ser. No. 961,032, Nov. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 858,589, Dec. 8, 1977, Pat. No. 4,202,822, Ser. No. 858,588, Dec. 8, 1977, Pat. No. 4,170,597, Ser. No. 858,580, Dec. 8, 1977, Pat. No. 4,197,245, Ser. No. 858,487, Dec. 8, 1977, abandoned, Ser. No. 858,504, Dec. 8, 1977, Pat. No. 4,172,839, and Ser. No. 858,579, Dec. 8, 1977, Pat. No. 4,212,969. This application Jun. 7, 1979, Ser. No. 46,721**

**Int. Cl.³ C07C *177/00***

**U.S. Cl. 568—330** **47 Claims**

1. An optically active compound of the formula:

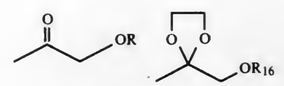


wherein Z is $-(CH_2)_g-$ or

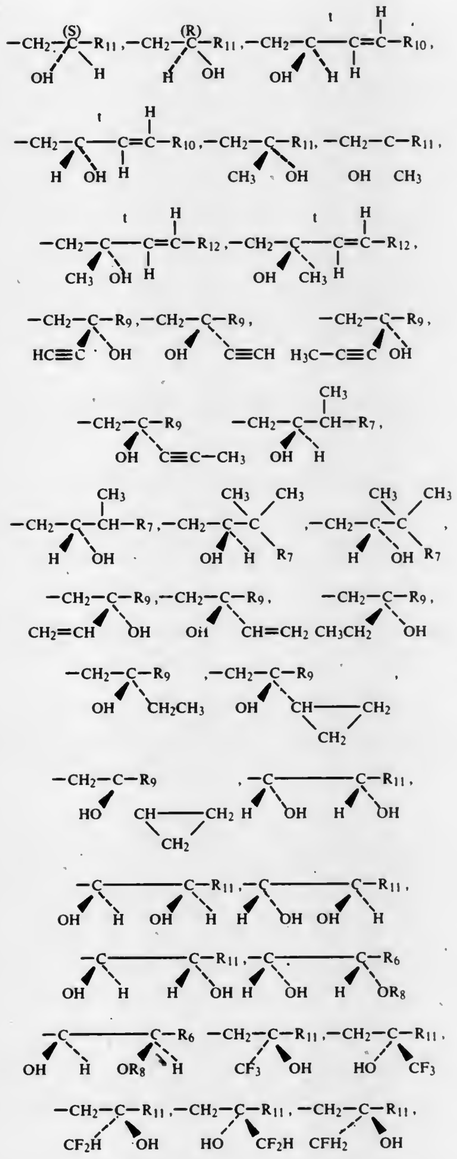
$$-CH_2-CH=CH-(CH_2)_f- \quad \text{cis}$$

wherein g is an integer from 5 to 7 inclusive, and f is an integer from 2 to 4, inclusive; $C_{13}$–$C_{14}$ is ethylene or trans-vinylene; $R_3$ is hydrogen or hydroxyl; G is selected from the group consisting of:





wherein R is $C_1$–$C_6$ alkyl, phenyl or phenyl substituted with one or more substituents selected from the group consisting of $C_1$–$C_4$ alkyl, $-OR_{15}$, $-SR_{15}$, Fl or Cl wherein $R_{15}$ is $C_1$–$C_4$ alkyl; $R_{16}$ is $C_1$ to $C_6$ alkyl; $R_2$ is selected from the group consisting of:



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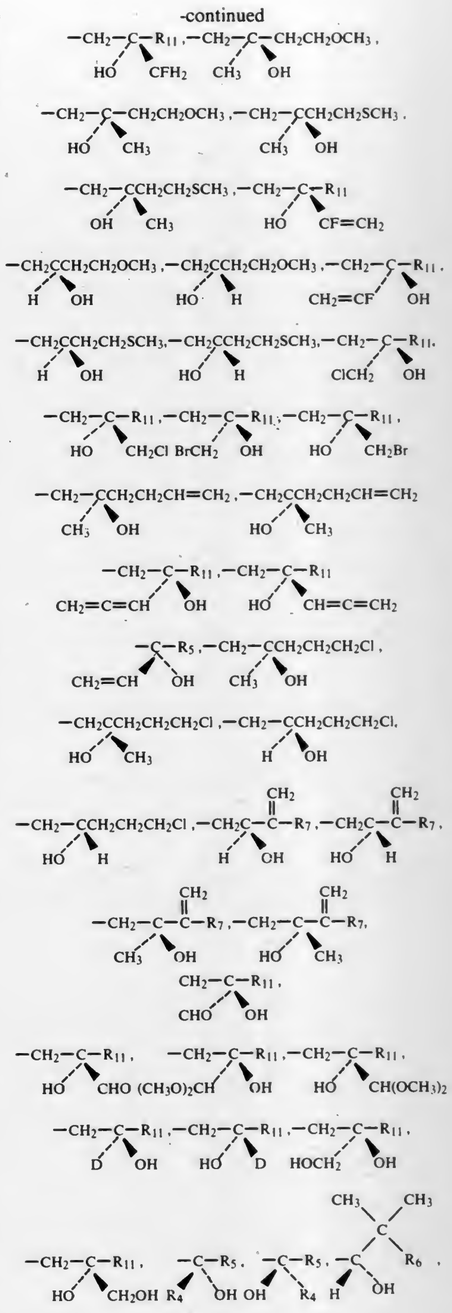

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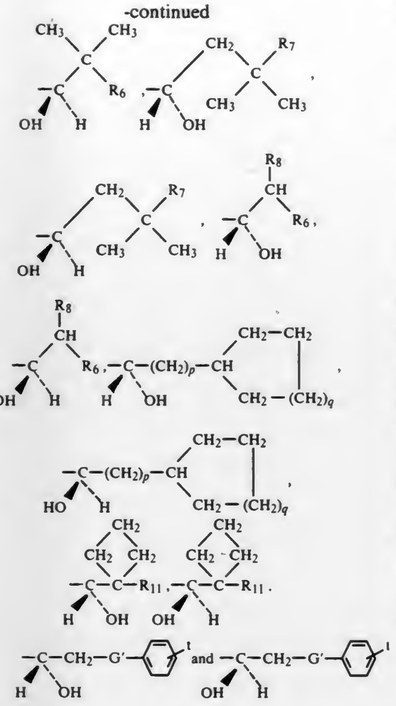

wherein $R_4$ is hydrogen or methyl; $R_5$ is selected from the group consisting of $C_4$–$C_7$ alkyl; $R_6$ is selected from the group consisting of $C_3$–$C_6$ alkyl; $R_7$ is selected from the group consisting of $C_2$–$C_4$ alkyl; $R_8$ is selected from the group consisting of $C_1$–$C_2$ alkyl; $R_9$ is selected from the group consisting of $C_3$–$C_6$ alkyl; $R_{10}$ is selected from the group consisting of $C_1$–$C_4$ alkyl; $R_{11}$ is selected from the group consisting of $C_3$–$C_7$ alkyl; $R_{12}$ is selected from the group consisting of $C_1$–$C_4$ alkyl; p is an integer from 0 to 3; q is 1 or 2; G' is —O— or —$CH_2$—; and t is hydrogen, chloro, fluoro, dichloro, trifluoremethyl or methoxy.

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**4,297,517**

## PREPARATION OF CARBONYL COMPOUNDS FROM ALLYLETHERS

**Johannes A. M. Van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Jul. 31, 1980, Ser. No. 174,074**

**Claims priority, application United Kingdom, Sep. 4, 1979, 30594/79**

**Int. Cl.³ C07C *45/59, 45/42***

**U.S. Cl. 568—361** **11 Claims**

1. A process for hydrolysing allylethers of the general formula:

$$R_6CH=CR_5—CR_4H—O—Cr_1R_2R_3 \quad (I)$$

wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$, which may be the same or different, represent a hydrogen atom or an alkyl group of from 1 to 8 carbon atoms or one of $R_1$, $R_2$ or $R_3$ and $R_6$ together represent a covalent bond, which comprises reacting at least one allylether according to the general formula I with water in the presence of a supported Group VIII metal catalyst selected from the group consisting of platinum, palladium, rhodium and iridium.

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**4,297,518**

## DECOMPOSITION OF CUMENE HYDROPEROXIDE WITH A HOMOGENEOUS CATALYST

**Ching-Yong Wu, O'Hara Township, Allegheny County; Wayne R. Pretzer, Oakmont, and Thaddeus P. Kobylinski, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed Nov. 18, 1977, Ser. No. 852,923**

**Int. Cl.³ C07C *27/00, 45/00, 49/08, 39/04***

**U.S. Cl. 568—385** **11 Claims**

1. The method for cleaving cumene hydroperoxide at high selectivity approaching 100 percent to phenol and acetone using a homogeneous rhenium catalyst which comprises adding cumene hydroperoxide to a solution consisting essentially of phenol and acetone at a mol ratio of phenol to acetone of from about 1:1 to about 1:10 and up to about 15 weight percent cumene in an amount to form a reaction solution having between about 0.1 and about 20 weight percent cumene hydroperoxide, heating said reaction solution of cumene hydroperoxide, phenol and acetone in the presence of a rhenium catalyst consisting essentially of about 20 to about 60 parts of a soluble rhenium compound determined as rhenium heptoxide per million parts of the total reaction mixture for an average time of about one to about 60 minutes at a temperature between about 40° C. and about 80° C., and correlating the temperature, the concentration of rhenium compound and the average reaction time within said ranges whereby decomposition of the cumene hydroperoxide to phenol and acetone results with minimum decomposition to undesired products.

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**4,297,519**

## PROCESS FOR THE PREPARATION OF 2-NITROBENZALDEHYDE

**Werner Ertel, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 8,633, Feb. 1, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,617**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808930**

**Int. Cl.³ C07C *45/28***

**U.S. Cl. 568—424** **2 Claims**

1. A process for the preparation of 2-nitrobenzaldehyde from 2-nitrotoluene which comprises brominating 2-nitrotoluene by a radical mechanism, to 2-nitrobenzyl bromide in the form of a bromination oil containing 20 to 50% of 2-nitrobenzyl bromide, and then oxidizing said bromination oil directly with a mixture of dimethylsulphoxide and sodium bicarbonate in a weight ratio of 3:1 to 10:1 at temperatures of up to 100° C. and subsequently isolating the 2-nitrobenzaldehyde via the bisulphite adduct.

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**4,297,520**

## PROCESS FOR PREPARING ANISALDEHYDE

**Kozo Nakaoji, Osaka, Japan, assignor to Daiwa Chemical Company Ltd., Japan**

**Filed Mar. 4, 1980, Ser. No. 127,071**

**Claims priority, application Japan, Mar. 12, 1979, 54-29067**

**Int. Cl.³ C07C *45/28***

**U.S. Cl. 568—426** **9 Claims**

1. A process for preparing anisaldehyde comprising oxidizing p-methoxytoluene with a dichromate ion forming substance in an amount of 30 to 100 parts by weight calculated as $CrO_3$ per 100 parts by weight of p-methoxytoluene and sulfuric acid in a concentration of about 5 to 40% by weight, to provide an aqueous phase and an organic phase, separating said phases and recovering anisaldehyde and p-methoxytoluene from said organic phase.



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**4,297,521**

## FOCUSING COVER SOLAR ENERGY COLLECTOR APPARATUS

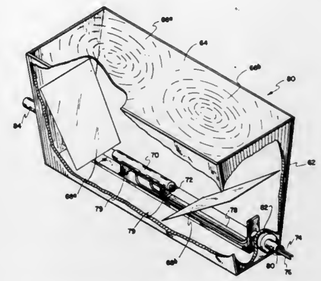
**Steven A. Johnson, 136 N. 1st West, Preston, Id. 83263**

**Filed Dec. 18, 1978, Ser. No. 970,762**

**The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.**

**Int. Cl.³ H01L *31/04;* F24J *3/02***

**U.S. Cl. 136—248** **20 Claims**



1. A solar collector comprising:
a shell structure, the shell structure having an open top;
first mounting means for the shell structure;
solar energy absorber means inside the shell structure;
second mounting means for the shell structure and supporting the solar energy absorber means coaxially inside the shell structure in a nonrotatable position relative to the sun to thereby accomodate rotational movement of the shell about the solar energy absorber means to accomodate rotating the shell structure about an axis of the second mounting means to orient the open top of the shell structure toward the sun, the second mounting means comprising a first hollow shaft and a second shaft, the shell structure being rotatably mounted on the first hollow shaft and the second shaft, the second mounting means further comprising a bridge structure extending between and substantially aligned with the first hollow shaft and the second shaft, the bridge structure supporting the solar energy absorber means; and
optical means in the shell structure for directing solar energy toward the solar energy absorber means, said optical means comprising a Fresnel lens means for focusing solar flux and mirror means for reflecting the focused solar flux toward the solar energy absorber means, said Fresnel lens means comprising a transparent cover over the open top of the shell structure.

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**4,297,522**

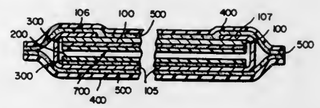
## CABLE SHIELD

**Harold W. Jesse, Amherst, and Peter M. Jones, Sandown, both of N.H., assignors to TME, Inc., Hudson, N.H.**

**Filed Sep. 7, 1979, Ser. No. 73,197**

**Int. Cl.³ H01B *11/10***

**U.S. Cl. 174—36** **6 Claims**



1. A cable shielding device comprising a length of a first sheet of self supporting metal foil, said first sheet having longitudinal edge portions, a length of a second sheet of self-supporting metal foil of a width greater than said first sheet, said second sheet having longitudinal edges, portions of said second sheet forming flanges which are in electrical contact with said first sheet surface which it overlies, a first low friction surface coupled to the first sheet on the sheet side opposite the flange of the second sheet, a second low friction surface coupled to said second sheet on the sheet side closest the first low friction surface but not covering the flange portions of the second sheet in electrical contact with the first sheet, and an outer insulating cover surrounding said first and second sheets.

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**4,297,523**

## GAS PIPE CABLE

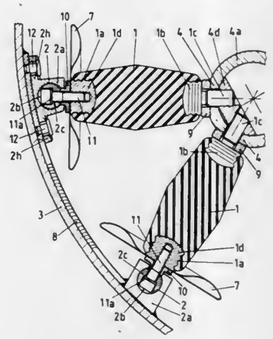
**Carl D. Floessel, Fislisbach, and Klaus Floessel, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland**

**Filed May 21, 1980, Ser. No. 152,148**

**Claims priority, application Switzerland, Jul. 5, 1979, 6277/79**

**Int. Cl.³ H01B *9/06;* H02G *5/06***

**U.S. Cl. 174—27** **16 Claims**





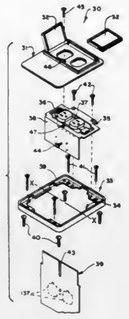
5. In a three phase gas pipe cable having at least one gas pipe cable section and having in said at least one gas pipe cable section three phase conductors arranged within an enclosing pipe in a triangular configuration, said three phase conductors each being held at support locations by at least one supporting insulator at each support location, a conductor supporting apparatus for each phase conductor comprising:
at least one supporting insulator for each phase conductor in each gas pipe cable section;
an insulator foot included on said supporting insulator, said foot facing said enclosing pipe;
a slide bearing, said slide bearing including:
a slide bearing block, said slide bearing block being rigidly connected to said enclosing pipe, and said slide bearing block having:
a bearing block groove, said bearing block groove being disposed substantially parallel to the longitudinal axis of said enclosing pipe and substantially parallel to the longitudinal axis of said phase conductor; and
a sliding bolt member, said sliding bolt member being rigidly connected to said insulator foot included on the supporting insulator, and said sliding bolt member having a free-standing end accommodated in said bearing block groove;
whereby said supporting insulator is capable of motion in the direction of the longitudinal axis of said enclosing pipe and in the direction of the longitudinal axis of said phase conductor.

**4,297,524**

## ELECTRICAL ACTIVATING ASSEMBLY AND RECEPTACLE SUPPORT MEANS THEREFOR

**Frank W. Fork, Allison Park, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.**

**Filed Dec. 26, 1979, Ser. No. 107,411**
**Int. Cl.³ H02G 3/12**
**U.S. Cl. 174—48** **13 Claims**



1. A barrier including a barrier outer surface; a chamber in said barrier having a chamber opening at said barrier outer surface; spaced-apart conduit means having conduit openings communicating with said chamber; and an assembly comprising:

rim means presenting a rim opening, said rim means residing within said chamber opening and below but proximate to said barrier outer surface;

a support plate supported in part by said rim means below but proximate to and substantially parallel with said barrier outer surface, said support plate having a central opening and support ears presented at said central opening;

a plate element formed integrally with and extending from one edge of said support plate into said chamber;

a petition element overlapping said plate element and cooperating therewith to divide said chamber into first and second compartments each containing one of said conduit openings;

an electrical receptacle secured to and supported by said support ears within said first compartment and presenting a plug at said barrier outer surface; and

a closure member supported at said barrier outer surface in capping relation with said rim opening.

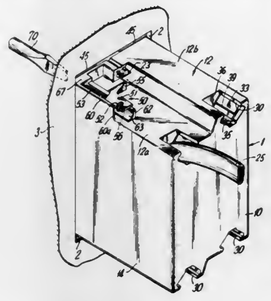
**4,297,525**

## ELECTRICAL OUTLET BOX AND PAWL MOUNTING DEVICE

**Wade R. Bowden, Jr., Northport, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.**

**Filed Mar. 22, 1979, Ser. No. 22,992**
**Int. Cl.³ H02G 3/08**
**U.S. Cl. 174—58** **14 Claims**

1. An electrical outlet box having a wall structure providing front to rear wall means and a bottom wall interconnected therebetween, the front to rear wall means and bottom wall defining a chamber within the wall structure which opens through the front of the box, said front to rear wall means comprising a pair of opposed side walls and a pair of opposed end walls interconnected between said side walls, each of said side and end walls terminating in a common frontal plane defining the front opening of said box, said box further including electrical fixture mounting post members adjacent the inside surface of each opposed end wall in opposed alignment generally centrally of said end walls, said wall means also defining an outermost periphery of said box and including end wall portions which are recessed inwardly from said periphery and inwardly from the remainder of said end wall so as to define recessed areas extending along said periphery of said box from the front to the rear thereof, said recessed areas in said end walls being in diagonally opposed alignment on opposite sides of said electrical fixture mounting post members, first flange means secured to said front to rear wall means extending laterally outwardly beyond said outermost periphery of said box, pawl means mounted in said recessed areas, said pawl means being rotatably actuable between a retracted position within the confines of said outermost periphery of said box and an extended position beyond said outermost periphery of said box, said pawl means including clamping flange means adapted to engage the wall surface adjacent said wall opening when said pawl means is in said extended position, means restraining rotational movement of said pawl means in both clockwise and



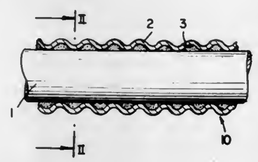
counterclockwise directions in said extended position, said means restraining rotational movement of said pawl means includes a single pawl stop flange member extending in a plane parallel to the plane defined by said pawl arm and pawl tab portions when said pawl means is in said extended position, a hub portion, an arm portion extending tangentially of said hub portion and terminating on one side thereof in said clamping flange means, and a tab portion extending coplanar with said arm portion and terminating on the side of said hub portion opposite said clamping flange means, whereby said pawl means travels linearly both into and out of clamping engagement with said wall surface adjacent said wall opening.

**4,297,526**

## FIRE RESISTANT ELECTRICAL CABLES

**Ottmar Leuchs, Hannover-Bothfeld, and Georg Maltz, Burgdorf, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette A.G., Hanover, Fed. Rep. of Germany**

**Filed Feb. 7, 1980, Ser. No. 119,532**
**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907473**
**Int. Cl.³ H01B 7/20, 7/28**
**U.S. Cl. 174—102 R** **5 Claims**



1. An electrical cable comprising a core assembly including at least one insulated conductor, a hermetically closed, tubular metallic sheath concentrically positioned about said core assembly, and a filler material dispersed in and partially occupying, the spaces between the inner surface of said metallic sheath and the outer surfaces of said core assembly throughout at least a major portion of the length of said electrical cable, the improvement comprising:

(i) said metallic sheath tightly engaging said core assembly successively along at least a major portion of the length of said core assembly, thus structurally limiting the hollow or unoccupied spaces within the electrical cable; and

(ii) said filler material being comprised of a thermoplastic admixture which absorbs at least a portion of acids and gases resulting from a decomposition of the insulation of said at least one conductor, and expands in volume upon its temperature exceeding a predetermined limit;

whereby, upon the continued subjection of a segment of said metallic sheath to concentrated heat, at least a portion of the acids and gases resulting from insulation decomposition is absorbed from said filler material within said heated segment, and the volume of said filler material within said heated segment expands to provide substantially complete cross-sectional occupation of any hollow spaces within said heated segment, resulting in a structural blockage to the longitudinal flow of acids and gases from within said heated segment into adjacent segments of said electrical cable.

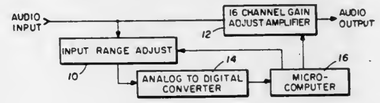


**4,297,527**

## INPUT GAIN ADJUSTING APPARATUS AND METHOD

**Jerry W. Pate, Houston, Tex., assignor to E-Systems, Inc., Dallas, Tex.**

**Filed May 1, 1979, Ser. No. 35,004**
**Int. Cl.³ H03G 3/30**
**U.S. Cl. 179—1 VC** **12 Claims**




1. A voice operated gain adjust apparatus for use in a voice processor that receives an analog input signal including voice signals and background noise, comprising:

means for converting the analog input signal into a digital input signal;

an amplifier having a variable gain for amplifying the analog input signal, said amplifier includes a plurality of different feedback loops and a switching circuit for connecting any of said feedback loops to the amplifier to determine the gain thereof; and

controller means including a central processing unit, a non-volatile memory for storing a program, and a volatile memory for use in executing the program, each of said memories being interconnected with said central processing unit, said controller means being responsive to the digital input signal and the stored program for detecting the presence and absence of voice signals in the analog input signal and for generating a control signal which is applied to said switching circuit for varying the gain of said amplifier according to the amplitude of the analog input signal occurring in selected time periods only when the presence of voice signals is detected.

**4,297,528**

## TRAINING CIRCUIT FOR AUDIO SIGNAL RECOGNITION COMPUTER

**Richard D. Beno, Cerritos, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.**

**Filed Sep. 10, 1979, Ser. No. 73,781**
**Int. Cl.³ G10L 1/00**
**U.S. Cl. 179—1 SB** **16 Claims**

1. Apparatus for signal pattern recognition, comprising:

means for storing a plurality of reference data patterns;

means for comparing a signal pattern with said reference data patterns for recognition; and

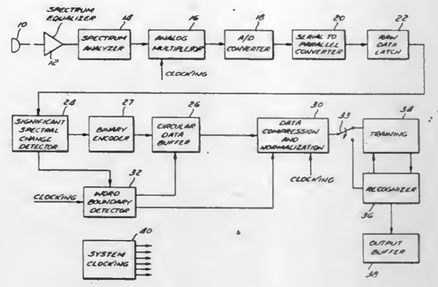
means for updating a selected one of said reference data patterns comprising:

means for inputting a training signal pattern;

means for comparing said training signal pattern with each said reference data pattern to generate a score signal for each said reference data pattern indicative of the similarities therebetween;

means for selecting the reference data pattern with the highest score for similarity with said training signal pattern;

means for combining said selected reference data pattern with said training pattern to produce a new reference data pattern; and



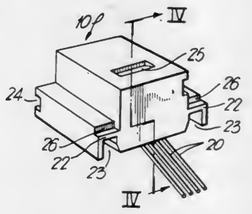

means for replacing said reference data pattern with said new reference data pattern in said storing means if said score signal is above a predetermined level without affecting any other said reference data patterns regardless of the scores of said other reference data patterns in comparison with said training signal pattern.

**4,297,529**

## MODULAR TELEPHONE JACK

**Gerald F. Webb, Thorndale, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Oct. 29, 1979, Ser. No. 89,224**
**Int. Cl.³ H01R 13/40, 13/62**
**U.S. Cl. 179—1 PC** **5 Claims**




1. A modular telephone jack having two parts, a top part and a bottom part, said parts defining an aperture therebetween for reception of a modular plug, and a plurality of cantilever spring wire contact members extending from a front end of said top part downward and rearward into said aperture, said contact members being molded at a front end integrally with said top part of the jack.

**4,297,530**

## ELECTRONICS PACKAGE

**Bayard F. Kessler, Woodland Hills, Calif., assignor to Novation, Inc., Calif.**

**Filed Dec. 20, 1978, Ser. No. 971,538**
**Int. Cl.³ H04M 11/00**
**U.S. Cl. 179—2 C** **13 Claims**

1. A modem comprising:

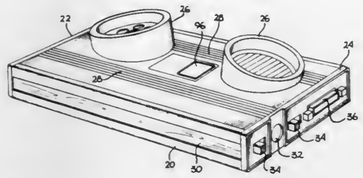
an extruded plastic central body having first and second open ends and an approximately rectangular section defining inner and outer section surfaces, said inner section surface having at least two facingly disposed slots formed

therein for receiving and supporting the side edges of at least one printed circuit board within said central body, said central body having a pair of openings on the top surface thereof,

at least one printed circuit board fitting within said two facingly disposed slots in central body,

a first and second muff, each fitting within one of said pair of openings on the top surface of said central body and being electrically coupled to said modem circuit board,

a first end cap having a portion thereof fitting within said first end of said central body for alignment therewith, said first end cap enclosing at least a substantial portion of said first end of said central body,




a second end cap having a portion thereof fitting within said second end of said central body for alignment therewith, said second end cap enclosing at least a substantial portion of said second end of said central body, at least one of said end caps having an opening for electrical connection to said printed circuit board therein, and

retaining means for retaining said first and second end caps on said first and second ends, respectively, of said central body.

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**4,297,531**

**CIRCUIT FOR SUPPRESSING NOISE INFLUENCES IN THE EVALUATION OF SIGNAL STATES ON TRANSMISSION LINES**

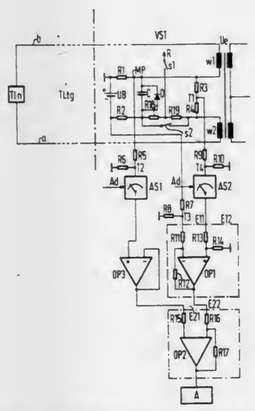
**Axel Dalhof, Puchheim, and Robert Lechner, Otterfing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 10, 1979, Ser. No. 83,250**

**Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850929**

**Int. Cl.³ H04M *3/22***

**U.S. Cl. 179—16 AA** **4 Claims**




1. A circuit arrangement for suppressing noise voltage components which are superposed on a DC voltage signal which is to be evaluated as a status signal on a two-wire transmission line which is connectible to and supplied in symmetrical branches at feed points by a DC voltage supply in a subscriber line circuit of an exchange, comprising:

an impedance connected between a first feed point of the DC voltage supply and a connection point coupled to the two-wire line carrying a first DC voltage superposed with noise voltage components; a high-resistance shunt connected across the feed points and including a tap point;

a first differential amplifier including a first input connected to said tap point to receive a second DC voltage superposed with noise voltage components, a second input connected to a second feed point of the DC voltage supply to receive a third DC voltage which is not influenced by noise, and an output providing the noise voltage components;

first and second input means connecting said first and second inputs, respectively, to said tap and the DC voltage supply and operable to provide the third DC voltage equal to the second DC voltage;

a second differential amplifier including a first input connected to said output of said first differential amplifier for receiving the noise voltage components, a second input, and an output; and

a voltage follower circuit including an input connected to said connection point to receive the first DC voltage superposed with noise voltage components and an output connected to and feeding said second input of said second differential amplifier so that said second differential amplifier provides a fourth DC voltage proportional to the original supply voltage and representing the state of the subscriber line.

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**4,297,532**

**INTERFACING CIRCUIT STATUS DETECTION ARRANGEMENT IN A TELEPHONE EXCHANGE**

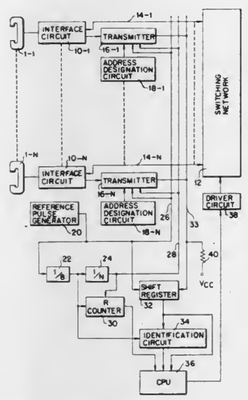
**Takeo Fukuda; Kazuhiko Hanawa; Kiyoshi Urui, and Michiko Haseyama, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 20, 1979, Ser. No. 50,228**

**Claims priority, application Japan, Jul. 11, 1978, 53-84203**

**Int. Cl.³ H04M *3/22***

**U.S. Cl. 179—18 AB** **8 Claims**




1. A telephone exchange comprising:

a switching network;

a plurality of interface circuits each having a transmit/-receive path connected to the switching network;

a plurality of data generating circuits respectively connected to the interface circuits for detecting the states of the interface circuits and for generating state variation information when the state of at least one of these interface circuits is varied from a previous state; and



a control circuit for receiving as an interrupt signal the state variation information from the data generating circuits and for setting the switching network to a state corresponding to the state of that interface circuit whose state variation has been detected.

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**4,297,533**

**DETECTOR TO DETERMINE THE PRESENCE OF AN ELECTRICAL SIGNAL IN THE PRESENCE OF NOISE OF PREDETERMINED CHARACTERISTICS**

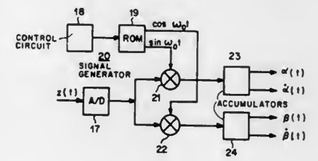
**Jean-Gabriel Gander, Recherswil, and Ralph Aubert, Zug, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland**

**Filed Jun. 7, 1979, Ser. No. 46,508**

**Claims priority, application Switzerland, Aug. 31, 1978, 9196/78**

**Int. Cl.³ H04M *1/50*; H04B *1/06*; H04K *5/20***

**U.S. Cl. 179—84 VF** **16 Claims**




1. A detector for determining the presence of an electrical signal in the form of a tone in the presence of noise, said electrical signal having at least two predetermined characteristics, comprising in combination:

signal transforming means for obtaining a plurality of independent estimates of each of said characteristics,

classification means connected to said signal transforming means for sorting said plurality of independent estimates into at least two classes, respectively, and

counting means for signaling the presence of said electrical signal when the number of said estimates within one of said classes exceeds a predetermined number.

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**4,297,534**

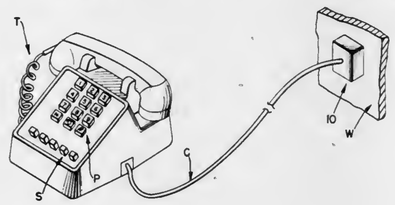
**PUSHBUTTON TELEPHONE SET DISABLING MEANS**

**Barry M. Epstein, 7523 Cliffbrook, Dallas, Tex. 75240, and Terry M. Gernstein, 6724 Melrose Dr., McLean, Va. 22101**

**Filed Jan. 3, 1980, Ser. No. 109,255**

**Int. Cl.³ H04M *1/66***

**U.S. Cl. 179—90 D** **50 Claims**




1. A device for preventing unauthorized use of a pushbutton telephone set comprising:

disabling means connected to the telephone set to be electrically interposed between the telephone set and a line connecting that telephone set to a call receiving means such as a central office, PBX, key system centrex, or the like, said disabling means including frequency signal altering means which alters at least one of said intercepted frequency signals in a manner such that the call receiving means is prevented from receiving a set of frequencies in a form which is required to operate equipment at such call receiving means so that such equipment will not be operated by said at least one altered frequency signal and a call which includes said altered frequency signal will not be completed, said disabling means permitting the telephone set to receive signals incoming thereto; and

connecting means on said disabling means for selectively connecting said frequency signal altering means to the telephone set and disconnecting said frequency signal altering means from the telephone set at any time.

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**4,297,535**

**STEREO HEADSET**

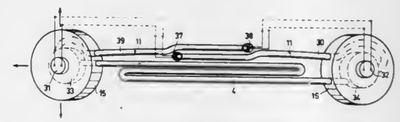
**Gunter Hehemann, Kaiser-Wilhelm Strasse 3B, D-8130 Starnberg, Fed. Rep. of Germany**

**Filed Jul. 14, 1978, Ser. No. 924,760**

**Claims priority, application Fed. Rep. of Germany, Jul. 18, 1977, 2732425; Aug. 1, 1977, 2734624; Sep. 12, 1977, 2741049; Sep. 12, 1977, 2741004; Nov. 3, 1977, 2749234**

**Int. Cl.³ H04R *5/00***

**U.S. Cl. 179—156 R** **10 Claims**




1. A stereophonic headphone comprising a pair of earpieces, each having an electro-acoustic main transducer and a sound chamber, a first sound tube coupling each of said sound chambers and a pair of auxiliary electro-acoustic sound transducers each connected electrically in parallel to the main transducer of an associated one of said earpieces, the sound chambers of each earpiece being respectively coupled acoustically to the auxiliary transducer connected to the main transducer of the other earpiece by one of a pair of second sound tubes acting to delay the transmission of said sound for a period of time which corresponds to the rectilinear propagation of the sound in a deflection section of 15 to 25 cm.

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**4,297,536**

**SELF-ADJUSTING HYBRID NETWORK**

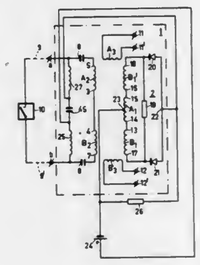
**Robert B. Buchner, Bussum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed May 11, 1979, Ser. No. 38,377**

**Claims priority, application Netherlands, May 19, 1978, 7805416**

**Int. Cl.³ H04B *1/58***

**U.S. Cl. 179—170 D** **6 Claims**



1. A hybrid network for connecting a two-wire subscriber's line to a four-wire line comprising:

a pair of terminals connected to said hybrid network,
a d.c. supply source,
a two-wire subscriber's line connectible to said pair of terminals,
first means for coupling said subscriber line to said four-wire line,
second means for coupling said source to said terminals for supplying said subscriber line with d.c. current,
an adjustable balancing network having control inputs and an impedance whose value varies in dependence on the direct current supplied to said control inputs, and
a third means for coupling said control inputs to said terminals and said d.c. supply source such that the direct current applied to said control inputs is proportional to the direct current supplied by said source to said subscriber's line when said subscriber's line is connected to said terminals, whereby said impedance of said balancing circut is adjusted to correspond to the impedance of said subscriber's line.

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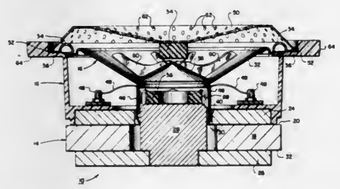
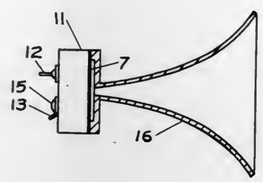
**4,297,537**
**DYNAMIC LOUDSPEAKER**
**Burton A. Babb, 6618 Briarhaven, Dallas, Tex. 75240**
**Filed Jul. 16, 1979, Ser. No. 58,105**
**Int. Cl.³ H04R** *7/26*
**U.S. Cl. 179—180** **5 Claims**



1. In a loudspeaker of the kind having a frame, a cylindrical center magnetic pole, an outer magnetic pole disposed around the center pole to form an annular flux gap therebetween, said outer pole and center pole being interconnected at their rear ends by a back pole plate, a speaker cone mounted on said frame in front of said poles for acoustically radiative reciprocation with respect thereto, said cone having an axially disposed dust cap thereon, a tubular voice coil mounted on the back of said cone and positioned in said flux gap, and an antifriction bearing member for said coil disposed in continuous sliding contact with said centerpole, the improvement comprising:
a grille positioned on said frame in front of said speaker cone;
a first bumper formed of resilient material mounted on the back of said grille, said first bumper being positioned and proportioned to lie forwardly of the largest desired forward excursion of said dust cap, said largest desired forward excursion being insufficient to displace said bearing member from said center pole, and to resiliently and quietly stop forward excursions of said dust cap which are larger than said largest desired forward excursion, said first bumper thereby affecting only those forward excursions which are greater than desired; and
a second bumper formed of resilient material mounted on the forward end of said center pole, said second bumper being positioned and proportioned to lie rearwardly of the largest desired rearward excursion of said dust cap, said largest desired rearward excursion being insufficient to impact said bearing against said back pole plate, and to resiliently and quietly stop rearward excursions of said dust cap which are larger than said largest desired rearward excursion, said second bumper thereby affecting only those rearward excursions which are greater than desired.

**4,297,538**
**RESONANT ELECTROACOUSTIC TRANSDUCER WITH INCREASED BAND WIDTH RESPONSE**
**Frank Massa, Hingham, Mass., assignor to The Stoneleigh Trust, Cohasset, Mass., Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees**
**Filed Jul. 23, 1979, Ser. No. 59,902**
**Int. Cl.³ G08B** *3/10;* **H04R** *1/28, 1/30*
**U.S. Cl. 179—180** **11 Claims**



1. In combination in an electroacoustic transducer including a peripherally-clamped vibratile diaphragm and electromechanical transducer means associated with said diaphragm for converting alternating electrical signals into mechanical vibrations, said peripherally-clamped diaphragm characterized in that its fundamental resonant frequency is greater than 1 kHz, and further characterized in that the clamped diameter of said diaphragm is less than one-half wavelength of the sound generated at said resonant frequency, said electroacoustic transducer characterized in that the band width of the frequency response characteristic in the vicinity of resonance is relatively narrow and is equivalent to a Q factor greater than 20, means for substantially increasing the band width of the response characteristic of said transducer such that the Q factor is reduced to a value less than 8, said means for increasing the band width includes means for damping the acoustic reactance of the peripherally-clamped vibratile diaphragm over a frequency range extending at least ±10% beyond the resonant frequency of said transducer, said damping means characterized in that the damping is not in the form of a mechanical resistance which adds viscosity loss to the vibrating diaphragm, but that said damping is in the form of increased acoustic radiation resistance added to the vibrating diaphragm by means of an acoustic coupler interposed between the radiating surface of said vibratile diaphragm and the medium into which the acoustic energy is radiated.

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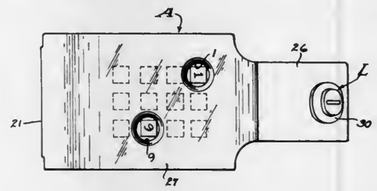
**4,297,539**
**TELEPHONE SECURITY ATTACHMENT**
**Thomas L. Fairbanks, 2443 34th St., Santa Monica, Calif. 90405**
**Filed Feb. 27, 1980, Ser. No. 125,033**
**Int. Cl.³ H04M** *1/66*
**U.S. Cl. 179—189 D** **3 Claims**



1. A security attachment for restricting the use of a telephone comprised of a base and a liftable hand-set, the base having a hand-set cradle and a dial extending forwardly from the cradle to the front end of the base and comprised of a plurality of push buttons representing the digits "0" through "9"; the attachment including integral planar body portions overlying the cradle and dial and front end of the base, the overlying front portion having an extension with hooked engagement beneath a bottom of the base, the body portion overlying the cradle being engageable with the cradle of the base, and the body portion overlying the dial being held in spaced relation from the dial on the base and having at least one finger aperture therethrough for access to a push button, there being lock means carried by the cradle portion of the attachment to releasably hook with the cradle of the base in opposition to said hooked engagement of the front portion.



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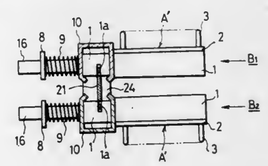
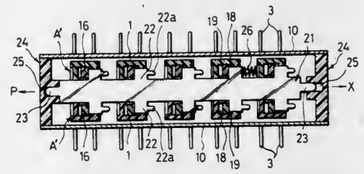
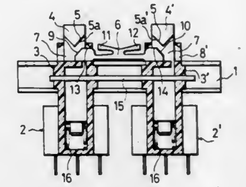
**4,297,540**
**INTERLOCKING GANG PUSH-BUTTON SWITCH**
**Kotaroh Tsutsui, Furukawa, and Ryoji Kinugawa, Suita, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**
**Filed Jun. 1, 1978, Ser. No. 911,388**
**Claims priority, application Japan, Jun. 8, 1977, 52-74611[U]**
**Int. Cl.³ H01H** *9/20*
**U.S. Cl. 200—5 B** **7 Claims**





1. In a switch assembly comprising a first and a second block of identical push button switches, each said switch including a plurality of fixed terminals arranged along its length and having an operation rod movable inwardly to a latched position electrically contacting a selected one of said terminals, said blocks being arranged generally parallel in back to back relation with their fixed terminals extending oppositely, and means for releasing any switch from its latched position when any other switch is actuated to its latched position, the improvement comprising said releasing means including identical first and second cam portions formed on respective sides of the operation rods of said switches, and a common latch member having first cam parts on one side thereof for engaging said first cam portions and second cam parts on the opposing side thereof engaging said second cam portions.

**4,297,541**
**GANGED PUSH BUTTON SWITCH HAVING MEANS PREVENTING SIMULTANEOUS ACTUATION OF TWO PUSH BUTTONS**
**Akira Niinuma, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**
**Filed Oct. 15, 1979, Ser. No. 84,533**
**Claims priority, application Japan, Oct. 20, 1978, 53-144226[U]**
**Int. Cl.³ H01H** *9/20*
**U.S. Cl. 200—5 E** **4 Claims**



1. A ganged push button switch assembly comprising:
a plurality of modular switches each including a push button formed with a respective cam surface, and a case formed with slots at positions adjoining said cam surface;
coupling means for coupling said plurality of modular switches into an integral switch block; and
a plate member slidably held in the slots of the respective modular switches so as to be between the two adjacent modular switches in said switch block, said plate member being formed at its ends with respective cam portions cooperating with the cam surface of said modular switches and being also formed at its central part with engaging portions having an elasticity so as to permit said plate member to be attached to and detached from said slots by deforming said engaging portions.

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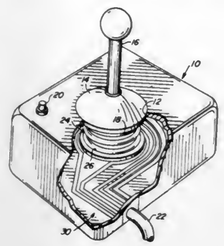
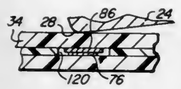
**4,297,542**
**FOLDED CIRCUIT SWITCH APPARATUS HAVING MULTIPLE CONTACTS**
**Anthony G. Shumway, 734 W. 6th Ave., Mesa, Ariz. 85202**
**Filed Dec. 19, 1979, Ser. No. 105,261**
**Int. Cl.³ H01H** *19/70, 25/04*
**U.S. Cl. 200—6 A** **6 Claims**

1. Switch apparatus for providing a plurality of output signals, comprising, in combination:
a first flexible insulative layer;
first conductive means disposed on the first flexible insulative layer including a plurality of arcuate conductive segments disposed symmetrically on the first flexible insulative layer;
a second insulative layer;
a second conductive means disposed on the second insulative layer and including a circular conductive segment disposed adjacent the plurality of arcuate conductive segments of the first conductive means;
a third insulative layer disposed between the first and second insulative layers;
opening means in the third insulative layer to allow electrical contact selectively between one conductive segment or with two adjacent conductive segments, of the first conductive means and the circular conductive segment of the second conductive means; and

switch actuation means to provide flexing of the first flexible insulative layer to cause electrical contact between the





first and second conductive means through the opening means.

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**4,297,543**

**SAFETY DEVICE FOR CONTAINER FILLER SYSTEMS**

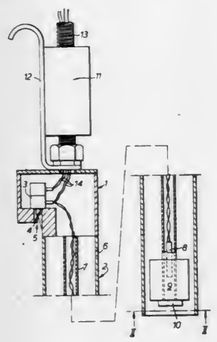
**Barry Shackcloth, Harpenden, England, assignor to Total Oil Great Britain Limited, London, England**

**Continuation of Ser. No. 844,041, Oct. 20, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,807**

**Claims priority, application United Kingdom, Oct. 22, 1976, 43956/76**

**Int. Cl.³ H01H *35/18***

**U.S. Cl. 200—18** **7 Claims**



1. The combination of a safety switch assembly and a container for use with equipment for filling said container with a liquid, the combination comprising:

a. container having a protruding peripheral wall rim defining a filler opening,

b. a switch assembly including a body portion having a first electrical switch and also having an elongated channel therein detachably receiving at least a segment of said peripheral wall rim of said container,

c. said first electrical switch having an actuator housed in said elongated body portion channel and operative to respond to the insertion of the peripheral wall rim segment of said filler opening into said elongated channel of said body portion whereby said first switch is actuated when said body portion is mounted on said filler opening peripheral wall rim to allow said liquid to enter said container, and

d. a sensing portion attached to said body portion and housing a second switch electrically connected with said first switch and operative to respond to the level of the liquid content in said container to be filled whereby said second switch is actuated and delivery of said liquid to said container is stopped when a predetermined liquid level in said container is reached.

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**4,297,544**

**PNEUMATICALLY OPERATING DELAY SWITCHES**

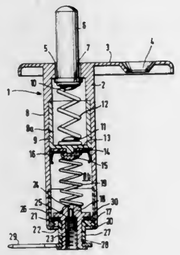
**Wolfgang Priesemuth, Postkamp 13, D-2210 Itzehoe-Nordoe, Fed. Rep. of Germany**

**Filed Dec. 26, 1978, Ser. No. 973,132**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758082**

**Int. Cl.³ H01H *7/03***

**U.S. Cl. 200—34** **5 Claims**



1. A pneumatically operating delay switch arrangement including a pneumatic piston cylinder means provided with an insulating cylinder bottom and an inner wall having an at least partially conducting portion and having a cylinder compartment in communication with outside air through a check valve and a throttle bore connected in parallel therewith and having a piston operatively connected with switch contacts comprising slide contacts as the switch contacts formed by a bracket spring rigidly connected with said piston and engaging the inner wall of the pneumatic piston-cylinder means and formed by said at least partially conducting portion of said inner wall, a first compression spring means as well as a second compression spring means located in the cylinder compartment, said second compression spring means being weaker than the first compression spring means, and an outer connection including a contact lug and a neck portion of a metallic abutment passing through the insulating cylinder bottom along with said second compression spring means having electrically conductive joinder to said bracket spring.

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**4,297,545**

**SWITCHING MEANS FOR A TIMING MECHANISM**

**Ronald G. Darner, Bargersville, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.**

**Filed Jan. 16, 1980, Ser. No. 112,604**

**Int. Cl.³ H01H *7/00***

**U.S. Cl. 200—38 R** **5 Claims**

1. In an electrical switching means wherein cooperating electrical contacts, carried by a fixed contact blade and a pair of movable contact blades, are sequentially opened and closed through movement of said pair of movable contact blades; a means providing individual sequential movement of said pair of movable contact blades with respect to said fixed blade comprising:

(a) a drive means,

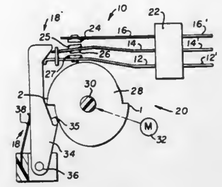
(b) cam means actuated by said drive means and a lever



engaging said cam means and a first blade of said pair of movable contact blades,

(c) a lost motion linkage means carried by said pair of movable contact blades and linking them together,

whereby initial movement of said lever by said cam means



causes movement of said first blade and continued movement thereof due to said lost motion linkage means causes movement of both of said pair of contact blades so as to selectively engage or disengage the electrical contacts carried by the movable blades and the fixed blade from each other.

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**4,297,546**

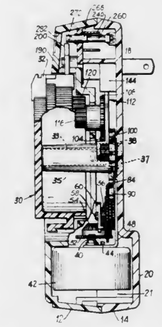
**ACTUATING MEANS FOR SWITCH OPERATION IN TIMING APPARATUS**

**Claude V. Koch, Two Rivers, Wis., assignor to AMF Incorporated, White Plains, N.Y.**

**Filed Apr. 14, 1980, Ser. No. 140,357**

**Int. Cl.³ H01H *43/10***

**U.S. Cl. 200—38 R** **11 Claims**



1. Timing apparatus for controlling the energization of an electrical plug receptacle into which the cord of a lamp or appliance, or the like, may be plugged, comprising

a case having front and back walls,

an electrical plug receptacle adapted to receive the prongs of an electrical plug,

electrical switch means within said case having only one movable contact blade that may be selectively moved to open and close contacts of the switch means,

said contact blade normally spring biasing said contacts to their closed positions,

means for connecting said switch means to a source of electrical power,

electrical conductor means connecting said switch means to said plug receptacle for energizing the plug receptacle when the switch means is closed and for deenergizing the plug receptacle when the switch means is open,

a time dial mounted on said case for rotation relative to said case,

an electrical motor mounted in said case,

means for energizing said motor,

gear train means coupling said motor to said time dial to rotate said time dial as a function to the rotation of said motor,

a plurality of time setting pins slidably mounted on the periphery of the time dial, each pin being slidable between an inner and an outer position, said inner and outer positions being along a path that is parallel to the axis of rotation of the time dial,

said setting pins having peripheral edges that comprise the outermost periphery of the time dial,

a switch actuator pivotally mounted for rotation about an axis that is parallel to, and fixed with respect to, the axis of rotation of said time dial,

said switch actuator having a free end that contacts said peripheral edges of the setting pins at an actuation position when the setting pins are in their inner positions but being out of contact with the peripheral edges of the pins when the setting pins are in their outer positions,

said free end of the switch actuator having such an extent relative to the circumference of the time dial with pins thereon that adjacent pins in their inner positions on the dial will continuously support said free end of the actuator as the adjacent pins pass the actuation position but a setting pin in its outer position that is between two pins in their inner positions will allow the actuator to pivot below the peripheral edges of the two inner pins and into the space therebetween,

push rod means for engaging said movable contact blade of the switch means,

said switch actuator urging said push rod means into engagement with said contact blade to move the blade to open the contacts of the switch means only when the free end of the switch actuator is in contact with the peripheral edge of a setting pin that is in its inner position.

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**4,297,547**

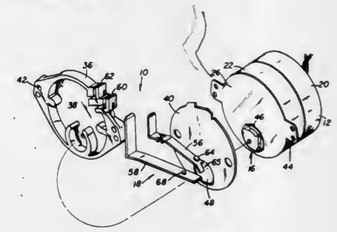
**MINIATURE TIMING MECHANISM**

**Benjamin F. Chestnut, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.**

**Continuation of Ser. No. 969,349, Dec. 14, 1978, abandoned. This application May 5, 1980, Ser. No. 146,616**

**Int. Cl.³ H01H *43/10***

**U.S. Cl. 200—38 R** **4 Claims**



1. A timing mechanism comprising:

(a) a motor and a gear train connected to said motor to be driven thereby,

(b) a first housing enclosing said gear train,

(c) a cup shaped second housing carried by said first housing at an open end thereof,

(d) an electrically insulative member closing said open end,

(e) a bearing surface provided in said first housing and extending through an opening in said electrically insulative member,

(f) a gear of said gear train carried within said first housing and having a unitarily constructed hub portion extending through said opening in said insulative member into said cup shaped member and at least one cam lobe unitarily constructed with said hub portion,

(g) electrical switch means carried in said cup shaped member and responsive to said cam lobe, and

(h) a circular cover carried by said cup shaped member and partially surrounding said cam lobe and in line with said opening and an outer surface of said bearing surface.

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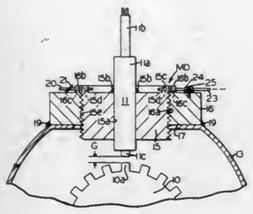
**4,297,548**

## VITAL INCIDENTAL MOVEMENT MONITORING ARRANGEMENT

**Donald R. Little, Greensburg, Pa., assignor to American Standard Inc., Swissvale, Pa.**

**Filed Dec. 19, 1979, Ser. No. 105,354**
**Int. Cl.³ H01H** *35/00*
**U.S. Cl. 200—61.08** **10 Claims**



1. A vital movement monitor comprising, a support member attached to a housing of a speed measuring device, a carrier member including a sensor adjustably joined to said support member, and an electrical conductor passing through apertures formed in said support and carrier members, said electrical conductor forming part of an electrical circuit which is disrupted when incidental relative rotational movement occurs between said support and carrier members.

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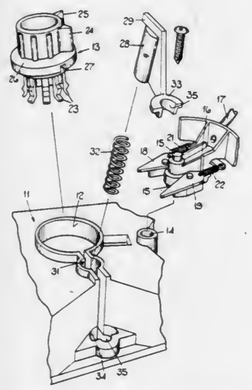
**4,297,549**

## DIRECTION INDICATOR SWITCH

**Steven J. Tregurtha, Near Acrington, and Edward Cryer, Burnley, both of England, assignors to Lucas Industries Limited, Birmingham, England**

**Filed Sep. 7, 1979, Ser. No. 73,557**
**Claims priority, application United Kingdom, Sep. 12, 1978, 36233/78**
**Int. Cl.³ H01H** *3/16*
**U.S. Cl. 200—61.27** **5 Claims**



1. A direction indicator switch and releasable latch means combination including a body, a member carried by the body and movable manually relative thereto from a rest position to either of first and second operative positions on opposite sides respectively of the rest position, a striker collar rotatable in use relative to said body with a steering shaft of a vehicle utilizing the switch to effect return movement of said member from either of said operative positions to said rest position, and said releasable latch means movably supported by said body whereby the striker collar is retained in a predetermined angular position relative to the body during assembly of the switch in the vehicle, said latch means being released after assembly of the switch in the vehicle to permit the collar to rotate with the steering shaft of the vehicle relative to the body.

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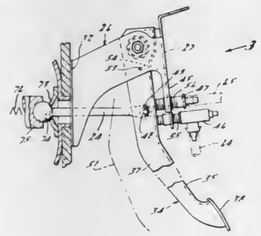
**4,297,550**

## METHOD AND CONSTRUCTION FOR VEHICLE BRAKE PEDAL AND SWITCH ASSEMBLY

**John D. Leighton, Bloomfield Hills, Mich., assignor to Betty Leighton, Bloomfield Hills, Mich., a part interest**

**Filed Mar. 1, 1979, Ser. No. 16,434**
**Int. Cl.³ H01H** *3/14*
**U.S. Cl. 200—61.89** **31 Claims**



1. In a method for assembly of an automotive brake pedal and switch, the steps of providing a pre-assembled module having a firewall mounting bracket member, a brake pedal lever member hinged thereto, resilient means urging said lever member rearwardly, and a switch carried by one of said members, adjusting said switch so that it will be actuated upon the desired movement of the brake pedal, said adjustment being made prior to mounting of the pre-assembled module upon said firewall, connecting said lever member to a brake system push rod member, mounting said module on a vehicle firewall, and connecting a lead wire to said switch, whereby forward movement of said lever member will actuate said switch.

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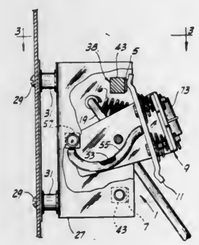
**4,297,551**

## ELECTRICAL TRANSFER SWITCH

**Leroy B. Ronk, Nokomis, Ill., assignor to Ronk Electrical Industries, Inc., Nokomis, Ill.**

**Filed Mar. 31, 1980, Ser. No. 135,266**
**Int. Cl.³ H01H** *5/08*
**U.S. Cl. 200—67 B** **11 Claims**



1. A transfer switch comprising:
a support;
first and second fixed contacts mounted on the support, the first contact being connected to a terminal adapted to be



connected to line power and the second contact being connected to a terminal adapted to be connected to a generator;
a rocker pivotable between first and second positions;
a contactor carried by the rocker, connected by a flexible conductor to a terminal mounted on the support, the contactor being movable with respect to the first and second contacts and being engageable with the first contact when the rocker is in its first position and being engageable with the second contact when the rocker is in its second position, whereby said terminal on the support is adapted to be connected to line power when the rocker is in its first position and to the generator when the rocker is in its second position; and
an actuator for moving the rocker between its first and second positions comprising a shaft rotatably mounted on the support and an overcentering spring, said shaft having a handle and a crank, said spring being secured at one end to the crank and at the other end to the rocker, the rocker being rotatably mounted on the shaft, the shaft being pivotable between first and second angular positions, the spring biasing the rocker to its first position when the shaft is in its first angular position and biasing the rocker to its second position when the shaft is in its second angular position, the spring applying a force to the rocker causing the rocker to snap from one of its positions to the other when the shaft is rotated from one of its angular positions to the other.

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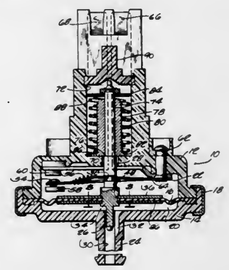
**4,297,552**

## VACUUM SWITCH

**Richard L. Lauritsen, Hoffman Estates, and Panagiotis K. Mandellos, Chicago, both of Ill., assignors to The Singer Company, Stamford, Conn.**

**Filed Jan. 30, 1980, Ser. No. 116,860**
**Int. Cl.³ H01H** *35/34*
**U.S. Cl. 200—83 P** **5 Claims**



1. A vacuum switch having a housing enclosing a chamber divided by a diaphragm into a vacuum chamber and a switch chamber, a conduit leading from the vacuum chamber for connection to a variable vacuum source, a switch in the switch chamber and having a switch blade provided with a contact moveable between a normally closed and normally open fixed contacts and having a tongue which is moved to cause movement of the blade with a snap action, an actuator connected to said diaphragm and to said tongue and extending through an aperture in the housing, characterized by,
a spring retainer fixed on the outboard end of the actuator,
a reset spring bearing against and compressed between the retainer and the housing,
said actuator having a shoulder thereon in the region of the actuator passing through the housing aperture,
a tubular eyelet slidably mounted on the actuator between said shoulder and the outboard end of the actuator and having a flange engageable with the shoulder and extending beyond the aperture so as to be engageable with the outside of the housing,
a trip spring bearing against and compressed between said flange and said retainer,
said trip spring being effective to exert a force on the actuator via the retainer when said flange is in engagement with the housing and being ineffective to exert such a force when the flange is in engagement with said shoulder.

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**4,297,553**

## ENCLOSED SWITCHING APPARATUS

**Yoshihiro Kawaguchi; Kosuke Higuchi, both of Yokohama, and Yoshiro Kitajima, Nagano, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan**

**Filed Feb. 14, 1979, Ser. No. 12,012**
**Claims priority, application Japan, Feb. 24, 1978, 53/19879**
**Int. Cl.³ H01H** *33/14, 33/54*
**U.S. Cl. 200—145** **6 Claims**

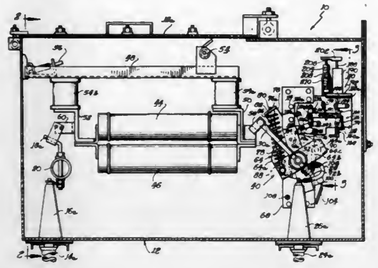
1. An enclosed switching apparatus of the type having:
a tank including a main cylindrical portion filled with an insulating gas and provided, at a first end thereof, with a removable cover,
a circuit breaker provided in and concentrically with said main cylindrical portion of said tank and including a housing, a stationary contact provided at a first end of said circuit breaker adjacent to said first end of said tank, and a movable contact provided at a second end of said circuit breaker,
first and second contact pedestals respectively provided at said first and second ends of said circuit breaker, and
a disconnecting switch including a stationary contact and a movable contact engageable with said stationary contact,
said tank being provided with a lead-out portion extending perpendicularly to the axis of said main cylindrical portion, with the axis of said lead-out portion intersecting the axis of said main cylindrical portion, and disposed adjacent to one of said contact pedestals, and said disconnecting switch being at least partially disposed in said lead-out portion, with the axis of said disconnecting switch being substantially coincident with the axis of said lead-out portion,
said enclosed switching apparatus further comprising:
a disconnecting switch operating device mounted to said main cylindrical portion for operating said movable contact of said disconnecting switch,
a drive bar member mechanically coupling said movable contact to said operating device, said drive bar member extending through said one of said contact pedestals and crossing the axis of said main cylindrical portion of said tank, substantially along a line of extension of the axis of said disconnecting switch, and including a conductor portion electrically connected to said movable contact of said disconnecting switch,
a slide contact mounted on said one of said contact pedestals to slidably receive said conductor portion of said drive bar member,
a circuit breaker operating device provided at a second end of said tank opposite to said first end, and including an insulating member movable for operating said movable contact of said circuit breaker,
said movable contact of said circuit breaker being detachable from said insulating member of said circuit breaker operating device.

**4,297,554**

## TIME DELAY SWITCH MECHANISM

**William R. Rueth, Jr., Hazel Crest, Ill., assignor to G & W Electric Specialty Company, Blue Island, Ill.**

**Filed Jan. 24, 1980, Ser. No. 114,742**
**Int. Cl.³ H01H** *7/03*
**U.S. Cl. 200—153 SC** **16 Claims**



1. In electrical switch apparatus including at least one pair of relatively movable switch contacts adapted for connection in an electrical circuit and operative between open and closed circuit conditions, switch transfer means operatively associated with at least one of said pair of contacts and operative between a first stored energy condition and a second condition enabling release of said stored energy so as to effect transfer of said switch contacts between said open and closed circuit conditions, and control means operatively associated with said switch transfer means and including a latching lever selectively operable between a latching position maintaining said switch transfer means in said first energy storing condition and a release position enabling release of said stored-energy to cause said transfer of said switch contacts between said open and closed circuit conditions; the combination therewith comprising mechanical time delay means including linkage means operatively associated with said latch lever and having at least one toggle linkage movable between an armed condition operative to maintain said latch lever in its said latching position and a release condition releasing said latch lever from its said latching position, a mechanical time delay operatively associated with said toggle linkage and directly responsive to initiation of movement of said toggle linkage from its said armed condition toward its said released condition so as to effect a predetermined time delay between initial movement of said toggle linkage and complete actuation thereof so as to release said latch lever, and actuator means for initiating movement of said toggle linkage from its said armed to its said released condition.

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**4,297,555**

## MOVABLE CONTACT ARM ASSEMBLY

**Michinobu Iwai, and Akira Tanimoto, both of Mieken, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawaski, Japan**

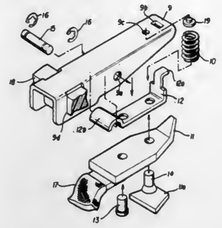
**Filed May 14, 1980, Ser. No. 149,753**
**Claims priority, application Japan, May 14, 1979, 54-063001[U]**
**Int. Cl.³ H01H** *1/22*
**U.S. Cl. 200—153 G** **6 Claims**

1. An electric switching device including at least one movable contact and means for moving said movable contact between the open and closed circuit positions comprising:

a movable contact arm having a pair of spaced wall portions including aligned holes therein, one end of said movable contact arm being provided with a hole;

an elongated contact member located between said wall portions of said contact arm;

a supporting member having at least one first generally L-shaped engaging member at one end thereof and including a first portion projecting from said supporting member and a second portion angled with respect to said first portion, said second portion engaged with said hole at one end of said movable contact arm and at least one engaging member at the other end thereof, said supporting member being mounted on said elongated contact member and being positioned between said elongated contact member and said movable contact arm; and



a pivot pin passing through said aligned holes in said wall portions of said movable contact arm, whereby said at least one engaging member at the other end of said supporting member is engaged with said pivot pin.

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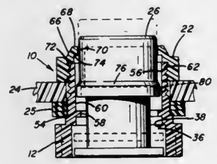
**4,297,556**

## PUSHBUTTON OPERATOR

**Glenn R. Taylor, 108 Duncan Cir., Beaver, Pa. 15009**

**Continuation of Ser. No. 13,664, Feb. 21, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,629**
**Int. Cl.³ H01H** *3/12*
**U.S. Cl. 200—330** **2 Claims**



1. A pushbutton operator for use with an electrical contact block having a stroker for actuating the block comprising:

A. a base portion and a hollow cylindrical extension made of insulating thermoplastic material having external threads on an end opposite the base portion;

B. a cap connected to a stem and disposed in the extension, the cap including an annular shoulder on its outside wall;

C. a base plate connected to the stem and located within the base portion;

D. means on the base portion for connection to the contact block; and

E. a clamp ring threaded to the extension to retain the cap, stem and plate in the extension and base portion of the operator, the clamp ring including an internally threaded bore having a pair of annular lips, the first lip comprising a limit for threading the clamp ring to the extension by the abutment of the first lip with the top of the extension and the second lip being of a smaller diameter than the first lip but larger than the annular shoulder on the cap to retain the cap within the extension

whereby when the operator is connected to a contact block the stroker abuts the plate to load the operator and depression of the cap moves the plate against the stroker to actuate the contact block.

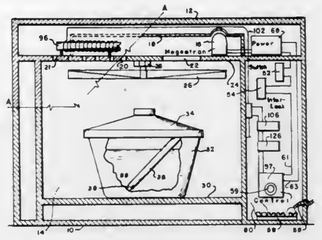


**4,297,557**

## MICROWAVE OVEN TEMPERATURE INDICATOR AND CONTROL MEANS

**Hugh J. Tyler, Santa Ana, and William H. Conway, Hacienda Heights, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed May 3, 1976, Ser. No. 682,198**
**Int. Cl.³ H05B** *6/68*
**U.S. Cl. 219—10.55 R** **6 Claims**



1. The combination of a microwave oven and telemetric temperature probe therefor which comprises:

(a) a microwave oven housing having internal walls defining and providing microwave shielding about an oven cavity;

(b) a telemetric temperature probe including:

($b_1$) microwave antenna means and power supply circuit means in circuit therewith to generate a power supply from received microwave radiation;

($b_2$) temperature responsive oscillator circuit mean driven by said power supply means to generate an oscillatory signal temperature modulated frequency and of a frequency distinct from said microwave frequency;

($b_3$) electromagnetic wave transmission means to broadcast said oscillatory signal; and

($b_4$) a probe housing having shielding means surrounding said power supply circuit means, oscillator circuit means and wave transmission means and of selective permeability to limit transmission of microwave energy while permitting transmission of said broadcast oscillatory signal;

(c) signal receiver means mounted in said oven to receive said broadcast oscillatory signal; and

(d) shielding means, of selective permeability to limit transmission of microwave energy while permitting transmission of said broadcast oscillatory signal, in said oven and surrounding said signal receiver means.

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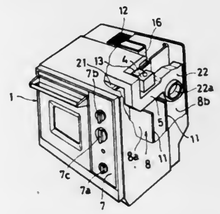
**4,297,558**

## COMPOSITE COOKING DEVICE

**Minoru Inayama, Komaki, and Yukio Furukawa, Konan, both of Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan**

**Filed Apr. 25, 1980, Ser. No. 143,873**
**Claims priority, application Japan, May 1, 1979, 54-57047**
**Int. Cl.³ H05B** *6/64*
**U.S. Cl. 219—10.55 R** **2 Claims**



1. A composite cooking device in which the main body of a box-type cooking device is provided with a heating chamber, a heat source, a magnetron, and a cooling fan for sending air into a cooling duct having the magnetron interposed therein, further in which there is formed, between the cooking device main body and the heating chamber, a one-sided chamber with a front operation panel and an upper space which extends from the space chamber and is in communication wth the atmosphere through an exhaust opening made in the upper portion of the main body, yet further in which a control means and a high-voltage element, such as a transformer, is contained in the space chamber in which the improvement comprises:

(a) said space chamber having its interior divided by at least one partition wall, such division forming (i) a front chamber adapted for containment of said control means and (ii) a rear chamber for containment of said high voltge element; and

(b) said cooling fan in communication at its intake side with the interior of said rear chamber, wherein the forward end of said cooling duct is in open communication with the exhaust opening of the main body.

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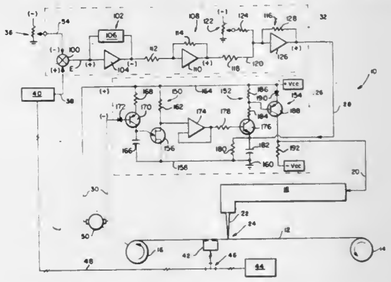
**4,297,559**

## APPARATUS FOR CONTROLLED PERFORATION OF MOVING WEBS WITH FIXED FOCUS LASER BEAM

**Hobart A. Whitman, III, Asheville, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.**

**Filed May 10, 1979, Ser. No. 37,727**
**Int. Cl.³ B23K** *26/02;* **H05B** *3/60*
**U.S. Cl. 219—121 LB** **13 Claims**



7. A control system for a laser beam perforating apparatus, comprising:

a porosity feedback arrangement producing an error signal representative of the difference between actual web porosity as measured and desired web porosity as preset, said feedback arrangement including porosity preset means for producing a preset signal corresponding to a predetermined web porosity, porosity sensing means for producing a porosity signal corresponding to actual web porosity after perforation, and a comparator circuit connected to said preset and sensing means for producing the error signal as a function of the difference between said preset signal and said porosity signal;

velocity sensing means for producing a sensed velocity signal corresponding to actual web velocity; and

an electronic control circuit connected to said comprator circuit of said porosity feedback arrangement and to said velocity sensing means for producing a continuous pulse train responsive both to said sensed velocity signal and to said error signal and for providing a replica of said pulse train to said fixed focus laser beam perforating apparatus, the repetition rate of said pulse train varying directly in response to the sensed velocity signal and the duration of each pulse in said pulse train varying in response to the error signal, whereby a constant number of elongated perforations per unit length are produced, with the length

of the perforations dependent upon the porosity feedback error signal.

13. In a method for controllably perforating a moving web by a pulsed laser beam, the improvements comprising:

(a) focusing the pulsed laser beam at a single plane coincident with the surface of said moving web;

(b) pulsing the laser beam at a repetition rate corresponding to the lineal velocity of the moving web;

(c) pulsing the laser beam with an individual pulse duration corresponding to the difference between an actual web porosity signal and a preset signal representing desired web porosity; and

(d) thereby controllably perforating said web by a serially distributed perforation pattern having a desired ratio of perforated to non-perforated area.

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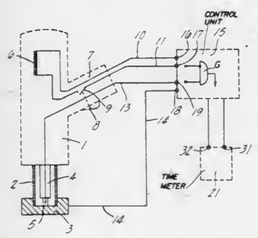
**4,297,560**

## PROCESS AND APPARATUS FOR TESTING ARC STUD WELDING GUNS

**Hermann Netzsch, Grueningen, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.**

**Filed Feb. 26, 1979, Ser. No. 14,802**
**Int. Cl.³ B23K** *9/20*
**U.S. Cl. 219—130.01** **7 Claims**




1. A test process for drawn arc stud welding guns comprising the steps of:

generating an electric starting signal which activates at least one electric solenoid associated with a holding means for a clamped-in welding stud, said generating step resulting from a switching operation occurring at the beginning of a welding operation,

deriving an electric cut-out signal from the short circuiting caused by the impact of the welding stud on its counter-electrodes, and

measuring the period of time between the electric starting signal and the electric cut-out signal.

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**4,297,561**

## SEMI-AUTOMATIC WELDING GUN

**Raymond L. Townsend; Jack R. Kester, and Kenneth A. Young, all of Wichita, Kans., assignors to Tweco Products, Inc., Wichita, Kans.**

**Filed Apr. 23, 1979, Ser. No. 32,350**
**Int. Cl.³ B23K** *9/32*
**U.S. Cl. 219—137.63** **5 Claims**

1. A welding gun apparatus to supply welding wire, electrical power and shielding gas to a working area, comprising:

(a) a supply adapted assembly connected to a welding wire and gas feed unit having shielding gas, welding wire, electrical power and a control circuit;

(b) a quick connector assembly releasably connected to said supply adapter assembly to receive the shielding gas, welding wire, electrical power, and a control circuit therefrom;

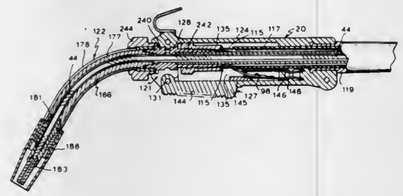
(c) a cable assembly having one end connected to said quick connector assembly to convey the shielding gas, welding wire, electrical power, and the control circuit within individual chambers;

(d) a welding gun assembly connected to the outer end of said cable assembly having control means connected to said control circuit selectively operable to semi-automatically feed the welding wire in conjunction with the electrical power and shielding gas to the working area;

(e) said welding gun assembly including a handle assembly connected to a conductor and supply tube assembly;

(f) said handle assembly having a gripper housing enclosing a cable connector assembly having a cable connector threaded on each of two end portions, and an actuator switch assembly;

(g) said quick connector assembly having a cable connector block to receive one end of a power supply conductor of said cable assembly and said conductor and supply tube therein, a separator member, and setscrews operable on



said power supply conductor and separator member to clamp said power supply conductor and said conductor and supply tube to said connector block for electrical continuity;

(h) said connector block having an elongated slot therethrough, and said separator member having upper and lower arcuate surfaces which cooperate with said setscrews and power supply conductor and said conductor and supply tube to firmly clamp said power supply conductor and said conductor supply tube therein for electrical continuity through said conductor and supply tube; and

(i) said cable connector assembly having a cable connector nut threadably engaging one of said two ends of said cable connector to secure thereto said power supply conductors of said cable assembly, said conductor and supply tube assembly including a removably, adjustable tube assembly connected to a nozzle assembly, said tube assembly having a conductor tube retaining nut engaging the other of said two ends of said cable connector in order to remove the tube assembly or to adjust the same with respect to said gun assembly.

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**4,297,562**

## HEAT ROLLER TYPE FIXING APPARATUS

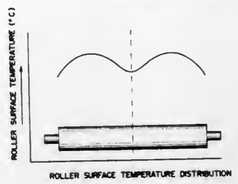
**Nin-ichi Kamogawa, Tokyo, and Takashi Ito, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

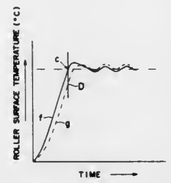
**Filed Dec. 10, 1979, Ser. No. 101,910**
**Claims priority, application Japan, Dec. 15, 1978, 53-156161**
**Int. Cl.³ H05B** *1/02*
**U.S. Cl. 219—216** **3 Claims**

1. In a heat roller type fixing apparatus having a heat roller with an axial center and two axial ends and accommodating a heating element arranged within said heat roller and adapted for fixing a toner image to a copying paper, a temperature sensing element spaced apart from said heat roller and for sensing the temperature of the heat roller surface and a control circuit adapted to cooperate with the temperature sensing element in controlling the heat roller surface temperature, an



improvement being that said heating element is an infrared ray heater having a temperature distribution property so arranged that the highest temperature is obtained between said axial center and both said axial ends when said heating element is energized, whereby said roller can suppress the overshoot of




roller surface temperature, said heating element providing a predetermined, nonuniform ray density along the axial direction of said roller whereby the energy emitted by said heating element varies axially along said roller, said temperature sensing element being positioned adjacent one of said points of highest temperature.

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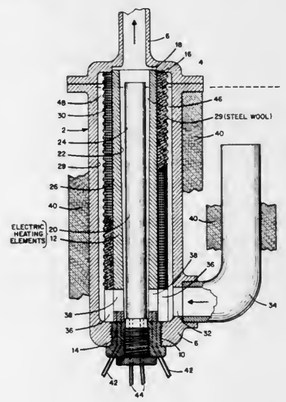
**4,297,563**

## ELECTRIC STEAM GENERATING UNIT

**Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104**

**Filed Mar. 26, 1980, Ser. No. 134,277**
**Int. Cl.³ F22B** *1/28;* **H05B** *3/82*
**U.S. Cl. 219—275** **4 Claims**




1. A steam generating unit comprising a housing having an upper end and a lower end,

a first elongated tubular immersion type electric heating element within said housing and separated therefrom along its length to provide a cylindrical space,

said first element at its upper end being in fluid tight engagement with said housing to close the upper end of said space,

a second elongated cylindrical rod-shaped immersion type electric heating element within and coaxial with said first element,

the dimensions of said elements providing therebetween a long generally cylindrical second space of which the inner surface of said first element and the outer surface of said second element comprise the walls of said second space,

said second space being of such small volume that water therein when subjected to the heat of both elements will turn quickly to steam,

the upper end of said second space being open to allow escape of steam from said space,

a discharge port at the upper end of said housing to receive steam generated in said space, and

a water inlet port into said housing and a passage therefrom to the lower end of said first and second spaces whereby water can be fed to said second space as fast as the water in said second space is being converted to steam and water may be maintained in said first space.

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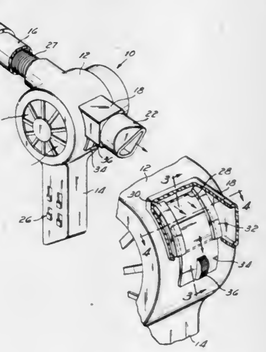
**4,297,564**

## HAIR DRYER

**Robert R. Bartolac, 560 Calle La Roda, Camarillo, Calif. 93010**

**Filed Nov. 29, 1978, Ser. No. 964,721**
**Int. Cl.³ A45D** *20/12*
**U.S. Cl. 219—367** **4 Claims**



1. In combination with a hand held, portable hair dryer, said hair dryer having a housing, a motor operated fan mounted within said housing capable of moving air, said housing including a graspable handle, said graspable handle being readily capable of being held within one hand of the operator and said housing to be easily reversibly positioned, said handle including electric switch means to operate said motor operated fan;

a first air outlet formed within said housing, an air heating element located within said first air outlet, air moved by said fan to be conducted through said first air outlet and discharged into the ambient, said first air outlet to discharge air in a first direction, the improvement comprising:

a second air outlet formed within said housing, said second air outlet also to receive air from said fan and conduct such into the ambient, the location of said second air outlet being spaced from said first air outlet, said second air outlet to discharge air in a second direction substantially opposite to said first direction, said second air outlet being void of an air heating device so as to discharge only cool air; and

means to close off said second air outlet, said means being manually movable between a closed position and an open position, said closed position not permitting conducting of air through said second air outlet and permitting the total

volume of air moved by said motor operated fan to be discharged through said first air outlet, said open position permitting conducting of air through said second air outlet resulting in the dividing of the airflow between said first air outlet and said second air outlet.

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**4,297,565**

## HEATED WINDOW STRUCTURE WITH AN ELECTRICAL CONNECTOR ASSEMBLY

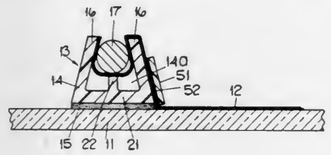
**David Parr, Aberystwyth, England, assignor to David Parr & Associates Limited, GB2**

**Filed Oct. 3, 1979, Ser. No. 81,388**

**Claims priority, application United Kingdom, Oct. 5, 1978, 39524/78; Oct. 5, 1978, 39525/78**

**Int. Cl.³ F27B** *3/06*

**U.S. Cl. 219—522** **10 Claims**




1. A window heater comprising:

a plurality of heating elements for adhesive attachment to a transparent window member;

an electrical connector assembly for one end of each of said heating elements, said electrical connector assembly including an elongated resilient synthetic resin channel member for attachment to said window, said channel member having therein a longitudinally extending channel of re-entrant cross-section, and an elongated electrically conductive part arranged to be received as a snap fit in said channel of said channel member so that said one end of each of said heating elements is trapped between said electrically conductive part and the wall of said channel in electrical connection with said electrically conductive part, said channel member including a surface which supports said electrically conductive part within said channel in a position spaced from the base of said channel in a direction towards the open face of said channel.

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**4,297,566**

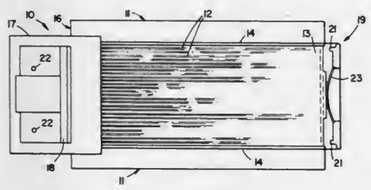
## PUNCH FRAME FOR DATA REGISTERING DEVICE

**John E. Ahmann, 1400 Duhig Rd., Napa, Calif. 94558**

**Filed Mar. 12, 1980, Ser. No. 129,585**

**Int. Cl.³ G07C** *13/00*

**U.S. Cl. 235—50 R** **15 Claims**




1. In a data registering device for use with a machine-processable record punch card and including a punch card frame supporting resilient strips for receiving punched-out chad pieces pushed between the strips by a hand-held stylus, and further including a lower card guide attached at a head end of the punch card frame, an upper card guide connected to the lower card guide, said card guides being adapted to receive the punch card between them, and a stylus-guiding template slidably positioned over the resilient strips for receiving in registry the punch card immediately below, the improvement comprising removable press-fit attachment means connecting the lower card guide with the punch card frame, for permitting removal of the lower card guide from the punch card frame and replacement of the resilient strips when required.

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**4,297,567**

## APPARATUS FOR RECEIVING STORING AND OUTPUTTING DIGITAL SIGNAL SEQUENCES

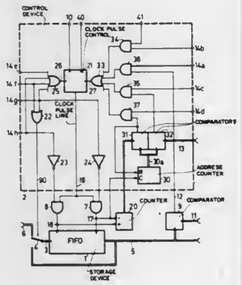
**Karl H. Herzner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jul. 20, 1979, Ser. No. 59,919**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834509**

**Int. Cl.³ H03K** *21/34*

**U.S. Cl. 235—92 PB** **6 Claims**




1. Apparatus for receiving, storing and outputting digital signal sequences, said apparatus comprising:

a serial first-in-first-out storage means, having a digital signal input and an input clock terminal for storing a digital signal received under control of an input clock signal, a digital signal output and an output clock terminal for outputting and erasing a digital signal stored under control of an output clock signal, retrocoupling means having a first position for interconnecting said digital signal output to said digital signal input and a second position for receiving a digital signal from an external terminal;

a control means having a primary clock input, a primary clock output coupled to said input clock and output clock terminals, first and second inhibit lines for selectively inhibiting said input clock terminal and output clock terminal, respectively, a further control output for controlling the position of said retrocoupling means, a first data input connected to said digital signal output and a second data input for receiving a further digital signal to be compared to the signal on said first data input in a first comparing means linked thereto; said control means having furthermore a control signal input for receiving mode control signals, said mode control signals comprising: a first signal for controlling a storing mode by driving said retrocoupling means to said second position while furthermore driving said input clock terminal but inhibiting said output clock terminal;

a second signal for controlling an erasing mode by driving said output clock terminal but inhibiting presentation of a digital signal at said digital signal input;

a third signal for controlling a modifying mode regarding an individual digital signal as stored in said storage means by driving said retrocoupling means to said second position while furthermore cooperatively driving said input clock terminal and said output clock terminal; a fourth signal for controlling an outputting mode thereby outputting a sequence of digital signals as stored in said storage means by driving said retrocoupling means to said first position while furthermore cooperatively driving said input clock terminal and said output clock terminal;

a fifth signal for controlling a first addressing mode thereby content-addressing said storage means by activating said first comparing means for generating, upon equality detected therein, a first equality signal for co-controlling a further one of said control signals.



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**4,297,568**

## COOKING APPARATUS

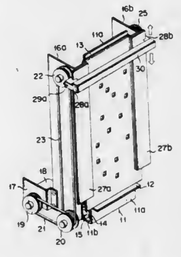
**Hisahi Okatsuka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed May 10, 1979, Ser. No. 37,953**

**Claims priority, application Japan, May 16, 1978, 53-57937**

**Int. Cl.³ H01H** *43/08;* **G06K** *7/00, 13/04, 13/06*

**U.S. Cl. 235—435** **6 Claims**




1. A cooking apparatus for automatically cooking according to a program fed from a recording medium comprising:

a housing having an interior space in which food is cooked, and a front panel; and

means secured to said front panel for receiving and reading a program on a recording medium to control heating of food including a support, a pair of spaced apart rockable holding members mounted for pivotable movement between a first position holding the recording medium for reading and a second position releasing the recording medium for insertion and removal, a recording medium receiving member for receiving said medium when it is inserted between said holding members and said support and falls onto said receiving member and detecting means movable along said medium to read a cooking program from said medium.

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**4,297,569**

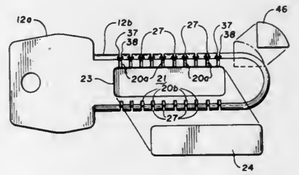
## MICROELECTRONIC MEMORY KEY WITH RECEPTACLE AND SYSTEMS THEREFOR

**William P. Flies, Frontenac, Minn., assignor to Datakey, Inc., Minneapolis, Minn.**

**Filed Jun. 28, 1979, Ser. No. 52,773**

**Int. Cl.³ G06K** *7/06, 19/00;* **E05B** *47/06*

**U.S. Cl. 235—443** **18 Claims**




1. In combination:

a key-like device having head and insert body portions, the insert body portion being adapted for insertion into a receptacle and rotation therein to a "locked" position and including in cross section

a major dimension with opposing upper and lower surfaces,

a smaller minor dimension with opposing side surfaces, and

a plurality of spaced transverse grooves formed on the major surfaces, and

An electrical circuit element encapsulated within the key, the element including a plurality of electrical leads, each of which extend into one of the grooves and lie therein to form a plurality of electrical contacts;

a receptacle defining a keyway for receiving the key insert body portion and the spaced electrical contacts carried thereby,

the keyway including a plurality of correspondingly spaced electrical contacts,

insertion guide means in the keyway for guiding the insert body portion during insertion with the contacts thereof angularly displaced from the keyway contacts,

rotation guide means in the keyway for guiding the insert body portion during rotation to a "locked" position in the receptacle and bringing the insert and keyway contacts together in contacting pairs, and wherein

each keyway contact comprises a conductive lead having a resilient bend portion positioned in the keyway for contacting a correspondingly spaced insert body contact upon rotation of the insert body to the "locked" position in the receptacle.

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**4,297,570**

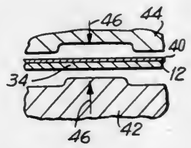
## MAGNETIC STRIPE

**George A. Kowalski, Deer Park, N.Y.; George Mayer, Hamden, Conn., and Murray Rosenbaum, New York, N.Y., assignors to Koller & Smith Co., Inc., Pelham, N.Y.**

**Filed Sep. 17, 1979, Ser. No. 76,158**

**Int. Cl.³ G06K** *19/02;* **G11B** *25/04;* **G06K** *19/06*

**U.S. Cl. 235—493** **9 Claims**




1. A flexible sheet for use in forming a magnetic recording medium in the form of a stripe on a paper substrate, said sheet comprising a first layer of magnetic-particle-free thermoplastic material, said first thermoplastic layer being bondable to said paper substrate by application of elevated temperature and pressure to a local area thereof, a middle layer of magnetizable material permanently bonded to said first thermoplastic layer, said layer of magnetizable material consisting of a plurality of discrete magnetizable particles dispersed in a thermoplastic matrix, a second layer of magnetic-particle-free thermoplastic material, said second thermoplastic layer being permanently bonded to said middle layer of magnetizable material, said middle layer of magnetizable material being compatible with both said first and second layers of thermoplastic material, and a carrier web detachably bonded to said second layer of thermoplastic material, such that when elevated temperature and pressure is applied to a narrow rectilinear local area of said web while said first layer of thermoplastic material is disposed on said paper substrate, a magnetic stripe composed of superposed portions of said first, middle and second layers is detached in the shape of said area from said carrier web and the portions of said layers remaining on the web and transferred to said paper substrate, said second layer of thermoplastic material in said stripe forming an outer polish layer on the stripe

that reduces irregularities in the outer surface of the stripe due to the magnetic particles and minimizes abrasion of recording, erasing and reading heads, said thermoplastic matrix of the middle layer of said stripe becoming sufficiently plastic under the influence of elevated temperature and pressure during bonding to permit migration of magnetic particles towards said paper substrate during the application of elevated temperature and pressure.

7. A document having a paper substrate and encodable with permanent, machine-readable digital data, said document having an integral permanently attached recording magnetic stripe comprising three successive layers, said three layers comprising a first layer of magnetic-particle-free thermoplastic material permanently bonded to said paper substrate by application of elevated temperature and pressure, a middle layer of magnetizable material permanently bonded to said first layer of thermoplastic material and consisting of a plurality of discrete magnetizable particles dispersed in a thermoplastic matrix, and a second layer of magnetic-particle-free thermoplastic material, said second layer of thermoplastic material being permanently bonded to said layer of magnetizable material and forming an outer polish layer on the stripe that reduces irregularities in the outer surface of the stripe due to the magnetic particles and minimizes abrasion of recording, erasing and reading heads, said thermoplastic matrix of said middle layer having become sufficiently plastic under the influence of elevated temperature and pressure during bonding so as to permit migration of magnetic particles towards said paper substrate during the application of elevated temperature and pressure.

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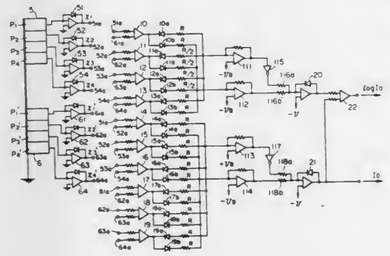
**4,297,571**

## FOCUS DETECTING DEVICE

**Ken Utagawa, Yokohama; Kunihisa Hoshino; Hiroshi Shirasu, both of Kawasaki, and Akira Ogasawara, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Jan. 3, 1980, Ser. No. 109,282**
**Claims priority, application Japan, Jan. 20, 1979, 54-5269**
**Int. Cl.³ G01J** *1/20*
**U.S. Cl. 250—201** **4 Claims**



1. A focus detecting device having first and second photoelectric element arrays each including a plurality of photoelectric elements disposed so as to mutually correspond in position, and optical means for forming a first image and a second image of an object on said first and second photoelectric element arrays, respectively, so that when an objective lens is in focused position with respect to the object, the first image and the second image are positioned on said mutually corresponding photoelectric elements of said first and second photoelectric element arrays, respectively, and that when said objective lens is offset from said focused position, the first image and the second image are positioned on the photoelectric elements of said first and second photoelectric element arrays, respectively, which do not mutually correspond, in accordance with said offset, said device being for detecting the focused condition of the objective lens from the positional relations of said first image and said second image with said first and second photoelectric element arrays, respectively, the improvement comprising:

(a) first means for calculating the differences between electrical outputs related to the outputs of the mutually corresponding ones of the photoelectric elements forming said first photoelectric element array and the photoelectric elements forming said second photoelectric element array and adding together the quantities based on said differences;

(b) second means for calculating the difference between each electrical output related to the output of each of said photoelectric elements and each electrical output related to the output of the photoelectric element spaced apart from each said photoelectric element with a predetermined number of photoelectric elements interposed therebetween in the direction of arrangement of the photoelectric elements of said arrays and adding together the quantities based on said differences; and

(c) third means for detecting the focused condition of the objective lens on the basis of the outputs of said first means and said second means.

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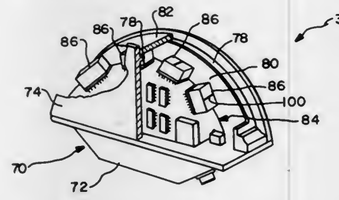
**4,297,572**

## TRACKING SOLAR ENERGY COLLECTOR ASSEMBLY

**Richard J. Carlton, Sunnyvale, Calif., assignor to Acurex Corporation, Mountain View, Calif.**

**Filed Aug. 14, 1979, Ser. No. 66,402**
**Int. Cl.³ G01J** *1/20*
**U.S. Cl. 250—203 R** **22 Claims**




1. A tracking type of solar energy collector assembly comprising:

means including a panel member for collecting solar energy, said panel member being mounted for movement along a tracking path in order to maintain a predetermined orientation with the sun as the latter moves across the sky from an initial position immediately following sunrise to a final position immediately preceding sunset;

means for moving said panel member along said tracking path;

solar position sensing means mounted for movement with said panel member and responsive to the position of the sun for producing an output indicating whether or not said panel member is in said predetermined orientation with the sun;

direct insolation monitoring means including a plurality of fixed light sensing elements positioned in a fixed orientation with the ambient surroundings to receive a limited beam of direct sunlight on at least one of said light sensing elements regardless of the position of the sun as the latter moves from its initial position in the sky to its final position, said monitoring means producing outputs respectively corresponding to the intensity of light received at said light sensing elements; and

control means connected with said moving means and responsive to the outputs from said solar position sensing means and said monitoring means when operating in an automatic searching and tracking mode for controlling the operation of said moving means to continuously place said panel member in said predetermined orientation with the sun as the latter moves across the sky from its initial position to its final position and so long as the intensity of light received on at least one of said sensing elements is at or above the threshold level indicative of the presence of direct sunlight.



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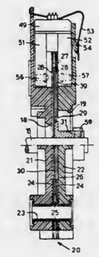
**4,297,573**

## POSITION TRANSDUCER FOR A ROTATING MEMBER

**Raffaele Becchi, Ivrea; Felice Giacone, Turin, and Andrea Accattino, Salerano, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy**

**Division of Ser. No. 973,011, Dec. 26, 1978. This application May 16, 1980, Ser. No. 150,441**
**Claims priority, application Italy, Dec. 30, 1977, 69951 A/77**
**Int. Cl.³ G01D** *5/34*
**U.S. Cl. 250—231 SE** **8 Claims**



1. An angular position transducer for a rotating member comprising a disc connected to said member, an index means carried by said disc on its periphery, and a detector responsive to the passage of said index means for detecting the angular position of said disc, and wherein the disc is fixed to said member by means of a thin, flexible lamina and is guided in a peripheral zone thereof by a guide adjacent to said detector, in such a way as to allow the recovery of misalignments and axial displacements of said rotating member by the compliance of said lamina, in order to maintain substantially constant the distance between the detector means and the periphery of the disc.

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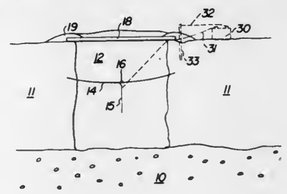
**4,297,574**

## RADON DETECTION

**Jeffrey W. Card, 229 Argyle Ave., Apt. #308, Ottawa, Ontario, Canada (K2P 1B8), and Keith Bell, 295 5th Ave., Ottawa, Ontario, Canada (K1S 2NP)**

**Filed Apr. 26, 1979, Ser. No. 33,497**
**Claims priority, application Canada, Feb. 26, 1979, 322299**
**Int. Cl.³ G01V** *5/00;* **G01T** *1/04*
**U.S. Cl. 250—253** **19 Claims**




1. A method of exploring for uranium by detecting decay products of radon as an indication of the presence of uranium mineralization, comprising the steps of:

providing, at respective spaced-apart locations at a uranium exploration site, a plurality of decay product collectors having at least substantially similar surface areas;

enclosing each of said collectors at its respective location in an air space in which said collectors are exposed to radon migrating from the ground;

the enclosure of the air spaces maintaining the air within the air spaces in a substantially undisturbed condition during the exposure of said collectors;

continuing the exposure of said collectors for a period of time sufficient for the radon to migrate by natural processes into the air spaces and for the decay products of the migrating radon to become deposited on said collectors;

terminating the exposure of said collectors;

measuring alpha particles, beta particles or gamma rays emitted by decay of the decay products deposited on said collectors;

the measurements of the alpha particles, beta particles or gamma rays being initiated at at least substantially equal respective time intervals following the terminations of the exposures of said collectors and being effected over at least substantially equal measurement periods; and

comparing the measurements thus obtained from the spaced-apart locations to provide an indication of the presence or absence of uranium mineralization at, or geologically associated with, the uranium exploration site.

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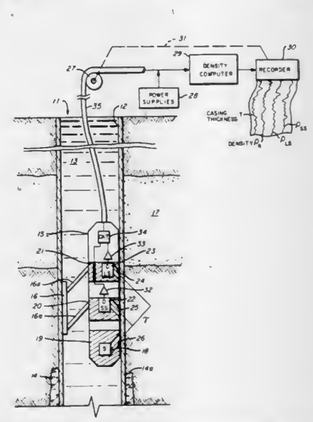
**4,297,575**

## SIMULTANEOUS GAMMA RAY MEASUREMENT OF FORMATION BULK DENSITY AND CASING THICKNESS

**Harry D. Smith, Jr.; Dan M. Arnold, both of Houston, and Kenneth J. Smith, Rosenberg, all of Tex., assignors to Halliburton Company, Duncan, Okla.**

**Filed Aug. 13, 1979, Ser. No. 66,125**
**Int. Cl.³ G01V** *5/00*
**U.S. Cl. 250—265** **15 Claims**




1. A method for logging a cased well borehole to determine simultaneously the bulk density of earth formations behind the wall casing and the thickness of the well casing, comprising the steps of:

emitting low energy gamma radiation from a source of such radiation in a well borehole into the casing and earth formations surrounding a cased well borehole;

detecting at a first, longitudinally spaced distance from said source, gamma radiation scattered back into the borehole by the casing and earth formations and generating first count rate signals representative thereof;

detecting at a second, differently longitudinally spaced distance from said source, gamma radiation scattered back into the borehole by the casing and earth formations and generating secound count rate signals representative thereof;

combining said first and second count rate signals according to a predetermined relationship to derive a third signal

representative of the earth formation bulk density compensated for detector standoff from the earth formation caused by the casing and a fourth correction signal representing the correction required to compensate said third signal for the standoff;

combining said third and fourth signals according to a second, different predetermined relationship, to derive a fifth signal representative of the thickness of the casing in the vicinity of said detectors; and

recording at least said third and fifth signals.

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**4,297,576**

## DEVICE FOR THE INTERCONNECTION OF CONDUCTIVE TERMINALS LOCATED WITHIN A DEMOUNTABLE ENCLOSURE AND CONDUCTIVE TERMINALS LOCATED OUTSIDE SAID ENCLOSURE

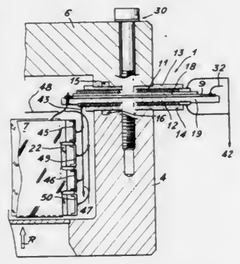
**Michel Laval, Saint Martin D'Uriage, and Edmond Tournier, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Nov. 23, 1979, Ser. No. 97,051**

**Claims priority, application France, Nov. 28, 1978, 78 33545**

**Int. Cl.³ G01T *1/18*; G01N *21/00***

**U.S. Cl. 250—336** **6 Claims**



1. A device for providing interconnection between conductive terminals, said terminals having variable potentials appearing thereat and being located within a conductive enclosure comprising two demountable portions, and conductive terminals located outside said enclosure, said device comprising conductive layers, a plurality of conductors mutually insulated from one another and lying between said conductive layers, and means for bringing said conductive layers and said conductors to a polarization potential, said conductive layers and said conductors passing through the wall of said enclosure between the two demountable portions thereof and being insulated from said enclosure.

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**4,297,577**

## RADIATION DETECTION OF GAS COMPOSITIONS

**Charles D. Coe, Barlow, and Philip Wright, Dronfield Woodhouse, both of England, assignors to Land Pyrometers Limited, Sheffield, England**

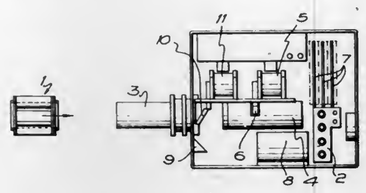
**Filed Nov. 29, 1979, Ser. No. 99,008**

**Claims priority, application United Kingdom, Nov. 29, 1978, 846533/78**

**Int. Cl.³ G01J *1/00***

**U.S. Cl. 250—343** **1 Claim**

1. Equipment for the monitoring of gas in-situ comprising an infra-red source adapted to propagate a radiation beam through ducting or the like through which the gas to be analysed passes, a detector spaced from the infra red source responsive to radiation from the beam, a band-pass filter in the beam path to restrict beam radiation incident on the detector to a predetermined wavelength range, and a filter cell adapted to be positioned in the radiation path between the detector and the source, said cell being filled with the gas component requiring analysis, the detector and source being arranged such that the detector is responsive to beam radiation that passes in the ducting only through the gas to be analysed and to beam radiation that passes through the gas to be analysed and the cell, the detector being connected in a circuit including first means for measuring radiation passing through a first radiation path, second means for measuring radiation passing through a second radiation path, said gas to be analysed being in said first and second radiation paths, said gas component filter cell being in only said second radiation path, third means responsive to said first means and second means respectively for obtaining



two levels of radiation, fourth means for determining a difference between the two levels of radiation, a fifth means for dividing the difference by either of the two levels of radiation received by the detector, an output of said circuit being a function of the amount of monitored gas present in the gas flow, including calibration means comprising a second infra red source generating radiation along a sight path, said sight path including an enclosure containing a fixed concentration of gas or no gas, said detector being selectively exposed in said sight path for equipment calibration.

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**4,297,578**

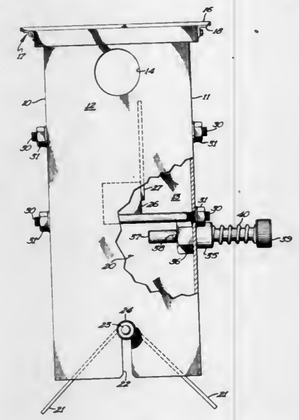
## AIRBORNE DUST MONITOR

**William R. Carter, 5021 Wooddale La., Minneapolis, Minn. 55424**

**Filed Jan. 9, 1980, Ser. No. 110,601**

**Int. Cl.³ G01J *1/00*; G01N *21/00***

**U.S. Cl. 250—343** **7 Claims**



1. In an airborne dust monitor of the type having photosensitive means for detecting a predetermined airborne dust level at a test region, the improvement which comprises generally vertical flue means for establishing a flow of ambient air through said test region, said detecting means being housed within said flue means adjacent said test region, and test means, including test element means, operable from the outside of said flue means for selectively positioning said test element means within said test region.



**4,297,579**

## BI-FREQUENCY INFRARED SPECTROMETER

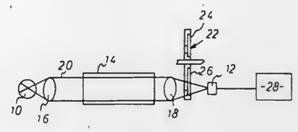
**Tilman P. Spaeth, Sipplingen, Fed. Rep. of Germany, assignor to Bodenseewerk Geosystem GmbH, Uberlingen, Fed. Rep. of Germany**

**Filed Jun. 4, 1980, Ser. No. 156,505**

**Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924131; Jun. 15, 1979, 2924132; European Pat. Off., Jun. 15, 1979, 79101976**

**Int. Cl.³ G01N *21/26***

**U.S. Cl. 250—343** **13 Claims**



1. Signal processing circuit for the separation of overlapping signals, which are provided by a detector subjected to alternating measuring quantities and having inertia and/or memory,

wherein the detector signal is integrated by an integrator during predetermined reference and measuring time intervals, each of which is associated with one of the alternating measuring quantities,

characterized in that

(a) a clamp circuit acting on the detector signal and controlled by a programmer is provided,

(b) the output signal of the clamp circuit is applied to the integrator directly through a first switch controlled by the programmer, and inverted through a second switch also controlled by the programmer,

(c) one switch is closed by the programmer during each reference and measuring time interval and the other switch is closed during compensation time intervals defined before each reference and measuring time interval,

(d) the clamp circuit is arranged to be actuated by the programmer to clamp the detector signal to a baseline before each reference, measuring and compensation time interval,

(e) the programmer is arranged to apply the output signal of the integrator or a function of this signal to one memory circuit each, after each reference time interval and after each measuring time interval, and

(f) furthermore the integrator is arranged to be reset to zero by the programmer after each application of the output signal to one of the memory circuits.

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**4,297,580**

## X-RAY OPTICAL SYSTEM FOR ARTICLE INSPECTION, WITH COMPONENTS DISPOSED ON PARALLEL AXES

**Adolph Juner, City Island, and David J. Haas, Suffern, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 864,503, Dec. 27, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,467**

**Int. Cl.³ G01T *1/00***

**U.S. Cl. 250—368** **20 Claims**

1. An X-ray optical system for examining an inanimate article, comprising:

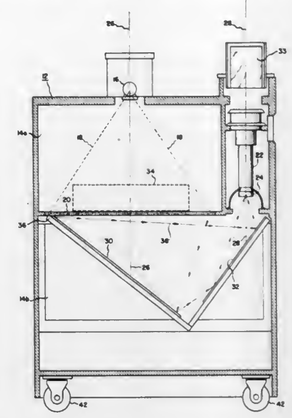
(a) a source of X-rays directed in a generally downward first direction,

(b) a flourescent screen means for converting said X-rays to a light image, said screen means being disposed below said X-ray source,

(c) means for receiving said article between said X-ray source and said fluorescent screen means such that said X-rays passing through said article reach said screen means to generate thereat a light image of said article,

(d) a first light reflecting means disposed below said fluorescent screen means for receiving said light image from said fluorescent screen means, said light image being directed in said first direction,

(e) second light reflecting means disposed opposite and obliquely to said first light reflecting means for receiving said light image reflected from said first light reflecting



means and for redirecting said light image in a upward second direction, and

(f) means for viewing said redirected light image, said viewing means being disposed above said second light reflecting means, said viewing means including an image intensifier for receiving said light image from said second light reflecting means.

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**4,297,581**

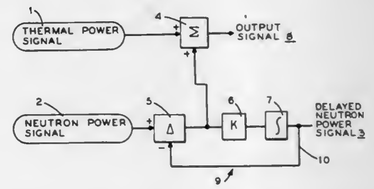
## METHOD FOR THE FAST AND ACCURATE IDENTIFICATION OF CORE POWER IN NUCLEAR REACTORS

**William T. Brunson, and Anthony F. Lexa, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Jan. 15, 1979, Ser. No. 3,444**

**Int. Cl.³ G01T *3/00***

**U.S. Cl. 250—391** **4 Claims**




1. A method for accurately and rapidly generating an output signal corresponding to the power of a nuclear reactor having a reactor core and a heat receiving fluid passing through said core in heat transfer relationship therewith which comprises: generating a first neutron flux signal corresponding to reactor power at a first point in time; generating a second neutron flux signal corresponding to reactor power at a subsequent point in time; generating a thermal power signal, at the subsequent point in time, derived from a thermal differential of the fluid cooling the reactor; generating an output signal, at the subsequent point in time, by varying the thermal power signal in

proportion with a predetermined relationship of the first and second neutron flux signals.

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**4,297,582**

## RADIATION DIAGNOSTIC DEVICE FOR GENERATING TOMOGRAPHIC IMAGES

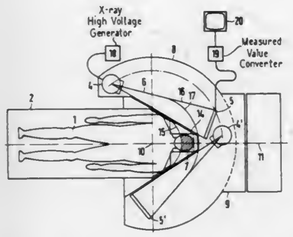
**Günter Schwierz; Rudolf Schittenhelm; Günter Schmitt, all of Erlangen, and Edgar Tschunt, Rathsberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jul. 18, 1979, Ser. No. 58,464**

**Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834934**

**Int. Cl.³ G03B *41/16***

**U.S. Cl. 250—445 T** **2 Claims**




1. A diagnostic device for generating layer images of an exposure subject, said device comprising

(a) a patient support (**2**) providing a generally horizontal patient support surface at which a patient is supported so as to position a body layer to be examined in a longitudinally disposed scan plane generally parallel to the plane of said patient support surface and at a predetermined distance above the patient support surface less than the patient thickness,

(b) a measuring arrangement for the irradiation of the body layer to be examined by means of x-rays to produce a series of scan projections with respective directional axes lying in said scan plane and each projection providing a multiplicity of beam paths in said scan plane and intersecting the body layer in a generally fan shaped beam configuration, said measuring arrangement including an x-ray radiation soruce (**4**) which emits x-ray radiation for providing said fan beam configuration in said scan plane with lateral extent corresponding to the extent of said body layer in said scan plane,

(c) said measuring arrangement further including a radiation receiver (**5**) disposed in the plane of said fan shaped beam configuration and arranged to intercept the fan shaped beam configuration on the opposite side of the body layer from the radiation source during irradiation of the body layer for each scan projection in said scan plane, and to supply output signals corresponding to the measured radiation intensity for respective beam paths of the fan shaped beam configuration for each scan projection of the body layer,

(d) a measured value converter (**19**) connected with the radiation receiver for calculating attenuation values for specific image points of the irradiated body layer from the output signals of the radiation receiver,

(e) scanning means (**8**, **10***a*) coupled with said measuring arrangement and providing for movement thereof in said scan plane so as to irradiate said body layer along the respective directional axes in accordance with said series of scan projections during a scanning operation, and so that the body layer to be examined is scanned by being penetrated exclusively along beam paths of the fan shaped bean configuration each of which is crossed, along its entire length in the body layer, by a multitiude of other beam paths,

(f) mounting means (**9**, **12**) mounting said scanning means (**8**, **10***a*) such that the measuring arrangement moves along a path lying in the scan plane and such that the fan shaped beam configuration sweeps through an acruate region lying in the scan plane and extending from one side of the patient support to the other over an angular extent of substantially less than 360° to avoid irradiating a patient lying on the patient support except at the body layer, and

(f) means comprising said scanning means and said mounting means for sweeping the fan beam configuration during a scanning operation in a scan plane lying a distance above the patient support surface less than the patient thickness such that a 360° movement of the measuring arrangement about the body layer, which is prevented by a patient on the patient support, is unnecessary to the production of a layer image of said body layer, said last-mentioned means directing the beam configuration obliquely relative to a radial line from the x-ray radiation source (**4**) to the center of curvature (**10**) of the arcuate region swept by the beam configuration such that the arcuate region swept by the beam configuration durng the scanning operation is essentially clear of the patient except at the body layer.

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**4,297,583**

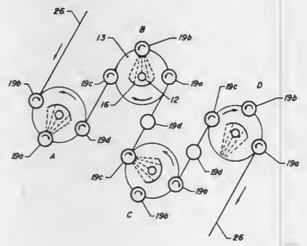
## ULTRAVIOLET LIGHT APPARATUS

**Irving Nerod, Spotswood, N.J., assignor to American Can Company, Greenwich, Conn.**

**Continuation-in-part of Ser. No. 11,525, Feb. 8, 1979, abandoned. This application Feb. 28, 1980, Ser. No. 125,373**

**Int. Cl.³ H01J *37/00*; F26B *3/30***

**U.S. Cl. 250—453** **4 Claims**



1. Apparatus for curing ink or coatings on a cylindrical container comprising:

(a) a frame;

(b) a wheel, mounted on said frame for rotation about an axis;

(c) a reflector, affixed to said wheel for movement therewith about said axis, said axis being co-incident with a first focus of said reflector and wherein a second focus is outward thereof;

(d) a radiant energy source fixedly mounted on said frame, substantially co-extensive with said reflector and disposed at said first reflector focus;

(e) a belt disposed to engage said wheel at the circumference and drive said wheel, said belt including a plurality of carriers mounted thereon for (one of said carriers) supporting and (maintaining said container in confronting alignment with said reflector) conveying said containers, said carriers being disposed along said belt at intervals equal to the circumference of said wheel, said belt engaging said wheel to advance said carriers into individual registration with said reflector wherein said container mounted on said registered carrier is substantially co-extensive with said energy source and is confrontingly aligned with said reflector whereby said confrontingly aligned container intercepts rays from said reflector, proximate the second focus of said reflector, and wherein said rays are maintained substantially in focus on said confrontingly aligned containers as said confrontingly aligned container moves around said energy source; and

(f) means for rotating said carriers as said carriers move around said energy source thereby ensuring uniform irradiation of said confrontingly aligned container by said focused rays of energy.



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**4,297,584**

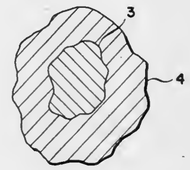
## RARE EARTH PHOSPHORS AND PHOSPHOR SCREENS

**Robert A. Buchanan, Palo Alto; T. Grant Maple, and Alden F. Sklensky, both of Sunnyvale, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.**

**Filed Apr. 11, 1977, Ser. No. 786,227**

**Int. Cl.³ G01J *1/58***

**U.S. Cl. 250—483** **33 Claims**




1. A stabilized rare earth oxybromide phosphor consisting essentially of at least one oxybromide selected from the group consisting of yttrium oxybromide, lanthanum oxybromide and gadolinium oxybromide in which from about 0.001 percent to about 10 percent of the host metal ions have been replaced by trivalent cerium ions and characterized by having an integral, continuous surface layer of at least one rare earth oxychloride selected from the group consisting of yttrium oxychloride, lanthanum oxychloride and gadolinium oxychloride in which from about 0.001 percent to about 10 percent of the host metal ions have been replaced by trivalent cerium ions.

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**4,297,585**

## SYSTEM FOR THE DETECTION OF SPLICING DEFECTS IN FILM

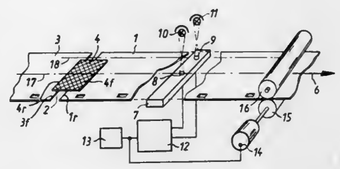
**Werner Puschmann, Langenfeld, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 27, 1979, Ser. No. 107,652**

**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856705**

**Int. Cl.³ G01N *21/86***

**U.S. Cl. 250—560** **16 Claims**



1. A system for identifying a defective splice which improperly bridges a gap located between a leading strip of film and a trailing strip of film, and for identifying an improper gap, when the strips are moving at a constant rate past a fixed line segment located on and oriented transversely to a path along which the strips travel, the path dividing an imaginary line which intersects the line segment and is oriented normally with respect to the path into a first side and a second side, comprising:

a gap sensor producing a time-varying gap signal with a gap stage and a strip state, the gap signal assuming the strip state whenever a strip is located at the line segment and assuming the gap state whenever a gap is located at the line segment;

a splice sensor producing a time-varying splice signal with a splice state and a non-splice state, the splice signal assuming that splice state whenever a splice is located at the line segment and assuming the non-splice state otherwise; and

a congruance computer responsive to the gap signal and splice signal and producing an output signal with a congruance state and a discongruance state, the output signal assuming the congruance state when and only when the splice is properly bridging the gap and the gap is proper, and assuming the discongruance state otherwise.

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**4,297,586**

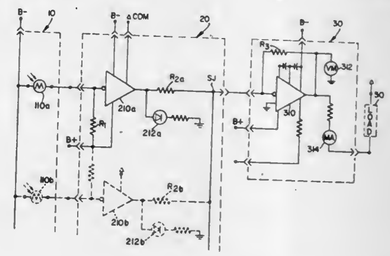
## PHOTO-ELECTRIC DIGITAL CIRCUIT FOR MONITORING STRIP LOOP POSITION

**John M. Rodgers, 12990 Club Dr., Redlands, Calif. 92373**

**Filed Feb. 25, 1980, Ser. No. 124,628**

**Int. Cl.³ G01N *21/86***

**U.S. Cl. 250—561** **5 Claims**




1. Apparatus for monitoring strip loop position in a strip loop reservoir comprising:

a plurality of light sources and a corresponding plurality of photo-detectors spaced from each other on opposite sides of the strip loop path in the strip loop reservoir;

a plurality of first amplifying means, each said first amplifying means having its input coupled to a corresponding photo-detector, said first amplifying means being normally biased to be driven substantially to positive or negative saturation as a function of the input voltage applied to said first amplifying means through said corresponding photo-detector, the outputs of said plurality of first amplifying means being coupled together at a summing junction;

second amplifying means having its input coupled to the summing junction for amplifying the voltage and current signals appearing at said summing junction; and

means coupled to the output of said second amplifying means for remotely visually monitoring the strip loop position as a function of the output of said second amplifying means.

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**4,297,587**

## ABSOLUTE DC SYSTEM FOR A LASER INSPECTION SYSTEM

**Cole H. Baker, Westport, Conn., assignor to Intec Corporation, Trumbull, Conn.**

**Filed Mar. 7, 1980, Ser. No. 128,286**

**Int. Cl.³ G01N *21/30***

**U.S. Cl. 250—563** **7 Claims**

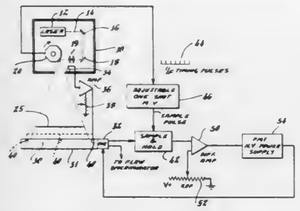
1. A stabilized absolute direct current system for controlling the sensitivity of a light inspection system having a laser generating a laser beam and a scanner for scanning said laser beam

over a surface of a moving material being inspected thereby to detect flaws in said material comprising:

a receiver for collecting laser beam radiation emanating from said material,

said receiver having a photomultiplier tube for detecting and generating signals in accordance with the intensity of radiation applied thereto,

means for applying a sample of radiation from said laser beam to said photomultiplier tube for generating a reference pedestal signal dependent on the intensity of said



laser beam which is free of the influence of the characteristics of the material,

comparator means having a reference potential and said reference pedestal signal applied thereto for deriving a control signal,

a power supply for said photomultiplier tube,

a closed loop feedback circuit for coupling said control signal to said power supply and coupling said power supply to said photomultiplier tube for automatically regulating the power gain to said photomultiplier tube to a constant value thereby providing a stabilized dc system.

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**4,297,588**

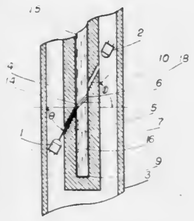
**ELECTRO-OPTICAL LEVEL**

**Albin A. Hastbacka, 3 Singlefoot Rd., Chelmsford, Mass. 01824**

**Filed Feb. 6, 1979, Ser. No. 9,853**

**Int. Cl.³ G01N *15/06***

**U.S. Cl. 250—577** **3 Claims**



1. A level indicating device comprising:

a device with two legs joined at one end wherein said legs are spaced to form a slot within which a solid or liquid in a container is capable of being placed;

a collimated light source within one leg of said device which is directed to fall upon a light sensor in the second leg of said device in the absence of a solid or liquid in a container within said slot wherein the collimated light beam from said light source is positioned to strike a transparent solid or transparent liquid in a transparent container, inserted into said slot of said device, at an angle which is substantially off of a line perpendicular to the surface of said inserted solid or liquid container so that the refracted light beam passing through said transparent solid or liquid container will not fall upon said light sensor in the presence of said transparent solid or transparent liquid in transparent container;

a pair of rectangular slots or cylindrical tunnels which aperture limit the light beam emanating from said light source and the received light beam falling upon said light sensor;

means for exciting said light source;

means for detecting the presence or absence of said light beam falling upon said light sensor so as to provide a visible or audible indication of the presence or absence of said solid or liquid between said light source and light sensor.

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**4,297,589**

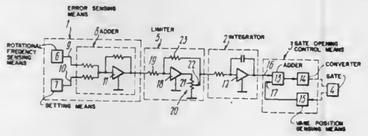
**SPEED GOVERNOR FOR A HYDROELECTRIC UNIT**

**Oleg I. Bashnin, prospekt Maiorova, 53, kv. 13; Vasily V. Semenov, Moskovsky prospekt, 171, kv. 92; Vasily N. Fedorov, Prazhskaya ulitsa, 23, kv. 61; Nikolai M. Gorbunov, ulitsa Brjusovskaya, 6, kv. 100; Evgeny I. Rodionov, prospekt Raevskogo, 8, kv. 21, and Nikolai A. Sorokin, Sredneokhtinsky prospekt, 46, kv. 4, all of Leningrad, U.S.S.R.**

**Filed Mar. 14, 1980, Ser. No. 130,267**

**Int. Cl.³ F01D *17/02***

**U.S. Cl. 290—40 R** **2 Claims**



1. A speed governor, for a hydroelectric unit including a hydraulic turbine having a gate apparatus for controlling the flow of water to the hydraulic turbine runner, comprising:

an error sensing means having a signal generated at an output which is representative of a deviation of the hydroelectric unit rotational frequency from an assigned value;

an integrator having an input and an output;

a gate opening control means connected to said output of said integrator and adjusting the degree of opening of said gate apparatus in accordance with the value of the integrator output signal; and

a limiter having an input and an output, said input of said limiter being connected to said output of said error sending means, and said output of said limiter being connected to said input of said integrator, said limiter limiting the maximum value of the signal applied to said input of said integrator to a limit value equal to the minimum integrator input signal value which insures a maximum permissible rate of change of the degree of opening of said gate apparatus.

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**4,297,590**

**POWER SUPPLY SYSTEM**

**Ande Vail, 3702 Unit C, Overland Rd., Boise, Id. 84705**

**Filed Mar. 10, 1980, Ser. No. 128,566**

**Int. Cl.³ H02J *7/34***

**U.S. Cl. 307—43** **4 Claims**

1. A power supply system for supplying direct current to a load, said system comprising:

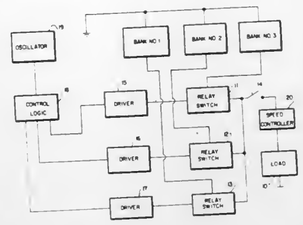
three sets of batteries, with each set of batteries having an ampere/hour rating of at least ten times the value of the load current;

circuitry connecting each of the three sets of batteries to the load;

three sets of switching means for opening and closing the respective circuits between the load and each set of batteries; and

control means for alternating each set of switches in open and closed position, wherein the closed position has a time duration about twice that of the open position, and the switches are switched open and closed in cyclic, predetermined order with the first switch closing at about the same time the second switch opens, the second switch closing





about the same time the third switch opens, the third switch closing about the same time the first switch opens, and then repeating the cycle.

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**4,297,591**

**ELECTRONIC COUNTER FOR ELECTRICAL DIGITAL PULSES**

**Helmut Roesler, and Otto Muehlbauer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jun. 25, 1979, Ser. No. 51,675**

**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833211**

**Int. Cl.³ H03K *23/08, 21/30, 21/06***

**U.S. Cl. 307—224 C** **9 Claims**



1. In a counter of the type in which a plurality of flip-flops each having a pair of inputs and a pair of outputs are provided in a chain connection and a plurality of transfer circuits are respectively interposed between successive flip-flops, the improvement wherein each of said transfer circuits comprises:

a plurality of transfer transistors having conduction paths connected between the outputs of one flip-flop and the inputs of the subsequently connected flip-flop and control electrodes for receiving control signals to determine the direction of counting,

said plurality of transfer transistors comprising

a first field effect transistor including a source-drain path connected between a first output of a first flip-flop and a first input of a next successive, second flip-flop, and a gate connected to receive a forward count control signal;

a second field effect transistor including a source-drain path connected between a second output of the first flip-flop and a second input of the second flip-flop, and a gate connected to receive the forward count control signal;

a third field effect transistor including a source-drain path connected between said second output and said first input, and a gate connected to receive a backward count control signal; and

a fourth field effect transistor including a source-drain path connected between said first output and said second input, and a gate connected to receive the backward count control signal.

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**4,297,592**

**INTEGRATABLE DYNAMIC CURRENT SOURCE FOR SEMICONDUCTOR MODULES**

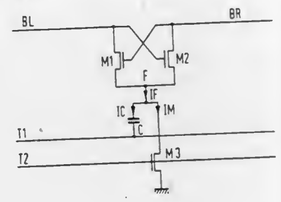
**Karlheinz Url, Munich, and Paul W. von Basse, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 15, 1979, Ser. No. 66,867**

**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2839073**

**Int. Cl.³ H03K *5/00, 5/22***

**U.S. Cl. 307—583** **3 Claims**



1. A current source for a read-out amplifier having two transistors cross-coupled to two bit lines of a MOS memory, said transistors having respective source electrodes connected together at a node which is charged before the beginning of a read-out cycle and is successively discharged in a selected manner for the evaluation of a read-out signal, said current source for use with a first and a second clock pulse line and comprising:

a capacitor connected between the node and the first clock pulse line;

a switching transistor having a control electrode connected to the second clock pulse line and having a first terminal connected to said node and a second terminal connected to a reference potential;

said first clock pulse line providing a voltage signal during each read-out cycle which changes from a high voltage level to a reference voltage level;

said second clock pulse line providing a voltage signal during each read-out cycle changing from a reference potential level to a high potential level;

said capacitor and said switching transistor operating in combination to provide a voltage signal at said node during each read-out cycle, said signal changing from a high potential to a reference potential through a transition portion of said signal, said transition portion having an initial region of slow transition having a low slope followed by a region of rapid transition having a high slope.

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**4,297,593**

**GLITCH ELIMINATOR CIRCUIT FOR TTL TRANSPARENT LATCH**

**Gordon H. Allen, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 10, 1980, Ser. No. 128,773**

**Int. Cl.³ H03K *17/56***

**U.S. Cl. 307—247 R** **11 Claims**

1. A latch circuit capable of operating in a transparent mode or a latching mode and having an input terminal for receiving an input data signal which may assume high or low voltage levels and having an output terminal, comprising:

an input transistor having base, emitter and collector terminals, said base terminal coupled to said input terminal;

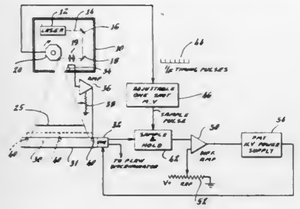
a latching transistor having base, emitter and collector terminals, the emitter and collector terminals of said latching transistor being coupled to the emitter and collector ter-

over a surface of a moving material being inspected thereby to detect flaws in said material comprising:

a receiver for collecting laser beam radiation emanating from said material,

said receiver having a photomultiplier tube for detecting and generating signals in accordance with the intensity of radiation applied thereto,

means for applying a sample of radiation from said laser beam to said photomultiplier tube for generating a reference pedestal signal dependent on the intensity of said



laser beam which is free of the influence of the characteristics of the material,

comparator means having a reference potential and said reference pedestal signal applied thereto for deriving a control signal,

a power supply for said photomultiplier tube,

a closed loop feedback circuit for coupling said control signal to said power supply and coupling said power supply to said photomultiplier tube for automatically regulating the power gain to said photomultiplier tube to a constant value thereby providing a stabilized dc system.

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**4,297,588**

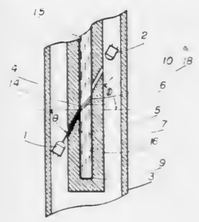
**ELECTRO-OPTICAL LEVEL**

**Albin A. Hastbacka, 3 Singlefoot Rd., Chelmsford, Mass. 01824**

**Filed Feb. 6, 1979, Ser. No. 9,853**

**Int. Cl.³ G01N** *15/06*

**U.S. Cl. 250—577** **3 Claims**



1. A level indicating device comprising:

a device with two legs joined at one end wherein said legs are spaced to form a slot within which a solid or liquid in a container is capable of being placed;

a collimated light source within one leg of said device which is directed to fall upon a light sensor in the second leg of said device in the absence of a solid or liquid in a container within said slot wherein the collimated light beam from said light source is positioned to strike a transparent solid or transparent liquid in a transparent container, inserted into said slot of said device, at an angle which is substantially off of a line perpendicular to the surface of said inserted solid or liquid container so that the refracted light beam passing through said transparent solid or liquid container will not fall upon said light sensor in the presence of said transparent solid or transparent liquid in transparent container;

a pair of rectangular slots or cylindrical tunnels which aperture limit the light beam emanating from said light source and the received light beam falling upon said light sensor;

means for exciting said light source;

means for detecting the presence or absence of said light beam falling upon said light sensor so as to provide a visible or audible indication of the presence or absence of said solid or liquid between said light source and light sensor.

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**4,297,589**

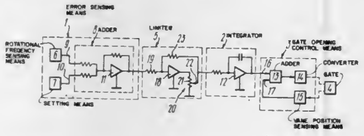
**SPEED GOVERNOR FOR A HYDROELECTRIC UNIT**

**Oleg I. Bashnin, prospekt Maiorova, 53, kv. 13; Vasily V. Semenov, Moskovsky prospekt, 171, kv. 92; Vasily N. Fedorov, Prazhskaya ulitsa, 23, kv. 61; Nikolai M. Gorbunov, ulitsa Brjusovskaya, 6, kv. 100; Evgeny I. Rodionov, prospekt Raevskogo, 8, kv. 21, and Nikolai A. Sorokin, Sredneokhtinsky prospekt, 46, kv. 4, all of Leningrad, U.S.S.R.**

**Filed Mar. 14, 1980, Ser. No. 130,267**

**Int. Cl.³ F01D** *17/02*

**U.S. Cl. 290—40 R** **2 Claims**



1. A speed governor, for a hydroelectric unit including a hydraulic turbine having a gate apparatus for controlling the flow of water to the hydraulic turbine runner, comprising:

an error sensing means having a signal generated at an output which is representative of a deviation of the hydroelectric unit rotational frequency from an assigned value;

an integrator having an input and an output;

a gate opening control means connected to said output of said integrator and adjusting the degree of opening of said gate apparatus in accordance with the value of the integrator output signal; and

a limiter having an input and an output, said input of said limiter being connected to said output of said error sending means, and said output of said limiter being connected to said input of said integrator, said limiter limiting the maximum value of the signal applied to said input of said integrator to a limit value equal to the minimum integrator input signal value which insures a maximum permissible rate of change of the degree of opening of said gate apparatus.

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**4,297,590**

**POWER SUPPLY SYSTEM**

**Ande Vail, 3702 Unit C, Overland Rd., Boise, Id. 84705**

**Filed Mar. 10, 1980, Ser. No. 128,566**

**Int. Cl.³ H02J** *7/34*

**U.S. Cl. 307—43** **4 Claims**

1. A power supply system for supplying direct current to a load, said system comprising:

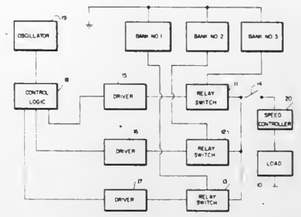
three sets of batteries, with each set of batteries having an ampere/hour rating of at least ten times the value of the load current;

circuitry connecting each of the three sets of batteries to the load;

three sets of switching means for opening and closing the respective circuits between the load and each set of batteries; and

control means for alternating each set of switches in open and closed position, wherein the closed position has a time duration about twice that of the open position, and the switches are switched open and closed in cyclic, predetermined order with the first switch closing at about the same time the second switch opens, the second switch closing





about the same time the third switch opens, the third switch closing about the same time the first switch opens, and then repeating the cycle.

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**4,297,591**

**ELECTRONIC COUNTER FOR ELECTRICAL DIGITAL PULSES**

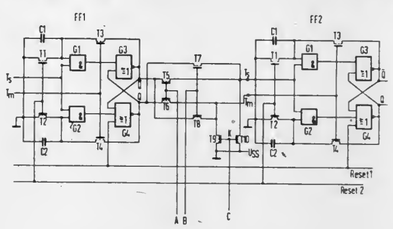
**Helmut Roesler, and Otto Muehlbauer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jun. 25, 1979, Ser. No. 51,675**

**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833211**

**Int. Cl.³ H03K** *23/08, 21/30, 21/06*

**U.S. Cl. 307—224 C** **9 Claims**



1. In a counter of the type in which a plurality of flip-flops each having a pair of inputs and a pair of outputs are provided in a chain connection and a plurality of transfer circuits are respectively interposed between successive flip-flops, the improvement wherein each of said transfer circuits comprises:

a plurality of transfer transistors having conduction paths connected between the outputs of one flip-flop and the inputs of the subsequently connected flip-flop and control electrodes for receiving control signals to determine the direction of counting,

said plurality of transfer transistors comprising

a first field effect transistor including a source-drain path connected between a first output of a first flip-flop and a first input of a next successive, second flip-flop, and a gate connected to receive a forward count control signal;

a second field effect transistor including a source-drain path connected between a second output of the first flip-flop and a second input of the second flip-flop, and a gate connected to receive the forward count control signal;

a third field effect transistor including a source-drain path connected between said second output and said first input, and a gate connected to receive a backward count control signal; and

a fourth field effect transistor including a source-drain path connected between said first output and said second input, and a gate connected to receive the backward count control signal.

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**4,297,592**

**INTEGRATABLE DYNAMIC CURRENT SOURCE FOR SEMICONDUCTOR MODULES**

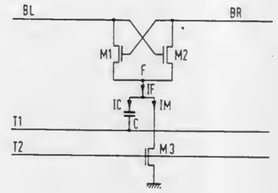
**Karlheinz Url, Munich, and Paul W. von Basse, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 15, 1979, Ser. No. 66,867**

**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2839073**

**Int. Cl.³ H03K** *5/00, 5/22*

**U.S. Cl. 307—583** **3 Claims**



1. A current source for a read-out amplifier having two transistors cross-coupled to two bit lines of a MOS memory, said transistors having respective source electrodes connected together at a node which is charged before the beginning of a read-out cycle and is successively discharged in a selected manner for the evaluation of a read-out signal, said current source for use with a first and a second clock pulse line and comprising:

a capacitor connected between the node and the first clock pulse line;

a switching transistor having a control electrode connected to the second clock pulse line and having a first terminal connected to said node and a second terminal connected to a reference potential;

said first clock pulse line providing a voltage signal during each read-out cycle which changes from a high voltage level to a reference voltage level;

said second clock pulse line providing a voltage signal during each read-out cycle changing from a reference potential level to a high potential level;

said capacitor and said switching transistor operating in combination to provide a voltage signal at said node during each read-out cycle, said signal changing from a high potential to a reference potential through a transition portion of said signal, said transistion portion having an initial region of slow transition having a low slope followed by a region of rapid transition having a high slope.

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**4,297,593**

**GLITCH ELIMINATOR CIRCUIT FOR TTL TRANSPARENT LATCH**

**Gordon H. Allen, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 10, 1980, Ser. No. 128,773**

**Int. Cl.³ H03K** *17/56*

**U.S. Cl. 307—247 R** **11 Claims**

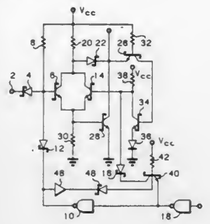
1. A latch circuit capable of operating in a transparent mode or a latching mode and having an input terminal for receiving an input data signal which may assume high or low voltage levels and having an output terminal, comprising:

an input transistor having base, emitter and collector terminals, said base terminal coupled to said input terminal;

a latching transistor having base, emitter and collector terminals, the emitter and collector terminals of said latching transistor being coupled to the emitter and collector ter-

minals respectively of said input transistor, the collector terminals of both said input and said latching transistors being coupled to said output terminal;

a first source of a latch disabling signal coupled to the base of said input transistor, said latch disabling signal capable of assuming high or low voltage levels for placing said latch circuit in the transparent mode when said latch disabling signal is high;



a second source of a latch enabling signal for enabling said latching transistor, said latch enabling signal capable of assuming high or low voltage levels for placing said latch circuit in the latching mode when said latch enabling signal is high, said latch enabling signal occurring prior to said latch disabling signal; and

means for synchronizing said latch disabling signal with said latch enabling signal so as to turn said input transistor on substantially simultaneously with turning said latching transistor off when said input data signal is high.

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**4,297,594**

## GATE CIRCUIT FOR A GATE TURN-OFF THYRISTOR

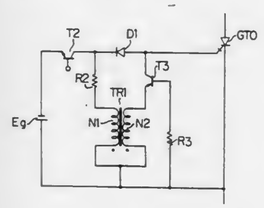
**Kenichi Onda, Hitachi; Sadaji Tashiro, Kumagaya, and Hisao Amano, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan**

**Filed Jun. 21, 1979, Ser. No. 50,522**

**Claims priority, application Japan, Sep. 27, 1978, 53-119015**

**Int. Cl.³ H03K** *17/72*

**U.S. Cl. 307—252 C** **4 Claims**



1. A gate circuit for a gate turn-off thyristor having a cathode, an anode, and a gate, comprising:

a series connection of a d.c. power supply source and a first switching element, said series connection being inserted between the cathode and the gate of said gate turn-off thyristor through a diode, the positive pole of said d.c. power supply source being connected to the cathode of said gate turn-off thyristor, while the negative pole of said d.c. power supply source is connected to the gate of said gate turn-off thyristor through said first switching element and said diode; and

a transformer having a primary winding and a secondary winding both wound with the same polarity, one end of said primary winding being connected to the cathode of said diode through a resistor while the other end of said primary winding is connected to the cathode of said gate turn-off thyristor, and one end of said secondary winding being connected to the anode of said diode through a second switching element while the other end of said secondary winding is connected to the cathode of said gate turn-off thyristor.

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**4,297,595**

## SIGNAL REGENERATING CIRCUIT WITH IMPROVED INPUT-OUTPUT ISOLATION

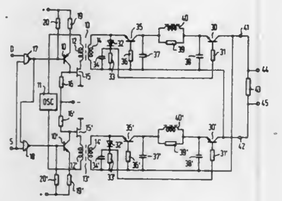
**Josef Huellwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany**

**Filed Jun. 18, 1979, Ser. No. 49,136**

**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826897**

**Int. Cl.³ H03K** *5/01*

**U.S. Cl. 307—268** **9 Claims**



1. In a regenerating system for generating output signals at a system output terminal corresponding to data signals applied at a system input terminal, said system having transformer means having a primary and a secondary winding, means connected to said primary winding for applying thereto high frequency signals modulated by said data signals, main rectifier means connected to said secondary winding for rectifying said modulated high frequency signals, thereby creating first rectified signals constituting said output signals, and buffer circuit means having a high impedance and a low impedance in the absence and presence of a control signal, respectively: the improvement comprising

additional rectifier means connected to said secondary winding for rectifying said modulated high frequency signals, thereby creating additional rectified signals:

and connecting means for connecting said additional rectifier means to said buffer circuit means so that said additional rectified signals constitute said control signals.

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**4,297,596**

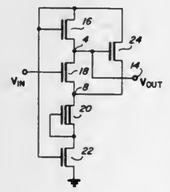
## SCHMITT TRIGGER

**Kim Eckert, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed May 1, 1979, Ser. No. 35,050**

**Int. Cl.³ H03K** *3/295, 3/356*

**U.S. Cl. 307—279** **2 Claims**



1. A MOS Schmitt trigger circuit comprising:

a first field effect transistor of the enhancement type and having a drain and a gate coupled to a first potential, and a source coupled to an output terminal;

a second field effect transistor of the enhancement type and having a drain coupled to the source of the first transistor, a gate coupled to an input terminal, and a source;

a third field effect transistor of the depletion type and having a drain coupled to the source of the second transistor, a gate, and a source;

a fourth field effect transistor of the enhancement type and having a drain coupled to the gate and source of the third transistor, a gate coupled to the first potential, and a source coupled to a second potential; and

a fifth field effect transistor of the enhancement type and having a drain coupled to the first potential, a gate coupled to the drain of the second transistor, and a source coupled to the drain of the third transistor.



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**4,297,597**

## DARLINGTON-CONNECTED SEMICONDUCTOR DEVICE

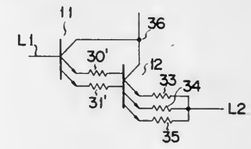
**Takashi Kimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Jun. 13, 1979, Ser. No. 48,003**

**Claims priority, application Japan, Jun. 20, 1978, 53/73734**

**Int. Cl.³ H03K** *3/26;* **H01L** *29/72*

**U.S. Cl. 307—315** **6 Claims**



1. A Darlington-connected semiconductor device for amplifying an input signal, comprising:

a pre-stage transistor circuit portion including at least one pre-stage transistor with a plurality of emitters, a collector, and at least one base;

input terminal means connected to the base of said pre-stage transistor for receiving an input signal to be amplified by said device;

a rear-stage transistor circuit portion including at least one rear-stage transistor with a plurality of bases and emitters, said rear-stage transistor having a collector in common with said collector of said pre-stage transistor;

a plurality of resistors connected respectively between the emitters of said pre-stage transistor and the bases of said rear-stage transistor, to connect said input terminal means to the bases of said rear-stage transistor through the emitters of said pre-stage transistor and said resistors; and

output terminal means connected to the emitters of said rear-stage transistor for receiving an amplified form of said input signal.

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**4,297,598**

## I²L SENSING CIRCUIT WITH INCREASED SENSITIVITY

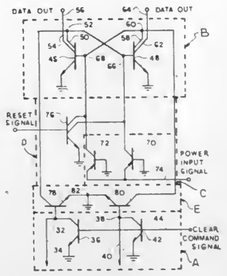
**Kent F. Smith, Salt Lake City, Utah, assignor to General Instrument Corporation, Clifton, N.J.**

**Filed Apr. 5, 1979, Ser. No. 27,507**

**Int. Cl.³ H03K** *5/24;* **G11C** *7/00*

**U.S. Cl. 307—355** **35 Claims**

1. An I²L circuit for sensing relatively small differences in signal magnitude between first and second input signals comprising first and second means adapted to receive the first and second input signals, respectively; dual input bistable means for generating an output representative of the relative degree of actuation of said bistable means inputs, subsequent to the resetting of said bistable means; means for supplying current to said bistable means to energize same; means for resetting said bistable means; and means, operably connected to said bistable means inputs and said receiving means, for actuating said bistable means inputs, respectively, to degrees dependent upon the relative magnitudes of the signals applied at said first and second receiving means.



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**4,297,599**

## CIRCUIT ARRANGEMENT FOR OBTAINING AN INTERFERENCE-FREE TRIGGER SIGNAL ESPECIALLY FOR A FUEL APPORTIONMENT DEVICE IN AN INTERNAL COMBUSTION ENGINE

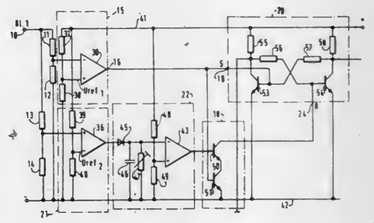
**Peter Werner, Wiernsheim-Iptingen; Ulrich Drews, Vaihingen-Pulverdingen; Theodor Elbers, Krofdorf-Gleiberg, and Klaus Jäckel, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 15, 1979, Ser. No. 66,743**

**Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847290**

**Int. Cl.³ H03K** *5/153, 19/20*

**U.S. Cl. 307—355** **8 Claims**



1. In an interference-free triggering circuit, for regulating ignition current signals to an electronic fuel apportionment device for an internal combustion engine, the triggering circuit including:

a first threshold switch to which a first current signal is applied to generate an output if a first threshold value is exceeded by the first current signal;

a second threshold switch to which a second current signal is applied to generate an output if a second threshold value is exceeded by the second current signal;

a time-lag circuit connected to the second threshold switch to receive and delay the second threshold output;

a logic circuit, connected to the first threshold switch and the time-lag circuit to receive the output of the first threshold switch and the output of the time-lag circuit such that the logic circuit generates a reset signal only when the logic circuit receives no output from the first threshold switch and no output from the time-lag circuit; and

a switching element, connected to the first threshold switch and the logic circuit such that the switching element is set by the first threshold switch output and is reset by the

logic circuit reset signal to generate a command signal to the fuel apportionment device.

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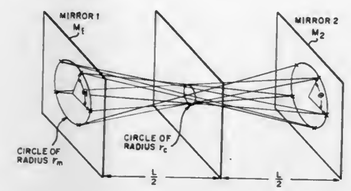
**4,297,600**

## MULTIPATH RAMAN CELL FOR WAVELENGTH CONVERSION

**William R. Trutna, Jr., Palo Alto, Calif., assignor to Board of Trustees of Leland Stanford University, Stanford, Calif.**

**Filed Jun. 19, 1978, Ser. No. 916,592**
**Int. Cl.[2] H03F *7/00***
**U.S. Cl. 307—426** **8 Claims**




1. In a method for wavelength conversion by Raman scattering, the steps of:

directing a beam of pumping optical radiation of a wavelength greater than 1 micron into an optical resonator defined by the space between a pair of optical reflectors, said beam of optical radiation being directed into the optical resonator at an angle to the optical axis of the resonator such that the optical beam is caused to be reflected to and fro within said resonator between said reflectors over a path which includes a plurality of transits of said resonator and which path walks over the surfaces of the reflectors and out of said resonator;

filling a region of space within said resonator with a Raman active gaseous medium for interaction with said beam of optical radiation for converting pump energy into stimulated Raman scattering radiation of a Stokes wavelength longer than that of said pump wave energy; and

focusing the reflected beam on each transit of said resonator at a point within said Raman active gaseous medium for enhancing the Raman scattering interaction.

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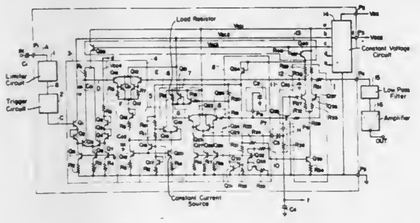
**4,297,601**

## MONOSTABLE MULTIVIBRATOR CIRCUIT AND FM DETECTOR CIRCUIT EMPLOYING PREDETERMINED LOAD RESISTANCE AND CONSTANT CURRENT TO INCREASE RESPONSE RATE OF DIFFERENTIAL TRANSISTOR PAIR

**Takeshi Wada, Kodaira; Yasuo Kominami, Kokubunji; Yukihiko Miyamoto, and Tsuneo Yamada, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Trio Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Jan. 16, 1979, Ser. No. 3,962**
**Claims priority, application Japan, Mar. 15, 1978, 53/28663**
**Int. Cl.[3] H03K *5/12, 3/284***
**U.S. Cl. 307—555** **5 Claims**




1. In a monostable multivibrator circuit having: a time constant circuit which includes a capacitor; an amplifier circuit connected to receive an output signal of the time constant circuit; a positive feedback circuit which is connected between an output of said amplifier circuit and an input of said time constant circuit and which comprises a pair of differential transistors, a constant-current circuit including a constant-current transistor the collector of which is connected to the emitters of said pair of differential transistors and a load resistor connected to the collector of one of the pair of differential transistors, means for supplying the base of said one of said pair of differential transistors with an output signal from the output of said amplifier circuit and means for transmitting the voltage at said load resistor to said input of said time constant circuit; and trigger input terminal means coupled to a circuit loop including said time constant circuit, said amplifier circuit and said positive feedback circuit and to which a trigger signal is applied, characterized in that clamp circuit means is coupled to said one of the differential transistors for clamping the collector potential of said one of said differential transistors to a value higher than the base input potential thereof, wherein said constant-current circuit includes means for setting the constant collector current of said constant-current transistor and the resistance of said load resistor is set so that the falling rate of the voltage at said load resistor during a change of said one of said pair of differential transistors from a non-conductive state to a conductive state is higher than the rising rate of the voltage at said load resistor during a change thereof from a conductive state to a non-conductive state, whereby said monostable multivibrator circuit is triggered by a leading edge in a change of the voltage at said load resistor from a non-conductive state of said one of said pair of differential transistors to a conductive state thereof.

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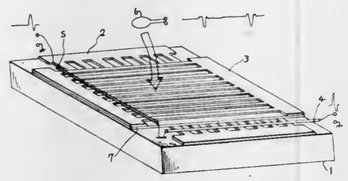
**4,297,602**

## MAGNETOSTRICTIVE CO-ORDINATE PLATE FOR CO-ORDINATE READER

**Toshihiko Kobayashi, Mitaka, and Tetsusaburo Kamibayashi, Niza, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan**

**Continuation-in-part of Ser. No. 14,736, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 775,465, Mar. 8, 1977, abandoned. This application Mar. 12, 1980, Ser. No. 129,575**
**Claims priority, application Japan, Mar. 10, 1976, 51-25870; Apr. 23, 1976, 51-46226**
**Int. Cl.[3] H01L *41/12***
**U.S. Cl. 310—26** **16 Claims**



1. A co-ordinate plate for a co-ordinate reader, comprising: a pair of thin sheets of magnetostrictive material, each of said sheets of magnetostrictive material having a dimension defined by a preferred direction of magnetostrictive oscillating wave propagation within a sheet, and said pair of sheets of magnetostrictive material superposed and oriented with their respective preferred directions of magnetostrictive oscillating wave propagation defining respective co-ordinate axes of a co-ordinate system; an acoustically insulating sheet of material disposed between said pair of sheets of magnetostrictive material for keeping said pair of sheets of magnetostrictive material from contacting each other, and said pair of thin sheets and said acoustically insulating sheet disposed with said pair of thin sheets of magnetostrictive material in contact with said acoustically insulating sheet to define a co-ordinate plane; and exciting means for producing magnetostrictive oscillating waves propagating in the respective preferred directions of propagation in said pair of sheets of magnetostrictive material.



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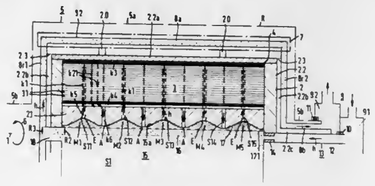
**4,297,603**

## ARRANGEMENT FOR COOLING THE ROTOR OF AN ELECTRIC MACHINE WITH A SUPERCONDUCTING FIELD WINDING

**Erich Weghaupt, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Filed Nov. 15, 1979, Ser. No. 94,432**
**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849602**
**Int. Cl.[3] H02K *9/00***
**U.S. Cl. 310—53** **6 Claims**



1. Arrangement for cooling the rotor of an electric machine, comprising a superconducting field winding, at least one cold shield surrounding said field winding, and a co-rotatable mixing chamber containing a phase mixture of coolant fed thereto from outside said rotor, said coolant mixture having a liquid level and branching into a first stream of liquid coolant for cooling said field winding and a second stream of at least partially evaporated coolant for cooling said cold shield, said second coolant stream being conducted from said mixing chamber through said cold shield and returned from the machine in an outer loop, said first coolant stream being conducted through a multiplicity of parallel-connected open thermal-syphon inner loops from said mixing chamber, through cooling canals subdivided into corresponding cooling canal sections of winding conductors of said field winding, and returned to said mixing chamber, said coolant in said inner and outer loops being transported by the self-pumping effect of rotation of said rotor, said inner loops having radial entrance and exit branches distributed over the length and circumference of said rotor and field winding, mixing chamber sections associated with said respective inner loops, said mixing chamber sections having a given axial length and radial height forming collecting pockets leading into said entrance branches for coolant which is colder than the average temperature of the liquid phase and produced by evaporation at said liquid level, means for fanning-up a directional thermal-syphon loop flow from weight and pressure differences of said radial coolant canal sections of said respective inner loops, said mixing chamber sections being distributed over the axial length and inner circumference of said rotor in accordance with the placement of said thermal-syphon inner loops, and being disposed concentrically about the central longitudinal axis of said mixing chamber of said rotor, each of said mixing chamber sections having at least one loop entrance point spaced from the axis, and at least one loop exit point in vicinity of a thermal-syphon inner loop.

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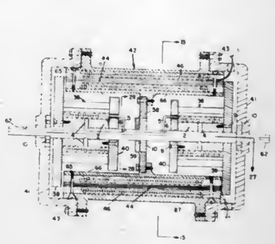
**4,297,604**

## AXIAL AIR GAP ALTERNATORS/GENERATORS OF MODULAR CONSTRUCTION

**Ian S. Tawse, Weston, Canada, assignor to Gen-Tech, Inc., Miami, Fla.**

**Filed May 11, 1979, Ser. No. 38,251**
**Int. Cl.[3] H02K *21/38***
**U.S. Cl. 310—168** **14 Claims**



1. An electrical generator comprising:

(a) a generally cylindrical casing including two radially spaced-apart walls,

(b) a plurality of individual elongated magnetic cores located between the casing walls, each core having an electrical coil wound around it, the cores and coils defining the stator of the generator,

(c) a rotor within the inner of the casing walls, the rotor being rotatable about an axis parallel to the axis of the casing, the rotor having a plurality of radially projecting magnetic pole pieces, the magnetic pole pieces extending into axial alignment with the magnetic cores and being axially spaced from the ends of those cores,

(d) whereby as the rotor rotates the magnetic cooperation between the pole pieces and cores generates electric current in the stator coils on the cores.

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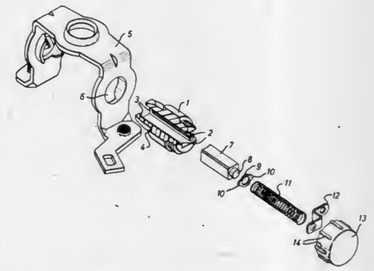
**4,297,605**

## BRUSH ASSEMBLIES FOR ELECTRIC MOTORS OR GENERATORS

**Shiu M. Tak, Kowloon, Hong Kong, assignor to Wah Ming Electrics Limited, Kowloon, Hong Kong**

**Filed Jan. 22, 1980, Ser. No. 114,317**
**Claims priority, application United Kingdom, Oct. 30, 1979, 37524/79**
**Int. Cl.[3] H02K *13/00***
**U.S. Cl. 310—242** **4 Claims**



1. A brush assembly for one of an electric motor and an electric generator, comprising a brush having a first end for contacting a commutator of the one of the motor and the generator and a second end, a holder for said brush, a contact for connection to a supply of electrical power, conductive restraining means disposed at said second end of said brush, and a conductive spring having a first end which abuts against

said restraining means and a second end which abuts against said contact, whereby said spring urges said brush against the commutator, said restraining means prevents said first end of said spring from contacting the commutator when said brush has worn away, and said spring and said restraining means provide a conductive path between said contact and said brush.

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**4,297,606**

## METHOD OF BRACING END TURNS OF AN ELECTRIC MACHINE BY MEANS OF A BINDING BAND; AND DEVICE USED THEREIN

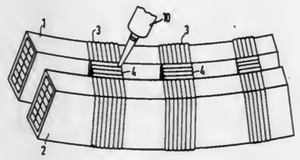
**Arnold Wichmann, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Filed Mar. 22, 1978, Ser. No. 889,003**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713847**

**Int. Cl.³ H02K** *3/48*

**U.S. Cl. 310—271** **4 Claims**



1. In a device for bracing winding end turns of an electric machine wherein a pair of winding bars forming the end turns are disposed spaced from and substantially parallel to one another, a spacer member disposed between and contacting the winding bars and defining and predetermining the spacing between the pair of winding bars, a first binding tape wrapped transversely around the pair of winding bars at the location of said spacer member, a second binding tape wrapped transversely about the wrapped first binding tape in the space between the pair of winding bars, the wrapped first and second binding tapes and mutually opposing surfaces of the parallel winding bars defining a substantially closed inner space therewithin wherein said spacer member is disposed, and a cold hardened, flowable-type cement mass injectedly received in said inner space, said spacer member having a shape affording penetration by said flowable-type cement from a given injection point to every part of said inner space unoccupied by said spacer member and to all surfaces defining said unoccupied part of said inner space, said spacer member comprising a substantially parallelepipedal body formed with at least one lateral recess providing a passageway for penetration by a flowing cement mass from one side to another of said body.

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**4,297,607**

## SEALED, MATCHED PIEZOELECTRIC TRANSDUCER

**Lawrence C. Lynnworth, Waltham; Kenneth A. Fowler, and Dana R. Patch, both of Medfield, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.**

**Filed Apr. 25, 1980, Ser. No. 143,714**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—334** **50 Claims**

1. A sealed ultrasonic transducer assembly for use adjacent a fluid of characteristic acoustic impedance $Z_4$, comprising,

an electroacoustic transducer element having a front surface and a rear surface and a characteristic acoustic impedance $Z_1$,

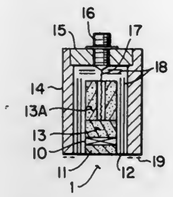
an impedance-transforming matching element positioned in contact with the front surface of said transducer element,

an electrically conductive shielding housing having an aperture for transmitting ultrasonic radiation from said transducer assembly, and

a sealing element enclosing said aperture and hermetically sealed to said housing,

said matching element being formed of a non-resilient material having an effective characteristic impedance intermediate between that of said transducer element and said fluid;

said sealing element having an acoustic impedance higher than that of said matching element by a factor of at least 2



and having a thickness between 1/10th and 1/1000th of a wavelength at the center frequency of ultrasonic waves being transmitted from said transducer element, said sealing element being electrically conductive over at least one surface, said electrically conductive housing being in electrical contact with said electrically conductive surface;

the combination of said sealing element, matching element and transducer being restrained axially and radially within said housing.

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**4,297,608**

## MEASURING EQUIPMENT FOR ACOUSTIC DETERMINATION OF THE SPECIFIC GRAVITY OF LIQUIDS

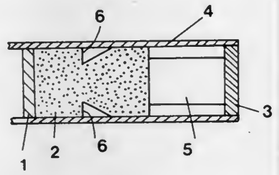
**Borge R. Jensen, Kobenhavn, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed May 1, 1980, Ser. No. 145,620**

**Claims priority, application Denmark, May 10, 1979, 01924/79**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—335** **1 Claim**



1. A measuring probe for the acoustic determination of the specific gravity of a liquid, comprising, a holder having a piezoelectric ceramic disc attached at one end thereof and a parallel arranged reflection disc attached at the other end thereof, a reference element having parallel end faces and a known acoustical impedance, said reference element having one of said end faces in abutting engagement with said piezoelectric disc and the other of said end faces in spaced relation to said reflection disc to form a sampling space therebetween, said reference element having an annularly shaped groove formed therein intermedite said end faces and having a planar surface adjacent to and parallel to said ceramic disc, said holder having wall means bounding and surrounding said annular groove, and said wall means forming an opening to provide ingress and egress to and from said sampling space for a medium externally of said probe.



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**4,297,609**

## HIGH-VOLTAGE GENERATING DEVICE

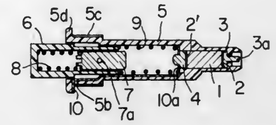
**Tsuneo Hirao, and Masao Onishi, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Apr. 3, 1980, Ser. No. 137,007**

**Claims priority, application Japan, Apr. 6, 1979, 54-46078[U]**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—339** **4 Claims**



1. A high-voltage generating device comprising a piezoelectric element, a driven member of an electrical conductor disposed on one side of said piezo-electric element, an abutment member of an electrical conductor disposed on the other side of said piezo-electric element, an outer casing of an electrical insulator accommodating said piezo-electric element therein in such a relation that said conductive abutment member is partly exposed to the exterior of said outer casing, an inner casing telescopically received in said outer casing, said inner casing accommodating therein a hammer for imparting an impact to said conductive driven member and a hammer spring for imparting a drive force to said hammer, a return spring for normally biasing said inner casing in a return direction in which said inner casing protrudes partly from said outer casing, and a strip of an electrical conductor pressed at one end thereof against said conductive driven member by said return spring and exposed at the other end thereof to the exterior of said outer casing.

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**4,297,610**

## SMALL PIEZOELECTRIC TUNING FORK

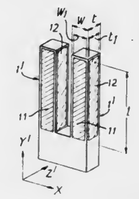
**Kunimoto Ito, 37-9, 1-chome, Kikunodai, Chofu-shi, Tokyo; Tsutomu Kakizawa, 23-17, 2 chome, Miyasaka, Setagaya-ku, Tokyo; Kengo Yonetani, 23-17, 2 chome, Miyasaka, Setagaya-ku, Tokyo, Japan, and Hiroshi Nariai, 23-17, 2-chome, Miyasaka, Setagaya-ku, Tokyo, all of Japan**

**Continuation-in-part of Ser. No. 709,067, Jul. 27, 1976, abandoned, which is a continuation of Ser. No. 546,042, Jan. 31, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,964**

**Claims priority, application Japan, Feb. 4, 1974, 49-14354; Jan. 17, 1975, 50-7023**

**Int. Cl.³ H01L** *41/08*

**U.S. Cl. 310—370** **1 Claim**



1. A piezoelectric flection vibrator which comprises a tuning fork-type quartz vibrator body having a pair of leg members extending from the base portion of said vibrator body, the lengths of said leg members being equal to each other, said base portion of said vibrator body and said leg members including a pair of generally U-shaped principal faces positioned in parallel to each other, each said leg member having a pair of side faces each extending between and connecting said principal faces perpendicularly to each other, each said side face and each face on said leg members included in a said principal face of the vibrator body being provided with an electrode formed thereon, characterized in that said length of said leg member is less than six millimeters and the ratio t/w where t and w are the thickness and the width respectively of said leg member is chosen at a value less than one, whereby the point of zerotemperature coefficient of said vibrator body is set at a temperature appearing normally within a wrist watch carried on the human body.

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**4,297,611**

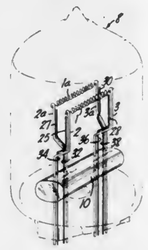
## CONTROL OF TUNGSTEN FILAMENT EROSION IN A HALOGEN LAMP

**Salvatore F. Cortorillo, Parsippany, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.**

**Filed Oct. 2, 1979, Ser. No. 81,270**

**Int. Cl.³ H01K** *1/50, 1/18*

**U.S. Cl. 313—222** **11 Claims**



1. In an incandescent lamp of the type having at least two operative tungsten filaments in a bulb enclosing an atmosphere containing a halogen gas, the improvement comprising an inoperative surrogate filament within said bulb comprising a tungsten surface positioned in a region near said tungsten filaments to passively receive chemical attack by said halogen gas whereby said operative tungsten filaments are at least partially protected from attack by said halogen gas and wherein said operative tungsten filaments have two support legs each, said inoperative surrogate filament comprises four tungsten wires, one each positioned near a support leg, each said tungsten wire separated a small distance from said support leg and extending substantially parallel to its associated support leg.

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**4,297,612**

## ELECTRON GUN STRUCTURE

**Yoshimitsu Anezaki, Fukaya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan**

**Division of Ser. No. 835,062, Sep. 21, 1977, Pat. No. 4,185,223. This application Apr. 4, 1979, Ser. No. 27,036**

**Claims priority, application Japan, Sep. 27, 1976, 51-114645**

**Int. Cl.³ H01J** *29/02*

**U.S. Cl. 313—446** **5 Claims**

1. An electron gun for producing and directing at least one electron beam along a beam path; said structure comprising:

a plurality of grid electrodes (**18**, **20** . . . **26**) including a first control grid electrode (**18**),

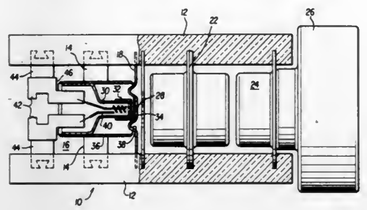
a cathode (**16**) comprising a cathode sleeve (**30**), which has an open end and a closed end having an electron emissive coating (**34**) adjacent to the first control grid electrode,

a heater comprising a heater coil (**40**) made of thin wire,

and, heater supporting straps (**42**), which support said heater positioned within said cathode sleeve, having an arcing induction means (**46**) confronting the open end of said cathode sleeve, wherein:

the open end of said cathode sleeve extends toward said

arcing induction (46) means of said heater supporting straps so that the distance between them is smaller than the distance between said cathode sleeve and said heater



coil in order to make an arc between cathode sleeve and said heater supporting straps before inducing an arc between said cathode and the heater coil.

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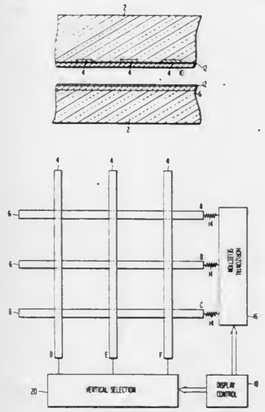
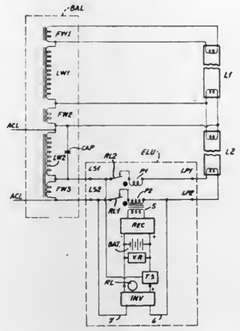
**4,297,613**
**D.C. SCAN PANEL**
**Mohamed O. Aboelfotoh, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**
**Filed May 8, 1979, Ser. No. 37,082**
**Int. Cl.[3] H01J** *17/34, 61/067*
**U.S. Cl. 315—58** **14 Claims**



1. In a d.c. gaseous discharge display device,
an ionizable gaseous medium in a gas chamber formed by a pair of glass plates,
a plurality of cathode conductors orthogonal to said anode conductors and disposed on a surface of the other of said glass plates,
a quantity of material overlying said cathode conductors to protect said cathode conductors from sputtering during gaseous discharge, said material comprising a doped mixture of a refractory oxide insulator and a metal dopant, said doped refractory oxide material having sufficient conductivity to prevent the build-up of a surface wall charge during d.c. operation of said display device and having sufficient secondary emissivity to reduce the voltage required to sustain gaseous discharge.

**4,297,614**
**EMERGENCY LIGHTING SYSTEM**
**Edward A. Chandler, Montreal, Canada, assignor to Kaufel Group Ltd., Montreal, Canada**
**Filed Mar. 12, 1980, Ser. No. 129,696**
**Int. Cl.[3] H05B** *37/00*
**U.S. Cl. 315—86** **6 Claims**



1. For use with an electric discharge lamp in a fixture, said lamp having a first input terminal and a second input terminal;
an emergency lighting unit comprising:
a transformer, having two closely coupled windings constituting the primary of said transformer, and a secondary winding,
first adjacent ends of said coupled windings comprising the input of said emergency lighting unit, and second adjacent ends of said coupled windings comprising the output terminals of said emergency lighting unit;
said input terminals of said emergency lighting unit being adapted to be connected to a source of ac power;
said output terminals of said emergency lighting unit being adapted to be connected to respective ones of said first and second input terminals of said lamp;
whereby each one of said closely coupled windings is in a different line between said source of ac power and a respective one of said first and second input terminals of said lamp;
rectifier means connected across the output of said secondary winding;
rechargeable battery means connected across the output of said rectifier means and being rechargeable by the dc output thereof;
inverter means connected in parallel with said battery means and adaptable to convert the dc output of said battery means to an ac signal; and
means for sensing a loss of ac power from said source of ac power and to, upon such sensing, connecting said inverter in circuit with said input terminals.

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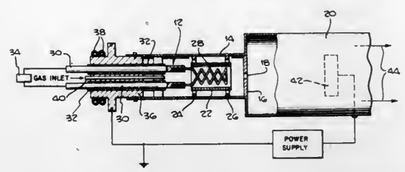
**4,297,615**
**HIGH CURRENT DENSITY CATHODE STRUCTURE**
**Dan M. Goebel, Santa Monica; James T. Crow, Los Angeles, and A. Theodore Forrester, Beverly Hills, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.**
**Filed Mar. 19, 1979, Ser. No. 21,461**
**Int. Cl.[3] H01J** *1/20;* **H05H** *1/24*
**U.S. Cl. 315—111.21** **16 Claims**

1. A system including a compact cathode assembly having high electron emission current densities for producing a dense gas plasma, comprising:
a high plasma density cathode enclosure;
inlet means connected to said cathode enclosure for supplying gas to said cathode enclosure;
a low plasma density utilization chamber coupled to receive plasma from said cathode enclosure through a restricted opening between said enclosure and said chamber;
a cathode element of lanthanum hexaboride having an emitting surface exposed within said cathode enclosure;
means for heating said lanthanum hexaboride element to an elevated temperature from a surface of said lanthanum hexaboride away from the emitting surface, whereby contamination of said emitting surface is avoided;



said system including means for establishing a high plasma density, in the order of $2\times10^{12}$ electrons per cubic centimeter or more, within said cathode enclosure, substantially higher than in said utilization chamber;
power supply means for drawing current densities greater than five amperes per square centimeter from the emitting surface of said lanthanum hexaboride cathode; and
means for mounting said lanthanum hexaboride cathode on carbon material support arrangements.

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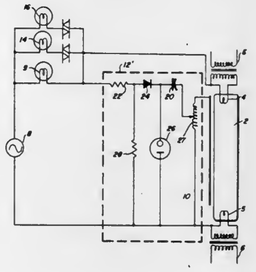
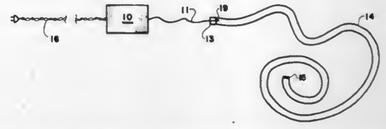
**4,297,616**
**FLUORESCENT LAMP WITH INCANDESCENT BALLASTING SYSTEMS**
**Stephen C. Corona, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**
**Filed Mar. 17, 1980, Ser. No. 130,929**
**Int. Cl.[3] H05B** *35/00, 41/19*
**U.S. Cl. 315—179** **9 Claims**



1. An incandescent ballasting circuit for a fluorescent lamp comprising:
at least one incandescent device connected between an electrical power source and fluorescent lamp,
means for applying a preheat voltage to the fluorescent lamp filaments, and
means for applying a trigger voltage to said fluorescent lamp sufficient to initiate lamp discharge
said triggering voltage means including:
a conductive plane adjacent to said fluorescent lamp,
a transformer electrically connected to said conductive plane, and
a pulse generating circuit connected between said incandescent device and said transformer, said circuit adapted to operate from said power source to generate a high voltage pulse and apply said pulse to said lamp via the transformer and conductive plane, initiating lamp discharge,
said circuit means further adapted to be disabled following initiation of lamp discharge.



**4,297,617**
**LIGHT PRODUCING DEVICE**
**Charles E. Galaspie, Rte. 1, Box 353, Bumpass, Va. 23024**
**Filed Mar. 24, 1980, Ser. No. 132,742**
**Int. Cl.[3] H01J** *61/30;* **H05B** *41/26*
**U.S. Cl. 315—326** **7 Claims**



1. A light producing device comprising an elongated flexible transparent thermoplastic tube having sealed proximal and distal ends and containing an electrically excitable gas, and an electrical supply which associates with said proximal end, said tube having a substantially uniform cross sectional configuration along its length, a length to diameter ratio in excess of 20, a flexibility such that said ends can be readily brought into contact, a wall thickness capable of resisting collapse of said tube under a pressure gradient of one atmosphere, and a transparency such that a significant percentage of the light generated within said tube will emerge through the wall of said tube, said electrically excitable gas being a mono or polyatomic gas or gas mixture at a pressure of between about 1 and 7 mm Hg., said electrical supply providing an output current which is a pulsed direct current of sub-ampere intensity having a peak voltage between 20,000 and 50,000 volts and a pulse frequency of about 60 pulses per second, said output current being directed by a single electrical conductor to a pointed metal electrode protruding through the proximal end of said tube and coaxial therewith, and thermal shielding means annularly disposed between said electrode and the adjacent wall of said tube.

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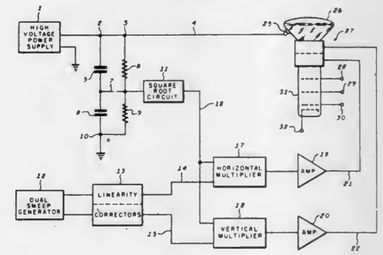
**4,297,618**
**ANODE VOLTAGE DEFLECTION GAIN CONTROL FOR CATHODE RAY DISPLAYS**
**Thomas W. Spilsbury, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.**
**Filed Sep. 15, 1980, Ser. No. 187,039**
**Int. Cl.[3] H01J** *29/56*
**U.S. Cl. 315—371** **8 Claims**



1. Cathode ray display apparatus including a cathode ray display tube having at least anode means, cathode means, and associated electron beam deflection coil means, power supply means for supplying an anode voltage to said anode means,
sampling circuit means for deriving a sample of said anode voltage,
square root signal extractor means responsive to said anode voltage sample,
circuit means for generating a sweep signal, and
multiplier means responsive to said square root signal and to said sweep signal for generating a compensated electron

beam deflection current for driving said electron beam deflection coil means.

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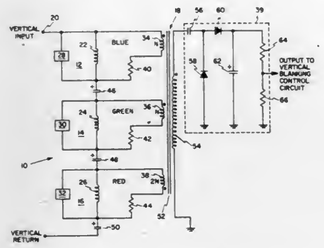
**4,297,619**
**PHOSPHOR PROTECTION CIRCUIT FOR MULTIPLE CRT PROJECTION TELEVISION**
**Terence J. Kiteley, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**
**Filed Jan. 2, 1981, Ser. No. 222,205**
**Int. Cl.³ H01J** *29/52*
**U.S. Cl. 315—381** **24 Claims**




1. In a projection color television system having a projecting screen, three cathode ray tubes each having a phosphor screen for producing, by means of an electron beam incident upon said phosphor screen, and projecting onto said projecting screen a different one of the three primary colors of a light beam containing image information therein, and a vertical deflection coil in each of said cathode ray tubes for deflecting said electron beams across said projecting screen in a vertical direction by means of vertical deflection signals provided to said deflection coils, a protection system comprising:

means for connecting said vertical deflection coils serially;

transformer means including a core, three primary windings each connected in parallel across one of said vertical deflection coils and a secondary winding coupled inductively to said primary windings, with two of said primary windings each having N turns and a first winding polarity and the third primary winding having 2 N turns and a second winding polarity opposite to said first polarity, such that said transformer is balanced when all of said deflection coils transmit said vertical deflection signals with no signal induced in said secondary winding; and

shutdown means coupled to said secondary winding and to said cathode ray tubes for receiving a signal induced in said secondary winding due to transformer imbalance caused by a discontinuity in the current transmitted by one or more of said primary coils and terminating the electron beam in each said cathode ray tubes in response thereto.

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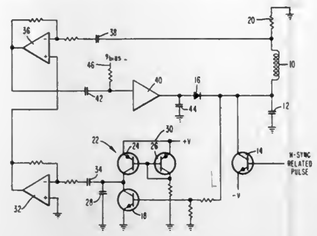
**4,297,620**
**QUASI FEEDBACK HORIZONTAL SCAN LINEARIZATION FOR CATHODE RAY TUBES**
**Ronald Quan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.**
**Filed Mar. 10, 1980, Ser. No. 129,059**
**Int. Cl.³ H01J** *29/72*
**U.S. Cl. 315—389** **5 Claims**

1. A scan circuit for linearizing the non-linear yoke current during the horizontal scan interval of a horizontal scan circuit including a yoke and serial switching transistor, comprising the combination of;

a current sensing resistor in series with the yoke for generating a non-linear voltage ramp commensurate with the non-linear yoke current;

a resonating capacitor coupled to the yoke oppsoite the sensing resistor;

linear ramp generator means coupled to the yoke opposite the sensing resistor and including a holding capacitor and transistor means coupled thereto, wherein the ramp generator means generates a linear voltage ramp in response to a reset pulse due to the yoke inductance during the fly-back interval of the horizontal scan; and




feedback means including the ramp generator means and a damper diode coupled to the yoke opposite the sensing resistor for selectively feeding back the linear voltage ramp to the yoke circuit during the first half of a selected line scan interval to linearize the corresponding non-linear yoke current.

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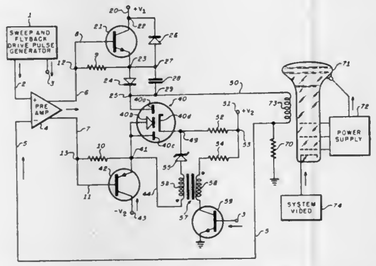
**4,297,621**
**CATHODE RAY TUBE BEAM DEFLECTION AMPLIFIER SYSTEM**
**Thomas W. Spilsbury, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.**
**Filed Oct. 2, 1980, Ser. No. 193,236**
**Int. Cl.³ H01J** *29/70, 29/76*
**U.S. Cl. 315—397** **6 Claims**




1. A cathode ray tube electron beam deflection control system having linear and non-linear operating modes, comprising:

deflection coil means;

preamplifier means having an input terminal and first and second output terminals, said input terminal responsive to an input sweep signal during said linear mode of operation;

first amplifier means having input and output terminals, said input terminal being coupled to said first output terminal of said preamplifier, for amplifying the current received therefrom;

second amplifier means having input and output terminals, said input terminal being coupled to said second output terminal of said preamplifier, for amplifying the current received therefrom;

fly-back diode means having first and second terminals, said first terminal coupled to said amplifier output terminal for unidirectionally conducting current received from said amplifier output terminal to said flyback diode second terminal;

diode means having first and second terminals, said first terminal coupled to a first power supply having a first voltage potential and said second terminal coupled to said second amplifier output terminal, for unidirectionally coupling current to said first power supply from said diode means second terminal

fly-back capacitor means coupled in series relationship with said diode means and in shunt relationship with said fly-back diode means and further coupled to said deflection coil; and

switcing means responsive to an applied fly-back drive signal for coupling said second amplifier output terminal with said fly-back diode means second terminal in said linear mode of operation and for decoupling said second amplifier output terminal with said fly-back diode means in said non-linear mode of operation.



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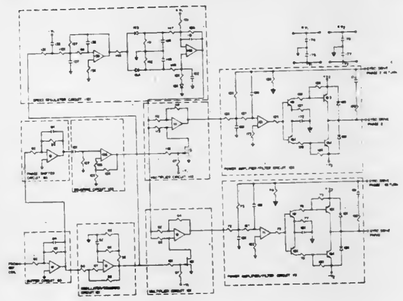
**4,297,622**
**MOTOR DRIVE**
**Charles C. Dittman, Dallas, Tex., and Richard C. St. Clair, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**
**Filed Oct. 26, 1979, Ser. No. 88,498**
**Int. Cl.³ H02K** *29/02*
**U.S. Cl. 318—254** **3 Claims**



1. A two phase sequential bipolar analog drive with closed loop speed control in a motor having a plurality of windings as a stator which interacts with a permanently magnetized gyro rotor which is free to pivot and rotate relative to the stator comprising:

means place about said stator for sensing rotation of said stator which generates a single reference signal of known phase relationship to the plurality of windings of said stator;

means for generating a plurality of gyro motor drive signals properly phased to the rotation of said gyro rotor based on said reference signal comprising:

a buffer circuit receiving said reference signal for filtering and amplifying said reference signal to a predetermined output signal from said buffer circuit;

an oscillator/squaring circuit which inputs said buffer circuit output for emitting a predetermined driving pulse when said buffer output is beneath a present threshold frequency and for squaring up said buffer circuit output when it is above said present threshold frequency;

a phase shifter circuit which inputs said buffer circuit output for changing the phase of said buffer circuit output a predetermined amount when said buffer circuit output frequency is beneath a defined limit;

a squaring circuit connected to said phase shifter circuit for squaring up said phase shifted buffer circuit output and inputting it to said stator for driving said rotor; and

means for controlling the level of said plurality of gyro rotor drive signals based on said reference signal.

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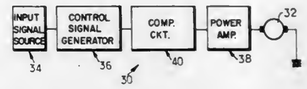
**4,297,623**
**SYSTEM FOR CONTROLLING A SEPARATELY EXCITED CONSTANT LOAD DC ELECTRIC MOTOR**
**Jean M. Dupont, Paris, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France**
**Filed Jun. 12, 1978, Ser. No. 914,987**
**Claims priority, application France, Jun. 20, 1977, 77 18874**
**Int. Cl.³ H02P** *5/16*
**U.S. Cl. 318—410** **15 Claims**




1. A system for controlling a separately excited constant load DC electric motor in response to a source of a control signal defining desired time periods corresponding to desired motor operating conditions and without the use for a feedback circuit responsive to exciting current supplied by the source to the motor, the motor exciting current having a term representing resistive and reactive losses in an electric circuit responsive to the exciting current, comprising simulator means for only the resistive losses, said simulator means being responsive to the control signal for modifying, during at least one of said desired time periods, the magnitude of the control signal in accordance with only the resistive losses the motor is expected to have in response to the control signal during said one time period, and means responsive to said modified control signal for applying a current that is a replica of the modified control signal to the motor armature, and independent of a response from any feedback circuit responsive to the motor armature current to preclude the need for any feedback circuit responsive to the armature current, said control signal being independent of actual motor operating current.

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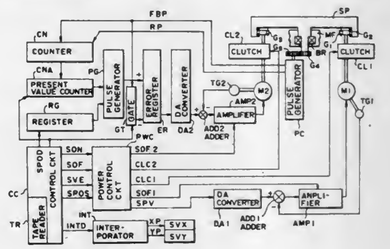
**4,297,624**
**SPINDLE CONTROL SYSTEM**
**Hidetsugu Komiya, Hino, Japan, assignor to Fujitsu Fanuc Limited, Japan**
**Filed Apr. 27, 1979, Ser. No. 34,142**
**Claims priority, application Japan, Apr. 28, 1978, 53-51694**
**Int. Cl.³ G05B** *11/18*
**U.S. Cl. 318—594** **7 Claims**




1. A spindle control system for a spindle control arrangement including a first motor for driving a spindle and a second motor for positioning the spindle, comprising:

first clutch means for selectively coupling the first motor with the spindle;

second clutch means for selectively coupling the second motor with the spindle;

a pulse generator coupled with the spindle for generating pulses proportional in number to the rotational angle of the spindle;

counter means for counting the pulses from the pulse generator to detect the rotational position of the spindle; and

means responsive to the counter means for controlling the rotational positioning of the spindle by the second motor via the second clutch means with the first clutch means disconnected.

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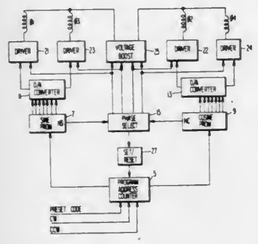
**4,297,625**

## APPARATUS FOR DIVIDING THE STEP ANGLE OF A STEPPING MOTOR

**Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.**

**Filed Apr. 9, 1979, Ser. No. 28,618**
**Int. Cl.³ G05B** *19/40*
**U.S. Cl. 318—696** **1 Claim**



1. A step divider apparatus for dividing the primary step of a stepping motor having a plurality of phase windings, comprising:

means for generating input timing signals;

counting means for counting the number of input timing signals from a preset count state;

memory means for storing a plurality of digital words, each digital word defining an incremental current step portion of a non-linear current signal;

means for applying the count state of said counting means to access associated digital words of said memory means;

converter means for generating an analog voltage defined by an accessed digital word;

a driver means for each of said phase windings, each driver means responsive to at least a portion of an accessed digital word for passing a unipolar current that is proportional to the analog voltage associated with the digital word;

phase select means for applying a plurality of sequentially generated analog voltages of said converter means to selected driver means to energize at least one pair of said phase windings, one winding of said at least one pair of windings energized with non-linear current steps defining an increasing non-linear unipolar current signal and the other winding of said at least one pair of windings energized with non-linear current steps defining a decreasing non-linear unipolar current signal;

voltage boost means connected to said phase windings for applying an increased voltage to a phase winding when increasing current is applied to the winding and for applying a reduced voltage to the winding at all other times;

said memory means including a sine programmable memory having stored data words for defining the positive portion of a sine current waveform as a function of the number of input timing signals applied to said counting means and a cosine programmable memory having stored data words for defining the positive portion of a cosine current waveform as a function of the number of input timing signals applied to said counting means;

said motor having four phase windings and including counter reset means for defining a number n of count states of said counting means in an energization cycle for the motor, said number n being equal to the product of a selected step divider factor times four, the step divider factor being the number by which the step divider apparatus divides the primary step of the motor.

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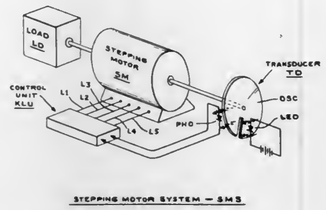
**4,297,626**

## METHOD OF DETERMINING OPERATING CURRENTS FOR STEPPING MOTOR

**David Chiang, 649 Caledonia Rd., Dix Hills, N.Y. 11746**

**Filed Feb. 7, 1980, Ser. No. 119,503**
**Int. Cl.³ G05B** *19/40*
**U.S. Cl. 318—696** **10 Claims**




STEPPING MOTOR SYSTEM — SMS

1. For a stepping motor having a rotor which is driven to rotate in response to currents having given waveforms in the stator windings, the method of determining an an operating parameter of the motor comprising the steps of: periodically imparting a series of current impulses of alternating polarity to the stator windings so that the rotor can oscillate about a give rest position with the amplitude of the oscillations increasing, each of said current pulses having a duration that is an integer multiple of the resonant period of the motor; monitoring the resulting oscillations; and indicating the operating parameter of the motor in accordance with the amplitude of at least one of said resulting oscillations.

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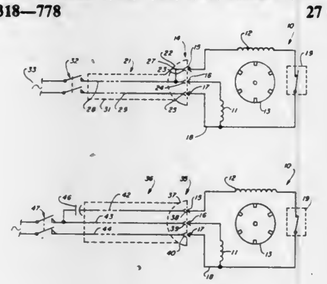
**4,297,627**

## ELECTRIC MOTOR CONSTRUCTION

**Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.**

**Continuation-in-part of Ser. No. 896,768, Apr. 17, 1978, abandoned. This application Nov. 7, 1978, Ser. No. 958,534**
**Int. Cl.³ H02P** *1/26, 7/36, 1/42;* **H02K** *11/00*
**U.S. Cl. 318—778** **27 Claims**



1. In combination, an electric motor operable as a split phase or as a capacitor start motor, comprising an outer casing, a run winding circuit, a start winding circuit including a start winding cutout switch, said run and start winding circuits being mounted within said casing, power circuit means adapted to connect said start and run winding circuits to a power supply, said start winding and power circuits having an electrical gap formed therebetween, and removable interchangeable attachment means exterior of said casing and connectable to bridge said gap, one of said attachment means causing said motor to operate as a capacitor start motor and another if said attachment means causing said motor to operate as a split phase motor.



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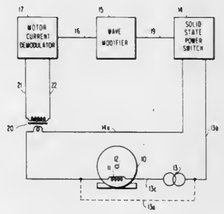
**4,297,628**

## ENERGY ECONOMIZER FOR INDUCTION MOTORS

**Rhey W. Hedges, Ft. Lauderdale, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.**

**Filed Jul. 3, 1980, Ser. No. 165,574**
**Int. Cl.³ H02P** *7/36, 1/26*
**U.S. Cl. 318—798** **37 Claims**




1. In an energy economizing AC power control system operative to reduce the iron and copper losses in a conventional AC induction motor having a stator winding and a rotor adapted to be coupled to a load, said system being of the type comprising a sine wave power source for energizing said stator winding to effect rotation of said rotor, and a nonlinear closed loop positive feedback control means conditionally operative to control the form and magnitude of energization of said stator winding from said power source, said feedback control means comprising motor load detecting means for producing a control signal which varies as a function of the load of said motor, wave modifier means responsive to said control signal, and switching means disposed between said sine wave power source and said stator winding, the conduction time of said switching means being controllable during each cycle of said power source as a function of said control signal to apply full sine waves of voltage from said power source to said stator winding during rotational start-up and speed build-up of said motor and, as said motor reaches a near synchronous speed, then being operative to provide varying fractions or complete cycles of each sine wave of voltage from said power source to said stator winding in accordance with the inherent electromechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, the improvement wherein said motor load detecting means comprises a motor current demodulator circuit coupled to said stator winding and jointly responsive to at least two load-related variations of the parameters of the inrush current to said stator winding each time the current in said stator winding increases from zero for producing said variations of said control signal, said parameters including the magnitude of the stator inrush current at the beginning of each current alteration and also including the instantaneous phase of said stator inrush current.

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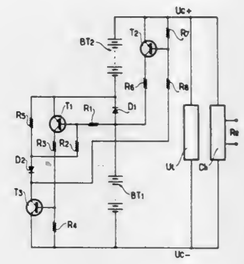
**4,297,629**

## AUTOMATIC SWITCHING ARRANGEMENT FOR TWO BATTERIES WHICH ARE CHARGED IN PARALLEL AND DISCHARGED IN SERIES

**Pierre Godard, Tremblay les Gonesse, and Michel Billot, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France**

**Filed Apr. 1, 1980, Ser. No. 136,355**
**Claims priority, application France, Apr. 13, 1979, 79 09469; Dec. 6, 1979, 79 29942**
**Int. Cl.³ H02J** *7/04*
**U.S. Cl. 320—7** **15 Claims**




1. An automatic switching arrangement for connecting two batteries in parallel between a pair of power supply leads for charging and in series between the same power supply rails for discharging to supply power thereto in the event of a failure of a power supply to the said leads, the switching arrangement comprising:

positive and negative terminals for respective connection to said power supply leads;

first and second storage batteries, the negative pole of the first battery being connected to the negative terminal and the positive pole of the second battery being connected to the positive terminal;

first and second switchable charging circuits, the first switchable charging circuit being connected between the positive pole of the first battery and the positive terminal, and the second switchable charging circuit being connected between the negative pole of the second battery and the negative terminal;

unidirectionally conductive means connected in series between the positive pole of the first battery and the negative pole of the second battery in order to allow a discharge current to flow in series through the batteries but to prevent a charging current from flowing in series through the batteries; and

control means arranged to switch on said first and second switchable charging circuits when there is sufficient externally applied voltage at the positive and negative terminals for the batteries to be charged therefrom, and to switch off said switchable charging circuits otherwise to enable the batteries to supply power in series to said positive and negative terminals;

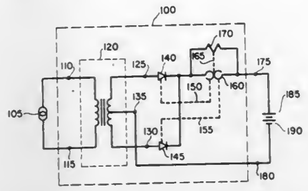
the control means including a first transistor connected to be turned on and off by the direction of the potential difference between the positive pole of the first battery and the negative pole of the second battery, and positive feedback means arranged to saturate the first transistor when it turns on.

**4,297,630**

## TIMED FAST CHARGER

**Ferdinand H. Mullersman, Gainsville, Fla., assignor to General Electric Company, Gainsville, Fla.**

**Filed Jun. 23, 1980, Ser. No. 162,152**
**Int. Cl.³ H02J** *7/04*
**U.S. Cl. 320—35** **9 Claims**




1. Charging apparatus for a rechargeable cell having a sequential timed fast-rate charging mode and a slow-rate charging mode comprising:
(a) means adapted for connection to an external electrical source including rectifying means for providing a source of unidirectional charging current; and
(b) thermally activated charging control means connected in series between said charging current means and said rechargeable cell and including:
(1) first control means thermally coupled to said rectifying means for providing and maintaining for a predetermined period of time a fast-rate charging current path between said charging current means and said rechargeable cell, and
(2) second control means connected in parallel with, and thermally coupled to, said first control means for providing thereafter a slow-rate charging current path between said charging current means and said rechargeable cell.

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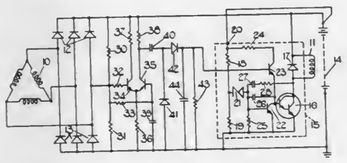
**4,297,631**

## BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

**Thomas Nicol, Oxted; David Wiley, Walsall, and Maurice J. Allport, Edgbaston, all of England, assignors to Lucas Industries Limited, Birmingham, England**

**Filed Mar. 7, 1980, Ser. No. 128,225**
**Claims priority, application United Kingdom, Mar. 16, 1979, 9372/79**
**Int. Cl.³ H02J** *7/16*
**U.S. Cl. 320—64** **6 Claims**



1. A battery charging system comprising an alternator having a stator winding and a field winding, rectifier means connecting the stator winding to the battery, a voltage regulator having an output stage connected in series with the field winding across the battery and an input stage coupled to the output stage and sensitive to the battery voltage so that, in use, the mean current in the field winding is controlled to maintain a desired battery voltage, and switch means sensitive to an a.c. signal derived from the alternator for preventing current flow through the field winding when the alternator is at rest, said switch means including a differential amplifier connected to detect the presence of an a.c. signal at the alternator output and a diode pump circuit driven by the output of said differential amplifier.

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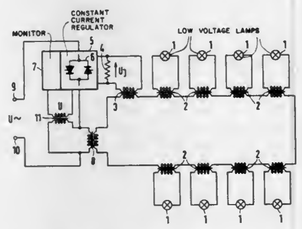
**4,297,632**

## DEVICE FOR MONITORING LAMP FAILURE IN AIRPORT NAVIGATION LIGHTING

**Helmut Glaser, Forchheim, and Ludwig Schick, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jun. 28, 1979, Ser. No. 52,843**
**Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829135**
**Int. Cl.³ G01R** *31/02*
**U.S. Cl. 324—51** **6 Claims**




1. A device for monitoring lamp failures in an airport landing light system comprising:
a plurality of lamps each of which is supplied by a current transformer;
a high voltage transformer having a primary winding connected to an AC network via a constant current regulator and a secondary winding connected in series with the series-connected primary windings of the current transformers;
a current measuring transformer connected for measuring the current flowing in the primary windings of the current transformers;
a voltage measuring transformer for measuring the voltage on the primary winding of the high voltage transformer;
means for monitoring and indicating the percentage of failed lamps comprising a first sample-and-hold memory connected to the output of the current measuring transformer and a second sample-and-hold memory connected to the output of the voltage measuring transformer;
an extreme value detector for activating the sample-and-hold memories upon the occurrence of an extreme value in the output signal of the current measuring transformer;
a first proportional amplifier connected to the output of the first sample-and-hold memory;
means for taking the difference between the output of the second sample-and-hold memory and the first proportional amplifier and supplying it to a second proportional amplifier;
means for dividing the output of the second proportional amplifier by the output of the first proportional amplifier; and
means responsive to the output of the dividing means for indicating the condition of the lamps.

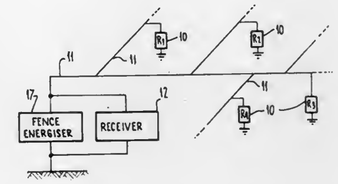


**4,297,633**

## ELECTRIC FENCE MONITORING SYSTEM WITH ENERGIZER, RESPONDER AND RECEIVER

**John C. McCutchan, Lower Plenty, and Rex C. Niven, East Melbourne, both of Australia, assignors to The University of Melbourne, Parkville, Australia**

**Continuation of Ser. No. 923,348, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 753,903, Dec. 23, 1976, abandoned. This application Jul. 9, 1979, Ser. No. 56,004**
**Claims priority, application Australia, Dec. 23, 1975, PC4375**
**Int. Cl.³ G01R** *31/02;* **G08B** *26/00*
**U.S. Cl. 324—51** **9 Claims**




1. In an electric fence including an energizer transmitting a plurality of electric pulses having a predetermined animal deterring value along said fence, a monitoring system comprising at least one responder connected to said fence at a chosen point along its length for receiving said pulses and measuring a predetermined parameter thereof and being activated to transmit a return signal along said fence to a receiver, located at a location on the fence different than the location of the responder, on each occasion said responder receives at least one said electric pulse having said predetermined parameter of a predetermined value indicative of the effectiveness of the fence in deterring animals, said receiver including means for determining the time delay between the return signals from said responder and for providing an alarm indication if the time delay exceeds a value indicative that the effectiveness of the fence has fallen below a predetermined minimum.

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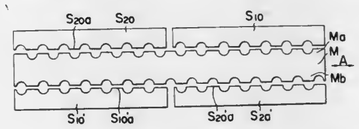
**4,297,634**

## DEVICE FOR MEASURING THE AMOUNT OF MOVEMENT OF A STRAIGHTLY MOVING OBJECT

**Hiroomi Ogasawara, 3821-4, and Masaomi Ogasawara, 3833, both of Yamakita, Yamakitamachi, Ashigarakami-Gun, Kanagawa-Ken, Japan**

**Filed Nov. 30, 1979, Ser. No. 99,154**
**Claims priority, application Japan, Dec. 4, 1978, 53-149837**
**Int. Cl.³ G01R** *27/26*
**U.S. Cl. 324—61 R** **6 Claims**




1. A device for measuring the amount of movement of a straightly moving object comprising:
(a) sensor means including (i) an elongated electrode member having gear-like graduations cut on two longitudinal outer walls thereof, (ii) a first pair of electrode plate members having gear-like graduations confronting respectively the graduations on said two longitudinal walls of said elongated electrode member to form therewith a first pair of capacitors, the relation of the graduations on the confronting surface of a first one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member being shifted 180° in phase from the relation of the graduations on the confronting surface of the other one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member, and (iii) a second pair of electrode plate members having gear-like graduations confronting respectively the graduations on said two longitudinal walls of said elongated electrode member to form therewith a second pair of capacitors, the relation of the graduations on the confronting surface of a first one of said second pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member being the same as the relation of the graduations on the confronting surface of the first one of said first pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member and being shifted 180° in phase from the relation of the graduations on the confronting surface of the other one of said second pair of electrode plate members and the graduations on its respective longitudinal wall of said elongated electrode member;
one of (i) said elongated electrode member and (ii) said first and second pairs of electrode plate members being adapted to move longitudinally in response to longitudinal movement of the straightly moving object while the other one thereof is stationary, so that the capacitance of a first capacitor of each of said pairs of capacitors increases and the capacitance of the othercapacitor of each of said pairs of capacitors correspondingly decreases differentially as said straightly moving object moves longitudinally;
(b) two oscillator circuits, one oscillator circuit having said first one of said first pair of capacitors and said first one of said second pair of capacitors incorporated therein as frequency varying components, the other oscillator circuit having said second one of said first pair of capacitors and said second one of said second pair of capacitors incorporated therein as frequency varying components; and
(c) mixer means connected to said two oscillator circuits for providing a frequency difference signal determined by the difference in the frequencies of said two oscillator circuits and indicative of the extent of longitudinal movement of the straightly moving object.

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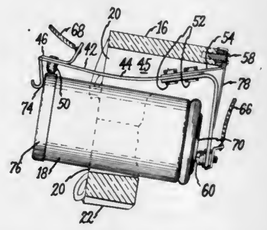
**4,297,635**

## WATTHOUR METER AND BATTERY RETAINING APPARATUS THEREFOR

**Francis J. Stevens, North Berwick, Me., assignor to General Electric Company, Somersworth, N.H.**

**Filed Nov. 19, 1979, Ser. No. 95,163**
**Int. Cl.³ G01R** *1/04, 11/04;* **H01R** *13/48;* **H01M** *2/10*
**U.S. Cl. 324—156** **17 Claims**



1. Apparatus for retaining a replaceable battery comprising:
(a) a unitary structure characterized by a rigid material having first and second oppositely disposed ends and including therein a chamber longitudinally extending between the oppositely disposed ends, said chamber having an opening in at least one of the ends and having a wall

for surroundingly supporting a battery to be inserted into the chamber from the open end;

(b) a retaining means for retaining said battery in the chamber of said unitary structure, said retaining means characterized by an elongated member of resilient spring material, said elongated member having a lip formed on each end thereof, each lip extending substantially perpendicularly in the same direction from said elongated member and at a predetermined angle with respect thereto; and

(c) means, including said retaining means and said unitary structure, for mounting said retaining means on said unitary structure with a first lip of said retaining means disposed in the chamber at the first end of said unitary structure and a second lip of said retaining means disposed in the chamber at the second end of said unitary structure, one of the lips of said retaining means providing sufficient clearance in the chamber opening to allow said battery to be inserted into the chamber, whereby, when said battery is being inserted into the chamber, one of the first and second lips contacts one terminal end of said battery, while the other lip slidingly engages the outside surface of said battery creating concurrent and opposing forces at opposite ends of said elongated member causing said elongated member to bend and to thereby cause said other lip to slide off of the outside surface of said battery and snap over the other terminal end of said battery, when said battery is fully inserted into the chamber, to thus securely retain said battery in the chamber of said structure.

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**4,297,636**

## MAGNET AND PROBE MOUNTING MEANS ON A ROTATING HEAD OF MAGNETIC DEFECT TESTING APPARATUS

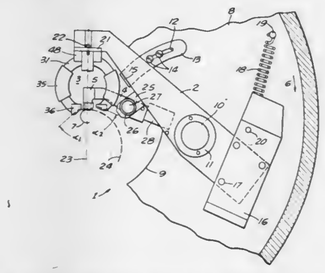
**Hans Link, Reutlingen, and Ulrich Dreher, Trochtelfingen, both of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Förster Prüfgerätebau, Reutlingen, Fed. Rep. of Germany**

**Filed Aug. 1, 1979, Ser. No. 62,708**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838388**

**Int. Cl.³ G01R *33/00*; G01N *27/82***

**U.S. Cl. 324—262** **18 Claims**



1. A rotating head for magnetic defect testing of elongated cylindrical ferromagnetic test articles in which a rearwardly closed magnet yoke rotates about the test articles, a winding on said yoke excites magnetic flux therein, pole faces of the said magnet yoke are directed towards the test article surface, and a probe support is arranged between the pole faces including at least one field-responsive test probe, said probe support being fastened to a probe lever mounted to swing in a plane transversely perpendicular to the longitudinal axis of the test article and having a sliding shoe bearing resiliently against the test article surface, the improvement comprising:

a yoke lever mounted on the rotating head for swinging movement in a plane transversely perpendicular to the longitudinal axis of the test article, said yoke lever having one end interconnected with the magnet yoke and an end opposite said magnet yoke carrying a counterweight; and said probe lever being rotatively mounted on the yoke lever.

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**4,297,637**

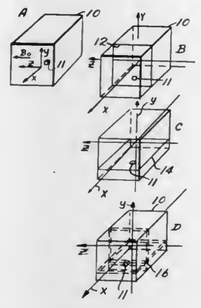
## METHOD AND APPARATUS FOR MAPPING LINES OF NUCLEAR DENSITY WITHIN AN OBJECT USING NUCLEAR MAGNETIC RESONANCE

**Lawrence E. Crooks, Richmond; John C. Hoenninger, III, Berkeley, and Mitsuaki Arakawa, Forest City, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.**

**Filed Jul. 20, 1978, Ser. No. 926,571**

**Int. Cl.³ G01N *27/00***

**U.S. Cl. 324—309** **35 Claims**



1. A method for determining the relative densities of nuclei within an object, said nuclei having nuclear spins at Larmor frequencies in accordance with the intensity of a magnetic field operating thereon, the method comprising the steps of:

selectively effecting the generation of spin echo signals by nuclei disposed within a predetermined volume of said object by exciting intersecting regions in said object, said predetermined volume being defined by the intersection of said regions; and

detecting the intensity of said spin echo signals to obtain a measure of the relative density of nuclei in said predetermined volume.

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**4,297,638**

## X-RAY SYSTEM SIGNAL DERIVATION CIRCUITS FOR HEAT UNIT INDICATORS AND/OR CALIBRATION METERS

**Robert R. LaFrance, St. Malo, Manitoba, Canada**

**Continuation-in-part of Ser. No. 914,504, Jun. 12, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,252**

**Claims priority, application United Kingdom, Sep. 15, 1978, 36982/78**

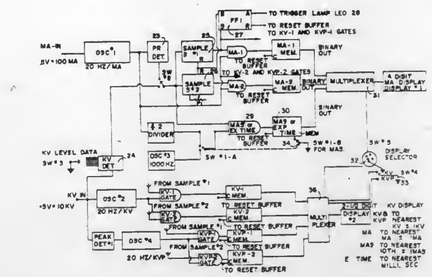
**Int. Cl.³ G01R *31/024***

**U.S. Cl. 324—410** **12 Claims**

1. Signal derivation circuits for X-ray tubes, said tubes including a high tension transformer having a secondary winding and a primary winding, said secondary winding being operatively connected to the X-ray tube, said signal derivation circuits comprising in combination a milliampere circuit operatively connected to the mid point of the secondary winding of the high tension transformer thereby providing a signal that is proportional to the milliamperes flowing through said mid point of the secondary winding, a kilovolt circuit operatively connected to the primary voltage on the high tension transformer thereby providing, in conjunction with a load compensation signal derived from said milliampere circuit, a signal proportional to the kilovoltage across the X-ray tube and a multiplier circuit operatively connected to said milliampere circuit and said kilovolt circuit, and a heat unit indicating module operatively connected to said multiplier, said heat unit



indicator module including a memory unit operatively connected to said multiplier circuit, and read-out means operatively connected to said memory unit, and a source of power for said circuit.



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**4,297,639**

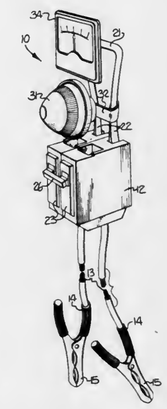
## BATTERY TESTING APPARATUS WITH OVERLOAD PROTECTIVE MEANS

**Tillman W. Branham, Rte. 1, Box 149, Lugoff, S.C. 29078**

**Continuation-in-part of Ser. No. 969,066, Dec. 13, 1978, abandoned. This application Jul. 18, 1979, Ser. No. 58,687**

**Int. Cl.³ G01N *27/42***

**U.S. Cl. 324—429** **11 Claims**



1. A battery testing apparatus for evaluating the charge capacity of a storage battery under no-load and load conditions while limiting the duration of the test and protecting both the testing apparatus and battery from excessive and potentially harmful current being drawn from the battery during the test, and comprising

cable means adapted to be connected to the electrodes of the storage battery,

voltage indicator means electrically connected to said cable means and operable for detecting the voltage available between the electrodes of the battery,

a load circuit including a load resistor connected in parallel with said voltage indicator means and switch means connected in series with said load resistor and positionable between open and closed states so that the relative magnitude of the voltage of the battery under a no-load condition can be determined when said switch means is open and the relative magnitude of the voltage of the battery under a load condition can be determined when said switch means is closed,

and said switch means comprising current responsive means which will open in response to the passage of current of a magnitude exceeding a predetermined amperage rating, the predetermined amperage rating of said current responsive means being correlated to the resistance of said load resistor and to a predetermined acceptable level of battery capability such that a battery undergoing testing and having a capability at or above said predetermined acceptable level will result in a current in the load circuit exceeding said predetermined amperage rating of the current responsive means, thereby opening said load circuit and protecting the battery and the testing apparatus from excessive current.

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**4,297,640**

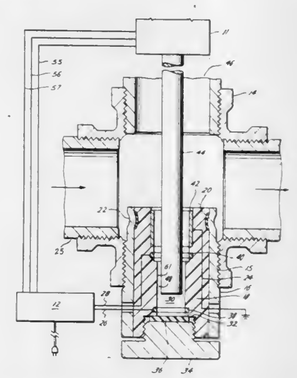
## APPARATUS FOR MEASURING THE ELECTRIC CHARGE CONDITION OF NON-CONDUCTIVE PARTICLES IN A MILDLY CONDUCTIVE ELECTROLYTE

**Zack J. Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Feb. 11, 1980, Ser. No. 120,405**

**Int. Cl.³ G01R *5/28***

**U.S. Cl. 324—458** **3 Claims**



1. In an apparatus for determining a function of the electrical charge condition in a flowable liquid media containing electrical charge influencing species, said apparatus having: (a) a substantially vertical tubular flowpath member which has walls which are electrically insulating, which tubular flowpath has an open end at its top and a closed end at its bottom, which closed end is also electrically insulating, and which tubular flowpath is disposed so that it may be substantially filled with said flowable liquid media; (b) a block-like reciprocating element whose outer wall, at least, is electrically insulating and which is disposed in slidable relationship within said flowpath member, said reciprocating element having a transverse cross-section such that it fits adjacent to but spaced from said walls of said flowpath member when it reciprocates in said flowpath member; (c) a pair of spaced sensing electrodes located within said flowpath member, the electrodes being made of the same metal, the first of said sensing electrodes being at least near the closed end of said flowpath member and the second of said sensing electrodes being spaced above the first sensing electrode nearer the open end of said flowpath member with both electrodes so disposed as to be contacted by said flowable liquid media entering or leaving said flowpath member; (d) means for reciprocating said reciprocating element in said flowpath member; (e) means for admitting of said flowable liquid media to said flowpath member; and (f) means coupled to said first and second electrodes to detect and amplify any

alternating component of any electrical current flowing betweeen said first and second spaced sensing electrodes; the improvement which comprises:

a guard electrode located inside said tubular flowpath spaced above said second sensing electrode, said second sensing electrode being located below the guard electrode which itself is located at or near the top of said tubular flowpath and above the first sensing electrode which itself is located at or near the bottom of said tubular flowpath with all three electrodes spaced from one another, said guard electrode circling the interior insulating wall of said tubular flowpath means but spaced sufficiently from the block-like reciprocating element to allow free flow of said flowable liquid medium between said guard electrode and said block-like reciprocating element, said guard electrode being electrically grounded and made of the metal as are the said two sensing electrodes, and said guard electrode having a surface and body large enough with respect to the surfaces and bodies of the two sensing electrodes so that its electrical resistivity is negligible with respect to the electrical resistivities of the sensing electrodes in order to shield the sensing electrodes from any galvanic cell-type electrical current which wouold flow through said flowable liquid media between these sensing electrodes and any external metals different in composition from the sensing electrodes in contact with the flowable liquid.

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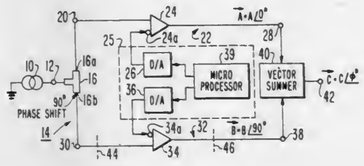
**4,297,641**

## SERRODYNING SYSTEM EMPLOYING AN ADJUSTABLE PHASE SHIFTING CIRCUIT

**Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Sep. 28, 1979, Ser. No. 80,103**
**Int. Cl.³ H03B *19/00***
**U.S. Cl. 328—15** **1 Claim**




1. A phase shifting circuit for producing an output signal adjustably shifted in phase relative to an input alternating frequency signal, comprising in combination:

a first signal path having an input terminal receptive of said input signal and having a first output terminal, said first signal path comprising a first adjustable level signal translating device including a first level control terminal, said device being positioned intermediate said input terminal and output terminal;

a second signal path having an input terminal receptive of said input signal and having a second output terminal, said second signal path comprising a second adjustable level signal translating device including a second level control terminal;

means for effecting a 90° relative phase shift in one signal path relating to the other;

means coupled to said first and second output terminals for producing said output signal which is the vector sum of the signals appearing at said first and second output terminals;

means coupled to said first and second control terminals for respectively applying control signals thereto for controlling the level of signal produced respectively at said first and second output terminals for controlling the phase of said output signal by any amount between 0° and 90° relative to said input signal;

means for selectively shifting said output signal by N·90° where N=0, 1, 2, or 3 for thereby effecting a 0° to 360° phase shift relative to said input signal; and

means for providing to said phase shifting circuit a signal at a given frequency $f_1$, means for continuously and uniformly shifting the phase of said signal in said phase shifting circuit between 0° and 360° and means responsive to said output signal from said phase shifting circuit for producing a signal at frequency $f_2$ where $f_2$ differs from $f_1$ by an amount determined by the rate at which said phase shift occurs in said phase shifting circuit.

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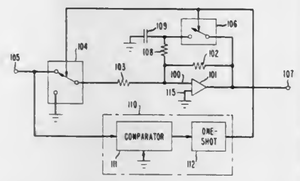
**4,297,642**

## OFFSET CORRECTION IN OPERATIONAL AMPLIFIERS

**Gary L. Baldwin, Palo Alto, and James L. McCreary, Los Gatos, both of Calif., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 31, 1979, Ser. No. 89,851**
**Int. Cl.³ H03F *1/00***
**U.S. Cl. 330—9** **8 Claims**




1. Apparatus including an operational amplifier (**101**) which is adapted to receive an input signal, said apparatus comprising:

means (**104**, **106**) connected with the output of said operational amplifier and operable to cancel d.c. offset in said amplifier,

CHARACTERIZED BY means (**110**) for operating said cancelling means in response to zero crossings in said input signal.

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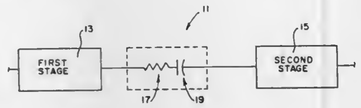
**4,297,643**

## NOISE OBVIATING ELECTRONIC SIGNAL COUPLING MEANS

**Thomas J. Pearson, Jr., Rte. 1, Box 18, Coffeeville, Ala. 36524**

**Filed Nov. 13, 1979, Ser. No. 93,541**
**Int. Cl.³ H03F *1/00***
**U.S. Cl. 330—178** **2 Claims**




1. An improved coupling means for transferring an electronic signal from the output of any stage of gain to the input of the succeeding stage for obviating the noises as the signal is transferred, said coupling means including a circuit means for extending between the output of the stage of gain and the input of the succeeding stage and capacitor electrically mounted in the circuit means, wherein the improvement comprises: a resistor electrically mounted in the circuit means between the output of the stage of gain and the capacitor with no other electrical components or connections being placed between said resistor and the capacitor, said resistor being in series with the capacitor.

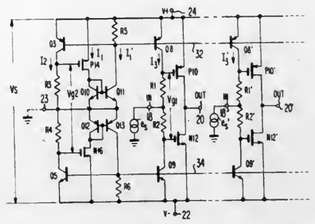


**4,297,644**

## AMPLIFIER WITH CROSS-OVER CURRENT CONTROL

**Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 23, 1979, Ser. No. 96,739**
**Int. Cl.³ H03F *3/30***
**U.S. Cl. 330—264** **9 Claims**




1. A complementary symmetry amplifier comprising:

first, second, third, and fourth field-effect transistors, each having respective source and drain electrodes defining the ends of its conduction channel and each having a gate electrode, said first and third transistors being of P-channel type and said second and fourth transistors being of N-channel type;

means for applying an operating potential between the source electrodes of said first and second transistors;

input and output terminals;

respective means for connecting the drain electrodes of said first and second transistors to said output terminal;

means for connecting the gate electrode of said first transistor to said input terminal;

means for connecting the gate electrode of said second transistor to said input terminal;

means for regulating the current flows through the conduction channels of said third and fourth transistors to a prescribed value substantially independent of said operating potential; and

means responsive to the resulting gate-to-source voltages of said third and fourth transistors for applying respective potentials proportional to said resulting gate-to-source voltages as the respective gate-to-source voltages of said first and second transistors.

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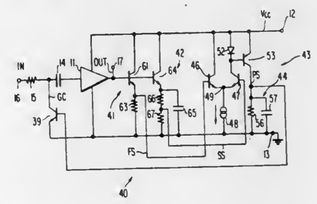
**4,297,645**

## AUTOMATIC GAIN CONTROL CIRCUIT COMPRISING A CIRCUIT FOR COMPARING A MODULATED SIGNAL WITH AN ENVELOPE DETECTED SIGNAL

**Kouichi Tanaka, Tokyo, and Kiyoshi Amazawa, Ohmiya, both of Japan, assignors to Nippon Electric Co., Ltd. and Clarion Co., Ltd., both of Tokyo, Japan**

**Filed Sep. 20, 1979, Ser. No. 77,222**
**Int. Cl.³ H03G *3/30***
**U.S. Cl. 330—280** **5 Claims**




1. An automatic gain control circuit to be coupled to an amplifier having a controllable gain and responsive to an input signal and a gain control signal for amplifying said input signal with the gain automatically controlled in compliance with said gain control signal to produce an amplified signal, said automatic gain control circuit being responsive to said amplified signal for producing said gain control signal, wherein the improvement comprises:

first means having a first reference level and responsive to said amplified signal for superposing said amplified signal on said first reference level to produce a first signal of a first level variable in compliance with said amplified signal;

second means having a second reference level and responsive to said amplified signal for carrying out envelope detection of said amplified signal to produce a second signal of a second level variable in response to said amplified signal with said second variable level offset by said second reference level so that said second variable level traverses said first variable level during discrete intervals of time;

third means for comparing said first signal with said second signal to produce a pulse signal during said discrete intervals; and fourth means for smoothing said pulse signal to produce said gain control signal.

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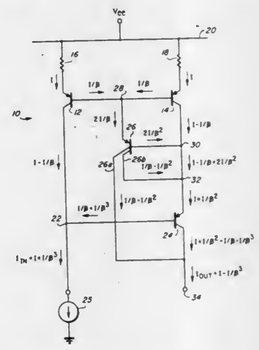
**4,297,646**

## CURRENT MIRROR CIRCUIT

**James J. LoCascio, Mesa, and Robert B. Jarrett, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jan. 25, 1980, Ser. No. 115,522**
**Int. Cl.³ H03F *3/14***
**U.S. Cl. 330—288** **10 Claims**




1. A current mirror, comprising:

current turn around means for supplying first, second and third currents at respective outputs, said current turn around means being coupled to a terminal which is adapted to receive an operating potential;

current source means coupled to a first one of said outputs of said current turn around means for supplying an input current thereto;

output electron control means having a first, a second and a control electrode, said first electrode being connected to a second one of said outputs of said current turn around means, said second electrode being coupled to an output terminal of the current mirror, said control electrode being coupled to said current source means; and

first electron control means having first, second, third and control electrodes, said first electrode being coupled to a third one of said outputs of said current turn around means, said second electrode being coupled to said output terminal of the current mirror, and said third and control electrodes each being coupled to said first electrode of said output electron control means.

**4,297,647**

## HYBRID INTEGRATED CIRCUIT AND A METHOD FOR PRODUCING THE SAME

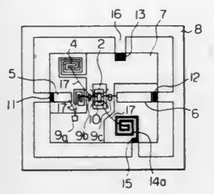
**Masahiro Akiyama; Katuzo Kaminishi, and Yasushi Kawakami, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Jun. 15, 1979, Ser. No. 48,849**

**Claims priority, application Japan, Jun. 16, 1978, 53/81657[U]**

**Int. Cl.³ H03F *3/14*; H05K *5/02***

**U.S. Cl. 330—307** **9 Claims**




6. A hybrid integrated circuit comprising of a ceramic substrate, a conductive pattern attached on the ceramic substrate for providing electronic components including an inductor and a connection terminal, a lead frame having a closed frame and being connected to said conductive pattern; gold layer plated on said conductive pattern and the lead frame; electronic components mounted on said conductive pattern; and said electronic components and said conductive pattern being wired with one another, characterized in that the lead frame has an inductance pattern projected inside of the closed frame, and the inductance pattern on the lead frame overlaps on the corresponding inductance pattern of the conductive pattern on the ceramic substrate.

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**4,297,648**

## MICROWAVE FREQUENCY DIVISION BY PHASE LOCKED LOOPS

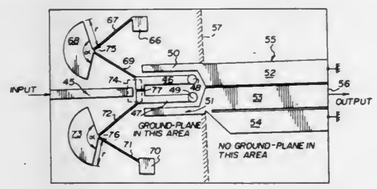
**Trevor W. Tucker, and William D. Cornish, both of Ottawa, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada**

**Filed Aug. 3, 1979, Ser. No. 63,171**

**Claims priority, application Canada, Aug. 31, 1978, 310452**

**Int. Cl.³ H03L *7/00***

**U.S. Cl. 331—1 R** **2 Claims**




1. Apparatus for producing a stable microwave frequency signal comprising an rf oscillator for supplying microwave signals of frequency $f_1$ above 2 GHz to an output terminal of the apparatus and to an input of a microwave analog frequency divider, said frequency divider dividing said microwave signals by N, where N is an integer, and a phase detector having one input connected to receive the output of said frequency divider, said phase detector having another input fed by a reference oscillator of frequency $f_2$, wherein $f_2=f_1/N$, said phase detector having an output connected to a control input of said rf oscillator whereby the output frequency of said rf oscillator is adjustable to equal $Nf_2$, said frequency divider comprising resonant circuit means, comprising at least two microwave transmission lines and a corresponding number of non-linear reactance elements, for receiving said microwave signal and for providing a balanced output signal of a frequency 1/N times the input signal, said microwave transmission lines comprising terminated microstrip transmission lines and said non-linear reactance elements comprising varactor diodes located at the terminated ends of the microstrip transmission lines, said frequency divider further comprising a balun electromagnetically coupled to said microstrip transmission lines.

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**4,297,649**

## MALFUNCTION DETECTOR FOR A GROUP OF CYCLICALLY INTERCONNECTED PHASE-LOCKED OSCILLATORS

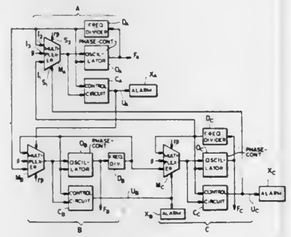
**Anes Sbuelz, and Francesco Marchelli, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy**

**Filed Jun. 29, 1979, Ser. No. 53,280**

**Claims priority, application Italy, Jul. 3, 1978, 25268 A/78**

**Int. Cl.³ H03L *7/00***

**U.S. Cl. 331—2** **5 Claims**



1. A circuit arrangement for generating a multiplicity of oscillations locked in phase with one another, comprising a multiplicity of cyclically interconnected generator stages each comprising:

a phase-controlled oscillator with a synchronizing input and with a feedback loop between an output and another input thereof;

a multiplexer with a first input connected to the output of the oscillator of the immediately preceding stage, a second input connected to said feedback loop and an output connected to said synchronizing input; and

a control circuit with inputs connected in parallel with those of said oscillator to said feedback loop and to the output of said multiplexer, respectively, said control circuit being responsive to a disparity between the frequencies of feedback and synchronizing oscillations appearing on its said inputs for switching only the multiplexer of the immediately succeeding stage to said second input thereof with concurrent emission of an alarm signal indicative of a malfunction of the associated oscillator.

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**4,297,650**

## PHASE LOCKED LOOP CARRIER RECOVERY CIRCUIT WITH FALSE LOCK PREVENTION

**Saburo Shinmyo, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 27, 1979, Ser. No. 108,249**

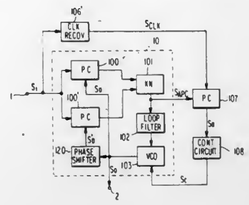
**Claims priority, application Japan, Dec. 27, 1978, 53-164883**

**Int. Cl.³ H03L *7/10***

**U.S. Cl. 331—11** **6 Claims**

1. A carrier recovery apparatus comprising an input terminal for receiving a phase-modulated carrier, a voltage-controlled oscillator for generating a variable frequency oscillation in response to a control signal, a first phase comparator for providing a comparison output representative of the phase difference between said modulated carrier and the output of said voltage-controlled oscillator, a loop filter for supplying said voltage-controlled oscillator with the low-frequency component of the output of said first phase comparator as said control signal, a clock recovery circuit for generating a clock signal in response to said modulated carrier, a second phase comparator for providing a comparison output representative of the phase difference between the output of said first phase comparator and said clock signal, and means for superimposing the low-frequency component of the output of said second phase comparator on one of the outputs of said first phase comparator and said loop filter.



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**4,297,651**

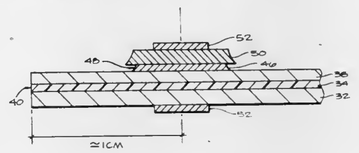
## METHODS FOR SIMULTANEOUS SUPPRESSION OF LASER PULSATIONS AND CONTINUOUS MONITORING OF OUTPUT POWER

**John C. Dyment, Kanata, and Kiuchi D. Chik, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada**

**Filed Aug. 23, 1979, Ser. No. 68,887**

**Int. Cl.³ H01S *3/19***

**U.S. Cl. 331—94.5 H** **6 Claims**




1. A semiconductor laser device adapted for suppression of transient relaxation oscillations and sustained spontaneous pulsations, the device comprising:

A semiconductor ship having a substrate, a first confining layer, a waveguide layer, an active layer and a second confining layer, the active layer and the second confining layer formed as a laser mesa, the mesa having a metal contact thereon, a corresponding surface area of the substrate also having a metal contact thereon, the waveguide being of higher refractive index than an underlying layer, the waveguide layer having one end of non-linear configuration, the waveguide being longer at a central region than at peripheral regions at said one end, and tapering gradually to zero thickness at said one end whereby collimated light directed along the waveguide towards said one end is reflected back therefrom and is returned to the laser active layer, such reflection occurring between 0.3 and 2 centimeters from the laser active layer.

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**4,297,652**

## INJECTION-TYPE SEMICONDUCTOR LASER

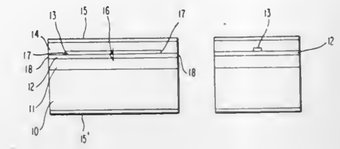
**Izuo Hayashi, and Hiroo Yonezu, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Oct. 9, 1979, Ser. No. 83,043**

**Claims priority, application Japan, Oct. 11, 1978, 53-125585**

**Int. Cl.³ H01S *3/19***

**U.S. Cl. 331—94.5 H** **10 Claims**




1. In a semiconductor laser having a multi-layer structure formed on a substrate and two opposing cleaved surfaces, said semiconductor laser comprising:

a first semiconductor layer for guiding a laser beam;

an active layer disposed in contact with said first semiconductor layer, said active layer being formed in the shape of a stripe, said stripe having substantially planar ends which are spaced from said cleaved surfaces;

a third semiconductor layer burying said active stripe;

a first electrode for supplying a first electric potential through said third semiconductor layer; and

a second electrode formed on said substrate for supplying a second electric potential thereto.

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**4,297,653**

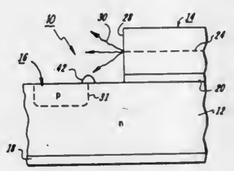
## HYBRID SEMICONDUCTOR LASER/DETECTORS

**Donald R. Scifres, and Wolfgang E. Stutius, both of Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 30, 1979, Ser. No. 34,238**

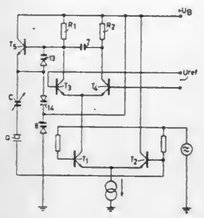
**Int. Cl.³ H01S *3/19***

**U.S. Cl. 331—94.5 S** **10 Claims**




1. A hybrid semiconductor laser/detector on a single semiconductor substrate, said laser having front and rear light emitting facets and being mounted on the surface of said substrate, an optical detector integral to said substrate, said detector being adjacent to one of said light emitting facets to detect a small portion of the light emitted therefrom, a bias circuit connected to supply an operating current to said laser, said detector being connected to said bias circuit to provide a feedback signal proportional to the detected light from said one facet to adjust and maintain said operating current to provide a predetermined optical power output level and means formed on said substrate to enhance the light collecting efficiency of said detector, said laser mounted on a metalized region formed on said substrate surface, the elevation of said mounted laser being below said detector, a portion of said metalized region extending on said substrate surface beyond said mounted laser, said extended portion acting as a reflector and constituting said substrate formed means.

**4,297,654**
**CRYSTAL OSCILLATOR INCLUDING A MOS-CAPACITOR**
**Joachim Goerth, Lüneburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**
**Division of Ser. No. 929,442, Jul. 31, 1978, Pat. No. 4,214,252. This application Jan. 10, 1980, Ser. No. 111,136**
**Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735529; Jun. 15, 1978, 2826192**
**Int. Cl.³ H03B** *5/36*
**U.S. Cl. 331—108 D** **4 Claims**



1. A semiconductor device comprising a semiconductor substrate of first conductivity type; a semiconductor layer of second conductivity type overlying said semiconductor substrate; an insulating layer on said semiconductor layer; a conductive layer formed on said insulating layer; a highly doped zone of said second conductivity type formed in the surface of said semiconductor layer; said highly doped zone, said insulating layer, and said conductive layer formaing a MOS-capacitor; a further zone of said first conductivity type entirely surrounding said highly doped zone and interposed between said highly doped zone and said semiconductor layer; and a separate connection electrode at each of said highly doped zone, said further zone, and said semiconductor layer; an emitter follower transistor being connected in parallel to the barrier layer capacitance between said highly doped zone and said further zone; and said device further comprising a tunable oscillator including a differential amplifier, a current distributor controlled by a control voltage and being disposed in a branch of said differential amplifier, a phase shifting element including said MOS-capacitor, and a feedback path present between said phase-shifting element and input to said differential amplifier, said feedback path comprising a quartz oscillator and said emitter follower transistor, said barrier layer capacitance between said highly doped zone of said second conductivity type and said further zone of said first conductivity type being connected in parallel to the emitterbase current path of said emitter follower transistor, and the connection point between additional barrier layer capacitances of said device being connected to a supply voltage.

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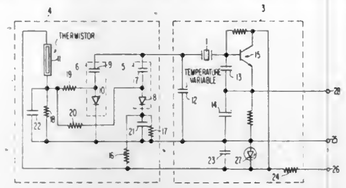
**4,297,655**
**TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR**
**Shuzo Fujii, and Yoshikatsu Sato, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**
**Filed Oct. 15, 1979, Ser. No. 84,693**
**Claims priority, application Japan, Oct. 20, 1978, 53-129260; Dec. 15, 1978, 53-156128**
**Int. Cl.³ H03B** *5/04, 5/36*
**U.S. Cl. 331—116 R** **6 Claims**

1. In a temperature compensated crystal oscillator comprising an oscillator section having a crystal resonator and an amplifying element, and a temperature compensating section for compensating for a change in the oscillator frequency due to a temperature change of said oscillator section, the improvement wherein said temperature compensating section comprises: a low temperature compensating circuit comprising a series circuit including a fixed capacitor connected in series with said crystal resonator and a diode, and a thermistor for




applying a forward-bias temperature-dependent voltage to a connection point between said fixed capacitor and said diode.

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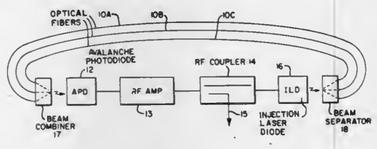
**4,297,656**
**PLURAL FREQUENCY OSCILLATOR EMPLOYING MULTIPLE FIBER-OPTIC DELAY LINE**
**Jing-Jong Pan, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.**
**Filed Mar. 23, 1979, Ser. No. 23,394**
**Int. Cl.³ H03B** *5/00, 17/00*
**U.S. Cl. 331—135** **7 Claims**




6. An oscillator comprising:
a gain producing element having an input and an output;
a plurality of feedback paths connected between said input and said output of said gain producing element; and
frequency determining means within said feedback paths comprising an electrical-to-optical transducer producing a light signal in response to the output of the gain producing element, a plurality of optical fibers responsive to light signals from said transducer, each respective optical fiber having a respectively different phase delay, an optical-to-electric transducer responsive to the outputs of said optical fibers, means for causing the light signals from said electrical-to-optical transducer to be coupled simultaneously through each of said optical fibers, and means for coupling light signals from each of said optical fibers simultaneously to said optical-to-electric transducer.

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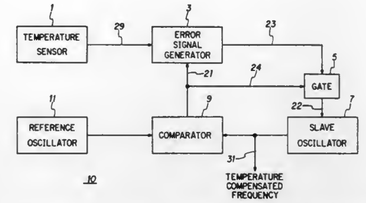
**4,297,657**
**CLOSED LOOP TEMPERATURE COMPENSATED FREQUENCY REFERENCE**
**Marvin E. Frerking, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**
**Filed Oct. 29, 1979, Ser. No. 88,908**
**Int. Cl.³ H03L** *1/02*
**U.S. Cl. 331—176** **6 Claims**

1. A closed loop temperature compensated frequency reference, comprising:
controllable oscillator means for generating a first frequency;
reference oscillator means for generating a second frequency;
comparator means for comparing the first frequency means with the second frequency means to obtain a composite signal;
sensor means for measuring the temperature of the reference oscillator means and to provide a temperature signal representative of the measured temperature; and



error signal generator means for generating a control signal to control the controllable oscillator means and the first




frequency thereby, the control signal being generated by error signal generator means in response to the composite signal and the temperature signal.

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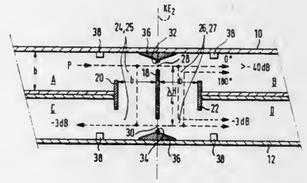
**4,297,658**
**3DB WAVEGUIDE DIRECTIONAL COUPLER**
**Leo Treczka, Munich, Fed. Rep. of Germany, assignor to Spinner GmbH Elektrotechnische Fabrik, Munich, Fed. Rep. of Germany**
**Filed Feb. 1, 1980, Ser. No. 117,472**
**Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904054**
**Int. Cl.³ H01P** *5/18*
**U.S. Cl. 333—113** **11 Claims**




1. A 3dB waveguide directional coupler, comprising:
first and second rectangular waveguides, each of which has a longitudinal axis and each of which extends parallel to its respective said longitudinal axis; each said wave guide comprising four side walls, said four side walls of each said waveguide including two wide side walls having a first width and two narrow side walls having a second width less than said first width; one said wide side wall of said first waveguide and one said wide side wall of said second waveguide being adjacent each other;
said adjacent wide side walls each having an aperture formed therein such that the interiors of said waveguides communicate through said aperture; and
means disposed in said waveguides and cooperating with said aperture in such a manner that when energy is input from one end of said first waveguide in a direction along said first axis and toward said aperture, substantially all of said input energy is transmitted to said second waveguide via said aperture and is propagated along said second axis, substantially equal amounts of said transmitted energy being propagated along said second axis in a first longitudinal direction and along said second axis in a second longitudinal direction opposite said first longitudinal direction, the energy in each of the longitudinal directions along said second axis being substantially greater than any energy along said first axis propagating away from said aperture.

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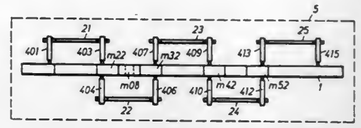
**4,297,659**
**CRYSTAL FILTER STRUCTURE**
**Horst G. Augst, Skärholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden**
**Filed Dec. 10, 1979, Ser. No. 102,032**
**Claims priority, application Sweden, Dec. 20, 1978, 7813107**
**Int. Cl.³ H03H** *9/50, 9/56, 9/58, 9/60*
**U.S. Cl. 333—191** **6 Claims**




5. A crystal filter structure of the polylithic type comprising an elongated planar support means, first, second and third quartz plates, each including two acoustically coupled resonators, each resonator being defined by first and second electrodes on the first and second sides, respectively of a portion of a quartz plate, means for mounting said first and third resonators on one side of said planar support means, means for mounting said second resonator on the other side of said planar support means axially intermediate said first and second resonators, the first electrode of the first resonator of the first quartz plate being adapted to receive a signal, means for connecting the first electrode of the second resonator of said first quartz plate to the first electrode of the first resonator of said second quartz plate, and means for connecting the first electrode of the second resonator of said second quartz plate to the first electrode of the first resonator of said third quartz plate, and said first electrode of the second resonator of said third quartz plate being adapted to transmit a signal.

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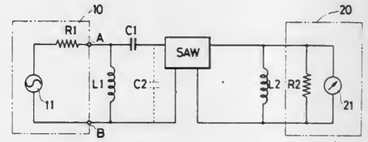
**4,297,660**
**ELECTRIC CIRCUIT USING SURFACE ACOUSTIC WAVE DEVICE**
**Hideharu Ieki, Nagaokakyo, and Seiichi Arai, Muko, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan**
**Filed Dec. 7, 1979, Ser. No. 101,279**
**Claims priority, application Japan, Dec. 14, 1978, 53-173215**[U]; Dec. 26, 1978, 53-182526[U]
**Int. Cl.³ H03H** *9/64, 9/42*
**U.S. Cl. 333—194** **7 Claims**




1. An electric circuit including a surface acoustic wave device, comprising:
a surface acoustic wave device including an input transducer and an output transducer formed on a piezoelectric substrate, each of said transducers having a respective pair of terminals, and the impedance of each of said transducers as measured across said respective pair of terminals having a respective resistive component and a respective capacitive component; and
impedance conversion circuit means, including first capacitor means having one end connected to one terminal of one of said pairs of terminals and inductor means having one end connected to a second end of said first capacitor means and having a second end connected to the other terminal of said one of said pairs of terminals, the value of said first capacitor means being such that the impedance

measured across said ends of said inductor means has a larger resistive component than said resistive component of said transducer impedance measured across said one of said pairs of terminals.

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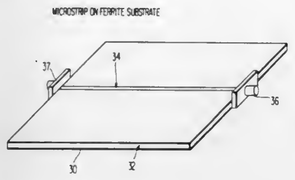
**4,297,661**

## FERRITE SUBSTRATE MICROWAVE FILTER

**Ronald E. Stegens, Brookeville, Md., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed Dec. 27, 1979, Ser. No. 108,248**
**Int. Cl.³ H01P** *1/203, 1/215, 3/08*
**U.S. Cl. 333—204** **8 Claims**




1. A microwave filter comprising:
a pair of conductors;
a non-magnetized ferrite material located between said pair of conductors, said ferrite material having a saturation magnetization $4\pi M_s$ chosen to substantially absorb frequencies below a critical frequency $f_{CRIT}$ such that

$$f_{CRIT} \approx 2.8 * 4\pi M_s$$

to produce a first filter characteristic, said ferrite material substantially absorbing frequencies below said critical frequency, wherein said first filter characteristic provides (i) high attenuation below said critical frequency, (ii) low attenuation above said critical frequency, and (iii) low reflected-to-incident power ratio above and below said critical frequency.

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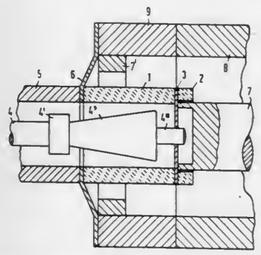
**4,297,662**

## GAS-TIGHT-HIGH-FREQUENCY PERMEABLE WINDOW ARRANGEMENT IN A COAXIAL LINE, PARTICULARLY FOR TRAVELING WAVE TUBES

**Franz Gross, Loerrach; Gerit Boehme, Germering; Wolf Wiehler, Neubiberg, and Wilhelm Bibracher, Otterloh, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Jan. 24, 1980, Ser. No. 115,011**
**Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907808**
**Int. Cl.³ H01P** *1/08, 5/02*
**U.S. Cl. 333—252** **4 Claims**




1. A gas-tight, high-frequency permeable window arrangement between a coaxial line on an input side and a coaxial line on an output side, each of the coaxial lines having respective inner and outer conductors, particularly for traveling wave tubes, comprising:
a ceramic hollow cylinder arranged between the input side and the output side, said cylinder surrounding the inner conductor of the input side in the area of its transition to the coaxial line of the output side and connected as a continuation of the outer conductor of the coaxial line of the input side; and
a membrane connected gas-tight to the inner conductor of the coaxial line at the input side and to the inner conductor of the coaxial line of the output side.

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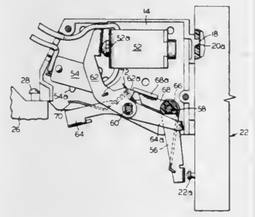
**4,297,663**

## CIRCUIT BREAKER ACCESSORIES PACKAGED IN A STANDARDIZED MOLDED CASE

**Raymond K. Seymour, Plainville, and Frank H. Murphy, West Hartford, both of Conn., assignors to General Electric Company, New York, N.Y.**

**Filed Oct. 26, 1979, Ser. No. 88,714**
**Int. Cl.³ H01H** *73/06, 73/08*
**U.S. Cl. 335—20** **8 Claims**




1. An accessory for installation within the molded case enclosure of an automatic electric circuit breaker, said accessory comprising, in combination:
A. a molded insulative case consisting of at least two parts secured together to substantially enclose the accessory operating components;
B. first mounting provisions provided externally on said case for mounting said accessory within the circuit breaker enclosure;
C. second mounting provisions preformed in said case parts;
D. third mounting provisions preformed in said case parts;
E. at least one auxiliary swtich stationarily mounted by said second mounting provisions within said case; and
F. an actuating arm for said switch mounted within said case by said third mounting provisions for movement between said first and second positions, said arm protruding through an opening in said case into operative relation with the movable contacts of the circuit breaker, said arm being propelled between its first and second positions in response to movement of the breaker movable contacts between their open and closed circuit positions.

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**4,297,664**

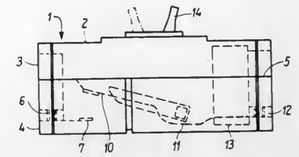
## ELECTROMAGNETIC OVERCURRENT TRIPPING DEVICE WITH ADJUSTABLE ARMATURE AIR GAP

**Manfred Küger; Wolfgang Nawrot, and Bernhard Preüss, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Mar. 28, 1979, Ser. No. 24,511**
**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2815130**
**Int. Cl.³ H01H** *69/01*
**U.S. Cl. 335—176** **5 Claims**

1. In an electromagnetic overcurrent tripping device for electric circuit breakers having a stationary magnetic yoke with associated pole surfaces, an armature which is supported for motion relative to the pole surfaces, and means for changing the spacing between the pole surfaces and the armature to provide different tripping current levels, the improvement comprising:
the means for changing the spacing comprising a removable armature stop member and a support means for fixing the






position of the removable stop member relative to the pole surfaces,
the removable stop member being mounted on the support means in one of a number of predetermined positions to establish a corresponding spacing of the armature relative to the support means.

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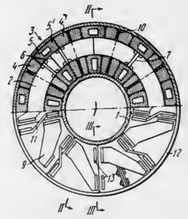
**4,297,665**

## DOUGHNUT-TYPE TRANSFORMER FOR RESISTANCE BUTT WELDING

**Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vasily A. Sakharnov, ulitsa Solomenskaya, 41, kv. 93; Boris A. Galyan, ulitsa Lenina, 88/92, kv. 110, and Stanislav D. Dobrovolsky, ulitsa Zhukova, 22, kv. 7, all of Kiev, U.S.S.R.**

**Filed May 14, 1980, Ser. No. 149,734**
**Claims priority, application U.S.S.R., Aug. 6, 1979, 2789203**
**Int. Cl.³ H01F** *27/08, 27/28*
**U.S. Cl. 336—60** **3 Claims**




1. A doughnut-type transformer for resistance butt welding comprising:
an annular core,
an array of annularly disposed transformer sections, each including;
a primary winding composed of turns each of which shaped as a sector in the plane of the transformer cross-section, and
a cooled secondary winding composed of a turn shaped as a sector in the plane of the transformer cross-section, and placed between the turns of said primary winding so that the turns of said primary winding with their lateral sides are near the lateral sides of each turn of said secondary winding,
each turn of both said primary winding and said secondary winding of each said transformer section having an opening forming part of an annular space with said annular core extending therethrough so that the geometric center of each said winding is displaced from the geometric center of said annular core in the cross-sectional plane thereof, the geometric center of said annular core being farther from the transformer axis to level off current density per winding.

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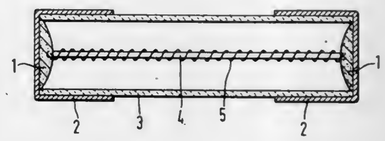
**4,297,666**

## SLOW-BLOWING FUSE USING ZINC-MANGANESE ALLOY LINK

**Nasrollah Asdollahi, Witten, Fed. Rep. of Germany, assignor to Wickmann Werke AG, Fed. Rep. of Germany**

**Filed Jan. 26, 1979, Ser. No. 6,779**
**Claims priority, application Austria, Feb. 3, 1978, 757/78**
**Int. Cl.³ H01H** *85/06*
**U.S. Cl. 337—163** **8 Claims**




1. A slow-blowing fuse having a fusible conductor and a carrier body, said fusible conductor comprising a wire wound on said carrier body and said wire consisting of a zinc-manganese alloy which contains 0.005% to 2% by weight of manganese.

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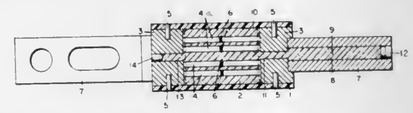
**4,297,667**

## FUSIBLE ELECTRIC CABLE PROTECTOR

**Frederick J. Kozacka, South Hampton, N.H., assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed Apr. 2, 1980, Ser. No. 136,629**
**Int. Cl.³ H01H** *85/16*
**U.S. Cl. 337—251** **3 Claims**



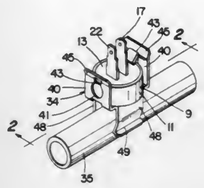

1. A fusible electric cable protector including a casing of electric insulating material defining a first internal space, a pair of terminal elements each located on one end of said casing and closing said casing, fusible elements conductively interconnecting said pair of terminal elements, a granular arc-quenching filler inside said first space, a pair of connector elements each conductively connected to one of said pair of terminal elements and each extending axially outwardly from one of said pair of terminal elements for connecting said cable protector into an electric circuit, at least one of said pair of connector elements having a cylindrical outer surface wherein the improvement comprises a second internal space defined by said one of said pair of connector elements having a cylindrical outer surface, said second internal space being filled with a granular arc-quenching filler, said second internal space and said first internal space communicating with each other by a passageway extending through one of said pair of terminal elements, and said one of said pair of connector elements having a cylindrical surface being closed at the axially outer end thereof to preclude loss of said granular arc-quenching filler.

**4,297,668**

## THERMOSTAT WITH BRACKET FOR ATTACHMENT TO A TUBULAR MEMBER

**Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio**

**Filed Feb. 13, 1980, Ser. No. 121,138**
**Int. Cl.³ H01H** *37/04*
**U.S. Cl. 337—365** **10 Claims**



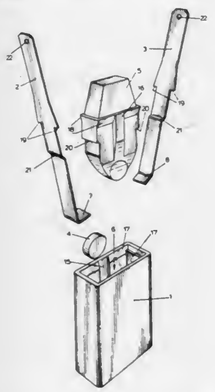
1. A thermostat assembly for attachment to a tubular member which comprises a thermostat having a heat-conductive bottom and containing thermal responsive means therein; and means for mounting the thermostat on a tubular member which comprises a base portion adjacent to the bottom of the thermostat and which is adapted to fit against and extend longitudinally along the tubular member and which has a longitudinal opening therein to permit the bottom of the thermostat to directly contact the tubular member, a pair of thermostat-retaining portions which extend from the base portion on either side of the thermostat and which have means for attaching to the thermostat, and a clip portion which extends from the base portion and which is adapted to extend around the tubular member to tightly attach the base portion to the tubular member.

**4,297,669**

## THERMAL CUT-OUTS AND TO THE METHOD OF ASSEMBLING A MULTIPLICITY OF SUCH THERMAL CUT-OUTS

**James A. Gale, Warminster, England, assignor to Kenneth E. Beswick Ltd., Somerset, England**

**Filed Aug. 27, 1979, Ser. No. 70,028**
**Claims priority, application United Kingdom, Mar. 8, 1978, 34926/78**
**Int. Cl.³ H01H** *37/76, 69/00*
**U.S. Cl. 337—407** **6 Claims**



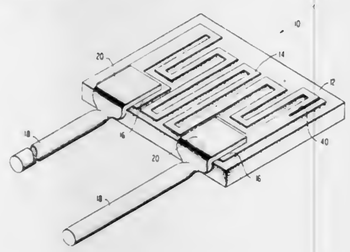
1. A thermal cut-out which is adapted to open an electrical circuit in response to an excessive rise in temperature associated with the circuit protected by said cut-out, said cut-out comprising a hollow body made from electrically insulating material and having an opening permitting access to the interior of the body, a pair of contact members projecting into the body through said opening and having their inner ends disposed within the body, one of said contact members being bent and hooked over an adjacent bent end portion of the other contact and in surface-to-surface contact therewith, a plug of insulating material being disposed within the opening in the body between said contacts, so as to close said opening and stress the contacts to a condition in which they are biased apart, surfaces of said contact members being retained in engagement by an element bearing with surface contact against one side of one of the contacts as long as its temperature has not risen to a predetermined temperature, said element being made of such a material that having reached said predetermined temperature it deforms and permits the contacts to open.

**4,297,670**

## METAL FOIL RESISTOR

**Benjamin Solow, North Hollywood, Calif., assignor to Angstrohm Precision, Inc., Hagerstown, Md.**

**Division of Ser. No. 803,291, Jun. 3, 1977, Pat. No. 4,176,445.**
**This application May 24, 1979, Ser. No. 41,928**
**Int. Cl.³ H01C** *10/00*
**U.S. Cl. 338—195** **15 Claims**



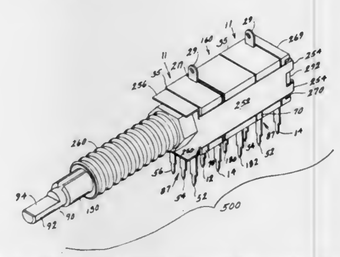
1. A resistor having an insulating substrate, and a metal foil circuit pattern attached to the substrate, wherein at least a portion of the metal foil circuit is reduced in thickness by acid etching to adjust the value of the resistor.

**4,297,671**

## TANDEM INSERT MOLDED ELECTRICAL CONTROLS AND PROCESS FOR PRODUCING SAME

**Thomas W. Flanders, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.**

**Filed Jun. 11, 1980, Ser. No. 158,597**
**Int. Cl.³ H01C** *10/50*
**U.S. Cl. 338—200** **20 Claims**



1. A process for performing multiple electrical control functions, comprising the steps of aligning linearly at least three insert molded electrical control means within an impact construction, said construction comprising a front plate having side straps extending the cumulative length of said control



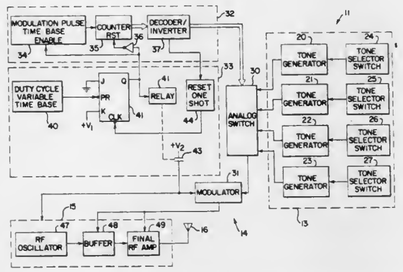
means to encompass them longitudinally and disposed exteriorly of said control means, each of said straps including finger ends, and a rear plate, mechanically securing the finger ends to the rear plate positioned against the endmost one of said aligned control means, said control means comprising a variable resistance control, a power control, and a momentary switch, each of which is insert molded and relatively changeable in their relative alignment within said construction, a hollow concentric insulator shaft for operation of said controls, and a longitudinal metallic shaft journaled within said concentric insulator shaft, and rotating the longitudinal metallic shaft which extends through the respective control means.

**4,297,672**

## EARLY WARNING SYSTEM FOR APPROACHING TRANSPORTATION VEHICLES

**Russell L. Fruchey, Copley, and Daniel E. Kupar, Barberton, both of Ohio, assignors to D.E.W. Line, Inc., Hiram, Ohio**

**Filed Feb. 4, 1980, Ser. No. 118,517**
**Int. Cl.³ G08G** *1/12*
**U.S. Cl. 340—23** **21 Claims**




1. A radio signaling system for providing advanced warning of an approaching transportation vehicle to passengers within a plurality of predesignated pickup regions, comprising:

transmitting system means on the vehicle for generating a low-frequency-modulated radio-frequency signal including

transmitter means for generating a radio-frequency signal,

a plurality of low-frequency generators for generating a plurality of low-frequency modulation signals, and,

modulator and control circuit means for modulating said radio-frequency signal with each said plurality of low-frequency modulation signals in a preselected sequence, including

analog switch means for receiving each of said plurality of low-frequency modulation signals and selectively gating the same to said transmitter means,

modulation-pulse time control means for generating an output signal to said analog switch means to control the sequence of and rate at which said low-frequency modulation signals are gated by said analog switch means and generating a cycle-complete output signal after all said plurality of low-frequency modulation signals have been gated to said transmitter means by said analog switch means, and

transmitter operation time control means for selectively gating power to said transmitter means and thereby controlling the duration said transmitter means generates said radio-frequency signal, and receiving said cycle-complete output signal and generating an output signal for controlling said modulation-pulse time control means, said output signal for controlling said modulation-pulse time control means disabling the same upon receipt of said cycle-complete output signal and subsequently enabling the operation of said modulation-pulse time control means in synchronization with said gating of power to said transmitter means; and,

receiving system means in proximity to a predesignated pickup region for providing an alarm signal only when the transportation vehicle is approaching the predesignated pickup region with which that particular receiving system means is associated including

receiver means receiving said low-frequency-modulated radio-frequency signal and providing a demodulated output signal,

a plurality of low-frequency decoders receiving said demodulated output signal each of which is tuned to the frequency of one of said plurality of low-frequency generators for providing an output signal upon receipt of that low-frequency signal,

synchronous detector means receiving said output signals from all said plurality of low-frequency decoders and providing an alarm output signal only upon receipt of said output signals from said plurality of low-frequency decoders in said preselected sequence, and,

alarm means receiving said alarm output signal from said synchronous detector means and providing an advanced warning of the approaching vehicle to passengers within the predesignated pickup region with which said receiving system is associated.

**4,297,673**

## OMNIDIRECTIONAL SPEED COCKPIT DISPLAY

**David L. Green, Potomac, Md., assignor to Pacer Systems, Inc., Burlington, Mass.**

**Filed Mar. 14, 1978, Ser. No. 886,485**
**Int. Cl.³ B64D** *45/00;* **G08G** *5/02*
**U.S. Cl. 340—27 NA** **28 Claims**

1. Omnidirectional speed cockpit display apparatus for helicopters and the like comprising a drum having markings of lateral speed and forward and rearward speed having shaft means connected to drive means for supporting and turning the drum, a first zero point mark on the drum, and a safe flight envelope marked on the drum, and at least partially surrounding said first zero point; a face plate with a second zero point mark, for indicating forward and rearward speed with the drum a lateral flight indicator means moving left or right of said second zero point as a means cooperating with lateral speed markings and the safe flight envelope for indicating lateral speed and safety of lateral speed.

**4,297,674**

## PASSIVE SECURITY DEVICE

**Richard C. Merten, Omaha, Nebr., assignor to Jubilee Manufacturing Co., Omaha, Nebr.**

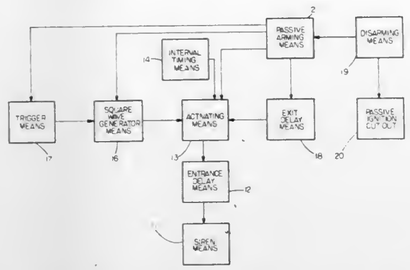
**Filed Oct. 18, 1979, Ser. No. 86,117**
**Int. Cl.³ B60R** *25/10*
**U.S. Cl. 340—63** **11 Claims**

1. A passive security device, for use with vehicles having an electrical system including a starter, and an ignition switch having "on" and "accessory" contacts, said device comprising:

first means for connecting said device to the electrical system;

detection and alarm means including trigger means for detecting voltage variations and producing an electrical

signal in response thereto, said trigger means being connected to said first means, generating means for converting said electrical signal into a square wave signal, said generating means being connected to said trigger means, siren means for sounding an alarm, and activating means connecting said generating means and said siren means and being responsive to said square wave signal to activate said siren means;




first passive means for arming said detection and alarm means;

second passive means for arming an ignition cut-out circuit; and

disarming means connected between said first means and said first and second passive means.

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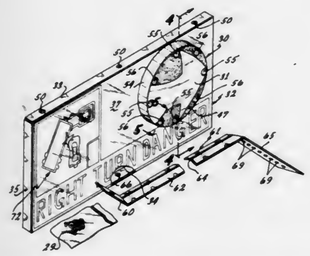
**4,297,675**

## SUPPLEMENTAL RIGHT TURN SIGNAL FOR SEMITRAILERS

**Nolan R. Rubottom, 1832 W. Corak, West Covina, Calif. 91790, and Jerry W. Fine, 2105 Vallecito Dr., Hacienda Heights, Calif. 91745**

**Filed Jan. 21, 1980, Ser. No. 113,740**
**Int. Cl.³ B60Q *1/00***
**U.S. Cl. 340—107** **5 Claims**




1. A supplemental right turn signal unit for mounting on a semitrailer having the bed of the chassis thereof supported by spaced transverse structural beams and having a pair of landing gears attached to the bottom of the bed of said chassis inward of the front end thereof, said signal unit comprising:

a vertically disposed rectangular sheet metal support member having its marginal top, bottom and side edges bent bak at right angles to the surfaces thereof;

a socket for a light bulb mounted on the upper right portion of the surface of said support member;

a translucent cover enclosing said light bulb, said cover having portions of the face thereof made non-translucent to define an arrow pointing to the right side of the support member, and said cover having a translucent cylindrical sidewall disposed normal to the surface of said support member whereby light emitted by said bulb can radiate sidewardly and downwardly to illuminate indicia including a pictorial indication of the impending danger provided on the left and bottom portion of the surface of said support member;

a bracket having an angular intermediate portion with a horizontal lower end portion and an elongated horizontal upper end portion; and

attachment means for attaching said support member beneath the bed of the semitrailers so that the right side thereof is aligned with the sidewall of said semitrailer by attaching the top marginal edge thereof on a transverse structural beam located to the rear and adjacent to the pair of landing gears and by attaching the horizontal lower end portion of said bracket to the bottom marginal edge of said support member and the horizontal upper end portion of said bracket to the next forward transverse structural beam.

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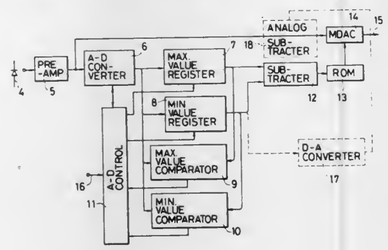
**4,297,676**

## MARK SIGNAL AMPLIFIER

**Shigeru Moriya, Hoya; Nobuo Hamamto; Kazuo Ichino, both of Tokyo, and Kanji Ozawa, Akishima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,087**
**Claims priority, application Japan, Dec. 22, 1978, 53-157417**
**Int. Cl.³ G06K *9/32***
**U.S. Cl. 340—146.3 AG** **7 Claims**




1. A mark signal amplifier comprising:

first means for obtaining the maximum and minimum values of a mark signal from a detector as detected by scanning an electron beam over a mark area formed on a sample;

second means for obtaining a peak-to-peak value of an amplitude of the detected mark signal from said maximum and minimum values; and

third means for supplying an output signal of a constant amplitude in accordance with said peak-to-peak value of said amplitude independently of fluctuations in said detected mark signal,

wherein said first means comprises means for amplifying said detected mark signal, an analog-to-digital converter for converting said detected mark signal to a digital signal, comparators for comparing the output digital signals from said analog-to-digital converter with the contents of a maximum value register for storing the maximum value of said detected mark signal and with the contents of a minimum value register for storing the minimum value of said detected mark signal, and means to renew the respective contents of the maximum and minimum value registers in accordance with the comparators outputs, whereby said maximum and minimum values of said detected mark signal are obtained.

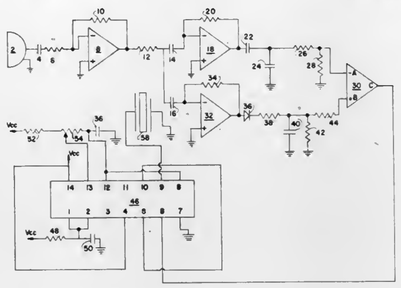


**4,297,677**

## PERSONAL AMBIENT SOUND REFERENCED ANNUNCIATOR

**John S. Lewis, 8525 Wolftrap Rd., Vienna, Va. 22180; Edmond P. DiGiannantonio, 1638 Wateredge La., Reston, Va. 22070, and Howard R. Boyle, Alexandria, Va., assignors to John S. Lewis, Vienna and Edmund P. DiGiannatonio, Reston, both of, Va.**

**Filed Dec. 10, 1979, Ser. No. 101,735**
**Int. Cl.³ G08B *13/00***
**U.S. Cl. 340—148** **9 Claims**



1. A personal annunciator responsive to present ambient sound conditions in the immediate vicinity of the user who is unable to recognize changes in ambient sound level, comprising:

(a) a small portable housing,

(b) an indicator connected to said housing,

(c) ambient sound receiving means disposed in the housing for picking up the continually varying present ambient sound in the vicinity of the housing and producing a variable amplitude signal reflecting the varying amplitude of the present ambient sound,

(d) activating signal generating means disposed in the housing and connected to the output of the ambient sound receiving means for receiving the variable amplitude signal therefrom and producing an activating signal only when an abrupt amplitude increase occurs within a fixed predetermined interval, said amplitude being greater by a fixed predetermined increment than the varying sound level received immediately therebefore to which it is referenced, and

(e) the activating signal generating means is connected to the indicator, which on receipt of the activating signal gives the user a non-audible type warning signal which he can readily recognize.

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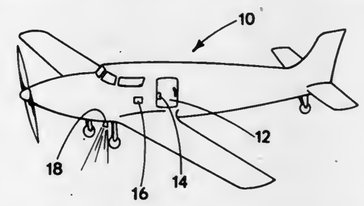
**4,297,678**

## AIRCRAFT SAFETY ALARM SYSTEM

**Byung H. Lee, Suite 203, 1810 Craig Rd., St. Louis, Mo. 63101**

**Filed Jan. 29, 1979, Ser. No. 7,195**
**Int. Cl.³ C08B *3/10***
**U.S. Cl. 340—328** **5 Claims**




1. An aircraft safety alarm system for sounding an alarm that the aircraft engine may be started, comprising speaker alarm means located outside the aircraft and being connected in an electrical circuit to a switch that is automatically activated by the aircraft operator prior to operating the aircraft, said electrical circuit being connected to a battery and including an alarm circuit and a timer device, said timer device being automatically activated by said switch to operate said alarm circuit for a predetermined time period to activate the speaker means, said timer device becoming de-activated after said predetermined time period to de-energize said alarm circuit and said speaker alarm means, said alarm circuit further including a base oscillator circuit and an audio oscillator circuit to produce an intermittent sound through the speaker alarm means, said audio oscillator circuit being operated at a frequency different than the base oscillator circuit, and audio amplifying means for amplifying the audio tone through the speaker alarm means, said speaker alarm means further including means to produce an intermittent sound that is both a safety alarm as well as a travel alert.

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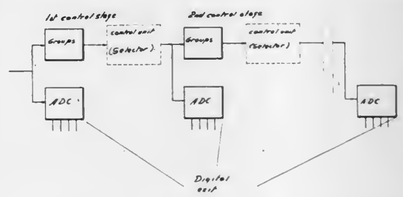
**4,297,679**

## CIRCUIT FOR CONTINUOUS CONVERSION OF SIGNALS INTO DIGITAL MAGNITUDES

**Arie Arbel, Haifa, Israel, and Rainer Kurz, Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany**

**Continuation of Ser. No. 541,931, Jan. 17, 1975. This application Jul. 25, 1978, Ser. No. 927,842**
**Claims priority, application Fed. Rep. of Germany, Jan. 17, 1974, 2402072**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 AD** **12 Claims**



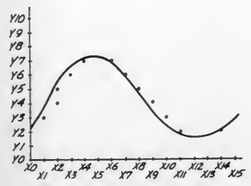

1. An apparatus for converting an analog current or voltage signal into a digital representation of that signal, the apparatus consisting of a plurality of stages to receive the signal, each stage comprising an analog-to-digital convertor and each stage preceding the last stage having a group of differential amplifiers with input thereof connected in parallel with the analog-to-digital converter and designed to fold the signal received a plurality of times and a selector control unit receiving the signal from the group and transmitting the signal to the next succeeding stage, each analog-to-digital convertor being designed to output a plurality of digits representing the binary magnitude of the encoded signal with the digits representing the next most significant binary magnitudes from the preceding stage, the final stage being an analog-to-dital convertor designed to output digits representing the least significant binary magnitudes of the encoded signal, all of the digits together forming a complete binary magnitude representation of the encoded signal.

**4,297,680**

## ANALOG WAVEFORM DIGITIZER

**Henriecus Koeman, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.**

**Filed Aug. 3, 1979, Ser. No. 63,521**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 AD** **10 Claims**



1. A waveform digitizer for digitizing analog signals comprising:
reference voltage means for sequentially producing a series of digitallyderived reference voltages one-at-a-time, each reference voltage having a different voltage value;
comparison means coupled to said voltage reference means for sequentially comparing each of said series of digitally derived reference voltages with an analog signal whose waveform is to be digitized during a series of comparison sequences and producing a comparison pulse each time said reference voltage and the analog signal voltage cross during said comparison sequences;
timing means starting at the beginning of each comparison sequence for continuously producing a digital time signal during each comparison sequence; and,
combining means coupled to said comparison means and said timing means for receiving said comparison pulses and said digital time signal and developing a digital word each time a comparison pulse is received, said digital word having a portion related to the value of the digitally derived reference voltage produced by said reference voltage means and a position related to the digital time signal present when said comparison pulse is received.

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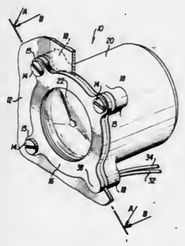
**4,297,681**

## ELECTROLUMINESCENT RING LIGHT ADAPTER FOR AIRCRAFT INSTRUMENTS

**Arnold D. Dircksen, 2974 State Rte. 725, Spring Valley, Ohio 45370**

**Filed Aug. 11, 1980, Ser. No. 177,241**
**Int. Cl.³ G01D *11/28***
**U.S. Cl. 340—366 F** **9 Claims**



1. In an aircraft indicating instrument having means for displaying information to be viewed externally of the instrument through a substantially planar transparent cover having a peripheral edge and inner and outer surfaces, said cover being arranged in front of the displaying means and means mounted to said instrument for illuminating said displaying means, the improvement wherein said illuminating means comprises an electroluminescent lamp arranged externally of said instrument, means for removably mounting said electroluminescent lamp in non-sealed, confronting relation with the outer surface of said transparent cover and means connected to said electroluminescent lamp for supplying an electric field thereto, said removable mounting means comprising an adapter element surrounding and in overlapping relation with the peripheral edge of the planar transparent cover, said adapter element having a recess on the side thereof confronting the peripheral edge of the planar transparent cover, said electroluminescent lamp being disposed in said recess such that, upon supply of an electric field to said electroluminescent lamp, said lamp directly illuminates the information displaying means of said instrument.

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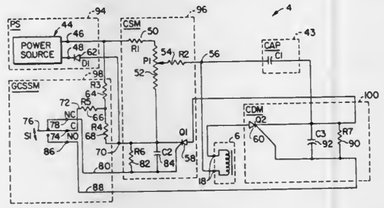
**4,297,682**

## FLEXIBLE CONVEX DIAPHRAGM SOUND REPRODUCING DEVICE

**Barry L. Spletzer, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.**

**Filed Jan. 7, 1980, Ser. No. 110,160**
**Int. Cl.³ G08B *3/00***
**U.S. Cl. 340—384 E** **9 Claims**




1. Apparatus for reproducing the sound produced when a convex, thin, flexible diaphragm is flexed comprising:
an electromagnetic coil;
means for mounting a relatively thin electrically conductive flexible plate adjacent to one end of said coil;
said coil and said mounting means configured to allow said flexible plate to flex; and
means, electrically coupled to said coil and to a power source having a first terminal and a second terminal, for selectively energizing said coil whereby said flexible plate deflects and vibrates thereby reproducing said sound.

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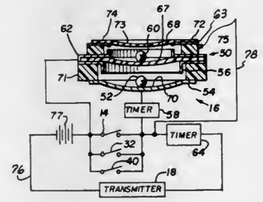
**4,297,683**

## VANDAL ALARM SYSTEM FOR PARKING METERS

**Ralph R. Roberts, 740 Hillsdale Ave., Hillsdale, N.J. 07642**

**Continuation-in-part of Ser. No. 23,014, Mar. 22, 1979, abandoned. This application Mar. 6, 1980, Ser. No. 127,589**
**Int. Cl.³ G08B *19/00, 25/00***
**U.S. Cl. 340—539** **8 Claims**




1. A parking meter vandal alarm apparatus which includes a



radio transmitter secured therein and adapted to send a radio signal in response to an electrical actuation signal to a radio receiver, said signal indicated on a monitor, said apparatus including: (a) a parking meter of conventional construction including a housing and having at least one access door to be opened and closed by a key or the like; (b) a battery within said parking meter housing; (c) a first switch in association with said access door and disposed in a normally open condition, any slight movement toward the opening of the access door causing the switch to close and produce a first electrical actuation signal produced by said battery; (d) a first timer in association with said first switch and having a timed period of selected duration whereby the closing of said first switch causes the electrical actuation signal to continue for said selected time period beyond the closing and then opening of said first switch; (e) a first tilt switch normally in an "open" condition and contained within the parking meter housing and disposed so as to be actuated to a closed condition and produce a second electrical actuation signal produced by said battery when the housing is displaced to an attitude of about twenty to forty-five degrees; (f) a second timer associated with said first tilt switch, said timer delaying the produced signal from the first tilt switch in the closed actuated condition for a selected period of time, this time delay enabling a jarring, shaking and the like of the meter to occur without producing an electrical actuation; (g) a second tilt switch which is within the housing and support, said second tilt switch in a normally "open" condition and being activated to a closed condition when the housing and/or a support is tilted to more than forty-five degrees producing an electronic signal produced by said battery indicating a tilt of the housing beyond said designated angle, such an angle indicating vandalism which may also include cutting of the support; (h) a conducting means in association with this second tilt switch connected to feed a produced signal to and through said first timer and producing an electrical signal persisting for a determined period of time after actuation; (i) a radio transmitter of a relatively short range powered by said battery and arranged so that when a switch is closed an actuation signal produced by said battery is supplied to the transmitter and at least one frequency signal is broadcast from the transmitter, and (j) a radio receiver at a distance from the transmitter and having a constant "on" power source and having means for monitoring said signals.

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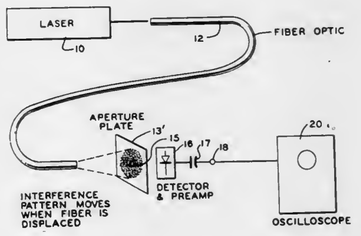
**4,297,684**

## FIBER OPTIC INTRUDER ALARM SYSTEM

**Charles D. Butter, Cologne, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 26, 1979, Ser. No. 24,125**
**Int. Cl.³ G08B *13/22, 13/10***
**U.S. Cl. 340—557** **8 Claims**




1. Intruder detector apparatus comprising:
intruder sensor means consisting of a length of multimode optic fiber to be positioned in an area under surveillance for intruders;
means directing a source of coherent light into said optic fiber for transmittal through said length of fiber, said transmitted coherent light emanating from the end of the fiber in a generally cone-shaped beam; and,
light detector means receiving at least a portion of the coherent light beam emanating from said fiber, the cross section of the light beam exhibiting an interference pattern of light intensity, and which interference pattern changes when said sensor means is deformed by the presence of an intruder.

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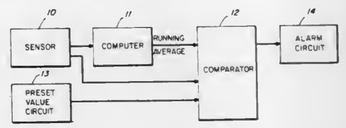
**4,297,685**

## APPARATUS AND METHOD FOR SLEEP DETECTION

**Edward C. Brainard, II, Marion, Mass., assignor to Environmental Devices Corporation, Marion, Mass.**

**Filed May 31, 1979, Ser. No. 44,268**
**Int. Cl.³ G08B *21/00***
**U.S. Cl. 340—575** **13 Claims**




1. Apparatus for detecting the onset of sleep in a human being, said apparatus comprising:
means, including a temperature responsive sensor, for measuring the temperature within the auditory canal of said human being;
differentiator means interconnected with said temperature measuring means for generating the time rate of change of said temperature; and
comparator means for producing an output signal when said time rate of change of said temperature exceeds a predetermined value.

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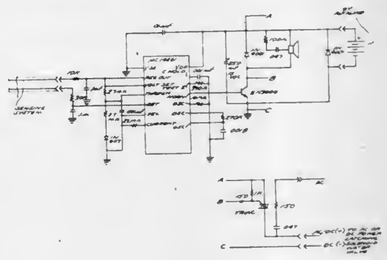
**4,297,686**

## WATER DETECTION DEVICE

**M. Dale Tom, R.D. #1, Norwich, Ohio 43767**

**Filed Oct. 1, 1979, Ser. No. 80,658**
**Int. Cl.³ G08B *21/00*; F16K *23/00***
**U.S. Cl. 340—604** **4 Claims**



1. A resistive liquid detection and shut-off system comprising:
means for detecting liquid drips, flows and trickles, but not liquid beads, on a floor area where liquid damage could result, said means including an elongated sensor comprising a flexible plastic tape with an adhesive backing and having a surface thereof with a pair of conductive metal strips thereon spaced apart in a dimension perpendicular to the dimension of elongation of said tape;
detection circuit means operatively connected to said elongated sensor for measuring resistance changes in said elongated sensor;
a solenoid-operated water shut-off valve;
output circuitry means operatively connected to said detec-

tion circuit means and said water shut-off valve for activating said water shut-off valve in response to predetermined resistivity changes in said elongated sensor;

a battery for providing power for said detection circuit means, solenoid valve operator, and said output circuitry means; and

battery monitoring circuitry means operatively connected to said battery and said shut-off valve for monitoring the strength of said battery and for operating said shut-off valve if said battery strength drops below a predetermined value.

3. A resistive liquid detection system comprising:

means for detecting liquid drips, flows and trickles, but not liquid beads, on a floor area where liquid damage could result, said means including an elongated sensor comprising a flexible plastic tape with an adhesive backing and having a surface thereof with a pair of conductive metal strips spaced apart in a dimension perpendicular to the dimension of elongation of said tape, said tape being formed in at least two pieces;

a connector for interconnecting said two pieces of said sensor tape, said connector comprising: a body of electrically insulating material having two pairs of electrically connected electrical terminals mounted thereon, the terminals of each pair being spaced apart a distance corresponding to the spacing of said conductive metal strips; means defining a pair of slots in said body, each for receipt of a piece of said tape for allowing said conductive metal strips of said tape to contact said terminals within said body; and adhesive for maintaining each piece of said tape in contact with said connector body;

detection circuit means operatively connected to said elongated sensor for detecting changes in the resistivity thereof;

an alert means for alerting an individual to resistivity changes in said sensor means;

output circuitry means operatively connected to said detection circuit means and said alert means for activating said alert means in response to predetermined resistivity changes in said elongated sensor; and

power means for providing electrical current for powering said circuitry means and said alert means.

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**4,297,687**

## LEAK DETECTION APPARATUS

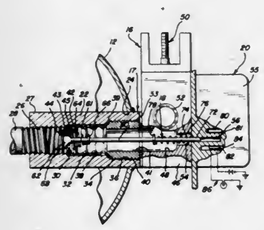
**Joe E. Fuzzell, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US80/00180, § 371 Date Feb. 22, 1980, § 102(e) Date Feb. 22, 1980, PCT Pub. No. WO81/02484, PCT Pub. Date Sep. 3, 1981**

**PCT Filed Feb. 22, 1980, Ser. No. 130,488**

**Int. Cl.³ G08B** *21/00*

**U.S. Cl. 340—626** **15 Claims**



1. A leak detection apparatus (**18**) for a pressurized system having a source of pressurized fluid (**12**) and a distribution system (**14**) having at least one outlet (**100**) for said pressurized fluid, said distribution system (**14**) being maintained under pressure approximately equal to the pressure of the pressurized fluid in said source comprising:

means (**38,138, 62,162**) for sealing the source of pressurized fluid (**12**), said means (**38,138, 62,162**) including a movable member (**62,162**) seatable on a seat (**68,168**) positioned between said source of pressurized fluid and said distribution system (**14**);

rod means (**60,160,260**) carried by said movable member (**62,162**) and being movable with said movable member (**62,162**); and

means (**82,182,295**) operatively conditioned by movement of said movable member (**62,162**) and of said rod means (**60,160,260**) for signalling a pressure differential between said source of pressurized fluid (**12**) and said distribution system (**14**).

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**4,297,688**

## PHOTOELECTRIC SMOKE SENSING AND ALARMING DEVICE

**Takao Kakigi, Tokyo, Japan, assignor to Cybernet Electronics Corp., Kawasaki, Japan**

**Continuation-in-part of Ser. No. 107,041, Dec. 26, 1979, which is a continuation of Ser. No. 942,186, Sep. 14, 1978, abandoned. This application Jan. 2, 1980, Ser. No. 109,145**

**Claims priority, application Japan, Sep. 30, 1977, 52-131414[U]**

**Int. Cl.³ G08B** *17/10*

**U.S. Cl. 340—630** **1 Claim**

1. A photoelectric smoke sensing and alarming device of a type having a pulse generator, a chamber, a light emitting element disposed in said chamber and adapted to emit a light beam in the form of pulses in cooperation with said pulse generator, and a light-receiving element disposed in said chamber and adapted to receive the light from said pulses of light beam, so as to sense the presence of smoke in said chamber through a detection of scattering of said light beem caused in said chamber by said smoke, comprising:

an amplifier having gain control and connected to said light-receiving element for producing an output upon reception of light by said light-receiving element;

a threshold detecting comparator for producing a pulse output when the output of said amplifier exceeds a predetermined threshold level;

a delay circuit coupled to the pulse generator for producing a delayed pulse output in synchronism with the output of the comparator;

a gate circuit having a pair of inputs respectively connected to the output of the comparator and the output of the delay circuit for delivering a first output upon simultaneous receipt of output pulses from said comparator and said delay circuit and for producing a second output upon the occurrence of the delayed output pulse of the delay circuit in the absence of the output pulse of said comparator; and

a flip-flop circuit coupled to said gate circuit and adapted to be set by the first output from said gate circuit, wherein an alarm is generated over a time length which is at least as long as the time between successive of said pulses generated by said pulse generator, only when at least n ($n>2$) successive of said first outputs are delivered by said gate circuit to said flip-flop circuit, said second output of said gate circuit being used to reset the flip-flop circuit in the absence of successive first output signals from said gate circuit.



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**4,297,689**

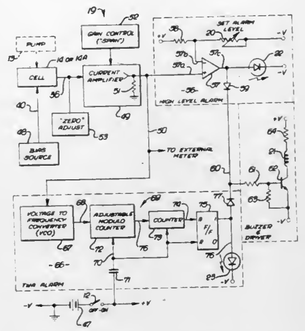
## PERSONNEL-CARRIED DOSIMETER

**Manuel Shaw, Bel Air, and Imbrie Thatcher, Chatsworth, both of Calif., assignors to Interscan Corporation, Chatsworth, Calif.**

**Filed Jan. 8, 1980, Ser. No. 110,359**

**Int. Cl.³ G01N** *27/46, 27/54;* **G08B** *23/00*

**U.S. Cl. 340—632** **17 Claims**



1. An electrochemical sensing cell for use in a dosimeter, comprising:

a housing including a body having a planar base and upright sides extending thereform to define an interior region and a lid emplaceable atop said sides to enclose said interior region,

a zigzag recess in said base opening into said interior region, together with a pair of openings through said body at the respective ends of said recess, said openings serving respectively as inlet and outlet ports for the flow of gas through said cell,

a generally planar sensing element disposed in said body interior region atop said base, gas entrant to the cell through said inlet port flowing throgh said zigzag recess in contact with said sensing electrode along substantially the entire length of said recess, said gas then exiting through said outlet port,

a reference electrode and an electrolyte also disposed within said interior region, the electrical current developed across said sensing and reference electrodes in the presence of a certain contaminant in said gas being indicative of the concentration of that contaminant in the gas,

an annular seal between said base and said sensing electrode and surrounding said zigzag recess, said seal limiting the flow of gas between said base and said sensing electrode to within a perimeter defined by said seal, and

a flow channel extending from said inlet port along the exterior of said base and thence through at least one of said walls and through said lid, gas thereby being supplyable to said recess via said channel from a location atop said lig.

6. A dosimeter comprising:

an electrochemical sensing cell and means for enabling the entry of a gas sample into said sensing cell, the current from said cell indicating the concentration of a certain contaminant species in said gas sample,

a "high level" alarm circuit means, connected to said cell, for providing a first alarm signal when the current from said cell indicates that the present concentration of said certain contaminant species exceeds a first threshold limit value, and

a "time weighted average" alarm circuit means, also connected to said cell and operative over a certain extended time duration, for providing a second alarm signal when the current from said cell, effectively integrated over a time interval less than or equal to said certain duration, indicates that the time weighted average concentration level of said contaminant species has exceeded a second threshold limit value during that interval, said "time weighted average" alarm circuit means including:

a frequency converter, cooperatively connected to said cell, for providing an output pulse signal having a frequency proportional to the current from said cell, and

a counter connected to count the pulses from said frequency converter, said second alarm signal being produced when the count of said counter reaches a preset value within said certain extended time duration.

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**4,297,690**

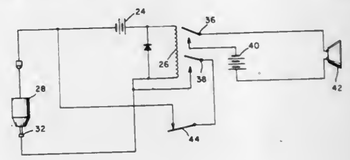
## EARTHQUAKE ALARM SYSTEM

**Gerald E. Baker, 23018 Arlington Ave., Torrance, Calif. 90501**

**Continuation-in-part of Ser. No. 933,166, Aug. 14, 1978. This application Mar. 5, 1980, Ser. No. 127,428**

**Int. Cl.³ G08B** *21/00*

**U.S. Cl. 340—690** **3 Claims**



1. An earthquake alarm comprising:

a member having a referenced support at one end,

a mass attached at the opposite end of said member a fixed distance from said referenced support,

said mass being supported to have a preferred vertical position for a movement in a lateral direction only,

adjustable mechanical detecting means for limiting the impulse lateral movement of said mass without changing the fixed distance of said mass from said referenced support,

said mass being cylindrical and containing an opening at the lowermost end for accepting a vertically aligned adjustable probe attached to said mechanical detecting means and adapted to be selectively located in said opening without touching said mass, and

electrical means connecting said mechanical detecting means with an audio generating device for translating selected impulse movement of said mass into an audible signal.

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**4,297,691**

## FIGURE DISPLAYING DEVICE

**Kazuyuki Kodama, Kokubunji; Kunihiro Okada; Takeyuki Endoh, both of Hinode, and Yasutaka Shibuya, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Aug. 29, 1979, Ser. No. 70,821**

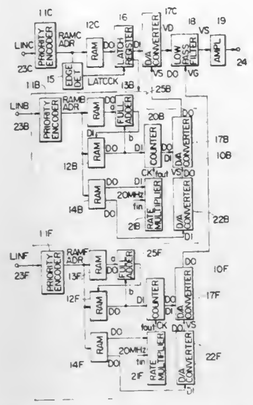
**Claims priority, application Japan, Aug. 30, 1978, 53-104944**

**Int. Cl.³ G06F** *3/14;* **G09B** *9/00*

**U.S. Cl. 340—723** **4 Claims**

1. A figure displaying device comprising display means for displaying information of a figure, first generation means for generating a brightness signal which corresponds to the figure information to be displayed, second generation means for generating a brightness modulation signal which varies continuously in at least one direction within a predetermined first region on a display screen of said display means, third generation means for generating a frequency characteristic control signal which varies continuously in at least one direction within a predetermined second region on said display screen which is in overlapping relationship with at least a portion of said first region, modulation and control means connected to said first, second and third generation means for brightness-modulating the brightness signal from said first generation means in accordance with the signal from said second genera-

tion means and for controlling a frequency characteristic of the brightness signal from said first generation means in accordance with the signal from said third generation means to selectively vary the composition of frequency components in



the brightness signal and thereby affect the resolution of the displayed image, and means for applying the modulated and controlled brightness signal from said modulation and control means to said display means.

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**4,297,692**

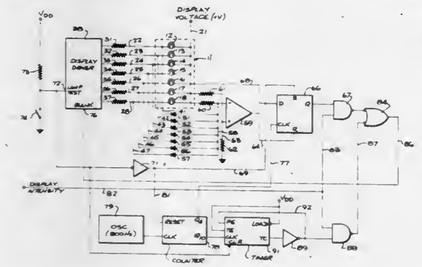
## SEGMENT FAILURE DETECTOR FOR DIGITAL DISPLAY

**Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.**

**Continuation of Ser. No. 18,209, Mar. 7, 1979, abandoned. This application Apr. 8, 1980, Ser. No. 138,474**

**Int. Cl.[3] G06F *3/14*; G09F *9/32***

**U.S. Cl. 340—715** **7 Claims**



1. A digital display device including:

a power source connected to drive the digital display device;

a plurality of character-forming display segments;

a driver circuit connected to the plurality of display segments to selectively energize the plurality of display segments;

a failure detection circuit connected to the plurality of display segments to detect the failure of any of the plurality display segments to energize; and to generate a blanking signal indicative of display segment failure;

an override circuit to override the blanking signal;

wherein the driver circuit is connected to the failure detection circuit to receive the blanking signal such that the driver circuit de-energizes the plurality of display segments on receipt of the blanking signal; and

wherein the override circuit is connected to the driver circuit such that the timer circuit overrides the blanking signal to permit energizing of the plurality of non-failed display segments by the driver circuit.

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**4,297,693**

## APPARATUS FOR DISPLAYING GRAPHICS SYMBOLS

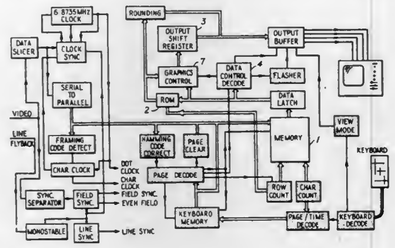
**Robert Parsons, St. Neots, England, assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 806,415, Jun. 14, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,722**

**Claims priority, application United Kingdom, Jun. 21, 1976, 25726/76**

**Int. Cl.[3] G06F *3/14***

**U.S. Cl. 340—744** **10 Claims**



1. Apparatus for controlling the display of information which is built up line by line on a raster-type display in response to digital coded data and mode control signals selectively occurring during individual lines of said display, there being a plurality of modes including a graphics mode in which data signals can be displayed during a respective line of said display, the mode control signals indicating the mode in which subsequent data signals are to be displayed during at least part of that line but not themselves generating a display, the apparatus including graphics symbol store means for providing in the graphics mode, in parallel, signals representative of the specified graphics symbol until a further data signal is received, parallel to serial converter means for securing the parallel signals from the graphics symbol store means and in response thereto producing in serial form, signals characteristic of the graphics symbol to be displayed, and control logic means for changing the contents of the graphics symbol store means in response to a graphics symbol signal and to cause said store means to continue to produce the parallel signals already stored in the graphics symbol store means for the duration of a mode control signal when the said mode control signal occurs in place of a data signal during the display of graphics symbols and thereby avoid a blank space in said display resulting from occurrence of said mode control signal.

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**4,297,694**

## SYMBOL GENERATOR FOR A GRAPHIC CONSOLE

**Philippe Matherat, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed May 16, 1979, Ser. No. 39,260**

**Claims priority, application France, May 18, 1978, 78 14765**

**Int. Cl.[3] G06F *3/153***

**U.S. Cl. 340—750** **18 Claims**

1. A symbol generator for tracing, on a sensitive medium, alphanumeric characters and the like, said characters being formed on a grid comprising l.P adjacent columns, each column comprising m.Q points, said generator comprising:

(a) first and second input busses, each connectable to an external control means (MPU), said first bus comprising a data channel (MPDB) and said second bus comprising an address channel (MPAB);

(b) means for supplying a clock signal (CKIN) to control the timing of said symbol generator;

(c) a character memory (**65**), connected to said first and

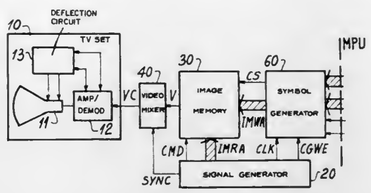


second input busses, said memory having lX m memory calls for each character and further comprising:

1. first and second addressing inputs; and

2. a signal output for driving said sensitive medium;

(d) a writing pointer circuit (**66**) connected to said first and second input busses, said pointer circuit comprising first (X) and second (Y) up/down counters connected to said clock signal supplying means, each of said counters having first (ENX) and second (ENY) enabling inputs and a command input (U/DY) for setting the counter to count up or count down, the outputs of said up/down counters



respectively comprising the X and Y address inputs for the means driving said sensitive medium; and

(e) a writing circuit (**61**), connected to said first and second input busses and to said clock signal supplying means, said writing circuit including means, responsive to the factors P and Q, for programming said writing circuit, said writing circuit having first, second, and third outputs respectively corresponding and connected to the first and second enabling inputs and the command input of said writing pointer circuit, and first and second address outputs respectively corresponding and connected to the first and second addressing inputs of said character memory.

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**4,297,695**

## ELECTROCHROMIC DISPLAY DEVICE

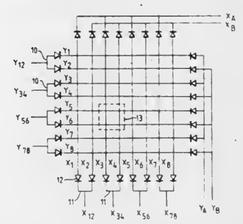
**Richard C. Marshall, Harpenden, England, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 17, 1979, Ser. No. 103,910**

**Claims priority, application United Kingdom, Dec. 28, 1978, 50066/78**

**Int. Cl.[3] G02F *1/17***

**U.S. Cl. 340—752** **5 Claims**



1. A display device including apparatus for electrically addressing a material in matrix fashion wherein each individual point in the matrix is addressable to produce a local change in an optical characteristic of the material by the application at that point of two electrical signals, the improvement comprising

first and second matrix addressing means for sequentially applying first and second electrical signals to said matrix, the combination of which is sufficient to cause said local change,

said first matrix addressing means for selectively applying said first signals to groups of rows and columns of said matrix defining submatrices,

said second matrix addressing means for selectively applying said second signals to individual rows and columns in said submatrices to select at least one of said individual points in said submatrices and produce said local change thereat.

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**4,297,696**

## COLOR UNIFORMING DRIVE IN AN ELECTROCHROMIC DISPLAY DEVICE

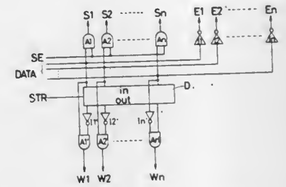
**Sadakatsu Hashimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 23, 1980, Ser. No. 143,015**

**Claims priority, application Japan, Apr. 24, 1979, 54-50968**

**Int. Cl.[3] G06F *3/14***

**U.S. Cl. 340—785** **4 Claims**



1. In a drive system for driving an electrochromic display cell during a coloration period, and a bleaching period, said display cell having a memory period when said drive system is not driving said electrochromic display cell, said drive system including an external power source, said cell including an electrochromic material and a predetermined number of display segments, different combinations of said display segments defining different desired display patterns, said drive system comprising:

coloration means for conducting coloration operations by applying a coloration voltage to selected ones of said display segments during said coloration period;

holding means for maintaining colored segments in an electrically opened state for a predetermined period of time after completion of said coloration period; and

communication means for electrically connecting said colored segments with each other during said memory period after completion of operation of said holding means.

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**4,297,697**

## POWER SUPPLY METHOD FOR LIQUID CRYSTAL DISPLAY

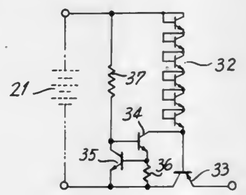
**Yoshihiro Mitsui, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan**

**Filed Dec. 29, 1978, Ser. No. 974,402**

**Claims priority, application Japan, Dec. 29, 1977, 52/159275**

**Int. Cl.[3] G08B *5/36***

**U.S. Cl. 340—813** **3 Claims**



1. A power supply for a liquid crystal display, comprising:

DC power source means for delivering a source voltage larger than the driving voltage for driving said display,

said power source means having first and second reference terminals;

voltage regulator means coupled to said power source means for receiving said source voltage and in response thereto supplying a regulated output voltage having a negative temperature characteristic, said regulated output voltage corresponding to the driving voltage of said display, said voltage regulator means including first and second output terminals for outputting said regulated voltage,

logic circuit means coupled intermediate said first and second output terminals and said liquid crystal display for receiving said regulated output voltage and in response thereto selectively driving said liquid crystal display;

a transistor coupled in series between said second reference terminal and said second output terminal;

said voltage regulator means including constant-current circuit means coupled intermediate said first reference terminal and said transistor, and a plurality of series-connected forward biased diode means coupled between said first reference terminal and said transistor, each of said diode means having the same forward voltage and negative temperature characteristic, said constant-current circuit supplying said forward current to said plurality of series-connected diode means, said regulated output voltage being substantially determined by multiplying the forward voltage of one of said diode means by the number of said diode means, said negative temperature characteristic of said regulated output voltage being substantially determined by multiplying the negative temperature characteristic of said forward voltage of one of said diode means by the number of diode means.

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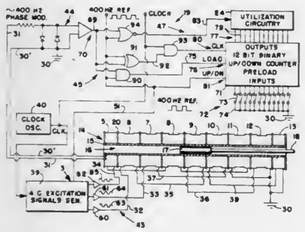
**4,297,698**

## 360 DEGREE LINEAR VARIABLE PHASE TRANSFORMER

**Michael A. Pauwels, Kalamazoo, and Abraham L. Poot, Portage, both of Mich., assignors to Pneumo Corporation, Boston, Mass.**

**Filed Nov. 2, 1977, Ser. No. 847,938**
**Int. Cl.³ G08C** *19/06;* **H01F** *21/06*
**U.S. Cl. 340—870.32** **38 Claims**



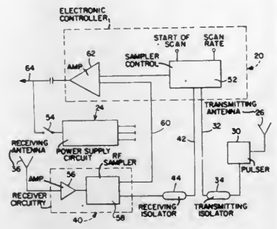

1. A displacement to phase transducer, comprising at least three primary means for producing in response to alternating current excitation alternating magnetic fluxes, combining means for producing an output flux having a phase dependent on the relative positions of said combining means and said primary means, at least one of said primary means and combining means being movable relative to the other, and secondary means for producing an output AC electrical signal having a phase corresponding to the phase of said output flux, and wherein each of said primary means includes a plurality of full layers of circumferentially wound turns and at least one partial layer of circumferentially wound turns so arranged to provide a substantially linear relation between the phase of said output flux with respect to the relative positions of said combining meand and said primary means.

**4,297,699**

## RADAR DRILL GUIDANCE SYSTEM

**James C. Fowler, Burke; Steven D. Hale, Vienna, both of Va., and Theodore E. Moser, Rockville, Md., assignors to Ensco, Inc., Springfield, Va.**

**Filed Oct. 24, 1979, Ser. No. 87,811**
**Int. Cl.³ G01S** *13/02*
**U.S. Cl. 343—5 NA** **19 Claims**




10. A radar guidance system for determining subterranean distances including a source of electromagnetic pulses, a transmitting means connected to said source of electromagnetic pulses to transmit said electromagnetic pulses into the earth, a receiving means positioned in spaced relationship to said transmitting means to receive electromagnetic energy which returns to said receiving means following the reflection of said electromagnetic pulses from various geological discontinuities within the earth, a control circuit means connected to both said source of electromagnetic pulses and said receiving means for controlling both the transmission of said electromagnetic pulses from said transmitting means and the reception of said electromagnetic energy by said receiving means, said control circuit means being positioned in spaced relationship relative to said transmitting means such that said transmitting means is positioned intermediate said control circuit means and said receiving means, said radar guidance system also including a casing which encloses said source of electromagnetic pulses, said transmitting means, said receiving means and said control circuit means, said casing having a shielding element mounted around the inner surface thereof to prevent direct electromagnetic coupling between said transmitting means and said receiving means.

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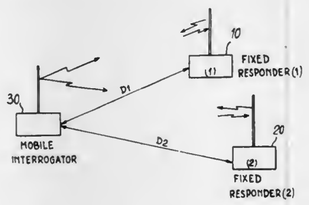
**4,297,700**

## METHOD AND APPARATUS FOR MEASURING DISTANCES

**Georges Nard, Nantes; Jean Rabian, Ste. Luce, and Michel Rouaud, Thouare, all of France, assignors to Societe d'Etudes, Recherches et Constructions Electroniques Sercel, Carquefou, France**

**Continuation of Ser. No. 517,157, Oct. 22, 1974, abandoned.**
**This application Jan. 26, 1977, Ser. No. 762,729**
**Claims priority, application France, Oct. 23, 1973, 73 37740**
**Int. Cl.³ G01S** *13/80*
**U.S. Cl. 343—6.5 R** **14 Claims**




1. A ranging method, comprising the following steps:



at a first location;

transmitting during a first time-period a first high frequency wave train comprising a carrier signal of predetermined frequency being phase-reversal modulated according to a first repetitive chain of a known pseudo-random sequence of binary elements,

at a second location:

receiving the first high-frequency wave train and correlating the first repetitive chain of the known pseudo-random sequence, said first chain of the sequence being modulated on said first wave train, with a local second repetitive chain of the same pseudo-random sequence, said second repetitive chain being shifted with respect to time so as to substantially coincide with the first repetitive chain received, and

transmitting during a second time-period a second high frequency wave train comprising a carrier signal of the same predetermined frequency being phase-reversal modulated according to the second local repetitive chain of the pseudo-random squence thus shifted, said second time-period extending after and disjointed from said first time-period,

at a third location:

receiving the second high-frequency wave train and correlating the second repetitive chain of the known pseudo-random sequence, said second chain of the sequence being modulated on said second wave train, with a third local repetitive chain of the same pseudo-random sequence, said third repetitive chain being shifted with respect to time until it is caused to coincide with the second repetitive chain received, and

sensing the time shift between the thus shifted third repetitive chain of the pseudo-random sequence and a fourth repetitive chain of the pseudo-random sequence, and sequentially repeating these steps with each of the first and second transmission time-periods of the first and second wave trains being disjointed.

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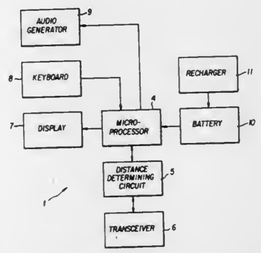
**4,297,701**

## RANGEFINDER USING EXPANDED TIME DELAY

**Lance Henriques, New York, N.Y., assignor to John D. Angleman, Brookside, N.J.**

**Filed Aug. 8, 1979, Ser. No. 64,390**
**Int. Cl.³ G01S** *13/78*
**U.S. Cl. 343—6.5 LC** **7 Claims**




1. A system for determining the distance between a first point and a second point comprising:

(a) first transceiver means located at the first point for transmitting a first signal burst on a given frequency and for receiving signals on the given frequency;

(b) second transceiver means located at the second point for receiving the first signal burst on the given frequency and for retransmitting a second signal burst on the given frequency in response to the first signal burst; and

(c) timing means for measuring the period of time between the transmission of the first signal burst by the first transceiver means and the receipt of the second signal burst by the second transceiver means, whereby the period of time is directly proportional to the distance between the first point and the second point, said timing means being comprised of an integrator including a capacitor, a means for linearly charging the capacitor at a charge rate during the period of time, a means for linearly discharging at a slower rate than said charge rate the capacitor after the period of time, a threshold detector for detecting when the state of charge of the capacitor reaches a predetermined value;

(d) and a microprocessor for measuring an amount of time that the capacitor is charged to a value of at least said predetermined value, the amount of time corresponding to said distance between the first point and the second point.

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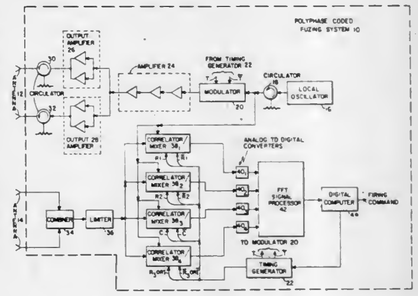
**4,297,702**

## POLYPHASE CODED FUZING SYSTEM

**Irven S. Carnes, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.**

**Filed May 24, 1978, Ser. No. 909,098**
**Int. Cl.³ G01S** *13/26*
**U.S. Cl. 343—7 PF** **2 Claims**




1. In a radar fuzing system for use in a guided missile, such system being adapted periodically to transmit a radio frequency signal modulated in accordance with a predetermined polyphase code and, after reception of an echo signal, to process such signal in a bank of similar correlator/mixers, each one of such correlator/mixers comprising:

(a) first and second dual gate field effect transistors;

(b) means, operative during selected successive intervals of time between the transmission of each predetermined polyphase code, for alternately biasing the first and second dual gate field effect transistors into a conducting state;

(c) means for applying a local oscillator signal to one of the gates of each one of the first and the second dual gate field effect transistors;

(d) means for applying the echo signal directly to the second gate of one of the dual gate field effect transistors and for reversing the phase of such signal and applying the resulting signal to the second gate of the second one of such transistors; and

(e) means for combining the output signals from the dual gate field effect transistors.

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**4,297,703**

## TELEMETRY DEVICE FOR TRACKING RADAR AND RADAR SYSTEM COMPRISING SUCH A DEVICE

**Philippe Lacomme, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Dec. 4, 1979, Ser. No. 100,143**
**Claims priority, application France, Dec. 5, 1978, 78 34225**
**Int. Cl.³ G01S** *13/70*
**U.S. Cl. 343—7.3** **7 Claims**

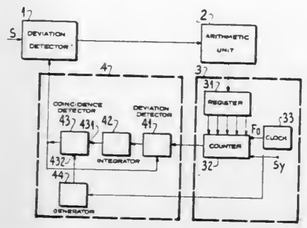
4. A telemetry device for tracking radar comprising:

a first loop for tracking the distance of a moving echo comprising

a first deviation detector for determining the position deviation of an echo signal and a telemetry mark,

means for the digital calculation of the distance of the echo,

means for generating clock pulses of a predetermined repetition frequency, and




generating means for providing a reference tracking window by adding-subtracting clock pulses, and

a second analog loop, connected in said first loop between the generating means for providing a reference tracking window and the position deviation detector providing a time filtering in distance of the reference tracking window.

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**4,297,704**

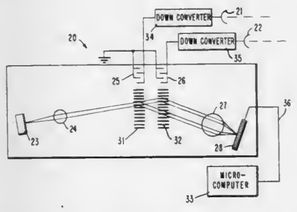
**PHASE SENSITIVE SPECTRUM ANALYZER**

**Emanuel Marom, Los Angeles; Michael K. Barnoski, and Richard L. Abrams, both of Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Aug. 13, 1979, Ser. No. 66,199**

**Int. Cl.³ G01S *5/02*; G01R *23/16*; G02B *5/14*; G01B *9/02***

**U.S. Cl. 343—113 R** **6 Claims**




1. An acousto-optic processing arrangement which determines the direction of arrival of energy applied thereto, said arrangement comprising:

a laser source;

a first lens disposed to collimate laser light provided by said laser source;

a second lens disposed to focus the collimated laser light provided by said first lens;

a detector array disposed at the focal plane of said second lens;

two surface acoustic wave transducers disposed between said first and second lenses and adjacent to an optical path between said lenses, said two surface acoustic wave transducers being disposed adjacent to one another and disposed such that the surface acoustic waves radiated thereby are substantially parallel to one another;

two antennas, each antenna being individually coupled by means of separate downconverters to one of said surface acoustic wave transducers, said antennas being disposed so as to have their respective lines-of-sight substantially parallel to one another; and

computer means coupled to said detector array for determining the direction of arrival of said applied energy.

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**4,297,705**

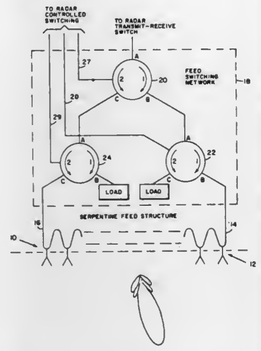
**FREQUENCY AGILITY TECHNIQUE FOR FREQUENCY SCANNED ANTENNA**

**Robert R. Boothe, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 3, 1980, Ser. No. 126,516**

**Int. Cl.³ H01Q *3/26, 13/10***

**U.S. Cl. 343—771** **3 Claims**




1. A frequency agility circuit for a frequency scanned antenna comprising: bidirectional switching means adapted for coupling electromagnetic radiation therethrough, said switching means being adapted for receiving energy from a source of electromagnetic radiation; a serpentine feed structure coupled to said switching means for directing electromagnetic radiation bidirectionally therethrough, said serpentine feed structure being adapted for coupling said radiation to and from a frequency scanned antenna array, and said serpentine feed structure having first and second feed inputs for directing energy bidirectionally therethrough; and wherein said switching means comprises first, second, and third microwave circulators, each circulator having first, second, and third input-output ports, said first port of the first circulator being adapted for receiving energy from a radiation source, said second circulator having the first input-output port coupled to said second port of the first circulator and having the second port coupled to the first input of said serpentine feed structure, said third circulator having the first port coupled to said third port of the first circulator and having the third input-output port coupled to the second input of said serpentine feed structure; and further comprising a load circuit coupled to the third port of said second circulator and to the second port of said third circulator for absorbing residual energy.

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**4,297,706**

**CIRCULARLY POLARIZED SLOTTED PYLON ANTENNA**

**Nicholas Nikolayuk, Gibbsboro, N.J., assignor to RCA Corporation, New York, N.Y.**

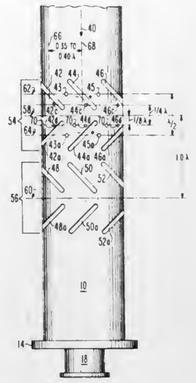
**Filed Mar. 17, 1980, Ser. No. 131,273**

**Int. Cl.³ H01Q *13/12***

**U.S. Cl. 343—771** **11 Claims**

1. An antenna comprising a conducting vertical cylinder having a plurality of slots, said slots being disposed in a plurality of vertically stacked bays, each bay comprising at least one pair of slots disposed at about right angles to each other, slots of each pair being vertically spaced with respect to each other by about one half of a wavelength of a desired center frequency, said vertical spacing being established between horizontal centers of said slots, and means for exciting said slots so that slots comprising a pair are in about ninety degree time phase relationship and have about equal amplitudes with respect to each other.





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**4,297,707**

**MULTIPLE OMNIDIRECTIONAL ANTENNA**

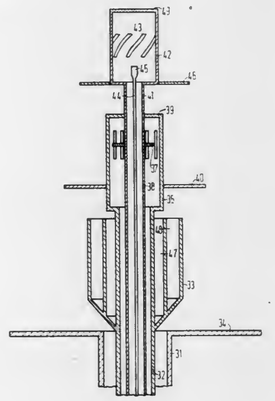
**Anton Brunner, Wangen, and Nikolaus Willburger, Olching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 810,592, Jun. 27, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,228**

**Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629502**

**Int. Cl.³ H01Q *13/12***

**U.S. Cl. 343—725** **5 Claims**



1. An omnidirectional end antenna which forms an assembly with one or more other antennas mounted on a common axis comprising a wave shaping base plate member (**10, 21, 46**), a coaxial feed line having an outer conductor (**8, 19, 41**) attached to said base plate member (**10, 21, 46**) on one side thereof and extending through said one or more other antennas, an opening formed in said base plate member, an inner conductor (**8*a*, 19*a*, 44**) of said feed line extending for a finite length through said opening formed in said base plate member (**10, 21,46**), a cylindrical shaped radiating member (**6, 17, 42**) into which the end of feed line extends attached to the second side of said base plate member (**10, 21, 46**) and formed with a short circuit cover member (**11, 23, 49**) over its remote end, and at least one radiating slot (**7, 14, 43**) formed in the side walls for radiating radiant energy.

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**4,297,708**

**APPARATUS AND METHODS FOR CORRECTING DISPERSION IN A MICROWAVE ANTENNA SYSTEM**

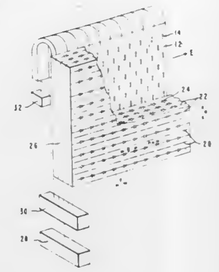
**Paul Vidal, Paris, France, assignor to Societe d'Etude du Radant, Orsay, France**

**Filed Jun. 22, 1978, Ser. No. 918,152**

**Claims priority, application France, Jun. 24, 1977, 77 19364**

**Int. Cl.³ H01Q *19/06***

**U.S. Cl. 343—754** **13 Claims**



1. A nondispersive microwave antenna system comprising:

(a) antenna means for radiating a microwave beam which exhibits variation in the direction of propagation of said beam in a first plane with variation in the frequency of said beam;

(b) lens means for controllably deflecting the direction of propagation of said beam in said first plane, said lens means comprising a plurality of networks located one behind the other, each in the direction of propagation of said beam and each network comprising a plurality of portions with said portions comprising first means for conducting said first means for conducting being cut into sections, second means for conducting and a plurality of first means for switching having conductive and non-conductive states, said first means for switching being spaced apart on said second means for conducting to selectively render said second means for conducting discontinuous when said first means for switching is in said non-conductive state to assure a shift in the phase of said beam passing through said portions of said networks depending upon said conductive and non-conductive states of said first means for switching in said portions of said networks; and

(c) control means for setting the state of conduction of said first means for switching to establish phase shifts in said beam in said portions which phase shifts correct for said variation in the direction of propagation of said beam with variation in the frequency of said beam.

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**4,297,709**

**LUNEBERG LENS ANTENNA**

**Knut E. Cassel, and Bengt T. Molin, both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 23, 1980, Ser. No. 114,490**

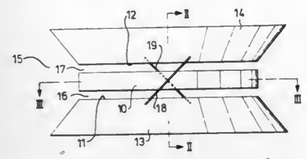
**Claims priority, application Sweden, Feb. 6, 1979, 7901047**

**Int. Cl.³ H01Q *15/08***

**U.S. Cl. 343—754** **7 Claims**

1. An antenna comprising a round disc shaped lens element of the Luneberg type, having a radially varying diffraction index decreasing in the peripheral direction, surrounded on its planar sides by two conductive planes and having feeders distributed across at least a portion of the circumference, said feeders being shaped and oriented to transmit and receive, respectively, a polarized wave, the polarization direction of

which forms an angle less than 90° with the plane of the lens element, a substantial portion of the distance between the conductive planes external to said lens element being formed



by a dielectric medium having the dielectric constant of air, the thickness of said medium being substantially constant across the lens.

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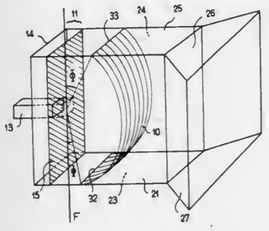
**4,297,710**
**PARALLEL-PLANE ANTENNA WITH ROTATION OF POLARIZATION**

**Albert Dupressoir, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Mar. 4, 1980, Ser. No. 127,097**
**Claims priority, application France, Mar. 9, 1979, 79 06135**
**Int. Cl.³ H01Q *19/195***
**U.S. Cl. 343—756** **12 Claims**



1. A parallel-plane antenna comprising two parallel metal plates limited by a cylindrical-parabolic end-wall illuminated by a source, said source being placed on the focal line of said antenna at an equal distance from the two plates, at the rear of said antenna on the opposite side of the emitted wave and said cylindrical-parabolic end-wall comprising a semitransparent reflector and said plane at right angles to the plates and containing the focal line being formed by a polarizing reflector unit.

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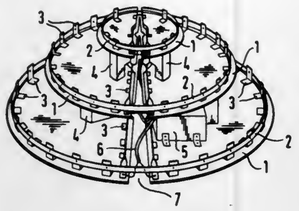
**4,297,711**
**OMNIDIRECTIONAL RECEIVING ANTENNA**

**Hans Ekström, Mankkaanpuro 19, SF-02180 Espoo 18, Finland**

**Filed Jul. 25, 1979, Ser. No. 60,368**
**Claims priority, application Finland, Jul. 31, 1978, 782364**
**Int. Cl.³ G08B *5/22*; G09F *9/00***
**U.S. Cl. 343—794** **7 Claims**

1. An omnidirectional receiving antenna primarily for receiving TV signals comprising at least one substantially circular antenna element tuned to receive signals in a predetermined frequency range, said at least one element including
a substantially circular metal plate having means defining a slot extending along a diameter of the plate, said slot opening at one edge of the plate and extending to a terminus close to but spaced radially inwardly from the opposite edge;
an elongated metal band extending circularly around the periphery of said plate and across the open end of said slot, the end portions of said band being bent inwardly to form substantially straight symmetrical leg portions extending along the edges of said slot from bends therein on opposite sides of the slot opening;
means for connecting the distal ends of said leg portions to said plate adjacent said slot; and



means for mounting said band in axially spaced relationship from said plate;
an amplifier having input terminals connected to said end portions of said band; and
a housing for said antenna element.

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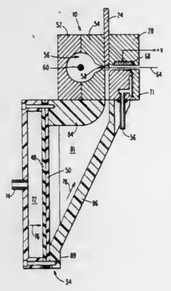
**4,297,712**
**AIR FLOW TUNNEL FOR REDUCING INK JET DRAG ON ARRAY HEAD**

**Gerald B. Lammers, Boulder, and Gordon J. Smith, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 17, 1979, Ser. No. 76,093**
**Int. Cl.³ G01D *15/18***
**U.S. Cl. 346—75** **13 Claims**



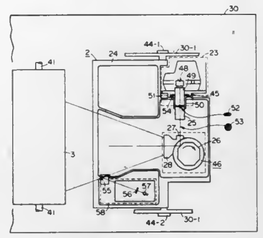
1. An integrated ink jet aspirator comprising:
a housing means having an air inlet port, an interconnecting flow channel and an outlet port;
said interconnecting flow channel includes a first section operable to reduce turbulence in a stream of incoming air, a second section being coupled to the first section and operable to increase the velocity of the incoming air; a third section being coupled to the second section said third section having a noncircular cross section with a constant geometry along its longitudinal axis and operable to maintain a constant velocity in the incoming air; and
an ink jet head positioned relative to the housing means and in linear alignment with the third section whereby ink droplets emanating from the ink jet head are being propelled into a nonturbulent uniform velocity air flow.



**4,297,713**
**LASER RECORDING APPARATUS**

**Junji Ichikawa; Nobuhiro Imai; Kimio Kohno; Koichi Kadokura, and Masaaki Ishii, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 29, 1979, Ser. No. 43,246**
**Claims priority, application Japan, Jun. 3, 1978, 53-66858; Sep. 21, 1978, 53-117237**
**Int. Cl.³ G01D *15/14***
**U.S. Cl. 346—108** **3 Claims**



1. A laser recording apparatus, comprising:
laser means comprising a laser element for emitting a laser beam;
optical means supporting said laser means, said optical means receiving the laser beam therefrom at an entrance end and emitting a collimated laser from an exit end thereof, said optical means being provided with a mounting standard face, wherein the difference between the distance of the laser element from said standard face and the distance of the entrance end from said standard face are maintained within the focal depth of said optical means even in the presence of a temperature change;
a support member comprising a mounting standard face on which is affixed said mounting standard face of said optical means; and
deflector means for directly receiving the laser beam from said optical means and directing said laser beam toward a recording medium.

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**4,297,714**
**THERMAL PEN**

**Kazunari Ando, Tajimi; Hirokazu Matsunaga, Tsushima, and Hideaki Ayabe, Tokyo, all of Japan, assignors to Nippon Toki Kabushiki Kaisha, Nagoya and Watanabe Instruments Corp., Tokyo, both of, Japan**

**Continuation of Ser. No. 853,874, Nov. 22, 1977, abandoned. This application Aug. 30, 1979, Ser. No. 71,035**
**Claims priority, application Japan, Apr. 5, 1977, 52-42519[U]**
**Int. Cl.³ G01D *15/10***
**U.S. Cl. 346—139 C** **8 Claims**

1. A thermal pen of the thick film type for thermal recording, comprising a thermal pen tip and a thermal pen tip holder connected to said thermal pen tip for holding the thermal pen tip, said thermal pen tip comprising a high resistance, low thermal-conductivity, planar substrate formed in the form of a pen point and having a rectangular cross section, a heater element in the form of a thick film having a flat top surface on a portion of the end surface of the pen point of said high resistance, low thermal-conductivity, planar substrate, a generally semispherically prefabricated minute recording piece having a flat bottom surface and made of a heat-resistant, wear-resistant material having a thermal-conductivity substantially equal to or higher than that of said substrate, said recording piece being attached at its flat bottom surface to a portion of said flat top surface of said heater element and being adapted to be heated by said heater element for performing the thermal recording, and an electrical conductor in the form of a thick film so as to connect to said heater element of the high resistance substrate, said thermal pen tip holder and said planar substrate arranged so that during said thermal recording said substrate moves in the direction of the longitudinal length of said rectangular cross section.

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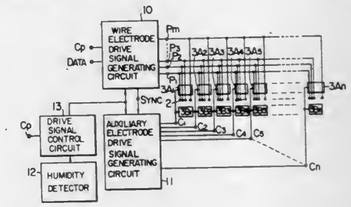
**4,297,715**
**ELECTROSTATIC RECORDING APPARATUS**

**Masaharu Tadauchi; Kunio Sato, both of Hitachi, and Kiyohiko Tanno, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 2, 1979, Ser. No. 54,273**
**Claims priority, application Japan, Jul. 14, 1978, 53-85162**
**Int. Cl.³ G11B *15/60*; G01W *1/02***
**U.S. Cl. 346—150** **9 Claims**

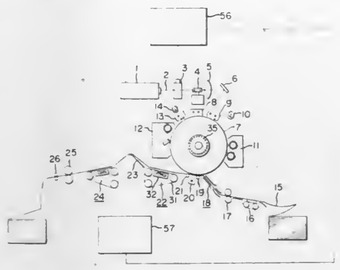


1. An electrostatic recording apparatus comprising:
a wire electrode row including a multiplicity of wire electrodes which are continuously arranged substantially in a row and are divided into a plurality of wire electrode blocks each having the same number of wire electrodes;
a plurality of auxiliary electrodes arranged along said wire electrode row and respectively in opposition to said plurality of wire electrode blocks;
a driving circuit for selectively applying driving signals to said wire electrodes and said auxiliary electrodes in response to a recording signal, said driving circuit simultaneously applying said driving signals to the corresponding wire electrodes of the respective wire electrode blocks;
an electrostatic recording medium disposed close to said wire electrodes and aid auxiliary electrodes, of which the portion close to both of the driven auxiliary electrode and the driven wire electrode opposite to the driven auxiliary electrode is charged thereby to have an electrostatic latent image thereon;
means for relatively moving said wire electrodes, said auxiliary electrodes and said recording medium;
a humidity detector for detecting ambient humidity thereby producing a signal representing a detected value;
control means for controlling a waveform of at least one of a drive signal applied to said wire electrode and a drive signal applied to said auxiliary electrode in accordance with the output signal from said humidity detector; and
means for developing said charged recording medium to obtain a visualized image without formation of a ghost image.

**4,297,716**
**RECORDING APPARATUS INCLUDING A CONTINUOUS TRANSFER WEB**

**Kazuhiro Hirayama, Yokohama, and Susumu Sugiura, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 819,142, Jul. 26, 1977, abandoned. This application Aug. 21, 1979, Ser. No. 68,419**
**Claims priority, application Japan, Jul. 30, 1976, 51-91836**
**Int. Cl.³ G01D** *15/06*
**U.S. Cl. 346—153.1** **16 Claims**



1. A recording apparatus comprising:
an image bearing member;
means for forming continual images on said image bearing member;
means for feeding a continuous transfer material to a transfer station;
means for transferring the images formed on said image bearing member onto the continuous transfer material;
means for fixing the transferred images on the transfer material; and
means, responsive to the start and stop of operation of said image forming means, for controlling the actuation of said feeding means, transferring means, and fixing means at different delayed times from each other to transfer a series of images from said image bearing member onto desired portions of said continuous transfer material irrespective of image location on said image bearing member.

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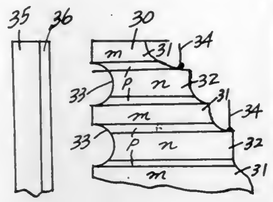
**4,297,717**
**SEMICONDUCTOR DEVICE**

**Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576**

**Continuation-in-part of Ser. No. 7,584, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 764,433, Jan. 31, 1977, Pat. No. 4,136,435, which is a continuation-in-part of Ser. No. 405,138, Oct. 10, 1973, abandoned, which is a continuation of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, Ser. No. 386,102, Aug. 6, 1973, and Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, which is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned. This application Aug. 24, 1979, Ser. No. 69,298**
**Int. Cl.³ H01L** *29/64*
**U.S. Cl. 357—15** **17 Claims**

1. An active solid state structure comprising:
a metal substrate sheet and a layer of solid material adhered to the metal substrate sheet;
said solid material comprising a multiplicity of elongated bodies of a single crystal semiconductor device material spaced from each other by similarly elongated bodies of a metal, there being electronic barriers between said elongated bodies of the semiconductor material and elongated bodies of metal; and
said elongated bodies of semiconductor material and of a metal and said electronic barriers therebetween being



formed concurrently with each other as an integral structure by a temperature gradient process.

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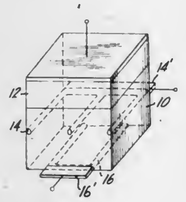
**4,297,718**
**VERTICAL TYPE FIELD EFFECT TRANSISTOR**

**Jun-Ichi Nishizawa, Sendai, and Takashi Kitsuregawa, Itami, both of Japan, assignors to Semiconductor Research Foundation Mitsubishi Denki K.K., Japan**

**Continuation-in-part of Ser. No. 469,017, May 10, 1974, abandoned. This application Jun. 8, 1976, Ser. No. 693,894**
**Claims priority, application Japan, May 22, 1973, 48-58054**
**Int. Cl.³ H01L** *29/80*
**U.S. Cl. 357—22** **3 Claims**



1. A vertical type field effect transistor comprising a semiconductor substrate including a pair of main opposite faces, a source electrode, a gate electrode, and a drain electrode, at least one of said source, gate and drain electrodes being disposed on one of said main opposite faces, at least one of the remaining electrodes being disposed on the other main face of the substrate, an input terminal and an output terminal, wherein at least two highly doped semiconductor regions form respective ones of said electrodes and are formed elongated and slender and having a dimension and impurity concentration imparting thereto a low resistance in a direction of travel of an electromagnetic wave traveling therein to form a transmission line whereby the transistor performs in a traveling wave mode of operation, and wherein said transmission line includes a common line defined by one of said source and gate electrodes, an input line defined by said common line and the other of said source and gate electrodes, and an output line defined by said common line and said drain electrode, and said input and output terminals are disposed on opposite sides of said transistor substrate and respectively connected to said input line and said output line.

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**4,297,719**
**ELECTRICALLY PROGRAMMABLE CONTROL GATE INJECTED FLOATING GATE SOLID STATE MEMORY TRANSISTOR AND METHOD OF MAKING SAME**

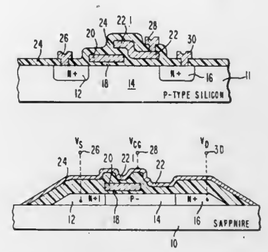
**Sheng T. Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Aug. 10, 1979, Ser. No. 65,436**
**Int. Cl.³ H01L** *29/78*
**U.S. Cl. 357—23** **11 Claims**

1. A non-volatile memory structure of the type including a



conductive floating gate storage device having a floating gate member for storing charge injected thereon, a conductive control gate member, a body of semiconductor material in which spaced drain and source regions of a first conductivity type are embedded at the surface thereof, the drain and source regions spaced a given distance one from the other to define a channel region of an opposite conductivity type therebetween, a drain-channel junction formed at the boundary of the drain and channel regions, a source-channel junction formed at the boundary of the source and channel regions, a first layer of insulating material deposited on the body of semiconductor material over the channel region for insulating the floating gate



member from the channel region, and a second layer of insulating material deposited on the floating gate member for insulating the floating gate member, the improvement comprising:
the floating gate member offset in the channel region in a direction toward the source region; and
a write-erase window portion located in a region of the control gate member, the window portion positioned over only a portion of the floating gate member and in closer proximity to the floating gate member than the remainder of the control gate member whereby charge is injected into the floating gate member solely from the window portion of the control gate member.

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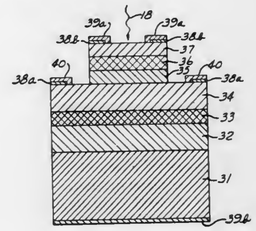
**4,297,720**
**MULTI-PHOTODIODES**

**Hideaki Nishizawa, and Shin-Ichi Iguchi, both of Nishinomiya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Jul. 19, 1979, Ser. No. 59,118**
**Claims priority, application Japan, Jul. 21, 1978, 53-89690**
**Int. Cl.³ H01L** *27/14, 29/161*
**U.S. Cl. 357—30** **5 Claims**



1. Multi-photodiodes comprising a first photodiode, having a photo-sensitive region with a forbidden band-gap $E_1$, and a second photodiode, having a photo-sensitive region with a forbidden band-gap $E_2$, each photodiode consisting of p-n structures or p-i-n structures of semiconductor compounds, said first and second photodiodes integrated into one body with an intermediate connecting semiconductor compound layer of at least one of said photodiodes providing a filter layer having a forbidden band-gap $E_3$, said forbidden band-gaps $E_1$, $E_2$, and $E_3$ being under the condition of $E_1 < E_3 < E_2$.

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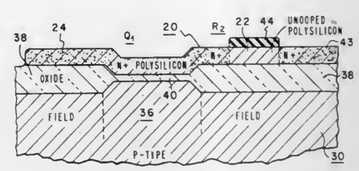
**4,297,721**
**EXTREMELY LOW CURRENT LOAD DEVICE FOR INTEGRATED CIRCUIT**

**Vernon C. McKenny, and Tsiu C. Chan, both of Carrollton, Tex., assignors to Mostek Corporation, Carrollton, Tex.**

**Division of Ser. No. 957,587, Nov. 3, 1978, which is a continuation of Ser. No. 743,810, Nov. 22, 1976, abandoned. This application May 29, 1979, Ser. No. 43,419**
**Int. Cl.³ H01L** *29/04*
**U.S. Cl. 357—59** **10 Claims**



1. A semiconductive impedance structure comprising:
a substrate of monocrystalline semiconductor material;
an insulating layer deposited over a portion of a surface of said substrate;
a unitary body of substantially intrinsic polycrystalline semiconductor material disposed on a portion of said insulating layer defining a first conductive path;
A doped area of extrinsic impurities of a first conductivity type disposed within a first region of said unitary body defining a second conductive path, an intrinsic-extrinsic junction being defined by the interface of the extrinsic diffusion region within the unitary intrinsic body;
the first and second conductive paths defining a series electrical path for the flow of current through the intrinsic-extrinsic junction.

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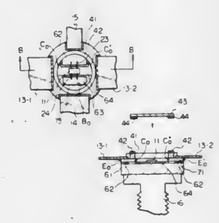
**4,297,722**
**CERAMIC PACKAGE FOR SEMICONDUCTOR DEVICES HAVING METALIZED LEAD PATTERNS FORMED LIKE A FLOATING ISLAND**

**Tsutomu Nagahama, Kawasaki, and Michio Ishihara, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 18, 1979, Ser. No. 76,577**
**Claims priority, application Japan, Sep. 18, 1978, 53-127835[U]**
**Int. Cl.³ H01L** *23/02, 23/12, 39/02*
**U.S. Cl. 357—74** **6 Claims**



1. A transistor device comprising:
a first ceramic plate which is provided with an emitter lead, a base lead and a collector lead, these emitter, base and collector leads being formed as metallized layers on the plate and being electrically connected to the correspond-

ing base, emitter and collector areas of a transistor chip element which is also mounted on the first ceramic plate; and

a second ceramic plate which is provided with an emitter guide lead, a base guide lead and a collector guide lead, these emitter, base and collector guide leads being formed as metallized layers on the plate and having corresponding emitter, base and collector lead terminals, respectively, wherein the emitter, base and collector leads of the first ceramic plate are electrically connected to the corresponding emitter, base and collector guide leads of the second ceramic plate, respectively, by means of respective conductive paths formed longitudinally along and on the side surface of the second ceramic plate.

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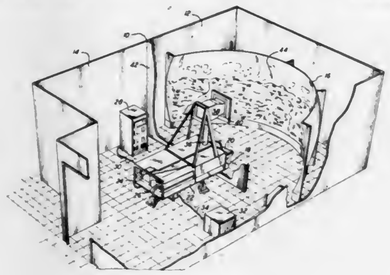
**4,297,723**

## WIDE ANGLE LASER DISPLAY SYSTEM

**Clyde M. Whitby, Duncanville, Tex., assignor to The Singer Company, Binghamton, N.Y.**

**Filed Jan. 28, 1980, Ser. No. 107,686**
**Int. Cl.³ H04N *9/31***
**U.S. Cl. 358—60** **4 Claims**



1. A scanned light beam video display apparatus for use with a viewing surface, comprising:

(a) light means for providing three groups of light beams, each group comprising a plurality of beams of substantially monochromatic light such that the light of each group corresponds to a different one of the three primary colors;

(b) video means for providing three groups of video signals, each group comprising a plurality of primary color video channel signals, such that each group of signals corresponds to a different one of the three color video channels for a plurality of contiguous scene parts to be viewed;

(c) light modulation means associated with said light means and said video means and responsive to said three groups of video signals for intensity modulating said three groups of light beams in accordance with the video information contained in said signals to produce three groups of intensity modulated light beams, each group of modulated beams comprising a plurality of beams of substantially monochromatic light corresponding to a different one of the three primary colors, each of said plurality of beams within each said group being intensity modulated in accordance with the video information of one of the three color video channels for a different one of said plurality of contiguous scene parts to be viewed;

(d) light combining and parallelizing means for combining said three groups of modulated light beams such that each of said modulated beams corresponding to the channels of each one of said contiguous scene parts is combined so as to form composite beams of video intensity modulated light for raster scanning to form each of said contiguous scene parts, thereby producing a plurality of said composite beams in parallel relationship;

(e) single scanning means for scanning simultaneously said plurality of parallel composite beams in the pattern of a TV raster for each;

(f) projection means for projecting said plurality of raster scanned composite beams onto the viewing surface; and

(g) beam separation means for spatially separating said projected plurality of raster scanned composite beams such that said separated beams raster scan said scene parts contiguously onto the viewing surface to form a single continuous scene.

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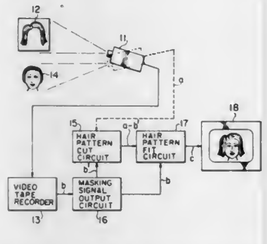
**4,297,724**

## METHOD AND MACHINE FOR TRYING ON A HAIR FORM IN IMAGE

**Tatsunosuke Masuda; Yoshio Ono, and Seiya Sakamoto, all of Kyoto, Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha and Takara Belmont Co., Ltd., both of, Japan**

**Filed Jan. 23, 1980, Ser. No. 114,947**
**Claims priority, application Japan, Jan. 24, 1979, 54-7375; Mar. 12, 1979, 54-28454**
**Int. Cl.³ H04M *7/18***
**U.S. Cl. 358—93** **11 Claims**




1. A method for trying on a hair form in image, comprising:

photographing a face shape and a hair pattern by a video camera to obtain first and second signals respectively corresponding to face shape and hair pattern;

preparing a third signal for masking the hair pattern portion in the face shape by using said second, hair pattern representing signal;

combining said third signals with said first signal so as to mask effectively the hair pattern portion of the face shape;

adding said second signal to the modified first signal so as to effectively add the hair pattern to partially masked face shape signal, thereby obtaining a fourth composite signal for making the face shape with the hair pattern thereon; and

displaying the fourth signal to generate a face shape with the desired hair pattern thereon in a display means.

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**4,297,725**

## METHOD FOR MEASUREMENT OF DISPLACEMENT OF MOVING BODY BY USE OF TARGET MARK AND APPARATUS THEREFOR

**Ken-Ichi Shimizu, Tokorozawa, and Chuji Ikeya, Higashi-Murayama, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan**

**Filed Aug. 21, 1979, Ser. No. 68,438**
**Claims priority, application Japan, Aug. 24, 1978, 53-103211**
**Int. Cl.³ H04N *7/18***
**U.S. Cl. 358—125** **6 Claims**

1. A method for the measurement of the displacement of a moving body by use of a target mark placed on the body, which target mark has two quarter shaded dark areas symmentrically opposed to each other, comprising the steps of:

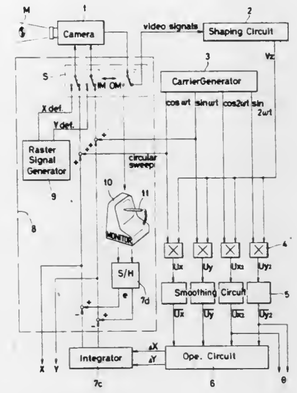
(a) taking the image of the target mark with an image pickup tube by causing carriers for circular sweep to be respectively superposed on the relative deflection voltages, thereby to produce video signals;



(b) shaping an alternating current component of the video signals to produce a bistable video signal;

(c) subjecting said bistable video signal with each of said carriers and with sub-carriers having a frequency two times that of said carriers to synchronous rectification and smoothing, thereby to produce mean values ($\overline{U}_x$ and $\overline{U}_y$) for said carriers and mean values ($\overline{U}_{x2}$ and $\overline{U}_{y2}$) for said sub-carriers, the ratio of said mean values for the sub-carriers being equivalent to the angular displacement;

(d) calculating the deviation values ($\Delta X$ and $\Delta Y$) of the center of the target mark from the center of the circular sweep in accordance with the formulas:




$$\Delta X = \overline{U}_x \cdot \overline{U}_{x2} = \overline{U}_y \cdot \overline{U}_{y2}$$

$$\Delta Y = \overline{U}_x \cdot \overline{U}_{y2} = \overline{U}_y \cdot \overline{U}_{x2};$$

and

(e) feeding back to the deflecting system of the image pickup tube said deviation values as deflection-correcting voltages, thereby to cause the center of the circular sweep to coincide with that of the target mark, whereby the positional displacement of the target mark is determined on the basis of said deviation values and the angular displacement is determined on the basis of said mean values for the sub-carriers.

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**4,297,726**

## TELEVISION RECEIVER CHASSIS ADAPTED TO BE COMPATIBLE WITH DIFFERENT TUNER AND CABINET CONFIGURATIONS

**John E. Nicholson, Indianapolis, and Paul C. Wilmarth, Noblesville, both of Ind., assignors to RCA Corporation, New York, N.Y.**

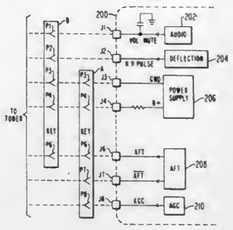
**Filed Feb. 7, 1980, Ser. No. 114,872**
**Int. Cl.³ H04N *5/655***
**U.S. Cl. 358—254** **8 Claims**

1. A television receiver chassis containing television signal processing circuits including a plurality of different signal points, adapted for assembly with either a first or a second television receiver subsystem having different signal interface requirements with said chassis to form a television receiver, said first subsystem including a first connector coupled to the subsystem, said first connector including a first array of unblocked contact holes and one blocked contact hole, and said second subsystem including a second connector coupled to said second subsystem, said second connector including a second array of unblocked contact holes and one blocked contact hole; said television receiver chassis comprising:

an array of terminal locations, the number of said locations being equal to or greater than the number of contact holes in each connector, each of said locations being occupied by a terminal, with the exception of a blank terminal location which does not contain a terminal;

means for coupling said terminals to respective ones of said plurality of different signal points,

wherein a first combination of some of said terminal locations including said blank terminal location is capable of




engaging said first connector when said blank terminal location is aligned with said blocked hole of said first connector, and wherein a second different combination of said terminal locations including said blank terminal location is capable of engaging said second connector when said blank terminal location is aligned with said blocked hole of said second connector.

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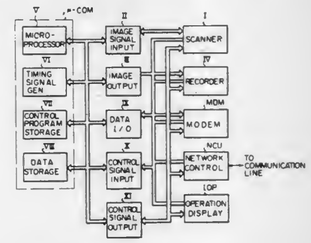
**4,297,727**

## FACSIMILE APPARATUS

**Mutsuo Ogawa; Yuji Koseki; Yuichi Saitoh; Shingo Yamaguchi, and Shigeru Katsuragi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jun. 30, 1980, Ser. No. 164,466**
**Claims priority, application Japan, Jul. 9, 1979, 54-85826**
**Int. Cl.³ H04M *1/00***
**U.S. Cl. 358—261** **12 Claims**




1. A facsimile apparatus comprising:

scanner means;

recorder means;

microcomputer means having a central processing unit, a read only memory containing an operating program and a random access memory;

modem means;

first interface means connected between the scanner means and the microcomputer means;

second interface means connected between the microcomputer means and the modem means; and

third interface means connected between the microcomputer means and the recorder means;

in a transmission mode, the operating program controlling the microcomputer means to store image data from the scanner means in a first section of the random access memory through the first interface means, encode the data

and store the encoded data in a second section of the random access memory and transfer the encoded data from the second section of the random access memory through the second interface means to the modem for transmission;

in a reception mode, the operating program controlling the microcomputer means to store encoded data received through the modem in the second section of the random access memory through the second interface means, decode the data and store the decoded data in the first section of the random access memory and transfer the decoded data from the first section of the random access memory through the third interface means to the recorder for producing a facsimile reproduction.

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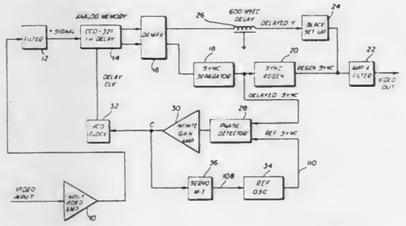
**4,297,728**

## CHARGED COUPLED DEVICE TIME BASE CORRECTOR SYSTEM

**Virgil L. Lowe, 1411 Noble Forest Dr., Norcross, Ga. 30092**

**Filed Apr. 6, 1979, Ser. No. 27,926**
**Int. Cl.[3] H04N** *5/04, 5/785*
**U.S. Cl. 360—36** **6 Claims**




1. An analog video time base corrector system comprising:

input circuit means for receiving a video signal including synchronization information from a source, said input circuit means having an output;

analog delay line means coupled to said output of said input circuit means for delaying said video signal and said included synchronization information, said analog delay line means having first and second outputs;

first feedback circuit means coupled to the first output of said analog delay line means for controlling the delay thereof in response to said delayed synchronization information contained in said delayed video signal, said first feedback circuit means including an infinite gain phase detector means coupled to the first output of said delay line means for comparing the delayed synchronization information contained in said delayed video signal with a reference synchronization signal to detect the phase error in said delayed synchronization information, said phase detector means producing an output signal which is coupled through an infinite gain voltage amplifier to an input of a voltage controlled clock generator means, said clock generator means supplying a clock signal to a clock input of said delay line means, said clock signal having a frequency proportional to the phase error of said delayed synchronization information;

second feedback circuit means coupled to receive the output of said infinite gain voltage amplifier of said first feedback circuit means for supplying said reference synchronization signal to said first feedback circuit means, said second feedback circuit means including an adaptive time constant amplifier means coupled to receive the output of said infinite gain voltage amplifier for automatically controlling the response rate of said second feedback circuit means based upon the phase error of said synchronization information, said second feedback circuit means further including a first voltage controlled oscillator means coupled to receive the output of said adaptive amplifier means for generating said reference synchronization signal; and

output circuit means coupled to the second output of said analog delay line means and coupled to receive said delayed synchronization information for interfacing the delayed output of said analog delay line means with circuitry external to said video time base corrector system;

whereby said system acts to slowly correct small phase errors and to rapidly correct large phase errors in synchronization timing such that a stable output video signal is produced for a wide range of input synchronization errors.

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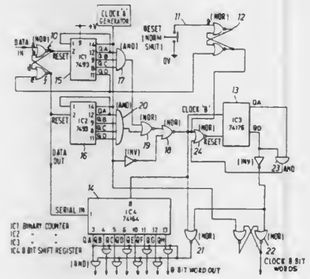
**4,297,729**

## ENCODING AND DECODING OF DIGITAL RECORDINGS

**James H. Steynor, High Wycombe, and Frederick Hayes, Southall, both of England, assignors to EMI Limited, Hayes, England**

**Filed Nov. 20, 1978, Ser. No. 961,933**
**Claims priority, application United Kingdom, Nov. 24, 1977, 48917/77**
**Int. Cl.[3] G11B** *5/09*
**U.S. Cl. 360—40** **11 Claims**




1. An arrangement for generating controlled clock pulses synchronized to a signal comprising a sequence of '1's, each indicated by the presence of a signal pulse and '0's each indicated by the absence of a signal pulse, so that in a sequence of consecutive '0's no signal pulses are present, the arrangement including a first counter receiving the said signal and arranged to count for a first predetermined period from a predetermined point in relation to each '1' of said signal and to provide a controlled clock pulse synchronized to said signal at the termination of the first period, a second counter arranged to count for a second and longer predetermined period from a preceding controlled clock pulse or until reset prior to the termination of said period and, if not reset, to provide at the termination of said second period a further controlled clock pulse and means for resetting the second counter on reception of a further '1' at the first counter.

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**4,297,730**

## MAGNETIC RECORDING AND REPRODUCING DEVICE

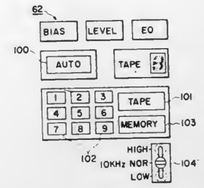
**Hidetaka Kadowaki; Akira Inomata; Kiyoshi Yanagida; Tsunao Hasegawa; Satoshi Ishii, and Yasushi Ohtake, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**PCT No. PCT/JP00051, § 371 Date Nov. 1, 1979, §102(e) Date Oct. 29, 1979, PCT Pub. No. WO79/00715, PCT Pub. Date Oct. 4, 1979.**
**This PCT application filed Nov. 1, 1979, Ser. No. 174,389**
**Int. Cl.[3] G11B** *5/47, 15/12*
**U.S. Cl. 360—66** **11 Claims**

1. A magnetic recording and reproducing device comprising: means for setting an optimum recording bias current, said optimum recording bias current being set by varying a record-



ing bias current at arbitrary time intervals and digitally storing and operating reference recording/reproducing signals corresponding to the recording bias current thus varied; means for setting an optimum recording level, said optimum recording level being set by varying a recording level at arbitrary time intervals and comparing reference recording/reproducing signals corresponding to the record level thus varied with a reference level; and means for setting an optimum recording




equalization characteristic, said optimum recording equalization characteristic being set by varying a recording equalization characteristic at arbitrary time intervals and comparing high frequency band reference recording/reproducing signals corresponding to the record equalization characteristic thus varied.

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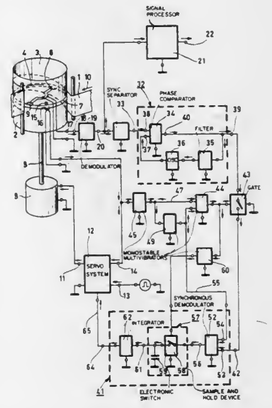
**4,297,731**

## PLAYBACK APPARATUS FOR CORRECTING LOCKING ERRORS

**Harald Melwisch, Vienna, Austria, and Hendrikus Looren de Jong, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 807,976, Jun. 20, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,019**
**Claims priority, application Austria, Jul. 30, 1976, 5674/76**
**Int. Cl.[3] G11B** *27/10, 21/10*
**U.S. Cl. 360—70** **4 Claims**




1. A tracking error detector for a playback apparatus having a rotary transducer with at least two magnetic heads whose effective gaps have mutually different azimuth angles for detecting television signals containing synchronizing pulses recorded on a record carrier in oblique signal tracks, said detector comprising means coupled to said magnetic heads for separating said synchronizing pulses from the detected television signal, means coupled to said separating means for detecting the phase shift between two consecutive synchronizing pulse trains each associated with a respective one of a pair of adjacent signal tracks and for supplying an output signal of a magnitude and polarity indicative of said phase shift which corresponds to the combined effects of tracking error and length variations of said record carrier, and means for removing from said output signal components due to length variations of said record carrier.

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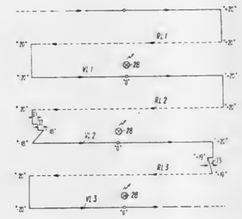
**4,297,732**

## METHOD AND DEVICE FOR LOCATING A SOUND EVENT ON A MAGNETIC TAPE

**Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria**

**Filed May 25, 1979, Ser. No. 42,690**
**Claims priority, application Austria, Jun. 5, 1978, 4045/78**
**Int. Cl.[3] G11B** *15/18, 19/02*
**U.S. Cl. 360—72.1** **26 Claims**




1. A method for coordination of a location signal to a sound event stored on a magnetic tape in a magnetic tape device, particularly for ascertaining the precise location of the beginning and/or end of the sound event on the tape with respect to a reference point on the tape device, comprising the steps of

starting the playback of the tape which contains the sound event from a point before the sound event,

upon hearing the sound event activating a counter to set it to count condition zero and via the counter initiating a detectable location signal automatically when the counter is at the count condition zero and simultaneously causing the counter to count forward with counts of the counter being dependent on the length of tape being transported by the tape device,

subsequently reversing the magnetic tape to travel back at least to the sound event and causing the counter to count backwards dependent on the transported length of the tape in the reverse direction,

repeating playback of the tape together with operation of the counter to count forward, causing the location signal to occur automatically when the counter reaches the count condition zero and the sound event to occur when the sound event plays on the tape device,

perceiving and estimating the time relationship between the played back sound event and the occurring location signal,

changing a count condition of the counter based on the perceived and estimated time relationship between the sound event and the location signal so that a subsequent occurrence of the location signal is shifted vis-a-vis the played back sound event during a subsequently repeated playback step,

repeating the perception and estimation, changing, reversing and repeating playback steps so as to progressively shift the then occurring location signal vis-a-vis the then played back sound event until the location signal and the played back sound event are perceived as substantially concurrent by the user and are thereby correlated, and

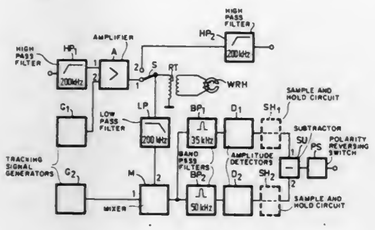
positioning the sound event on the magnetic tape with respect to a reference point on the tape device using the correlated location signal.

**4,297,733**

## METHOD OF CONTROLLING THE POSITION OF A WRITE OR READ HEAD AND A DEVICE FOR CARRYING OUT THE METHOD

**Hendrik J. Sanderson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 880,437, Feb. 23, 1978, abandoned.**
**This application Apr. 1, 1980, Ser. No. 136,235**
**Claims priority, application Netherlands, Mar. 16, 1977, 7702815**
**Int. Cl.³ G11B** *5/52, 21/10*
**U.S. Cl. 360—77** **6 Claims**




1. A method of detecting the position of a magnetic recording/playback head relative to one of four or more tracks on a record carrier, said tracks containing first information signals and at least four consecutive tracks containing second tracking signals having mutually different frequencies recorded therein in cyclic sequence, said frequencies of said tracking signals being different from frequencies of said information signals, said method comprising the steps of generating a third signal having a frequency which changes from track to track in relation to the frequency of said tracking signals such that, for a given pair of adjacent tracks, the frequency of the third signal associated with one track of said pair differs from the frequency of the tracking signal recorded on the other track of said pair by one of a first and second predetermined number of cycles which are different from each other, subtracting the frequency of said third signal associated with said one track from the frequencies of tracking signals in the tracks adjacent said one track to produce a pair of fourth signals each having a frequency corresponding to said first and second number of cycles, respectively, and obtaining from said pair of fourth signals a resultant signal indicative of displacement of said head from the track being read.

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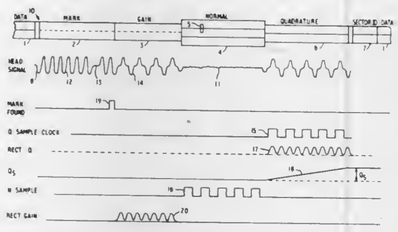
**4,297,734**

## SAMPLED DATA SERVO POSITIONING SYSTEM

**William J. Laishley, and John R. Taylor, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 107,120**
**Claims priority, application United Kingdom, Dec. 27, 1978, 49980/78**
**Int. Cl.³ G11B** *21/08, 21/10*
**U.S. Cl. 360—78** **13 Claims**

1. A sampled data servo positioning system for moving a member between a current and a target position comprising:
- an actuator responsive to applied drive signals to move such a member;
- a position transducer movable with the member for producing signals in response to motion thereof;
- position signal generating means responsive to the position transducer signals to produce at least one incremental position signal representative of the position of the member at sampling times;
- a model responsive to an input signal to produce at least one continually available model incremental position signal;
- profile signal generating means for generating a profile signal, corresponding to a predetermined velocity profile, as an input signal for the model;
- phase comparing means for comparing and indicating the phase difference between the sampled and model position signals at the sampling times;
- actuator feedforward signal generating means for generating a feedforward control signal for the actuator corresponding to the predetermined velocity profile;
- and stage indicating means for indicating various stages of the motion in accordance with predetermined conditions;
- the system being characterized by switching means responsive to the stage indicating means to switch the system between first and second operational configurations, by a source of saturation control signals of opposite polarity for application to the actuator to cause maximum acceleration or deceleration thereof,




- and by means for deriving a continuous performance signal representative of actuator motion; and wherein, in the first operational configuration, the switching means connects the saturation control signal source to the actuator and connects a combination of the actuator performance signal as a feedforward input and the position phase difference signal as a feedback input to the model so that the model tracks the actuator system,
- and wherein, in the second operational configuration, the switching means connects the model input profile signal to the model, and connects a combination of the actuator feedforward control signal as a feedforward input and the position phase difference signal as a feedback input to the actuator so that the actuator tracks the model.

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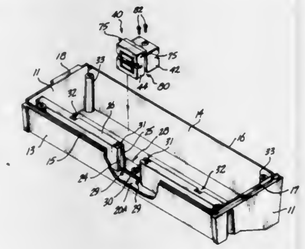
**4,297,735**

## MANUALLY OPERABLE MAGNETIC CARD READER AND MAGNETIC HEAD ASSEMBLY THEREFOR

**Helmut Eppich, West Vancouver, Canada, assignor to EBCO Industries, Ltd., Richmond, Canada**

**Filed Jul. 26, 1979, Ser. No. 60,776**
**Int. Cl.³ G11B** *21/20, 5/48*
**U.S. Cl. 360—104** **24 Claims**



1. For use in a magnetic card reader which includes a housing defining a housing slot through which a card is manually moved, by grasping the card and sliding the card along the housing slot, to effect reading of data magnetically recorded on the card, a magnetic head assembly separate from the housing and comprising:
- block means having formed therein a block slot through which the card passes as the card is manually moved through the housing slot, and also having formed therein first and second apertures extending into said block means from said block slot and opposing each other across said block slot;
- a magnetic reading head in said first aperture and a pressure pad in said second aperture, and separate means respectively mounting said magnetic reading head and said pressure pad in there respective apertures for reciprocal motion therein to and from said block slot; and
- means yieldably biasing said magnetic reading head and said pressure pad toward said block slot.



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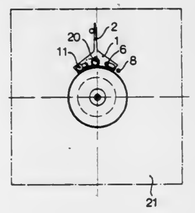
**4,297,736**

## DEVICE FOR ADJUSTING AND FIXING DETECTING MEANS RELATIVE TO THE INDEX MARK ON A RECORDING DISC

**Klaus Manzke, Westheim; Roland Brotzler, Hochdorf-Assenheim, and Klaus Schulze-Berge, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 27, 1979, Ser. No. 106,891**
**Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 7900696[U]**
**Int. Cl.³ G11B** *7/08, 17/00, 3/86*
**U.S. Cl. 360—109** **3 Claims**




1. A device for adjusting and fixing an index-mark-detecting means relative to the index mark on a recording disc, which device is arranged on a recording/reproducing apparatus for the recording disc and comprises a holding device for a detecting means, the position of which can be altered and which can be aligned and fixed relative to the index mark on the disc, wherein the holding device for the detecting means is a slidably mounted member which has at least one elongated hole and is spring-loaded against the chassis of the apparatus, said member moving on an arcuate path defined by the curved line passing centrally through the elongated hole and the middle of the detecting means.

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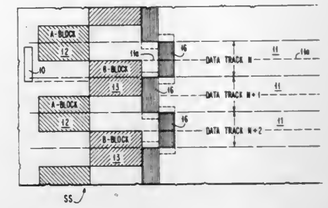
**4,297,737**

## SECTOR SERVO WITH SYNC MARKS

**Rolf Andresen, and John H. Christian, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 107,104**
**Int. Cl.³ G11B** *5/82, 21/10*
**U.S. Cl. 360—135** **5 Claims**

1. A track following disk file including a record storage disk having a plurality of circumferentially spaced apart servo signal sectors, each sector having servo signals identifying a data track location line for track following, said data track locations containing recorded data signals, each of said servo sectors for each of said data track locations lines including a sync signal recorded adjacent a trailing edge of a servo signal and centered on said data track location line,
- each said sync signal including recorded information relative to the validity of the servo signals in its associated sector,
- transducing means for reproducing said servo signals, said sync signals and said data signals,
- means for separating said sync signals from said reproduced signals,




- means operative only during the approximate time interval of occurrence of each of said sync signals for decoding each said sync signal to determine the validity of the servo signals in its associated sector, and
- means for modifying any of said sync signals indicating valid servo signals if said servo signals subsequently become invalid.

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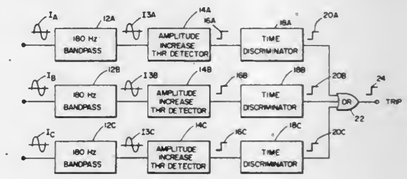
**4,297,738**

## APPARATUS FOR AND METHOD OF DETECTING HIGH IMPEDANCE FAULTS ON DISTRIBUTION CIRCUITS WITH DELTA CONNECTED LOADS

**Ilyoul Lee, Pacific Palisades, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed Oct. 29, 1979, Ser. No. 89,202**
**Int. Cl.³ H02H** *3/16*
**U.S. Cl. 361—42** **6 Claims**



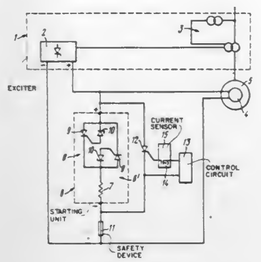

1. A device for use in detecting high impedance faults in a three-phase distribution circuit with delta connected load, said device comprising first means for providing the third harmonic current component from each three phase line current of said distribution circuit, second means connected with said first means for sensing the presence of a predetermined minimum increase in amplitude in each of said third harmonic components, and third means connected with said second means for producing a signal in response to the presence of said increase in any one of said components for a continuous predetermined period of time, said signal indicating a high impedance fault in the line carrying said one component.

**4,297,739**

## DEVICE FOR EXCITING SYNCHRONOUS MACHINE

**Rodion G. Goldin, ulitsa Mamina-Sibiryaka, 8, kv. 56, and Valentin G. Yakimenko, ulitsa Taganskaya, 48, kv. 89, both of Sverdlovsk, U.S.S.R.**

**Filed Jul. 30, 1979, Ser. No. 62,177**
**Int. Cl.³ H02H** *7/06, 7/09*
**U.S. Cl. 361—55** **4 Claims**




1. A device for exciting a synchronous machine, comprising:
an exciter electrically connected to an exciting winding of said synchronous machine;
a starting unit connected parallel to said exciter and comprising at least one branch composed of a resistor and a thyristor switch placed in series, each branch protecting said exciting winding of said synchronous machine and said exciter against overvoltages during transient operation conditions; and a control circuit of said thyristor switch including voltage actuated threshold elements making thyristors of said thyristor switch conductive in order to activate said branch when voltage in said exciting winding exceeds the setting of said threshold element;
at least one safety device connected in series in the circuit of a respective branch of the starting unit and disconnecting said respective branch in case of a fault in said respective branch;
at least one protective thyristor connected parallel to a respective branch of the starting unit to bypass said respective branch in case of a fault in said respective branch;
at least one current sensor of a respective branch of the starting unit connected in said respective branch and having a delayed-action commutator;
at least one control circuit of a respective protective thyristor connected to a control electrode of said respective protective thyristor via a respective delayed-action commutator of said sensor, said control circuit of said protective thyristor producing a control pulse making the protective thyristor conductive when said commutator closes the current flowing in said respective branch of the starting unit increases beyond a permissible level.

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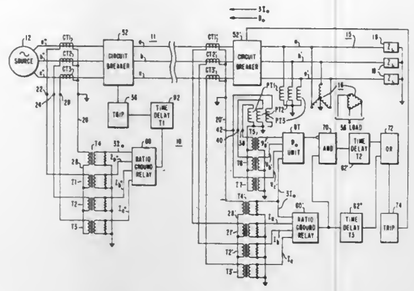
**4,297,740**

## PROTECTIVE RELAYING APPARATUS

**John E. Hagberg, Mountain Lakes, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 5, 1979, Ser. No. 9,012**
**Int. Cl.³ H02H** *3/28*
**U.S. Cl. 361—67** **8 Claims**

1. Protective relaying apparatus for detecting and clearing high impedance faults on a polyphase electrical distribution circuit, comprising:
a polyphase source of alternating potential,
a polyphase distribution circuit,
a load circuit,
a first circuit breaker for controlling the connection of the distribution circuit to the source,
a second circuit breaker for controlling the connection of the distribution circuit to the load circuit,
first and second ratio ground relays at the first and second circuit breakers, respectively, for tripping the associated circuit breaker after a predetermined delay time when the ratio of zero sequence current to a predetermined phase current related quantity indicates a fault condition,




and a zero sequence directional relay at the second circuit breaker for coordinating the first and second ratio ground relays by adjusting the trip delay time of the second circuit breaker relative to the trip delay time of the first circuit breaker, in response to the flow direction of a zero sequence quantity at the second circuit breaker.

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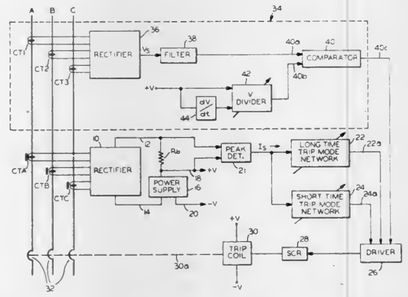
**4,297,741**

## RATE SENSING INSTANTANEOUS TRIP MODE NETWORK

**Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.**

**Filed Sep. 4, 1979, Ser. No. 72,374**
**Int. Cl.³ H02H** *3/08*
**U.S. Cl. 361—93** **10 Claims**




1. For protecting an AC electrical power distribution circuit against high level fault currents, an instantaneous trip mode network comprising, in combination:
A. a separate air-core current transformer linked with each phase conductor of the distribution circuit and including a multi-turn secondary winding in which is developed a sinusoidal secondary voltage signal proportional to the rate of change of the phase current flowing in the linked phase conductor;
B. a diode rectifying network connected with said secondary winding of each said air-core transformer for developing a rectified voltage signal corresponding to the one of said secondary voltage signals having the greatest magnitude;
C. a signal input circuit connected to receive said rectified voltage signal, said circuit including
(1) an input lead on which appears a voltage input signal proportional to said rectified voltage signal,



(2) capacitance means connected with said input lead for filtering from said voltage input signal spurious, short duration, high amplitude voltage spikes which are not indicative of ultimate phase current peak amplitude, and
(3) said input circuit affording effective charging and discharging current paths for said capacitance means such that said voltage input signal constitutes a rectified sinusoidal wave continuously reflecting the rate of change of that one of the phase currents having the greatest magnitude;
D. detector means connected with said input lead to receive said voltage input signal and operating to issue a circuit breaker trip initiating signal when said voltage input signal achieves a pre-selected threshold voltage level, whereby to predicate circuit breaker tripping solely on the change of phase current with respect to time exceeding a pre-selected rate.

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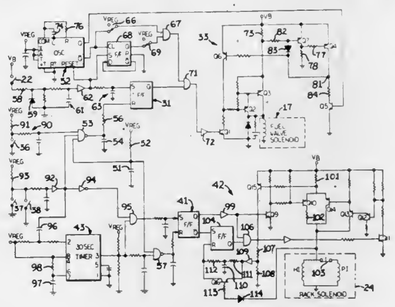
**4,297,742**

## ENGINE AND FUEL SHUTDOWN CONTROL

**Gary N. Heitzman, Washington; Clay L. Hutchings, Pekin; Gary L. Knepp, Eureka, and Robert G. Miller, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Division of Ser. No. 823,770, Aug. 11, 1977, Pat. No. 4,150,654. This application Jan. 8, 1979, Ser. No. 1,816**
**Int. Cl.³ H01H** *47/04*
**U.S. Cl. 361—154** **30 Claims**



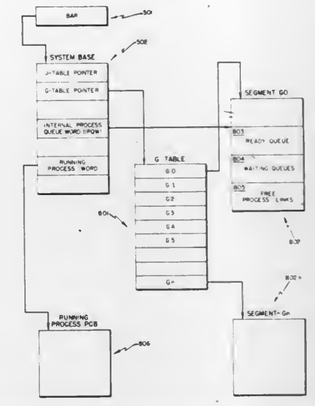
1. Apparatus for controlling solenoid operation comprising:
a solenoid,
a source of electrical energy,
a control switch having an operative position,
a settable and resettable latch means,
means for setting said latch means in response to movement of said control switch to its operative position,
means for connecting said solenoid to said source of electrical energy in response to movement of said control switch to its operative position and for supplying full current to said solenoid from said source for a desired period of time following such switch movement,
means for automatically reducing the level of current flowing from said source to said solenoid at the end of said desired period of time and for maintaining said reduced-level current to said solenoid for as long as said latch means is set,
means for resetting said latch means and for thereby terminating the flow of current from said source to said solenoid.

**4,297,743**

## CALL AND STACK MECHANISM FOR PROCEDURES EXECUTING IN DIFFERENT RINGS

**Marc Appell, Paris; Jean-Louis Bogaert, Clamart; Claude Massuard, Paris; John Bradley, Garches, all of France, and Benjamin S. Franklin, Cambridge, Mass., assignors to Compagnie Honeywell Bull, Paris, France**

**Continuation of Ser. No. 529,019, Dec. 2, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,814**
**Claims priority, application France, Nov. 30, 1973, 73 42705**
**Int. Cl.³ G06F** *9/46*
**U.S. Cl. 364—200** **32 Claims**




1. In combination with an automatic data processing apparatus comprising a virtual memory having a plurality of segments, each of some of said segments storing one of a plurality of procedures to be executed by said automatic data processing apparatus with privilege protection between said procedures, a central processing unit (CPU) connectable with said virtual memory to transfer data to and from said virtual memory, said CPU for processing information under control of a selected one of said plurality of procedures, each of said plurality of procedures having at least one level of privilege, said CPU having a plurality of registers for indicating the state of said selected procedure currently in control of said CPU, said virtual memory further having a push-down store for storing a plurality of different types of groups of information in stacks wherein the last group of information stored is the top of the stack, said groups of information being accessed in last-in-first-out fashion, each of said stacks being included within a uniquely addressable space bounded by one of said plurality of segments having adjustable bounds; a procedure call mechanism comprising:
(a) first means for initiating a transfer of control of said CPU from a first procedure stored in a first of said plurality of segments to a second of said plurality of procedures, by providing a call signal to said second procedure;
(b) second means responsive to said call signal for defining a plurality of data organizations, each of said data organizations having a predetermined format and being associated with a corresponding one of said plurality of procedures to receive data facilitating the transfer of control of said CPU from said first, calling procedure to said second, called procedure;
(c) third means responsive to the level of privilege of a procedure for stacking said data organizations of said procedure into said push-down store of said virtual memory in a manner such that each of said stacks of data organizations is bounded by a predetermined one of said plurality of segments, said predetermined segment being classified with a level of privilege; and
(d) and fourth means for identifying and storing the first loca-

tion of a top-most stack of data organizations in said push-down store.

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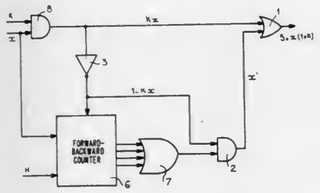
**4,297,744**

## PROCESS AND DEVICE FOR MULTIPLYING A STOCHASTIC VALUE BY A COEFFICIENT GREATER THAN THE UNIT

**Jean-Claude Hoffmann; Francis Castanie, both of Toulouse; Henri Crabere, L'Union; Jean-Pierre Verdier, Cazeres, and Norbert Voisin, Bruguieres, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France**

**Continuation of Ser. No. 956,963, Nov. 2, 1978, abandoned. This application Jun. 19, 1980, Ser. No. 161,009**
**Claims priority, application France, Nov. 9, 1977, 77 33777**
**Int. Cl.[3] G06F *7/70***
**U.S. Cl. 364—703** **11 Claims**




3. A device for multiplying a stochastic value x not greater than 0.5 by a number (1+K) wherein K is positive and not greater than 1, said stochastic value being coded by a random noise and being physically represented by an initial sequence of logic **0** and **1** levels such that in a certain interval of time, N logic **1** levels appear, comprising:

first means for forming, from said initial sequence representing x, a first auxiliary sequence comprising KN logic **1** levels;

second means for forming, from said initial sequence representing x, a second auxiliary sequence comprising N logic **1** levels, wherein each of said N logic **1** levels of said second auxiliary sequence occurs during a logic **0** level of said first auxiliary sequence; and

means for adding said first and second auxiliary sequences.

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**4,297,745**

## GAIN RANGING AMPLIFIER

**James E. Layton, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 30, 1978, Ser. No. 955,903**
**Int. Cl.[3] G01V *1/22*; H03F *1/02***
**U.S. Cl. 367—66** **10 Claims**

1. In a seismic system for geophysical exploration comprising:

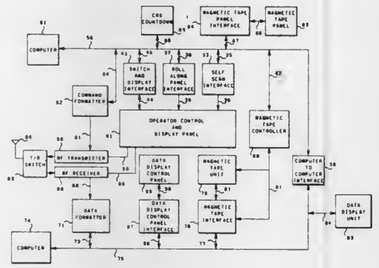
a plurality of remote geophone monitoring means, each of said remote geophone monitoring means being adapted to receive electrical signals from at least one geophone means; and

a central control means for generating electrical signals for initiating the operation of said plurality of remote geophone means;

each of said plurality of remote geophone monitoring means comprising:

a gain ranging amplifier means having a plurality of amplifiers for compressing the dynamic range of electrical analog signals;

means for converting the compressed electrical analog signals into digital seismic data; and




means for transmitting said digital seismic data to said central control means;

said central control means comprising:

means for transmitting commands to said plurality of remote geophone monitoring means; and

means for receiving data from said plurality of remote geophone monitoring means;

the improvement comprising:

means for grounding the input of each one of said plurality of amplifiers for which a voltage offset compensation value is to be calculated;

an analog-to-digital conversion means;

a computer means;

means for providing the output of each one of said plurality of amplifiers, having the inputs thereof grounded, to said analog-to-digital conversion means to therein convert the output of said plurality of amplifiers to digital form;

means for providing the digital output of said analog-to-digital conversion means to said computer means to therein calculate a voltage offset compensation value for each of said plurality of amplifiers for which it is desired to calculate a voltage offset compensation value, each voltage offset compensation value having a voltage level which, if applied to the input of a respective one of said plurality of amplifiers for which the particular voltage offset compensation value was calculated, would drive the output signal from the respective one of said plurality of amplifiers to essentially zero when no electrical analog input signal is applied to the input of the respective one of said plurality of amplifiers;

a digital memory means associated with said computer means;

means for providing the calculated voltage offset compensation values for each of said plurality of amplifiers to said digital memory means;

a digital-to-analog converter means;

means for providing said calculated voltage offset compensation values from said digital memory means to said digital-to-analog converter means; and

means for providing the particular voltage offset compensation value determined for a particular one of said plurality of amplifiers from said digital-to-analog converter means to that particular one of said plurality of amplifiers, said calculated voltage offset compensation values being transferred from said digital memory means to said digital-to-analog converter means when electrical analog input signals are applied to the input of at least one of said plurality of amplifiers and the particular voltage offset compensation value determined for a particular one of said plurality of amplifiers being transferred from said digital-to-analog converter means to that particular one of said plurality of amplifiers when an electrical analog input signal is applied to the input of that particular one of said plurality of amplifiers to thereby substantially reduce errors caused by voltage offset.

# DESIGNS

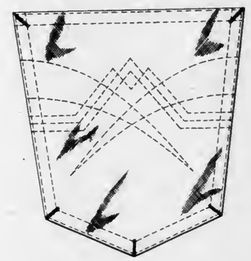
OCTOBER 27, 1981

**261,445**

## POCKET FOR JEANS OR THE LIKE

**Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.**

**Filed Jan. 29, 1980, Ser. No. 116,426**
**Term of patent 14 years**
**Int. Cl. D2—*02***
**U.S. Cl. D2—25**



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**261,446**

## SHOE

**Michael W. Schmohl, Nuremberg, Fed. Rep. of Germany, assignor to Uniroyal GmbH, Aachen, Fed. Rep. of Germany**

**Filed May 26, 1978, Ser. No. 909,878**
**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 7736457[U]**
**Term of patent 14 years**
**Int. Cl. D2—*04***
**U.S. Cl. D2—309**

**261,447**

## WORKMAN'S VEST

**Matti Viio, Box 563, 191 05 Sollentuna, Sweden**

**Filed May 2, 1978, Ser. No. 902,153**
**Claims priority, application Sweden, Nov. 2, 1977, 2223**
**Term of patent 14 years**
**Int. Cl. D2—*02***
**U.S. Cl. D2—190**

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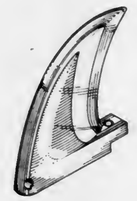
**261,448**

## KEY RING ORNAMENT

**Frank M. Liebscher, 298 Live Oak Rd., Watsonville, Calif. 95076**

**Filed Apr. 18, 1979, Ser. No. 31,071**
**Term of patent 14 years**
**Int. Cl. D3—*01***
**U.S. Cl. D3—65**



**261,449**
**COUNTER DISPLAY STAND**
Sydney Edson, East Meadow, N.Y., assignor to Howard Displays, Inc., New York, N.Y.
Filed Apr. 18, 1979, Ser. No. 31,081
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23

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**261,450**
**PORTABLE SEAT**
Robert J. Jenkins, 5806 Georgia, Kansas City, Kans. 66104
Filed Oct. 13, 1978, Ser. No. 951,065
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

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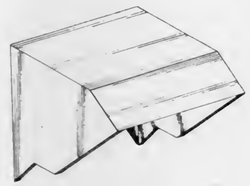
**261,451**
**SOFA**
Ramon R. Albert, 630 NW. 7th Ave., Homestead, Fla. 33030
Filed Feb. 6, 1978, Ser. No. 875,581
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

**261,452**
**TOILET TISSUE COVER**
Marlene Y. Chandler, 3174 Forest Manor, Indianapolis, Ind. 46218
Filed Oct. 26, 1979, Ser. No. 88,547
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86



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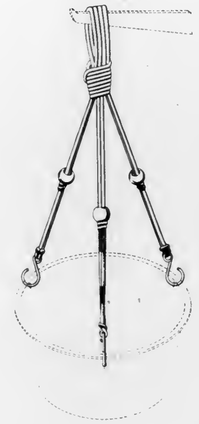
**261,453**
**COMBINED HOLDER AND DISPENSER FOR COLLAPSIBLE TUBES**
Daniel L. Pool, 4414 E. Lincoln Dr., Paradise Valley, Ariz. 85253
Filed Nov. 30, 1979, Ser. No. 98,810
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D6—87

**261,454**
**POTTED PLANT HANGER**
William Hobrecht, Brockton, Mass., assignor to New England Pottery Co., Stoughton, Mass.
Filed Sep. 24, 1979, Ser. No. 78,652
Term of patent 14 years
Int. Cl. D6—*06*; D11—*02*
U.S. Cl. D6—113



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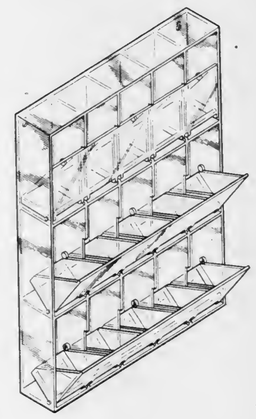
**261,455**
**SPICE RACK**
Carl H. Ewert, 1201 Monument Blvd., Apartment #76, Concord, Calif. 94520
Filed Aug. 9, 1979, Ser. No. 65,055
Term of patent 14 years
Int. Cl. D06—*04*; D07—*07*
U.S. Cl. D6—130



**261,456**
**SERVICE COUNTER**
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,305
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

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**261,457**
**SERVICE COUNTER**
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,311
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

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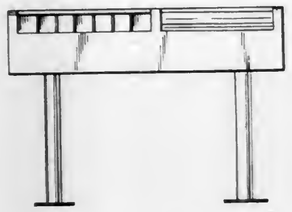
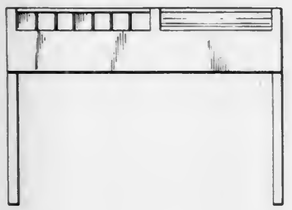
**261,458**
**TELLER COUNTER**
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,944, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,415
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157

261,459
DESK
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,941, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,422
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



261,460
DESK
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,941, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,491
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



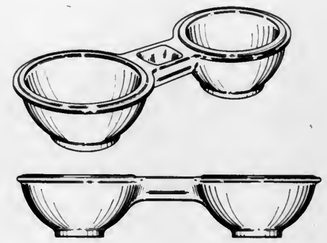
261,461
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,304
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

261,462
SERVICE COUNTER
James S. Berman, New York, and Sigurd Stegmaier, Malverne, both of N.Y., assignors to Citibank, N.A., New York, N.Y.
Division of Ser. No. 875,952, Feb. 7, 1978. This application Jan. 22, 1980, Ser. No. 114,416
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

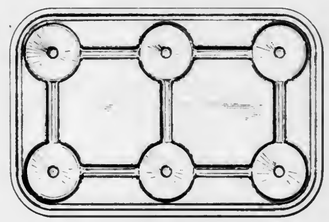
261,463
SIMULATIVE PHOTO FRAME
Nick P. Martin, 438 Cresent, Santa Maria, Calif. 93454
Filed Apr. 14, 1980, Ser. No. 140,232
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—243

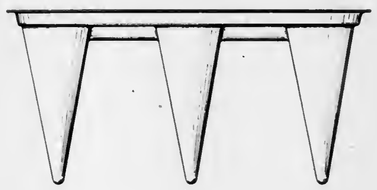
261,464
COMBINATION BEACH TOWEL-CARRY BAG
Allan B. Smith, 31 Bathurst St., Woollahra, N.S.W. 2025, Australia
Filed Aug. 14, 1978, Ser. No. 933,650
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—265

261,465
SERVING BOWL
Scott R. Minchew, 3778 Hillandale, Toledo, Ohio 43606
Filed Nov. 23, 1979, Ser. No. 96,844
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—19

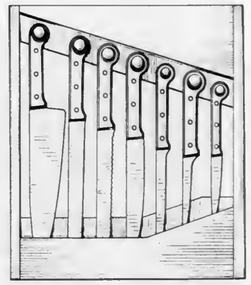


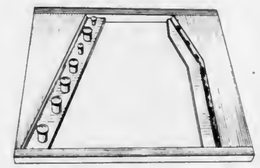
261,466
ICE CREAM CONE SERVING TRAY
Russell W. Harper, Oak Brook, Ill., assignor to Maryland Cup Corporation, Owings Mills, Md.
Filed Aug. 13, 1979, Ser. No. 66,294
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



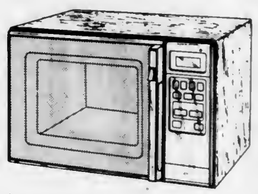


261,467
COMBINED KNIFE SET AND RACK
Paul P. Alessandrini, and Anna M. Alessandrini, both of 215-55 26th Ave., Bayside, N.Y. 11360
Filed Sep. 21, 1979, Ser. No. 77,619
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—74



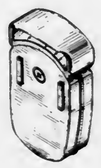


261,468
MICROWAVE OVEN
Yoichi Takahashi, Kouriyama; Mashimichi Yamamura, Osaka; Toshio Harada, and Shigefumi Inoue, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 17, 1979, Ser. No. 76,006
Claims priority, application Japan, Mar. 16, 1979, 54-10693
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



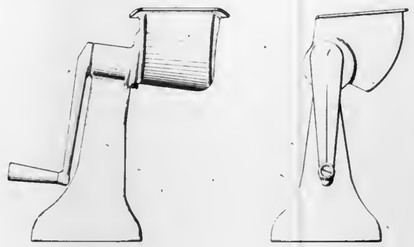
261,469
COMBINED ROTISSERIE MOTOR AND EXTENDED LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Apr. 2, 1979, Ser. No. 25,789
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

261,470
COMBINED ROTISSERIE MOTOR AND LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Apr. 2, 1979, Ser. No. 26,034
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

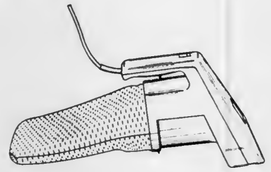


261,471
COMBINED ROTISSERIE MOTOR AND LIGHT
Walter Koziol, Russell, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 31, 1979, Ser. No. 108,563
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

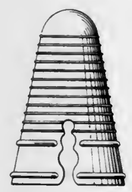
261,472
FOOD CUTTER
Elwood M. Graham, Ocean Springs, Miss., and John Polivka, Ocean Side, Calif., assignors to M. H. Graham Corporation, Biloxi, Miss.
Filed Mar. 2, 1979, Ser. No. 16,777
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—155



261,473
SUCTION BRUSH
Niklaus Hug, Romanshorn, Switzerland, assignor to Rommag P. Wörwag & Co., Romanshorn, Switzerland
Filed Jun. 12, 1979, Ser. No. 47,923
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 1218
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—18

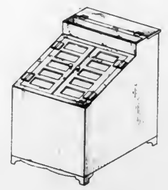


261,474
CLOTHES PIN
Clive E. Joseph, 1 Church Sq., St. Kilda, Victoria, 3182, Australia
Continuation-in-part of Ser. No. 947,697, Oct. 2, 1978, Pat. No. Des. 256,539. This application Oct. 15, 1979, Ser. No. 84,677
Claims priority, application Australia, May 31, 1979, 78011
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—61

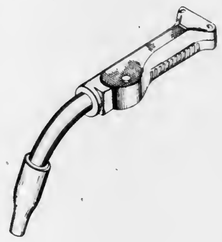




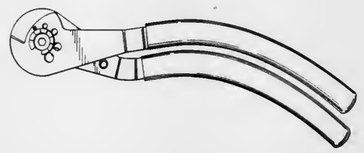
261,475
WOOD BOX
Raymond Wolfe, R.R. #1, Box 198, Farmland, Ind. 47340
Filed Jun. 25, 1979, Ser. No. 51,992
Term of patent 14 years
Int. Cl. D7—*07*; D6—*04*
U.S. Cl. D7—212



261,476
WELDING GUN
Thomas P. O'Donnell, Wheaton, Ill., and James A. Howery, Menomonee Falls, Wis., assignors to C-R-O, Inc., Menomonee Falls, Wis.
Filed Aug. 30, 1979, Ser. No. 69,721
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

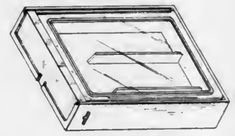


261,477
CABLE OR RIVET CUTTER
Frank E. Shaffer, P.O. Box 1546, Costa Mesa, Calif. 92626
Filed Apr. 16, 1979, Ser. No. 29,994
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



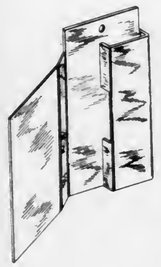
261,478
TAMPER PROOF STRIKER PLATE
William P. Gauntt, P.O. Box 744, Teague, Tex. 75860
Filed Aug. 20, 1979, Ser. No. 67,831
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—344

261,479
COMBINED SHIPPING, STORAGE AND SERVING UNIT FOR BOTTLES OF WINE OR THE LIKE
Philip Marks, New York, N.Y., assignor to Advertising Displays Corporation, Englewood Cliffs, N.J.
Filed Jan. 15, 1979, Ser. No. 3,686
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



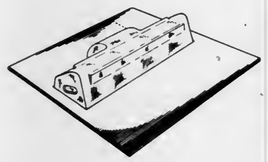
261,480
COMBINED COSMETIC CONTAINER AND ABRADER
Jana Lowenthal, 8029 Willow Glen Dr., Los Angeles, Calif. 90046
Continuation of Ser. No. 841,330, Nov. 31, 1977. This application Feb. 11, 1980, Ser. No. 120,723
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D9—314

261,481
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,266
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

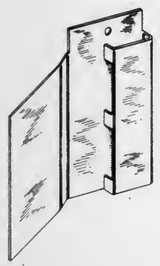


261,482
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,267
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

261,483
COMBINED DISPLAY AND PACKAGING CONTAINER FOR A SHAVING UNIT
Donald Thorpe, Madison, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 18, 1979, Ser. No. 49,685
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—342

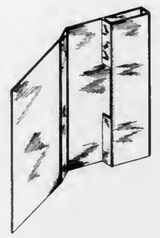


261,484
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,268
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341

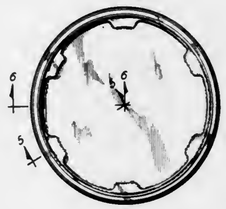




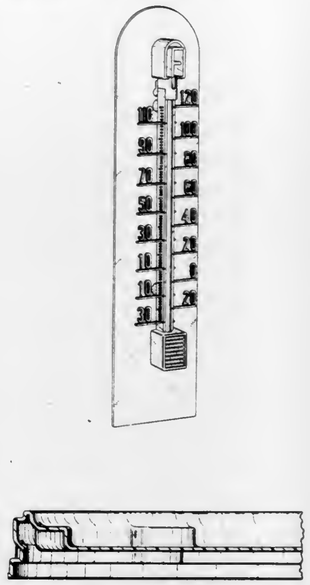
261,485
PACKAGING CONTAINER FOR CASSETTES OR THE LIKE
Carol A. Haubert, Upper Grandview, N.Y., assignor to Raytheon Company, Lexington, Mass.
Filed Sep. 4, 1979, Ser. No. 72,269
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



261,486
CONTAINER CLOSURE OR SIMILAR ARTICLE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Co., Bartlesville, Okla.
Filed Sep. 5, 1979, Ser. No. 72,754
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—452



261,487
THERMOMETER
Yoshiharu Kohno, Suita, Japan, assignor to Kohno Plastic Co., Ltd., Osaka, Japan
Filed Dec. 11, 1979, Ser. No. 102,451
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—58

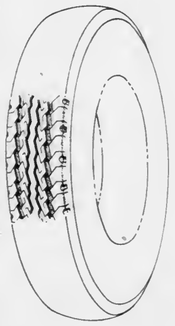


261,488
MULTIMETER
James R. Lindsay, Yorba Linda, and Gene D. Vedder, Reseda, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jul. 9, 1979, Ser. No. 55,940
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

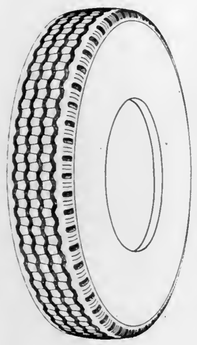
261,489
REFLECTOR
Arthur E. DuBois, Box 707, Dennisport, Mass. 02639
Filed Dec. 7, 1978, Ser. No. 967,230
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

261,490
FIGURINE OF A BASSET HOUND
Jesus A. S. Carbajales, and Javier B. S. Carbajales, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 29, 1978, Ser. No. 946,847
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

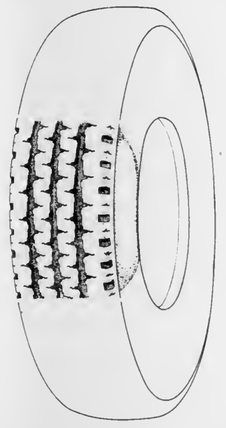
261,491
TIRE TREAD AND BUTTRESS
Philip S. Hammond, Mogadore, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 16, 1979, Ser. No. 21,138
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142



261,492
TIRE
Raymond M. Remy, Capellen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,634
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



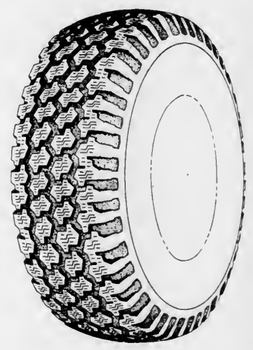
261,493
TIRE
Andre E. J. Baus, Colmar-Berg, Luxembourg, and Robert E. L. A. Pair, Arlon, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,987
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



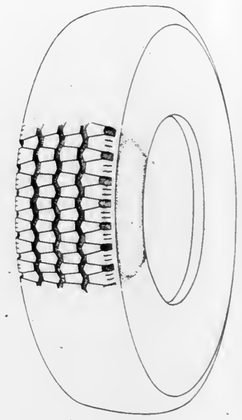


261,494
VEHICLE TIRE
Norio Suzuki, Kodaira, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan
Filed Apr. 3, 1979, Ser. No. 26,708
Claims priority, application Japan, Jan. 31, 1979, 542969
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

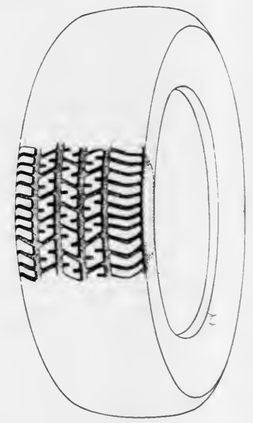
261,495
TIRE TREAD AND BUTTRESS
Charles G. Yurkovich, Boardman, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 30, 1979, Ser. No. 34,703
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



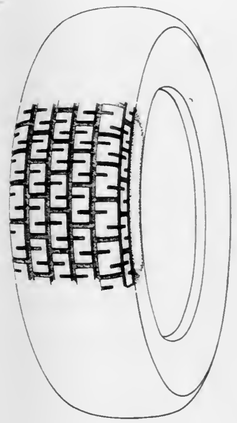
261,496
TIRE
Raymond M. Remy, Capellen, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 8, 1979, Ser. No. 1,635
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



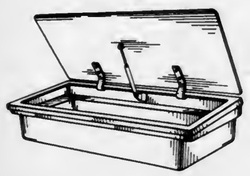
261,497
TIRE
Andre E. J. Baus, Colmar-Berg; Jean F. L. Fontaine, Ingeldorf, and Brian L. Ham, Mertzig, all of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 21, 1979, Ser. No. 13,492
Claims priority, application United Kingdom, Sep. 27, 1978, 986566
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



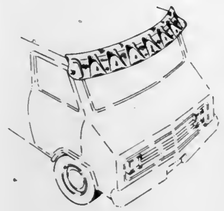
261,498
TIRE
Andre E. J. Baus, Colmar-Berg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 21, 1979, Ser. No. 13,590
Claims priority, application United Kingdom, Sep. 20, 1978, 986440
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148



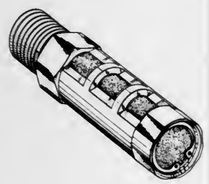
261,499
STORAGE TRUNK FOR A PICKUP TRUCK
Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182
Filed Jul. 12, 1979, Ser. No. 56,977
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



261,500
VEHICLE VISOR
James P. Butler, Lewisville, Tex., assignor to Affiliated Hatch and Sunroof, Inc., Dallas, Tex.
Filed Dec. 4, 1978, Ser. No. 966,470
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

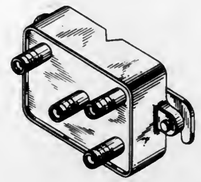


261,501
COMBINED AIR MUFFLER AND FILTER
Michael Schenker, Warren, N.J., assignor to Coilhose Pneumatics, Inc., Middlesex, N.J.
Filed Aug. 10, 1979, Ser. No. 65,592
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194

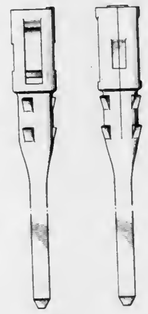


261,502
WHEEL
Bjorn E. A. Envall, Vanersborg, Sweden, assignor to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Oct. 18, 1978, Ser. No. 952,566
Claims priority, application Sweden, Apr. 18, 1978, 78-1085
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

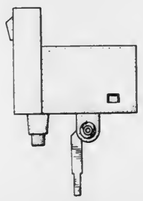
261,503
C.A.T.V. SIGNAL SPLITTER
David F. Shu, Hoffman Estate, Ill., assignor to TDS, Inc., Elk Grove Village, Ill.
Filed Apr. 18, 1979, Ser. No. 31,082
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11



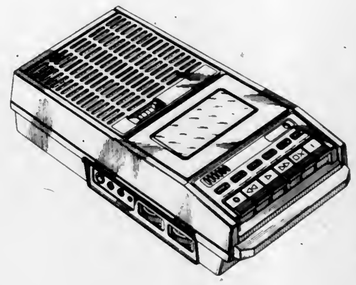
261,504
PIN SOCKET
Gene C. Hollingsworth, Cerritos, Calif., assignor to Zero Corporation, El Monte, Calif.
Filed Oct. 2, 1978, Ser. No. 947,426
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



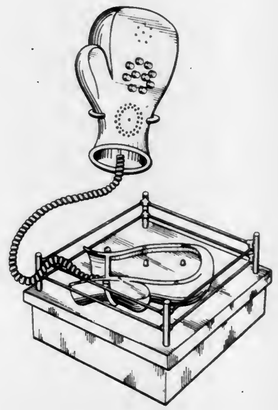
261,505
ELECTRICAL CONTROL HOUSING ASSEMBLY
Gerald K. Miller, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.
Filed Sep. 12, 1979, Ser. No. 74,635
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



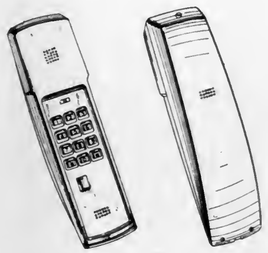
261,506
TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Sep. 10, 1979, Ser. No. 73,741
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



261,507
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed May 7, 1979, Ser. No. 36,587
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

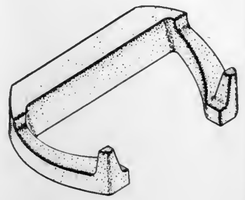


261,508
HAND-HELD TELEPHONE
John Pardo, Yonkers, N.Y., assignor to Leisurecraft Products Ltd., Plainview, N.Y.
Filed Aug. 10, 1979, Ser. No. 65,599
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—64

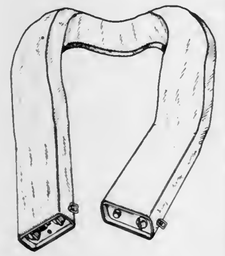


261,509
WALL MOUNTED HOLDER FOR A TELEPHONE SET
Richard E. Cobb, Western Springs, Ill., assignor to GTE Automatic Electric Labs. Inc., Northlake, Ill.
Filed Jun. 4, 1979, Ser. No. 44,899
Term of patent 14 years
Int. Cl. D14—*03;* D6—*01*
U.S. Cl. D14—65

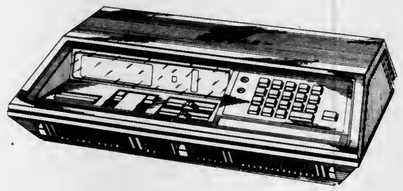
261,510
TELEPHONE HANDSET HOLDER
John H. Havens, Los Angeles, Calif., assignor to Antonio M. Escobedo, Sepulveda, Calif.
Filed Jul. 18, 1979, Ser. No. 58,731
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65



261,511
RADIO RECEIVER
William J. Hass, 3707 Russett La., Northbrook, Ill. 60062
Filed Dec. 14, 1979, Ser. No. 103,570
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

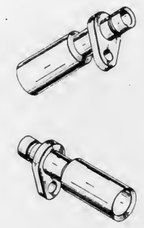


261,512
CLOCK RADIO OR SIMILAR ARTICLE
John S. Kolwaite, Dewitt, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Jan. 23, 1980, Ser. No. 114,712
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73

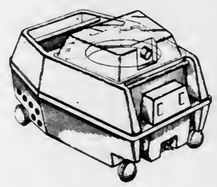




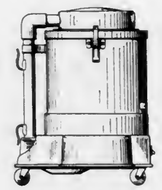
261,513
TRANSMISSION DETENT CABLE CONNECTOR
Richard B. Muller, 5415 Providence Rd., Charlotte, N.C. 28211
Filed Jan. 18, 1979, Ser. No. 4,500
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—5



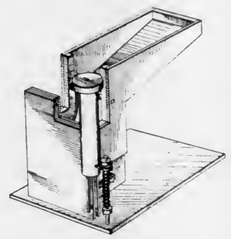
261,514
VACUUM CLEANER
Patrick D. Cody, Dollard des Ormeaux, Canada, assignor to Innova Equipment Limited, Quebec, Canada
Filed Dec. 27, 1979, Ser. No. 107,572
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21

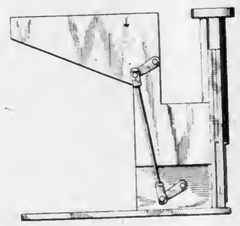


261,515
PRESSURE SPRAY CARPET CLEANER
Harold W. Schaefer, Bloomington, Ill., and Martin E. Wiese, South Bend, Ind., assignors to National Union Electric Corporation, Greenwich, Conn.
Filed Aug. 20, 1979, Ser. No. 67,730
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—23

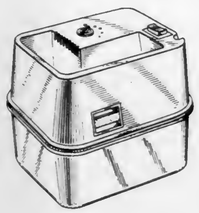


261,516
MACHINE FOR DISPENSING AND INSERTING STICKS IN COMESTIBLES
Edward D. Cottrell, and Michael B. Robbins, both of Cattaraugus, N.Y., assignors to Champion International Corporation, Stamford, Conn.
Filed May 24, 1979, Ser. No. 42,002
Term of patent 14 years
Int. Cl. D07—*04;* D15—*08*
U.S. Cl. D15—92

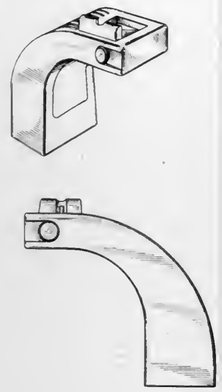




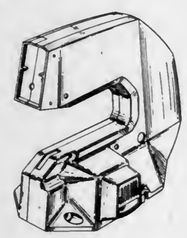
261,517
FOODSTUFF MILL
Thomas D. Dickson, Jr., 1099 Del Cambre, San Jose, Calif. 95129
Filed Apr. 9, 1979, Ser. No. 28,208
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—98



261,518
BARRIER FREE DRINKING FOUNTAIN
Ann F. Butter, and Bert Blumberg, both of 12 W. 96th St., New York, N.Y. 10025
Filed Apr. 30, 1979, Ser. No. 34,428
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D15—118

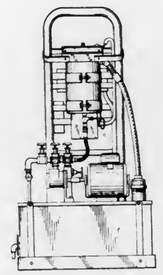


261,519
HOUSING FOR A BENCH TOP BAND SAW
Edward A. Irelan, Columbia, Mo., assignor to Benchmark Tool Company, Vandalia, Ohio
Filed Aug. 31, 1979, Ser. No. 71,181
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—134

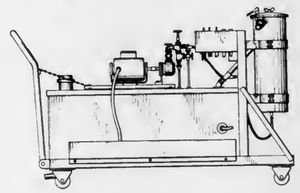




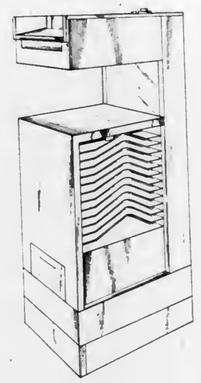
261,520
TWO-WHEELED OIL REFINER DOLLY OR THE LIKE
Lester L. Johnson, Sr., 6175 Fordham Cir., East, Jacksonville, Fla. 32217
Filed Aug. 22, 1979, Ser. No. 68,695
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—150



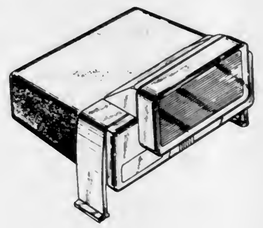
261,521
OIL REFINER MOVABLE CARRIAGE OR THE LIKE
Lester L. Johnson, Sr., 6175 Fordham Cir., East, Jacksonville, Fla. 32217
Filed Aug. 22, 1979, Ser. No. 68,696
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—150



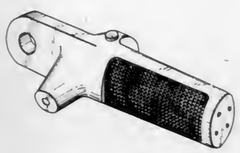
261,522
PAPER COLLATOR FOR USE WITH OFFICE COPYING MACHINES
Donald L. Snellman, 2807 W. Galer, Seattle, Wash. 98199
Filed Oct. 18, 1979, Ser. No. 86,032
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



261,523
ELECTRONIC FLASH OR SIMILAR ARTICLE
James M. Conner, Harrison, and James M. Ryan, New York, both of N.Y., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Sep. 25, 1978, Ser. No. 945,190
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

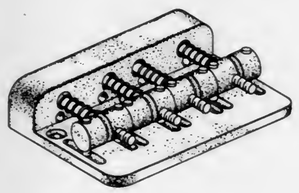


261,524
GRIP FOR A CINECAMERA
Masahiro Kando, Tokyo, and Hiroshi Shinkai, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 26, 1978, Ser. No. 973,110
Claims priority, application Japan, Jul. 3, 1978, 53-27956
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—44

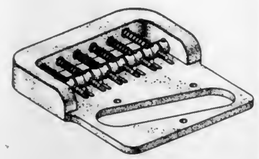


261,525
EYE GLASS FRAME
Irving Rips, Beverly Hills, Calif., assignor to Younger Manufacturing Company, Los Angeles, Calif.
Filed Jun. 11, 1979, Ser. No. 47,789
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—115

261,526
BRIDGE ASSEMBLY FOR GUITARS
Billie R. Carson, Placentia, Calif., assignor to CBS Inc., New York, N.Y.
Filed Oct. 9, 1979, Ser. No. 82,667
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21

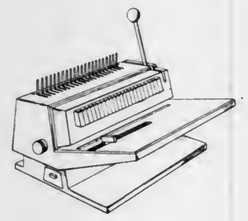


261,527
BRIDGE ASSEMBLY FOR GUITARS
Billie R. Carson, Placentia, Calif., assignor to CBS Inc., New York, N.Y.
Filed Oct. 11, 1979, Ser. No. 83,588
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—21



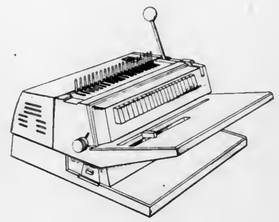
261,528
DESK TOP ELECTRONIC CALCULATOR
Masaaki Sakai, Tokyo, and Kunio Hirose, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 28, 1979, Ser. No. 52,989
Claims priority, application Japan, Jan. 15, 1979, 54-2567
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

261,529
COMBINED PUNCH AND BINDING MACHINE
Herbert H. Hausmann, Prairie View, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Sep. 4, 1979, Ser. No. 72,484
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D18—34





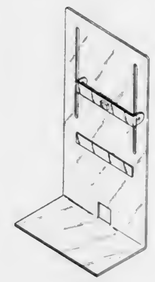
261,530
COMBINED ELECTRIC PUNCH AND BINDING MACHINE
Herbert H. Hausmann, Prairie View, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Sep. 4, 1979, Ser. No. 72,486
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D18—34



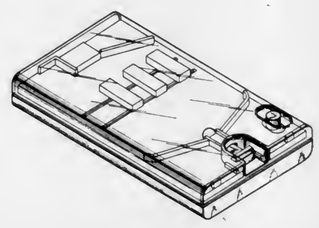
261,531
MARKING PEN
Guy Delcroix, Paris, France, assignor to Waterman S.A., Paris, France
Filed Jun. 11, 1979, Ser. No. 47,108
Claims priority, application France, Dec. 12, 1978, 77111
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—4

261,532
WRIST-WEARABLE TIME TEACHING INSTRUMENT
Toshinori Tabata, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 2, 1979, Ser. No. 90,546
Claims priority, application Japan, May 21, 1979, 54-20597
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64

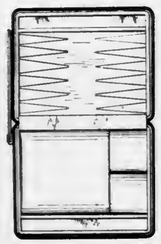
261,533
TYPING COPY HOLDER
Bruce K. Nagley, 4765 Kingshill Dr., Columbus, Ohio 43229
Filed Feb. 21, 1980, Ser. No. 123,126
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



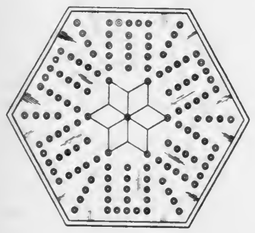
261,534
POCKET SIZE GAME BOX
Masaki Mayuzumi, and Masaaki Yoshimura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 2, 1979, Ser. No. 90,312
Claims priority, application Japan, May 23, 1979, 54-20883
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—10



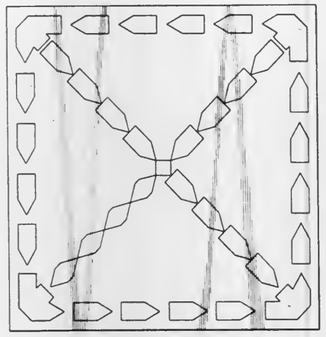
261,535
COMBINED BACKGAMMON GAME AND CARRYING CASE
Abraham I. Tawil, New York, N.Y., assignor to H.I.T. Industries Ltd., Avenel, N.J.
Filed May 12, 1977, Ser. No. 796,206
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



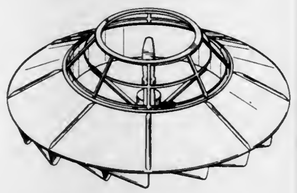
261,536
GAME BOARD
Michael C. Cicerrella, 1524 Lakeview Rd., #203, Clearwater, Fla. 33516
Filed Dec. 17, 1979, Ser. No. 104,164
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



261,537
GAME BOARD
Richard D. Homich, Box 600, R.D. 3, Annville, Pa. 17003
Filed Oct. 2, 1979, Ser. No. 81,238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



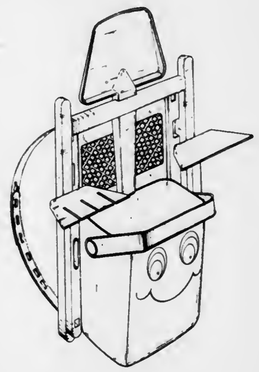
261,538
AERIAL TOY
James E. Sides, Rte. 3, Western Acres, El Campo, Tex. 77437
Filed Jul. 2, 1979, Ser. No. 54,137
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86



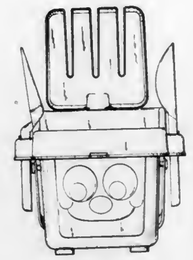


261,539
SHILLELAGH OR SIMILAR ARTICLE
Ernest H. Smith, P.O. Box 891, W. Sacramento, Calif. 95691
Filed Dec. 30, 1977, Ser. No. 866,461
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—211

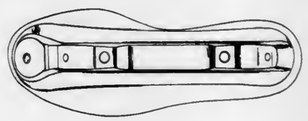
261,540
COMBINED TOY BUCKET AND TOOLS THEREFOR
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and Paul B. Means, III, Basking Ridge, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Oct. 22, 1979, Ser. No. 87,243
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



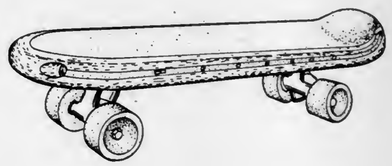
261,541
COMBINED TOY BUCKET AND TOOLS THEREFOR
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Feb. 8, 1980, Ser. No. 119,992
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



261,542
INTEGRAL SHOE SOLE AND WHEEL MOUNTING FOR ROLLER SKATE
David L. Landay, Brookline, and Alvan H. Wolf, Worcester, both of Mass., assignors to Brookfield Athletic Shoe Company, Inc., East Brookfield, Mass.
Filed Jul. 18, 1979, Ser. No. 40,115
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226



261,543
SKATEBOARD
Leonard A. Morris, Sr., 138 Panorama Dr., Benicia, Calif. 94510
Filed Jan. 28, 1980, Ser. No. 115,740
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227



**261,544**
**SKATEBOARD**
Lyle L. Cramer, 1113 Markham, Flint, Mich. 48507
Continuation-in-part of Ser. No. 900,333, Apr. 26, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,047
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

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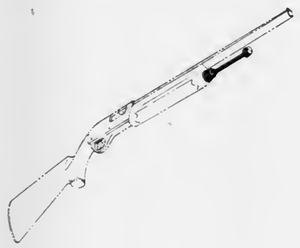
**261,545**
**ADJUSTABLE PLUG FOR SHOTGUN SHELL CHAMBER**
Larry A. Holmberg, 5765 Main St., Fridley, Minn. 55432
Filed Mar. 3, 1980, Ser. No. 126,533
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



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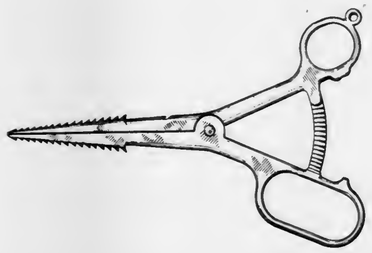
**261,546**
**FISH HOLDING TOOL**
Ronald W. Smalley, 5415 SE. 174th St., Portland, Oreg. 97236
Filed Apr. 14, 1980, Ser. No. 140,233
Term of patent 14 years
Int. Cl. D22—*05*; D8—*03*
U.S. Cl. D22—31



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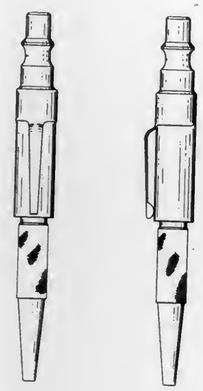
**261,547**
**AIR REGULATING NOZZLE**
W. Rod Parke, R.F.D. No. 3, Dixon, Ill. 61021
Filed May 29, 1979, Ser. No. 42,859
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



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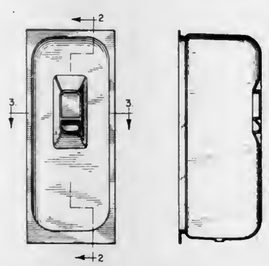
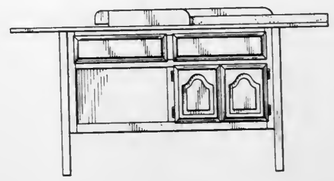
**261,548**
**MODULAR SHOWER STALL**
James E. Chisholm, Mariemont, Ohio, assignor to MCC-Powers-Fiat, Skokie, Ill.
Filed Jun. 1, 1979, Ser. No. 44,703
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—57






**261,549**
**PEDIATRIC EXAMINATION TABLE**
Donald R. Patterson, 2509 Jackson, Joplin, Mo. 64801
Filed Apr. 12, 1979, Ser. No. 29,286
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3



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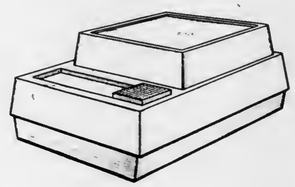
**261,550**
**CONTACT LENS STERILIZER UNIT**
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Aug. 23, 1979, Ser. No. 69,112
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9



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**261,551**
**HOUSING FOR AN ELECTRONIC STIMULATOR**
Eli Boroda, 3896 Effress Rd., White Bear Lake, Minn. 55110
Filed May 10, 1979, Ser. No. 37,633
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41

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**261,552**
**HOUSING FOR AN ELECTRONIC STIMULATOR**
Eli Boroda, 3896 Effress Rd., White Bear Lake, Minn. 55110
Filed May 10, 1979, Ser. No. 37,634
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41

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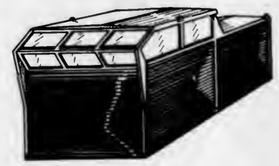
**261,553**
**ASPHALT PLANT CONTROL HOUSE**
Richard F. Chambers, 8431 Dayton Pike, Daisy, Tenn. 37319
Filed May 2, 1980, Ser. No. 146,001
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



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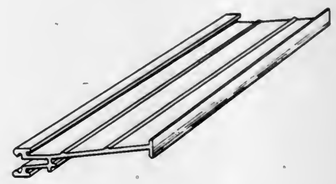
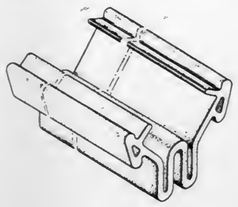
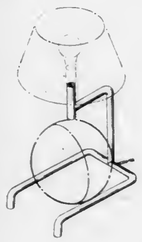
**261,554**
**CABLE CHANNEL SHELF**
Bengt E. Legerius, Hagvägen 6, S-611 00 Nyköping, Sweden
Filed Feb. 19, 1980, Ser. No. 122,303
Claims priority, application Sweden, Sep. 7, 1979, 79-1983
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,555
EXPANSION JOINT SEALING STRIP FOR ROADWAY JOINTS AND THE LIKE
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Mar. 26, 1980, Ser. No. 134,310
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

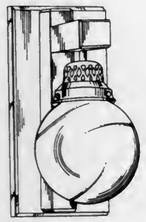


261,556
COMBINED LAMP BASE AND BALL HOLDER
Bryan O'Reilly, 129 Franklin St., Westfield, Mass. 01085
Filed May 31, 1979, Ser. No. 44,052
Term of patent 14 years
Int. Cl. D26—*05*; D6—*04*
U.S. Cl. D26—51



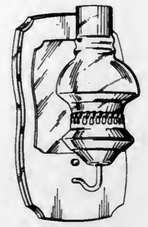
261,557
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 35,997
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

261,558
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,000
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87



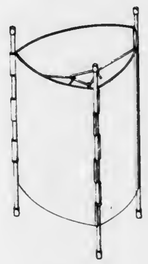
261,559
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,001
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

261,560
LIGHTING FIXTURE
James J. Palka, Arlington Heights, and Robert Rekart, Villa Park, both of Ill., assignors to General Bathroom Products Company, Elk Grove Village, Ill.
Filed May 4, 1979, Ser. No. 36,002
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D26—87

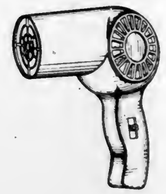


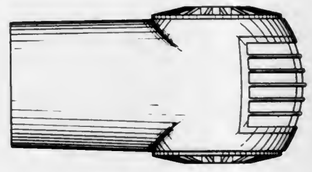
261,561
LIGHTING FIXTURE
Marc-André Letourneau, 3600 Park Ave., Apt. 1611, Montreal, Quebec, Canada
Filed Feb. 16, 1979, Ser. No. 12,602
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—88

261,562
LAMP
Akira Suzuki, Tokyo, Japan, assignor to Kazusuke Takagi, Tokyo, Japan, a part interest
Filed Oct. 4, 1979, Ser. No. 81,679
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—111



261,563
HAIR DRYER
Ernest Lee, Park Ridge, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jun. 30, 1980, Ser. No. 164,191
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

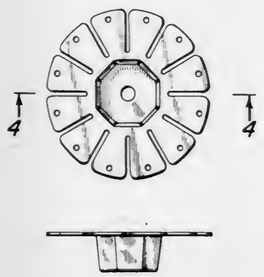




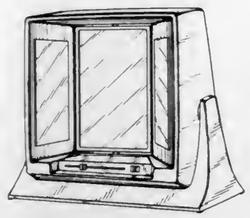
261,564
RAZOR HANDLE
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 7, 1979, Ser. No. 101,164
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

**261,565**
**RAZOR HANDLE**
**Kenneth H. Grange, London, England, assignor to Wilkinson Sword Ltd., Buckinghamshire, England**
**Filed Jan. 3, 1980, Ser. No. 109,290**
**Claims priority, application United Kingdom, Jul. 16, 1979, 990 721/79**
**Term of patent 14 years**
**Int. Cl. D28—*03***
**U.S. Cl. D28—48**

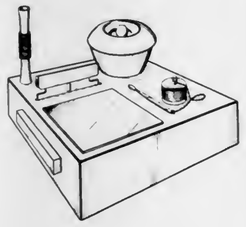
**261,566**
**COMBINATION FLOSS HOLDER, KEY CHAIN FOB AND DENTAL APPOINTMENT REMINDER**
**David V. Olson, St. Paul, Minn.**
**Continuation-in-part of Ser. No. 881,078, Feb. 23, 1978, Pat. No. Des. 255,388. This application Jul. 30, 1979, Ser. No. 62,101**
**Term of patent 14 years**
**Int. Cl. D29—*99*; D3—*01***
**U.S. Cl. D28—64**



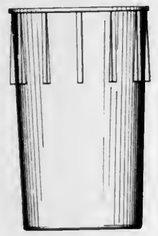

**261,567**
**MAKE-UP MIRROR**
**Alfred W. Madl, Glendale, Wis., assignor to Sunbeam Corporation, Chicago, Ill.**
**Filed Feb. 8, 1980, Ser. No. 119,731**
**Term of patent 14 years**
**Int. Cl. D28—*03***
**U.S. Cl. D28—67**



**261,568**
**COMBINED CADDY FOR POWDERED PRODUCTS OR THE LIKE AND IMPLEMENTS THEREFOR**
**Ralph L. Davis, Washington, D.C., assignor to Wilbert A. Payne, Seat Pleasant, Md.**
**Filed Feb. 14, 1979, Ser. No. 12,031**
**Term of patent 14 years**
**Int. Cl. D28—*03***
**U.S. Cl. D28—77**



**261,569**
**DRUM**
**Roger E. Darois, Perryville, Md., assignor to Container Corporation of America, Chicago, Ill.**
**Filed Sep. 4, 1979, Ser. No. 72,568**
**Term of patent 14 years**
**Int. Cl. D99—*99***
**U.S. Cl. D34—39**



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 27TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Carl Munters: *See—*
Norbach, Per, 4,296,780, Cl. 138-40.000.
AB ASEA-ATOM: *See—*
Olsson, Torsten, 4,297,171, Cl. 376-440.000.
AB Jarnkonstruktioner: *See—*
Jarnum, Lennart, 4,296,516, Cl. 14-71.700.
AB Volvo: *See—*
Mattsson, Karl-Erik H., 4,296,679, Cl. 92-52.000.
Abbott Laboratories: *See—*
Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., 4,296,949, Cl. 285-18.000.
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, to Sakai Chemical Industry Co., Ltd. Method for packing catalysts. 4,297,248, Cl. 252-477.00R.
Abe, Osamu: *See—*
Furuhashi, Toshio; and Abe, Osamu, 4,296,722, Cl. 123-492.000.
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, to Kao Soap Co., Ltd. Cosmetic composition for skin and hair treatment. 4,297,340, Cl. 424-70.000.
Abele, Karl-Heinz: *See—*
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.
Abeler, Gerd; and Maul, Rudolf, to Ciba-Geigy Corporation. 1,4-Dihydro-2,6 dimethylyridine-3,5-dicarboxylic acid ester compositions. 4,297,268, Cl. 260-45.80N.
Abex Corporation: *See—*
Kennedy, Leroy P., 4,296,707, Cl. 116-58.00A.
Abo, Toshimi; and Kanegae, Hidetoshi, to Nissan Motor Company, Limited. Fuel control device for a gas turbine. 4,296,600, Cl. 60-39.28R.
Aboelfotoh, Mohamed O., to International Business Machines Corporation. D.C. Scan panel. 4,297,613, Cl. 315-58.000.
Abramovich, Dan: *See—*
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.
Abrams, Richard L.: *See—*
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.
Accattino, Andrea: *See—*
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.
ACF Chemiefarma NV: *See—*
van Zorge, Jacob A., 4,297,359, Cl. 424-263.000.
Achard, Georges; Chion, Pierre; and Menault, Jacques, to Rhone-Poulenc-Textile. Two-component mixed acrylic fibres wherein acrylic components have different amounts of non-ionizable plasticizing comonomer. 4,297,412, Cl. 428-370.000.
Acurex Corporation: *See—*
Carlton, Richard J., 4,297,572, Cl. 250-203.00R.
Adams, James R., Jr., to Rollei of America, Inc. Photoflash device. 4,297,011, Cl. 354-23.00D.
Adamson, Arthur P., to General Electric Company. Turbine cooling air modulation apparatus. 4,296,599, Cl. 60-39.230.
Adreas Stihl: *See—*
Dirks, Rudolf; and Nitschmann, Karl, 4,296,553, Cl. 30-381.000.
Aeroquip Corporation: *See—*
Allread, Alan R., 4,296,914, Cl. 251-149.200.
Gies, Paul E., 4,296,675, Cl. 91-396.000.
McCracken, Donald G., 4,296,952, Cl. 285-98.000.
Agence Nationale de valorisation de la Recherche (ANVAR): *See—*
Monties, Jean R.; and Havlik, Patrick J. C., 4,296,500, Cl. 3-1.700.
Agency of Industrial Science & Technology: *See—*
Shimizu, Ken-Ichi; and Ikeya, Chuji, 4,297,725, Cl. 358-125.000.
AGFA-Gevaert AG: *See—*
Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, 4,297,439, Cl. 430-434.000.
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.
AGFA-Gevaert Aktiengesellschaft: *See—*
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Puschmann, Werner, 4,297,585, Cl. 250-560.000.
Aggarwal, Sundar L.: *See—*
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.
Agip Nucleare, S.p.A.: *See—*
Brambilla, Giovanni; and Sartorelli, Adelmo, 4,297,174, Cl. 204-1.500.
Ahmann, John E. Punch frame for data registering device. 4,297,566, Cl. 235-50.00R.
Ahmed, Adel A. A., to RCA Corporation. Amplifier with cross-over current control. 4,297,644, Cl. 330-264.000.
Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground swing. 4,296,923, Cl. 272-85.000.
Ahrweiler, Karl-Heinz: *See—*
Kusters, Eduard; and Ahrweiler, Karl-Heinz, 4,296,537, Cl. 29-116.0AD.
Aikoh Co., Ltd.: *See—*
Hayashi, Yoshihiro, 4,296,921, Cl. 266-270.000.
Aimono, Yuji: *See—*
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, 4,297,471, Cl. 526-328.000.
Airey, Frederick K.; and Evans, Arthur R. Apparatus for separating and contacting friable particulate organic matter from and with liquids. 4,297,213, Cl. 210-195.100.
Aisin Seiki Kabushiki Kaisha: *See—*
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Kagata, Tooru; and Goto, Hiromi, 4,296,848, Cl. 192-35.000.
Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.
Terada, Takami, 4,296,966, Cl. 297-369.000.
Aitken, Inc.: *See—*
Cusick, Kenneth M., 4,297,116, Cl. 55-319.000.
Ajinomoto Company, Incorporated: *See—*
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.
Yasuda, Naohiko; and Nakanishi, Eiji, 4,297,279, Cl. 260-239.100.
Akebono Brake Industry Co., Ltd.: *See—*
Nakazato, Hiroshi, 4,296,971, Cl. 303-115.000.
Akimoto, Hidetoshi: *See—*
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, to OKI Electric Industry Co., Ltd. Hybrid integrated circuit and a method for producing the same. 4,297,647, Cl. 330-307.000.
Akkerman, Neil H., to Baker International Corporation. Apparatus for pumping fluid from a well through a tubing string. 4,297,087, Cl. 417-378.000.
Akkerman, Neil H., to Baker International Corporation. Pump assembly comprising gas spring means. 4,297,088, Cl. 417-378.000.
Aktiebolaget Electrolux: *See—*
Kullander, Jan O., 4,296,982, Cl. 312-257.00R.
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, to Mitsubishi Petrochemical Co., Ltd. Process for producing electric conductors coated with crosslinked polyethylene resin. 4,297,310, Cl. 264-83.000.
Akzona Incorporated: *See—*
Bohler, Joachim; and Jordon, Hans, 4,296,517, Cl. 15-93.00R.
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.
Albany International Corporation: *See—*
Bloyce, Lionel T.; and Morley, Michael J., 4,296,886, Cl. 239-264.000.
Alberto-Culver Company: *See—*
Dasher, George F.; and Schamper, Thomas J., 4,297,098, Cl. 8-412.000.
Albrecht, Ernst: *See—*
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.
Alcan Research and Development Limited: *See—*
Dube, Ghyslain, 4,297,105, Cl. 23-230.00R.
Aldrich, Frederic C., to General Motors Corporation. Engine fuel system with fuel/water separation. 4,296,723, Cl. 123-510.000.
Alfa-Pet, Inc.: *See—*
Schulein, Benjamin M., Jr., 4,296,709, Cl. 119-1.000.
Allegheny Ludlum Steel Corporation: *See—*
Patil, Balaji V.; and Tommaney, Joseph W., 4,297,132, Cl. 75-10.00V.
Allen, Gordon H., to Motorola, Inc. Glitch eliminator circuit for TTL transparent latch. 4,297,593, Cl. 307-247.00R.
Allied Chemical Coporation: *See—*
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,296,535, Cl. 28-257.000.
Allo, Vincent F., to Chicago Bridge & Iron Company. Freeze exchanger with removable tube liner. 4,296,612, Cl. 62-123.000.
Allport, Maurice J.: *See—*
Nicol, Thomas; Wiley, David; and Allport, Maurice J., 4,297,631, Cl. 320-64.000.
Allread, Alan R., to Aeroquip Corporation. Full flow breakaway coupling. 4,296,914, Cl. 251-149.200.
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Lindstrom, YrjoV., 4,296,627, Cl. 73-15.00R.

Alps Electric Co., Ltd.: *See—*
Niinuma, Akira, 4,297,541, Cl. 200-5.00E.
Tsutsui, Kotaroh; and Kinugawa, Ryoji, 4,297,540, Cl. 200-5.00B.
Alsthom-Atlantique: *See—*
Roux, Marc, 4,296,692, Cl. 105-397.000.
Alston, William G. Jump trainer. 4,296,925, Cl. 273-1.50A.
Altmeyer, Hans J.; and Gebel, Josef, to Hein, Lehmann AG. Belt filter press. 4,297,215, Cl. 210-386.000.
Aluma Form, Inc.: *See—*
Farmer, Marion R., 4,296,904, Cl. 248-218.400.
Aluminum Company of America: *See—*
Foster, Perry A., Jr., 4,297,180, Cl. 204-67.000.
Amada Company, Limited: *See—*
Kaneko, Tomonobu, 4,296,661, Cl. 83-796.000.
Amano, Hisao: *See—*
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Amazawa, Kiyoshi: *See—*
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AMCA International Corporation: *See—*
Heckelsberg, Robert E., 4,296,581, Cl. 52-520.000.
American Can Company: *See—*
Detroit, William J.; and Sanford, Michael E., 4,296,813, Cl. 166-293.000.
Nerod, Irving, 4,297,583, Cl. 250-453.000.
American Chemical & Refining Company Incorporated: *See—*
Fletcher, Augustus; and Moriarty, William L., 4,297,177, Cl. 204-43.00N.
Skomoroski, Robert M., 4,297,179, Cl. 204-47.000.
American Cyanamid Company: *See—*
Bernstein, Seymour, 4,297,372, Cl. 424-315.000.
Los, Marinus, 4,297,128, Cl. 71-92.000.
Lutz, Albert W.; and Diehl, Robert E., 4,297,127, Cl. 71-88.000.
O'Neal, Thomas D., 4,297,126, Cl. 71-78.000.
Wissner, Allan, 4,297,516, Cl. 568-330.000.
American Home Products Corporation: *See—*
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,297,373, Cl. 424-322.000.
American Science and Engineering, Inc.: *See—*
Silk, John K., 4,296,737, Cl. 126-438.000.
American Standard Inc.: *See—*
Lippa, Giuseppe, 4,296,908, Cl. 249-58.000.
Little, Donald R., 4,297,548, Cl. 200-61.080.
AMF Incorporated: *See—*
Koch, Claude V., 4,297,546, Cl. 200-38.00R.
Amos, Richard W.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.
AMP Incorporated: *See—*
Herrmann, Henry O., Jr., 4,296,986, Cl. 339-89.00C.
Hughes, Donald W. K.; and Myers, Ronald W., 4,296,991, Cl. 339-176.0MP.
Kobler, Robert J., 4,296,550, Cl. 29-884.000.
Warner, Gary N., 4,296,988, Cl. 339-97.00R.
Ampex Corporation: *See—*
Quan, Ronald, 4,297,620, Cl. 315-389.000.
Anaconda Company, The: *See—*
Rice, Hoyt G., Jr.; and Reynolds, Daniel J., 4,296,576, Cl. 52-90.000.
Anderson, Alonzo B. Anti-backflow valve for sewer traps. 4,296,778, Cl. 137-433.000.
Anderson Company of Indiana, The: *See—*
Arndt, John J., 4,296,520, Cl. 15-250.320.
Anderson, Robert L.: *See—*
Northup, Robert P.; and Anderson, Robert L., 4,296,670, Cl. 89-43.00R.
Andersson, Poul G., to Ring Lock Container S. A. Receptacle with a cover of plastics material. 4,296,871, Cl. 220-306.000.
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, to Nippon Toki Kabushiki Kaisha; and Watanabe Instruments Corp. Thermal pen. 4,297,714, Cl. 346-139.00C.
Ando, Ryo; and Sato, Kazuyoshi, to Nippon Kokan Kabushiki Kaisha. Apparatus for vitrifying blast furnace slag. 4,297,119, Cl. 65-141.000.
Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.
Andresen, Rolf; and Christian, John H., to International Business Machines Corporation. Sector servo with sync marks. 4,297,737, Cl. 360-135.000.
Andrews, David K.; and Smart, Michael W., to Dowty Fuel Systems Limited. Control mechanism. 4,296,676, Cl. 91-417.00R.
Anezaki, Yoshimitsu, to Tokyo Shibaura Electric Co., Ltd. Electron gun structure. 4,297,612, Cl. 313-446.000.
Angleman, John D.: *See—*
Henriques, Lance, 4,297,701, Cl. 343-6.5LC.
Angstrohm Precision, Inc.: *See—*
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Anic S.p.A: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.
Anritsu Electric Company Limited: *See—*
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.
Antes, Gregor; and Greenaway, David L., to LGZ Landis & Gyr Zug AG. Projection screen and method for making same. 4,297,001, Cl. 350-129.000.
Antonious, Anthony J. Adjustable and flexible closure assembly for shoes with segmented uppers. 4,296,558, Cl. 36-50.000.
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., to Health Innovations, Inc. Torsion exercise apparatus. 4,296,924, Cl. 272-117.000.
Anzaldua, David A.: *See—*
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.
Aoki, Harumi: *See—*
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Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive element. 4,297,440, Cl. 430-505.000.
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., to Compagnie Honeywell Bull. Call and stack mechanism for procedures executing in different rings. 4,297,743, Cl. 364-200.000.
Arai, Seiichi: *See—*
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Arakawa, Mitsuaki: *See—*
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,297,637, Cl. 324-309.000.
Aratame, Kazuhisa: *See—*
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.
Arbel, Arie; and Kurz, Rainer, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Circuit for continuous conversion of signals into digital magnitudes. 4,297,679, Cl. 340-347.0AD.
Arbit, Harry A.: *See—*
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.
Archer, Richard W. Beach umbrella support. 4,296,693, Cl. 108-28.000.
Armbrust, William D.; and McCreery, James F., to Kennametal Inc. Indexable cutting insert. 4,297,058, Cl. 407-113.000.
Armentrout, James L.; and Schneider, George H. Devious path bacterial barrier. 4,296,862, Cl. 206-439.000.
Arndt, Frederick P., to General Motors Corporation. Transmission shift lever backdrive and column locking mechanism. 4,296,847, Cl. 192-4.00A.
Arndt, John J., to Anderson Company of Indiana, The. Pin connector. 4,296,520, Cl. 15-250.320.
Arnold, Bernhard: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Arnold, Dan M.: *See—*
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.
Arnold, Harmon W.; and Erwin, Galen B., to Flex-o-lators, Inc. Component strand for wire fabrics. 4,297,418, Cl. 428-595.000.
Arons, Howard L.: *See—*
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Arthur Smith Industries, Inc.: *See—*
Balbach, George C.; and Peterman, Robert J., 4,296,570, Cl. 49-360.000.
Artz, Glen D.: *See—*
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Asahi Glass Company, Ltd.: *See—*
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,297,182, Cl. 204-98.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,297,014, Cl. 354-25.000.
Asahi-Seiki Manufacturing Co., Ltd.: *See—*
Ohdai, Yozo; and Takahata, Yasuyuki, 4,296,621, Cl. 72-130.000.
Asami, Takayoshi, to Kobe Steel, Limited. Heat transfer tubing for natural gas evaporator. 4,296,539, Cl. 29-157.30A.
Asano, Masahide: *See—*
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Asdollahi, Nasrollah, to Wickmann Werke AG. Slow-blowing fuse using zinc-manganese alloy link. 4,297,666, Cl. 337-163.000.
Ashworth, Denis H., to Simon Engineering Dudley Limited. Hydraulically operated access equipment. 4,296,833, Cl. 182-2.000.
Atkin, Howard S., to Holset Engineering Company Limited. Sealing assembly. 4,296,934, Cl. 277-81.00R.
Atlantic Richfield Company: *See—*
Mooi, John, 4,297,244, Cl. 252-455.00Z.
Aubert, Ralph: *See—*
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Augat Inc.: *See—*
Bertoglio, Guido, 4,296,549, Cl. 29-874.000.
Wellington, Roger D., 4,296,993, Cl. 339-275.00B.
Augst, Horst G., to Telefonaktiebolaget L M Ericsson. Crystal filter structure. 4,297,659, Cl. 333-191.000.
Autoclave Engineers, Inc.: *See—*
Ruyak, Robert F., 4,296,912, Cl. 251-65.000.
Automated Building Components, Inc.: *See—*
Jureit, John C.; and Greenley, Henry R., 4,297,048, Cl. 403-189.000.
Automotive Products Limited: *See—*
Farrant, David J. R., 4,297,047, Cl. 403-138.000.
Autotote, Ltd.: *See—*
Lees, Robert, 4,297,039, Cl. 400-120.000.
Aviram, Ari, to International Business Machines Corporation. Photodeformable article having photoionizable groups on a polymer backbone. 4,297,434, Cl. 430-270.000.
Ayabe, Hideaki: *See—*
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.
B. F. Goodrich Company, The: *See—*
Blalock, Gary L., 4,296,855, Cl. 198-502.000.
Cohen, Louis, 4,297,320, Cl. 422-131.000.
Lai, John T., 4,297,497, Cl. 544-384.000.
Babb, Burton A. Dynamic loudspeaker. 4,297,537, Cl. 179-180.000.
Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., to Upjohn Company, The. Male contraceptive steroids and methods of use. 4,297,350, Cl. 424-238.000.
Babcock & Wilcox Company, The: *See—*
Brunson, William T.; and Lexa, Anthony F., 4,297,581, Cl. 250-391.000.
Zadiraka, Allan J., 4,296,730, Cl. 126-421.000.
Bacardit, Juan S., to Bendiberica S.A. Power steering mechanism. 4,296,673, Cl. 91-375.00A.
Bacchi, Anthony C.: *See—*
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Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., to International Business Machines Corporation. Document feeder system having a suspending-/commencing mode. 4,297,025, Cl. 355-14.0SH.
Bachofen AG.: *See—*
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,774, Cl. 137-322.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.
Bachtell, Stephen R. Method and apparatus for securing a hairpiece. 4,296,765, Cl. 132-53.000.
Bagusche, Siegfried, to W. Hegenscheidt Gesellschaft mbH. Smoothing rolling mill. 4,296,620, Cl. 72-100.000.
Baker, Cole H., to Intec Corporation. Absolute DC system for a laser inspection system. 4,297,587, Cl. 250-563.000.
Baker, Eugene E.; and Carter, Ernest E., Jr., to Halliburton Services. Isolation packer extension. 4,296,808, Cl. 166-191.000.
Baker, Gerald E. Earthquake alarm system. 4,297,690, Cl. 340-690.000.
Baker International Corporation: *See—*
Akkerman, Neil H., 4,297,087, Cl. 417-378.000.
Akkerman, Neil H., 4,297,088, Cl. 417-378.000.
Balbach, George C.; and Peterman, Robert J., to Arthur Smith Industries, Inc. Hydraulic door operator. 4,296,570, Cl. 49-360.000.
Baldwin, Gary L.; and McCreary, James L., to Bell Telephone Laboratories, Incorporated. Offset correction in operational amplifiers. 4,297,642, Cl. 330-9.000.
Baldwin Piano & Organ Company: *See—*
Wade, David R.; and Munch, Walter, 4,296,667, Cl. 84-345.000.
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F. Covers for electrical boxes. 4,296,870, Cl. 220-3.300.
Ballinger, Paul V. Demountable interconnection. 4,297,074, Cl. 414-723.000.
Ballmann, Josef. Projectile with spin-producing flow passages. 4,296,893, Cl. 244-3.230.
Bally Manufacturing Corporation: *See—*
Frederiksen, Jeffrey E., 4,296,930, Cl. 273-313.000.
Bals, Hans G. Process and apparatus for extracting a substance from a body of water. 4,297,218, Cl. 210-661.000.
Baltensperger, Rudolf; and Pfister, Hans B. Hanger for track-type suspended railway. 4,296,690, Cl. 104-91.000.
Bando, Yoshiaki: *See—*
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Banucci, Eugene G.; and Boldebuck, Edith M., to General Electric Company. Particulated polyetherimide and method for making. 4,297,385, Cl. 427-27.000.
Barcza, Sandor, to Sandoz, Inc. Silicon-bearing carboxylic acids and amides. 4,297,349, Cl. 424-184.000.
Barge, Presley O. Spherical living module or space. 4,296,892, Cl. 244-2.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Martens, Gerhard, 4,296,889, Cl. 242-18.100.
Barnoski, Michael K.: *See—*
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.
Barrash, Marshall J., to Coca-Cola Company, The. Elastic band and handle structure for forming packages of groups of containers. 4,296,861, Cl. 206-428.000.
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, to Pfaff Industriemaschinen GmbH. Sewing machine with a work holder for wrapping button shanks. 4,296,697, Cl. 112-109.000.
Bartl, Herbert: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
Bartley, Burton H.; and Estes, John H., to Texaco Inc. Catalyst for the preparation of methane. 4,297,245, Cl. 252-460.000.
Bartolac, Robert R. Hair dryer. 4,297,564, Cl. 219-367.000.
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Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.
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Beale, Harry A., 4,297,387, Cl. 427-38.000.
Baugh, Edward D.; and Hoffman, Mark B., to General Motors Corporation. Diesel engine shutdown control system. 4,296,718, Cl. 123-198.00D.
Baumann, Hans D. Eccentric rotary disk valve with elastic metal seal. 4,296,915, Cl. 251-174.000.
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Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
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Beggs, George R. Rigid shell for building structures. 4,296,797, Cl. 165-48.00S.

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Dufft, William H., 4,296,998, Cl. 350-96.200.
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Belles, David E., to Lok-A-Wat, Inc. Chain-lock actuated magnetic switch. 4,296,957, Cl. 292-264.000.

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Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., 4,296,985, Cl. 339-48.000.
Monroe, William E., 4,296,674, Cl. 91-391.00R.
Roberts, James K., 4,296,845, Cl. 188-341.000.
Tang, Louis S., 4,296,671, Cl. 91-5.000.

Bengtsson, Sigurd W. Strap fastening means. 4,296,531, Cl. 24-200.000.

Benis, Isak. Manicuring case and supporting apparatus. 4,296,766, Cl. 132-73.000.

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Beno, Richard D., to Interstate Electronics Corp. Training circuit for audio signal recognition computer. 4,297,528, Cl. 179-1.05B.

Benson, Samuel L., to J. I. Case Company. Brake release mechanism. 4,296,846, Cl. 192-4.00A.

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Raible, Donald A., 4,297,318, Cl. 422-46.000.

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Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, to AGFA-Gevaert AG. Production of photographic silver halide emulsion. 4,297,439, Cl. 430-434.000.

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Berndtson, Gene A. Staple-nail for securing ceiling support strip to wallboard. 4,297,064, Cl. 411-470.000.

Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, to Volkswagenwerk AG. Solar radiation collector. 4,296,732, Cl. 126-426.000.

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Berry, Clyde F. Electric steam generating unit. 4,297,563, Cl. 219-275.000.

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Bilberg, Erik A., to EABVV Utvecklings Aktiebolag. Heating boiler. 4,296,711, Cl. 122-22.000.

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Wallace, Christopher B., 4,297,122, Cl. 71-12.000.

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Kurtz, Leonard D.; and Bidwell, Robert E., 4,296,748, Cl. 128-276.000.

Bird, Richard M.: *See—*
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Bissar, Saadi, to Timex Corporation. Protective membrane for electrochromic displays. 4,297,006, Cl. 350-357.000.

Bjorklund, Gary C., to International Business Machines Corporation. Method and device for detecting a specific spectral feature. 4,297,035, Cl. 356-402.000.

Blahak, Johannes, to Metzeler Kautschuk GmbH. Cellular elastomeric foams and method of production using an expanding agent containing a component reactive with the polyamine chain-lengthening agent. 4,297,442, Cl. 521-107.000.

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Blanchard, Kenneth G.; and Ronne, Reuben N. Firearm shooting support table. 4,296,963, Cl. 297-170.000.

Blaser, Don E., to Exxon Research & Engineering Co. Two-stage integrated coking for chemicals and coke gasification process. 4,297,202, Cl. 208-54.000.

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Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
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Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, to Office National d'Etudes et de Recherches Aerospatiales. Novel acrylic polymers and method of making same. 4,297,466, Cl. 526-218.000.

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Bloyce, Lionel T.; and Morley, Michael J., to Albany International Corporation. Shower fittings. 4,296,886, Cl. 239-264.000.

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Thompson, Bernard B., 4,296,897, Cl. 244-111.000.

Boffardi, Bennett P., to Calgon Corporation. Polyphosphate and polymaleic anhydride combination for treating corrosion. 4,297,237, Cl. 252-389.00A.

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Bohler, Joachim; and Jordon, Hans, to Akzona Incorporated. Portable spinneret cleaner. 4,296,517, Cl. 15-93.00R.

Bohn, Hans; and Haupt, Heinz, to Behringwerke Aktiengesellschaft. Protein from red blood cells and process for isolating it. 4,297,274, Cl. 260-112.00B.

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Boothe, Robert R., to United States of America, Army. Frequency agility technique for frequency scanned antenna. 4,297,705, Cl. 343-771.000.

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Bortle, Bonnie. Self-packaging urine conduit. 4,296,502, Cl. 4-144.100.

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Bowden, Wade R., Jr., to Slater Electric Inc. Electrical outlet box and pawl mounting device. 4,297,525, Cl. 174-58.000.

Bowman, Wayne A.; Bishop, John F.; and Noonan, John M., to Eastman Kodak Company. Two-sheet diffusion transfer assemblages and photographic elements. 4,297,432, Cl. 430-215.000.

Boyd, Leroy. Racheting pipe cutter. 4,296,551, Cl. 30-98.000.

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Brack, Frederick. Reversible dual windshield wiper. 4,296,522, Cl. 15-250.360.

Bradley, John: *See—*
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Brand, Derek A.: *See—*
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Bray, Lynn W., to United States Steel Corporation. Rod cooling box air wipe nozzle. 4,296,556, Cl. 34-107.000.

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Breuckner, Keith A., to KMS Fusion, Inc. Fuel pellets for controlled nuclear fusion. 4,297,165, Cl. 376-103.000.

Brezinski, Donald P.; and Morse, Leroy R., to Corning Glass Works. pH Electrode glass compositions. 4,297,193, Cl. 204-195.00G.

Bridge, John G. Anti-gravity spinnaker. 4,296,704, Cl. 114-103.000.

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Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.

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Briley, Patrick B. Method for hydroconversion of solid carbonaceous materials. 4,297,200, Cl. 208-10.000.

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Broderick, Ronald J. Archery bow improvement and camera therefor. 4,296,725, Cl. 124-24.00R.

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Brucken, Byron L., to General Motors Corporation. Guide mechanism for compressor socket plate. 4,297,085, Cl. 417-222.000.

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Bryant, David R.; and Galley, Richard A., to Union Carbide Corporation. Hydroformylation catalyst reactivation. 4,297,239, Cl. 252-412.000.

BSL Corporation: *See—*
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Buchanan, Robert A.; Maple, T. Grant; and Sklensky, Alden F., to Lockheed Missiles & Space Company, Inc. Rare earth phosphors and phosphor screens. 4,297,584, Cl. 250-483.000.

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Buchner, Robert B., to U.S. Philips Corporation. Self-adjusting hybrid network. 4,297,536, Cl. 179-170.00D.

Buck, Gordon H.; and Hardwick, Martha K., to Mattel, Inc. Red light - green light game. 4,296,926, Cl. 273-86.00R.

Buckler, Robert T.; and Schroeder, Hartmut R., to Miles Laboratories, Inc. Chemiluminescent phthalhydrazide-labeled protein and polypeptide conjugates. 4,297,273, Cl. 260-112.00B.

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Buckshaw, Thomas M.: *See—*
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Burdeska, Kurt; and Kabas, Guglielmo, to Ciba-Geigy Corporation. Benzoxazolyl-stilbenes. 4,297,234, Cl. 252-301.240.

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C. & W. Berges Maschinenfabrik, Firma: *See—*
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Cabelli, Michael D.: *See—*
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Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, to BASF Aktiengesellschaft. Aging-resistant fireproofing material. 4,297,252, Cl. 252-606.000.

Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., to United Kingdom Atomic Energy Authority. Method of producing dense refractory oxide coatings on metallic substrates and the production of catalysts from the coated substrates. 4,297,246, Cl. 252-465.000.

Calamur, Narasimhan; and Schoenberg, Morris R., to Standard Oil Company (Indiana). Method and apparatus for sampling hot homogeneous mixtures. 4,296,637, Cl. 73-863.110.

Calgon Corporation: *See—*
Boffardi, Bennett P., 4,297,237, Cl. 252-389.00A.
McConomy, Thomas A.; and Wells, Bruce D., 4,297,334, Cl. 423-321.00R.

Cama, Lovji D.: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.

Cameron, John H.: *See—*
Sherman, Norman; and Cameron, John H., 4,297,311, Cl. 264-109.000.

Camp International, Inc.: *See—*
Tyo, James H., 4,296,761, Cl. 128-80.00G.

Campagna, Barry A., to Teledyne Industries, Inc. Lockable key holding receptacle. 4,296,617, Cl. 70-63.000.

Campbell, Billy H.: *See—*
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.

Campbell, Edward C.: *See—*
Kirk, Joseph R.; and Campbell, Edward C., 4,297,219, Cl. 210-669.000.

Campbell, J. Allan: *See—*
Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., 4,297,350, Cl. 424-238.000.

Campbell, Willis R.: *See—*
Waldrop, T. William; and Campbell, Willis R., 4,296,596, Cl. 56-341.000.

Campos, Conrad. Arm or shoulder attachment for gunstocks. 4,296,566, Cl. 42-71.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Tucker, Trevor W.; and Cornish, William D., 4,297,648, Cl. 331-1.00R.

Canadian General Electric Company Limited: *See—*
Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, 4,297,305, Cl. 264-0.500.

Canon Kabushiki Kaisha: *See—*
Hirayama, Kazuhiro; and Sugiura, Susumu, 4,297,716, Cl. 346-153.100.
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.
Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,297,013, Cl. 354-23.00D.
Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, 4,297,018, Cl. 354-50.000.
Yamada, Yasuyuki; and Okuno, Youichi, 4,297,020, Cl. 354-225.000.

Canron Inc.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.

Card, Jeffrey W.; and Bell, Keith. Radon detection. 4,297,574, Cl. 250-253.000.

Caribbean Properties Limited: *See—*
Ross, Leon I., 4,297,111, Cl. 55-92.000.

Carl Still GmbH & KG, Firma: *See—*
Offermann, Ludwig; and Wippich, Rheinhold, 4,296,938, Cl. 277-135.000.

Carlson, Gerald E., to Xerox Corporation. Apparatus and method for diagnostic entry. 4,297,029, Cl. 355-133.000.

Carlson, Ronald R.: *See—*
Wilson, Kermit H.; and Carlson, Ronald R., 4,296,573, Cl. 52-6.000.

Carlsson, Per-Olov A. V.; and Hakansson, Bo H., to Gambro AB. Electrical stimulator. 4,296,760, Cl. 128-788.000.

Carlton, Richard J., to Acurex Corporation. Tracking solar energy collector assembly. 4,297,572, Cl. 250-203.00R.

Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., to Akzona Incorporated. Method of manufacture and use of improved 2$\beta$, 16$\beta$-piperidino androstanes. 4,297,351, Cl. 424-241.000.

Carnes, Irven S., to Raytheon Company. Polyphase coded fuzing system. 4,297,702, Cl. 343-7.0PF.

Carrier Corporation: *See—*
Strasiicka, William A., 4,296,538, Cl. 29-156.40R.

Carroll, Charles B.; and Scheible, Howard G., to RCA Corporation. Method for preparing stylus lapping discs. 4,297,312, Cl. 264-134.000.

Carter, Ernest E., Jr.: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,296,808, Cl. 166-191.000.

Carter, William R. Airborne dust monitor. 4,297,578, Cl. 250-343.000.

Cascade Corporation: *See—*
Didtel, Stuart R., 4,297,070, Cl. 414-497.000.

Cassel, Knut E.; and Molin, Bengt T., to U.S. Philips Corporation. Luneberg lens antenna. 4,297,709, Cl. 343-754.000.

Castanie, Francis: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Caterpillar Tractor Co.: *See—*
Day, Ralph R.; and Wulff, B. James, 4,296,917, Cl. 254-400.000.
Fuzzell, Joe E., 4,297,687, Cl. 340-626.000.
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., 4,297,742, Cl. 361-154.000.

Cavalli born Meyer, Chantal: *See—*
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.

Cazenave, Paul: *See—*
Horman, Ian; and Cazenave, Paul, 4,297,380, Cl. 426-597.000.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Paulus, Philippe, 4,297,398, Cl. 427-320.000.

Centre National de Transfusion Sanguine: *See—*
Claude, Matte, 4,297,104, Cl. 23-230.00B.

Centre National pour l'Exploitation des Oceans: *See—*
Sachetto, Jean-Pierre; and Cuccolo, Sergio, 4,297,137, Cl. 106-15.050.

Centro Ricerche Fiat S.p.A.: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.

Ceserani, Roberto: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.

Ceskoslovenska Akademie Ved: *See—*
Beranek, Jaroslav, 4,297,321, Cl. 422-143.000.

Cha, John H.: *See—*
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.

Chaborski, Hoiko, to MITEC-Moderne-Industrietechnik GmbH. Method and apparatus for measuring the distance and/or relative elevation between two points. 4,297,030, Cl. 356-5.000.

Chamberlin, Richard L., to Dresser Industries, Inc. Corrosion resistant pipe joint. 4,296,950, Cl. 285-45.000.

Champeau, Marcel; and Tabutin, Andre, to Societe Anonyme dite: Ramo S.A. Clamping device for simultaneously machining internally and/or externally, the two ends of a workpiece. 4,296,658, Cl. 82-30.000.

Chan, Tsiu C.: *See—*
McKenny, Vernon C.; and Chan, Tsiu C., 4,297,721, Cl. 357-59.000.

Chandler, Edward A., to Kaufel Group Ltd. Emergency lighting system. 4,297,614, Cl. 315-86.000.

Chandler, Ollie W.: *See—*
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.

Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., to Ford Motor Company. Coating composition of aminoplast, hydroxy polymers and vinylic monomers. 4,297,448, Cl. 525-162.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., 4,297,388, Cl. 427-47.000.

Charlton, Webster T., to Stone & Webster Engineering Corp. Apparatus and process for lubricating electrical cable. 4,296,837, Cl. 184-15.00R.

Charrier, Denis: *See—*
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.

Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy. Folding door or like closure device. 4,296,791, Cl. 160-206.000.

Chef-Reddy Foods Corporation: *See—*
Harney, David L.; and Young, Harlow S., 4,297,377, Cl. 426-438.000.

Chemische Fabrik Stockhausen & Cie: *See—*
Chmelir, Miroslay; and Dahmen, Kurt, 4,297,468, Cl. 526-276.000.

Chemische Werke Huels, Aktiengesellschaft: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,297,505, Cl. 560-219.000.

Chen, Cheng-Lin, to Westinghouse Electric Corp. Isotopic separation. 4,297,191, Cl. 204-193.000.

Chen, Rocky W.: *See—*
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Chenaux, Bernard; and Leroux, Alain, to Compagnie Generale d'Electricite. Electrode for a lead accumulator. 4,297,420, Cl. 429-217.000.

Chern, Mao-Jin; and Lowrey, Robert D., to Minnesota Mining & Manufacturing Company. Liquid crystal display and photopolymerizable sealant therefor. 4,297,401, Cl. 428-1.000.

Chesebrough-Pond's Inc.: *See—*
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.

Chestnut, Benjamin F., to Emhart Industries, Inc. Miniature timing mechanism. 4,297,547, Cl. 200-38.00R.

Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, to Techinter S.A. Photosetting adhesive from unsaturated oligomer, photoinitiator, and betaine-forming mixture of unsaturated tert.amine and unsaturated acid. 4,297,185, Cl. 204-159.150.

Chevron Research Company: *See—*
Clark, William J., 4,296,523, Cl. 15-415.00R.
Edwards, Laroy H., 4,297,124, Cl. 71-66.000.

Chiang, David. Method of determining operating currents for stepping motor. 4,297,626, Cl. 318-696.000.

Chiasson, Bertrand A., to Union Carbide Corporation. Process for preparing alkali metal salts 3-amino-2, 5-dichlorobenzoic acid. 4,297,509, Cl. 562-456.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,296,663, Cl. 84-1.010.

Chicago Bridge & Iron Company: *See—*
Allo, Vincent F., 4,296,612, Cl. 62-123.000.
O'Meara, David M., 4,297,037, Cl. 366-114.000.

Chien-Sheng, Chiang. Stepless controlled flush closet. 4,296,505, Cl. 4-324.000.

Chik, Kiuchi D.: *See—*
Dyment, John C.; and Chik, Kiuchi D., 4,297,651, Cl. 331-94.50H.

Chion, Pierre: *See—*
Achard, Georges; Chion, Pierre; and Menault, Jacques, 4,297,412, Cl. 428-370.000.

Chisso Corporation: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.

Chmelir, Miroslay; and Dahmen, Kurt, to Chemische Fabrik Stockhausen & Cie. Allyl amido phosphorous copolymers. 4,297,468, Cl. 526-276.000.

Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, to Merck & Co., Inc. 7-$\alpha$-Methoxy cephalosporins. 4,297,488, Cl. 544-21.000.





Christian, John H.: *See—*
Andresen, Rolf; and Christian, John H., 4,297,737, Cl. 360-135.000.

Christian, Robert F., to Jude Engineering, Inc. Inclined helical flight conveyor. 4,297,208, Cl. 210-94.000.

Ciba-Geigy Corporation: *See—*
Abeler, Gerd; and Maul, Rudolf, 4,297,268, Cl. 260-45.80N.
Burdeska, Kurt; and Kabas, Guglielmo, 4,297,234, Cl. 252-301.240.
Felder, Louis; and Kirchmayr, Rudolf, 4,297,513, Cl. 568-43.000.
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.
Kern, Jorg; and Guth, Christian, 4,297,400, Cl. 427-389.000.
Koci, Zdenek; and Mollet, Hans, 4,297,100, Cl. 8-527.000.
Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, 4,297,365, Cl. 424-270.000.
Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, 4,297,492, Cl. 544-211.000.

CIR - S.p.A. Divisione SASIB: *See—*
Cristiani, Athos, 4,296,660, Cl. 83-100.000.

Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, to List, Hans. Transducer device for measuring the internal pressure in pipes. 4,296,635, Cl. 73-730.000.

Claffy, Richard D.; and Lovelace, Reginald B., to United States of America, Navy. Quiet impulse steam trap. 4,296,771, Cl. 137-110.000.

Clarion Co., Ltd.: *See—*
Tanaka, Kouichi; and Amazawa, Kiyoshi, 4,297,645, Cl. 330-280.000.

Clark, Michael J.: *See—*
Ford, William D.; and Clark, Michael J., 4,297,203, Cl. 208-74.000.

Clark, William J., to Chevron Research Company. Dust-collection head for a dust collection system. 4,296,523, Cl. 15-415.00R.

Claude, Matte, to Centre National de Transfusion Sanguine. Method of detecting or identifying virus antigens, erythrocyte or cell antigens or antibodies in a biological medium. 4,297,104, Cl. 23-230.00B.

Clement, Joseph, to Mead Corporation, The. Display device with price change cartridges. 4,296,563, Cl. 40-518.000.

Clifford, Roy, to Kangol Magnet Limited. Emergency release systems. 4,296,942, Cl. 280-803.000.

Cluff, C. Brent. Tracking booster and multiple mirror concentrator floating collector. 4,296,731, Cl. 126-424.000.

CMI Corporation: *See—*
Van Wassenhove, Bernard, 4,296,941, Cl. 280-423.00B.

Coal Industry (Patents) Limited: *See—*
Bennett, Stuart C., 4,296,831, Cl. 181-224.000.

Coca-Cola Company, The: *See—*
Barrash, Marshall J., 4,296,861, Cl. 206-428.000.

Coe, Charles D.; and Wright, Philip, to Land Pyrometers Limited. Radiation detection of gas compositions. 4,297,577, Cl. 250-343.000.

Cohen, Louis, to B. F. Goodrich Company, The. Coating polymerization reactors with the reaction products of thiodiphenols and a bleach. 4,297,320, Cl. 422-131.000.

Cohen, Merrill L. Automotive oil system. 4,296,838, Cl. 184-106.000.

Coleman, Richard L.: *See—*
Witte, Arnold C.; and Coleman, Richard L., 4,297,227, Cl. 252-18.000.

Colleoni, Alec: *See—*
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., 4,297,009, Cl. 352-86.000.

Colombo, Angelo, to Valli & Colombo S.p.A. Cam operated lock, particularly for doors. 4,296,956, Cl. 292-169.180.

Commissariat a l'Energie Atomique: *See—*
Laval, Michel; and Tournier, Edmond, 4,297,576, Cl. 250-336.000.
Sauvage, Henri; and Tarnero, Maurice, 4,297,324, Cl. 422-268.000.

Communications Satellite Corporation: *See—*
Stegens, Ronald E., 4,297,661, Cl. 333-204.000.

Compagnie Generale d'Electricite: *See—*
Chenaux, Bernard; and Leroux, Alain, 4,297,420, Cl. 429-217.000.

Compagnie Honeywell Bull: *See—*
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., 4,297,743, Cl. 364-200.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See—*
Dupont, Jean M., 4,297,623, Cl. 318-410.000.

Concha, Edward; Jaffe, Max; and Bedford, Riley, to United States of America, Army. Cargo container transporter. 4,297,068, Cl. 414-458.000.

Conoco Inc.: *See—*
Stalder, John L.; and Martin, William L., 4,296,814, Cl. 166-303.000.

Consiglio Nazionale Delle Richerche: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.

Conway, William H.: *See—*
Tyler, Hugh J.; and Conway, William H., 4,297,557, Cl. 219-10.55R.

Conwed Corporation: *See—*
Sherman, Norman; and Cameron, John H., 4,297,311, Cl. 264-109.000.

Cook, Edward H., Jr.: *See—*
Lazarz, Christine A.; and Cook, Edward H., Jr., 4,297,196, Cl. 204-296.000.

Cooper, George H., to Suntime, Inc. Solar hot water heating system. 4,296,729, Cl. 126-421.000.

Cooper Industries, Inc.: *See—*
Jameson, James J., 4,296,645, Cl. 74-688.000.

Cooper, Thomas F. Sky seat safety descent apparatus. 4,296,836, Cl. 182-193.000.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Compositions of epichlorohydrin rubber and nylon. 4,297,453, Cl. 525-408.000.

Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, to Snamprogetti S.p.A.; and Anic S.p.A. Polymerization of monoolefins using an aluminum-titanium catalyst system. 4,297,462, Cl. 526-125.000.

Cordes, Gunter: *See—*
Sandrock, Klaus; and Cordes, Gunter, 4,297,286, Cl. 260-347.800.

Cornelius, Morris E. Motorcycle throttle gripper. 4,296,643, Cl. 74-531.000.

Corning Glass Works: *See—*
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.
Brezinski, Donald P.; and Morse, Leroy R., 4,297,193, Cl. 204-195.00G.
Lawless, William N., 4,296,607, Cl. 62-6.000.
Lawless, William N., 4,296,608, Cl. 62-6.000.
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.
Paisley, Robert J., 4,297,140, Cl. 428-310.000.
Wu, Che-Kuang, 4,297,417, Cl. 428-410.000.

Cornish, William D.: *See—*
Tucker, Trevor W.; and Cornish, William D., 4,297,648, Cl. 331-1.00R.

Corona, Stephen C., to Xerox Corporation. Fluorescent lamp with incandescent ballasting systems. 4,297,616, Cl. 315-179.000.

Cortorillo, Salvatore F., to Wagner Electric Corporation. Control of tungsten filament erosion in a halogen lamp. 4,297,611, Cl. 313-222.000.

Corvino, Janice E.: *See—*
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.

Costantini, Michel; and Jouffret, Michel, to Rhone-Poulenc Industries. Production of epoxides from lower alkane-1,2-diols. 4,297,287, Cl. 260-348.160.

Cowan, Kiplin D., to Phillips Petroleum Co. Synthesis of esters. 4,297,506, Cl. 560-246.000.

CPC International Inc.: *See—*
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Mise, Yoshinari; and Tomimura, Eijiro, 4,297,146, Cl. 127-60.000.

Crabere, Henri: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Craven, Richard L., to Upjohn Company, The. Controlled release cycloheximide compositions. 4,297,339, Cl. 424-19.000.

Crawford, Roger A.; and Simmons, Robert B., to PPG Industries, Inc. Method of decomposing hypochlorite ion in a basic solution. 4,297,333, Cl. 423-241.000.

Cristiani, Athos, to CIR - S.p.A. Divisione SASIB. Device for feeding rod-like articles. 4,296,660, Cl. 83-100.000.

Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude. Method of preparing stable dilute solutions of aliphatic carboxylic peracids, and the resulting solutions. 4,297,298, Cl. 260-502.00R.

Crone, William F., Jr.: *See—*
Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, 4,296,662, Cl. 83-880.000.

Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, to University of California, The Regents of the. Method and apparatus for mapping lines of nuclear density within an object using nuclear magnetic resonance. 4,297,637, Cl. 324-309.000.

Crosby, Jeffrey N., to International Nickel Company, Inc., The. Ruthenium electroplating and baths and compositions therefor. 4,297,178, Cl. 204-47.000.

Crow, James T.: *See—*
Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, 4,297,615, Cl. 315-111.210.

Cryer, Edward: *See—*
Tregurtha, Steven J.; and Cryer, Edward, 4,297,549, Cl. 200-61.270.

CTS Corporation: *See—*
Flanders, Thomas W., 4,297,671, Cl. 338-200.000.

Cuccolo, Sergio: *See—*
Sachetto, Jean-Pierre; and Cuccolo, Sergio, 4,297,137, Cl. 106-15.050.

Cundari, Sante M.: *See—*
Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M., 4,297,303, Cl. 264-3.00R.

Cunningham, Joel, to Baxter Travenol Laboratories, Inc. Maintaining the dimensional integrity of thermoplastic tubing ends for receiving a luer. 4,297,316, Cl. 422-1.000.

Curtil, Remi; and Devaux, Alain, to Societe d'Etudes de Machines Thermiques S.E.M.T. Apparatus for external cooling of an exhaust valve. 4,296,715, Cl. 123-90.150.

Cusick, Kenneth M., to Aitken, Inc. Apparatus for separating foreign matter from a gas stream. 4,297,116, Cl. 55-319.000.

Custom Rollforming Company Limited: *See—*
Berdan, Gunter, 4,296,587, Cl. 52-788.000.

Cyber Diagnostics, Inc.: *See—*
Dunning, Ted E.; and Enright, Paul L., 4,296,756, Cl. 128-716.000.

Cybernet Electronics Corp.: *See—*
Kakigi, Takao, 4,297,688, Cl. 340-630.000.

D.E.W. Line, Inc.: *See—*
Fruchey, Russell L.; and Kupar, Daniel E., 4,297,672, Cl. 340-23.000.

Dachtler, William G. Baby bottle support jig. 4,296,902, Cl. 248-102.000.

Dahmen, Kurt: *See—*
Chmelir, Miroslay; and Dahmen, Kurt, 4,297,468, Cl. 526-276.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Miki, Tosaku; and Asano, Masahide, 4,297,357, Cl. 424-251.000.

Daimler-Benz Aktiengesellschaft: *See—*
Wulf, Helmut, 4,296,796, Cl. 165-46.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.

Daiwa Chemical Company Ltd.: *See—*
Nakaoji, Kozo, 4,297,520, Cl. 568-426.000.

Dake Corporation, Division of JSJ Corporation: *See—*
Kruse, Gary L., 4,296,589, Cl. 53-300.000.

D'Alelio, Gaetano F., deceased: *See—*
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Dalhof, Axel; and Lechner, Robert, to Siemens Aktiengesellschaft. Circuit for suppressing noise influences in the evaluation of signal states on transmission lines. 4,297,531, Cl. 179-16.0AA.

Dalle & Cie, S.A.: *See—*
Dalle, Joel, 4,297,156, Cl. 156-93.000.

Dalle, Joel, to Dalle & Cie, S.A. Process for manufacture of wall coverings and wall coverings thus obtained. 4,297,156, Cl. 156-93.000.

Dana Corporation: *See—*
Schetter, Thomas C., 4,296,642, Cl. 74-475.000.

Danavox A/S: *See—*
Pedersen, Jorgen R., 4,296,829, Cl. 181-129.000.

Danfoss A/S: *See—*
Jensen, Borge R., 4,297,608, Cl. 310-335.000.

Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, to Centro Ricerche Fiat S.p.A.; and Consiglio Nazionale Delle Richerche. Process for the electrolytic coating of conductive substrates with protective films of phenolic resins. 4,297,188, Cl. 204-181.00R.

Dargatz, Dayton O., to Plessey Peripheral Systems. Impact printer inclined ribbon scanner. 4,297,043, Cl. 400-224.000.

Darner, Ronald G., to Emhart Industries, Inc. Switching means for a timing mechanism. 4,297,545, Cl. 200-38.00R.

Dart Industries Inc.: *See—*
Elias, Moenes L.; and Shah, Narendra K., 4,297,257, Cl. 260-29.60H.

Das, Dilip K.: *See—*
Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., 4,297,388, Cl. 427-47.000.

Dasher, George F.; and Schamper, Thomas J., to Alberto-Culver Company. Method for gradual coloring of hair to a light brown shade and preparations for use therein. 4,297,098, Cl. 8-412.000.

Datakey, Inc.: *See—*
Flies, William P., 4,297,569, Cl. 235-443.000.

Datamedix Inc.: *See—*
Judell, Neil H. K., 4,296,755, Cl. 128-705.000.

David Parr & Associates Limited: *See—*
Parr, David, 4,297,565, Cl. 219-522.000.

Davidson, Donald R.; and Marsh, Walter H. W., to Singer Company, The. Button attaching hand tool with button storage compartment. 4,296,698, Cl. 112-110.000.

Davies, John H.: *See—*
Davis, Royston H.; and Davies, John H., 4,297,496, Cl. 544-332.000.

Davis, Gerald T.: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,296,947, Cl. 282-27.500.

Davis, Michael W.: *See—*
Simpson, Harold G.; and Davis, Michael W., 4,296,582, Cl. 52-590.000.

Davis, Robert B., to Union Carbide Corporation. Liquid cryogen delivery system. 4,296,610, Cl. 62-55.000.

Davis, Royston H.; and Davies, John H., to Shell Oil Company. Nitrimine derivatives. 4,297,496, Cl. 544-332.000.

Day, Ralph R.; and Wulff, B. James, to Caterpillar Tractor Co. Contoured cable roller. 4,296,917, Cl. 254-400.000.

Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M. Preparation and reaction of energy producing waste material composition. 4,297,303, Cl. 264-3.00R.

Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., to United States of America, Army. Rocket tube launcher with cast-in place tube support bulkhead. 4,296,669, Cl. 89-1.816.

Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912B nucleus. 4,297,277, Cl. 260-112.50R.

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Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.

Deere & Company: *See—*
Marquart, Gordon L., 4,296,649, Cl. 74-751.000.

Deguchi, Ryuichi: *See—*
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.

Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, to Toray Industries, Inc. Surface treatment of plastic material. 4,297,187, Cl. 204-165.000.

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Kleinschmit, Peter; and Schwarz, Rudolf, 4,297,143, Cl. 501-103.000.
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

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Sundeen, Joseph E.; and Dejneka, Tamara, 4,297,275, Cl. 260-112.50R.

De Koch, Robert J.; Kolb, Gerald C.; and Lalk, James W., to Dow Chemical Company, The. Process for the manufacture of oxazoline and/or oxazine-modified adsorbent polymer resins. 4,297,452, Cl. 525-367.000.

Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, to P C U K Produits Chimiques Ugine Kuhlmann. 5-Amino-1,2,3,4-tetrahydroanthraquinone and its preparation. 4,297,288, Cl. 260-378.000.

Delfosse, Claude, to Fives-Cail Babcock. Centrifugal separator. 4,297,210, Cl. 210-107.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., to Wisconsin Alumni Research Foundation. Vitamin D compounds isotopically substituted at carbon T and process for their preparation. 4,297,289, Cl. 260-397.200.

Demers, Daniel E.: *See—*
Durgin, George A.; and Demers, Daniel E., 4,297,077, Cl. 416-97.00R.

Den-Mat, Inc.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,297,266, Cl. 260-42.140.

Denack Design Corporation: *See—*
Haack, Dennis A., 4,296,964, Cl. 297-218.000.

Denning, Richard; Spak, Mark A.; and Polhemus, Barry, to RCA Corporation. Method of applying thin metal deposits to a substrate. 4,297,393, Cl. 427-88.000.

Dennis, Ronald D.: *See—*
Lawson, John E.; and Dennis, Ronald D., 4,297,498, Cl. 546-116.000.

De Ruiter, Robert S.; and Kambanis, Stamatis M., to Reichhold Limited. Process for preparing alkoxylated cross linking agents by preparing (a) an aqueous alkanolic alkoxylated amino resin (b) azeotropic distillation and (c) distilling excess alcohol. 4,297,264, Cl. 260-33.40R.

Detroit, William J.; and Sanford, Michael E., to American Can Company. Well cementing. 4,296,813, Cl. 166-293.000.

Deubel, Reinhold: *See—*
Uhrig, Heinz; and Deubel, Reinhold, 4,297,270, Cl. 260-104.000.

Devaux, Alain: *See—*
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DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., to Dover Corporation. High solids filter. 4,297,209, Cl. 210-107.000.

D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, to Pierre Fabre S.A. Process for the preparation of purified bacterial membranal proteoglycans. 4,297,272, Cl. 260-112.00R.

Diamond Shamrock Corporation: *See—*
Dotson, Ronald L.; and O'Leary, Kevin J., 4,297,194, Cl. 204-257.000.
Papalos, John G.; and Kavchok, Ronald W., 4,297,259, Cl. 260-29.6NR.

Dichter, Michael: *See—*
Horowitz, Carl; and Dichter, Michael, 4,297,108, Cl. 44-1.0SR.

Didtel, Stuart R., to Cascade Corporation. Apparatus for automatically depositing a load in a predetermined position. 4,297,070, Cl. 414-497.000.

Diehl, Robert E.: *See—*
Lutz, Albert W.; and Diehl, Robert E., 4,297,127, Cl. 71-88.000.

Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, to Hoechst Aktiengesellschaft. Water miscible corrosion inhibitors. 4,297,236, Cl. 252-389.00R.

Dietrich, Lynn A.: *See—*
Harshman, Ronald W.; and Dietrich, Lynn A., 4,296,773, Cl. 137-312.000.

DiGiannantonio, Edmond P.: *See—*
Lewis, John S.; DiGiannantonio, Edmond P.; and Boyle, Howard R., 4,297,677, Cl. 340-148.000.

DiGiannatonio, Edmund P.: *See—*
Lewis, John S.; DiGiannantonio, Edmond P.; and Boyle, Howard R., 4,297,677, Cl. 340-148.000.

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Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.

Dircksen, Arnold D. Electroluminescent ring light adapter for aircraft instruments. 4,297,681, Cl. 340-366.00F.

Dirks, Rudolf; and Nitschmann, Karl, to Adreas Stihl. Portable power chain saw. 4,296,553, Cl. 30-381.000.

Dittman, Charles C.; and St. Clair, Richard C., to United States of America, Navy. Motor drive. 4,297,622, Cl. 318-254.000.

Dobbie, Derek J.: *See—*
Ward, Herbert J.; Dobbie, Derek J.; and Lyall, Brian, 4,297,415, Cl. 428-516.000.

Dobias, Bohuslav; and Heckmann, Klaus, to Heckmann, Klaus. Method to directly bond rubber to metal. 4,297,159, Cl. 156-307.700.

Dobrovolsky, Stanislav D.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.



Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 4,297,033, Cl. 356-374.000.

Doerges, Alexander: *See—*
Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, 4,297,330, Cl. 423-232.000.

Doerter, Randall H., to Talon, Inc. Snap fastener component strip. 4,296,533, Cl. 24-216.000.

Dokoupil, Jiri; and Hacker, Kurt. Method for continuous processing of flexible workpieces. 4,296,514, Cl. 12-142.00R.

Dolenc, Bozidar: *See—*
Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, 4,297,293, Cl. 260-448.00B.

Donachie, Stephen J.: *See—*
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.

Donham, Robert E.; and Heimbold, Richard L., to Lockheed Corporation. Wind turbine. 4,297,076, Cl. 416-37.000.

Dorina Nahmaschinen GmbH: *See—*
Meier, Willi; and Rojahn, Bernd, 4,296,702, Cl. 112-258.000.

Doster, John L.: *See—*
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Dotson, Ronald L.; and O'Leary, Kevin J., to Diamond Shamrock Corporation. Electrolytic production of high purity alkali metal hydroxide. 4,297,194, Cl. 204-257.000.

Dover Corporation: *See—*
DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., 4,297,209, Cl. 210-107.000.

Dow Chemical Company, The: *See—*
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Ma, King W., 4,297,514, Cl. 568-321.000.
McDonald, Charles J., 4,297,256, Cl. 260-29.4UA.
Moore, Zack J., 4,297,640, Cl. 324-458.000.
Nelson, Linnea E.; and Reineke, Charles E., 4,297,475, Cl. 528-271.000.

Dowty Fuel Systems Limited: *See—*
Andrews, David K.; and Smart, Michael W., 4,296,676, Cl. 91-417.00R.

Drabert Sohne Minden: *See—*
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Dreher, Ulrich: *See—*
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Drent, Eit: *See—*
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Dresser Industries, Inc.: *See—*
Chamberlin, Richard L., 4,296,950, Cl. 285-45.000.
O'Neil, John C., deceased, 4,297,057, Cl. 405-303.000.

Drews, Ulrich: *See—*
Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, 4,297,599, Cl. 307-355.000.

Dube, Ghyslain, to Alcan Research and Development Limited. Automatic photometric titrator. 4,297,105, Cl. 23-230.00R.

Dubreux, Bernard: *See—*
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Duckstein, Stuart S. Method for manufacturing a pacifier. 4,297,313, Cl. 264-273.000.

Dufft, William H., to Bell Telephone Laboratories, Incorporated. Encapsulated light source with coupled fiberguide. 4,296,998, Cl. 350-96.200.

DuJack, George M., Jr.: *See—*
Goodale, Robert H.; and DuJack, George M., Jr., 4,296,634, Cl. 73-864.860.

Dukes, Jesse M. Agricultural crop cover. 4,296,568, Cl. 47-20.000.

Dunbar, Glenn G. Weight transfer apparatus. 4,297,071, Cl. 414-542.000.

Dunlop Limited: *See—*
Popplewell, Frank W., 4,297,308, Cl. 264-46.600.

Dunning, Ted E.; and Enright, Paul L., to Cyber Diagnostics, Inc. Remote pulmonary function tester. 4,296,756, Cl. 128-716.000.

Du Pont de Nemours, E. I., and Company: *See—*
Phillips, Thomas R., 4,297,262, Cl. 260-31.600.
Soboczenski, Edward J., 4,297,370, Cl. 424-298.000.

Dupont, Jean M., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. System for controlling a separately excited constant load DC electric motor. 4,297,623, Cl. 318-410.000.

Dupressoir, Albert, to Thomson-CSF. Parallel-plane antenna with rotation of polarization. 4,297,710, Cl. 343-756.000.

Duracell International Inc.: *See—*
Przybyla, Franciszek J.; and Rossler, Eleanor J., 4,297,249, Cl. 252-518.000.

Durand, Jacques: *See—*
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Durgin, George A.; and Demers, Daniel E., to Westinghouse Electric Corp. Cooled turbine vane. 4,297,077, Cl. 416-97.00R.

Durst, Richard R.: *See—*
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Dyachkov, Vasily M.: *See—*
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Dyer, Christopher K., to United Chemi-Con, Inc. Method of etching aluminum. 4,297,184, Cl. 204-129.400.

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Dyment, John C.; and Chik, Kiuchi D., to Northern Telecom Limited. Methods for simultaneous suppression of laser pulsations and continuous monitoring of output power. 4,297,651, Cl. 331-94.50H.

Dynamit Nobel Aktiengesellschaft: *See—*
Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, 4,297,502, Cl. 560-35.000.
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, 4,297,099, Cl. 8-484.000.

E. C. H. Will (GmbH & Co.): *See—*
Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, 4,297,066, Cl. 414-43.000.

E. J. Brooks Company: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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E-Systems, Inc.: *See—*
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EABVV Utvecklings Aktiebolag: *See—*
Bilberg, Erik A., 4,296,711, Cl. 122-22.000.

Eadie, Brian K. M., to Eadie Bros. & Co. Limited. Textile combing roller. 4,296,527, Cl. 19-112.000.

Eadie Bros. & Co. Limited: *See—*
Eadie, Brian K. M., 4,296,527, Cl. 19-112.000.

Eastman Kodak Company: *See—*
Bowman, Wayne A.; Bishop, John F.; and Noonan, John M., 4,297,432, Cl. 430-215.000.
Smith, Thomas W., 4,297,465, Cl. 526-141.000.

Eaton Corporation: *See—*
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Rice, Robert A., 4,296,770, Cl. 137-62.000.

Ebata, Noboru: *See—*
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EBCO Industries, Ltd.: *See—*
Eppich, Helmut, 4,297,735, Cl. 360-104.000.

Eber, Nicholas. Absorption refrigerator. 4,296,613, Cl. 62-515.000.

Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, to Iwatsu Electric Co., Ltd. Exposure device of an electrographic copying apparatus. 4,297,024, Cl. 355-14.00E.

EC Erdolchemie GmbH: *See—*
Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, 4,297,512, Cl. 564-490.000.

Eckert, Kim, to Motorola, Inc. Schmitt trigger. 4,297,596, Cl. 307-279.000.

Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., to International Minerals & chemical Corporation. Method for polyurethane foam using a tri-tertiary amine catalyst. 4,297,443, Cl. 521-129.000.

Edel, Hans J., to Drabert Sohne Minden. Actuator button apparatus for adjustable chairs. 4,296,903, Cl. 248-162.100.

Edelman, Seymour: *See—*
Wooden, Bruce J.; and Edelman, Seymour, 4,297,394, Cl. 427-100.000.

Edwards, Bryant, to Illinois Tool Works Inc. Nestable and stackable transplanting system. 4,296,569, Cl. 47-73.000.

Edwards, Laroy H., to Chevron Research Company. N-Tetrachloroethylthio-substituted halomethanesulfonamides as aquatic weed control agents. 4,297,124, Cl. 71-66.000.

Egenlauf, Louis D. Slap trim interior molding. 4,296,583, Cl. 52-717.000.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Semi-continuous hot rolling of metal strip and plates. 4,296,623, Cl. 72-227.000.

Eicher, Theobald; and Muller, Friedemann, to Bayer Aktiengesellschaft. Smokable products. 4,296,762, Cl. 131-359.000.

Eidenschink, Rudolf; and Pohl, Ludwig, to Merck Patent Gesellschaft mit Beschrankter Haftung. Diketones useful as liquid crystals. 4,297,515, Cl. 568-329.000.

Eisele Apparate-und Geratebau GmbH: *See—*
Taddicken, Hermann; and Sachs, Wolfgang, 4,296,696, Cl. 112-70.000.

Ekstrom, Hans. Omnidirectional receiving antenna. 4,297,711, Cl. 343-794.000.

Elastoflon Inc.: *See—*
Yasuda, Toshio, 4,297,447, Cl. 525-133.000.

Elbers, Theodor: *See—*
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Electric Power Research Institute, Inc.: *See—*
Lee, Ilyoul, 4,297,738, Cl. 361-42.000.

Electrostatic Equipment Corporation: *See—*
Gillette, Donald J., 4,297,386, Cl. 427-27.000.

Eli Lilly and Company: *See—*
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Elias, Moenes L.; and Shah, Narendra K., to Dart Industries Inc. Metal stripping composition and method. 4,297,257, Cl. 260-29.60H.

Elkem-Spigerverket a/s: *See—*
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Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.

Emhart Industries, Inc.: *See—*
Chestnut, Benjamin F., 4,297,547, Cl. 200-38.00R.
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EMI Limited: *See—*
Steynor, James H.; and Hayes, Frederick, 4,297,729, Cl. 360-40.000.

Endoh, Hiroyuki: *See—*
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, 4,297,413, Cl. 428-394.000.

Endoh, Takeyuki: *See—*
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.

Engelbach, Heinz: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.

Engelhard Minerals & Chemicals Corporation: *See—*
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Engeman, Rock A.: *See—*
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Enomoto, Yutaka: *See—*
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Enright, Paul L.: *See—*
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Ensco, Inc.: *See—*
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Environmental Devices Corporation: *See—*
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Envoys U.S.A., Inc.: *See—*
Gamm, Robert J., 4,296,559, Cl. 36-136.000.

Eppich, Helmut, to EBCO Industries, Ltd. Manually operable magnetic card reader and magnetic head assembly therefor. 4,297,735, Cl. 360-104.000.

Epstein, Barry M.; and Gernstein, Terry M. Pushbutton telephone set disabling means. 4,297,534, Cl. 179-90.00D.

Erickson, Erick E.; Katzman, Allison W.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Method and apparatus for making doll clothing and doll house accessories. 4,297,153, Cl. 156-63.000.

Ermebrant, Lennart C.: *See—*
Rossander, Bror L. E.; Ermebrant, Lennart C.; and Lesser, Martin, 4,296,830, Cl. 181-208.000.

Ernst, Richard J., to Illinois Tool Works Inc. Driver bit attachment. 4,296,656, Cl. 81-429.000.

Ertel, Werner, to Bayer Aktiengesellschaft. Process for the preparation of 2-nitrobenzaldehyde. 4,297,519, Cl. 568-424.000.

Erwin, Galen B.: *See—*
Arnold, Harmon W.; and Erwin, Galen B., 4,297,418, Cl. 428-595.000.

Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Preparation of 2-isopropylamino pyrimidine. 4,297,495, Cl. 544-330.000.

Escobosa, Alfonso S. Hydraulic controlled sonic induction system. 4,296,911, Cl. 251-57.000.

Estes, John H.: *See—*
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Evak Sanitar AB: *See—*
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Evans, Arthur R.: *See—*
Airey, Frederick K.; and Evans, Arthur R., 4,297,213, Cl. 210-195.100.

Evans, Roger C. Ball holder. 4,296,874, Cl. 221-307.000.

Evans, Samuel: *See—*
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Ex-Cell-O Corporation: *See—*
Fleury, James C., 4,296,805, Cl. 165-151.000.

Exxon Production Research Company: *See—*
Willman, Bertram T., 4,296,969, Cl. 299-2.000.

Exxon Research & Engineering Co.: *See—*
Blaser, Don E., 4,297,202, Cl. 208-54.000.
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Fag Kugelfischer Georg Schafer & Co.: *See—*
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Fagan, Robert D.: *See—*
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Fagersta A.B.: *See—*
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Fairbanks, Thomas L. Telephone security attachment. 4,297,539, Cl. 179-189.00D.

Falborn, James A.: *See—*
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Falkenbach, Guenther, to Braun AG. Electric blender. 4,297,038, Cl. 366-206.000.

Farmer, Marion R., to Aluma Form, Inc. Electrical equipment mount. 4,296,904, Cl. 248-218.400.

Farmer, Zane M., to Polaroid Corporation. Photographic camera apparatus. 4,297,017, Cl. 354-34.000.

Farmitalia Carlo Erba S.p.A.: *See—*
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Farrant, David J. R., to Automotive Products Limited. Ball and socket joint. 4,297,047, Cl. 403-138.000.

Faulconer, Richard J. Fruit picker. 4,296,594, Cl. 56-336.000.

Faure, Jean-Louis. Apparatus for providing false twist to moving yarn. 4,296,598, Cl. 57-284.000.

Faustini, Franco: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.

Federal-Mogul Corporation: *See—*
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Fedorov, Vasily N.: *See—*
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Felder, Donald W. Polish rod jack system. 4,296,678, Cl. 92-13.100.

Felder, Louis; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of benzophenone thioethers. 4,297,513, Cl. 568-43.000.

Feldman, Nicholas, to Exxon Research & Engineering Co. Zirconium additives for residual fuel oil. 4,297,110, Cl. 44-66.000.

Feldstein, Nathan. Catalytic promoters in electroless plating catalysts in true solutions. 4,297,397, Cl. 427-304.000.

Ferd. Wagner: *See—*
Krug, Hans; and Heilmann, Kurt, 4,297,416, Cl. 428-576.000.

Fergason, James L., to Becton, Dickinson and Company. Liquid crystal compositions and devices. 4,296,631, Cl. 73-356.000.

Fergg, Berthold: *See—*
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.

Ferm, Donald J.: *See—*
Speak, Richard C.; and Ferm, Donald J., 4,297,229, Cl. 252-109.000.

Ferree, William I., Jr.; and Nguyen, Giao V., to Liquid Paper Corporation. Erasable writing medium composition. 4,297,260, Cl. 260-29.70H.

Fett, Helen M.: *See—*
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Fetty, Harold D.: *See—*
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Feuerherd, Karl-Heinz: *See—*
Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, 4,297,300, Cl. 260-544.00C.

Fichet-Bauche: *See—*
Guiraud, Francois, 4,296,618, Cl. 70-358.000.

Filtrol Corporation: *See—*
Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, 4,297,325, Cl. 423-122.000.

Finan, Thomas P.: *See—*
Burton, Robert L.; and Finan, Thomas P., 4,297,045, Cl. 400-641.000.

Fine, Jerry W.: *See—*
Rubottom, Nolan R.; and Fine, Jerry W., 4,297,675, Cl. 340-107.000.

Fine, Louis B.: *See—*
Pontifex, Edward J., 4,296,749, Cl. 128-283.000.

Finke, Ulrich; and Moretto, Hans-Heinrich, to Bayer Aktiengesellschaft. Conversion of low-boiling constituents from alkyl-chlorosilane synthesis. 4,297,500, Cl. 556-466.000.

Fischer, Michael A., to Grinnell Fire Protection Systems Company, Inc. Horizontal sprinkler deflector with flow lifting formation. 4,296,816, Cl. 169-37.000.

Fischer & Porter Co.: *See—*
Mannherz, Elmer D., 4,296,636, Cl. 73-861.120.

Fisher, Sidney E.: *See—*
Hunt, Keith R.; and Fisher, Sidney E., 4,296,961, Cl. 296-216.000.

Fives-Cail Babcock: *See—*
Delfosse, Claude, 4,297,210, Cl. 210-107.000.

Fivizzani, Mary A.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.

Flanders, Thomas W., to CTS Corporation. Tandem insert molded electrical controls and process for producing same. 4,297,671, Cl. 338-200.000.

Fletcher, Augustus; and Moriarty, William L., to American Chemical & Refining Company Incorporated. Method and composition for electrodepositing palladium/nickel alloys. 4,297,177, Cl. 204-43.00N.

Fleury, James C., to Ex-Cell-O Corporation. Accessory clearance hole. 4,296,805, Cl. 165-151.000.

Flex-o-lators, Inc.: *See—*
Arnold, Harmon W.; and Erwin, Galen B., 4,297,418, Cl. 428-595.000.

Flies, William P., to Datakey, Inc. Microelectronic memory key with receptacle and systems therefor. 4,297,569, Cl. 235-443.000.

Floessel, Carl D.; and Floessel, Klaus, to BBC Brown, Boveri & Company, Ltd. Gas pipe cable. 4,297,523, Cl. 174-27.000.

Floessel, Klaus: *See—*
Floessel, Carl D.; and Floessel, Klaus, 4,297,523, Cl. 174-27.000.





Flood, John B.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.

Focke & Co.: *See—*
Focke, Heinz, 4,296,590, Cl. 53-531.000.

Focke, Heinz, to Focke & Co. Method and apparatus for conveying six-pack containers to carton blank. 4,296,590, Cl. 53-531.000.

Folonari, Carlo: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.

Fong, Harry H. S.: *See—*
Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., 4,297,341, Cl. 424-80.000.

Ford Motor Company: *See—*
Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., 4,297,448, Cl. 525-162.000.
Giardini, Dante S., 4,297,089, Cl. 417-437.000.
May, James I., 4,296,641, Cl. 74-422.000.

Ford, William D.; and Clark, Michael J., to Standard Oil Company (Indiana). Apparatus for the catalytic cracking of hydrocarbons. 4,297,203, Cl. 208-74.000.

Forenade Fabriksverken: *See—*
Hammar, Jan E., 4,296,767, Cl. 134-15.000.

Fork, Frank W., to H. H. Robertson Company. Electrical activating assembly and receptacle support means therefor. 4,297,524, Cl. 174-48.000.

Forrester, A. Theodore: *See—*
Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, 4,297,615, Cl. 315-111.210.

Forsman, Lars O. Device for transmitting linear measuring motion. 4,296,975, Cl. 308-6.00R.

Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, to British Petroleum Company Limited, The. Protective metal oxide films on metal or alloy substrate surfaces susceptible to coking, corrosion or catalytic activity. 4,297,150, Cl. 148-6.300.

Foster, Perry A., Jr., to Aluminum Company of America. Electrolytic production of metal. 4,297,180, Cl. 204-67.000.

Fowler, James C.; Hale, Steven D.; and Moser, Theodore E., to Ensco, Inc. Radar drill guidance system. 4,297,699, Cl. 343-5.0NA.

Fowler, Kenneth A.: *See—*
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.

Fox, Roland T. V.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Framatome: *See—*
Leclercq, Joseph, 4,297,170, Cl. 376-442.000.

Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., to United States of America, Air Force. Energetic monopropellant. 4,297,152, Cl. 149-88.000.

Franklin, Benjamin S.: *See—*
Appell, Marc; Bogaert, Jean-Louis; Massuard, Claude; Bradley, John; and Franklin, Benjamin S., 4,297,743, Cl. 364-200.000.

Franklin Electric Co., Inc.: *See—*
Schaefer, Edward J., 4,297,627, Cl. 318-778.000.

Franz, Karl; and Schonfeld, Bernd, to Riedel-de Haen Aktiengesellschaft. Process for the preparation of a red emitting phosphor coated with red iron oxide and its application. 4,297,390, Cl. 427-64.000.

Frazier, Stephen E., to Rush-Hampton Industries, Inc. Composition and method for the treatment of acne. 4,297,348, Cl. 424-180.000.

Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. TV Game apparatus. 4,296,930, Cl. 273-313.000.

Freed, Donald L., Jr., to National Mine Service Company. Material gathering device for a mining machine. 4,296,856, Cl. 198-514.000.

Freitag, Dieter: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.

Frerking, Marvin E., to Rockwell International Corporation. Closed loop temperature compensated frequency reference. 4,297,657, Cl. 331-176.000.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Method and device for locating a sound event on a magnetic tape. 4,297,732, Cl. 360-72.100.

Fricke, Gunter: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.

Friedman, Jack S.: *See—*
Schmitt, Wilhelm E., 4,296,519, Cl. 15-184.000.

Fries, James E. Solar lighting system. 4,297,000, Cl. 350-96.240.

Froehlich, Helmut: *See—*
Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, 4,297,493, Cl. 544-241.000.

Frohlich, Horst: *See—*
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.

Fruchey, Russell L.; and Kupar, Daniel E., to D.E.W. Line, Inc. Early warning system for approaching transportation vehicles. 4,297,672, Cl. 340-23.000.

Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 2,2-dimethyl-3-(2-fluoroalkyl-2-oxy-vinyl)-cyclopropane-carboxylic acid esters. 4,297,366, Cl. 424-274.000.

Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with (±)-trans-3-(E/Z-2-chloro-2-(4-chlorophenyl)-vinyl)-2,2-dimethyl-cyclopropanecarboxylic acid (±)-(α-cyano-3-phenoxy-4-fluoro-benzyl) ester and the individual E- and Z-isomers. 4,297,371, Cl. 424-304.000.

Fuji Kiko Co., Ltd.,: *See—*
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.

Fuji Photo Film Co., Ltd.: *See—*
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.
Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,297,392, Cl. 427-75.000.
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.
Takehara, Nobumitsu; and Isayama, Shogo, 4,297,396, Cl. 427-284.000.

Fujii, Etsuo: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.

Fujii, Kenji, to Yoshida Iron Works Co., Ltd. Method and means for adding treating agent for molten metal. 4,297,133, Cl. 75-53.000.

Fujii, Shuzo; and Sato, Yoshikatsu, to Nippon Electric Co., Ltd. Temperature compensated crystal oscillator. 4,297,655, Cl. 331-116.00R.

Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, to Toyo Jozo Kabushiki Kaisha. Aminoglycoside antibiotic G-367-1 and method for the production thereof. 4,297,486, Cl. 536-17.00R.

Fujii, Takashi: *See—*
Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.

Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Pipe coupling and pipe joint connection. 4,296,954, Cl. 285-331.000.

Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Antirattle spring for a disc brake of vehicles. 4,296,841, Cl. 188-73.380.

Fujisawa Pharmaceutical Co. Ltd.: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.

Fujitsu Fanuc Limited: *See—*
Komiya, Hidetsugu, 4,297,624, Cl. 318-594.000.

Fujitsu Limited: *See—*
Nagahama, Tsutomu; and Ishihara, Michio, 4,297,722, Cl. 357-74.000.

Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Interfacing circuit status detection arrangement in a telephone exchange. 4,297,532, Cl. 179-18.0AB.

Fukuoka, Yohei: *See—*
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.

Fumagalli, Angelo: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.

Furrier, Joseph P.; and Gilbert, Allan H., to Lever Brothers Company. Toothbrush and gum massaging accessory. 4,296,518, Cl. 15-110.000.

Furuhashi, Toshio; and Abe, Osamu, to Hitachi, Ltd. Control apparatus for an internal combustion engine. 4,296,722, Cl. 123-492.000.

Furukawa, Takashi: *See—*
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.

Furukawa, Takeshi: *See—*
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.

Furukawa, Yukio: *See—*
Inayama, Minoru; and Furukawa, Yukio, 4,297,558, Cl. 219-10.55R.

Furusawa, Kahei: *See—*
Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, 4,296,996, Cl. 350-96.200.

Furutachi, Nobuo: *See—*
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.

Furutani, Toshinobu: *See—*
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.

Fuzzell, Joe E., to Caterpillar Tractor Co. Leak detection apparatus. 4,297,687, Cl. 340-626.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,297,487, Cl. 542-412.000.
Raymond, Christopher D., 4,296,745, Cl. 128-156.000.

G & W Electric Specialty Company: *See—*
Rueth, William R., Jr., 4,297,554, Cl. 200-153.0SC.

Gaertner, Friedheim: *See—*
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.

Gaines, Jack R.: *See—*
Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, 4,297,125, Cl. 71-77.000.

Galaspie, Charles E. Light producing device. 4,297,617, Cl. 315-326.000.

Gale, James A., to Kenneth E. Beswick Ltd. Thermal cut-outs and to the method of assembling a multiplicity of such thermal cut-outs. 4,297,669, Cl. 337-407.000.

Gallagher, David A., to Bunker Ramo Corporation. Electrical connector assembly. 4,296,992, Cl. 339-186.00M.

Gallenkamp, Bernd: *See—*
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, 4,297,371, Cl. 424-304.000.

Gallet, Georges: *See—*
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.

Galley, Richard A.: *See—*
Bryant, David R.; and Galley, Richard A., 4,297,239, Cl. 252-412.000.

Galyan, Boris A.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Gambro AB: *See—*
Carlsson, Per-Olov A. V.; and Hakansson, Bo H., 4,296,760, Cl. 128-788.000.
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.

Gamm, Robert J., to Envoys U.S.A., Inc. Athletic shoe pocket. 4,296,559, Cl. 36-136.000.

Gander, Jean-Gabriel; and Aubert, Ralph, to LGZ Landis & Gyr Zug AG. Detector to determine the presence of an electrical signal in the presence of noise of predetermined characteristics. 4,297,533, Cl. 179-84.0VF.

Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., to Farmitalia Carlo Erba S.p.A. Pharmaceutically useful 5,6-saturated PGI compounds. 4,297,368, Cl. 424-285.000.

Garbe, Dietmar R. Spirometers. 4,296,758, Cl. 128-728.000.

Garrett Corporation, The: *See—*
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.
McGowan, Peter T., 4,297,086, Cl. 417-271.000.

Garrett, Harold E., to United States of America, Army. Segmented sabot projectile. 4,296,687, Cl. 102-518.000.

Garrett, Robert W., to Western Electric Co., Inc. Method for removing heat from a workpiece during processing in a vacuum chamber. 4,297,190, Cl. 204-192.00E.

Gaughan, Edmund J.; and Kezerian, Charles, to Stauffer Chemical Company. N-(Benzenesulfonyl) thiocarbamates-herbicidal antidotes. 4,297,295, Cl. 260-455.00A.

Gebel, Josef: *See—*
Altmeyer, Hans J.; and Gebel, Josef, 4,297,215, Cl. 210-386.000.

Geisler, Irving: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.

Gen-Tech, Inc.: *See—*
Tawse, Ian S., 4,297,604, Cl. 310-168.000.

General Atomic Company: *See—*
Taylor, Edward S.; and Hirschle, George W., 4,296,713, Cl. 122-32.000.

General Dynamics Corporation: *See—*
Pazmany, Ladislao, 4,296,895, Cl. 244-3.290.
Peller, Robert C.; and Dyer, Jack E., 4,296,839, Cl. 188-378.000.

General Electric Company: *See—*
Adamson, Arthur P., 4,296,599, Cl. 60-39.230.
Banucci, Eugene G.; and Boldebuck, Edith M., 4,297,385, Cl. 427-27.000.
Bloomer, Milton D.; and Kornrumpf, William P., 4,296,632, Cl. 73-362.0AR.
Griffin, James R.; and Schreck, Raymond M., 4,296,611, Cl. 62-89.000.
Grubb, Willard T., 4,297,168, Cl. 376-418.000.
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Hill, Michael S.; and Poff, David A., 4,296,546, Cl. 29-730.000.
Howell, Edward K., 4,297,741, Cl. 361-93.000.
Mullersman, Ferdinand H., 4,297,630, Cl. 320-35.000.
Northup, Robert P.; and Anderson, Robert L., 4,296,670, Cl. 89-43.00R.
Rodenbeck, Philip G.; and Koenig, Fredrick, 4,296,784, Cl. 140-92.200.
Seymour, Raymond K.; and Murphy, Frank H., 4,297,663, Cl. 335-20.000.
Shah, Siddharth A.; Woodcock, Sidney J.; and Fagan, Robert D., 4,297,072, Cl. 414-684.300.
Smearing, Robert W., 4,297,389, Cl. 427-58.000.
Stark, Charles J., Jr., 4,297,457, Cl. 525-507.000.
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Stevens, Francis J., 4,297,635, Cl. 324-156.000.
Verbicky, John W., 4,297,283, Cl. 260-346.300.
Williams, Frank J., III; and Relles, Howard M., 4,297,474, Cl. 528-170.000.

General Foods Corporation: *See—*
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.

General Instrument Corporation: *See—*
Smith, Kent F., 4,297,598, Cl. 307-355.000.

General Motors Corporation: *See—*
Aldrich, Frederic C., 4,296,723, Cl. 123-510.000.
Arndt, Frederick P., 4,296,847, Cl. 192-4.00A.
Baugh, Edward D.; and Hoffman, Mark B., 4,296,718, Cl. 123-198.00D.
Brucken, Byron L., 4,297,085, Cl. 417-222.000.
Kosek, Thomas P.; and Steinhilper, Eric A., 4,296,888, Cl. 239-403.000.
Reider, Samuel B., 4,296,606, Cl. 60-754.000.
Staub, Vincent M., Jr., 4,296,854, Cl. 192-106.100.

General Tire & Rubber Company, The: *See—*
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.

Georgeaux, Andre, to Societe Miniere et Metallurgique de Penarroya. Process for the treatment of solutions of lead chloride. 4,297,183, Cl. 204-117.000.

Gerber Products Company: *See—*
Spletzer, Barry L., 4,297,682, Cl. 340-384.00E.

Gernstein, Terry M.: *See—*
Epstein, Barry M.; and Gernstein, Terry M., 4,297,534, Cl. 179-90.00D.

Gholson, Wayne, to Varel Manufacturing Company. Cable tool with circulating drill stem. 4,296,823, Cl. 175-308.000.

Giacoletto, Glen: *See—*
Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, 4,297,125, Cl. 71-77.000.

Giacone, Felice: *See—*
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.

Giardini, Dante S., to Ford Motor Company. Arcuate tubular pump. 4,297,089, Cl. 417-437.000.

Giba-Geigy Corporation: *See—*
Pfeifer, Josef; and Reinehr, Dieter, 4,297,480, Cl. 528-346.000.

Gibson, Willie M.: *See—*
Verable, Diara; and Gibson, Willie M., 4,296,575, Cl. 52-66.000.

Gidge, Kenneth N.; and Richard, Henry J., to BSL Corporation. Transparent reach-through curtain for open refrigerators. 4,296,792, Cl. 160-332.000.

Gies, Paul E., to Aeroquip Corporation. Cylinder cushion with contractable ring. 4,296,675, Cl. 91-396.000.

Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, to Marko Materials, Inc. High strength iron, nickel and cobalt base crystalline alloys with ultrafine dispersion of borides and carbides. 4,297,135, Cl. 75-123.00B.

Gilbert, Allan H.: *See—*
Furrier, Joseph P.; and Gilbert, Allan H., 4,296,518, Cl. 15-110.000.

Gilbert, Richard J.; and Rice, Doris M., to Texaco Development Corp. Process for rim elastomers with superior high temperature dimensional stability. 4,297,444, Cl. 521-160.000.

Gillette, Donald J., to Electrostatic Equipment Corporation. Control grid in electrostatic fluidized bed coater. 4,297,386, Cl. 427-27.000.

Gist-Brocades N.V.: *See—*
van der Lugt, Arie, 4,296,769, Cl. 134-68.000.

Gjelsvik, Norvald; and Hundere, Ingleif, to Elkem-Spigerverket a/s. Method of producing a pure aluminiumoxide from solutions containing dissolved ions of aluminium and iron. 4,297,326, Cl. 423-126.000.

Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., to Elkem-Spigerverket A/S. Method of precipitation of pure aluminiumchloride from solutions which contain ions of aluminium and magnesium. 4,297,327, Cl. 423-126.000.

GKN-Stenman AB: *See—*
Widen, Bo G., 4,296,619, Cl. 70-451.000.

Glace, William R.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,297,266, Cl. 260-42.140.

Glaser, Helmut; and Schick, Ludwig, to Siemens Aktiengesellschaft. Device for monitoring lamp failure in airport navigation lighting. 4,297,632, Cl. 324-51.000.

Glazov, Vladimir G.: *See—*
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.

Glazunov, Sergei G.: *See—*
Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D., 4,296,793, Cl. 164-24.000.

Gliewe, Russell H.: *See—*
Jaffin, Harry A.; and Gliewe, Russell H., 4,296,565, Cl. 42-1.00T.

Gmelch, John C. Highway guide post. 4,297,050, Cl. 404-10.000.

Godard, Pierre; and Billot, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Automatic switching arrangement for two batteries which are charged in parallel and discharged in series. 4,297,629, Cl. 320-7.000.

Goebel, Dan M.; Crow, James T.; and Forrester, A. Theodore, to University of California, The Regents of the. High current density cathode structure. 4,297,615, Cl. 315-111.210.

Goerth, Joachim, to U.S. Philips Corporation. Crystal oscillator including a MOS-capacitor. 4,297,654, Cl. 331-108.00D.

Goldin, Rodion G.; and Yakimenko, Valentin G. Device for exciting synchronous machine. 4,297,739, Cl. 361-55.000.

Goldstein, Allan L.; and Low, Teresa L. K., to Hoffman-La Roche Inc. Thymosin beta 3 and beta 4. 4,297,276, Cl. 260-112.50R.

Good, Maynard: *See—*
Sidaway, H. John; and Good, Maynard, 4,296,891, Cl. 242-110.000.

Goodale, Robert H.; and DuJack, George M., Jr. Septum for use in gas chromatography and method of operation. 4,296,634, Cl. 73-864.860.

Goodall SemiMetallic Hose & Mfg. Co.: *See—*
Marshall, Don J., 4,297,079, Cl. 416-140.000.





Goodyear Tire & Rubber Company, The: *See—*
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Gorbunov, Nikolai M.: *See—*
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.

Goron, John, to Midland-Ross Corporation. Accumulator head used in the formation of a multi-layer parison. 4,297,092, Cl. 425-133.100.

Gotman, Alexander, to Presco, Inc. Control of small parts in a manufacturing operation. 4,296,542, Cl. 29-574.000.

Goto, Hiromi: *See—*
Kagata, Tooru; and Goto, Hiromi, 4,296,848, Cl. 192-35.000.

Goto, Jugo; and Saegusa, Takeo, to Takeda Chemical Industries, Ltd. Production of crosslinked polymers using an oxazoline derivative. 4,297,449, Cl. 525-329.000.

Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., to Bristol-Myers Company. 7-α-Amino-substituted acylamino-3-(1-carboxymethyltetrazol-5-ylthiomethyl)-3-cephem-4-carboxylic acids. 4,297,489, Cl. 544-27.000.

Goudin, Robert, to U.S. Philips Corporation. Support for a transducer for emitting and/or receiving ultrasonic signals in a given angular sector. 4,296,753, Cl. 128-660.000.

Gould Inc.: *See—*
Kozacka, Frederick J., 4,297,667, Cl. 337-251.000.

Graffin, Andre J., to Serac. Method and apparatus for heat-sealing lids on glass containers. 4,297,161, Cl. 156-583.300.

Graham, Richard H.: *See—*
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.

Granatek, Alphonse P.: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,297,489, Cl. 544-27.000.

Granger, Michel: *See—*
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Gratzmuller, Jean L. Hydraulically controlled safety valve. 4,296,910, Cl. 251-28.000.

Gray, John C.: *See—*
Frankel, Milton B.; Arbit, Harry A.; Artz, Glen D.; and Gray, John C., 4,297,152, Cl. 149-88.000.

Great Lakes Chemical Corporation: *See—*
Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., 4,297,224, Cl. 210-755.000.

Greco, Alberto: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.

Green, David L., to Pacer Systems, Inc. Omnidirectional speed cockpit display. 4,297,673, Cl. 340-27.0NA.

Greenaway, David L.: *See—*
Antes, Gregor; and Greenaway, David L., 4,297,001, Cl. 350-129.000.

Greene, Del F.: *See—*
Little, Jane; and Greene, Del F., 4,296,677, Cl. 91-510.000.

Greenley, Henry R.: *See—*
Jureit, John C.; and Greenley, Henry R., 4,297,048, Cl. 403-189.000.

Gresch, Heinz: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.

Grewatta Heinz: *See—*
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

Griffin, James R.; and Schreck, Raymond M., to General Electric Company. Household refrigerator air flow control and method. 4,296,611, Cl. 62-89.000.

Grinnell Fire Protection Systems Company, Inc.: *See—*
Fischer, Michael A., 4,296,816, Cl. 169-37.000.
Mears, James W., 4,296,815, Cl. 169-37.000.

Griste, Charles R., to Hughes Tool Company. Cable tensioner for a downcrowding device for earth boring machines. 4,296,819, Cl. 173-147.000.

Grobler, Johannes H. Sealing of leaks in tanks and the like. 4,296,932, Cl. 277-1.000.

Grohmann, Andreas: *See—*
Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and Marks, Helmut, 4,297,221, Cl. 210-702.000.

Grolig, Johann: *See—*
Becker, Robert; Grolig, Johann; and Rasp, Christian, 4,297,501, Cl. 560-24.000.

Groman, Ernest V.; and Cabelli, Michael D., to Baxter Travenol Laboratories, Inc. Xanthine tracers. 4,297,494, Cl. 544-267.000.

Gross, Franz; Boehme, Gerit; Wiehler, Wolf; and Bibracher, Wilhelm, to Siemens Aktiengesellschaft. Gas-tight-high-frequency permeable window arrangement in a coaxial line, particularly for traveling wave tubes. 4,297,662, Cl. 333-252.000.

Grossman, David G.: *See—*
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Grubb, Willard T., to General Electric Company. Nuclear fuel assembly and process. 4,297,168, Cl. 376-418.000.

Grubb, Willard T., to General Electric Company. Nuclear fuel assembly and process. 4,297,169, Cl. 376-418.000.

Grumman Aerospace Corporation: *See—*
Kress, Robert W.; and Bacchi, Anthony C., 4,296,896, Cl. 244-12.400.

Grummon, Glenn D.: *See—*
Vitello, John P.; and Grummon, Glenn D., 4,296,785, Cl. 141-105.000.

Grundmann, Edgard: *See—*
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,296,732, Cl. 126-426.000.

Gruner & Jahr AG & Co.: *See—*
Wangermann, Jochen, 4,296,684, Cl. 100-292.000.

Gualandi, Paolo. Deodorizing composition for ash trays. 4,297,233, Cl. 252-259.500.

Guarnaschelli, Claudio. Aerator. 4,297,214, Cl. 210-219.000.

Gudze, Robert A.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix. Reusable heat devices containing xylitol as the heat-storage material. 4,296,801, Cl. 165-104.170.

Guigues, Francois; and Trinh, Stephane, to Rhone Poulenc Agrochemie. 2-Phenyl-4-pyrone derivatives, their preparation and their use as fungicides. 4,297,367, Cl. 424-283.000.

Guiler, Richard S., to E. J. Brooks Company. Adaptor for plunger lock operating tool. 4,296,616, Cl. 70-34.000.

Guiraud, Francois, to Fichet-Bauche. Lock and key device. 4,296,618, Cl. 70-358.000.

Gulbins, Erich: *See—*
Schenck, Hans-Uwe; and Gulbins, Erich, 4,297,255, Cl. 260-18.0PF.

Gulf Research & Development Company: *See—*
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.

Gupta, Tapan K.; and Pietsch, Herbert E., to Westinghouse Electric Corp. Method of producing homogeneous ZnO non-linear powder compositions. 4,297,250, Cl. 252-518.000.

Gutehoffnungshutte Sterkrade A.G.: *See—*
von Petery, Curt, 4,297,083, Cl. 417-53.000.

Guth, Christian: *See—*
Kern, Jorg; and Guth, Christian, 4,297,400, Cl. 427-389.000.

Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Guaiaconic acid A from guaiac resin. 4,297,271, Cl. 260-107.000.

H. Berthold Aktiengesellschaft: *See—*
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.

H. H. Robertson Company: *See—*
Fork, Frank W., 4,297,524, Cl. 174-48.000.

Haack, Dennis A., to Denack Design Corporation. Structural component for upholstered furniture and method of making. 4,296,964, Cl. 297-218.000.

Haas, David J.: *See—*
Juner, Adolph; and Haas, David J., 4,297,580, Cl. 250-368.000.

Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, to Ciba-Geigy Corporation. Novel 4,7-phenanthroline derivatives and pharmaceutical compositions containing them and their use. 4,297,358, Cl. 424-256.000.

Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., to Pillsbury Company, The. Refrigerated shelf stable pie crust dough. 4,297,378, Cl. 426-532.000.

Hacker, Kurt: *See—*
Dokoupil, Jiri; and Hacker, Kurt, 4,296,514, Cl. 12-142.00R.

Haeussler, Ernst. Apparatus for forming recess around a pickup bolt of a concrete body. 4,296,909, Cl. 249-94.000.

Hafner-Milac, Natasa: *See—*
Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, 4,297,293, Cl. 260-448.00B.

Haga, Ryooichi: *See—*
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.

Hagberg, John E., to Westinghouse Electric Corp. Protective relaying apparatus. 4,297,740, Cl. 361-67.000.

Hahnefeld, Fedor: *See—*
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.

Hahnkamm, Volker: *See—*
Buxbaum, Gunter; Schopper, Heinrich-Christian; Leitner, Lutz; and Hahnkamm, Volker, 4,297,395, Cl. 427-127.000.

Haissig, Bruce E.; Gaines, Jack R.; and Giacoletto, Glen, to United States of America, Agriculture. Tree rooting using synthetic auxins. 4,297,125, Cl. 71-77.000.

Hakansson, Bo H.: *See—*
Carlsson, Per-Olov A. V.; and Hakansson, Bo H., 4,296,760, Cl. 128-788.000.

Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., to Gambro AB. Device for temperature measurement. 4,296,633, Cl. 73-362.0AR.

Hakoi, Tsutomu, to Yoshida Kogyo K.K. Apparatus for loading a pull tab on a slider body. 4,296,547, Cl. 29-766.000.

Hale, Steven D.: *See—*
Fowler, James C.; Hale, Steven D.; and Moser, Theodore E., 4,297,699, Cl. 343-5.0NA.

Hales, Marwood J.; and Thorpe, Cameron L. Apparatus for extracting energy from water waves. 4,296,602, Cl. 60-398.000.

Halford, David W.; Price, Frank C.; and Bosworth, George H., to USM Corporation. Seat and waist lasting machine-independently pivotable side lasting fingers. 4,296,513, Cl. 12-12.000.

Halliburton Company: *See—*
Hendrickson, James D.; and White, Pat M., 4,296,807, Cl. 166-184.000.
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.

Halliburton Services: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,296,808, Cl. 166-191.000.

Hamamto, Nobuo: *See—*
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.

Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Method of and apparatus for fabricating stator assemblies of electrical machines. 4,296,543, Cl. 29-596.000.

Hamar, Martin R. Apparatus and process for sweeping a flat optical light plane. 4,297,031, Cl. 356-247.000.

Hammann, Ingeborg: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.

Hammar, Jan E., to Forenade Fabriksverken. Method and apparatus for cleaning a continuous web of material. 4,296,767, Cl. 134-15.000.

Hammerstrom, Everett A. Tape measure and marking device. 4,296,554, Cl. 33-138.000.

Hanawa, Kazuhiko: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Hancor, Inc.: *See—*
Sidaway, H. John; and Good, Maynard, 4,296,891, Cl. 242-110.000.

Handa, Noritoshi, to Nissan Motor Company, Limited. Rubbing-contact sealing structure for rotary heat regenerator. 4,296,937, Cl. 277-88.000.

Handler, Michael D.: *See—*
Mason, Stanley I., Jr.; and Handler, Michael D., 4,296,746, Cl. 128-201.150.

Hannah, Stephen J.; and Livingstone, Bryan, to National Research Development Corporation. Surface passivation of compound semiconductors. 4,297,176, Cl. 204-37.00R.

Hannaht, David J., to University of Surrey, a part interest. Manufacture of articles from an organic material and a water-hardenable mass. 4,297,409, Cl. 428-247.000.

Hannestad, Gunnar: *See—*
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.

Haraikawa, Tetsuo: *See—*
Tamura, Koichi; and Haraikawa, Tetsuo, 4,296,844, Cl. 188-73.380.

Harder, Willard J., to Bethany Fellowship, Inc. Solar energy collecting panel assembly. 4,296,741, Cl. 126-449.000.

Hardesty, Thomas K. C., to United States of America, Navy. Rotary locking mechanism. 4,296,689, Cl. 102-260.000.

Harding, Steven R.: *See—*
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Hardwick, Martha K.: *See—*
Buck, Gordon H.; and Hardwick, Martha K., 4,296,926, Cl. 273-86.00R.

Hargis, Ivan G.: *See—*
Bingham, Robert E.; Durst, Richard R.; Fabris, Hubert J.; Hargis, Ivan G.; Livigni, Russell A.; and Aggarwal, Sundar L., 4,297,240, Cl. 252-431.00R.

Harima, Hiroshi: *See—*
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.

Harney, David L.; and Young, Harlow S., to Chef-Reddy Foods Corporation. Method of making French fryable frozen potato strips. 4,297,377, Cl. 426-438.000.

Harris Corporation: *See—*
Pan, Jing-Jong, 4,297,656, Cl. 331-135.000.

Harshman, Ronald W.; and Dietrich, Lynn A., to Walter Kidde & Company, Inc. Hydraulic selector valve having joy stick control. 4,296,773, Cl. 137-312.000.

Hart, Dale H., to Hi Shear Corporation. Telescoping self-retaining safety bolt assembly. 4,297,063, Cl. 411-199.000.

Hartley, Bobby G. Recycling centrifuge for the reduction of viscosity and gel strength of drilling fluids. 4,297,225, Cl. 210-779.000.

Hartwell, Charles A. Segmented hardfaced collar for tool joints. 4,296,973, Cl. 308-4.00A.

Hasegawa, Tsunao: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, to AGFA-Gevaert Aktiengesellschaft. Color-photographic development process. 4,297,438, Cl. 430-377.000.

Haseyama, Michiko: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Hashimoto, Kazuyuki: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Hashimoto, Mitsuru: *See—*
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.

Hashimoto, Sadakatsu, to Sharp Kabushiki Kaisha. Color uniforming drive in an electrochromic display device. 4,297,696, Cl. 340-785.000.

Hashimoto, Shunichi: *See—*
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.

Hashimoto, Tamotu: *See—*
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.

Hashimoto, Tutomu: *See—*
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.

Hashizume, Kiyozo: *See—*
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.

Hasselbarth, Ulrich: *See—*
Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and Marks, Helmut, 4,297,221, Cl. 210-702.000.

Hastbacka, Albin A. Electro-optical level. 4,297,588, Cl. 250-577.000.

Haupt, Heinz: *See—*
Bohn, Hans; and Haupt, Heinz, 4,297,274, Cl. 260-112.00B.

Hauser, John. Fastening of shoe uppers for lasting. 4,296,515, Cl. 12-142.0LC.

Hauser, Raimund: *See—*
Freudenschuss, Otto, 4,297,732, Cl. 360-72.100.

Havlik, Patrick J. C.: *See—*
Monties, Jean R.; and Havlik, Patrick J. C., 4,296,500, Cl. 3-1.700.

Hayashi, Hideo: *See—*
Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, 4,297,450, Cl. 525-333.000.

Hayashi, Izuo; and Yonezu, Hiroo, to Nippon Electric Co., Ltd. Injection-type semiconductor laser. 4,297,652, Cl. 331-94.50H.

Hayashi, Mitsuo: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.

Hayashi, Shigeyuki: *See—*
Sada, Kenzo; and Hayashi, Shigeyuki, 4,296,644, Cl. 74-606.00R.

Hayashi, Takayuki: *See—*
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.

Hayashi, Yoshihiro, to Aikoh Co., Ltd. Lance pipe for refining and method of making the same. 4,296,921, Cl. 266-270.000.

Hayes, Frederick: *See—*
Steynor, James H.; and Hayes, Frederick, 4,297,729, Cl. 360-40.000.

Health Innovations, Inc.: *See—*
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.

Heckelsberg, Robert E., to AMCA International Corporation. Roofing structure. 4,296,581, Cl. 52-520.000.

Heckmann, Klaus: *See—*
Dobias, Bohuslav; and Heckmann, Klaus, 4,297,159, Cl. 156-307.700.

Hedges, Rhey W., to Parker, Louis W. Energy economizer for induction motors. 4,297,628, Cl. 318-798.000.

Hehemann, Gunter. Stereo headset. 4,297,535, Cl. 179-156.00R.

Heilmann, Kurt: *See—*
Krug, Hans; and Heilmann, Kurt, 4,297,416, Cl. 428-576.000.

Heimbold, Richard L.: *See—*
Donham, Robert E.; and Heimbold, Richard L., 4,297,076, Cl. 416-37.000.

Heimburger, Norbert: *See—*
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, 4,297,344, Cl. 424-101.000.

Hein, Lehmann AG: *See—*
Altmeyer, Hans J.; and Gebel, Josef, 4,297,215, Cl. 210-386.000.

Heinrich Wunder KG: *See—*
Zoor, Reinhold, 4,296,615, Cl. 70-19.000.

Heiss, Herbert L., to Mobay Chemical Corporation. Method of producing color stable thermoplastic polymethanes and products made thereby. 4,297,472, Cl. 528-84.000.

Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., to Caterpillar Tractor Co. Engine and fuel shutdown control. 4,297,742, Cl. 361-154.000.

Helbig, Rolf W. Rack hanging device for garments. 4,296,959, Cl. 294-143.000.

Helger, Roland: *See—*
Vormbrock, Rolf; and Helger, Roland, 4,297,238, Cl. 252-408.000.

Helwerth, Rainer: *See—*
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.

Hendricks, Udo-Winfried; and Wollny, Klaus, to Bayer Aktiengesellschaft. Process for the continuous one-bath dyeing of pile fabrics made of polyacrylonitrile/cotton. 4,297,103, Cl. 8-534.000.

Hendrickson, James D.; and White, Pat M., to Halliburton Company. Crossover tool. 4,296,807, Cl. 166-184.000.

Hennig, Ewald M. C.; and Nicol, Klaus. Method for determining the value of cardiologic quantities and apparatus for performing said method. 4,296,754, Cl. 128-694.000.

Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., to Zoecon Corp.; and Imperial Chemical Industries Limited. α-Cyano-β-(substituted-anilino)-N-ethoxycarbonylacrylamide intermediates. 4,297,297, Cl. 260-465.00D.

Henriques, Lance, to Angleman, John D. Rangefinder using expanded time delay. 4,297,701, Cl. 343-6.5LC.





Hensley, Albert L., Jr.; and Quick, Leonard M., to Standard Oil Company (Indiana). Process for demetallation and desulfurization of heavy hydrocarbons. 4,297,242, Cl. 252-439.000.

Herbert, Hugh G. Folding bicycle. 4,296,940, Cl. 280-278.000.

Herchenhan, Bernd: *See—*
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, 4,297,344, Cl. 424-101.000

Hercules Incorporated: *See—*
Jolly, Jennings L.; and Roos, Leo, 4,297,435, Cl. 430-270.000.
Leardi, Anthony, 4,296,503, Cl. 4-228.000.

Herman, Seymour S., to Stan Herman Studio, Inc. Hospital patient gown. 4,296,497, Cl. 2-114.000.

Hermann Rappold & Co. GmbH: *See—*
Muller, Rudolf; Lengsfeld, Franz; and Uerlichs, Johannes, 4,296,776, Cl. 137-340.000.

Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, to Dynamit Nobel Aktiengesellschaft. Aromatic bisazomethines, a method for their preparation, and their use as reactive pigments. 4,297,502, Cl. 560-35.000.

Herrmann, Henry O., Jr., to AMP Incorporated. High voltage hermetically sealed connector. 4,296,986, Cl. 339-89.00C.

Herrmann, Walter: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.

Herzner, Karl H., to U.S. Philips Corporation. Apparatus for receiving storing and outputting digital signal sequences. 4,297,567, Cl. 235-92.0PB.

Heshmat, Hooshang, to Mechanical Technology Incorporated. Crossplies support element for compliant bearings. 4,296,976, Cl. 308-9.000.

Heslep, Curtis A.: *See—*
Robertson, Kenneth L.; and Heslep, Curtis A., 4,296,708, Cl. 118-233.000.

Heurteux, Bernard M., to Shur-Lok International, S.A. Fastening device for a honeycombed panel employed in particular in aeronautic structures. 4,296,586, Cl. 52-787.000.

Hewitt, Harvey J., to Xerox Corporation. Overcoated photoreceptor containing gold injecting layer. 4,297,424, Cl. 430-58.000.

Heymes, Rene; and Lutz, Andre, to Roussel Uclaf. Novel oximes. 4,297,352, Cl. 424-246.000.

Hi Shear Corporation: *See—*
Hart, Dale H., 4,297,063, Cl. 411-199.000.

Hicke, David W., to Reagent Chemical and Research, Inc. Method of manufacturing cartridge cases. 4,296,536, Cl. 29-1.300.

Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, to Inkomag. Filtering apparatus. 4,297,211, Cl. 210-136.000.

Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, to Fuji Photo Film Co., Ltd. High frequency sputtering produces thin film amorphous silicon photoconductor. 4,297,392, Cl. 427-75.000.

Higuchi, Kosuke: *See—*
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.

Hijikata, Kazuo, to Olympus Optical Company Limited. Specimen applicator. 4,297,199, Cl. 204-299.00R.

Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, to Ajinomoto Company, Incorporated. Method for determining ammonia and sensor therefor. 4,297,173, Cl. 204-1.00T.

Hildebrandt, Norbert; Becker, Norbert; Walter, Rolf; and Hoffman, Manfred. Desk with a channel for receiving cables, wires etc. 4,296,981, Cl. 312-194.000.

Hill, Michael S.; and Poff, David A., to General Electric Company. Apparatus for assembling electrochemical cell. 4,296,546, Cl. 29-730.000.

Hinatase, Fumio: *See—*
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, 4,296,719, Cl. 123-198.00F.

Hines, David A.; and Bolton, David H., to Imperial Chemical Industries Limited. Treatment of wastewater. 4,297,217, Cl. 210-621.000.

Hinson, Virgil H.: *See—*
Jarman, Davis R.; and Hinson, Virgil H., 4,296,626, Cl. 72-392.000.

Hirabayashi, Shigeto: *See—*
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.

Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, to Shionogi & Co., Ltd. 4,1-Benzoxazepines. 4,297,280, Cl. 260-245.500.

Hirao, Tsuneo; and Onishi, Masao, to Matsushita Electric Industrial Co., Ltd. High-voltage generating device. 4,297,609, Cl. 310-339.000.

Hirayama, Kazuhiro; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Recording apparatus including a continuous transfer web. 4,297,716, Cl. 346-153.100.

Hirayama, Tatsuyuki: *See—*
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.

Hirmann, Georg: *See—*
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,774, Cl. 137-322.000.
Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.

Hirschberger, August: *See—*
Jardin, Hans; and Hirschberger, August, 4,296,962, Cl. 296-217.000.

Hirschle, George W.: *See—*
Taylor, Edward S.; and Hirschle, George W., 4,296,713, Cl. 122-32.000.

Hisabayashi, Satoshi: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Hisaka Works, Ltd.: *See—*
Sumitomo, Hiroyuki, 4,296,803, Cl. 165-110.000.

Hitachi Chemical Co., Ltd.: *See—*
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, 4,297,471, Cl. 526-328.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.

Hitachi, Ltd.: *See—*
Furuhashi, Toshio; and Abe, Osamu, 4,296,722, Cl. 123-492.000.
Inouye, Hiroshi, 4,296,935, Cl. 277-81.00R.
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,297,715, Cl. 346-150.000.
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.

Hitachi Metals, Ltd.: *See—*
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, 4,297,594, Cl. 307-252.00C.

Ho, Kok-Kit, to Timex Corporation. Clasp for watch strap. 4,296,532, Cl. 24-206.00R.

Hoda, Syed N.: *See—*
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Hodges, Everett L. Hydraulic mining tool apparatus. 4,296,970, Cl. 299-67.000.

Hoechst Aktiengesellschaft: *See—*
Diery, Helmut; Helwerth, Rainer; Frohlich, Horst; and Lorke, Horst, 4,297,236, Cl. 252-389.00R.
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, 4,297,323, Cl. 422-208.000.
Uhrig, Heinz; and Deubel, Reinhold, 4,297,270, Cl. 260-104.000.
von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, 4,297,101, Cl. 8-531.000.

Hoenninger, John C., III: *See—*
Crooks, Lawrence E.; Hoenninger, John C., III; and Arakawa, Mitsuaki, 4,297,637, Cl. 324-309.000.

Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine for an automobile with a divided oil pan. 4,296,716, Cl. 123-195.00C.

Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, to Thyssen Aktiengesellschaft vormals August Thyssen-Hutte. Method for dividing a strand into slabs. 4,297,151, Cl. 148-9.00R.

Hoffman-La Roche Inc.: *See—*
Goldstein, Allan L.; and Low, Teresa L. K., 4,297,276, Cl. 260-112.50R.

Hoffman, Manfred: *See—*
Hildebrandt, Norbert; Becker, Norbert; Walter, Rolf; and Hoffman, Manfred, 4,296,981, Cl. 312-194.000.

Hoffman, Mark B.: *See—*
Baugh, Edward D.; and Hoffman, Mark B., 4,296,718, Cl. 123-198.00D.

Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, to Societe Nationale Industrielle Aerospatiale. Process and device for multiplying a stochastic value by a coefficient greater than the unit. 4,297,744, Cl. 364-703.000.

Hoffmann, Ralph M., to Trochoid Power Corporation. Rotary expansion power unit with valve disc connected to crankshaft. 4,297,090, Cl. 418-61.00A.

Hofmann, Heinrich; and Markfelder, Gunther, to Fag Kugelfischer Georg Schafer & Co. Journal bearing for the shaft of a water pump or the like. 4,296,979, Cl. 308-174.000.

Hofmann, Karl, to Robert Bosch GmbH. Heat protected fuel injection plug for internal combustion engines. 4,296,887, Cl. 239-397.500.

Hofstetter, Robert A. Energy saving pots, pans and adapter. 4,296,728, Cl. 126-376.000.

Holscher & Leuschner GmbH & Co.: *See—*
Holscher, Werner, 4,296,918, Cl. 256-68.000.

Holscher, Werner, to Holscher & Leuschner GmbH & Co. Animal pen post. 4,296,918, Cl. 256-68.000.

Holset Engineering Company Limited: *See—*
Atkin, Howard S., 4,296,934, Cl. 277-81.00R.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Industrie-Wert Beteiligungsgesellschaft mbH. Respiratory device for catastrophic fires and/or smog weather conditions. 4,297,117, Cl. 55-389.000.

Homeyer, Bernhard: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.

Honda, Hiroyuki; and Ura, Hiroaki, to Konishiroku Photo Industry Co., Ltd. Cleaning apparatus for copy machines. 4,297,026, Cl. 355-15.000.

Honeywell Inc.: *See—*
Butter, Charles D., 4,297,684, Cl. 340-557.000.

Honig, Ernst-August: *See—*
Oberpichler, Gerd; and Honig, Ernst-August, 4,296,652, Cl. 74-868.000.

Hooker Chemicals & Plastics Corp.: *See—*
Lazarz, Christine A.; and Cook, Edward H., Jr., 4,297,196, Cl. 204-296.000.

Horholt, Anders; and Kvist, Ulrik. Joining member. 4,296,524, Cl. 16-150.000.

Horman, Ian; and Cazenave, Paul, to Societe d'Assistance Technique pour Produits Nestle S.A. Tea flavoring process and product. 4,297,380, Cl. 426-597.000.

Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, to H. Berthold Aktiengesellschaft. Additional attachment for all types of key operated machines. 4,297,044, Cl. 400-473.000.

Horowitz, Carl; and Dichter, Michael, to Polymer Research Corp. of America. Desulfurization of coal. 4,297,108, Cl. 44-1.0SR.

Horton, Herbert D.: *See—*
Keast, Larry G.; and Horton, Herbert D., 4,296,842, Cl. 188-61.000.

Horvath, Joseph. Profile grinding apparatus. 4,296,571, Cl. 51-32.000.

Hosaka, Dennis B., to Stauffer Chemical Company. Process for drying compositions containing derived protein-containing compositions and additives. 4,297,382, Cl. 426-656.000.

Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, to Fuji Photo Film Co., Ltd. Method of preparing a microcapsule dispersion. 4,297,235, Cl. 252-316.000.

Hoshino, Kunihisa: *See—*
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.

Hotchkiss, Lloyd C.: *See—*
Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., 4,296,985, Cl. 339-48.000.

Housman, Richard J., to Westinghouse Air Brake Company. Housing for draft gear. 4,296,868, Cl. 213-50.000.

Hoval Interliz AG: *See—*
Vogt, Alfred, 4,296,712, Cl. 122-22.000.

Howarth, Thomas T., to Beecham Group Limited. Antibacterial agents. 4,297,345, Cl. 424-114.000.

Howell, Edward K., to General Electric Company. Rate sensing instantaneous trip mode network. 4,297,741, Cl. 361-93.000.

Howell, Stephen L., to Kimball International, Inc. Fill note generator for electronic organ. 4,296,665, Cl. 84-1.030.

Hoyer, Ernst H. J. Ball valve. 4,296,913, Cl. 251-76.000.

Hsu, Fu-Tong; and Kantz, John F., to Union Carbide Corporation. Bulk material box. 4,296,860, Cl. 206-386.000.

Hsu, Sheng T., to RCA Corporation. Electrically programmable control gate injected floating gate solid state memory transistor and method of making same. 4,297,719, Cl. 357-23.000.

Huck, William V., to Minnesota Mining and Manufacturing Company. Protective band for photosensitive film on spools. 4,296,857, Cl. 206-53.000.

Hudson Products Corporation: *See—*
Larinoff, Michael W., 4,296,802, Cl. 165-110.000.

Huellwegen, Josef, to Nixdorf Computer AG. Signal regenerating circuit with improved input-output isolation. 4,297,595, Cl. 307-268.000.

Hughes Aircraft Company: *See—*
Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., 4,297,704, Cl. 343-113.00R.
Wurtz, Howard P.; and Peterson, Eugene W., 4,297,082, Cl. 417-51.000.

Hughes, Donald W. K.; and Myers, Ronald W., to AMP Incorporated. Electrical connector receptacle. 4,296,991, Cl. 339-176.0MP.

Hughes, Eugene M., to British Petroleum Company Limited, The. Anchor. 4,296,706, Cl. 114-294.000.

Hughes Tool Company: *See—*
Griste, Charles R., 4,296,819, Cl. 173-147.000.
Kennington, Kerry S., 4,296,824, Cl. 175-340.000.

Hull, Michael N.: *See—*
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.

Hundere, Ingleif: *See—*
Gjelsvik, Norvald; and Hundere, Ingleif, 4,297,326, Cl. 423-126.000.
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.

Hunt, Keith R.; and Fisher, Sidney E., to Britax Weathershields Limited. Opening roofs for vehicles. 4,296,961, Cl. 296-216.000.

Hunter, Walter D., to Texaco Development Corp. Process for secondary recovery. 4,297,226, Cl. 252-8.55D.

Hunter, Walter D., to Texaco Development Corp. Bipolymer of vinyl sulfonic acid-glycidol adduct and acrylamide. 4,297,469, Cl. 526-287.000.

Hussmann, Eckart, to JENAer Glaswerk Schott & Gen. Flat solar energy collector with low heat contact between absorber and edge of collector. 4,296,742, Cl. 126-450.000.

Hutchings, Clay L.: *See—*
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L., and Miller, Robert G., 4,297,742, Cl. 361-154.000.

Hutchins, Alma A., to Hutchins Manufacturing Co. Vacuum cleaner having bag cleaning apparatus. 4,297,114, Cl. 55-299.000.

Hutchins Manufacturing Co.: *See—*
Hutchins, Alma A., 4,297,114, Cl. 55-299.000.

Hutchins, Ned M.: *See—*
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.

Hutchison, Joseph A., to Solar Kinetics, Inc. Solar collector module. 4,297,003, Cl. 350-292.000.

Hydell, Robert C.: *See—*
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,296,947, Cl. 282-27.500.

Ibsen, Robert L.; and Glace, William R., to Den-Mat, Inc. Microfilled dental composite and method using the same. 4,297,266, Cl. 260-42.140.

Ichikawa, Hideji: *See—*
Nishiyama, Yukinori; and Ichikawa, Hideji, 4,296,843, Cl. 188-73.430.

Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, to Canon Kabushiki Kaisha. Laser recording apparatus. 4,297,713, Cl. 346-108.000.

Ichimatsu, Eiji, to Nissan Motor Company, Ltd. Weft yarn end treating device for shuttleless loom. 4,296,783, Cl. 139-302.000.

Ichino, Kazuo: *See—*
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.

ICI Americas Inc.: *See—*
Long, William P., Jr., 4,297,258, Cl. 260-29.6MN.
Stockburger, George J., 4,297,290, Cl. 260-410.600.

Ieki, Hideharu; and Arai, Seiichi, to Murata Manufacturing Co., Ltd. Electric circuit using surface acoustic wave device. 4,297,660, Cl. 333-194.000.

Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.

Iguchi, Eiko: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.

Iguchi, Shin-Ichi: *See—*
Nishizawa, Hideaki; and Iguchi, Shin-Ichi, 4,297,720, Cl. 357-30.000.

Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Internal combustion engine. 4,296,724, Cl. 123-568.000.

Ikai, Shigeru: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.

Ikeya, Chuji: *See—*
Shimizu, Ken-Ichi; and Ikeya, Chuji, 4,297,725, Cl. 358-125.000.

Illinois Tool Works Inc.: *See—*
Edwards, Bryant, 4,296,569, Cl. 47-73.000.
Ernst, Richard J., 4,296,656, Cl. 81-429.000.
Platt, John R., 4,296,858, Cl. 206-150.000.

Imai, Nobuhiro: *See—*
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.

Imamura, Shinzo: *See—*
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.

Imanaka, Hiroshi: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.

Imperial Chemical Industries Limited: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.
Hines, David A.; and Bolton, David H., 4,297,217, Cl. 210-621.000.
Marsden, Robert S., 4,297,336, Cl. 423-395.000.
Stead, John C.; and Waghorn, Peter E., 4,297,408, Cl. 428-240.000.

IMS Limited: *See—*
Ogle, Robert W., 4,296,747, Cl. 128-220.000.

Inayama, Minoru; and Furukawa, Yukio, to Rinnai Kabushiki Kaisha. Composite cooking device. 4,297,558, Cl. 219-10.55R.

Industrie-Wert Beteiligungsgesellschaft mbH: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,297,117, Cl. 55-389.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Becchi, Raffaele; Giacone, Felice; and Accattino, Andrea, 4,297,573, Cl. 250-231.0SE.

Inhofer, Harold G., to Proteus Corporation. Reciprocating piston-cylinder combination and valving control therefor. 4,296,672, Cl. 91-271.000.

Inkomag: *See—*
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.

Innocenti Santeustacchio S.p.A.: *See—*
Nessi, Aurindo, 4,296,622, Cl. 72-208.000.

Inomata, Akira: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Inoue, Shigeo: *See—*
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-70.000.





Inoue, Tokuji: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.

Inoue, Yoshimi: *See—*
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.

Inouye, Hiroshi, to Hitachi, Ltd. Mechanical seal. 4,296,935, Cl. 277-81.00R.

Institut Dr. Friedrich Forster Prufgeratebau: *See—*
Link, Hans; and Dreher, Ulrich, 4,297,636, Cl. 324-262.000.

Institut Francais du Petrole: *See—*
Layotte, Pierre-Claude; and James, Andre, 4,296,828, Cl. 181-121.000.

Institut National de la Sante et de la Recherche Medicale: *See—*
Rips, Richard; and Morier, Elisabeth, 4,297,346, Cl. 424-177.000.

Intec Corporation: *See—*
Baker, Cole H., 4,297,587, Cl. 250-563.000.

International Business Machines Corporation: *See—*
Aboelfotoh, Mohamed O., 4,297,613, Cl. 315-58.000.
Andresen, Rolf; and Christian, John H., 4,297,737, Cl. 360-135.000.
Aviram, Ari, 4,297,434. Cl. 430-270.000.
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.
Bjorklund, Gary C., 4,297,035, Cl. 356-402.000.
Burton, Robert L.; and Finan, Thomas P., 4,297,045, Cl. 400-641.000.
Laishley, William J.; and Taylor, John R., 4,297,734, Cl. 360-78.000.
Lammers, Gerald B.; and Smith, Gordon J., 4,297,712, Cl. 346-75.000.
Schaefer, John O., 4,297,041, Cl. 400-161.400.

International Minerals & chemical Corporation: *See—*
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.

International Nickel Company, Inc., The: *See—*
Crosby, Jeffrey N., 4,297,178, Cl. 204-47.000.
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.

International Telephone and Telegraph Corporation: *See—*
Bickel, Gary W., 4,296,995, Cl. 350-96.150.
Salman, Syed, 4,297,197, Cl. 204-297.00W.

Interscan Corporation: *See—*
Shaw, Manuel; and Thatcher, Imbrie, 4,297,689, Cl. 340-632.000.

Interstate Electronics Corp.: *See—*
Beno, Richard D., 4,297,528, Cl. 179-1.0SB.

Irvin, William A. Liquid level control system. 4,297,081, Cl. 417-2.000.

Isaka, Tsutomu: *See—*
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, 4,297,310, Cl. 264-83.000.

Isayama, Shogo: *See—*
Takehara, Nobumitsu; and Isayama, Shogo, 4,297,396, Cl. 427-284.000.

Isenberg, Jack M., to Boeing Company, The. Apparatus and method for manufacturing laminar flow control aircraft structure. 4,296,899, Cl. 244-207.000.

Ishiba, Teruyuki: *See—*
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297,280, Cl. 260-245.500.

Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, to Hitachi, Ltd. Apparatus for removing nitrogen oxides from flue gas. 4,297,319, Cl. 422-114.000.

Ishida, Atsuo: *See—*
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-70.000.

Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, to Hitachi, Ltd. Method for treatment of biochemical waste. 4,297,216, Cl. 210-613.000.

Ishida, Takashi; and Tanaka, Mamoru, to Nissan Motor Company, Limited. Support assembly for an exhaust system of a motor vehicle. 4,296,907, Cl. 248-573.000.

Ishihara, Michio: *See—*
Nagahama, Tsutomu; and Ishihara, Michio, 4,297.722, Cl. 357-74.000.

Ishii, Masaaki: *See—*
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.

Ishii, Satoshi: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Ishii, Sizuo: *See—*
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.

Ishikawa, Masakazu: *See—*
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.

Ishioka, Mitsugu: *See—*
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, 4,297,310, Cl. 264-83.000.

Isobe, Mitsuhide, to Shimano Industrial Company, Limited. Rear hub having improved mounting of a cylindrical bearing member to an inner member. 4,296,850, Cl. 192-64.000.

Ito, Fumio: *See—*
Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, 4,297,018, Cl. 354-50.000.

Ito, Isao; and Tunashima, Seiichi, to NGK Insulators, Ltd. Apparatus for measuring contour configuration of articles. 4,297,034, Cl. 356-394.000.

Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi. Small piezoelectric tuning fork. 4,297,610, Cl. 310-370.000.

Ito, Tadashi: *See—*
Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, 4,297,018, Cl. 354-50.000.

Ito, Takaharu: *See—*
Yasuba, Shoichi; and Ito, Takaharu, 4,296,657, Cl. 82-1.00C.

Ito, Takashi: *See—*
Kamogawa, Nin-ichi; and Ito, Takashi, 4,297,562, Cl. 219-216.000.

Ito, Thomas I.: *See—*
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.

Iwai, Michinobu; and Tanimoto, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Movable contact arm assembly. 4,297,555, Cl. 200-153.00G.

Iwamoto, Masaru. Speed up device for bicycle. 4,296,939, Cl. 280-212.000.

Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Automatic power transmission shift valve. 4,296,651, Cl. 74-869.000.

Iwasa, Masakazu: *See—*
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.

Iwatsu Electric Co., Ltd.: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Izod, Thomas J. P.: *See—*
Lok, Brent M. T.; and Izod, Thomas J. P., 4,297,335, Cl. 423-328.000.

J. I. Case Company: *See—*
Benson, Samuel L., 4,296,846, Cl. 192-4.00A.

Jachimowicz, Felek, to W. R. Grace & Co. Process of forming polymeric polyamine/amide. 4,297,481, Cl. 528-392.000.

Jackel, Klaus: *See—*
Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, 4,297,599, Cl. 307-355.000.

Jacobs Manufacturing Company, The: *See—*
Price, Robert B., 4,296,605, Cl. 60-599.000.

Jacobs, Marcellus L.; and Jacobs, Paul R. Automatic storm protection control for wind energy system. 4,297,075, Cl. 416-14.000.

Jacobs, Paul R.: *See—*
Jacobs, Marcellus L.; and Jacobs, Paul R., 4,297,075, Cl. 416-14.000.

Jaeggi, Knut A.: *See—*
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.

Jaffe, Max: *See—*
Concha, Edward; Jaffe, Max; and Bedford, Riley, 4,297,068, Cl. 414-458.000.

Jaffin, Harry A.; and Gliewe, Russell H. Apparatus for collecting ejected cartridges. 4,296,565, Cl. 42-1.00T.

James, Andre: *See—*
Layotte, Pierre-Claude; and James, Andre, 4,296,828, Cl. 181-121.000.

James, Kenneth A.: *See—*
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.

Jameson, James J., to Cooper Industries, Inc. Powershift transmission with direct drive and modulated torque converter drive in forward and reverse. 4,296,645, Cl. 74-688.000.

Janson, Mats O., to Tylo Sauna S.A. Sauna heating unit and shield therefor. 4,296,507, Cl. 4-524.000.

Jardin, Hans; and Hirschberger, August, to Webasto-Werk W. Baier GmbH & Co. Wind deflector for sliding roofs of motor vehicles. 4,296,962, Cl. 296-217.000.

Jarman, Davis R.; and Hinson, Virgil H. Wheel alignment apparatus. 4,296,626, Cl. 72-392.000.

Jarnum, Lennart, to AB Jarnkonstruktioner. Vertically adjustable bridge for connection with ships. 4,296,516, Cl. 14-71.700.

Jarrett, Robert B.: *See—*
LoCascio, James J.; and Jarrett, Robert B., 4,297,646, Cl. 330-288.000.

Jawad, Maan, to Nooter Corporation. Pressure vessel head. 4,296,869, Cl. 220-3.000.

Jehle, Fritz; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for the automatic guiding of a workpiece on a sewing machine. 4,296,700, Cl. 112-153.000.

JENAer Glaswerk Schott & Gen.: *See—*
Hussmann, Eckart, 4,296,742, Cl. 126-450.000.
Ritze, Willy, 4,297,142, Cl. 501-77.000.

Jensen, Borge R., to Danfoss A/S. Measuring equipment for acoustic determination of the specific gravity of liquids. 4,297,608, Cl. 310-335.000.

Jensen, Michael E.: *See—*
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.

Jervis, James E., to Raychem Corporation. Heat-shrinkable hollow article. 4,297,155, Cl. 156-86.000.

Jesse, Harold W.; and Jones, Peter M., to TME, Inc. Cable shield. 4,297,522, Cl. 174-36.000.

Jewett, M. Pearson. Submersible pump puller. 4,296,916, Cl. 254-380.000.

Jidosha Kiki Co., Ltd.: *See—*
Ohta, Ryuji; and Kobayashi, Michio, 4,296,680, Cl. 92-98.00D.

Jikihara, Tomo: *See—*
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.

John C. Lehman, Inc.: *See—*
Lehman, John C., 4,296,984, Cl. 312-268.000.

John Fluke Mfg. Co., Inc.: *See—*
Koeman, Henriecus, 4,297,680, Cl. 340-347.0AD.

John Zink Company: *See—*
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.

Johnson, Allen S., Jr., to Staclean Diffuser Company. Bag-type filter with air diffuser tubes of helical construction. 4,297,115, Cl. 55-302.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Scanning shutter blade arrangement with dynamic apertures for ambient and flash exposures. 4,297,016, Cl. 354-27.000.

Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., to Bell Telephone Laboratories, Incorporated. Persistent memory cell. 4,297,005, Cl. 350-357.000.

Johnson & Johnson: *See—*
Nguyen, Hien V., 4,297,404, Cl. 428-85.000.
Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, 4,296,752, Cl. 128-635.000.

Johnson, Matthey & Co., Limited: *See—*
Sermon, Paul A., 4,297,331, Cl. 423-239.000.

Johnson, Paul H., to Phillips Petroleum Company. Waste heat recovery. 4,296,800, Cl. 165-95.000.

Johnson, Steven A. Focusing cover solar energy collector apparatus. 4,297,521, Cl. 136-248.000.

Jolly, Jennings L.; and Roos, Leo, to Hercules Incorporated. Contrast colorant for photopolymerizable compositions. 4,297,435, Cl. 430-270.000.

Jones, John B.; and Kunchal, S. Kumar. Process for oil shale retorting. 4,297,201, Cl. 208-11.00R.

Jones, Peter M.: *See—*
Jesse, Harold W.; and Jones, Peter M., 4,297,522, Cl. 174-36.000.

Joppien, Harmut: *See—*
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Harmut, 4,297,361, Cl. 424-263.000.

Jordening, Harold G. Bike carrying adapter. 4,296,879, Cl. 224-42.45R.

Jordon, Hans: *See—*
Bohler, Joachim; and Jordon, Hans, 4,296,517, Cl. 15-93.00R.

Joslin, Joel A.; and Ranford, Alan B., to Sherwood Medical Industries Inc. Blood collection device and method with anti-backflow means. 4,296,759, Cl. 128-766.000.

Jouffret, Michel: *See—*
Costantini, Michel; and Jouffret, Michel, 4,297,287, Cl. 260-348.160.

Jozwiak, Edward L., Jr., to PPG Industries, Inc. Cationic polymers and their use in electrodeposition. 4,297,261, Cl. 260-29.7RP.

Jubilee Manufacturing Co.: *See—*
Merten, Richard C., 4,297,674, Cl. 340-63.000.

Jude Engineering, Inc.: *See—*
Christian, Robert F., 4,297,208, Cl. 210-94.000.

Judell, Neil H. K., to Datamedix Inc. Method and apparatus for determining ventricular fibrillation. 4,296,755, Cl. 128-705.000.

Juner, Adolph; and Haas, David J., to North Amer an Philips Corporation. X-ray optical system for article inspection, with components disposed on parallel axes. 4,297,580, Cl. 250-368.000.

Jung, Wilhelm; and Rau, Karl, to VDO Adolf Schindling AG. Apparatus for capacitive filling-level measuring, particularly in a motor vehicle tank. 4,296,630, Cl. 73-304.00C.

Jureit, John C.; and Greenley, Henry R., to Automated Building Components, Inc. Fasteners for joining angularly related wooden members. 4,297,048, Cl. 403-189.000.

Jyojiki, Masao: *See—*
Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, 4,297,014, Cl. 354-25.000.

Kabas, Guglielmo: *See—*
Burdeska, Kurt; and Kabas, Guglielmo, 4,297,234, Cl. 252-301.240.

Kabel-und Metallwerke Gutehoffnungshuette A.G.: *See—*
Leuchs, Ottmar; and Maltz, Georg, 4,297,526, Cl. 174-102.00R.

Kabushiki Kaisha Fujikoshi: *See—*
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Mitsui, Yoshihiro, 4,297,697, Cl. 340-813.000.

Kabushiki Kaisha Taiyohatsujyo Seisakusho: *See—*
Nagano, Kenji, 4,296,534, Cl. 24-270.000.

Kabushikikaisha Asahi Shinbunsha: *See—*
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.

Kadokura, Koichi: *See—*
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.

Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, to Pioneer Electronic Corporation. Magnetic recording and reproducing device. 4,297,730, Cl. 360-66.000.

Kagata, Tooru; and Goto, Hiromi, to Aisin Seiki Kabushiki Kaisha. Free wheel hub mechanism. 4,296,848, Cl. 192-35.000.

Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, to Bachofen AG. Device for detachably coupling the orifice of a branchline to a line carrying a pressure medium. 4,296,774, Cl. 137-322.000.

Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, to Bachofen, AG. Device for detachably coupling a branchline to a pressure line. 4,296,775, Cl. 137-322.000.

Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Process for producing a positive electrode for a non-aqueous electrolytic cell. 4,297,231, Cl. 252-182.100.

Kai, Yoshiyuki: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.

Kajavo, Kari: *See—*
Lampinen, Esko; and Kajavo, Kari, 4,296,545, Cl. 29-602.00R.

Kakigi, Takao, to Cybernet Electronics Corp. Photoelectric smoke sensing and alarming device. 4,297,688, Cl. 340-630.000.

Kakimi, Fujio: *See—*
Hoshi, Yoshiyuki; Hayashi, Takayuki; and Kakimi, Fujio, 4,297,235, Cl. 252-316.000.

Kakizawa, Tsutomu: *See—*
Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi, 4,297,610, Cl. 310-370.000.

Kalfoglou, George, to Texaco Inc. Surfacant waterflooding oil recovery method. 4,296,812, Cl. 166-274.000.

Kali and Salz AG: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.

Kalns, Ilmars, to Eaton Corporation. Two-speed transaxle. 4,296,650, Cl. 74-751.000.

Kamada, Masataka; and Satoh, Seiji. Decorated soap and method for producing the same. 4,297,228, Cl. 252-92.000.

Kamar International, Inc.: *See—*
Kamar, Pascal M., 4,296,567, Cl. 46-163.000.

Kamar, Pascal M., to Kamar International, Inc. Figure toy with flexible appendages. 4,296,567, Cl. 46-163.000.

Kambanis, Stamatis M.: *See—*
De Ruiter, Robert S.; and Kambanis, Stamatis M., 4,297,264, Cl. 260-33.40R.

Kamibayashi, Tetsusaburo: *See—*
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,297,602, Cl. 310-26.000.

Kaminishi, Katuzo: *See—*
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.

Kamogawa, Nin-ichi; and Ito, Takashi, to Konishiroku Photo Industry Co., Ltd. Heat roller type fixing apparatus. 4,297,562, Cl. 219-216.000.

Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Photographic material and diffusion transfer processing solution for making printing plates and method for making printing plates. 4,297,429, Cl. 430-204.000.

Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Photographic material for production of printing plates and method for production of printing plates. 4,297,430, Cl. 430-204.000.

Kanegae, Hidetoshi: *See—*
Abo, Toshimi; and Kanegae, Hidetoshi, 4,296,600, Cl. 60-39.28R.

Kaneko, Tomonobu, to Amada Company, Limited. Feed control for horizontal bandsaw machines. 4,296,661, Cl. 83-796.000.

Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Processing method of silver halide color photographic material. 4,297,437, Cl. 430-376.000.

Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Photographic material. 4,297,441, Cl. 430-543.000.

Kangol Magnet Limited: *See—*
Clifford, Roy, 4,296,942, Cl. 280-803.000.

Kansas State University Research Foundation: *See—*
Kyle, Benjamin G., 4,297,172, Cl. 203-19.000.

Kantz, John F.: *See—*
Hsu, Fu-Tong; and Kantz, John F., 4,296,860, Cl. 206-386.000.

Kao Soap Co., Ltd.: *See—*
Abe, Yoshiaki; Inoue, Shigeo; and Ishida, Atsuo, 4,297,340, Cl. 424-70.000.
Tsuchiya, Yoshimi; Sagae, Masayuki; and Mizutani, Hiroshi, 4,297,410, Cl. 428-283.000.

Kaplan, Murray A.: *See—*
Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,297,489, Cl. 544-27.000.

Kara, Frederick E.: *See—*
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., 4,296,920, Cl. 266-216.000.

Karady, Sandor: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.

Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., to Bendix Corporation, The. Integral electrical contact and method of making same. 4,296,985, Cl. 339-48.000.

Karube, Isao: *See—*
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.

Kasahara, Nobuyoshi; and Nonomura, Koutaro, to Mitsui Mining & Smelting Co., Ltd. Corrosion resistant metallic article having a matt nacreous appearance. 4,297,405, Cl. 428-141.000.

Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, to Kuraray Company, Ltd. Method of making wig archetype. 4,297,315, Cl. 264-322.000.





Kashiwabara, Akira: *See—*
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.

Kato, Hisashi: *See—*
Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, 4,297,384, Cl. 427-14.100.

Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, to Nihon Medi-Physics, Co., Ltd. Thallium-carrying target material and its production. 4,297,166, Cl. 376-194.000.

Kato, Shiro: *See—*
Tsuboi, Akira; and Kato, Shiro, 4,296,541, Cl. 29-568.000.

Katoh, Haruhiko: *See—*
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.

Katsube, Junki: *See—*
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, 4,297,282, Cl. 260-326.200.

Katsunuma, Nobuhiko. Nucleoside derivatives and an antileukemial agent containing the same as an active ingredient. 4,297,347, Cl. 424-180.000.

Katsuragi, Shigeru: *See—*
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.

Katzman, Allison W.: *See—*
Erickson, Erick E.; Katzman, Allison W.; and Breslow, Jeffrey D., 4,297,153, Cl. 156-63.000.

Kaufel Group Ltd.: *See—*
Chandler, Edward A., 4,297,614, Cl. 315-86.000.

Kaufman, Jack W.: *See—*
Blake, Joseph W., III; and Kaufman, Jack W., 4,296,751, Cl. 128-325.000.

Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., to Union Carbide Corporation. Method of preparing an olefin hydration catalyst. 4,297,241, Cl. 252-435.000.

Kavchok, Ronald W.: *See—*
Papalos, John G.; and Kavchok, Ronald W., 4,297,259, Cl. 260-29.6NR.

Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Enclosed switching apparatus. 4,297,553, Cl. 200-145.000.

Kawakami, Tomiko: *See—*
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.

Kawakami, Yasushi: *See—*
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.

Kawakatsu, Satoshi: *See—*
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.

Kawamura, Masaharu; Uchidoi, Masanori; Shigeta, Yoshihiro; Sugiura, Yoji; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Coordinating control system for camera. 4,297,013, Cl. 354-23.00D.

Kawaziri, Kazuhiro: *See—*
Higashi, Akio; Kawaziri, Kazuhiro; and Nakajima, Yosuke, 4,297,392, Cl. 427-75.000.

KBI Corp., The: *See—*
Kirk, Joseph R.; and Campbell, Edward C., 4,297,219, Cl. 210-669.000.

Keast, Larry G.; and Horton, Herbert D., to World Wide Oil Tools, Inc. Pawl and ratchet mechanism. 4,296,842, Cl. 188-61.000.

Keckman, Heikki. Skylight apparatus. 4,296,578, Cl. 52-200.000.

Kekalo, Vasily I.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Controlling overheating of vacuum mold used to shape glass sheets. 4,297,118, Cl. 65-104.000.

Keller, Robert N., to National Steel Corporation. Method of manufacturing expanded reinforcing sheet material. 4,297,154, Cl. 156-79.000.

Kelman, Charles D. Intraocular lens and method of making the same. 4,296,501, Cl. 3-13.000.

Kelsey, Wayne R.: *See—*
Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., 4,296,949, Cl. 285-18.000.

Kelton, Wallace G. Cylindrical solar energy collector. 4,296,738, Cl. 126-443.000.

Kemi-Intressen AB: *See—*
Lundgren, Sune I.; and Rehnberg, Leif E. L., 4,296,653, Cl. 81-3.46R.

Kemper, Yves J., to Vadetec Corporation. Differential transmission drive unit. 4,296,647, Cl. 74-690.000.

Kempf, Georg: *See—*
Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, 4,297,330, Cl. 423-232.000.

Ken-Koat, Inc.: *See—*
Robertson, Kenneth L.; and Heslep, Curtis A., 4,296,708, Cl. 118-233.000.

Kennametal Inc.: *See—*
Armbrust, William D.; and McCreery, James F., 4,297,058, Cl. 407-113.000.

Kennedy, Leroy P., to Abex Corporation. Railroad car hand brake signal device. 4,296,707, Cl. 116-58.00A.

Kenneth E. Beswick Ltd.: *See—*
Gale, James A., 4,297,669, Cl. 337-407.000.

Kennington, Kerry S., to Hughes Tool Company. Nozzle placement in large diameter earth boring bits. 4,296,824, Cl. 175-340.000.

Kenyon, Ralph E.: *See—*
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., 4,297,379, Cl. 426-565.000.

Keplinger, Klaus: *See—*
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.

Kern, Jorg; and Guth, Christian, to Ciba-Geigy Corporation. Process for imparting to textile materials a soft handle using unsaturated aliphatic acid amides. 4,297,400, Cl. 427-389.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Arbel, Arie; and Kurz, Rainer, 4,297,679, Cl. 340-347.0AD.

Kernforschungszentrum Karlsruhe, GmbH: *See—*
Scheffler, Knut; and Riege, Ulrich, 4,297,304, Cl. 264-0.500.

Kessler, Bayard F., to Novation, Inc. Electronics package. 4,297,530, Cl. 179-2.00C.

Kester, Jack R.: *See—*
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.

Kezerian, Charles: *See—*
Gaughan, Edmund J.; and Kezerian, Charles, 4,297,295, Cl. 260-455.00A.

Kicinski, Kenneth J., to Nelson Industries, Inc. Exhaust muffler. 4,296,832, Cl. 181-255.000.

Kiekhaefer, Elmer C. Stern drive mechanism. 4,297,097, Cl. 440-59.000.

Kieserling & Albrecht: *See—*
Weller, Alois; and Mai, Wolfgang, 4,296,625, Cl. 72-345.000.

Kihira, Masafumi: *See—*
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,296,543, Cl. 29-596.000.

Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., to Rohm and Haas Company. 3-Pyridylmethylthiocarbamates. 4,297,342, Cl. 424-84.000.

Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., to Union Carbide Corporation. Method for making fasteners. 4,296,512, Cl. 10-27.00E.

Killer, Walter HP. Method and apparatus for reducing the activation energy of chemical reactions. 4,297,186, Cl. 204-165.000.

Kimball International, Inc.: *See—*
Howell, Stephen L., 4,296,665, Cl. 84-1.030.
Wilcox, Brian N.; and Robinson, John W., 4,296,666, Cl. 84-1.260.

Kimberly-Clark Corporation: *See—*
Woon, Lin-Sun; and Wilson, John C., 4,296,750, Cl. 128-287.000.

Kimura, Kiyoshi: *See—*
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.

Kimura, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Darlington-connected semiconductor device. 4,297,597, Cl. 307-315.000.

Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, to Meito Co. Ltd.; and Toyo Pulp Co. Ltd. Packaging bag. 4,297,402, Cl. 428-35.000.

Kinoshita, Toshio: *See—*
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,296,543, Cl. 29-596.000.

Kinugawa, Ryoji: *See—*
Tsutsui, Kotaroh; and Kinugawa, Ryoji, 4,297,540, Cl. 200-5.00B.

Kirchmayr, Rudolf: *See—*
Felder, Louis; and Kirchmayr, Rudolf, 4,297,513, Cl. 568-43.000.

Kirimura, Shunichiro: *See—*
Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, 4,297,187, Cl. 204-165.000.

Kirk, Joseph R.; and Campbell, Edward C., to KBI Corp., The. Temporary stream filtration system. 4,297,219, Cl. 210-669.000.

Kita, Toshio: *See—*
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.

Kitahara, Tohru: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.

Kitajima, Yoshiro: *See—*
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.

Kiteley, Terence J., to Zenith Radio Corporation. Phosphor protection circuit for multiple CRT projection television. 4,297,619, Cl. 315-381.000.

Kitsuregawa, Takashi: *See—*
Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, 4,297,718, Cl. 357-22.000.

Kizaki, Jiro; and Fujii, Takashi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Tandem master cylinder. 4,296,604, Cl. 60-562.000.

Klaeui, Heinrich: *See—*
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.

Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., to CPC International Inc. High speed corrugating adhesives. 4,297,144, Cl. 106-197.00C.

Kleine-Kleffmann, Werner: *See—*
Hoflken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.

Kleinschmit, Peter; and Schwarz, Rudolf, to Degussa Aktiengesellschaft. Temperature stabilized silicon dioxide-mixed oxide, the process for its production and use. 4,297,143, Cl. 501-103.000.

KMS Fusion, Inc.: *See—*
Breuckner, Keith A., 4,297,165, Cl. 376-103.000.

Knappe, Rudolf: *See—*
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, 4,297,207, Cl. 209-9.000.

Knepp, Gary L.: *See—*
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., 4,297,742, Cl. 361-154.000.

Knoll International, Inc.: *See—*
Stephens, William I., 4,296,574, Cl. 52-27.000.

Kobayashi, Hideo: *See—*
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.

Kobayashi, Itaru. Guitarist's foot-rest. 4,296,694, Cl. 108-116.000.

Kobayashi, Michio: *See—*
Ohta, Ryuji; and Kobayashi, Michio, 4,296,680, Cl. 92-98.00D.

Kobayashi, Susumu, to Terumo Corporation. Centrifugal fluid processing device. 4,296,882, Cl. 233-21.000.

Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, to Kokusai Denshin Denwa Kabushiki Kaisha. Magnetostrictive co-ordinate plate for co-ordinate reader. 4,297,602, Cl. 310-26.000.

Kobe Steel, Limited: *See—*
Asami, Takayoshi, 4,296,539, Cl. 29-157.30A.
Morimoto, Kotaro; and Suzuki, Tomio, 4,297,093, Cl. 431-10.000.

Kobler, Robert J., to AMP Incorporated. Method of manufacturing electrical connector receptacle. 4,296,550, Cl. 29-884.000.

Kobylinski, Thaddeus P.: *See—*
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.

Koch, Arnold K.: *See—*
Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, 4,297,305, Cl. 264-0.500.

Koch, Claude V., to AMF Incorporated. Actuating means for switch operation in timing apparatus. 4,297,546, Cl. 200-38.00R.

Koci, Zdenek; and Mollet, Hans, to Ciba-Geigy Corporation. Aqueous dye preparations. 4,297,100, Cl. 8-527.000.

Kodama, Akira: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.

Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Figure displaying device. 4,297,691, Cl. 340-723.000.

Koegel, Wolfram: *See—*
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.

Koehler, Robert P. Slide tray protector. 4,297,010, Cl. 353-122.000.

Koeman, Henriecus, to John Fluke Mfg. Co., Inc. Analog waveform digitizer. 4,297,680, Cl. 340-347.0AD.

Koenig, Fredrick: *See—*
Rodenbeck, Philip G.; and Koenig, Fredrick, 4,296,784, Cl. 140-92.200.

Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, to BASF Aktiengesellschaft. Novel α-haloalkylcarbamic acid halides, and a process for the preparation of α-haloalkylcarbamic acid halides. 4,297,300, Cl. 260-544.00C.

Koffski, Leonard E. Bracket. 4,296,835, Cl. 182-184.000.

Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, to Chisso Corporation. Novel disubstituted dichlorosilane and method for producing same. 4,297,499, Cl. 556-465.000.

Kohno, Kimio: *See—*
Ichikawa, Junji; Imai, Nobuhiro; Kohno, Kimio; Kadokura, Koichi; and Ishii, Masaaki, 4,297,713, Cl. 346-108.000.

Kohsaka, Masanobu: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.

Koike, Toshio: *See—*
Ebisawa, Kiyohito; Hisabayashi, Satoshi; Koike, Toshio; and Hashimoto, Kazuyuki, 4,297,024, Cl. 355-14.00E.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,297,602, Cl. 310-26.000.
Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, 4,296,996, Cl. 350-96.200.

Kolb, Gerald C.: *See—*
De Koch, Robert J.; Kolb, Gerald C.; and Lalk, James W., 4,297,452, Cl. 525-367.000.

Kolb, Gustav, to Mannesmann Aktiengesellschaft; and Kolb, Gustav. Sampling molten metal. 4,296,638, Cl. 73-863.210.

Koleske, Joseph V., to Union Carbide Corporation. Ester diol alkoxylate based alkyd resins. 4,297,476, Cl. 528-300.000.

Koller & Smith Co., Inc.: *See—*
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.

Kolowski, Michael A.: *See—*
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, to Mitsubishi Gas Chemical Co. Inc. Process and apparatus for producing terephthalic acid with high purity. 4,297,507, Cl. 562-416.000.

Kominami, Yasuo: *See—*
Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, 4,297,601, Cl. 307-555.000.

Komiya, Hidetsugu, to Fujitsu Fanuc Limited. Spindle control system. 4,297,624, Cl. 318-594.000.

Kondo, Yoshinobu: *See—*
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.

Konig, Klaus: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.

Koning, Menno G., to Northrop Corporation. Free rotor gyro with three torquers and three pickoffs. 4,296,639, Cl. 74-5.460.

Konishiroku Photo Industry Co., Ltd.: *See—*
Honda, Hiroyuki; and Ura, Hiroaki, 4,297,026, Cl. 355-15.000.
Kamogawa, Nin-ichi; and Ito, Takashi, 4,297,562, Cl. 219-216.000.
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.
Nagoshi, Mitsuru, 4,297,023, Cl. 355-8.000.
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.

Koons, Patrick R.; and Neilson, John M. S., to RCA Corporation. Method of treating SiPOS passivated high voltage semiconductor device. 4,297,149, Cl. 148-1.500.

Kornrumpf, William P.: *See—*
Bloomer, Milton D.; and Kornrumpf, William P., 4,296,632, Cl. 73-362.0AR.

Kosek, Thomas P.; and Steinhilper, Eric A., to General Motors Corporation. Powdered coal air dispersion nozzle. 4,296,888, Cl. 239-403.000.

Koseki, Yuji: *See—*
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.

Koshibe, Shigeru; and Nanjo, Motoyuki, to Sumitomo Bakelite Company Limited. Quick-curing phenolic resin and process for preparing same. 4,297,473, Cl. 528-144.000.

Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, to Koller & Smith Co., Inc. Magnetic stripe. 4,297,570, Cl. 235-493.000.

Kowitz, Friedrich: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.

Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, to Hitachi Chemical Company, Ltd. Odorless or low-odor crosslinkable compound and resin composition containing the same. 4,297,471, Cl. 526-328.000.

Kozacka, Frederick J., to Gould Inc. Fusible electric cable protector. 4,297,667, Cl. 337-251.000.

Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, to BASF Aktiengesellschaft. Preparation of coated catalysts. 4,297,247, Cl. 252-468.000.

Kraft, Raymond D.: *See—*
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Schabert, Hans-Peter, 4,297,167, Cl. 376-273.000.
Weghaupt, Erich, 4,297,603, Cl. 310-53.000.
Wichmann, Arnold, 4,297,606, Cl. 310-271.000.

Krall, Kenneth M., to Vought Corporation. Airfoil construction. 4,296,900, Cl. 244-219.000.

Kratzer, Reinhold H.: *See—*
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.

Krauss, Timothy A.; and Roman, Stephan, to United Technologies Corporation. Rotor blade pitch control linkage. 4,297,080, Cl. 416-141.000.

Krawczyk, Adam: *See—*
Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, 4,297,305, Cl. 264-0.500.

Kremer, Hubert, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Double-lift open-shed Jacquard machine. 4,296,782, Cl. 139-65.000.

Kress, Robert W.; and Bacchi, Anthony C., to Grumman Aerospace Corporation. VTOL Airplane. 4,296,896, Cl. 244-12.400.

Krjuk, Timur P.: *See—*
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.

Kroger, Walter. Folding sawhorse. 4,296,834, Cl. 182-155.000.

Kroll, Rudolf: *See—*
Bernhardt, Winfried; Grunomann, Edgard; and Kroll, Rudolf, 4,296,732, Cl. 126-426.000.

Kronert, Curt, to Thyssen Industrie AG. Rotation-elastic, shock and vibration damping clutch. 4,296,853, Cl. 192-106.100.

Krueger, Walter J.: *See—*
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.

Krug, Hans; and Heilmann, Kurt, to Ferd. Wagner. Gold alloy wire for jewelry chains. 4,297,416, Cl. 428-576.000.

Kruse, Gary L., to Dake Corporation, Division of JSJ Corporation. Packaging machine with cam-operated cutter and container supports therefor. 4,296,589, Cl. 53-300.000.



Kubinski, Karen R.: *See—*
Beall, George H.; Grossman, David G.; Hoda, Syed N.; and Kubinski, Karen R., 4,297,139, Cl. 501-2.000.

Kubo, Tatsuru: *See—*
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.

Kubota, Ltd.: *See—*
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.
Sada, Kenzo; and Hayashi, Shigeyuki, 4,296,644, Cl. 74-606.00R.

Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, to Fuji Photo Film Co., Ltd. Method for producing a multilayer printing plate. 4,297,436, Cl. 430-310.000.

Kuchuk-Yatsenko, Sergei I.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Kudo, Yoshio; Iwasa, Masakazu; and Kato, Hisashi, to Fuji Photo Film Co., Ltd. Method of developing electrostatic latent image. 4,297,384, Cl. 427-14.100.

Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, to Siemens Aktiengesellschaft. Electromagnetic overcurrent tripping device with adjustable armature air gap. 4,297,664, Cl. 335-176.000.

Kuhlmann, Dieter: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.

Kuiper, Joe A.: *See—*
DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., 4,297,209, Cl. 210-107.000.

Kullander, Jan O., to Aktiebolaget Electrolux. Knock-down cabinet assembly. 4,296,982, Cl. 312-257.00R.

Kumar, Kaplesh; Das, Dilip K.; and Wettstein, Ernest C., to Charles Stark Draper Laboratory, Inc., The. Process of making permanent magnets. 4,297,388, Cl. 427-47.000.

Kumpe, Gerhardt: *See—*
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerharot; and Herchenhan, Bernd, 4,297,344, Cl. 424-101.000.

Kunchal, S. Kumar: *See—*
Jones, John B.; and Kunchal, S. Kumar, 4,297,201, Cl. 208-11.00R.

Kupar, Daniel E.: *See—*
Fruchey, Russell L.; and Kupar, Daniel E., 4,297,672, Cl. 340-23.000.

Kuraray Company, Ltd.: *See—*
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.

Kurata, Tomoyuki: *See—*
Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.

Kureha Kugaku Kogyo Kabushiki Kaisha: *See—*
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, 4,297,413, Cl. 428-394.000.

Kurtz, Leonard D.; and Bidwell, Robert E., to BioResearch Inc. Underwater drainage apparatus with separable suction control chamber. 4,296,748, Cl. 128-276.000.

Kurz, Rainer: *See—*
Arbel, Arie; and Kurz, Rainer, 4,297,679, Cl. 340-347.0AD.

Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., to Pacer Technology and Resources, Inc.; and Sumitomo Chemical Company, Ltd. Locking and sealing compositions and methods for their application. 4,297,160, Cl. 156-331.100.

Kusters, Eduard; and Ahrweiler, Karl-Heinz, to Kusters, Eduard. Variable deflection roll controlled by hydraulically actuated reciprocating elements. 4,296,537, Cl. 29-116.0AD.

Kvist, Ulrik: *See—*
Horholt, Anders; and Kvist, Ulrik, 4,296,524, Cl. 16-150.000.

Kyle, Benjamin G., to Kansas State University Research Foundation. Low energy process of producing gasoline-ethanol mixtures. 4,297,172, Cl. 203-19.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.

Labovitz, Jeffrey N.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Lacomme, Philippe, to Thomson-CSF. Telemetry device for tracking radar and radar system comprising such a device. 4,297,703, Cl. 343-7.300.

Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning shaft bearing mounting assembly. 4,296,977, Cl. 308-19.000.

Ladish Co.: *See—*
Zimmerly, Robert D., 4,296,951, Cl. 285-95.000.

LaFrance, Robert R. X-ray system signal derivation circuits for heat unit indicators and/or calibration meters. 4,297,638, Cl. 324-410.000.

Lai, John T., to B. F. Goodrich Company, The. Synthesis of 2-keto-1,4-diazacycloalkanes. 4,297,497, Cl. 544-384.000.

L'Air Liquide, Societe Anonyme pour l'Etude Procedes Georges Claude: *See—*
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Laird, William J.: *See—*
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.

Laishley, William J.; and Taylor, John R., to International Business Machines Corporation. Sampled data servo positioning system. 4,297,734, Cl. 360-78.000.

Lalk, James W.: *See—*
De Koch, Robert J.; Kolb, Gerald C.; and Lalk, James W., 4,297,452, Cl. 525-367.000.

Lamare, Jacques: *See—*
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.

Lammers, Gerald B.; and Smith, Gordon J., to International Business Machines Corporation. Air flow tunnel for reducing ink jet drag on array head. 4,297,712, Cl. 346-75.000.

Lamos, Richard A.: *See—*
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.

Lampinen, Esko; and Kajavo, Kari, to Oy Helvar. Casing hook used to impregnate choke or transformer. 4,296,545, Cl. 29-602.00R.

Land Pyrometers Limited: *See—*
Coe, Charles D.; and Wright, Philip, 4,297,577, Cl. 250-343.000.

Lange, Kenneth: *See—*
Malinowski, Leon; and Lange, Kenneth, 4,296,818, Cl. 171-63.000.

Lapp, Otto: *See—*
Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, 4,297,439, Cl. 430-434.000.

Larinoff, Michael W., to Hudson Products Corporation. Steam condensing apparatus. 4,296,802, Cl. 165-110.000.

Larre, Frank J.; and Larre, Jeannine G. Book support. 4,296,946, Cl. 281-45.000.

Larre, Jeannine G.: *See—*
Larre, Frank J.; and Larre, Jeannine G., 4,296,946, Cl. 281-45.000.

Larsen, Donald W.: *See—*
Wood, Louis L.; and Larsen, Donald W., 4,297,482, Cl. 528-405.000.

Larsen, Robert H., to Singer Company, The. Threading arrangement for chainstitch sewing on a sewing machine. 4,296,701, Cl. 112-168.000.

Larsen, Russell E. Game board and cards. 4,296,927, Cl. 273-248.000.

Larson, Leslie. Drilling rig and conversion apparatus. 4,296,821, Cl. 175-87.000.

Larson, Roderick W.; and Whaley, Ralph D., to Minnesota Mining and Manufacturing Company. Multi-conductor flat cable connector. 4,296,989, Cl. 339-99.00R.

Larsson, Lars E., to Sandvik Aktiebolag. Rock drill. 4,296,825, Cl. 175-410.000.

Lasley, Robert A. Hyperbaric oxygen chamber with fluidic control. 4,296,743, Cl. 128-30.000.

Lauritsen, Richard L.; and Mandellos, Panagiotis K., to Singer Company, The. Vacuum switch. 4,297,552, Cl. 200-83.00P.

Laval, Michel; and Tournier, Edmond, to Commissariat a l'Energie Atomique. Device for the interconnection of conductive terminals located within a demountable enclosure and conductive terminals located outside said enclosure. 4,297,576, Cl. 250-336.000.

Lawless, William N., to Corning Glass Works. Cryogenic ceramic and apparatus. 4,296,607, Cl. 62-6.000.

Lawless, William N., to Corning Glass Works. Cryogenic ceramic and apparatus. 4,296,608, Cl. 62-6.000.

Lawrence, Peter. Picture frame having integral latching means. 4,296,561, Cl. 40-158.00R.

Lawson, Daniel C. Toilet seat lock. 4,296,504, Cl. 4-253.000.

Lawson, John E.; and Dennis, Ronald D., to Mead Johnson & Company. 4-Tertiary-amino-2,6-diaminopyridine l-oxides. 4,297,498, Cl. 546-116.000.

Layotte, Pierre-Claude; and James, Andre, to Institut Francais du Petrole. Mobil device for generating acoustic shear waves. 4,296,828, Cl. 181-121.000.

Layton, James E., to Phillips Petroleum Company. Gain ranging amplifier. 4,297,745, Cl. 367-66.000.

Lazarz, Christine A.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corp. Stable low voltage microporous diaphragm for electrolytic cells. 4,297,196, Cl. 204-296.000.

Leardi, Anthony, to Hercules Incorporated. In-tank bathroom deodorizer/cleaner. 4,296,503, Cl. 4-228.000.

Learnard, Stanley J. Article display stand. 4,296,866, Cl. 211-131.000.

Leatherman, Ivan R., to PPG Industries, Inc. Hexavalent chromium internal colorants for diol bis (allyl carbonate) polymerizates. 4,297,267, Cl. 260-42.530.

Lebedev, Vladimir K.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Lechner, Robert: *See—*
Dalhof, Axel; and Lechner, Robert, 4,297,531, Cl. 179-16.0AA.

Leclercq, Joseph, to Framatome. Devices for transversely holding the fuel rods of a nuclear reactor assembly. 4,297,170, Cl. 376-442.000.

Lecolier, Serge L.; and Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Process for the manufacture of organic acid chlorides. 4,297,301, Cl. 260-544.00K.

Lee, Byung H. Aircraft safety alarm system. 4,297,678, Cl. 340-328.000.

Lee, Harvey R.; Koch, Arnold K.; and Krawczyk, Adam, to Canadian General Electric Company Limited. Nuclear fuel recycling system. 4,297,305, Cl. 264-0.500.

Lee, Ilyoul, to Electric Power Research Institute, Inc. Apparatus for and method of detecting high impedance faults on distribution circuits with delta connected loads. 4,297,738, Cl. 361-42.000.

Lee, Peter F., to Weyerhaeuser Company. Process for displacement washing of porous media. 4,297,164, Cl. 162-60.000.

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Lees, Robert, to Autotote, Ltd. Thermal printer. 4,297,039, Cl. 400-120.000.
Lefebvre, Henry R., to Sun Aired Bag Co., Inc. Garment checking bag. 4,296,876, Cl. 223-91.000.
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Leland Stanford University, Board of Trustees of: *See—*
Trutna, William R., Jr., 4,297,600, Cl. 307-426.000.
Leliaert, Raymond M., to Wheelabrator-Frye Inc. Method of transmission of sonic energy to work pieces. 4,296,794, Cl. 164-131.000.
Lempa, Bernard J., Jr. Method for offset anchoring a fence post. 4,296,584, Cl. 52-742.000.
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Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. 5-(Pyridinyl)pyridine-2,3-diamines, preparation thereof and their cardiotonic use. 4,297,360, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4-(3,4-Diaminophenyl)pyridine or salts, and use thereof as cardiotonic. 4,297,362, Cl. 424-263.000.
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Rossander, Bror L. E.; Ermebrant, Lennart C.; and Lesser, Martin, 4,296,830, Cl. 181-208.000.
Lester, Robert W., to Static Systems Corporation. Light pipe valve liquid crystal transmissive display for direct imaging on photosensitive materials. 4,297,022, Cl. 355-3.00R.
Leuchs, Ottmar; and Maltz, Georg, to Kabel-und Metallwerke Gutehoffnungshuette A.G. Fire resistant electrical cables. 4,297,526, Cl. 174-102.00R.
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Metcalfe, John L.; and Wraige, Douglas, 4,297,406, Cl. 428-215.000.
Lewis, Jay L., to Robertshaw Controls Company. Pneumatically operated control system and unit therefor and methods of making the same. 4,296,795, Cl. 165-27.000.
Lewis, John S.; DiGiannantonio, Edmond P.; and Boyle, Howard R., to Lewis, John S.; and DiGiannatonio, Edmund P. Personal ambient sound referenced annunciator. 4,297,677, Cl. 340-148.000.
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Antes, Gregor; and Greenaway, David L., 4,297,001, Cl. 350-129.000.
Gander, Jean-Gabriel; and Aubert, Ralph, 4,297,533, Cl. 179-84.0VF.
Li, Chou H. Semiconductor device. 4,297,717, Cl. 357-15.000.
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., to Allied Chemical Coporation. Apparatus for texturizing continuous filaments. 4,296,535, Cl. 28-257.000.
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Lindmayer, Joseph, to Solarex Corporation. Method of applying electrical contacts to a photovoltaic cell. 4,297,391, Cl. 136-256.000.
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, to Bayer Aktiengesellschaft. ABS-moulding compositions having high notched impact strength. 4,297,446, Cl. 525-66.000.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid aryl esters of polyester-diols lengthened via carbonate groups and their use for the preparation of polyester-diol bis-diphenol carbonates and polyester/-polycarbonates. 4,297,455, Cl. 525-439.000.
Lindner, Daniel J.: *See—*
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Lindstrom, YrjoV., to Alnor Oy. Method and device for measuring the required cooling capacity of a cold space and the refrigeration capacity of the refrigerating machinery. 4,296,627, Cl. 73-15.00R.
Lingaraju, Bhartoor, to Square D Company. Pressure lock terminal. 4,296,987, Cl. 339-95.00D.
Link, Hans; and Dreher, Ulrich, to Institut Dr. Friedrich Forster Prufgeratebau. Magnet and probe mounting means on a rotating head of magnetic defect testing apparatus. 4,297,636, Cl. 324-262.000.
Lionelle, Joseph E.; and Staffa, Jeffrey A., to Bio Systems Research, Inc. Method of preparing the methyl ester of α-eleostearic acid. 4,297,291, Cl. 260-410.90R.
Lippa, Giuseppe, to American Standard Inc. Mold for integral base for casting ceramic material in the form of a slip. 4,296,908, Cl. 249-58.000.
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List, Hans: *See—*
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List, Helmut: *See—*
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Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, 4,297,325, Cl. 423-122.000.
Liu, Hsin. Equipment for treating and resource recovery from solid waste. 4,297,322, Cl. 422-184.000.
Livigni, Russell A.: *See—*
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Loftis, James B. Drilling apparatus. 4,296,820, Cl. 175-52.000.
Logan, Ted J.; and Lubsen, Timothy A., to Procter & Gamble Company, The. Fractionation of triglyceride mixtures. 4,297,292, Cl. 260-428.500.
Lohmer, Karl: *See—*
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Lohr, Robert. Apparatus for use on vehicle transporters. 4,296,691, Cl. 105-370.000.
Lok-A-Wat, Inc.: *See—*
Belles, David E., 4,296,957, Cl. 292-264.000.
Lok, Brent M. T.; and Izod, Thomas J. P., to Union Carbide Corporation. Aluminum deficient zeolite compositions and process for preparing same. 4,297,335, Cl. 423-328.000.
Long, William P., Jr., to ICI Americas Inc. Non-yellowing paint formulations containing iodo substituted alkynyl urethanes as fungicides. 4,297,258, Cl. 260-29.6MN.
Looren de Jong, Hendrikus: *See—*
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Lorenzini, Robert A. Reed protector for a woodwind instrument. 4,296,668, Cl. 84-383.00R.
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Los, Marinus, to American Cyanamid Co. Use of imidazolinyl benzoates as herbicidal agents. 4,297,128, Cl. 71-92.000.
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Love, Phillip W. Self-loading apparatus for transporting large bales of material. 4,297,065, Cl. 414-24.500.
Lovelace, Reginald B.: *See—*
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Luebke, Robert W., to True Temper Corporation. Containment reservoir and method. 4,296,884, Cl. 238-2.000.
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Kagi, Bruno; Hirmann, Georg; and Luginbuhl, Rolf, 4,296,775, Cl. 137-322.000.
Lundgren, Sune I.; and Rehnberg, Leif E. L., to Kemi-Intressen AB. Method and a device for removing corks from vessels. 4,296,653, Cl. 81-3.46R.
Lutz, Albert W.; and Diehl, Robert E., to American Cyanamid Company. Herbicidal use of 2,6-dinitroaniline herbicides. 4,297,127, Cl. 71-88.000.
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Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., to Panametrics, Inc. Sealed, matched piezoelectric transducer. 4,297,607, Cl. 310-334.000.
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M & W Gear Company: *See—*
Meiners, Elmo R., 4,296,595, Cl. 56-341.000.
Ma, King W., to Dow Chemical Company, The. Method of oxidizing compounds having activated methylene radicals. 4,297,514, Cl. 568-321.000.
Maahs, Gunther; and Rombusch, Konrad, to Chemische Werke Huels, Aktiengesellschaft. Process for the preparation of pentachloro-3-butenoic acid esters. 4,297,505, Cl. 560-219.000.
Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., to Great Lakes Chemical Corporation. Method for the control of biofouling in recirculating water systems. 4,297,224, Cl. 210-755.000.
Mack, Gerhard: *See—*
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Maeda, Keisuke: *See—*
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Maegawa, Yuzo; Masuko, Fujio; and Nakamura, Makoto, to Sumitomo Chemical Company, Limited. Process for producing 2 hydroxy-naphthalene-3-carboxylic acid. 4,297,508, Cl. 562-425.000.
Maeno, Hiroo: *See—*
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Maier, Lawrence C., to Simmonds Precision Products, Inc. Segment failure detector for digital display. 4,297,692, Cl. 340-715.000.
Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, to EC Erdolchemie GmbH. Process for the preparation of triethylamine. 4,297,512, Cl. 564-490.000.
Makari, Jack G. Malignant tumor immunity level detection. 4,297,338, Cl. 424-9.000.
Makino, Akira, to Nisshin Oil Mills, Ltd., The. Rapid method for the measurement of iodine value. 4,297,106, Cl. 23-230.0HC.
Makino, Itsuo: *See—*
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Malinowski, Leon; and Lange, Kenneth, to Leon's Manufacturing Co., Ltd. Rotary rock picker. 4,296,818, Cl. 171-63.000.
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Malsot, Christian; and Bouygues, Jean, to Socapex. Device for centering an optical fiber within a terminal, and a terminal constructed by means of said device. 4,296,997, Cl. 350-96.200.
Maltz, Georg: *See—*
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Manca, Francesco, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Finish composition for the spinning of highly crimped cellulose fibers using a composition cont. fatty acid ester, organic phosphoric acid ester, fatty acid ethylene oxide cond. prod. and fatty acid salt. 4,297,407, Cl. 428-224.000.
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Manecke, Siegfried E.; and Buckshaw, Thomas M., to Robertshaw Controls Company. Temperature responsive piston and cylinder unit having a heater carried thereby. 4,296,603, Cl. 60-528.000.
Mango, Frank D., to Shell Oil Company. Process for making 4,4'-methylene diphenyl diisocyanate. 4,297,294, Cl. 260-453.0PH.
Mangold, Dietrich: *See—*
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Mannesmann Aktiengesellschaft: *See—*
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Mannherz, Elmer D., to Fischer & Porter Co. Noise-reducing electrodes for electromagnetic flowmeter. 4,296,636, Cl. 73-861.120.
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., to Corning Glass Works. Solid-phase immunoassays using magnetic glass. 4,297,337, Cl. 424-1.000.
Manzke, Klaus; Brotzler, Roland; and Schulze-Berge, Klaus, to BASF Aktiengesellschaft. Device for adjusting and fixing detecting means relative to the index mark on a recording disc. 4,297,736, Cl. 360-109.000.
Maple, T. Grant: *See—*
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Marom, Emanuel; Barnoski, Michael K.; and Abrams, Richard L., to Hughes Aircraft Company. Phase sensitive spectrum analyzer. 4,297,704, Cl. 343-113.00R.
Marquart, Gordon L., to Deere & Company. Hydraulically operated transmission control. 4,296,649, Cl. 74-751.000.
Marsden, Robert S., to Imperial Chemical Industries Limited. Preparation of solutions of basic aluminium nitrate. 4,297,336, Cl. 423-395.000.
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Marshall, Don J., to Goodall SemiMetallic Hose & Mfg. Co. Variable pitch marine propeller. 4,297,079, Cl. 416-140.000.
Marshall, Richard C., to Xerox Corporation. Electrochromic display device. 4,297,695, Cl. 340-752.000.
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., to Sperry Corporation. Damped apparatus for quick-stopping rotating members. 4,296,591, Cl. 56-10.300.
Martens, Gerhard, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Method and apparatus for winding textile yarns. 4,296,889, Cl. 242-18.100.
Martin, Alfred C., to Westland Aircraft Limited. Helicopter rotors. 4,297,078, Cl. 416-134.00A.
Martin, Anthony N., to Otis Elevator Company. Electronic fuel control system. 4,296,601, Cl. 60-224.000.

Martin, Charles L., to Raychem Corporation. Composite coupling device with high recovery driver. 4,296,955, Cl. 285-381.000.
Martin Marietta Corporation: *See—*
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Mason, Stanley I., Jr.; and Handler, Michael D., to Surgikos. Disposable full-face surgical mask. 4,296,746, Cl. 128-201.150.
Massa, Frank, to Stoneleigh Trust, The, Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees. Resonant electroacoustic transducer with increased band width response. 4,297,538, Cl. 179-180.000.
Massuard, Claude: *See—*
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Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, to Dainippon Screen Seizo Kabushiki Kaisha; and Takara Belmont Co., Ltd. Method and machine for trying on a hair form in image. 4,297,724, Cl. 358-93.000.
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Matherat, Philippe, to Thomson-CSF. Symbol generator for a graphic console. 4,297,694, Cl. 340-750.000.
Matsumoto, Hisashi, to Mitsui Petrochemical Industries, Ltd. Reinforcing material for hydraulic substances and method for the production thereof. 4,297,414, Cl. 428-400.000.
Matsumoto, Mitsuo: *See—*
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Matsuoka, Hideoki; and Kondo, Yoshinobu, to Nissan Motor Company, Limited; and Fuji Kiko Co., Ltd.,. Covering construction of a guide rail. 4,296,944, Cl. 280-804.000.
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Matsushita Electric Industrial Co., Ltd.: *See—*
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,296,543, Cl. 29-596.000.
Hirao, Tsuneo; and Onishi, Masao, 4,297,609, Cl. 310-339.000.
Matsutani, Shigeru: *See—*
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,297,280, Cl. 260-245.500.
Mattel, Inc.: *See—*
Buck, Gordon H., and Hardwick, Martha K., 4,296,926, Cl. 273-86.00R.
Matthews, Gerald H.: *See—*
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.
Matthijsse, Matthijs, to U.S. Philips Corporation. Device having a balanced pivotable arm. 4,296,906, Cl. 248-280.100.
Mattsson, Karl-Erik H., to AB Volvo. Cylinder with two-stage movement, especially a welding cylinder. 4,296,679, Cl. 92-52.000.
Maul, Rudolf: *See—*
Abeler, Gerd; and Maul, Rudolf, 4,297,268, Cl. 260-45.80N.
Maulding, Hawkins V., to Sandoz, Inc. Non-irritating injectable dosage forms. 4,297,353, Cl. 424-247.000.
May, James I., to Ford Motor Company. Rack and pinion gear bearing support. 4,296,641, Cl. 74-422.000.
Mayer, George: *See—*
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.
McCarty, Frederick B.: *See—*
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.
McClinton, John L., to Burns and Russell Company, The. Pigment package. 4,296,859, Cl. 206-219.000.
McConomy, Thomas A.; and Wells, Bruce D., to Calgon Corporation. Process for removing color bodies from brown phosphoric acid. 4,297,334, Cl. 423-321.00R.
McCook, John P.: *See—*
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., 4,296,764, Cl. 132-7.000.
McCracken, Donald G., to Aeroquip Corporation. Rotary joint. 4,296,952, Cl. 285-98.000.
McCreary, James L.: *See—*
Baldwin, Gary L.; and McCreary, James L., 4,297,642, Cl. 330-9.000.
McCreery, James F.: *See—*
Armbrust, William D.; and McCreery, James F., 4,297,058, Cl. 407-113.000.
McCulloch Corporation: *See—*
Luerken, Adolf, 4,296,852, Cl. 192-104.00B.
McCutchan, John C.; and Niven, Rex C., to University of Melbourne, The. Electric fence monitoring system with energizer, responder and receiver. 4,297,633, Cl. 324-51.000.
McDaniel, Max P.; and Welch, Melvin B., to Phillips Petroleum Co. Treatment of silica. 4,297,460, Cl. 526-98.000.
McDonald, Charles J., to Dow Chemical Company, The. Preparation of water-immiscible, acid-soluble N-(aminomethyl)-$\alpha,\beta$-ethylenically unsaturated carboxamides, quaternary derivatives and polymers thereof. 4,297,256, Cl. 260-29.4UA.
McDonnell Douglas Corporation: *See—*
Little, Jane; and Greene, Del F., 4,296,677, Cl. 91-510.000.
McGill, Roy F. Turnbuckle. 4,297,046, Cl. 403-46.000.
McGowan, Peter T., to Garrett Corporation, The. Fluid motor-pump unit. 4,297,086, Cl. 417-271.000.
McGrath, Gilbert T.: *See—*
McGrath, Lindsay T.; and McGrath, Gilbert T., 4,296,922, Cl. 269-211.000.
McGrath, Lindsay T.; and McGrath, Gilbert T. Bench clamp device. 4,296,922, Cl. 269-211.000.
McGuire, Billy G.: *See—*
Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., 4,297,224, Cl. 210-755.000.
McIlwain, Irwin D., to Sperry Corporation. Auger floatation limit. 4,296,592, Cl. 56-14.400.
McKenny, Vernon C.; and Chan, Tsiu C., to Mostek Corporation. Extremely low current load device for integrated circuit. 4,297,721, Cl. 357-59.000.
Mead Corporation, The: *See—*
Clement, Joseph, 4,296,563, Cl. 40-518.000.
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., 4,296,947, Cl. 282-27.500.
Mead, John F., to Plessey Handel und Investments AG. Optical fibre connectors. 4,296,999, Cl. 350-96.210.
Mead Johnson & Company: *See—*
Lawson, John E.; and Dennis, Ronald D., 4,297,498, Cl. 546-116.000.
Mears, James W., to Grinnell Fire Protection Systems Company, Inc. Deflector with converging lower tines for horizontal sprinkler. 4,296,815, Cl. 169-37.000.
Meatabi, Tsuneyo, to Minolta Camera Kabushiki Kaisha. Arrangement of cylinder elements for a lens barrel. 4,297,002, Cl. 350-255.000.
Mechanical Technology Incorporated: *See—*
Heshmat, Hooshang, 4,296,976, Cl. 308-9.000.
Meckl, Heinz: *See—*
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Meckler, Milton. Modular solar insolation panels. 4,296,740, Cl. 126-448.000.
Meier, Willi; and Rojahn, Bernd, to Dorina Nahmaschinen GmbH. Storage compartment for sewing machine foot controller. 4,296,702, Cl. 112-258.000.
Meiners, Elmo R., to M & W Gear Company. Apparatus for wrapping a cover material around round bales. 4,296,595, Cl. 56-341.000.
Meito Co. Ltd.: *See—*
Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, 4,297,402, Cl. 428-35.000.
Meitzner, Erich F.; and Oline, James A., to Rohm and Haas Company. Macroreticulated copolymer adsorption process. 4,297,220, Cl. 210-690.000.
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, to Norsk Hydro a.s. Process for reducing the vinyl chloride content of aqueous dispersions of vinyl chloride polymers. 4,297,483, Cl. 528-500.000.
Melwisch, Harald; and Looren de Jong, Hendrikus, to U.S. Philips Corporation. Playback apparatus for correcting locking errors. 4,297,731, Cl. 360-70.000.
Menault, Jacques: *See—*
Achard, Georges; Chion, Pierre; and Menault, Jacques, 4,297,412, Cl. 428-370.000.
Mengoli, Guiliano: *See—*
Daolio, Sergio; Mengoli, Guiliano; Folonari, Carlo; and Musiani, Marco, 4,297,188, Cl. 204-181.00R.
Mercer, Albert E. Adjustable angled socket wrench extension. 4,296,654, Cl. 81-57.260.



Merck & Co., Inc.: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.
Merck Patent Gesellschaft mit Beschrankter Haftung: *See—*
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Merrick, George J.: *See—*
Wolfe, Donald L.; Modglin, Donald D.; and Merrick, George J., 4,297,061, Cl. 409-131.000.
Merten, Helmut L.; and Wilder, Gene R., to Monsanto Company. N,N'-Bis(1-cyclohexyl-1-ethyl)-p-phenylenediamine, and rubber compounds containing the same. 4,297,269, Cl. 260-45.9QB.
Merten, Richard C., to Jubilee Manufacturing Co. Passive security device. 4,297,674, Cl. 340-63.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Schnabele, Werner; Buckley, Jack; and Rieger, Ulrich, 4,296,894, Cl. 244-3.270.
Mesur-Matic Electronics Corporation: *See—*
Newell, Harold R., 4,297,625, Cl. 318-696.000.
Metallgesellschaft AG: *See—*.
Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, 4,297,330, Cl. 423-232.000.
Metcalfe, John L.; and Wraige, Douglas, to Lever Brothers Company. Product for treating fabric. 4,297,406, Cl. 428-215.000.
Metzeler Kautschuk GmbH: *See—*
Blahak, Johannes, 4,297,442, Cl. 521-107.000.
Meyer, Burton C.; Licitis, Gunars; and Brand, Derek A., to Marvin Glass & Associates. Electric eye actuated gun arcade. 4,296,929, Cl. 273-310.000.
Meyer, G. Robert: *See—*
Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, 4,296,662, Cl. 83-880.000.
Meyer, Gunther: *See—*
Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, 4,297,502, Cl. 560-35.000.
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., to Technicare Corporation. Image storage and display. 4,297,009, Cl. 352-86.000.
Michalski, Gunter: *See—*
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.
Michelet, Daniel, to Rhone-Poulenc Agrochimie. Preparation of 2,3-dihydro-2,2-dimethyl-7-hydroxybenzofuran. 4,297,284, Cl. 260-346.220.
Micro-Burner Systems Corporation: *See—*
Bryan, Edward L., 4,296,727, Cl. 126-116.00A.
Midland-Ross Corporation: *See—*
Goron, John, 4,297,092, Cl. 425-133.100.
Mieville, Rodney L., to Standard Oil Company (Indiana). Reforming with a catalyst comprising iridium, zirconia, and alumina. 4,297,205, Cl. 208-138.000.
Miki, Tosaku; and Asano, Masahide, to Daiichi Seiyaku Co., Ltd. N-Phenethylacetamide compounds and process for preparation thereof. 4,297,357, Cl. 424-251.000.
Miles Laboratories, Inc.: *See—*
Buckler, Robert T.; and Schroeder, Hartmut R., 4,297,273, Cl. 260-112.00B.
Miller, John G.; and Schwab, Thomas C., to Engelhard Minerals & Chemicals Corporation. Processing of titaniferous materials. 4,297,131, Cl. 75-1.00T.
Miller, Kirk D.; Flood, John B.; Dimou, George; Kara, Frederick E.; and Amos, Richard W., to Canron Inc. Molten metal treatment. 4,296,920, Cl. 266-216.000.
Miller, Robert G.: *See—*
Heitzman, Gary N.; Hutchings, Clay L.; Knepp, Gary L.; and Miller, Robert G., 4,297,742, Cl. 361-154.000.
Ministry of International Trade & Industry: *See—*
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Minnesota Mining & Manufacturing Company: *See—*
Chern, Mao-Jin; and Lowrey, Robert D., 4,297,401, Cl. 428-1.000.
Huck, William V., 4,296,857, Cl. 206-53.000.
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Minolta Camera Kabushiki Kaisha: *See—*
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Meatabi, Tsuneyo, 4,297,002, Cl. 350-255.000.
Nakai, Masaaki, 4,297,012, Cl. 354-23.00D.
Miracle Recreation Equipment Company: *See—*
Ahrens, Paul W., 4,296,923, Cl. 272-85.000.
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, to Onoda Cement Co., Ltd. Air classifier. 4,296,864, Cl. 209-144.000.
Mise, Yoshinari; and Tomimura, Eijiro, to CPC International Inc. Method for the production of powdered dextrose. 4,297,146, Cl. 127-60.000.
Mitchell, Robert P.; and Scalera, Frank T., to Rowe International, Inc. Delivery box assembly for merchandising machine. 4,296,872, Cl. 221-195.000.
MITEC-Moderne-Industrietechnik GmbH: *See—*
Chaborski, Hoiko, 4,297,030, Cl. 356-5.000.
Mitsubishi Gas Chemical Co. Inc.: *See—*
Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, 4,297,507, Cl. 562-416.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Tatani, Atsushi; and Okino, Susumu, 4,297,332, Cl. 423-240.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,429, Cl. 430-204.000.
Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,430, Cl. 430-204.000.
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Akutsu, Susumu; Isaka, Tsutomu; and Ishioka, Mitsugu, 4,297,310, Cl. 264-83.000.
Mitsuboshi Belting Ltd.: *See—*
Nosaka, Soukichi, 4,296,640, Cl. 474-262.000.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Kasahara, Nobuyoshi; and Nonomura, Koutaro, 4,297,405, Cl. 428-141.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
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Mitsui Toatsu Chemicals Inc.: *See—*
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Mitsui, Yoshihiro, to Kabushiki Kaisha Suwa Seikosha. Power supply method for liquid crystal display. 4,297,697, Cl. 340-813.000.
Miyagawa, Yoshitaka: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, to Mitsui Toatsu Chemicals Inc.; and Kabushikikaisha Asahi Shinbunsha. Method of making polypropylene printing plate using paper matrix. 4,297,263, Cl. 260-32.6PQ.
Miyamoto, Yukihiko: *See—*
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Miyanaga, Masaaki. Apparatus for forming holes in plate glass. 4,297,059, Cl. 408-202.000.
Mizutani, Hiroshi: *See—*
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Mizutani, Masato: *See—*
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Mobay Chemical Corporation: *See—*
Heiss, Herbert L., 4,297,472, Cl. 528-84.000.
Mobil Oil Corporation: *See—*
Weiner, Milton L., 4,297,411, Cl. 428-347.000.
Modglin, Donald D.: *See—*
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Molin, Bengt T.: *See—*
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Moll, Hans-Georg; Hasselbarth, Ulrich; Grohmann, Andreas; and Marks, Helmut. Process and apparatus for the treatment of untreated water. 4,297,221, Cl. 210-702.000.
Mollet, Hans: *See—*
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Monarch Marking Systems, Inc.: *See—*
Smith, Thomas M., 4,297,403, Cl. 428-42.000.
Monroe, William E., to Bendix Corporation, The. Quick take-up brake booster. 4,296,674, Cl. 91-391.00R.
Monsanto Company: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,297,453, Cl. 525-408.000.
Merten, Helmut L.; and Wilder, Gene R., 4,297,269, Cl. 260-45.9QB.
Monte, Anthony J., to United States of America, Army. Fire suppression system for military tanks. 4,296,817, Cl. 169-62.000.
Monties, Jean R.; and Havlik, Patrick J. C., to Agence Nationale de valorisation de la Recherche (ANVAR). Artifical heart. 4,296,500, Cl. 3-1.700.
Mooi, John, to Atlantic Richfield Company. Catalyst and process for conversion of hydrocarbons. 4,297,244, Cl. 252-455.00Z.
Moore, William P., Jr. Method for increasing the number of pods in legumes by foliar feeding. 4,297,130, Cl. 71-119.000.
Moore, Zack J., to Dow Chemical Company, The. Apparatus for measuring the electric charge condition of non-conductive particles in a mildly conductive electrolyte. 4,297,640, Cl. 324-458.000.
Moorehead, Eric L., to Union Oil Company of California. Molybdenum-exchanged crystalline aluminosilicate zeolite. 4,297,243, Cl. 252-455.00Z.
Moran, Malachy J. Bathtub for invalids. 4,296,508, Cl. 4-540.000.
Moretto, Hans-Heinrich: *See—*
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Moriarty, William L.: *See—*
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Morier, Elisabeth: *See—*
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Morimoto, Kotaro; and Suzuki, Tomio, to Kobe Steel, Ltd. Combustion method for reducing NOx and smoke emission. 4,297,093, Cl. 431-10.000.
Morimoto, Takeshi: *See—*
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Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, to Hitachi, Ltd. Mark signal amplifier. 4,297,676, Cl. 340-146.3AG.

Morley, Michael J.: *See—*
Bloyce, Lionel T.; and Morley, Michael J., 4,296,886, Cl. 239-264.000.

Morris, Charles W.; and Terry, Ronald E., to Phillips Petroleum Company. Method for permeability correction by in situ genesis of macroemulsions in hard brine. 4,296,811, Cl. 166-273.000.

Morse, Leroy R.: *See—*
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Moschter, Erwin: *See—*
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Moser, Theodore E.: *See—*
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Mostek Corporation: *See—*
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Motorola, Inc.: *See—*
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Eckert, Kim, 4,297,596, Cl. 307-279.000.
LoCascio, James J.; and Jarrett, Robert B., 4,297,646, Cl. 330-288.000.

Mower, Peter, to Trico Products Corporation. Wiper blades. 4,296,521, Cl. 15-250.320.

Mucke, Bruno: *See—*
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Muehlbauer, Otto: *See—*
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Mueller, Richard A., to G. D. Searle & Co. Phosphonium salts. 4,297,487, Cl. 542-412.000.

Muetterties, Andrew J.; Vcelka, John L.; and Kelsey, Wayne R., to Abbott Laboratories. Rotatable connecting device for I.V. administration set. 4,296,949, Cl. 285-18.000.

Mukhin, Vladislav N.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Muller, Friedemann: *See—*
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Muller, Klaus; and Mack, Gerhard, to Raymond, A. Clamp for trim strip. 4,296,530, Cl. 24-295.000.

Muller, Rudolf; Lengsfeld, Franz; and Uerlichs, Johannes, to Hermann Rappold & Co. GmbH. Gate valve for use in large size conduits. 4,296,776, Cl. 137-340.000.

Mullersman, Ferdinand H., to General Electric Company. Timed fast charger. 4,297,630, Cl. 320-35.000.

Multivac Sepp Haggenmuller KG: *See—*
Vetter, Artur, 4,296,588, Cl. 53-86.000.

Munch, Walter: *See—*
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Mundt, Randall S.; Wooldridge, Timothy A.; and Blasingame, Thomas O., to Texas Instruments Incorporated. Plasma etching using improved electrode. 4,297,162, Cl. 156-643.000.

Munter, Klaus: *See—*
Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, 4,297,512, Cl. 564-490.000.

Murakami, Hiroyashu; Ito, Tadashi; and Ito, Fumio, to Canon Kabushiki Kaisha. Printed circuit unit for a camera. 4,297,018, Cl. 354-50.000.

Murata Manufacturing Co., Ltd.: *See—*
Ieki, Hideharu; and Arai, Seiichi, 4,297,660, Cl. 333-194.000.

Murphy, Frank H.: *See—*
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Musiani, Marco: *See—*
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Muto, Naoki: *See—*
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Myers, Ronald W.: *See—*
Hughes, Donald W. K.; and Myers, Ronald W., 4,296,991, Cl. 339-176.0MP.

Nagahama, Tsutomu; and Ishihara, Michio, to Fujitsu Limited. Ceramic package for semiconductor devices having metalized lead patterns formed like a floating island. 4,297,722, Cl. 357-74.000.

Nagahara, Yasumori: *See—*
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.

Nagano, Kenji, to Osakasanko Kabushiki Kaisha; and Kabushiki Kaisha Taiyohatsujyo Seisakusho. Clamp for flexible hoses. 4,296,534, Cl. 24-270.000.

Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, to Kubota, Ltd. Slipping-off preventing pipe joint. 4,296,953, Cl. 285-302.000.

Nagata, Shoji: *See—*
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, 4,297,282, Cl. 260-326.200.

Nagoshi, Mitsuru, to Konishiroku Photo Industry Co., Ltd. Electrophotographic copying apparatus. 4,297,023, Cl. 355-8.000.

Naito, Masayuki: *See—*
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, 4,297,028, Cl. 355-41.000.

Nakagawa, Yasutsugu: *See—*
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Nakahara, James H.: *See—*
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Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Exposure control arrangement for photographic cameras. 4,297,012, Cl. 354-23.00D.

Nakajima, Kunio: *See—*
Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, 4,297,019, Cl. 354-171.000.

Nakajima, Yosuke: *See—*
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Nakamura, Kazuo; Jyojiki, Masao; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera focus detecting device. 4,297,014, Cl. 354-25.000.

Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, to Nissan Motor Company, Limited. Butterfly throttle valve with a raised upper lip. 4,297,302, Cl. 261-65.000.

Nakamura, Makoto: *See—*
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Nakamura, Yoichi: *See—*
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Nakanishi, Eiji: *See—*
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Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,296,720, Cl. 123-309.000.

Nakaoji, Kozo, to Daiwa Chemical Company Ltd. Process for preparing anisaldehyde. 4,297,520, Cl. 568-426.000.

Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, to Toray Industries, Incorporated. Polyamide having —NH—$(CH_2)_4$—CH(NRR')—CO—units. 4,297,477, Cl. 528-323.000.

Nakatsuji, Tadao: *See—*
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, 4,297,248, Cl. 252-477.00R.

Nakazato, Hiroshi, to Akebono Brake Industry Co., Ltd. Antiskid device. 4,296,971, Cl. 303-115.000.

Nakazawa, Toshitaka: *See—*
Kinbara, Koichi; Sugimoto, Norimaro; and Nakazawa, Toshitaka, 4,297,402, Cl. 428-35.000.

Nanjo, Motoyuki: *See—*
Koshibe, Shigeru; and Nanjo, Motoyuki, 4,297,473, Cl. 528-144.000.

Nanya, Takanori: *See—*
Nishimura, Katsuo; and Nanya, Takanori, 4,297,004, Cl. 350-336.000.

Narahara, Toshikazu: *See—*
Koyama, Tohru; Narahara, Toshikazu; and Aimono, Yuji, 4,297,471, Cl. 526-328.000.

Nard, Georges; Rabian, Jean; and Rouaud, Michel, to Societe d'Etudes, Recherches et Constructions Electroniques Sercel. Method and apparatus for measuring distances. 4,297,700, Cl. 343-6.50R.

Nariai, Hiroshi: *See—*
Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi, 4,297,610, Cl. 310-370.000.

National Mine Service Company: *See—*
Freed, Donald L., Jr., 4,296,856, Cl. 198-514.000.

National Petro Chemicals Corp.: *See—*
Speca, Anthony N., 4,297,461, Cl. 526-100.000.

National Research Development Corporation: *See—*
Hannah, Stephen J.; and Livingstone, Bryan, 4,297,176, Cl. 204-37.00R.

National Starch and Chemical Corporation: *See—*
Tessler, Martin M., 4,297,299, Cl. 260-502.500.

National Steel Corporation: *See—*
Keller, Robert N., 4,297,154, Cl. 156-79.000.

Nauman, Christopher A. Jack-O-Lantern forming method. 4,296,659, Cl. 83-54.000.

Nawrot, Wolfgang: *See—*
Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, 4,297,664, Cl. 335-176.000.

Naylor, Leonard, to Simon-Rosedowns Limited. Deodorization of edible oils. 4,297,112, Cl. 55-195.000.

Neblett, Boyd L.: *See—*
Debona, Edward J.; Neblett, Boyd L.; Krueger, Walter J.; Laird, William J.; Campbell, Billy H.; and Matthews, Gerald H., 4,296,669, Cl. 89-1.816.

Neilson, John M. S.: *See—*
Koons, Patrick R.; and Neilson, John M. S., 4,297,149, Cl. 148-1.500.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Incremental photoelectric measuring device. 4,297,033, Cl. 356-374.000.

Nelson Industries, Inc.: *See—*
Kicinski, Kenneth J., 4,296,832, Cl. 181-255.000.

Nelson, Linnea E.; and Reineke, Charles E., to Dow Chemical Co., The. Flame retardant intumescent polyamide from haloamide. 4,297,475, Cl. 528-271.000.

Nelson, Richard L.; and Nelson, Walter P. Corn-based snack product of nut-like consistency. 4,297,376, Cl. 426-94.000.

Nelson, Robert L.: *See—*
Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., 4,297,246, Cl. 252-465.000.





Nelson, Stephen J., to Upjohn Company, The. 2,3-Dihydro-2,3-dimethyl-7-benzofuryl N-[(phosphinyl)amino]thio- and N-[(phosphinothioyl)amino]thio- methylcarbamates. 4,297,285, Cl. 260-346.730.

Nelson, Walter P.: *See—*
Nelson, Richard L.; and Nelson, Walter P., 4,297,376, Cl. 426-94.000.

Nerod, Irving, to American Can Company. Uliraviolet light apparatus. 4,297,583, Cl. 250-453.000.

Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Device for inserting and thrusting a bar into a press piercing mill. 4,296,622, Cl. 72-208.000.

Nessler, Hermann: *See—*
Hiesinger, Edwin; Keplinger, Klaus; and Nessler, Hermann, 4,297,211, Cl. 210-136.000.

Netzsch, Hermann, to USM Corporation. Process and apparatus for testing arc stud welding guns. 4,297,560, Cl. 219-130.010.

Neumann, Peter, to Sandoz Ltd. Bicyclic heterocyclic amino derivatives. 4,297,490, Cl. 544-55.000.

Nevins, Robert L. Solar collector. 4,296,734, Cl. 126-431.000.

Newell, Harold R., to Mesur-Matic Electronics Corporation. Apparatus for dividing the step angle of a stepping motor. 4,297,625, Cl. 318-696.000.

NGK Insulators, Ltd.: *See—*
Ito, Isao; and Tunashima, Seiichi, 4,297,034, Cl. 356-394.000.

Nguyen, Giao V.: *See—*
Ferree, William I., Jr.; and Nguyen, Giao V., 4,297,260, Cl. 260-29.70H.

Nguyen, Hien V., to Johnson & Johnson. Non-woven fabric comprising buds and bundles connected by highly entangled fibrous areas and methods of manufacturing the same. 4,297,404, Cl. 428-85.000.

Nguyen, Van-Tao: *See—*
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.

Nichol, Thomas J.: *See—*
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.

Nicholas, Terry G., to Wavin B.V. Guttering. 4,297,053, Cl. 405-121.000.

Nicholson, John E.; and Wilmarth, Paul C., to RCA Corporation. Television receiver chassis adapted to be compatible with different tuner and cabinet configurations. 4,297,726, Cl. 358-254.000.

Nick, Howard H. Interplanetary conflict game. 4,296,928, Cl. 273-262.000.

Nickel, Horst, to Bayer Aktiengesellschaft. Pentakis-and heptakis-azoxy dyestuffs. 4,297,278, Cl. 260-143.000.

Nickerson, Harvey R.: *See—*
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.

Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., to United Technologies Corporation. Anode-matrix composite for molten carbonate fuel cell. 4,297,419, Cl. 429-44.000.

Nicol, Klaus: *See—*
Hennig, Ewald M. C.; and Nicol, Klaus, 4,296,754, Cl. 128-694.000.

Nicol, Thomas; Wiley, David; and Allport, Maurice J., to Lucas Industries Limited. Battery charging systems for road vehicles. 4,297,631, Cl. 320-64.000.

Nihon Medi-Physics, Co., Ltd.: *See—*
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, 4,297,166, Cl. 376-194.000.

Niinuma, Akira, to Alps Electric Co., Ltd. Ganged push button switch having means preventing simultaneous actuation of two push buttons. 4,297,541, Cl. 200-5.00E.

Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, to Kokusai Denshin Denwa Kabushiki Kaisha. Feedthrough for optical fiber. 4,296,996, Cl. 350-96.200.

Nikolayuk, Nicholas, to RCA Corporation. Circularly polarized slotted pylon antenna. 4,297,706, Cl. 343-771.000.

Nilsson, Robert, to Evak Sanitar AB. Non-return valve. 4,296,772, Cl. 137-269.500.

Ninomiya, Hidetaka: *See—*
Kaneko, Yutaka; Hirabayashi, Shigeto; Kawakatsu, Satoshi; and Ninomiya, Hidetaka, 4,297,437, Cl. 430-376.000.
Kaneko, Yutaka; Kawakatsu, Satoshi; Hirabayashi, Shigeto; and Ninomiya, Hidetaka, 4,297,441, Cl. 430-543.000.

Nintendo Co., Ltd.: *See—*
Yokoi, Gunpei, 4,296,931, Cl. 273-316.000.

Nippon Electric Co., Ltd.: *See—*
Fujii, Shuzo; and Sato, Yoshikatsu, 4,297,655, Cl. 331-116.00R.
Hayashi, Izuo; and Yonezu, Hiroo, 4,297,652, Cl. 331-94.50H.
Shinmyo, Saburo, 4,297,650, Cl. 331-11.000.
Tanaka, Kouichi; and Amazawa, Kiyoshi, 4,297,645, Cl. 330-280.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu, 4,296,663, Cl. 84-1.010.

Nippon Kogaku K.K.: *See—*
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Ando, Ryo; and Sato, Kazuyoshi, 4,297,119, Cl. 65-141.000.

Nippon Oil Co. Ltd.: *See—*
Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, 4,297,450, Cl. 525-333.000.

Nippon Steel Corporation: *See—*
Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, 4,296,919, Cl. 266-111.000.

Nippon Toki Kabushiki Kaisha: *See—*
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.

Nishi, Eijiro: *See—*
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.

Nishikawa, Masaji, to Olympus Optical Company Limited. Electrophotographic process for multiple images. 4,297,423, Cl. 430-54.000.

Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel benzamide derivative and method of preparing metoclopramide using same. 4,297,503, Cl. 560-42.000.

Nishimura, Katsuo; and Nanya, Takanori, to Technical Research of Citizen Watch Co., Ltd. Liquid crystal display cell. 4,297,004, Cl. 350-336.000.

Nishino, Takaichi: *See—*
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.

Nishiyama, Yukinori; and Ichikawa, Hideji, to Sumitomo Electric Industries, Ltd. Disc brake for two-wheeled vehicle. 4,296,843, Cl. 188-73.430.

Nishizawa, Hideaki; and Iguchi, Shin-Ichi, to Sumitomo Electric Industries, Ltd. Multi-photodiodes. 4,297,720, Cl. 357-30.000.

Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, to Semiconductor Research Foundation Mitsubishi Denki K.K. Vertical type field effect transistor. 4,297,718, Cl. 357-22.000.

Nissan Motor Company, Limited: *See—*
Abo, Toshimi; and Kanegae, Hidetoshi, 4,296,600, Cl. 60-39.28R.
Handa, Noritoshi, 4,296,937, Cl. 277-88.000.
Ichimatsu, Eiji, 4,296,783, Cl. 139-302.000.
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,296,724, Cl. 123-568.000.
Ishida, Takashi; and Tanaka, Mamoru, 4,296,907, Cl. 248-573.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,296,651, Cl. 74-869.000.
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,296,944, Cl. 280-804.000.
Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, 4,297,302, Cl. 261-65.000.
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.

Nisshin Oil Mills, Ltd., The: *See—*
Makino, Akira, 4,297,106, Cl. 23-230.0HC.

Nitschmann, Karl: *See—*
Dirks, Rudolf; and Nitschmann, Karl, 4,296,553, Cl. 30-381.000.

Niven, Rex C.: *See—*
McCutchan, John C.; and Niven, Rex C., 4,297,633, Cl. 324-51.000.

Nixdorf Computer AG: *See—*
Huellwegen, Josef, 4,297,595, Cl. 307-268.000.

Nonomura, Koutaro: *See—*
Kasahara, Nobuyoshi; and Nonomura, Koutaro, 4,297,405, Cl. 428-141.000.

Noonan, John M.: *See—*
Bowman, Wayne A.; Bishop, John F.; and Noonan, John M., 4,297,432, Cl. 430-215.000.

Nooter Corporation: *See—*
Jawad, Maan, 4,296,869, Cl. 220-3.000.

Norbach, Per, to A. B. Carl Munters. Apparatus including throttling device for use in ventilation duct. 4,296,780, Cl. 138-40.000.

Nordblom, George F.: *See—*
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., 4,297,421, Cl. 429-225.000.

Norden, Jurgen; and Ucinhazska, Bruno, to Ruhr-Stickstoff Aktiengesellschaft. Procedure for the careful application of liquids to plants in agricultural stands. 4,296,885, Cl. 239-1.000.

Normann, Richard W.: *See—*
Karol, James J.; Normann, Richard W.; and Hotchkiss, Lloyd C., 4,296,985, Cl. 339-48.000.

Normier, Gerard: *See—*
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Norsk Hydro a.s: *See—*
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.

North American Philips Corporation: *See—*
Juner, Adolph; and Haas, David J., 4,297,580, Cl. 250-368.000.

North, John W. Process of using and products from fume amorphous silica particulates. 4,297,309, Cl. 264-56.000.

Northern Telecom Limited: *See—*
Dyment, John C.; and Chik, Kiuchi D., 4,297,651, Cl. 331-94.50H.
Webb, Gerald F., 4,297,529, Cl. 179-1.0PC.

Northrop Corporation: *See—*
Koning, Menno G., 4,296,639, Cl. 74-5.460.

Northup, Robert P.; and Anderson, Robert L., to General Electric Company. Ordnance recoil energy control and recovery system. 4,296,670, Cl. 89-43.00R.

Norwood, Donald D.: *See—*
Short, James N.; and Norwood, Donald D., 4,297,445, Cl. 525-52.000.

Nosaka, Soukichi, to Mitsuboshi Belting Ltd. Power transmission V-belt and method of manufacture. 4,296,640, Cl. 474-262.000.

Nottingham, Dennis. Method and H-pile tip for driving piles in permafrost. 4,297,056, Cl. 405-232.000.

Novation, Inc.: *See—*
Kessler, Bayard F., 4,297,530, Cl. 179-2.00C.

Nowotny, Theodor: *See—*
Schlegel, Hans; and Nowotny, Theodor, 4,297,175, Cl. 204-15.000.
Nunciato, David J.; White, Norman H.; and Woodburn, William A., to Union Carbide Corporation. Method for decoking fired heater tubes. 4,297,147, Cl. 134-7.000.
Oberpichler, Gerd; and Honig, Ernst-August, to Volkswagenwerk Aktiengesellschaft. Hydraulic control for an automatic vehicle transmission. 4,296,652, Cl. 74-868.000.
Oberst, E. Ernest, to Marlin Firearms Company, The. Semi-automatic reloading firearm. 4,296,564, Cl. 42-1.00C.
Occidental Oil Shale, Inc.: *See—*
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, to Asahi Glass Company, Ltd. Production of alkali metal hydroxide. 4,297,182, Cl. 204-98.000.
Odawara, Youji: *See—*
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,297,216, Cl. 210-613.000.
Oder, Robin R.: *See—*
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., 4,296,809, Cl. 166-259.000.
Oene, Henk V.: *See—*
Chang, Yun-Feng; Oene, Henk V.; and Beckwith, Elaine C., 4,297,448, Cl. 525-162.000.
Oertel, Harald: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Offermann, Ludwig; and Wippich, Rheinhold, to Carl Still GmbH & KG, Firma. Immersion-type seal for the standpipe opening of coke ovens. 4,296,938, Cl. 277-135.000.
Office National d'Etudes et de Recherches Aerospatiales: *See—*
Bloch, Bertrand; Cavalli born Meyer, Chantal; and Charrier, Denis, 4,297,466, Cl. 526-218.000.
Ofuji, Hiromichi: *See—*
Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, 4,297,302, Cl. 261-65.000.
Ogasawara, Akira: *See—*
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.
Ogasawara, Hiroomi; and Ogasawara, Masaomi. Device for measuring the amount of movement of a straightly moving object. 4,297,634, Cl. 324-61.00R.
Ogasawara, Masaomi: *See—*
Ogasawara, Hiroomi; and Ogasawara, Masaomi, 4,297,634, Cl. 324-61.00R.
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, to Ricoh Company, Ltd. Facsimile apparatus. 4,297,727, Cl. 358-261.000.
Ogle, Robert W., to IMS Limited. Cath-a-jet. 4,296,747, Cl. 128-220.000.
Ohashi, Mochihiko; and Toda, Tosifusa. Concentrating electrophoresis apparatus. 4,297,198, Cl. 204-299.00R.
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Resolution of mercaptopropionic acids. 4,297,282, Cl. 260-326.200.
Ohashi, Yoshinobu: *See—*
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.
Ohdai, Yozo; and Takahata, Yasuyuki, to Asahi-Seiki Manufacturing Co., Ltd. Machines for forming coiled springs. 4,296,621, Cl. 72-130.000.
Ohgushi, Masuhito: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,297,499, Cl. 556-465.000.
Ohhira, Hiroshi: *See—*
Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, 4,297,413, Cl. 428-394.000.
Ohta, Ryuji; and Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Coupled shells for vacuum power servo booster. 4,296,680, Cl. 92-98.00D.
Ohta, Sakae: *See—*
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.
Ohta, Tazuo: *See—*
Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, 4,297,507, Cl. 562-416.000.
Ohtake, Yasushi: *See—*
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Ohtsuka, Kunio: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,296,651, Cl. 74-869.000.
Ohye, Hideo: *See—*
Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, 4,296,948, Cl. 282-27.500.
Oiji, Yoshimasa: *See—*
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, 4,297,369, Cl. 424-285.000.
Okada, Akira: *See—*
Niiro, Yasuhiko; Furusawa, Kahei; and Okada, Akira, 4,296,996, Cl. 350-96.200.
Okada, Kunihiro: *See—*
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.
Okamoto, Masanori: *See—*
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Okano, Hiroshi; and Sato, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Fujikoshi. Lubricated friction speed change gearing. 4,296,648, Cl. 74-798.000.
Okatsuka, Hisahi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cooking apparatus. 4,297,568, Cl. 235-435.000.
OKI Electric Industry Co., Ltd.: *See—*
Akiyama, Masahiro; Kaminishi, Katuzo; and Kawakami, Yasushi, 4,297,647, Cl. 330-307.000.
Okino, Susumu: *See—*
Tatani, Atsushi; and Okino, Susumu, 4,297,332, Cl. 423-240.000.
Okui, Mitsuhiko: *See—*
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, 4,296,597, Cl. 57-205.000.
Okuma Machinery Works, Ltd.: *See—*
Yasuba, Shoichi; and Ito, Takaharu, 4,296,657, Cl. 82-1.00C.
Okumura, Takeshi: *See—*
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Okuno, Youichi: *See—*
Yamada, Yasuyuki; and Okuno, Youichi, 4,297,020, Cl. 354-225.000.
Okuyama, Takesi: *See—*
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.
O'Leary, Kevin J.: *See—*
Dotson, Ronald L.; and O'Leary, Kevin J., 4,297,194, Cl. 204-257.000.
Olin Corporation: *See—*
Whitman, Hobart A., III, 4,297,559, Cl. 219-121.0LB.
Oline, James A.: *See—*
Meitzner, Erich F.; and Oline, James A., 4,297,220, Cl. 210-690.000.
Olsen, Thomas O., to Otto Fabric, Inc. Silicone rubber coating material having reduced surface tension. 4,297,265, Cl. 260-33.6SB.
Olshefsky, Frank A. Combination storage and carrying device. 4,296,880, Cl. 294-144.000.
Olsson, Torsten, to AB ASEA-ATOM. Nuclear reactor fuel assembly. 4,297,171, Cl. 376-440.000.
Olympus Optical Company Limited: *See—*
Hijikata, Kazuo, 4,297,199, Cl. 204-299.00R.
Nishikawa, Masaji, 4,297,423, Cl. 430-54.000.
Sato, Eiichi, 4,297,422, Cl. 430-54.000.
O'Meara, David M., to Chicago Bridge & Iron Company. Vacuum attached vibrator apparatus. 4,297,037, Cl. 366-114.000.
Omega Tools International: *See—*
Ormsby, Ronald D., 4,296,822, Cl. 175-249.000.
Onda, Kenichi; Tashiro, Sadaji; and Amano, Hisao, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Gate circuit for a gate turn-off thyristor. 4,297,594, Cl. 307-252.00C.
O'Neal, Thomas D., to American Cyanamid Co. Imidazolinyl benzamides as plant growth regulants. 4,297,126, Cl. 71-78.000.
O'Neil, Jean M., executor: *See—*
O'Neil, John C., deceased, 4,297,057, Cl. 405-303.000.
O'Neil, John C., deceased (by O'Neil, Jean M., executor), to Dresser Industries, Inc. Pivotal roof bolter and extendable rotatable protective canopy for mining machine. 4,297,057, Cl. 405-303.000.
Onishi, Masao: *See—*
Hirao, Tsuneo; and Onishi, Masao, 4,297,609, Cl. 310-339.000.
Ono, Hisatake: *See—*
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.
Ono, Yoshio: *See—*
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.
Onoda Cement Co., Ltd.: *See—*
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.
Onuma, Eiichi: *See—*
Misaka, Takaaki; Furukawa, Takeshi; and Onuma, Eiichi, 4,296,864, Cl. 209-144.000.
Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Orlandi, Robert G., to S.A. PRB Societe Anonyme. Electric circuit for firing a detonator. 4,296,688, Cl. 102-218.000.
Ormsby, Ronald D., to Omega Tools International. Multipurpose fluid flow assisted downhole tool. 4,296,822, Cl. 175-249.000.
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Image forming process. 4,297,470, Cl. 526-304.000.
Osakasanko Kabushiki Kaisha: *See—*
Nagano, Kenji, 4,296,534, Cl. 24-270.000.
Osegowitsch, Viktor: *See—*
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.
Osellame, Mirko: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.
Oshio, Hiromichi: *See—*
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Oswald, Hendrikus J.: *See—*
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Otani, Masaru: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.
Otis Elevator Company: *See—*
Martin, Anthony N., 4,296,601, Cl. 60-224.000.
Otis Engineering Corporation: *See—*
Taylor, Donald F.; and Bostock, James H., 4,296,806, Cl. 166-120.000.
Otsuka, Yasuhiro: *See—*
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.
Ott, Karl-Heinz: *See—*
Lindner, Christian; Ott, Karl-Heinz; Arnold, Bernhard; Kowitz, Friedrich; Oertel, Harald; and Kuhlmann, Dieter, 4,297,446, Cl. 525-66.000.
Otto Fabric, Inc.: *See—*
Olsen, Thomas O., 4,297,265, Cl. 260-33.6SB.
Outokumpu Oy: *See—*
Uusitalo, Leo; and Tuominen, Pertti, 4,297,067, Cl. 414-114.000.
Owen, R. Calvin, Jr., to Polaroid Corporation. Optical apparatus and method for changing a zoom camera to a fixed focus camera. 4,297,007, Cl. 350-432.000.
Oy Helvar: *See—*
Lampinen, Esko; and Kajavo, Kari, 4,296,545, Cl. 29-602.00R.
Oyobe, Isao: *See—*
Takeguchi, Masanobu; and Oyobe, Isao, 4,297,222, Cl. 210-748.000.
Ozawa, Kanji: *See—*
Moriya, Shigeru; Hamamto, Nobuo; Ichino, Kazuo; and Ozawa, Kanji, 4,297,676, Cl. 340-146.3AG.
P C U K Produits Chimiques Ugine Kuhlmann: *See—*
Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, 4,297,288, Cl. 260-378.000.
Paaren, Herbert E.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.
Pacer Systems, Inc.: *See—*
Green, David L., 4,297,673, Cl. 340-27.0NA.
Pacer Technology and Resources, Inc.: *See—*
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., to United States of America, Air Force. Unsymmetrical diphosphatetraazacyclooctatetraenes. 4,297,510, Cl. 564-13.000.
Padgett, Henry A., Sr. Oil filter unit. 4,297,212, Cl. 210-168.000.
Page, Donald F.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., to Xerox Corporation. Imaging member. 4,297,425, Cl. 430-58.000.
Paisley, Robert J., to Corning Glass Works. Ceramic foam cement. 4,297,140, Cl. 428-310.000.
Pajevic, Paul D. Shoe with sole cushioning assembly. 4,296,557, Cl. 36-7.800.
Pallone, Thomas J.; Lynch, Mark; Corvino, Janice E.; and McCook, John P., to Chesebrough-Pond's Inc. Hair waving and straightening method. 4,296,764, Cl. 132-7.000.
Palm, Peter: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.
Palmgren, Odd E.: *See—*
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.
Palumbo, Pasquale M. Dynamic patellar brace. 4,296,744, Cl. 128-80.00C.
Pan, Jing-Jong, to Harris Corporation. Plural frequency oscillator employing multiple fiber-optic delay line. 4,297,656, Cl. 331-135.000.
Panametrics, Inc.: *See—*
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.
Panasenko, Nikolai N.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.
Papalos, John G.; and Kavchok, Ronald W., to Diamond Shamrock Corporation. Synthetic polymer emulsifier. 4,297,259, Cl. 260-29.6NR.
Parker, Louis W.: *See—*
Hedges, Rhey W., 4,297,628, Cl. 318-798.000.
Parr, David, to David Parr & Associates Limited. Heated window structure with an electrical connector assembly. 4,297,565, Cl. 219-522.000.
Parsons, Robert, to Texas Instruments Incorporated. Apparatus for displaying graphics symbols. 4,297,693, Cl. 340-744.000.
Passarotti, Carlo: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,297,368, Cl. 424-285.000.
Patch, Dana R.: *See—*
Lynnworth, Lawrence C.; Fowler, Kenneth A.; and Patch, Dana R., 4,297,607, Cl. 310-334.000.
Pate, Jerry W., to E-Systems, Inc. Input gain adjusting apparatus and method. 4,297,527, Cl. 179-1.0VC.
Patel, Raman: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,297,453, Cl. 525-408.000.
Patil, Balaji V.; and Tommaney, Joseph W., to Allegheny Ludlum Steel Corporation. Electroslag remelting method and flux composition. 4,297,132, Cl. 75-10.00V.
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D. Doughnut-type transformer for resistance butt welding. 4,297,665, Cl. 336-60.000.
Patterson, Theodore P.; and Winner, Stephen E., to Patterson, Theodore P. Blister preventing foot cover. 4,296,499, Cl. 2-239.000.
Pauling, Horst: *See—*
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.
Paulus, Philippe, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Manufacturing coated steel strip. 4,297,398, Cl. 427-320.000.
Pauwels, Michael A.; and Poot, Abraham L., to Pneumo Corporation. 360 Degree linear variable phase transformer. 4,297,698, Cl. 340-870.320.
Pavlik, Kathleen W. Pocket secretary or the like. 4,296,945, Cl. 281-1.000.
Payne, Richard J. Tractor pull sled. 4,296,840, Cl. 188-8.000.
Pazmany, Ladislao, to General Dynamics Corporation. Fin erection mechanism. 4,296,895, Cl. 244-3.290.
Peacock, Richard C. Method of installing underground pipe. 4,297,055, Cl. 405-184.000.
Pearson, Thomas J., Jr. Noise obviating electronic signal coupling means. 4,297,643, Cl. 330-178.000.
Pedersen, Jorgen R., to Danavox A/S. Hook-shaped part of a behind-the-ear hearing aid. 4,296,829, Cl. 181-129.000.
Pellegrino, Luigi. Automatic torque regulator. 4,296,849, Cl. 192-61.000.
Peller, Robert C.; and Dyer, Jack E., to General Dynamics Corporation. Structurally damped bolt. 4,296,839, Cl. 188-378.000.
Pelz, Willibald: *See—*
Haseler, Helmut; Meckl, Heinz; Lohmer, Karl; and Pelz, Willibald, 4,297,438, Cl. 430-377.000.
Pennise, Robert J.: *See—*
Stoute, Neville, Sr.; and Pennise, Robert J., 4,296,506, Cl. 4-480.000.
Pereman, Gordon F.: *See—*
Kellar, John D.; and Pereman, Gordon F., 4,297,118, Cl. 65-104.000.
Permelec Electrode Ltd.: *See—*
Sato, Hideo; and Shimamune, Takayuki, 4,297,195, Cl. 204-290.00F.
Perrott, Francis C. Transportation systems. 4,296,901, Cl. 246-167.00R.
Persson, Lennart P. E.: *See—*
Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.
Perz, John S., to Martin Marietta Corporation. Method for curing concrete. 4,297,399, Cl. 427-385.500.
Peterman, Robert J.: *See—*
Balbach, George C.; and Peterman, Robert J., 4,296,570, Cl. 49-360.000.
Peterson, Eugene W.: *See—*
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Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,297,484, Cl. 528-423.000.
Peyssard, Guy: *See—*
Chaumat, Bernard; Gallet, Georges; Lamare, Jacques; and Peyssard, Guy, 4,296,791, Cl. 160-206.000.
Pfaff Industriemaschinen GmbH: *See—*
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.
Jehle, Fritz; and Willenbacher, Erich, 4,296,700, Cl. 112-153.000.
Pfeifer, Josef; and Reinehr, Dieter, to Giba-Geigy Corporation. Transparent polyamide from branched chain $C_{11}$ diamine. 4,297,480, Cl. 528-346.000.
Pfister, Hans B.: *See—*
Baltensperger, Rudolf; and Pfister, Hans B., 4,296,690, Cl. 104-91.000.
Phillips Petroleum Co.: *See—*
Cowan, Kiplin D., 4,297,506, Cl. 560-246.000.
Johnson, Paul H., 4,296,800, Cl. 165-95.000.
Layton, James E., 4,297,745, Cl. 367-66.000.
McDaniel, Max P.; and Welch, Melvin B., 4,297,460, Cl. 526-98.000.
Morris, Charles W.; and Terry, Ronald E., 4,296,811, Cl. 166-273.000.
Short, James N.; and Norwood, Donald D., 4,297,445, Cl. 525-52.000.
Trepka, William J., 4,297,464, Cl. 526-181.000.
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,297,451, Cl. 525-366.000.
Phillips, Raymond M. Anti-surge flotation mattress. 4,296,510, Cl. 5-450.000.
Phillips, Thomas R., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral plasticized with tetraethyleneglycol-di-n-heptanoate. 4,297,262, Cl. 260-31.600.

Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., to International Nickel Co., Inc., The. High strength aluminum alloy and process. 4,297,136, Cl. 75-206.000.

Pierce, William C., to Pitts Industries, Inc. Drive hub with curved springs and drive keys for electro-magnetic clutch. 4,296,851, Cl. 192-84.00C.

Pierre Fabre S.A.: *See*—
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Pietsch, Herbert E.: *See*—
Gupta, Tapan K.; and Pietsch, Herbert E., 4,297,250, Cl. 252-518.000.

Pillsbury Company, The: *See*—
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Pinel, Anne-Marie: *See*—
D'Hinterland, Lucien D.; Normier, Gerard; Pinel, Anne-Marie; and Durand, Jacques, 4,297,272, Cl. 260-112.00R.

Pioneer Electronic Corporation: *See*—
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.

Pitts Industries, Inc.: *See*—
Pierce, William C., 4,296,851, Cl. 192-84.00C.

Place, Donald E., to Therm-O-Disc, Incorporated. Thermostat with bracket for attachment to a tubular member. 4,297,668, Cl. 337-365.000.

Plastics Engineering Company: *See*—
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Platt, John R., to Illinois Tool Works Inc. Two-way container package. 4,296,858, Cl. 206-150.000.

Plessey Handel und Investments AG: *See*—
Mead, John F., 4,296,999, Cl. 350-96.210.

Plessey Peripheral Systems: *See*—
Dargatz, Dayton O., 4,297,043, Cl. 400-224.000.

Pneumo Corporation: *See*—
Pauwels, Michael A.; and Poot, Abraham L., 4,297,698, Cl. 340-870.320.

Pochan, Darlyn F.: *See*—
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.

Pochan, John M.: *See*—
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.

Podbeltsev, Viktor I.: *See*—
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.

Poff, David A.: *See*—
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Pohl, Ludwig: *See*—
Eidenschink, Rudolf; and Pohl, Ludwig, 4,297,515, Cl. 568-329.000.

Polaroid Corporation: *See*—
Farmer, Zane M., 4,297,017, Cl. 354-34.000.
Johnson, Bruce K.; and Whiteside, George D., 4,297,016, Cl. 354-27.000.
Owen, R. Calvin, Jr., 4,297,007, Cl. 350-432.000.
Sullivan, Charles I., 4,297,431, Cl. 430-215.000.

Polhemus, Barry: *See*—
Denning, Richard; Spak, Mark A.; and Polhemus, Barry, 4,297,393, Cl. 427-88.000.

Polk, Donald E.: *See*—
Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, 4,297,135, Cl. 75-123.00B.

Polymer Research Corp. of America: *See*—
Horowitz, Carl; and Dichter, Michael, 4,297,108, Cl. 44-1.0SR.

Pommer, Ernst-Heinrich: *See*—
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.

Pontifex, Edward J., to Fine, Louis B., a part interest. Colostomy appliance. 4,296,749, Cl. 128-283.000.

Pook, Karl-Heinz: *See*—
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., 4,297,354, Cl. 424-248.510.

Poot, Abraham L.: *See*—
Pauwels, Michael A.; and Poot, Abraham L., 4,297,698, Cl. 340-870.320.

Popplewell, Frank W., to Dunlop Limited. Method of manufacturing games rackets. 4,297,308, Cl. 264-46.600.

Porter, James A., Jr.: *See*—
Thigpen, Ben B.; and Porter, James A., Jr., 4,296,827, Cl. 181-107.000.

Posso, Patrick. Process for the simplified packing of a magnetic tape for computer and winding core for carrying out this process. 4,296,890, Cl. 242-71.800.

Potter, George R., to Burley Industries, Inc. Method for sealing a dryer. 4,296,540, Cl. 29-460.000.

Powell, Charles R. Building scaffold support. 4,296,905, Cl. 248-237.000.

PPG Industries, Inc.: *See*—
Crawford, Roger A.; and Simmons, Robert B., 4,297,333, Cl. 423-241.000.
Jozwiak, Edward L., Jr., 4,297,261, Cl. 260-29.7RP.
Kellar, John D.; and Pereman, Gordon F., 4,297,118, Cl. 65-104.000.
Leatherman, Ivan R., 4,297,267, Cl. 260-42.530.

PQ Corporation: *See*—
Thomas, Jeffrey R., 4,297,163, Cl. 159-48.00R.

Pratt & Lambert, Inc.: *See*—
Wolinski, Leon E.; and Berezuk, Peter D., 4,297,158, Cl. 156-305.000.

Pratt, Paul D.: *See*—
Haasl, Michael J.; Pratt, Paul D.; Chen, Rocky W.; and Fett, Helen M., 4,297,378, Cl. 426-532.000.

Presco, Inc.: *See*—
Gotman, Alexander, 4,296,542, Cl. 29-574.000.

Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, to Resistoflex Corporation. Corrosion resistant heat exchanger element and method of manufacture. 4,296,804, Cl. 165-133.000.

Preston, Mark D. Methods and apparatus for conditioning plywood veneer with high frequency radio energy. 4,296,555, Cl. 34-1.000.

Pretzer, Wayne R.: *See*—
Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., 4,297,518, Cl. 568-385.000.

Preuss, Bernhard: *See*—
Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, 4,297,664, Cl. 335-176.000.

Price, Ernest H. Method of producing oil from a formation fluid containing both oil and water. 4,296,810, Cl. 166-265.000.

Price, Frank C.: *See*—
Halford, David W.; Price, Frank C.; and Bosworth, George H., 4,296,513, Cl. 12-12.000.

Price, Robert B., to Jacobs Manufacturing Company, The. Compression relief retarders for supercharged internal combustion engines. 4,296,605, Cl. 60-599.000.

Priepke, Edward H.: *See*—
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., 4,296,591, Cl. 56-10.300.

Priesemuth, Wolfgang. Pneumatically operating delay switches. 4,297,544, Cl. 200-34.000.

Priest, Clayton W.; and Solomon, Edward T., to Priest, Clayton W. Hair conditioner. 4,296,763, Cl. 132-7.000.

Procter & Gamble Company, The: *See*—
Bernardino, Lowell W., 4,297,251, Cl. 252-545.000.
Logan, Ted J.; and Lubsen, Timothy A., 4,297,292, Cl. 260-428.500.
Rasser, Jacobus C., 4,297,230, Cl. 252-117.000.

Proteus Corporation: *See*—
Inhofer, Harold G., 4,296,672, Cl. 91-271.000.

Proud, Norman. Screen panel. 4,296,579, Cl. 52-239.000.

Przybyla, Franciszek J.; and Rossler, Eleanor J., to Duracell International Inc. Method of treating silver oxide powder and the product formed therefrom. 4,297,249, Cl. 252-518.000.

Puch, Diethelm; and Will, Norbert F., to Triumph-Werke Nurnberg A.G. Method and apparatus for positioning a type disc in a balanced force system. 4,297,040, Cl. 400-144.200.

Puschmann, Werner, to AGFA-Gevaert Aktiengesellschaft. System for the detection of splicing defects in film. 4,297,585, Cl. 250-560.000.

Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Harmut, to Schering Aktiengesellschaft. Thiazolylidene-oxo-propionitriles, insecticidal composition containing these compounds. 4,297,361, Cl. 424-263.000.

Quan, Ronald, to Ampex Corporation. Quasi feedback horizontal scan linearization for cathode ray tubes. 4,297,620, Cl. 315-389.000.

Quanbeck, Sherman H., to Wil-Rich, Inc. Seeding device with air distribution system. 4,296,695, Cl. 111-34.000.

Quick, Leonard M.: *See*—
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,297,242, Cl. 252-439.000.

Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for holographic processing. 4,296,994, Cl. 350-3.730.

Quinlan, Patrick M., to Petrolite Corporation. Quaternized derivatives of polymerized pyridines and quinolines. 4,297,484, Cl. 528-423.000.

Quintana, Pedro. Dust removing attachment device for automatic air files. 4,296,572, Cl. 51-170.0TL.

Rabian, Jean: *See*—
Nard, Georges; Rabian, Jean; and Rouaud, Michel, 4,297,700, Cl. 343-6.50R.

Raible, Donald A., to Bentley Laboratories, Inc. Blood oxygenator. 4,297,318, Cl. 422-46.000.

Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, to Ciba-Geigy Corporation. Benzimidazoles and pharmaceutical preparations containing such compounds. 4,297,365, Cl. 424-270.000.

Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, to E. C. H. Will (GmbH & Co.). Paper sheet layer forming and transferring arrangement. 4,297,066, Cl. 414-43.000.

Ranford, Alan B.: *See*—
Joslin, Joel A.; and Ranford, Alan B., 4,296,759, Cl. 128-766.000.

Rankin, William J. Bank erosion control units. 4,297,052, Cl. 405-16.000.

Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, to Ciba-Geigy Corporation. Phenolic-1,3,5-triazines. 4,297,492, Cl. 544-211.000.

Rasp, Christian: *See*—
Becker, Robert; Grolig, Johann; and Rasp, Christian, 4,297,501, Cl. 560-24.000.

Rasser, Jacobus C., to Procter & Gamble Company, The. Non-crystallizing transparent soap bars. 4,297,230, Cl. 252-117.000.





Rathmell, William G.: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.

Rau, Karl: *See*—
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Ray, Ranjan: *See*—
Giessen, Bill C.; Polk, Donald E.; and Ray, Ranjan, 4,297,135, Cl. 75-123.00B.

Raychem Corporation: *See*—
Jervis, James E., 4,297,155, Cl. 156-86.000.
Martin, Charles L., 4,296,955, Cl. 285-381.000.

Raymond, A.: *See*—
Muller, Klaus; and Mack, Gerhard, 4,296,530, Cl. 24-295.000.

Raymond, Christopher D., to G. D. Searle & Co. Surgical sealant composition. 4,296,745, Cl. 128-156.000.

Raytheon Company: *See*—
Carnes, Irven S., 4,297,702, Cl. 343-7.0PF.

RCA Corporation: *See*—
Ahmed, Adel A. A., 4,297,644, Cl. 330-264.000.
Carroll, Charles B.; and Scheible, Howard G., 4,297,312, Cl. 264-134.000.
Denning, Richard; Spak, Mark A.; and Polhemus, Barry. 4,297,393, Cl. 427-88.000.
Hsu, Sheng T., 4,297,719, Cl. 357-23.000.
Koons, Patrick R.; and Neilson, John M. S., 4,297,149, Cl. 148-1.500.
Nicholson, John E.; and Wilmarth, Paul C., 4,297,726, Cl. 358-254.000.
Nikolayuk, Nicholas, 4,297,706, Cl. 343-771.000.
Silcox, David R.; and Doster, John L., 4,297,095, Cl. 432-59.000.
Sterzer, Fred, 4,297,641, Cl. 328-15.000.

Reagent Chemical and Research, Inc.: *See*—
Hicke, David W., 4,296,536, Cl. 29-1.300.

Redon Trust: *See*—
Marer, Joseph, 4,296,686, Cl. 192-427.[illegible].

Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., to John Zink Company. Free-floating combustion chamber and stack. 4,297,094, Cl. 431-202.000.

Reed, Ronald R.; Crone, William F., Jr.; and Meyer, G. Robert, to Libbey-Owens-Ford Company. Method of and apparatus for cutting sheets of glass. 4,296,662, Cl. 83-880.000.

Rehnberg, Leif E. L.: *See*—
Lundgren, Sune I.; and Rehnberg, Leif E. L., 4,296,653, Cl. 81-3.46R.

Reichhold Limited: *See*—
De Ruiter, Robert S.; and Kambanis, Stamatis M., 4,297,264, Cl. 260-33.40R.

Reider, Samuel B., to General Motors Corporation. Porous laminated material. 4,296,606, Cl. 60-754.000.

Reinehr, Dieter: *See*—
Pfeifer, Josef; and Reinehr, Dieter, 4,297,480, Cl. 528-346.000.

Reineke, Charles E.: *See*—
Nelson, Linnea E.; and Reineke, Charles E., 4,297,475, Cl. 528-271.000.

Reischl, Artur; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for working up isocyanate distillation residues. 4,297,456, Cl. 525-452.000.

Reissenweber, Gernot; and Mangold, Dietrich, to BASF Aktiengesellschaft. Preparation of 2,3-dioxo-1,4-benzoxazine derivatives. 4,297,491, Cl. 544-105.000.

Reissmann, Klaus: *See*—
Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, 4,297,066, Cl. 414-43.000.

Relles, Howard M.: *See*—
Williams, Frank J., III; and Relles, Howard M., 4,297,474, Cl. 528-170.000.

Rentzea, Costin: *See*—
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.

REPA Feinstanzwerk GmbH: *See*—
Schmid, Johann, 4,296,525, Cl. 16-174.000.

Resistoflex Corporation: *See*—
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.

Reynolds, Daniel J.: *See*—
Rice, Hoyt G., Jr.; and Reynolds, Daniel J., 4,296,576, Cl. 52-90.000.

Rheinmetall GmbH: *See*—
Romer, Rudolf; and Schepp, Hans-Egon, 4,296,685, Cl. 102-387.000.

Rhone Poulenc Agrochemie: *See*—
Guigues, Francois; and Trinh, Stephane, 4,297,367, Cl. 424-283.000.

Rhone-Poulenc Agrochimie: *See*—
Michelet, Daniel, 4,297,284, Cl. 260-346.220.

Rhone-Poulenc Industries: *See*—
Costantini, Michel; and Jouffret, Michel, 4,297,287, Cl. 260-348.160.

Rhone-Poulenc-Textile: *See*—
Achard, Georges; Chion, Pierre; and Menault, Jacques, 4,297,412, Cl. 428-370.000.
Rochina, Vincent; and Sacco, Jean, 4,297,478, Cl. 528-336.000.
Rochina, Vincent; and Sacco, Jean, 4,297,479, Cl. 528-336.000.

Rhonehouse, Donald E., to TGS Systems, Inc. Glass tempering furnaces and systems. 4,297,121, Cl. 65-348.000.

Rice, Doris M.: *See*—
Gilbert, Richard J.; and Rice, Doris M., 4,297,444, Cl. 521-160.000.

Rice, Hoyt G., Jr.; and Reynolds, Daniel J., to Anaconda Company, The. Sloped wall structure and anchor clip. 4,296,576, Cl. 52-90.000.

Rice, Robert A., to Eaton Corporation. Freeze drain valve. 4,296,770, Cl. 137-62.000.

Richard, Henry J.: *See*—
Gidge, Kenneth N.; and Richard, Henry J., 4,296,792, Cl. 160-332.000.

Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, to BASF Aktiengesellschaft. Manufacture of 4-amino-5-chloro-1-phenylpyridaz-6-one using aqueous phenol-4-sulfonic acid. 4,297,493, Cl. 544-241.000.

Richway Industries Ltd.: *See*—
Borglum, Richard P., 4,296,875, Cl. 222-617.000.

Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., to Occidental Oil Shale, Inc. In situ oil shale retort having horizontally offset pillars. 4,296,968, Cl. 299-2.000.

Ricoh Company, Ltd.: *See*—
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.
Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, 4,297,426, Cl. 430-59.000.
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, 4,297,021, Cl. 355-3.00R.

Riedel-de Haen Aktiengesellschaft: *See*—
Franz, Karl; and Schonfeld, Bernd, 4,297,390, Cl. 427-64.000.

Riege, Ulrich: *See*—
Scheffler, Knut; and Riege, Ulrich, 4,297,304, Cl. 264-0.500.

Rieger, Ulrich: *See*—
Schnabele, Werner; Buckley, Jack; and Rieger, Ulrich, 4,296,894, Cl. 244-3.270.

Riemenschneider, Wilhelm: *See*—
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, 4,297,323, Cl. 422-208.000.

Ring Lock Container S. A.: *See*—
Andersson, Poul G., 4,296,871, Cl. 220-306.000.

Rink, Helm: *See*—
Press, Irving D.; Nickerson, Harvey R.; and Rink, Helm, 4,296,804, Cl. 165-133.000.

Rinnai Kabushiki Kaisha: *See*—
Inayama, Minoru; and Furukawa, Yukio, 4,297,558, Cl. 219-10.55R.

Rio, Michel: *See*—
Crommelynck, Francois; Granger, Michel; Rio, Michel; and Tourdot, Jacques, 4,297,298, Cl. 260-502.00R.

Rips, Richard; and Morier, Elisabeth, to Institut National de la Sante et de la Recherche Medicale. Pseudopeptides used as medicaments. 4,297,346, Cl. 424-177.000.

Rishel, John W.: *See*—
DeVisser, Richard B.; Rishel, John W.; and Kuiper, Joe A., 4,297,209, Cl. 210-107.000.

Ritscher, James S.; and Sandner, Michael R., to Union Carbide Corporation. Three-way catalytic process for gaseous streams. 4,297,328, Cl. 423-213.200.

Rittersdorf, Walter: *See*—
Guthlein, Werner; Wielinger, Hans; Rittersdorf, Walter; and Werner, Wolfgang, 4,297,271, Cl. 260-107.000.

Ritze, Willy, to Jenaer Glaswerk, Schott & Gen. Optical colored and filter glass. 4,297,142, Cl. 501-77.000.

Rivenbark, Morrison, to Smith, Douglas R. Method and apparatus for forming a chlorine-water solution and for utilizing the same to disinfect water lines and the like. 4,297,223, Cl. 210-754.000.

Robert Bosch GmbH: *See*—
Hofmann, Karl, 4,296,887, Cl. 239-397.500.
Schlagmuller, Walter, 4,296,717, Cl. 123-195.00A.
Schmidt, Waldemar, 4,297,314, Cl. 264-320.000.
Werner, Peter; Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, 4,297,599, Cl. 307-355.000.

Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., to Goodyear Tire & Rubber Company, The. Tread for pneumatic tire. 4,296,789, Cl. 152-209.00R.

Roberts, James K., to Bendix Corporation, The. Anchor plate for a drum brake assembly. 4,296,845, Cl. 188-341.000.

Roberts, Ralph R. Vandal alarm system for parking meters. 4,297,683, Cl. 340-539.000.

Robertshaw Controls Company: *See*—
Lewis, Jay L., 4,296,795, Cl. 165-27.000.
Manecke, Siegfried E.; and Buckshaw, Thomas M., 4,296,603, Cl. 60-528.000.
Steele, Everett T., Jr., 4,296,721, Cl. 123-407.000.
Tyler, Hugh J.; and Conway, William H., 4,297,557, Cl. 219-10.55R.

Robertson, Kenneth L.; and Heslep, Curtis A., to Ken-Koat, Inc. Apparatus for coating metal substrates with adhesive. 4,296,708, Cl. 118-233.000.

Robinet, Jules P.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,296,870, Cl. 220-3.300.

Robinson, Jesse L. Deformable highway marker. 4,297,051, Cl. 404-11.000.

Robinson, John W.: *See*—
Wilcox, Brian N.; and Robinson, John W., 4,296,666, Cl. 84-1.260.

Rochina, Vincent; and Sacco, Jean, to Rhone-Poulenc-Textile. Process for the discontinuous production of aromatic in mixture of polyamides calcium chloride and N-methylpyrrolidone-2. 4,297,478, Cl. 528-336.000.

Rochina, Vincent; and Sacco, Jean, to Rhone-Poulenc-Textile. Process for the continuous production of aromatic polyamides in a mixture of calcium chloride and N-methylpyrrolidone-2. 4,297,479, Cl. 528-336.000.

Rockwell International Corporation: *See—*
Frerking, Marvin E., 4,297,657, Cl. 331-176.000.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.
Smith, Elroy C., Jr.; and Yao, Shi K., 4,297,189, Cl. 204-192.0SP.

Rodemer, Karl, to Lincoln-Helios GmbH. Multiple coupling for lubricating systems. 4,296,777, Cl. 137-351.000.

Rodenbeck, Philip G.; and Koenig, Fredrick, to General Electric Company. Wire vibration damping device and method for coil winding apparatus. 4,296,784, Cl. 140-92.200.

Rodgers, John M. Photo-electric digital circuit for monitoring strip loop position. 4,297,586, Cl. 250-561.000.

Rodionov, Evgeny I.: *See—*
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.

Roesler, Helmut; and Muehlbauer, Otto, to Siemens Aktiengesellschaft. Electronic counter for electrical digital pulses. 4,297,591, Cl. 307-224.00C.

Rogers, Stanley J. C.; and Taplin, John F., to Vickers Limited. Edge joint for sheets. 4,296,983, Cl. 312-263.000.

Rohm and Haas Company: *See—*
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.
Meitzner, Erich F.; and Oline, James A., 4,297,220, Cl. 210-690.000.

Rojahn, Bernd: *See —*
Meier, Willi; and Rojahn, Bernd, 4,296,702, Cl. 112-258.000.

Rollei of America, Inc.: *See—*
Adams, James R., Jr., 4,297,011, Cl. 354-23.00D.

Rolls-Royce Motors Limited: *See—*
Thornton, Kenneth, 4,296,646, Cl. 74-688.000.

Roman, Alain: *See—*
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.

Roman, Stephan: *See—*
Krauss, Timothy A.; and Roman, Stephan, 4,297,080, Cl. 416-141.000.

Rombusch, Konrad: *See—*
Maahs, Gunther; and Rombusch, Konrad, 4,297,505, Cl. 560-219.000.

Romer, Rudolf; and Schepp, Hans-Egon, to Rheinmetall GmbH. Warhead with slave missiles disposed in a firing tube. 4,296,685, Cl. 102-387.000.

Ronk Electrical Industries, Inc.: *See—*
Ronk, Leroy B., 4,297,551, Cl. 200-67.00B.

Ronk, Leroy B., to Ronk Electrical Industries, Inc. Electrical transfer switch. 4,297,551, Cl. 200-67.00B.

Ronne, Reuben N.: *See—*
Blanchard, Kenneth G.; and Ronne, Reuben N., 4,296,963, Cl. 297-170.000.

Roos, Leo: *See—*
Jolly, Jennings L.; and Roos, Leo, 4,297,435, Cl. 430-270.000.

Rosenbaum, Murray: *See—*
Kowalski, George A.; Mayer, George; and Rosenbaum, Murray, 4,297,570, Cl. 235-493.000.

Rosenberger, Siegfried: *See—*
Rasberger, Michael; Rosenberger, Siegfried; and Evans, Samuel, 4,297,492, Cl. 544-211.000.

Rosheim, Mark E. Fluid driven servomechanism. 4,296,681, Cl. 92-122.000.

Ross, Byron W. Engraving machine. 4,297,060, Cl. 409-86.000.

Ross, Jim; and Vilicich, John. Collapsible charcoal lighting holder. 4,296,726, Cl. 126-25.00B.

Ross, Jury N.: *See—*
Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D., 4,296,793, Cl. 164-24.000.

Ross, Leon I., to Caribbean Properties Limited. Process and apparatus for the contact and separation of immiscible fluids. 4,297,111, Cl. 55-92.000.

Rossander, Bror L. E.; Ermebrant, Lennart C.; and Lesser, Martin, to Fagersta A.B. Product provided with sound damping element. 4,296,830, Cl. 181-208.000.

Rossi, Alberto: *See—*
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.

Rossler, Eleanor J.: *See—*
Przybyla, Franciszek J.; and Rossler, Eleanor J., 4,297,249, Cl. 252-518.000.

Rothbuhr, Lothar: *See—*
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, 4,297,145, Cl. 106-308.00Q.

Rouaud, Michel: *See—*
Nard, Georges; Rabian, Jean; and Rouaud, Michel, 4,297,700, Cl. 343-6.50R.

Rourke, James E.: *See—*
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., 4,297,419, Cl. 429-44.000.

Roussel Uclaf: *See—*
Heymes, Rene; and Lutz, Andre, 4,297,352, Cl. 424-246.000.

Roux, Marc, to Alsthom-Atlantique. Railway car ceiling panel. 4,296,692, Cl. 105-397.000.

Rowe International, Inc.: *See—*
Mitchell, Robert P.; and Scalera, Frank T., 4,296,872, Cl. 221-195.000.

Ruben, Samuel. Glycol-iodine composition and method of preparation. 4,297,232, Cl. 252-187.00R.

Rubottom, Nolan R.; and Fine, Jerry W. Supplemental right turn signal for semitrailers. 4,297,675, Cl. 340-107.000.

Rueth, William R., Jr., to G & W Electric Specialty Company. Time delay switch mechanism. 4,297,554, Cl. 200-153.0SC.

Ruhr-Stickstoff Aktiengesellschaft: *See—*
Norden, Jurgen; and Ucinhazska, Bruno, 4,296,885, Cl. 239-1.000.

Ruip, Terrence M.: *See—*
Roberts, Charles W.; Kolowski, Michael A.; Lindner, Daniel J.; Lynch, John E.; Ruip, Terrence M.; and Fetty, Harold D., 4,296,789, Cl. 152-209.00R.

Rush-Hampton Industries, Inc.: *See—*
Frazier, Stephen E., 4,297,348, Cl. 424-180.000.

Ruyak, Robert F., to Autoclave Engineers, Inc. Magnetically actuated metering valve. 4,296,912, Cl. 251-65.000.

Sabatino, David B. Cutting and splitting tool. 4,296,552, Cl. 30-183.000.

Sacco, Jean: *See—*
Rochina, Vincent; and Sacco, Jean, 4,297,478, Cl. 528-336.000.
Rochina, Vincent; and Sacco, Jean, 4,297,479, Cl. 528-336.000.

Sachetto, Jean-Pierre; and Cuccolo, Sergio, to Centre National pour l'Exploitation des Oceans. Anti-fouling paint. 4,297,137, Cl. 106-15.050.

Sachs, Wolfgang: *See—*
Taddicken, Hermann; and Sachs, Wolfgang, 4,296,696, Cl. 112-70.000.

Sada, Kenzo; and Hayashi, Shigeyuki, to Kubota, Ltd. Casing for a transmission. 4,296,644, Cl. 74-606.00R.

Saegusa, Takeo: *See—*
Goto, Jugo; and Saegusa, Takeo, 4,297,449, Cl. 525-329.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Godard, Pierre; and Billot, Michel, 4,297,629, Cl. 320-7.000.

Sagae, Masayuki: *See—*
Tsuchiya, Yoshimi; Sagae, Masayuki; and Mizutani, Hiroshi, 4,297,410, Cl. 428-283.000.

St. Clair, Richard C.: *See—*
Dittman, Charles C.; and St. Clair, Richard C., 4,297,622, Cl. 318-254.000.

St. Joseph Bank and Trust Company, executor: *See—*
Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased, 4,297,467, Cl. 526-259.000.

Saitoh, Yuichi: *See—*
Ogawa, Mutsuo; Koseki, Yuji; Saitoh, Yuichi; Yamaguchi, Shingo; and Katsuragi, Shigeru, 4,297,727, Cl. 358-261.000.

Sakai Chemical Industry Co., Ltd.: *See—*
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, 4,297,248, Cl. 252-477.00R.

Sakai, Kiyoshi; Hashimoto, Mitsuru; and Kawakami, Tomiko, to Ricoh Co., Ltd. Electrophotographic element with carbazole hydrazone or anile charge transport compounds. 4,297,426, Cl. 430-59.000.

Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, to Bridgestone Tire Company Limited. Light tire bodies using thick cords. 4,296,790, Cl. 152-354.00R.

Sakamoto, Seiya: *See—*
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.

Sakharnov, Vasily A.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Dobrovolsky, Stanislav D., 4,297,665, Cl. 336-60.000.

Sakurada, Kenichi; and Nishino, Takaichi, to Nissan Motor Company, Limited; and Tachikawa Spring Company, Limited. Seat with adjustable lumbar supporter. 4,296,965, Cl. 297-284.000.

Sakurai, Koichi; Furukawa, Takashi; Takechi, Hiroshi; and Matsuo, Munetsugu, to Nippon Steel Corporation. Apparatus for continuously producing a high strength dual-phase steel strip or sheet. 4,296,919, Cl. 266-111.000.

Saleck, Wilhelm: *See—*
Bergthaller, Peter; Saleck, Wilhelm; Lapp, Otto; and Mucke, Bruno, 4,297,439, Cl. 430-434.000.

Salman, Syed, to International Telephone and Telegraph Corp. Electroplating rack. 4,297,197, Cl. 204-297.00W.

Sanborn, George A. Traveling light display. 4,296,562, Cl. 40-438.000.

Sanderson, Hendrik J., to U.S. Philips Corporation. Method of controlling the position of a write or read head and a device for carrying out the method. 4,297,733, Cl. 360-77.000.

Sandner, Michael R.: *See—*
Ritscher, James S.; and Sandner, Michael R., 4,297,328, Cl. 423-213.200.

Sandoz, Inc.: *See—*
Barcza, Sandor, 4,297,349, Cl. 424-184.000.
Maulding, Hawkins V., 4,297,353, Cl. 424-247.000.

Sandoz Ltd.: *See—*
Baumann, Hans-Peter, 4,297,296, Cl. 260-459.00A.
Neumann, Peter, 4,297,490, Cl. 544-55.000.

Sandrock, Klaus; and Cordes, Gunter, to Sanol Schwarz-Monhein GmbH. Process for selectively producing isosorbide-5-nitrate. 4,297,286, Cl. 260-347.800.

Sandvik Aktiebolag: *See—*
Larsson, Lars E., 4,296,825, Cl. 175-410.000.

Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, to Sumitomo Chemical





Company, Limited. 3,5-Dioxo-1,2,4-triazines. 4,297,129, Cl. 71-93.000.

Sanford, Michael E.: *See—*
Detroit, William J.; and Sanford, Michael E., 4,296,813, Cl. 166-293.000.

Sanol Schwarz-Monhein GmbH: *See—*
Sandrock, Klaus; and Cordes, Gunter, 4,297,286, Cl. 260-347.800.

Santa Fe International Corporation: *See—*
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, 4,297,054, Cl. 405-168.000.

Sartorelli, Adelmo: *See—*
Brambilla, Giovanni; and Sartorelli, Adelmo, 4,297,174, Cl. 204-1.500.

Sasaki, Makoto: *See—*
Ishibashi, Yoji; Uchiyama, Yoshihiro; Akimoto, Hidetoshi; and Sasaki, Makoto, 4,297,319, Cl. 422-114.000.

Sasaki, Tohru; Endoh, Hiroyuki; and Ohhira, Hiroshi, to Kureha Kugaku Kogyo Kabushiki Kaisha. Concentric composite conjugate yarns and a process for manufacturing same. 4,297,413, Cl. 428-394.000.

Sato, Akira: *See—*
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.

Sato, Eiichi, to Olympus Optical Company Limited. Electrophotographic process for printing a plurality of copies. 4,297,422, Cl. 430-54.000.

Sato, Fumio: *See—*
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.

Sato, Haruyo: *See—*
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.

Sato, Hideo; and Shimamune, Takayuki, to Permelec Electrode Ltd. Electrode for use in electrolysis and process for production thereof. 4,297,195, Cl. 204-290.00F.

Sato, Hisatake; Makino, Masaharu; and Hayashi, Hideo, to Nippon Oil Co. Ltd. Hot melt type traffic paint compositions. 4,297,450, Cl. 525-333.000.

Sato, Kazuyoshi: *See—*
Ando, Ryo; and Sato, Kazuyoshi, 4,297,119, Cl. 65-141.000.

Sato, Kotaro: *See—*
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Sato, Kotaro, 4,297,436, Cl. 430-310.000.

Sato, Kunio: *See—*
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, 4,297,715, Cl. 346-150.000.

Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-skid brake control device. 4,296,972, Cl. 303-119.000.

Sato, Masamichi: *See—*
Kubotera, Kikuo; Sato, Masamichi; Kashiwabara, Akira; and Satò, Kotaro, 4,297,436, Cl. 430-310.000.

Sato, Yoshikatsu: *See—*
Fujii, Shuzo; and Sato, Yoshikatsu, 4,297,655, Cl. 331-116.00R.

Satoh, Seiji: *See—*
Kamada, Masataka; and Satoh, Seiji, 4,297,228, Cl. 252-92.000.

Satoh, Tsutomu; Ohye, Hideo; Tsukahara, Hirokazu; Senoh, Hideaki; and Torii, Takahiro, to Mitsubishi Paper Mills, Ltd. Color-developing sheet for no-carbon copying process. 4,296,948, Cl. 282-27.500.

Satoi, Shuzo: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.

Satomura, Masato: *See—*
Osada, Chiaki; Satomura, Masato; and Ono, Hisatake, 4,297,470, Cl. 526-304.000.

Sauber, Charles J. Cargo securing apparatus. 4,297,062, Cl. 410-37.000.

Saucedo, Rudy E. Portable dishwasher. 4,296,768, Cl. 134-47.000.

Saunders, Norman B. Heating, lighting and ventilation systems. 4,296,733, Cl. 126-428.000.

Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. α-Azolyl-α-phenylacetic acid derivatives. 4,297,364, Cl. 424-267.000.

Sauvage, Henri; and Tarnero, Maurice, to Commissariat a l'Energie Atomique. Apparatus for the continuous processing of compounds in a liquid. 4,297,324, Cl. 422-268.000.

Savage, David S.: *See—*
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.

Sawada, Satoru: *See—*
Aoki, Kozo; Sawada, Satoru; Yabuki, Yoshiharu; and Furutachi, Nobuo, 4,297,440, Cl. 430-505.000.

Sbuelz, Anes; and Marchelli, Francesco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Malfunction detector for a group of cyclically interconnected phase-locked oscillators. 4,297,649, Cl. 331-2.000.

Scalera, Frank T.: *See—*
Mitchell, Robert P.; and Scalera, Frank T., 4,296,872, Cl. 221-195.000.

Scalise, John M.: *See—*
Macchiarolo, Nick T.; McGuire, Billy G.; and Scalise, John M., 4,297,224, Cl. 210-755.000.

Schabert, Hans-Peter, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation. 4,297,167, Cl. 376-273.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Electric motor construction. 4,297,627, Cl. 318-778.000.

Schaefer, John O., to International Business Machines Corporation. Variable cam profile selection system for single element typewriter. 4,297,041, Cl. 400-161.400.

Schamper, Thomas J.: *See—*
Dasher, George F.; and Schamper, Thomas J., 4,297,098, Cl. 8-412.000.

Scheffler, Knut; and Riege, Ulrich, to Kernforschungszentrum Karlsruhe, GmbH. Method for solidifying aqueous radioactive wastes for non-contaminating storage. 4,297,304, Cl. 264-0.500.

Scheibel, Edward G., to Suntech, Inc. Solvent extraction of synfuel liquids. 4,297,206, Cl. 208-254.00R.

Scheible, Howard G.: *See—*
Carroll, Charles B.; and Scheible, Howard G., 4,297,312, Cl. 264-134.000.

Schelleng, Robert D.: *See—*
Pickens, Joseph R.; Schelleng, Robert D.; Donachie, Stephen J.; and Nichol, Thomas J., 4,297,136, Cl. 75-206.000.

Schenck, Hans-Uwe; and Gulbins, Erich, to BASF Aktiengesellschaft. Adduct and its use. 4,297,255, Cl. 260-18.0PF.

Schepp, Hans-Egon: *See—*
Romer, Rudolf; and Schepp, Hans-Egon, 4,296,685, Cl. 102-387.000.

Schering Aktiengesellschaft: *See—*
Puttner, Reinhold; Buhmann, Ulrich; and Joppien, Harmut, 4,297,361, Cl. 424-263.000.

Schering Corporation: *See—*
Blythin, David J., 4,297,355, Cl. 424-248.540.

Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, to Filtrol Corporation. Method of producing pseudoboehmite from aluminum salt solutions. 4,297,325, Cl. 423-122.000.

Schetter, Thomas C., to Dana Corporation. Transmission interlock. 4,296,642, Cl. 74-475.000.

Schick, Ludwig: *See—*
Glaser, Helmut; and Schick, Ludwig, 4,297,632, Cl. 324-51.000.

Schittenhelm, Rudolf: *See—*
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.

Schlagmuller, Walter, to Robert Bosch GmbH. Drive arrangement for auxiliary aggregates of an internal combustion engine. 4,296,717, Cl. 123-195.00A.

Schlauer, Johann; Kempf, Georg; and Doerges, Alexander, to Metallgesellschaft AG. Process of selectively desulfurizing gases. 4,297,330, Cl. 423-232.000.

Schlegel, Hans; and Nowotny, Theodor, to Wurttembergische Metallwarenfabrik. Process for partially electroplating flat silver. 4,297,175, Cl. 204-15.000.

Schleppinghoff, Bernhard: *See—*
Mainusch, Klaus; Schleppinghoff, Bernhard; and Munter, Klaus, 4,297,512, Cl. 564-490.000.

Schliebener, Claus; and Wernicke, Hans J., to Linde Aktiengesellschaft. Thermal cracking with post hydrogenation and recycle of heavy fractions. 4,297,204, Cl. 208-95.000.

Schlottke, Karl-Heinz: *See—*
Ramcke, Bernd; Schlottke, Karl-Heinz; Brandt, Eckhard; and Reissmann, Klaus, 4,297,066, Cl. 414-43.000.

Schlumpf, Alois, to Tax o mex AG. Automatic vending arrangement. 4,296,873, Cl. 221-213.000.

Schmid, Franz; and Schmid, Reinhard. Method and apparatus for withdrawing agricultural materials from storage. 4,297,073, Cl. 414-704.000.

Schmid, Johann, to REPA Feinstanzwerk GmbH. Swivel fitting for fitting parts of a safety belt. 4,296,525, Cl. 16-174.000.

Schmid, Reinhard: *See—*
Schmid, Franz; and Schmid, Reinhard, 4,297,073, Cl. 414-704.000.

Schmidt, Waldemar, to Robert Bosch GmbH. Method for permanent deformation of an elastic member. 4,297,314, Cl. 264-320.000.

Schmitt, Gunter: *See—*
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.

Schmitt, Wilhelm E., to Friedman, Jack S. Brush. 4,296,519, Cl. 15-184.000.

Schnabele, Werner; Buckley, Jack; and Rieger, Ulrich, to Messerschmitt-Bolkow-Blohm GmbH. Drone-type missile. 4,296,894, Cl. 244-3.270.

Schneider, Claus: *See—*
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., 4,297,354, Cl. 424-248.510.

Schneider, George H.: *See—*
Armentrout, James L.; and Schneider, George H., 4,296,862, Cl. 206-439.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.

Schoenberg, Morris R.: *See—*
Calamur, Narasimhan; and Schoenberg, Morris R., 4,296,637, Cl. 73-863.110.

Schonfeld, Bernd: *See—*
Franz, Karl; and Schonfeld, Bernd, 4,297,390, Cl. 427-64.000.

Schopper, Heinrich-Christian: *See—*
Buxbaum, Gunter; Schopper, Heinrich-Christian; Leitner, Lutz; and Hahnkamm, Volker, 4,297,395, Cl. 427-127.000.

Schramm, Horst. Integrated house. 4,296,798, Cl. 165-56.000.

Schreck, Raymond M.: *See—*
Griffin, James R.; and Schreck, Raymond M., 4,296,611, Cl. 62-89.000.

Schreckenberg, Manfred: *See—*
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
Schroder, Klaus, to C. & W. Berges Maschinenfabrik, Firma. Extruder for preplasticization of thermoset molding materials. 4,297,036, Cl. 366-77.000.
Schroeder, Harald: *See—*
Richarz, Winfried; Froehlich, Helmut; and Schroeder, Harald, 4,297,493, Cl. 544-241.000.
Schroeder, Hartmut R.: *See—*
Buckler, Robert T.; and Schroeder, Hartmut R., 4,297,273, Cl. 260-112.00B.
Schuette, Heinz G. Helical staircase support. 4,296,577, Cl. 52-187.000.
Schulein, Benjamin M., Jr., to Alfa-Pet, Inc. Animal litter preparation. 4,296,709, Cl. 119-1.000.
Schulze-Berge, Klaus: *See—*
Manzke, Klaus; Brotzler, Roland; and Schulze-Berge, Klaus, 4,297,736, Cl. 360-109.000.
Schwab, Thomas C.: *See—*
Miller, John G.; and Schwab, Thomas C., 4,297,131, Cl. 75-1.00T.
Schwartz, Robert E.: *See—*
Reed, Robert D.; Schwartz, Robert E.; and Kraft, Raymond D., 4,297,094, Cl. 431-202.000.
Schwarz, Rudolf: *See—*
Kleinschmit, Peter; and Schwarz, Rudolf, 4,297,143, Cl. 501-103.000.
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, to Siemens Aktiengesellschaft. Radiation diagnostic device for generating tomographic images. 4,297,582, Cl. 250-445.00T.
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Herchenhan, Bernd, to Behringwerke Aktiengesellschaft. Blood coagulation factors and process for their manufacture. 4,297,344, Cl. 424-101.000.
Schwob, Pierre, to SEB S.A. Water injection device for a steam iron. 4,296,560, Cl. 38-77.810.
Scifres, Donald R.; and Stutius, Wolfgang E., to Xerox Corporation. Hybrid semiconductor laser/detectors. 4,297,653, Cl. 331-94.50S.
SEB S.A.: *See—*
Schwob, Pierre, 4,296,560, Cl. 38-77.810.
Sebag, Henry: *See—*
Vanlerberghe, Guy; and Sebag, Henry, 4,297,102, Cl. 8-406.000.
Seidel, Martin P., to Westinghouse Electric Corp. Low temperature curing epoxy resin. 4,297,254, Cl. 260-18.0EP.
Seki, Yashiro; Kobayashi, Hideo; Kimura, Kiyoshi; and Naito, Masayuki, to Anritsu Electric Company Limited. Multi-item data input apparatus. 4,297,028, Cl. 355-41.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujimaki, Kiyoshi; Bando, Yoshiaki; Okuyama, Takesi; and Hashimoto, Tutomu, 4,296,954, Cl. 285-331.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Sugito, Kazuo; and Takeda, Sakuzo, 4,297,109, Cl. 44-56.000.
Sele, Alex: *See—*
Haas, Georges; Jaeggi, Knut A.; Rossi, Alberto; and Sele, Alex, 4,297,358, Cl. 424-256.000.
Selines, Ronald J.: *See—*
Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., 4,296,512, Cl. 10-27.00E.
Semenov, Vasily V.: *See—*
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Semiconductor Research Foundation Mitsubishi Denki K.K.: *See—*
Nishizawa, Jun-Ichi; and Kitsuregawa, Takashi, 4,297,718, Cl. 357-22.000.
Senet, Jean-Pierre G.: *See—*
Lecolier, Serge L.; and Senet, Jean-Pierre G., 4,297,301, Cl. 260-544.00K.
Senoh, Hideaki: *See—*
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Serac: *See—*
Graffin, Andre J., 4,297,161, Cl. 156-583.300.
Sermon, Paul A., to Johnson, Matthey & Co., Limited. Catalysis. 4,297,331, Cl. 423-239.000.
Severijns, Adrianus P.; and Staas, Frans A., to U.S. Philips Corporation. $^3$He-$^4$He refrigerator. 4,296,609, Cl. 62-514.00R.
Seymour, Raymond K.; and Murphy, Frank H., to General Electric Company. Circuit breaker accessories packaged in a standardized molded case. 4,297,663, Cl. 335-20.000.
Shackcloth, Barry, to Total Oil Great Britain Limited. Safety device for container filler systems. 4,297,543, Cl. 200-18.000.
Shackelford, John R., to Standard Oil Company (Indiana). Salt substitutes having reduced bitterness. 4,297,375, Cl. 426-62.000.
Shah, Narendra K.: *See—*
Elias, Moenes L.; and Shah, Narendra K., 4,297,257, Cl. 260-29.60H.
Shah, Siddharth A.; Woodcock, Sidney J.; and Fagan, Robert D., to General Electric Company. Manway handling apparatus. 4,297,072, Cl. 414-684.300.
Sharp Kabushiki Kaisha: *See—*
Hashimoto, Sadakatsu, 4,297,696, Cl. 340-785.000.
Shatai Kogyo Kabushiki Kaisha: *See—*
Terada, Takami, 4,296,966, Cl. 297-369.000.
Shaw, Manuel; and Thatcher, Imbrie, to Interscan Corporation. Personnel-carried dosimeter. 4,297,689, Cl. 340-632.000.
Shell Oil Company: *See—*
Davis, Royston H.; and Davies, John H., 4,297,496, Cl. 544-332.000.
Mango, Frank D., 4,297,294, Cl. 260-453.0PH.
Mast, Harm, 4,296,628, Cl. 73-28.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,297,517, Cl. 568-361.000.
Shephard, Margaret C.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.
Shepherd, Roger D.: *See—*
Bach, Paul S.; Harding, Steven R.; Lamos, Richard A.; Markham, Harvey R.; and Shepherd, Roger D., 4,297,025, Cl. 355-14.0SH.
Sherman, Norman; and Cameron, John H., to Conwed Corporation. Method of manufacturing improved mineral board. 4,297,311, Cl. 264-109.000.
Sherman, Paul D., Jr.: *See—*
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.
Sherwood Medical Industries Inc.: *See—*
Joslin, Joel A.; and Ranford, Alan B., 4,296,759, Cl. 128-766.000.
Shibanaka, Akira: *See—*
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, 4,296,719, Cl. 123-198.00F.
Shibuya, Yasutaka: *See—*
Kodama, Kazuyuki; Okada, Kunihiro; Endoh, Takeyuki; and Shibuya, Yasutaka, 4,297,691, Cl. 340-723.000.
Shigeta, Yoshihiro: *See—*
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Shiina, Yuichi: *See—*
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Shimamune, Takayuki: *See—*
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Shimano Industrial Company, Limited: *See—*
Isobe, Mitsuhide, 4,296,850, Cl. 192-64.000.
Shimizu, Ken-Ichi; and Ikeya, Chuji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for measurement of displacement of moving body by use of target mark and apparatus therefor. 4,297,725, Cl. 358-125.000.
Shimizu, Michimasa: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Shimotake, Munetoshi: *See—*
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Shinmyo, Saburo, to Nippon Electric Co., Ltd. Phase locked loop carrier recovery circuit with false lock prevention. 4,297,650, Cl. 331-11.000.
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst supported oxygen sensor element and a method of manufacturing same. 4,297,192, Cl. 204-195.00S.
Shionogi & Co., Ltd.: *See—*
Hirai, Kentaro; Matsutani, Shigeru; Ishiba, Teruyuki; and Makino, Itsuo, 4,257,280, Cl. 260-245.500.
Shirai, Akira: *See—*
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Shirasu, Hiroshi: *See—*
Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, 4,297,571, Cl. 250-201.000.
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P. Drawing mechanism. 4,296,528, Cl. 19-255.000.
Shono, Tatsuya. Process for preparing ketones. 4,297,181, Cl. 204-78.000.
Short, James N.; and Norwood, Donald D., to Phillips Petroleum Co. Continuous production of olefin block copolymers. 4,297,445, Cl. 525-52.000.
Shumway, Anthony G. Folded circuit switch apparatus having multiple contacts. 4,297,542, Cl. 200-6.00A.
Shur-Lok International, S.A.: *See—*
Heurteux, Bernard M., 4,296,586, Cl. 52-787.000.
Sico Incorporated: *See—*
Wilson, Kermit H.; and Carlson, Ronald R., 4,296,573, Cl. 52-6.000.
Sidaway, H. John; and Good, Maynard, to Hancor, Inc. Expandable core for rolls of tubing. 4,296,891, Cl. 242-110.000.
Siemens Aktiengesellschaft: *See—*
Brunner, Anton; and Willburger, Nikolaus, 4,297,707, Cl. 343-725.000.
Dalhof, Axel; and Lechner, Robert, 4,297,531, Cl. 179-16.0AA.
Glaser, Helmut; and Schick, Ludwig, 4,297,632, Cl. 324-51.000.
Gross, Franz; Boehme, Gerit; Wiehler, Wolf; and Bibracher, Wilhelm, 4,297,662, Cl. 333-252.000.
Kuger, Manfred; Nawrot, Wolfgang; and Preuss, Bernhard, 4,297,664, Cl. 335-176.000.
Roesler, Helmut; and Muehlbauer, Otto, 4,297,591, Cl. 307-224.00C.



Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.
Url, Karlheinz; and von Basse, Paul W., 4,297,592, Cl. 307-583.000.
Sigmund, Paul W.; and Butwell, Kenneth F., to Union Carbide Corporation. Vapor-liquid contacting system. 4,297,329, Cl. 423-228.000.
Sih, John C., to Upjohn Company, The. 19-Hydroxy-6a-carba-PGI$_1$ compounds. 4,297,504, Cl. 560-119.000.
Silcox, David R.; and Doster, John L., to RCA Corporation. Filament winding apparatus. 4,297,095, Cl. 432-59.000.
Silk, John K., to American Science and Engineering, Inc. Parabolic trough concentrating solar collector. 4,296,737, Cl. 126-438.000.
Sillers, William M., III. Automatic feeding apparatus. 4,296,710, Cl. 119-51.110.
Silver, Alexander: *See—*
Burgmeier, Lyman R.; McCarty, Frederick B.; and Silver, Alexander, 4,296,544, Cl. 29-598.000.
Simmonds Precision Products, Inc.: *See—*
Maier, Lawrence C., 4,297,692, Cl. 340-715.000.
Simmons, Dwane P.; and Lynn, Ray E. Portable invalid lift. 4,296,509, Cl. 5-81.00R.
Simmons, Robert B.: *See—*
Crawford, Roger A.; and Simmons, Robert B., 4,297,333, Cl. 423-241.000.
Simon Engineering Dudley Limited: *See—*
Ashworth, Denis H., 4,296,833, Cl. 182-2.000.
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Process for the production of a synthetic resin sheet material which is dyed unicolored or multicolored in accordance with a pattern. 4,297,099, Cl. 8-484.000.
Simon-Rosedowns Limited: *See—*
Naylor, Leonard, 4,297,112, Cl. 55-195.000.
Simpson, Harold G.; and Davis, Michael W., to Star Manufacturing Company of Oklahoma. Construction system and fasteners therefore. 4,296,582, Cl. 52-590.000.
Sims, Malcolm L.: *See—*
Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, 4,297,150, Cl. 148-6.300.
Singer Company, The: *See—*
Davidson, Donald R.; and Marsh, Walter H. W., 4,296,698, Cl. 112-110.000.
Larsen, Robert H., 4,296,701, Cl. 112-168.000.
Lauritsen, Richard L.; and Mandellos, Panagiotis K., 4,297,552, Cl. 200-83.00P.
Vartoukian, Artin G., 4,296,699, Cl. 112-121.150.
Whitby, Clyde M., 4,297,723, Cl. 358-60.000.
Singewald, Arno; Geisler, Irving; Fricke, Gunter; and Knappe, Rudolf, to Kali and Salz AG. Process and apparatus for the electrostatic dressing of carnallite-containing crude potassium salts. 4,297,207, Cl. 209-9.000.
Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,297,362, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,297,363, Cl. 424-263.000.
Singh, Shobha: *See—*
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.
SKF Kugellagerfabriken GmbH: *See—*
Loser, Norbert; and Tilgner, Leopold, 4,296,978, Cl. 308-37.000.
Sklensky, Alden F.: *See—*
Buchanan, Robert A.; Maple, T. Grant; and Sklensky, Alden F., 4,297,584, Cl. 250-483.000.
Skomoroski, Robert M., to American Chemical & Refining Company Incorporated. Palladium electroplating bath and process. 4,297,179, Cl. 204-47.000.
Slater Electric Inc.: *See—*
Bowden, Wade R., Jr., 4,297,525, Cl. 174-58.000.
Slater, Peter G. Carrying device. 4,296,788, Cl. 150-52.00R.
Sleigh, Thomas: *See—*
Carlyle, Ian C.; Sleigh, Thomas; and Savage, David S., 4,297,351, Cl. 424-241.000.
Sletzinger, Meyer: *See—*
Christensen, Burton G.; Cama, Lovji D.; Karady, Sandor; and Sletzinger, Meyer, 4,297,488, Cl. 544-21.000.
Smart, Michael W.: *See—*
Andrews, David K.; and Smart, Michael W., 4,296,676, Cl. 91-417.00R.
Smearing, Robert W., to General Electric Company. Antifoaming resin compositions. 4,297,389, Cl. 427-58.000.
Smick, Ronald H. Turbulator with ganged strips. 4,296,779, Cl. 138-38.000.
Smith, Douglas R.: *See—*
Rivenbark, Morrison, 4,297,223, Cl. 210-754.000.
Smith, Elroy C., Jr.; and Yao, Shi K., to Rockwell International Corporation. Deposition of ordered crystalline films. 4,297,189, Cl. 204-192.0SP.
Smith, Gordon J.: *See—*
Lammers, Gerald B.; and Smith, Gordon J., 4,297,712, Cl. 346-75.000.
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., to Halliburton Company. Simultaneous gamma ray measurement of formation bulk density and casing thickness. 4,297,575, Cl. 250-265.000.
Smith, Kenneth J.: *See—*
Smith, Harry D., Jr.; Arnold, Dan M.; and Smith, Kenneth J., 4,297,575, Cl. 250-265.000.
Smith, Kent F., to General Instrument Corporation. I$^2$L Sensing circuit with increased sensitivity. 4,297,598, Cl. 307-355.000.
Smith, Mark A.: *See—*
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.
Smith, Millard S.: *See—*
Wyse, Harold G.; and Smith, Millard S., 4,297,123, Cl. 71-58.000.
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L. Glass bending table. 4,297,120, Cl. 65-281.000.
Smith, Robert L.: *See—*
Smith, Robert J.; Smith, Mark A.; Jensen, Michael E.; and Smith, Robert L., 4,297,120, Cl. 65-281.000.
Smith, Thomas M., to Monarch Marking Systems, Inc. Coreless pressure sensitive label supply roll. 4,297,403, Cl. 428-42.000.
Smith, Thomas W., to Eastman Kodak Company. Catalysts for polymerizing propylene in a high temperature solution process. 4,297,465, Cl. 526-141.000.
Smitka, Gunter. Device for attaching two metal sheets or blanks together. 4,297,049, Cl. 403-403.000.
Snamprogetti S.p.A: *See—*
Corbellini, Margherita; Greco, Alberto; and Osellame, Mirko, 4,297,462, Cl. 526-125.000.
Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Manca, Francesco, 4,297,407, Cl. 428-224.000.
Soboczenski, Edward J., to Du Pont de Nemours, E. I., and Company. Insecticidal compositions. 4,297,370, Cl. 424-298.000.
Socapex: *See—*
Malsot, Christian; and Bouygues, Jean, 4,296,997, Cl. 350-96.200.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Sbuelz, Anes; and Marchelli, Francesco, 4,297,649, Cl. 331-2.000.
Societe Anonyme dite: Ramo S.A.: *See—*
Champeau, Marcel; and Tabutin, Andre, 4,296,658, Cl. 82-30.000.
S.A. PRB Societe Anonyme: *See—*
Orlandi, Robert G., 4,296,688, Cl. 102-218.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Horman, Ian; and Cazenave, Paul, 4,297,380, Cl. 426-597.000.
Societe d'Etude du Radant: *See—*
Vidal, Paul, 4,297,708, Cl. 343-754.000.
Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Curtil, Remi; and Devaux, Alain, 4,296,715, Cl. 123-90.150.
Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,297,495, Cl. 544-330.000.
Societe d'Etudes, Recherches et Constructions Electroniques Sercel: *See—*
Nard, Georges; Rabian, Jean; and Rouaud, Michel, 4,297,700, Cl. 343-6.50R.
Societe Miniere et Metallurgique de Penarroya: *See—*
Georgeaux, Andre, 4,297,183, Cl. 204-117.000.
Societe Nationale des Poudres et Explosifs: *See—*
Lecolier, Serge L.; and Senet, Jean-Pierre G., 4,297,301, Cl. 260-544.00K.
Societe Nationale Industrielle Aerospatiale: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.
Solar Kinetics, Inc.: *See—*
Hutchison, Joseph A., 4,297,003, Cl. 350-292.000.
Solarex Corporation: *See—*
Lindmayer, Joseph, 4,297,391, Cl. 136-256.000.
Solomon, Edward T.: *See—*
Priest, Clayton W.; and Solomon, Edward T., 4,296,763, Cl. 132-7.000.
Solomon, Paul W.: *See—*
Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., 4,297,451, Cl. 525-366.000.
Solow, Benjamin, to Angstrohm Precision, Inc. Metal foil resistor. 4,297,670, Cl. 338-195.000.
Sommer, Karl: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.
Soot, Olaf. Folded plate solar energy collector. 4,296,736, Cl. 126-438.000.
Sorbier, Pierre. Method of making moldable product. 4,297,253, Cl. 260-17.300.
Sorokin, Nikolai A.: *See—*
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Gorbunov, Nikolai M.; Rodionov, Evgeny I.; and Sorokin, Nikolai A., 4,297,589, Cl. 290-40.00R.
Spaeth, Tilman P., to Bodenseewerk Geosystem GmbH. Bi-frequency infrared spectrometer. 4,297,579, Cl. 250-343.000.
Spahn, Heinrich: *See—*
Krabetz, Richard; Herrmann, Walter; Engelbach, Heinz; Palm, Peter; Sommer, Karl; and Spahn, Heinrich, 4,297,247, Cl. 252-468.000.
Spak, Mark A.: *See—*
Denning, Richard; Spak, Mark A.; and Polhemus, Barry, 4,297,393, Cl. 427-88.000.
Sparrell, Patricia T.: *See—*
Vogt, Frederick G., deceased; and Sparrell, Patricia T., 4,297,317, Cl. 422-16.000.
Spatz, Sydney M.; Hydell, Robert C.; and Davis, Gerald T., to Mead Corporation, The. Pressure-sensitive transfer sheets using novel radiation curable coatings. 4,296,947, Cl. 282-27.500.
Speak, Richard C.; and Ferm, Donald J., to United States Borax & Chemical Corporation. Particulate borate-soap compositions. 4,297,229, Cl. 252-109.000.

Speca, Anthony N., to National Petro Chemicals Corp. Olefin polymerization catalyst. 4,297,461, Cl. 526-100.000.
Specktor, Gerald A. Accessory for an apparatus for repairing and straightening. 4,296,624, Cl. 72-308.000.
Sperry Corporation: *See*—
Martenas, Wayne B.; Priepke, Edward H.; and Wagstaff, Robert A., 4,296,591, Cl. 56-10.300.
McIlwain, Irwin D., 4,296,592, Cl. 56-14.400.
Spilsbury, Thomas W., 4,297,618, Cl. 315-371.000.
Spilsbury, Thomas W., 4,297,621, Cl. 315-397.000.
Waldrop, T. William; and Campbell, Willis R., 4,296,596, Cl. 56-341.000.
Sperry - New Holland: *See*—
Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., 4,296,593, Cl. 56-98.000.
Spiess, Karl-Heinz: *See*—
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, 4,297,099, Cl. 8-484.000.
Spilsbury, Thomas W., to Sperry Corporation. Anode voltage deflection gain control for cathode ray displays. 4,297,618, Cl. 315-371.000.
Spilsbury, Thomas W., to Sperry Corporation. Cathode ray tube beam deflection amplifier system. 4,297,621, Cl. 315-397.000.
Spinner GmbH Elektrotechnische Fabrik: *See*—
Treczka, Leo, 4,297,658, Cl. 333-113.000.
Spletzer, Barry L., to Gerber Products Company. Flexible convex diaphragm sound reproducing device. 4,297,682, Cl. 340-384.00E.
Spodig, Heinrich. Magnetic separator having two rotating magnetic drums of opposite polarity. 4,296,865, Cl. 209-216.000.
Square D Company: *See*—
Lingaraju, Bhartoor, 4,296,987, Cl. 339-95.00D.
Staas, Frans A.: *See*—
Severijns, Adrianus P.; and Staas, Frans A., 4,296,609, Cl. 62-514.00R.
Staclean Diffuser Company: *See*—
Johnson, Allen S., Jr., 4,297,115, Cl. 55-302.000.
Staffa, Jeffrey A.: *See*—
Lionelle, Joseph E.; and Staffa, Jeffrey A., 4,297,291, Cl. 260-410.90R.
Stahlschmitt, Horst: *See*—
Barth, Karl; Albrecht, Ernst; and Stahlschmitt, Horst, 4,296,697, Cl. 112-109.000.
Stalder, John L.; and Martin, William L., to Conoco Inc. Method for thermally insulating wellbores. 4,296,814, Cl. 166-303.000.
Stan Herman Studio, Inc.: *See*—
Herman, Seymour S., 4,296,497, Cl. 2-114.000.
Standard Oil Company (Indiana): *See*—
Calamur, Narasimhan; and Schoenberg, Morris R., 4,296,637, Cl. 73-863.110.
Ford, William D.; and Clark, Michael J., 4,297,203, Cl. 208-74.000.
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,297,242, Cl. 252-439.000.
Mieville, Rodney L., 4,297,205, Cl. 208-138.000.
Shackelford, John R., 4,297,375, Cl. 426-62.000.
Stanton, David B.: *See*—
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.
Star Manufacturing Company of Oklahoma: *See*—
Simpson, Harold G.; and Davis, Michael W., 4,296,582, Cl. 52-590.000.
Stark, Charles J., Jr., to General Electric Company. Curable epoxy resin composition. 4,297,457, Cl. 525-507.000.
Stark, Charles J., Jr., to General Electric Company. Curable epoxy resins. 4,297,458, Cl. 525-507.000.
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Static Systems Corporation: *See*—
Lester, Robert W., 4,297,022, Cl. 355-3.00R.
Staub, Vincent M., Jr., to General Motors Corporation. Flexible clutch with an elastomeric vibration damper. 4,296,854, Cl. 192-106.100.
Stauffer Chemical Company: *See*—
Gaughan, Edmund J.; and Kezerian, Charles, 4,297,295, Cl. 260-455.00A.
Hosaka, Dennis B., 4,297,382, Cl. 426-656.000.
Weil, Edward D., 4,297,138, Cl. 106-18.180.
Stead, John C.; and Waghorn, Peter E., to Imperial Chemical Industries Limited. Laminates of cloth and filled crystalline polypropyiene and a method for making them. 4,297,408, Cl. 428-240.000.
Steele, Everett T., Jr., to Robertshaw Controls Company. Control system having an improved condition responsive valve construction. 4,296,721, Cl. 123-407.000.
Steele, Richard S. Solar water tank and method of making same. 4,296,799, Cl. 165-74.000.
Steffen, Klaus-Dieter: *See*—
Herrmann, Hans-Joachim; Meyer, Gunther; and Steffen, Klaus-Dieter, 4,297,502, Cl. 560-35.000.
Stegens, Ronald E., to Communications Satellite Corporation. Ferrite substrate microwave filter. 4,297,661, Cl. 333-204.000.
Steinhilper, Eric A.: *See*—
Kosek, Thomas P.; and Steinhilper, Eric A., 4,296,888, Cl. 239-403.000.
Stejskal, Joseph F.: *See*—
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, to Agfa-Gevaert AG. Apparatus for exposing and developing photosensitive material. 4,297,027, Cl. 355-27.000.
Stendel, Wilhelm: *See*—
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,297,366, Cl. 424-274.000.
Fuchs, Rainer; Gallenkamp, Bernd; and Stendel, Wilhelm, 4,297,371, Cl. 424-304.000.
Stephens, William I., to Knoll International, Inc. Floor panel-furniture support system. 4,296,574, Cl. 52-27.000.
Sterling Drug Inc.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,297,360, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,297,362, Cl. 424-263.000.
Lesher, George Y.; and Singh, Baldev, 4,297,363, Cl. 424-263.000.
Sterzer, Fred, to RCA Corporation. Serrodyning system employing an adjustable phase shifting circuit. 4,297,641, Cl. 328-15.000.
Stevens, Donald G.: *See*—
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Stevens, Francis J., to General Electric Company. Watthour meter and battery retaining apparatus therefor. 4,297,635, Cl. 324-156.000.
Steynor, James H.; and Hayes, Frederick, to EMI Limited. Encoding and decoding of digital recordings. 4,297,729, Cl. 360-40.000.
Stock, Hugh J.: *See*—
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Stockburger, George J., to ICI Americas Inc. Process for preparing sorbitan esters. 4,297,290, Cl. 260-410.600.
Stokkers, Henk, to Maryland Cup Corporation. Lidded container structure and package structure for same. 4,296,863, Cl. 206-504.000.
Stone & Webster Engineering Corp.: *See*—
Charlton, Webster T., 4,296,837, Cl. 184-15.00R.
Stoneleigh Trust, The: *See*—
Massa, Frank, 4,297,538, Cl. 179-180.000.
Stoute, Neville, Sr.; and Pennise, Robert J., to Falborn, James A.; and Bird, Richard M., part interest to each. Invalid chair. 4,296,506, Cl. 4-480.000.
Stowers, Jeffery P.; and Stowers, Kimball E., to Virginia Panel Corporation. Electrical connector having insulated locking shell for use on panel having metal ground plane. 4,296,990, Cl. 339-128.000.
Stowers, Kimball E.: *See*—
Stowers, Jeffery P.; and Stowers, Kimball E., 4,296,990, Cl. 339-128.000.
Strahan, Virgil H.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,296,994, Cl. 350-3.730.
Stranders, Roelof J., to Werner Weber Holding AB. Holder for liquid packaging containers. 4,296,958, Cl. 294-27.00H.
Straslicka, William A., to Carrier Corporation. Method of providing a sealing assembly between a steam chest and turbine casing. 4,296,538, Cl. 29-156.40R.
Strefling, Michael R. Alfalfa pelletizing apparatus. 4,297,091, Cl. 425-84.000.
Studebaker, Irving G.: *See*—
Ricketts, Thomas E.; Hutchins, Ned M.; and Studebaker, Irving G., 4,296,968, Cl. 299-2.000.
Sturgeon, Benjamin R.: *See*—
Anzaldua, Alfred B.; Anzaldua, David A.; and Sturgeon, Benjamin R., 4,296,924, Cl. 272-117.000.
Stutius, Wolfgang E.: *See*—
Scifres, Donald R.; and Stutius, Wolfgang E., 4,297,653, Cl. 331-94.50S.
Sudarsanam, Vasudevan: *See*—
Rajappa, Srinivasachari; and Sudarsanam, Vasudevan, 4,297,365, Cl. 424-270.000.
Sugano, Kazuhiko: *See*—
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Sugasawa, Fukashi: *See*—
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Sugimoto, Norimaro: *See*—
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Sugito, Kazuo; and Takeda, Sakuzo, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Fuel composition. 4,297,109, Cl. 44-56.000.
Sugiura, Susumu: *See*—
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Sugiura, Yoji: *See*—
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Suhac, Peter; Hafner-Milac, Natasa; and Dolenc, Bozidar, to LEK, tovarna farmacevtskih in kemicnih izdelkov. n.sol.o. Sodium alumoglucoheptonate and a process for its preparation. 4,297,293, Cl. 260-448.00B.
Suling, Carlhans: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,297,455, Cl. 525-439.000.
Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., to American Home Products Corporation. Method of suppressing cardiac arrhythmias. 4,297,373, Cl. 424-322.000.
Sullivan, Charles I., to Polaroid Corporation. Diffusion control layers in diffusion transfer photographic products. 4,297,431, Cl. 430-215.000.



Sulzer Brothers Limited: *See*—
Biller, Efim, 4,297,511, Cl. 564-331.000.
Sumida, Seizo: *See*—
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.
Sumita Optical Glass Manufacturing Co., Ltd.: *See*—
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Sumitomo Bakelite Company Limited: *See*—
Koshibe, Shigeru; and Nanjo, Motoyuki, 4,297,473, Cl. 528-144.000.
Sumitomo Chemical Company, Ltd.: *See*—
Kusayama, Senji; Nishi, Eijiro; and Stock, Hugh J., 4,297,160, Cl. 156-331.100.
Maegawa, Yuzo; Masuko, Fujio; and Nakamura, Makoto, 4,297,508, Cl. 562-425.000.
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, 4,297,282, Cl. 260-326.200.
Sanemitsu, Yuzuru; Mizutani, Masato; Sumida, Seizo; Katoh, Haruhiko; Oshio, Hiromichi; and Hashimoto, Shunichi, 4,297,129, Cl. 71-93.000.
Sumitomo Electric Industries, Ltd.: *See*—
Nishiyama, Yukinori; and Ichikawa, Hideji, 4,296,843, Cl. 188-73.430.
Nishizawa, Hideaki; and Iguchi, Shin-Ichi, 4,297,720, Cl. 357-30.000.
Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Plate used in condenser. 4,296,803, Cl. 165-110.000.
Summers, William A.: *See*—
Eckler, Paul E.; Summers, William A.; and Chandler, Ollie W., 4,297,443, Cl. 521-129.000.
Sun Aired Bag Co., Inc.: *See*—
Lefebvre, Henry R., 4,296,876, Cl. 223-91.000.
Sun, Yih-Yau: *See*—
Scherzer, Julius; Liu, Anh-Thu; and Sun, Yih-Yau, 4,297,325, Cl. 423-122.000.
Sundeen, Joseph E.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. Inhibitors of mammalian collagenase. 4,297,275, Cl. 260-112.50R.
Suntech, Inc.: *See*—
Scheibel, Edward G., 4,297,206, Cl. 208-254.00R.
Thompson, Robert M., 4,297,454, Cl. 525-432.000.
Suntime, Inc.: *See*—
Cooper, George H., 4,296,729, Cl. 126-421.000.
Surgikos: *See*—
Mason, Stanley I., Jr.; and Handler, Michael D., 4,296,746, Cl. 128-201.150.
Suzuki, Kohji: *See*—
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Suzuki, Minoru: *See*—
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Suzuki, Sadao: *See*—
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Suzuki, Shuichi: *See*—
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Suzuki, Tomio: *See*—
Morimoto, Kotaro; and Suzuki, Tomio, 4,297,093, Cl. 431-10.000.
Tabutin, Andre: *See*—
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Tachikawa, Shiro: *See*—
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Tachikawa Spring Company, Limited: *See*—
Sakurada, Kenichi; and Nishino, Takaichi, 4,296,965, Cl. 297-284.000.
Tadauchi, Masaharu; Sato, Kunio; and Tanno, Kiyohiko, to Hitachi, Ltd. Electrostatic recording apparatus. 4,297,715, Cl. 346-150.000.
Taddicken, Hermann; and Sachs, Wolfgang, to Eisele Apparate-und Geratebau GmbH. Device for producing sewing seam patterns of stitch groups. 4,296,696, Cl. 112-70.000.
Tak, Shiu M., to Wah Ming Electrics Limited. Brush assemblies for electric motors or generators. 4,297,605, Cl. 310-242.000.
Takada, Juichiro. Device for holding a passive vehicle restraint belt at a restraining position. 4,296,943, Cl. 280-804.000.
Takada, Takuzo: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,297,306, Cl. 264-23.000.
Takagi, Yasushi: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
Takahashi, Kaneaki: *See*—
Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, 4,296,705, Cl. 114-219.000.
Takahashi, Koichi; Hinatase, Fumio; and Shibanaka, Akira, to Toyo Kogyo Co., Ltd. Multiple cylinder internal combustion engine having mixture cut off means. 4,296,719, Cl. 123-198.00F.
Takahata, Yasuyuki: *See*—
Ohdai, Yozo; and Takahata, Yasuyuki, 4,296,621, Cl. 72-130.000.
Takamatsu, Hiroshi: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,296,972, Cl. 303-119.000.
Takamizawa, Yuji: *See*—
Komatsu, Makoto; Takamizawa, Yuji; and Ohta, Tazuo, 4,297,507, Cl. 562-416.000.
Takaniemi, Tauno K. Automaton for dealing out food and drink. 4,296,980, Cl. 312-35.000.
Takara Belmont Co., Ltd.: *See*—
Masuda, Tatsunosuke; Ono, Yoshio; and Sakamoto, Seiya, 4,297,724, Cl. 358-93.000.
Takechi, Hiroshi: *See*—
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Takechi, Sanjuro: *See*—
Kasai, Goro; Takechi, Sanjuro; and Harima, Hiroshi, 4,297,315, Cl. 264-322.000.
Takeda Chemical Industries, Ltd.: *See*—
Goto, Jugo; and Saegusa, Takeo, 4,297,449, Cl. 525-329.000.
Takeda, Sakuzo: *See*—
Sugito, Kazuo; and Takeda, Sakuzo, 4,297,109, Cl. 44-56.000.
Takeguchi, Masanobu; and Oyobe, Isao, to Marui Industry Co., Ltd. Method of purifying water in fish keeping water tank. 4,297,222, Cl. 210-748.000.
Takehara, Nobumitsu; and Isayama, Shogo, to Fuji Photo Film Co., Ltd. Coating method. 4,297,396, Cl. 427-284.000.
Takizawa, Hiroshi; Enomoto, Yutaka; Oiji, Yoshimasa; Hirayama, Tatsuyuki; and Hashimoto, Tamotu, to Kyowa Hakko Kogyo Co., Ltd. Certain muscle relaxant 3-methyl-2-benzofuran acetamides. 4,297,369, Cl. 424-285.000.
Talley, Randall E., III: *See*—
Lidik, Albert F.; and Talley, Randall E., III, 4,296,683, Cl. 100-53.000.
Talmoen, Arne: *See*—
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.
Talon, Inc.: *See*—
Doerter, Randall H., 4,296,533, Cl. 24-216.000.
Tamasovics, John F.: *See*—
Balkwill, G. Russell; Robinet, Jules P.; and Tamasovics, John F., 4,296,870, Cl. 220-3.300.
Tamura, Kohki: *See*—
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Tamura, Koichi; and Haraikawa, Tetsuo, to Tokico Ltd. Floating caliper type disc brake. 4,296,844, Cl. 188-73.380.
Tamura, Nobuhiro: *See*—
Nishikido, Joji; Tamura, Nobuhiro; Fukuoka, Yohei; and Yamane, Hiroyuki, 4,297,503, Cl. 560-42.000.
Tanahashi, Toshio: *See*—
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Tanaka, Hirokazu: *See*—
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,297,096, Cl. 435-128.000.
Tanaka, Kouichi; and Amazawa, Kiyoshi, to Nippon Electric Co., Ltd.; and Clarion Co., Ltd. Automatic gain control circuit comprising a circuit for comparing a modulated signal with an envelope detected signal. 4,297,645, Cl. 330-280.000.
Tanaka, Mamoru: *See*—
Ishida, Takashi; and Tanaka, Mamoru, 4,296,907, Cl. 248-573.000.
Tanaka, Ryosaku: *See*—
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Tanaka, Takayasu: *See*—
Miyamoto, Kinzo; Tanaka, Takayasu; and Inoue, Yoshimi, 4,297,263, Cl. 260-32.6PQ.
Tang, Louis S., to Bendix Corporation, The. Hydraulic brake booster and control valve therefor. 4,296,671, Cl. 91-5.000.
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, to Teljin Limited. Cotton yarn-like textured composite yarn and a process for manufacturing the same. 4,296,597, Cl. 57-205.000.
Tani, Tatsuo; Nagahara, Yasumori; Ohta, Sakae; Suzuki, Minoru; and Hashizume, Kiyozo, to Ricoh Company, Ltd. Powder material transportation apparatus. 4,297,021, Cl. 355-3.00R.
Tanimoto, Akira: *See*—
Iwai, Michinobu; and Tanimoto, Akira, 4,297,555, Cl. 200-153.00G.
Tanno, Kiyohiko: *See*—
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Taplin, John F.: *See*—
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Tarnero, Maurice: *See*—
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Tashiro, Sadaji: *See*—
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Tatani, Atsushi; and Okino, Susumu, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treatment of a discharge liquid produced in treatment of an exhaust gas. 4,297,332, Cl. 423-240.000.
Tawse, Ian S., to Gen-Tech, Inc. Axial air gap alternators/generators of modular construction. 4,297,604, Cl. 310-168.000.
Tax o mex AG: *See*—
Schlumpf, Alois, 4,296,873, Cl. 221-213.000.
Taylor, Donald F.; and Bostock, James H., to Otis Engineering Corporation. High temperature well packer. 4,296,806, Cl. 166-120.000.

Taylor, Edward S.; and Hirschle, George W., to General Atomic Company. Vapor generator. 4,296,713, Cl. 122-32.000.
Taylor, Glenn R. Pushbutton operator. 4,297,556, Cl. 200-330.000.
Taylor, Gordon J., to Union Carbide Corporation. Process for producing carbon-carbon fiber composites suitable for use as aircraft brake discs. 4,297,307, Cl. 264-29.500.
Taylor, John R.: *See—*
Laishley, William J.; and Taylor, John R., 4,297,734, Cl. 360-78.000.
Taylor, Thomas. Respiratory monitor and excessive intrathoracic or abdominal pressure indicator. 4,296,757, Cl. 128-721.000.
Techinter S.A.: *See—*
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Technical Research of Citizen Watch Co., Ltd.: *See—*
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Technicare Corporation: *See—*
Mezrich, Reuben S.; Colleoni, Alec; and Lyons, David J., 4,297,009, Cl. 352-86.000.
Teledyne Industries, Inc.: *See—*
Campagna, Barry A., 4,296,617, Cl. 70-63.000.
Telefonaktiebolaget L M Ericsson: *See—*
Augst, Horst G., 4,297,659, Cl. 333-191.000.
Teljin Limited: *See—*
Tani, Masayuki; Okui, Mitsuhiko; and Matsumoto, Mitsuo, 4,296,597, Cl. 57-205.000.
Tellier, Pierre: *See—*
Delavarenne, Serge Y.; Dubreux, Bernard; and Tellier, Pierre, 4,297,288, Cl. 260-378.000.
Temple, Paul A., to United States of America, Navy. Dark field surface inspection illumination technique. 4,297,032, Cl. 356-366.000.
Tenuta, Antonio. Method of freezing tomatoes. 4,297,381, Cl. 426-615.000.
Terada, Takami, to Aisin Seiki Kabushiki Kaisha; and Shatai Kogyo Kabushiki Kaisha. Seat for an automotive vehicle. 4,296,966, Cl. 297-369.000.
Teramachi, Hiroshi. Linear ball bearing unit. 4,296,974, Cl. 308-6.00C.
Terry, Ronald E.: *See—*
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Terui, Yohji: *See—*
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Terumo Corporation: *See—*
Kobayashi, Susumu, 4,296,882, Cl. 233-21.000.
Tesoro, Joseph. Slip joint pliers. 4,296,655, Cl. 81-405.000.
Tessler, Martin M., to National Starch and Chemical Corporation. Novel N-(alkyl)-N-(2-haloethyl)-aminomethylphosphonic acids, a method for the preparation thereof and their use in the preparation of starch ether derivatives. 4,297,299, Cl. 260-502.500.
Tetzlaff, Karl-Heinz; Riemenschneider, Wilhelm; and Leuschner, Gunter, to Hoechst Aktiengesellschaft. Pressure vessel having quick-action locking means. 4,297,323, Cl. 422-208.000.
Texaco Development Corp.: *See—*
Gilbert, Richard J.; and Rice, Doris M., 4,297,444, Cl. 521-160.000.
Hunter, Walter D., 4,297,226, Cl. 252-8.55D.
Hunter, Walter D., 4,297,469, Cl. 526-287.000.
Texaco Inc.: *See—*
Bartley, Burton H.; and Estes, John H., 4,297,245, Cl. 252-460.000.
Kalfoglou, George, 4,296,812, Cl. 166-274.000.
Witte, Arnold C.; and Coleman, Richard L., 4,297,227, Cl. 252-18.000.
Texas Instruments Incorporated: *See—*
Mundt, Randall S.; Wooldridge, Timothy A.; and Blasingame, Thomas O., 4,297,162, Cl. 156-643.000.
Parsons, Robert, 4,297,693, Cl. 340-744.000.
TGS Systems, Inc.: *See—*
Rhonehouse, Donald E., 4,297,121, Cl. 65-348.000.
Thatcher, Imbrie: *See—*
Shaw, Manuel; and Thatcher, Imbrie, 4,297,689, Cl. 340-632.000.
Theodore, Louis. Gas filtration apparatus. 4,297,113, Cl. 55-213.000.
Therm-O-Disc, Incorporated: *See—*
Place, Donald E., 4,297,668, Cl. 337-365.000.
Thigpen, Ben B.; and Porter, James A., Jr., to Western Geophysical Company of America. Air-gun fire time sensor. 4,296,827, Cl. 181-107.000.
Thomas, Jeffrey R., to PQ Corporation. Drying of potassium silicate. 4,297,163, Cl. 159-48.00R.
Thompson, Bernard B., to Boeing Company, The. Brake torque limiter. 4,296,897, Cl. 244-111.000.
Thompson, Elmer R. Sewing machine conversion apparatus. 4,296,703, Cl. 112-310.000.
Thompson, Jerome B. English muffin, method and apparatus. 4,296,682, Cl. 99-426.000.
Thompson, Robert M., to Suntech, Inc. Manufacture of a block copolymer containing a polyetheramide and a polylactam. 4,297,454, Cl. 525-432.000.
Thomson-CSF: *See—*
Dupressoir, Albert, 4,297,710, Cl. 343-756.000.
Lacomme, Philippe, 4,297,703, Cl. 343-7.300.
Matherat, Philippe, 4,297,694, Cl. 340-750.000.
Thornton, Kenneth, to Rolls-Royce Motors Limited. Automatic transmission. 4,296,646, Cl. 74-688.000.
Thorpe, Cameron L.: *See—*
Hales, Marwood J.; and Thorpe, Cameron L., 4,296,602, Cl. 60-398.000.
Thyssen Aktiengesellschaft vormals August Thyssen-Hutte: *See—*
Hoffken, Erich; Kleine-Kleffmann, Werner; Bertram, Rolf; Abele, Karl-Heinz; and Michalski, Gunter, 4,297,151, Cl. 148-9.00R.
Thyssen Industrie AG: *See—*
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Tikhonov, Valentin N.: *See—*
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.
Tilgner, Leopold: *See—*
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Timex Corporation: *See—*
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Ho, Kok-Kit, 4,296,532, Cl. 24-206.00R.
TME, Inc.: *See—*
Jesse, Harold W.; and Jones, Peter M., 4,297,522, Cl. 174-36.000.
Toda, Tosifusa: *See—*
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Tokico Ltd.: *See—*
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Tokunaga, Shinobu; and Shiina, Yuichi, to Sumita Optical Glass Manufacturing Co., Ltd. Optical glass for optical paths. 4,297,141, Cl. 501-67.000.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.
Iwai, Michinobu; and Tanimoto, Akira, 4,297,555, Cl. 200-153.00G.
Kawaguchi, Yoshihiro; Higuchi, Kosuke; and Kitajima, Yoshiro, 4,297,553, Cl. 200-145.000.
Kimura, Takashi, 4,297,597, Cl. 307-315.000.
Okatsuka, Hisahi, 4,297,568, Cl. 235-435.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Anezaki, Yoshimitsu, 4,297,612, Cl. 313-446.000.
Tolliver, Wilbur E. Pipe joint seal. 4,296,933, Cl. 277-34.300.
Tom, M. Dale. Water detection device. 4,297,686, Cl. 340-604.000.
Tomimura, Eijiro: *See—*
Mise, Yoshinari; and Tomimura, Eijiro, 4,297,146, Cl. 127-60.000.
Tommaney, Joseph W.: *See—*
Patil, Balaji V.; and Tommaney, Joseph W., 4,297,132, Cl. 75-10.00V.
Topalian, Harry H.; Wyss, Clement R.; Kenyon, Ralph E.; and Dec, Anthony F., to General Foods Corporation. Frozen aerated ready-to-eat gelatin composition. 4,297,379, Cl. 426-565.000.
Toray Industries, Inc.: *See—*
Deguchi, Yukichi; Yamagishi, Hideki; and Kirimura, Shunichiro, 4,297,187, Cl. 204-165.000.
Nakata, Minoru; Sato, Haruyo; and Imamura, Shinzo, 4,297,477, Cl. 528-323.000.
Torgersen, Jan H.: *See—*
Gjelsvik, Norvald; Hannestad, Gunnar; Hundere, Ingleif; and Torgersen, Jan H., 4,297,327, Cl. 423-126.000.
Torii, Takahiro: *See—*
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Total Oil Great Britain Limited: *See—*
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Tournier, Claude. Skinning machine for the heads and limbs of slaughtered animals. 4,296,526, Cl. 17-21.000.
Tournier, Edmond: *See—*
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Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., to Tweco Products, Inc. Semi-automatic welding gun. 4,297,561, Cl. 219-137.630.
Toyo Jozo Kabushiki Kaisha: *See—*
Fujii, Tadashiro; Satoi, Shuzo; Muto, Naoki; Hayashi, Mitsuo; Kodama, Akira; and Otani, Masaru, 4,297,486, Cl. 536-17.00R.
Toyo Kogyo Co., Ltd.: *See—*
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Toyo Pulp Co. Ltd.: *See—*
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Toyoda Koki Kabushiki Kaisha: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Kizaki, Jiro; and Fujii, Takashi, 4,296,604, Cl. 60-562.000.
Nakanishi, Kiyoshi; Okumura, Takeshi; Deguchi, Ryuichi; and Tanahashi, Toshio, 4,296,720, Cl. 123-309.000.
Okano, Hiroshi; and Sato, Akira, 4,296,648, Cl. 74-798.000.
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.
Travis, Karen L.: *See—*
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.
Treczka, Leo, to Spinner GmbH Elektrotechnische Fabrik. 3dB Waveguide directional coupler. 4,297,658, Cl. 333-113.000.





Tregurtha, Steven J.; and Cryer, Edward, to Lucas Industries Limited. Direction indicator switch. 4,297,549, Cl. 200-61.270.
Trepka, William J., to Phillips Petroleum Co. Orthoesters as coupling agents for producing monovinylarene homopolymers. 4,297,464, Cl. 526-181.000.
Trico Products Corporation: *See—*
Mower, Peter, 4,296,521, Cl. 15-250.320.
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Trio Kabushiki Kaisha: *See—*
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Triumph-Werke Nurnberg A.G.: *See—*
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Trocciola, John C.: *See—*
Nickols, Richard C., Jr.; Trocciola, John C.; and Rourke, James E., 4,297,419, Cl. 429-44.000.
Trochoid Power Corporation: *See—*
Hoffmann, Ralph M., 4,297,090, Cl. 418-61.00A.
Trotzek, Gunter: *See—*
Hornberg, Harald; Trotzek, Gunter; and Hahnefeld, Fedor, 4,297,044, Cl. 400-473.000.
True Temper Corporation: *See—*
Luebke, Robert W., 4,296,884, Cl. 238-2.000.
Trutna, William R., Jr., to Leland Stanford University, Board of Trustees of. Multipath Raman cell for wavelength conversion. 4,297,600, Cl. 307-426.000.
TRW Inc.: *See—*
Zehren, James N., 4,296,548, Cl. 29-871.000.
Tsai, Shirley C.; Graham, Richard H.; and Oder, Robin R., to Gulf Research & Development Company. In situ gasification of bituminous coal. 4,296,809, Cl. 166-259.000.
Tschunt, Edgar: *See—*
Schwierz, Gunter; Schittenhelm, Rudolf; Schmitt, Gunter; and Tschunt, Edgar, 4,297,582, Cl. 250-445.00T.
Tsubai, Yasuo: *See—*
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Tsuboi, Akira; and Kato, Shiro, to Toyoda Koki Kabushiki Kaisha. Tool storage magazine for a machine tool. 4,296,541, Cl. 29-568.000.
Tsuchiya, Tsutomu: *See—*
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Tsuchiya, Yoshimi; Sagae, Masayuki; and Mizutani, Hiroshi, to Kao Soap Co., Ltd. Absorbent material. 4,297,410, Cl. 428-283.000.
Tsuda, Minoru; and Nakamura, Yoichi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Light sensitive compositions of polymethyl isopropenyl ketone. 4,297,433, Cl. 430-270.000.
Tsukahara, Hirokazu: *See—*
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Tsutsui, Kotaroh; and Kinugawa, Ryoji, to Alps Electric Co., Ltd. Interlocking gang push-button switch. 4,297,540, Cl. 200-5.00B.
Tsypina, Zinaida D.: *See—*
Berkhin, Iosif M.; Gudze, Robert A.; Kekalo, Vasily I.; Panasenko, Nikolai N.; Podbeltsev, Viktor I.; Tsypina, Zinaida D.; and Mukhin, Vladislav N., 4,296,867, Cl. 212-229.000.
Tucker, Trevor W.; and Cornish, William D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Microwave frequency division by phase locked loops. 4,297,648, Cl. 331-1.00R.
Tunashima, Seiichi: *See—*
Ito, Isao; and Tunashima, Seiichi, 4,297,034, Cl. 356-394.000.
Tuominen, Pertti: *See—*
Uusitalo, Leo; and Tuominen, Pertti, 4,297,067, Cl. 414-114.000.
Turillon, Pierre P.; Hull, Michael N.; and Nordblom, George F., to International Nickel Co., Inc., The. Battery and electrolytic cell electrodes. 4,297,421, Cl. 429-225.000.
Turpin, Daniel: *See—*
Chevreux, Pierre; Nguyen, Van-Tao; Roman, Alain; and Turpin, Daniel, 4,297,185, Cl. 204-159.150.
Tweco Products, Inc.: *See—*
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.
Tyler, Hugh J.; and Conway, William H., to Robertshaw Controls Company. Microwave oven temperature indicator and control means. 4,297,557, Cl. 219-10.55R.
Tylo Sauna S.A.: *See—*
Janson, Mats O., 4,296,507, Cl. 4-524.000.
Tyo, James H., to Camp International, Inc. Convertible parapodium. 4,296,761, Cl. 128-80.00G.
Ube Industries, Ltd.: *See—*
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Uchidoi, Masanori: *See—*
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Uchiyama, Yoshihiro: *See—*
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Ucinhazska, Bruno: *See—*
Norden, Jurgen; and Ucinhazska, Bruno, 4,296,885, Cl. 239-1.000.
Ueda, Hiroshi: *See—*
Sakai, Yoshihiro; Tanaka, Ryosaku; Kita, Toshio; Shimotake, Munetoshi; Yamada, Tsuguyoshi; and Ueda, Hiroshi, 4,296,790, Cl. 152-354.00R.
Ueda, Nobuo: *See—*
Kato, Makoto; Ueda, Nobuo; and Matsushima, Hiroaki, 4,297,166, Cl. 376-194.000.
Uemura, Hiroshi: *See—*
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, to Ube Industries, Ltd. Method for polymerizing α-olefin. 4,297,463, Cl. 526-128.000.
Uerlichs, Johannes: *See—*
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Uhrig, Heinz; and Deubel, Reinhold, to Hoechst Aktiengesellschaft. Manufacture and use of non-ionogenic interface-active agents based on modified rosins. 4,297,270, Cl. 260-104.000.
Umaba, Toshikatsu: *See—*
Abe, Kazunobu; Nakatsuji, Tadao; and Umaba, Toshikatsu, 4,297,248, Cl. 252-477.00R.
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Production of a selectively protected N-acylated derivative of an aminoglycosidic antibiotic. 4,297,485, Cl. 536-10.000.
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Union Carbide Corporation: *See—*
Bryant, David R.; and Galley, Richard A., 4,297,239, Cl. 252-412.000.
Chiasson, Bertrand A., 4,297,509, Cl. 562-456.000.
Davis, Robert B., 4,296,610, Cl. 62-55.000.
Hsu, Fu-Tong; and Kantz, John F., 4,296,860, Cl. 206-386.000.
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,297,241, Cl. 252-435.000.
Kilinskas, William A.; Selines, Ronald J.; and Vand den Sype, Jaak S., 4,296,512, Cl. 10-27.00E.
Koleske, Joseph V., 4,297,476, Cl. 528-300.000.
Lok, Brent M. T.; and Izod, Thomas J. P., 4,297,335, Cl. 423-328.000.
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,297,147, Cl. 134-7.000.
Ritscher, James S.; and Sandner, Michael R., 4,297,328, Cl. 423-213.200.
Sigmund, Paul W.; and Butwell, Kenneth F., 4,297,329, Cl. 423-228.000.
Taylor, Gordon J., 4,297,307, Cl. 264-29.500.
Union Oil Company of California: *See—*
Moorehead, Eric L., 4,297,243, Cl. 252-455.00Z.
United Chemi-Con, Inc.: *See—*
Dyer, Christopher K., 4,297,184, Cl. 204-129.400.
United Kingdom Atomic Energy Authority: *See—*
Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., 4,297,246, Cl. 252-465.000.
United States Borax & Chemical Corporation: *See—*
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Agriculture: *See—*
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Paciorek, Kazimiera J. L.; Kratzer, Reinhold H.; Ito, Thomas I.; and Nakahara, James H., 4,297,510, Cl. 564-13.000.
Army: *See—*
Boothe, Robert R., 4,297,705, Cl. 343-771.000.
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Garrett, Harold E., 4,296,687, Cl. 102-518.000.
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Claffy, Richard D.; and Lovelace, Reginald B., 4,296,771, Cl. 137-110.000.
Dittman, Charles C.; and St. Clair, Richard C., 4,297,622, Cl. 318-254.000.
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U.S. Philips Corporation: *See—*
Buchner, Robert B., 4,297,536, Cl. 179-170.00D.
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Goerth, Joachim, 4,297,654, Cl. 331-108.00D.
Goudin, Robert, 4,296,753, Cl. 128-660.000.
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Matthijsse, Matthijs, 4,296,906, Cl. 248-280.100.
Melwisch, Harald; and Looren de Jong, Hendrikus, 4,297,731, Cl. 360-70.000.
Sanderson, Hendrik J., 4,297,733, Cl. 360-77.000.

Severijns, Adrianus P.; and Staas, Frans A., 4,296,609, Cl. 62-514.00R.

United States Steel Corporation: *See*—
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United Technologies Corporation: *See*—
Krauss, Timothy A.; and Roman, Stephan, 4,297,080, Cl. 416-141.000.
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University of California, The Regents of the: *See*—
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University of Illinois Foundation: *See*—
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University of Melbourne, The: *See*—
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University of Surrey: *See*—
Hannaht, David J., 4,297,409, Cl. 428-247.000.

Upjohn Company, The: *See*—
Babcock, John C.; Campbell, J. Allan; and Lobl, Thomas J., 4,297,350, Cl. 424-238.000.
Craven, Richard L., 4,297,339, Cl. 424-19.000.
Nelson, Stephen J., 4,297,285, Cl. 260-346.730.
Sih, John C., 4,297,504, Cl. 560-119.000.

Ura, Hiroaki: *See*—
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Uraneck, Carl A.; Burleigh, John E.; and Solomon, Paul W., to Phillips Petroleum Company. Dienyllithium initiated polymers. 4,297,451, Cl. 525-366.000.

Url, Karlheinz; and von Basse, Paul W., to Siemens Aktiengesellschaft. Integratable dynamic current source for semiconductor modules. 4,297,592, Cl. 307-583.000.

Urui, Kiyoshi: *See*—
Fukuda, Takeo; Hanawa, Kazuhiko; Urui, Kiyoshi; and Haseyama, Michiko, 4,297,532, Cl. 179-18.0AB.

Uruta, Hisanari; Takahashi, Kaneaki; Masuda, Hirotsugu; and Kurata, Tomoyuki, to Bridgestone Tire Co., Ltd. Pneumatic marine fender. 4,296,705, Cl. 114-219.000.

Usardi, Maria M.: *See*—
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USM Corporation: *See*—
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Netzsch, Hermann, 4,297,560, Cl. 219-130.010.
Valks, Robert K., 4,296,614, Cl. 69-48.000.

Utagawa, Ken; Hoshino, Kunihisa; Shirasu, Hiroshi; and Ogasawara, Akira, to Nippon Kogaku K.K. Focus detecting device. 4,297,571, Cl. 250-201.000.

Uusitalo, Leo; and Tuominen, Pertti, to Outokumpu Oy. Method and apparatus for handling packed layers of support rods in an electrolytic refining plant. 4,297,067, Cl. 414-114.000.

Vadetec Corporation: *See*—
Kemper, Yves J., 4,296,647, Cl. 74-690.000.

Vail, Andc. Power supply system. 4,297,590, Cl. 307-43.000.

Valks, Robert K., to USM Corporation. Leather press. 4,296,614, Cl. 69-48.000.

Valli & Colombo S.p.A.: *See*—
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van der Lely, Cornelis. Vehicle having bogie mounted wheels. 4,296,826, Cl. 180-24.000.

van der Lugt, Arie, to Gist-Brocades N.V. Closure treatment machine. 4,296,769, Cl. 134-68.000.

Vanlerberghe, Guy; and Sebag, Henry, to L'Oreal. Cyclical tensio-active polyethers. 4,297,102, Cl. 8-406.000.

Vann, William P.: *See*—
Mansfield, Gerald R.; Travis, Karen L.; and Vann, William P., 4,297,337, Cl. 424-1.000.

Van Uitert, LeGrand G.: *See*—
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.

Van Vliet, Raymond A., to Weyerhaeuser Company. Method for application of elastic to articles. 4,297,157, Cl. 156-164.000.

Van Wassenhove, Bernard, to CMI Corporation. Folding gooseneck assembly. 4,296,941, Cl. 280-423.00B.

van Zorge, Jacob A., to ACF Chemiefarma NV. Anti-ulcer compositions containing certain pyridyl oxime ethers. 4,297,359, Cl. 424-263.000.

Varel Manufacturing Company: *See*—
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Vartoukian, Artin G., to Singer Company, The. Fabric clamp. 4,296,699, Cl. 112-121.150.

Vcelka, John L.: *See*—
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VDO Adolf Schindling AG: *See*—
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Verable, Diara; and Gibson, Willie M. Automobile shed. 4,296,575, Cl. 52-66.000.

Verbicky, John W., to General Electric Company. Chlorination of phthalic anhydride. 4,297,283, Cl. 260-346.300.

Verdier, Jean-Pierre: *See*—
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Vetter, Artur, to Multivac Sepp Haggenmuller KG. Sealing station of vacuum packaging machines. 4,296,588, Cl. 53-86.000.

Vickers Limited: *See*—
Rogers, Stanley J. C.; and Taplin, John F., 4,296,983, Cl. 312-263.000.

Vidal, Paul, to Societe d'Etude du Radant. Apparatus and methods for correcting dispersion in a microwave antenna system. 4,297,708, Cl. 343-754.000.

Viehrig, Wolfgang: *See*—
Stemme, Otto; Fergg, Berthold; Osegowitsch, Viktor; and Viehrig, Wolfgang, 4,297,027, Cl. 355-27.000.

Vik, Bjarne: *See*—
Mejdell, Glor T.; Palmgren, Odd E.; Talmoen, Arne; and Vik, Bjarne, 4,297,483, Cl. 528-500.000.

Vilicich, John: *See*—
Ross, Jim; and Vilicich, John, 4,296,726, Cl. 126-25.00B.

Vinson, Joseph J. Reversible garment. 4,296,498, Cl. 2-115.000.

Virginia Panel Corporation: *See*—
Stowers, Jeffery P.; and Stowers, Kimball E., 4,296,990, Cl. 339-128.000.

Vitello, John P.; and Grummon, Glenn D., to Mallinckrodt, Inc. System for generating and containerizing radioisotopes. 4,296,785, Cl. 141-105.000.

Vockenhuber, Karl: *See*—
Freudenschuss, Otto, 4,297,732, Cl. 360-72.100.

Vogel, Ignaz. Passenger seat. 4,296,967, Cl. 297-451.000.

Vogt, Alfred, to Hoval Interliz AG. Two-chamber boiler for burner firing and solid fuel firing. 4,296,712, Cl. 122-22.000.

Vogt, Frederick G., deceased (by Vogt, Mary J., executrix); and Sparrell, Patricia T., to Betz Laboratories, Inc. Low level chromate-based corrosion inhibition in aqueous mediums. 4,297,317, Cl. 422-16.000.

Vogt, Mary J., executrix: *See*—
Vogt, Frederick G., deceased; and Sparrell, Patricia T., 4,297,317, Cl. 422-16.000.

Voirol, Felix: *See*—
Guex, Woldemar; Klaeui, Heinrich; Pauling, Horst; and Voirol, Felix, 4,296,801, Cl. 165-104.170.

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Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,297,744, Cl. 364-703.000.

Volkswagenwerk AG: *See*—
Bernhardt, Winfried; Grundmann, Edgard; and Kroll, Rudolf, 4,296,732, Cl. 126-426.000.

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Hofbauer, Peter; Willmann, Michael; and Wundrak, Egon, 4,296,716, Cl. 123-195.00C.
Oberpichler, Gerd; and Honig, Ernst-August, 4,296,652, Cl. 74-868.000.

von Basse, Paul W.: *See*—
Url, Karlheinz; and von Basse, Paul W., 4,297,592, Cl. 307-583.000.

von der Eltz, Hans-Ulrich; Lehinant, Armand; Lehmann, Joachim W.; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for the dyeing of synthetic polyamide fibers with reactive dyes according to the batchwise exhaustion method. 4,297,101, Cl. 8-531.000.

von Petery, Curt, to Gutehoffnungshutte Sterkrade A.G. Positive control system for piston compressor valves. 4,297,083, Cl. 417-53.000.

Vormbrock, Rolf; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Hemolysing solution preparing hemolysed blood having a stabilized glucose content. 4,297,238, Cl. 252-408.000.

Vought Corporation: *See*—
Krall, Kenneth M., 4,296,900, Cl. 244-219.000.

Vuyovich, John M. Piston top-dead-center detector. 4,296,629, Cl. 73-116.000.

W. Hegenscheidt Gesellschaft mbH: *See*—
Bagusche, Siegfried, 4,296,620, Cl. 72-100.000.

W. R. Grace & Co.: *See*—
Jachimowicz, Felek, 4,297,481, Cl. 528-392.000.
Wood, Louis L.; and Larsen, Donald W., 4,297,482, Cl. 528-405.000.

Wada, Takeshi; Kominami, Yasuo; Miyamoto, Yukihiko; and Yamada, Tsuneo, to Hitachi, Ltd.; and Trio Kabushiki Kaisha. Monostable multivibrator circuit and FM detector circuit employing predetermined load resistance and constant current to increase response rate of differential transistor pair. 4,297,601, Cl. 307-555.000.

Wade, David R.; and Munch, Walter, to Baldwin Piano & Organ Company. Capture combination action system for electronic organs. 4,296,667, Cl. 84-345.000.

Waghorn, Peter E.: *See*—
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Wagner Electric Corporation: *See*—
Cortorillo, Salvatore F., 4,297,611, Cl. 313-222.000.

Wagner, Kuno: *See*—
Reischl, Artur; and Wagner, Kuno, 4,297,456, Cl. 525-452.000.



Wagstaff, Robert A.: *See*—
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Wah Ming Electrics Limited: *See*—
Tak, Shiu M., 4,297,605, Cl. 310-242.000.

Waitkus, Phillip A.; and D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor), to Plastics Engineering Company. Polymerization products of polyimide derivatives having unsaturated terminal amide groups. 4,297,467, Cl. 526-259.000.

Wakisaka, Hiroshi: *See*—
Shinohara, Hiroshi; Otsuka, Yasuhiro; Matsumoto, Shinichi; Wakisaka, Hiroshi; and Furutani, Toshinobu, 4,297,192, Cl. 204-195.00S.

Wakushima, Yoshikazu: *See*—
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Waldrop, T. William; and Campbell, Willis R., to Sperry Corporation. Automatic bale ejection drive. 4,296,596, Cl. 56-341.000.

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Hakansson, Hakan B.; Persson, Lennart P. E.; and Wall, Berth-Ove G., 4,296,633, Cl. 73-362.0AR.

Wallace, Christopher B., to Bio-Group, Inc. Process for the biological degradation of organic-containing waste matter. 4,297,122, Cl. 71-12.000.

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Walter Kidde & Company, Inc.: *See*—
Harshman, Ronald W.; and Dietrich, Lynn A., 4,296,773, Cl. 137-312.000.

Walter, Rolf: *See*—
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Walther, Gerhard: *See*—
Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., 4,297,354, Cl. 424-248.510.

Wang, An, to Wang Laboratories, Inc. Helical print head mechanism. 4,297,042, Cl. 400-163.200.

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Wangermann, Jochen, to Gruner & Jahr AG & Co. Apparatus for stacking folded printing products. 4,296,684, Cl. 100-292.000.

Wankel, Felix. Seal mechanism for the rotor periphery of a rotary piston engine. 4,296,936, Cl. 277-81.00P.

Ward, Franklin D.; and Engeman, Rock A. Surfboard carrier. 4,296,878, Cl. 224-32.00A.

Ward, Herbert J.; Dobbie, Derek J.; and Lyall, Brian, to British Cellophane Limited. Heat-sealable polypropylene films. 4,297,415, Cl. 428-516.000.

Warner, Gary N., to AMP Incorporated. Connector with improved terminal support. 4,296,988, Cl. 339-97.00R.

Watanabe, Hideo: *See*—
Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, 4,296,752, Cl. 128-635.000.

Watanabe Instruments Corp.: *See*—
Ando, Kazunari; Matsunaga, Hirokazu; and Ayabe, Hideaki, 4,297,714, Cl. 346-139.00C.

Watanabe, Yuichi: *See*—
Nagao, Shozo; Ohashi, Yoshinobu; Watanabe, Yuichi; and Wakushima, Yoshikazu, 4,296,953, Cl. 285-302.000.

Watson, Ronald S. Anchor device for propeller rotator. 4,296,898, Cl. 244-115.000.

Wavin B.V.: *See*—
Nicholas, Terry G., 4,297,053, Cl. 405-121.000.

Wayt, Newell E. Gas anchor. 4,297,084, Cl. 417-179.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Jardin, Hans; and Hirschberger, August, 4,296,962, Cl. 296-217.000.

Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., to Sperry - New Holland. Universal crop divider mechanism. 4,296,593, Cl. 56-98.000.

Webb, Gerald F., to Northern Telecom Limited. Modular telephone jack. 4,297,529, Cl. 179-1.0PC.

Weber, Karl-Heinz; Schneider, Claus; Walther, Gerhard; Pook, Karl-Heinz; Boke, Karin; and Bechtel, Wolf D., to Boehringer Ingelheim GmbH. Substituted 4-amino-2,6-diaryl-tetrahydrothiopyrans and salts thereof, and use as antidepressants. 4,297,354, Cl. 424-248.510.

Webster, Emmett G.: *See*—
Webb, Bryant F.; Makofka, Stanley J.; Webster, Emmett G.; and Blakeslee, Edward A., 4,296,593, Cl. 56-98.000.

Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft. Arrangement for cooling the rotor of an electric machine with a superconducting field winding. 4,297,603, Cl. 310-53.000.

Weil, Edward D., to Stauffer Chemical Company. Copolycondensation products of β-haloalkyl phosphates and dialkyl phosphonates. 4,297,138, Cl. 106-18.180.

Weiler, Ernest D.: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.

Weinar, Roger N. Wall constructed from panels held in position with the aid of concealed fasteners and concealable fasteners for use in assembling such wall. 4,296,580, Cl. 52-281.000.

Weiner, Milton L., to Mobil Oil Corporation. Heat sealable packaging film comprising propylene polymer substrate and a surface layer of an ethylene copolymer and a different olefin copolymer. 4,297,411, Cl. 428-347.000.

Weinmann, Ernst: *See*—
Bohn, Hans; and Weinmann, Ernst, 4,297,343, Cl. 424-85.000.

Weir, William D.: *See*—
Kilbourn, Edward E.; Weiler, Ernest D.; and Weir, William D., 4,297,342, Cl. 424-84.000.

Weiss, Richard: *See*—
Simon, Manfred; Moschter, Erwin; Spiess, Karl-Heinz; and Weiss, Richard, 4,297,099, Cl. 8-484.000.

Welch, Melvin B.: *See*—
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Weller, Alois; and Mai, Wolfgang, to Kieserling & Albrecht. Crank press with lateral rod ejector. 4,296,625, Cl. 72-345.000.

Wellington, Roger D., to Augat Inc. Electrical contact with improved means for solder wicking and degassing. 4,296,993, Cl. 339-275.00B.

Wells, Bruce D.: *See*—
McConomy, Thomas A.; and Wells, Bruce D., 4,297,334, Cl. 423-321.00R.

Welsh, Luther; Bergquist, Daryl J.; and Watanabe, Hideo, to Johnson & Johnson. Transcutaneous oxygen sensor with adjacent heater. 4,296,752, Cl. 128-635.000.

Werner, Peter, Drews, Ulrich; Elbers, Theodor; and Jackel, Klaus, to Robert Bosch GmbH. Circuit arrangement for obtaining an interference-free trigger signal especially for a fuel apportionment device in an internal combustion engine. 4,297,599, Cl. 307-355.000.

Werner Weber Holding AB: *See*—
Stranders, Roelof J., 4,296,958, Cl. 294-27.00H.

Werner, Wolfgang: *See*—
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Wernicke, Hans J.: *See*—
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Wess, Beatrice M. Skin moisturizing and cleansing cream. 4,297,374, Cl. 424-364.000.

Wessling, Diether, to Bayer Aktiengesellschaft. Process for halogenating copper phthalocyanine. 4,297,281, Cl. 260-314.500.

West Company, The: *See*—
Brignola, Dominic J., 4,296,786, Cl. 141-309.000.

Western Electric Co., Inc.: *See*—
Garrett, Robert W., 4,297,190, Cl. 204-192.00E.

Western Geophysical Company of America: *See*—
Thigpen, Ben B.; and Porter, James A., Jr., 4,296,827, Cl. 181-107.000.

Westinghouse Air Brake Company: *See*—
Housman, Richard J., 4,296,868, Cl. 213-50.000.

Westinghouse Electric Corp.: *See*—
Chen, Cheng-Lin, 4,297,191, Cl. 204-193.000.
Durgin, George A.; and Demers, Daniel E., 4,297,077, Cl. 416-97.00R.
Gupta, Tapan K.; and Pietsch, Herbert E., 4,297,250, Cl. 252-518.000.
Hagberg, John E., 4,297,740, Cl. 361-67.000.
Seidel, Martin P., 4,297,254, Cl. 260-18.0EP.
Wolfe, Donald L.; Modglin, Donald D.; and Merrick, George J., 4,297,061, Cl. 409-131.000.

Westland Aircraft Limited: *See*—
Martin, Alfred C., 4,297,078, Cl. 416-134.00A.

Wettstein, Ernest C.: *See*—
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Weyerhaeuser Company: *See*—
Lee, Peter F., 4,297,164, Cl. 162-60.000.
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Whaley, Ralph D.: *See*—
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Wheelabrator-Frye Inc.: *See*—
Leliaert, Raymond M., 4,296,794, Cl. 164-131.000.

Whitby, Clyde M., to Singer Company, The. Wide angle laser display system. 4,297,723, Cl. 358-60.000.

White, Norman H.: *See*—
Nunciato, David J.; White, Norman H.; and Woodburn, William A., 4,297,147, Cl. 134-7.000.

White, Pat M.: *See*—
Hendrickson, James D.; and White, Pat M., 4,296,807, Cl. 166-184.000.

Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,297,016, Cl. 354-27.000.

Whitman, Hobart A., III, to Olin Corporation. Apparatus for controlled perforation of moving webs with fixed focus laser beam. 4,297,559, Cl. 219-121.0LB.

Wichmann, Arnold, to Kraftwerk Union Aktiengesellschaft. Method of bracing end turns of an electric machine by means of a binding band; and device used therein. 4,297,606, Cl. 310-271.000.

Wickmann Werke AG: *See*—
Asdollahi, Nasrollah, 4,297,666, Cl. 337-163.000.

Widen, Bo G., to GKN-Stenman AB. Anchoring means for door lock plates. 4,296,619, Cl. 70-451.000.

Wiehler, Wolf: *See*—
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Wielinger, Hans: *See*—
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Wil-Rich, Inc.: *See*—
Quanbeck, Sherman H., 4,296,695, Cl. 111-34.000.
Wilcox, Brian N.; and Robinson, John W., to Kimball International, Inc. Solo sustain keyer system. 4,296,666, Cl. 84-1.260.
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Wiley, David: *See*—
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Will, Norbert F.: *See*—
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Williams, Frank J., III; and Relles, Howard M., to General Electric Company. Polyetherimides prepared by self-condensation of hydroxyaryl phthalimide salts. 4,297,474, Cl. 528-170.000.
Williams, Meurig W.; and AuClair, Christopher J., to Xerox Corporation. Polyblend coated carrier materials. 4,297,427, Cl. 430-108.000.
Willman, Bertram T., to Exxon Production Research Company. Thermal recovery of viscous hydrocarbons using arrays of radially spaced horizontal wells. 4,296,969, Cl. 299-2.000.
Willmann, Michael: *See*—
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Wilmarth, Paul C.: *See*—
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Wilson, John C.: *See*—
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Wilson, Kermit H.; and Carlson, Ronald R., to Sico Incorporated. Audience control barrier. 4,296,573, Cl. 52-6.000.
Winchester, Loren R. Inflatable camper. 4,296,960, Cl. 296-167.000.
Winner, Stephen E.: *See*—
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Wippich, Rheinhold: *See*—
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Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Paaren, Herbert E.; and Fivizzani, Mary A., 4,297,289, Cl. 260-397.200.
Wissner, Allan, to American Cyanamid Company. 1-Substituted-1-oxo-prostane-derivatives of the E, A and F series. 4,297,516, Cl. 568-330.000.
Witte, Arnold C.; and Coleman, Richard L., to Texaco Inc. Method for continuous grease manufacture. 4,297,227, Cl. 252-18.000.
Wolfe, Donald L.; Modglin, Donald D.; and Merrick, George J., to Westinghouse Electric Corp. Steam generator shell parting method and apparatus. 4,297,061, Cl. 409-131.000.
Wolff, Siegfried; Rothbuhr, Lothar; and Grewatta Heinz, to Degussa Aktiengesellschaft. Silane/filler preparations, process for their production and their use. 4,297,145, Cl. 106-308.00Q.
Wolinski, Leon E.; and Berezuk, Peter D., to Pratt & Lambert, Inc. Non-toxic activators for adhesive compositions. 4,297,158, Cl. 156-305.000.
Wollny, Klaus: *See*—
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Wood, Louis L.; and Larsen, Donald W., to W. R. Grace & Co. Chain-extended polyol compositions and method. 4,297,482, Cl. 528-405.000.
Wood, Robert C.: *See*—
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Woodburn, William A.: *See*—
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Woodcock, Sidney J.: *See*—
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Wooden, Bruce J.; and Edelman, Seymour, to United States of America, Navy. Piezoelectric polymer antifouling coating and method of use and application. 4,297,394, Cl. 427-100.000.
Woodford, Donald L. Method and apparatus for making a non spherical beveled contact lens. 4,297,008, Cl. 351-177.000.
Woodhead, James L.: *See*—
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Woolbright, Kenneth O. Sound broadcasting apparatus. 4,296,664, Cl. 84-1.030.
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Wu, Ching-Yong; Pretzer, Wayne R.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Decomposition of cumene hydroperoxide with a homogeneous catalyst. 4,297,518, Cl. 568-385.000.
Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Heat transfer system. 4,296,796, Cl. 165-46.000.
Wulff, B. James: *See*—
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Wurtz, Howard P.; and Peterson, Eugene W., to Hughes Aircraft Company. Vacuum gettering arrangement. 4,297,082, Cl. 417-51.000.
Wyse, Harold G.; and Smith, Millard S. Method and apparatus for producing a nitrate fertilizer. 4,297,123, Cl. 71-58.000.
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Xerox Corporation: *See*—
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Corona, Stephen C., 4,297,616, Cl. 315-179.000.
Hewitt, Harvey J., 4,297,424, Cl. 430-58.000.
Marshall, Richard C., 4,297,695, Cl. 340-752.000.
Pai, Damodar M.; Pochan, John M.; and Pochan, Darlyn F., 4,297,425, Cl. 430-58.000.
Scifres, Donald R.; and Stutius, Wolfgang E., 4,297,653, Cl. 331-94.50S.
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Yagi, Michio; Nakajima, Kunio; Nakagawa, Yasutsugu; Ishii, Sizuo; and Aratame, Kazuhisa, to Konishiroku Photo Industry Co., Ltd. Automatic film feeding apparatus for photographic camera. 4,297,019, Cl. 354-171.000.
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Kanada, Eiji; Yamada, Shoji; and Tsubai, Yasuo, 4,297,430, Cl. 430-204.000.
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Yamada, Yasuyuki; and Okuno, Youichi, to Canon Kabushiki Kaisha. View finder for single-lens reflex camera. 4,297,020, Cl. 354-225.000.
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Yamamoto, Kaneo. Process for making diazo photosensitive paper. 4,297,428, Cl. 430-169.000.
Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, to Yamanouchi Pharmaceutical Co., Ltd. Memory enhancer containing 2-(7-indenyloxymethyl-morpholine. 4,297,356, Cl. 424-248.570.
Yamane, Hiroyuki: *See*—
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Yamamoto, Minoru; Tachikawa, Shiro; and Maeno, Hiroo, 4,297,356, Cl. 424-248.570.
Yanagida, Kiyoshi: *See*—
Kadowaki, Hidetaka; Inomata, Akira; Yanagida, Kiyoshi; Hasegawa, Tsunao; Ishii, Satoshi; and Ohtake, Yasushi, 4,297,730, Cl. 360-66.000.
Yanna, Andrew F. Heat generation and distribution system. 4,296,883, Cl. 237-59.000.
Yano, Takefumi: *See*—
Ueno, Haruo; Yano, Takefumi; Inoue, Tokuji; Ikai, Shigeru; Kai, Yoshiyuki; and Shimizu, Michimasa, 4,297,463, Cl. 526-128.000.
Yao, Shi K.: *See*—
Smith, Elroy C., Jr.; and Yao, Shi K., 4,297,189, Cl. 204-192.0SP.



Yasinsky, Konstantin K.; Glazunov, Sergei G.; Ross, Jury N.; and Bykov, Igor D. Refractory suspension for making foundry moulds. 4,296,793, Cl. 164-24.000.
Yasuba, Shoichi; and Ito, Takaharu, to Okuma Machinery Works, Ltd. Method and apparatus for positioning work on a numerically controlled lathe. 4,296,657, Cl. 82-1.00C.
Yasuda, Naohiko; and Nakanishi, Eiji, to Ajinomoto Co., Inc. Imidazoledicarboxylic acid derivative. 4,297,279, Cl. 260-239.100.
Yasuda, Takeo: *See*—
Hikuma, Motohiko; Kubo, Tatsuru; Yasuda, Takeo; Karube, Isao; and Suzuki, Shuichi, 4,297,173, Cl. 204-1.00T.
Yasuda, Toshio, to Elastoflon Inc. Compound for coating containing fluorocarbonpolymer and method for its manufacture. 4,297,447, Cl. 525-133.000.
Yenzer, Dennis E.; Cha, John H.; and Abramovich, Dan, to Santa Fe International Corporation. Method of laying offshore pipeline from a reel carrying vessel. 4,297,054, Cl. 405-168.000.
Yokoi, Gunpei, to Nintendo Co., Ltd. Projecting-type shooting game apparatus. 4,296,931, Cl. 273-316.000.
Yokoi, Masatada: *See*—
Fujimori, Fumio; Yokoi, Masatada; Ishikawa, Masakazu; Uemura, Hiroshi; and Shirai, Akira, 4,296,841, Cl. 188-73.380.
Yokoyama, Junichi: *See*—
Nakamura, Ken; Ofuji, Hiromichi; and Yokoyama, Junichi, 4,297,302, Cl. 261-65.000.
Yonetani, Kengo: *See*—
Ito, Kunimoto; Kakizawa, Tsutomu; Yonetani, Kengo; and Nariai, Hiroshi, 4,297,610, Cl. 310-370.000.
Yonezu, Hiroo: *See*—
Hayashi, Izuo; and Yonezu, Hiroo, 4,297,652, Cl. 331-94.50H.
Yoshida Iron Works Co., Ltd.: *See*—
Fujii, Kenji, 4,297,133, Cl. 75-53.000.
Yoshida, Keizo; Tanaka, Hirokazu; Okamoto, Masanori; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Co. Ltd. Alkyl, alkenyl, and aryl substituted triazene compounds, their salts and production thereof. 4,297,096, Cl. 435-128.000.
Yoshida Kogyo K.K.: *See*—
Hakoi, Tsutomu, 4,296,547, Cl. 29-766.000.
Yoshida, Tomio: *See*—
Kahara, Toshiki; Tamura, Kohki; Ebata, Noboru; Sato, Fumio; and Yoshida, Tomio, 4,297,231, Cl. 252-182.100.
Yoshino Kogyosho Co., Ltd.: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,297,306, Cl. 264-23.000.
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, to Yoshino Kogyosho Co., Ltd. Neck orienting method of bottles of saturated polyester resins. 4,297,306, Cl. 264-23.000.
Young, Dennis: *See*—
Foster, Alan I.; Sims, Malcolm L.; and Young, Dennis, 4,297,150, Cl. 148-6.300.
Young, Harlow S.: *See*—
Harney, David L.; and Young, Harlow S., 4,297,377, Cl. 426-438.000.
Young, Kenneth A.: *See*—
Townsend, Raymond L.; Kester, Jack R.; and Young, Kenneth A., 4,297,561, Cl. 219-137.630.
Zadiraka, Allan J., to Babcock & Wilcox Company, The. Control system for a solar steam generator. 4,296,730, Cl. 126-421.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Takagi, Yasushi; and Jikihara, Tomo, 4,297,485, Cl. 536-10.000.
Zaneveld, Lourens J. D.: *See*—
Waller, Donald P.; Zaneveld, Lourens J. D.; and Fong, Harry H. S., 4,297,341, Cl. 424-80.000.
Zeeh, Bernd: *See*—
Sauter, Hubert; Zeeh, Bernd; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,297,364, Cl. 424-267.000.
Zehren, James N., to TRW Inc. Method for splicing an electrical cable. 4,296,548, Cl. 29-871.000.
Zeiringer, Rudolf: *See*—
Claassen, Peter; List, Helmut; and Zeiringer, Rudolf, 4,296,635, Cl. 73-730.000.
Zenith Radio Corporation: *See*—
Kiteley, Terence J., 4,297,619, Cl. 315-381.000.
Zervopoulos, Panagiotis. Masonry cleaning process and composition. 4,297,148, Cl. 134-3.000.
Zhestkov, Vitaly I.: *See*—
Shlykov, Gennady N.; Zhestkov, Vitaly I.; Tikhonov, Valentin N.; Dyachkov, Vasily M.; Glazov, Vladimir G.; and Krjuk, Timur P., 4,296,528, Cl. 19-255.000.
Zimmerly, Robert D., to Ladish Co. Spheroidal interconnector for filtration modules. 4,296,951, Cl. 285-95.000.
Zobel, Henry F.: *See*—
Klein, Gary H.; Arons, Howard L.; Stejskal, Joseph F.; Stevens, Donald G.; and Zobel, Henry F., 4,297,144, Cl. 106-197.00C.
Zoecon Corp.: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Fox, Roland T. V.; Rathmell, William G.; and Shephard, Margaret C., 4,297,297, Cl. 260-465.00D.
Zoor, Reinhold, to Heinrich Wunder KG. Anti-theft arrangement, particularly for a mast of a sailing craft. 4,296,615, Cl. 70-19.000.
Zuern, Ludwig: *See*—
Caesar, Arndt C.; Koegel, Wolfram; Zuern, Ludwig; and Gaertner, Friedheim, 4,297,252, Cl. 252-606.000.
Zydzik, George J.: *See*—
Johnson, David W., Jr.; Singh, Shobha; Van Uitert, LeGrand G.; and Zydzik, George J., 4,297,005, Cl. 350-357.000.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bollert, Ulrich: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Bridges, Ronald P. Group operated circuit disconnect apparatus for overhead electric power lines. Re. 30,784, Cl. 200-48.0KB.

Calfee, Richard W.: *See—*
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

Finke, Manfred: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Herwig, Walter: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Hileman, Russell K.: *See—*
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

Hoechst Aktiengesellschaft: *See—*
Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, Re. 30,783, Cl. 528-287.000.

Kleiner, Hans-Jerg; Finke, Manfred; Bollert, Ulrich; and Herwig, Walter, to Hoechst Aktiengesellschaft. Flame retarding linear polyesters and shaped articles thereof. Re. 30,783, Cl. 528-287.000.

Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., to Zentec Corporation. Microcomputer terminal system. Re. 30,785, Cl. 364-200.000.

Minnesota Mining and Manufacturing Company: *See—*
van Turnhout, Jan, Re. 30,782, Cl. 264-22.000.

van Turnhout, Jan, to Minnesota Mining and Manufacturing Company. Method for the manufacture of an electret fibrous filter. Re. 30,782, Cl. 264-22.000.

Zentec Corporation: *See—*
Lovercheck, Lawrence R.; Hileman, Russell K.; and Calfee, Richard W., Re. 30,785, Cl. 364-200.000.

# LIST OF DESIGN PATENTEES

Advertising Displays Corporation: *See—*
Marks, Philip, 261,479, Cl. D9-341.000.

Affiliated Hatch and Sunroof, Inc.: *See—*
Butler, James P., 261,500, Cl. D12-191.000.

Albert, Ramon R. Sofa. 261,451, 10-27-81, Cl. D6-63.000.

Alessandrini, Anna M.: *See—*
Alessandrini, Paul P.; and Alessandrini, Anna M., 261,467, Cl. D7-74.000.

Alessandrini, Paul P.; and Alessandrini, Anna M. Combined knife set and rack. 261,467, 10-27-81, Cl. D7-74.000.

Appel, Mel; and Means, Paul B., III, to Appel, Mel. Combined toy bucket and tools therefor. 261,540, 10-27-81, Cl. D21-120.000.

Appel, Mel; and Kress, George, to Appel, Mel. Combined toy bucket and tools therefor. 261,541, 10-27-81, Cl. D21-120.000.

Baus, Andre E. J.; and Pair, Robert E. L. A., to Goodyear Tire & Rubber Company, The. Tire. 261,493, 10-27-81, Cl. D12-143.000.

Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., to Goodyear Tire & Rubber Company, The. Tire. 261,497, 10-27-81, Cl. D12-147.000.

Baus, Andre E. J., to Goodyear Tire & Rubber Company, The. Tire. 261,498, 10-27-81, Cl. D12-148.000.

Beckman Instruments, Inc.: *See—*
Lindsay, James R.; and Vedder, Gene D., 261,488, Cl. D10-78.000.

Benchmark Tool Company: *See—*
Irelan, Edward A., 261,519, Cl. D15-134.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,456, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,457, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Teller counter. 261,458, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Desk. 261,459, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Desk. 261,460, 10-27-81, Cl. D6-157.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,461, 10-27-81, Cl. D6-162.000.

Berman, James S.; and Stegmaier, Sigurd, to Citibank, N.A. Service counter. 261,462, 10-27-81, Cl. D6-162.000.

Blumberg, Bert: *See—*
Butter, Ann F.; and Blumberg, Bert, 261,518, Cl. D15-118.000.

Boroda, Eli. Housing for an electronic stimulator. 261,551, 10-27-81, Cl. D24-41.000.

Boroda, Eli. Housing for an electronic stimulator. 261,552, 10-27-81, Cl. D24-41.000.

Bowman Construction Supply, Inc.: *See—*
Bowman, William E., 261,555, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip for roadway joints and the like. 261,555, 10-27-81, Cl. D25-74.000.

Bridgestone Tire Company, Limited: *See—*
Suzuki, Norio; and Kojima, Hiroshi, 261,494, Cl. D12-146.000.

Brookfield Athletic Shoe Company, Inc.: *See—*
Landay, David L.; and Wolf, Alvan H., 261,542, Cl. D21-226.000.

Butler, James P., to Affiliated Hatch and Sunroof, Inc. Vehicle visor. 261,500, 10-27-81, Cl. D12-191.000.

Butter, Ann F.; and Blumberg, Bert. Barrier free drinking fountain. 261,518, 10-27-81, Cl. D15-118.000.

C-R-O, Inc.: *See—*
O'Donnell, Thomas P.; and Howery, James A., 261,476, Cl. D8-30.000.

Canon Kabushiki Kaisha: *See—*
Kando, Masahiro; and Shinkai, Hiroshi, 261,524, Cl. D16-44.000.
Sakai, Masaaki; and Hirose, Kunio, 261,528, Cl. D18-7.000.

Carbajales, Javier B. S.: *See—*
Carbajales, Jesus A. S.; and Carbajales, Javier B. S., 261,490, Cl. D11-158.000.

Carbajales, Jesus A. S.; and Carbajales, Javier B. S., to John J. Madison Company, Inc. Figurine of a basset hound. 261,490, 10-27-81, Cl. D11-158.000.

Carson, Billie R., to CBS Inc. Bridge assembly for guitars. 261,526, 10-27-81, Cl. D17-21.000.

Carson, Billie R., to CBS Inc. Bridge assembly for guitars. 261,527, 10-27-81, Cl. D17-21.000.

CBS Inc.: *See—*
Carson, Billie R., 261,526, Cl. D17-21.000.
Carson, Billie R., 261,527, Cl. D17-21.000.

Chambers, Richard F. Asphalt plant control house. 261,553, 10-27-81, Cl. D25-22.000.

Champion International Corporation: *See—*
Cottrell, Edward D.; and Robbins, Michael B., 261,516, Cl. D15-92.000.

Chandler, Marlene Y. Toilet tissue cover. 261,452, 10-27-81, Cl. D6-86.000.

Chisholm, James E., to MCC-Powers-Fiat. Modular shower stall. 261,548, 10-27-81, Cl. D23-57.000.

Cicerrella, Michael C. Game board. 261,536, 10-27-81, Cl. D21-20.000.

Citibank, N.A.: *See—*
Berman, James S.; and Stegmaier, Sigurd, 261,456, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,457, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,458, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,459, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,460, Cl. D6-157.000.
Berman, James S.; and Stegmaier, Sigurd, 261,461, Cl. D6-162.000.
Berman, James S.; and Stegmaier, Sigurd, 261,462, Cl. D6-162.000.

Cobb, Richard E., to GTE Automatic Electric Labs. Inc. Wall mounted holder for a telephone set. 261,509, 10-27-81, Cl. D14-65.000.

Cody, Patrick D., to Innova Equipment Limited. Vacuum cleaner. 261,514, 10-27-81, Cl. D32-21.000.

Coilhose Pneumatics, Inc.: *See—*
Schenker, Michael, 261,501, Cl. D12-194.000.

Conner, James M.; and Ryan, James M., to Polaroid Corporation. Electronic flash or similar article. 261,523, 10-27-81, Cl. D16-42.000.

Container Corporation of America: *See—*
Darois, Roger E., 261,569, Cl. D34-39.000.

Cottrell, Edward D.; and Robbins, Michael B., to Champion International Corporation. Machine for dispensing and inserting sticks in comestibles. 261,516, 10-27-81, Cl. D15-92.000.

Cramer, Lyle L. Skateboard. 261,544, 10-27-81, Cl. D21-227.000.

Culbertson, Richard, to General Electric Company. Tape recorder and player or similar article. 261,506. 10-27-81, Cl. D14-6.000.





Darois, Roger E., to Container Corporation of America. Drum. 261,569, 10-27-81, Cl. D34-39.000.

Davis, Ralph L., to Payne, Wilbert A. Combined caddy for powdered products or the like and implements therefor. 261,568, 10-27-81, Cl. D28-77.000.

Delcroix, Guy, to Waterman S.A. Marking pen. 261,531, 10-27-81, Cl. D19-4.000.

Dickson, Thomas D., Jr. Foodstuff mill. 261,517, 10-27-81, Cl. D15-98.000.

DuBois, Arthur E. Reflector. 261,489, 10-27-81, Cl. D10-111.000.

Edson, Sydney, to Howard Displays, Inc. Counter display stand. 261,449, 10-27-81, Cl. D6-23.000.

Englishtown Sportswear, Ltd.: *See—*
Heinfling, Martin, 261,445, Cl. D2-25.000.

Envall, Bjorn E. A., to Saab-Scania Aktiebolag. Wheel. 261,502, 10-27-81, Cl. D12-211.000.

Escobedo, Antonio M.: *See—*
Havens, John H., 261,510, Cl. D14-65.000.

Ewert, Carl H. Spice rack. 261,455, 10-27-81, Cl. D6-130.000.

Fontaine, Jean F. L.: *See—*
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.

Gauntt, William P. Tamper proof striker plate. 261,478, 10-27-81, Cl. D8-344.000.

General Bathroom Products Company: *See—*
Palka, James J.; and Rekart, Robert, 261,557, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,558, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,559, Cl. D26-87.000.
Palka, James J.; and Rekart, Robert, 261,560, Cl. D26-87.000.

General Binding Corporation: *See—*
Hausmann, Herbert H., 261,529, Cl. D18-34.000.
Hausmann, Herbert H., 261,530, Cl. D18-34.000.

General Electric Company: *See—*
Culbertson, Richard, 261,506, Cl. D14-6.000.
Kolwaite, John S., 261,512, Cl. D14-73.000.

Gillette Company, The: *See—*
Poisson, Norman D., 261,564, Cl. D28-48.000.

Goodyear Tire & Rubber Company, The: *See—*
Baus, Andre E. J.; and Pair, Robert E. L. A., 261,493, Cl. D12-143.000.
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.
Baus, Andre E. J., 261,498, Cl. D12-148.000.
Hammond, Philip S., 261,491, Cl. D12-142.000.
Remy, Raymond M., 261,492, Cl. D12-143.000.
Remy, Raymond M., 261,496, Cl. D12-147.000.
Yurkovich, Charles G., 261,495, Cl. D12-146.000.

Graham, Elwood M.; and Polivka, John, to M. H. Graham Corporation. Food cutter. 261,472, 10-27-81, Cl. D7-155.000.

Grange, Kenneth H., to Wilkinson Sword Ltd. Razor handle. 261,565, 10-27-81, Cl. D28-48.000.

GTE Automatic Electric Labs. Inc.: *See—*
Cobb, Richard E., 261,509, Cl. D14-65.000.

H.I.T. Industries Ltd.: *See—*
Tawil, Abraham I., 261,535, Cl. D21-15.000.

Ham, Brian L.: *See—*
Baus, Andre E. J.; Fontaine, Jean F. L.; and Ham, Brian L., 261,497, Cl. D12-147.000.

Hammond, Philip S., to Goodyear Tire & Rubber Company, The. Tire tread and buttress. 261,491, 10-27-81, Cl. D12-142.000.

Harada, Toshio: *See—*
Takahashi, Yoichi; Yamamura, Mashimichi; Harada, Toshio; and Inoue, Shigefumi, 261,468, Cl. D7-128.000.

Harper, Russell W., to Maryland Cup Corporation. Ice cream cone serving tray. 261,466, 10-27-81, Cl. D7-38.000.

Hass, William J. Radio receiver. 261,511, 10-27-81, Cl. D14-68.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,481, 10-27-81, Cl. D9-341.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,482, 10-27-81, Cl. D9-341.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,484, 10-27-81, Cl. D9-341.000.

Haubert, Carol A., to Raytheon Company. Packaging container for cassettes or the like. 261,485, 10-27-81, Cl. D9-341.000.

Hausmann, Herbert H., to General Binding Corporation. Combined punch and binding machine. 261,529, 10-27-81, Cl. D18-34.000.

Hausmann, Herbert H., to General Binding Corporation. Combined electric punch and binding machine. 261,530, 10-27-81, Cl. D18-34.000.

Havens, John H., to Escobedo, Antonio M. Telephone handset holder. 261,510, 10-27-81, Cl. D14-65.000.

Heinfling, Martin, to Englishtown Sportswear, Ltd. Pocket for jeans or the like. 261,445, 10-27-81, Cl. D2-25.000.

Hirose, Kunio: *See—*
Sakai, Masaaki; and Hirose, Kunio, 261,528, Cl. D18-7.000.

Hobrecht, William, to New England Pottery Co. Potted plant hanger. 261,454, 10-27-81, Cl. D6-113.000.

Hollingsworth, Gene C., to Zero Corporation. Pin socket. 261,504, 10-27-81, Cl. D13-24.000.

Holmberg, Larry A. Adjustable plug for shotgun shell chamber. 261,545, 10-27-81, Cl. D22-7.000.

Homich, Richard D. Game board. 261,537, 10-27-81, Cl. D21-34.000.

Howard Displays, Inc.: *See—*
Edson, Sydney, 261,449, Cl. D6-23.000.

Howery, James A.: *See—*
O'Donnell, Thomas P.; and Howery, James A., 261,476, Cl. D8-30.000.

Hug, Niklaus, to Rommag P. Worwag & Co. Suction brush. 261,473, 10-27-81, Cl. D32-18.000.

Innova Equipment Limited: *See—*
Cody, Patrick D., 261,514, Cl. D32-21.000.

Inoue, Shigefumi: *See—*
Takahashi, Yoichi; Yamamura, Mashimichi; Harada, Toshio; and Inoue, Shigefumi, 261,468, Cl. D7-128.000.

Irelan, Edward A., to Benchmark Tool Company. Housing for a bench top band saw. 261,519, 10-27-81, Cl. D15-134.000.

Jenkins, Robert J. Portable seat. 261,450, 10-27-81, Cl. D6-26.000.

John J. Madison Company, Inc.: *See—*
Carbajales, Jesus A. S.; and Carbajales, Javier B. S., 261,490, Cl. D11-158.000.

Johnson, Lester L., Sr. Two-wheeled oil refiner dolly or the like. 261,520, 10-27-81, Cl. D15-150.000.

Johnson, Lester L., Sr. Oil refiner movable carriage or the like. 261,521, 10-27-81, Cl. D15-150.000.

Joseph, Clive E. Clothes pin. 261,474, 10-27-81, Cl. D32-61.000.

Kando, Masahiro; and Shinkai, Hiroshi, to Canon Kabushiki Kaisha. Grip for a cinecamera. 261,524, 10-27-81, Cl. D16-44.000.

Kohno Plastic Co., Ltd.: *See—*
Kohno, Yoshiharu, 261,487, Cl. D10-58.000.

Kohno, Yoshiharu, to Kohno Plastic Co., Ltd. Thermometer. 261,487, 10-27-81, Cl. D10-58.000.

Kojima, Hiroshi: *See—*
Suzuki, Norio; and Kojima, Hiroshi, 261,494, Cl. D12-146.000.

Kolwaite, John S., to General Electric Company. Clock radio or similar article. 261,512, 10-27-81, Cl. D14-73.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and extended light. 261,469, 10-27-81, Cl. D7-129.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and light. 261,470, 10-27-81, Cl. D7-129.000.

Koziol, Walter, to Modern Home Products Corp. Combined rotisserie motor and light. 261,471, 10-27-81, Cl. D7-129.000.

Kress, George: *See—*
Appel, Mel; and Kress, George, 261,541, Cl. D21-120.000.

Landay, David L.; and Wolf, Alvan H., to Brookfield Athletic Shoe Company, Inc. Integral shoe sole and wheel mounting for roller skate. 261,542, 10-27-81, Cl. D21-226.000.

Lee, Ernest, to Sunbeam Corporation. Hair dryer. 261,563, 10-27-81, Cl. D28-13.000.

Legerius, Bengt E. Cable channel shelf. 261,554, 10-27-81, Cl. D25-74.000.

Leisurecraft Products Ltd.: *See—*
Pardo, John, 261,508, Cl. D14-64.000.

Letourneau, Marc-Andre. Lighting fixture. 261,561, 10-27-81, Cl. D26-88.000.

Liebscher, Frank M. Key ring ornament. 261,448, 10-27-81, Cl. D3-65.000.

Lindsay, James R.; and Vedder, Gene D., to Beckman Instruments, Inc. Multimeter. 261,488, 10-27-81, Cl. D10-78.000.

Lowenthal, Jana. Combined cosmetic container and abrader. 261,480, 10-27-81, Cl. D9-314.000.

M. H. Graham Corporation: *See—*
Graham, Elwood M.; and Polivka, John, 261,472, Cl. D7-155.000.

Madl, Alfred W., to Sunbeam Corporation. Make-up mirror. 261,567, 10-27-81, Cl. D28-67.000.

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Martin, Nick P. Simulative photo frame. 261,463, 10-27-81, Cl. D6-243.000.

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Sauber, Charles J. Storage trunk for a pickup truck. 261,499, 10-27-81, Cl. D12-157.000.
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Schenker, Michael, to Coilhose Pneumatics, Inc. Combined air muffler and filter. 261,501, 10-27-81, Cl. D12-194.000.
Schmohl, Michael W., to Uniroyal GmbH. Shoe. 261,446, 10-27-81, Cl. D2-309.000.
Shaffer, Frank E. Cable or rivet cutter. 261,477, 10-27-81, Cl. D8-98.000.
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# CLASSIFICATION OF PATENTS

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4,297,538
189 D 4,297,539

**CLASS 180**

24 4,296,826

**CLASS 181**

107 4,296,827
121 4,296,828
129 4,296,829
208 4,296,830
224 4,296,831
255 4,296,832

**CLASS 182**

2 4,296,833
155 4,296,834
184 4,296,835
193 4,296,836

**CLASS 184**

15 R 4,296,837
106 4,296,838

**CLASS 188**

8 4,296,840
61 4,296,842
73.38 4,296,841
4,296,844
73.43 4,296,843
341 4,296,845
378 4,296,839

**CLASS 192**

4 A 4,296,846
4,296,847
35 4,296,848
61 4,296,849
64 4,296,850
84 C 4,296,851
104 B 4,296,852
106.1 4,296,853
4,296,854

**CLASS 198**

502 4,296,855
514 4,296,856

**CLASS 200**

5 B 4,297,540
5 E 4,297,541
6 A 4,297,542
18 4,297,543
34 4,297,544
38 R 4,297,545
4,297,546
4,297,547
48 KB Re.30,784
61.08 4,297,548
61.27 4,297,549
61.89 4,297,550
67 B 4,297,551
83 P 4,297,552
145 4,297,553
153 G 4,297,555
153 SC 4,297,554
330 4,297,556

**CLASS 203**

19 4,297,172

**CLASS 204**

1 T 4,297,173
1.5 4,297,174
15 4,297,175
37 R 4,297,176
43 N 4,297,177
47 4,297,178
4,297,179
67 4,297,180
78 4,297,181
98 4,297,182
117 4,297,183
129.4 4,297,184
159.15 4,297,185
165 4,297,186
4,297,187
181 R 4,297,188
192 E 4,297,190
192 SP 4,297,189
193 4,297,191
195 G 4,297,193
195 S 4,297,192
257 4,297,194
290 F 4,297,195
296 4,297,196
297 W 4,297,197
299 R 4,297,198
4,297,199

**CLASS 206**

53 4,296,857
150 4,296,858
219 4,296,859
386 4,296,860
428 4,296,861
439 4,296,862
504 4,296,863

**CLASS 208**

10 4,297,200
11 R 4,297,201
54 4,297,202
74 4,297,203
95 4,297,204
138 4,297,205
254 R 4,297,206

**CLASS 209**

9 4,297,207
144 4,296,864
216 4,296,865

**CLASS 210**

94 4,297,208
107 4,297,209
4,297,210
136 4,297,211
168 4,297,212
195.1 4,297,213
219 4,297,214
386 4,297,215
613 4,297,216
621 4,297,217
661 4,297,218
669 4,297,219
690 4,297,220
702 4,297,221
748 4,297,222
754 4,297,223
755 4,297,224
779 4,297,225

**CLASS 211**

131 4,296,866

**CLASS 212**

229 4,296,867

**CLASS 213**

50 4,296,868

**CLASS 219**

10.55 R 4,297,557
4,297,558
121 LB 4,297,559
130.01 4,297,560
137.63 4,297,561
216 4,297,562
275 4,297,563
367 4,297,564
522 4,297,565

**CLASS 220**

3 4,296,869
3.3 4,296,870
306 4,296,871

**CLASS 221**

195 4,296,872
213 4,296,873
307 4,296,874

**CLASS 222**

617 4,296,875

**CLASS 223**

91 4,296,876
99 4,296,877

**CLASS 224**

32 A 4,296,878
42.45 R 4,296,879

**CLASS 227**

30 4,296,881

**CLASS 233**

21 4,296,882

**CLASS 235**

50 R 4,297,566
92 PB 4,297,567
435 4,297,568
443 4,297,569
493 4,297,570

**CLASS 237**

59 4,296,883

**CLASS 238**

2 4,296,884

**CLASS 239**

1 4,296,885
264 4,296,886
397.5 4,296,887
403 4,296,888

**CLASS 242**

18.1 4,296,889
71.8 4,296,890
110 4,296,891

**CLASS 244**

2 4,296,892
3.23 4,296,893
3.27 4,296,894
3.29 4,296,895
12.4 4,296,896
111 4,296,897
115 4,296,898
207 4,296,899
219 4,296,900

**CLASS 246**

167 R 4,296,901

**CLASS 248**

102 4,296,902
162.1 4,296,903
218.4 4,296,904
237 4,296,905
280.1 4,296,906
573 4,296,907

**CLASS 249**

58 4,296,908
94 4,296,909

**CLASS 250**

201 4,297,571
203 R 4,297,572
231 SE 4,297,573
253 4,297,574
265 4,297,575
336 4,297,576
343 4,297,577
4,297,578
4,297,579
368 4,297,580
391 4,297,581
445 T 4,297,582
453 4,297,583
483 4,297,584
560 4,297,585
561 4,297,586
563 4,297,587
577 4,297,588

**CLASS 251**

28 4,296,910
57 4,296,911
65 4,296,912
76 4,296,913
149.2 4,296,914
174 4,296,915

**CLASS 252**

8.55 D 4,297,226
18 4,297,227
92 4,297,228
109 4,297,229
117 4,297,230
182.1 4,297,231
187 R 4,297,232
259.5 4,297,233
301.24 4,297,234
316 4,297,235
389 A 4,297,237
389 R 4,297,236
408 4,297,238
412 4,297,239
431 R 4,297,240
435 4,297,241
439 4,297,242
455 Z 4,297,243
4,297,244
460 4,297,245
465 4,297,246
468 4,297,247
477 R 4,297,248
518 4,297,249
4,297,250
545 4,297,251
606 4,297,252

**CLASS 254**

380 4,296,916
400 4,296,917

**CLASS 256**

68 4,296,918

**CLASS 260**

17.3 4,297,253
18 EP 4,297,254
18 PF 4,297,255
29.4 UA 4,297,256
29.6 H 4,297,257
29.6 MN 4,297,258
29.6 NR 4,297,259
29.7 H 4,297,260
29.7 RP 4,297,261
31.6 4,297,262
32.6 PQ 4,297,263
33.4 R 4,297,264
33.6 SB 4,297,265
42.14 4,297,266
42.53 4,297,267
45.8 N 4,297,268
45.9 QB 4,297,269
104 4,297,270
107 4,297,271
112 B 4,297,273
4,297,274
112 R 4,297,272
112.5 R 4,297,275
4,297,276
4,297,277
143 4,297,278
239.1 4,297,279
245.5 4,297,280
314.5 4,297,281
326.2 4,297,282
346.22 4,297,284
346.3 4,297,283
346.73 4,297,285
347.8 4,297,286
348.16 4,297,287
378 4,297,288
397.2 4,297,289
410.6 4,297,290
410.9 R 4,297,291
428.5 4,297,292
448 B 4,297,293
453 PH 4,297,294
455 A 4,297,295
459 A 4,297,296
465 D 4,297,297
502 R 4,297,298
502.5 4,297,299
544 C 4,297,300
544 K 4,297,301

**CLASS 261**

65 4,297,302

**CLASS 264**

0.5 4,297,304
4,297,305
3 R 4,297,303
22 Re.30,782
23 4,297,306
29.5 4,297,307
46.6 4,297,308
56 4,297,309
83 4,297,310
109 4,297,311
134 4,297,312
273 4,297,313
320 4,297,314
322 4,297,315

**CLASS 266**

111 4,296,919
216 4,296,920
270 4,296,921

**CLASS 269**

211 4,296,922

**CLASS 272**

85 4,296,923
117 4,296,924

**CLASS 273**

1.5 A 4,296,925
86 R 4,296,926
248 4,296,927
262 4,296,928
310 4,296,929
313 4,296,930
316 4,296,931

**CLASS 277**

1 4,296,932
34.3 4,296,933
81 P 4,296,936
81 R 4,296,934
4,296,935
88 4,296,937
135 4,296,938

**CLASS 280**

212 4,296,939
278 4,296,940
423 B 4,296,941
803 4,296,942
804 4,296,943
4,296,944

**CLASS 281**

1 4,296,945
45 4,296,946

**CLASS 282**

27.5 4,296,947
4,296,948

**CLASS 285**

18 4,296,949
45 4,296,950
95 4,296,951
98 4,296,952
302 4,296,953
331 4,296,954
381 4,296,955

**CLASS 290**

40 R 4,297,589

**CLASS 292**

169.18 4,296,956
264 4,296,957

**CLASS 294**

27 H 4,296,958
143 4,296,959
144 4,296,880

**CLASS 296**

167 4,296,960
216 4,296,961
217 4,296,962

**CLASS 297**

170 4,296,963
218 4,296,964
284 4,296,965
369 4,296,966
451 4,296,967

**CLASS 299**

2 4,296,968
4,296,969
67 4,296,970

**CLASS 303**

115 4,296,971
119 4,296,972

**CLASS 307**

43 4,297,590
224 C 4,297,591
247 R 4,297,593
252 C 4,297,594
268 4,297,595
279 4,297,596
315 4,297,597
355 4,297,598
4,297,599
426 4,297,600
555 4,297,601
583 4,297,592

**CLASS 308**

4 A 4,296,973
6 C 4,296,974
6 R 4,296,975
9 4,296,976
19 4,296,977
37 4,296,978
174 4,296,979

**CLASS 310**

26 4,297,602
53 4,297,603
168 4,297,604
242 4,297,605
271 4,297,606
334 4,297,607
335 4,297,608
339 4,297,609
370 4,297,610

**CLASS 312**

35 4,296,980
194 4,296,981
257 R 4,296,982
263 4,296,983
268 4,296,984

**CLASS 313**

222 4,297,611
446 4,297,612

**CLASS 315**

58 4,297,613
86 4,297,614
111.21 4,297,615
179 4,297,616
326 4,297,617
371 4,297,618
381 4,297,619
389 4,297,620
397 4,297,621

**CLASS 318**

254 4,297,622
410 4,297,623
594 4,297,624
696 4,297,625
4,297,626
778 4,297,627
798 4,297,628

**CLASS 320**

7 4,297,629
35 4,297,630
64 4,297,631

**CLASS 324**

51 4,297,632
61 R 4,297,634
156 4,297,635
262 4,297,636
309 4,297,637
410 4,297,638
429 4,297,639
458 4,297,640

**CLASS 328**

15 4,297,641

**CLASS 330**

9 4,297,642
178 4,297,643
264 4,297,644
280 4,297,645
288 4,297,646
307 4,297,647

**CLASS 331**

1 R 4,297,648
2 4,297,649
11 4,297,650
94.5 H 4,297,651
4,297,652
94.5 S 4,297,653
108 D 4,297,654
116 R 4,297,655
135 4,297,656
176 4,297,657

**CLASS 333**

113 4,297,658
191 4,297,659
194 4,297,660
204 4,297,661
252 4,297,662

**CLASS 335**

20 4,297,663
176 4,297,664

**CLASS 336**

60 4,297,665

**CLASS 337**

163 4,297,666
251 4,297,667
365 4,297,668
407 4,297,669

**CLASS 338**

195 4,297,670
200 4,297,671

**CLASS 339**

48 4,296,985
89 C 4,296,986
95 D 4,296,987
97 R 4,296,988
99 R 4,296,989
128 4,296,990
176 MP 4,296,991
186 M 4,296,992
275 B 4,296,993

**CLASS 340**

23 4,297,672
27 NA 4,297,673
63 4,297,674
107 4,297,675
146.3 AG 4,297,676
148 4,297,677
328 4,297,678
347 AD 4,297,679
4,297,680
366 F 4,297,681
384 E 4,297,682
539 4,297,683
557 4,297,684
575 4,297,685



604 4,297,686
626 4,297,687
630 4,297,688
632 4,297,689
690 4,297,690
715 4,297,692
723 4,297,691
744 4,297,693
750 4,297,694
752 4,297,695
785 4,297,696
813 4,297,697
870.32 4,297,698

**CLASS 343**

5 NA 4,297,699
6.5 LC 4,297,701
6.5 R 4,297,700
7 PF 4,297,702
7.3 4,297,703
113 R 4,297,704
725 4,297,707
754 4,297,708
4,297,709
756 4,297,710
771 4,297,705
4,297,706
794 4,297,711

**CLASS 346**

75 4,297,712
108 4,297,713
139 C 4,297,714
150 4,297,715
153.1 4,297,716

**CLASS 350**

3.73 4,296,994
96.15 4,296,995
96.20 4,296,996
4,296,997
4,296,998
96.21 4,296,999
96.24 4,297,000
129 4,297,001
255 4,297,002
292 4,297,003
336 4,297,004
357 4,297,005
4,297,006
432 4,297,007

**CLASS 351**

177 4,297,008

**CLASS 352**

86 4,297,009

**CLASS 353**

122 4,297,010

**CLASS 354**

23 D 4,297,011
4,297,012
4,297,013
25 4,297,014
4,297,015
27 4,297,016
34 4,297,017
50 4,297,018
171 4,297,019
225 4,297,020

**CLASS 355**

3 R 4,297,021
4,297,022
8 4,297,023
14 E 4,297,024
14 SH 4,297,025
15 4,297,026
27 4,297,027
41 4,297,028
133 4,297,029

**CLASS 356**

5 4,297,030
247 4,297,031
366 4,297,032
374 4,297,033
394 4,297,034
402 4,297,035

**CLASS 357**

15 4,297,717
22 4,297,718
23 4,297,719
30 4,297,720
59 4,297,721
74 4,297,722

**CLASS 358**

60 4,297,723
93 4,297,724
125 4,297,725
254 4,297,726
261 4,297,727

**CLASS 360**

36 4,297,728
40 4,297,729
66 4,297,730
70 4,297,731
72.1 4,297,732
77 4,297,733
78 4,297,734
104 4,297,735
109 4,297,736
135 4,297,737

**CLASS 361**

42 4,297,738
55 4,297,739
67 4,297,740
93 4,297,741
154 4,297,742

**CLASS 364**

200 Re.30,785
4,297,743
703 4,297,744

**CLASS 366**

77 4,297,036
114 4,297,037
206 4,297,038

**CLASS 367**

66 4,297,745

**CLASS 376**

103 4,297,165
194 4,297,166
273 4,297,167
418 4,297,168
4,297,169
440 4,297,171
442 4,297,170

**CLASS 400**

120 4,297,039
144.2 4,297,040
161.4 4,297,041
163.2 4,297,042
224 4,297,043
473 4,297,044
641 4,297,045

**CLASS 403**

46 4,297,046
138 4,297,047
189 4,297,048
403 4,297,049

**CLASS 404**

10 4,297,050
11 4,297,051

**CLASS 405**

16 4,297,052
121 4,297,053
168 4,297,054
184 4,297,055
232 4,297,056
303 4,297,057

**CLASS 407**

113 4,297,058

**CLASS 408**

202 4,297,059

**CLASS 409**

86 4,297,060
131 4,297,061

**CLASS 410**

37 4,297,062

**CLASS 411**

199 4,297,063
470 4,297,064

**CLASS 414**

24.5 4,297,065
43 4,297,066
114 4,297,067
458 4,297,068
462 4,297,069
497 4,297,070
542 4,297,071
684.3 4,297,072
704 4,297,073
723 4,297,074

**CLASS 416**

14 4,297,075
37 4,297,076
97 R 4,297,077
134 A 4,297,078
140 4,297,079
141 4,297,080

**CLASS 417**

2 4,297,081
51 4,297,082
53 4,297,083
179 4,297,084
222 4,297,085
271 4,297,086
378 4,297,087
4,297,088
437 4,297,089

**CLASS 418**

61 A 4,297,090

**CLASS 422**

1 4,297,316
16 4,297,317
46 4,297,318
114 4,297,319
131 4,297,320
143 4,297,321
184 4,297,322
208 4,297,324
268

**CLASS 423**

122 4,297,325
126 4,297,326
4,297,327
213.2 4,297,328
228 4,297,329
232 4,297,330
239 4,297,331
240 4,297,332
241 4,297,333
321 R 4,297,334
328 4,297,335
395 4,297,336

**CLASS 424**

1 4,297,337
9 4,297,338
19 4,297,339
70 4,297,340
80 4,297,341
84 4,297,342
85 4,297,343
101 4,297,344
114 4,297,345
177 4,297,346
180 4,297,347
4,297,348
184 4,297,349
238 4,297,350
241 4,297,351
246 4,297,352
247 4,297,353
248.51 4,297,354
248.54 4,297,355
248.57 4,297,356
251 4,297,357
256 4,297,358
263 4,297,359
4,297,360
4,297,361
4,297,362
4,297,363
267 4,297,364
270 4,297,365
274 4,297,366
283 4,297,367
285 4,297,368
4,297,369
298 4,297,370
304 4,297,371
315 4,297,372
322 4,297,373
364 4,297,374

**CLASS 425**

84 4,297,091
133.1 4,297,092

**CLASS 426**

62 4,297,375
94 4,297,376
438 4,297,377
532 4,297,378
565 4,297,379
597 4,297,380
615 4,297,381
656 4,297,382

**CLASS 427**

1 4,297,383
14.1 4,297,384
27 4,297,385
4,297,386
38 4,297,387
47 4,297,388
58 4,297,389
64 4,297,390
75 4,297,392
88 4,297,393
100 4,297,394
127 4,297,395
284 4,297,396
304 4,297,397
320 4,297,398
385.5 4,297,399
389 4,297,400

**CLASS 428**

1 4,297,401
35 4,297,402
42 4,297,403
85 4,297,404
141 4,297,405
215 4,297,406
224 4,297,407
240 4,297,408
247 4,297,409
283 4,297,410
310 4,297,140
347 4,297,411
370 4,297,412
394 4,297,413
400 4,297,414
410 4,297,417
516 4,297,415
576 4,297,416
595 4,297,418

**CLASS 429**

44 4,297,419
217 4,297,420
225 4,297,421

**CLASS 430**

54 4,297,422
4,297,423
58 4,297,424
4,297,425
59 4,297,426
108 4,297,427
169 4,297,428
204 4,297,429
4,297,430
215 4,297,431
4,297,432
270 4,297,433
4,297,434
4,297,435
310 4,297,436
376 4,297,437
377 4,297,438
434 4,297,439
505 4,297,440
543 4,297,441

**CLASS 431**

10 4,297,093
202 4,297,094

**CLASS 432**

59 4,297,095

**CLASS 435**

128 4,297,096

**CLASS 440**

59 4,297,097

**CLASS 474**

262 4,296,640

**CLASS 501**

2 4,297,139
67 4,297,141
77 4,297,142
103 4,297,143

**CLASS 521**

107 4,297,442
129 4,297,443
160 4,297,444

**CLASS 525**

52 4,297,445
66 4,297,446
133 4,297,447
162 4,297,448
329 4,297,449
333 4,297,450
366 4,297,451
367 4,297,452
408 4,297,453
432 4,297,454
439 4,297,455
452 4,297,456
507 4,297,457
4,297,458
4,297,459

**CLASS 526**

98 4,297,460
100 4,297,461
125 4,297,462
128 4,297,463
141 4,297,465
181 4,297,464
218 4,297,466
259 4,297,467
276 4,297,468
287 4,297,469
304 4,297,470
328 4,297,471

**CLASS 528**

84 4,297,472
144 4,297,473
170 4,297,474
271 4,297,475
287 Re.30,783
300 4,297,476
323 4,297,477
336 4,297,478
4,297,479
346 4,297,480
392 4,297,481
405 4,297,482
423 4,297,484
500 4,297,483

**CLASS 536**

10 4,297,485
17 R 4,297,486

**CLASS 542**

412 4,297,487

**CLASS 544**

21 4,297,488
27 4,297,489
55 4,297,490
105 4,297,491
211 4,297,492
241 4,297,493
267 4,297,494
330 4,297,495
332 4,297,496
384 4,297,497

**CLASS 546**

116 4,297,498

**CLASS 556**

465 4,297,499
466 4,297,500

**CLASS 560**

24 4,297,501
35 4,297,502
42 4,297,503
119 4,297,504
219 4,297,505
246 4,297,506

**CLASS 562**

416 4,297,507
425 4,297,508
456 4,297,509

**CLASS 564**

13 4,297,510
331 4,297,511
490 4,297,512

**CLASS 568**

43 4,297,513
321 4,297,514
329 4,297,515
330 4,297,516
361 4,297,517
385 4,297,518
424 4,297,519
426 4,297,520

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 25 | 261,445 | | 38 | 261,466 | | 111 | 261,489 | | | 261,510 | | 91 | 261,533 | | 74 | 261,554 |
| | 190 | 261,447 | | 74 | 261,467 | D11— | 158 | 261,490 | | 68 | 261,511 | D21— | 10 | 261,534 | | | 261,555 |
| | 309 | 261,446 | | 128 | 261,468 | D12— | 142 | 261,491 | | 73 | 261,512 | | 15 | 261,535 | D26— | 51 | 261,556 |
| D3— | 65 | 261,448 | | 129 | 261,469 | | 143 | 261,492 | D15— | 5 | 261,513 | | 20 | 261,536 | | 87 | 261,557 |
| D6— | 23 | 261,449 | | | 261,470 | | | 261,493 | | 92 | 261,516 | | 34 | 261,537 | | | 261,558 |
| | 26 | 261,450 | | | 261,471 | | 146 | 261,494 | | 98 | 261,517 | | 86 | 261,538 | | | 261,559 |
| | 63 | 261,451 | | 155 | 261,472 | | | 261,495 | | 118 | 261,518 | | 120 | 261,540 | | | 261,560 |
| | 86 | 261,452 | | 212 | 261,475 | | 147 | 261,496 | | 134 | 261,519 | | | 261,541 | | 88 | 261,561 |
| | 87 | 261,453 | D8— | 30 | 261,476 | | | 261,497 | | 150 | 261,520 | | 211 | 261,539 | | 111 | 261,562 |
| | 113 | 261,454 | | 98 | 261,477 | | 148 | 261,498 | | | 261,521 | | 226 | 261,542 | D28— | 13 | 261,563 |
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| | | 261,457 | | 341 | 261,479 | | 194 | 261,501 | | 44 | 261,524 | D22— | 7 | 261,545 | | 64 | 261,566 |
| | | 261,458 | | | 261,481 | | 211 | 261,502 | | 115 | 261,525 | | 31 | 261,546 | | 67 | 261,567 |
| | | 261,459 | | | 261,482 | D13— | 11 | 261,503 | D17— | 21 | 261,526 | D23— | 34 | 261,547 | | 77 | 261,568 |
| | | 261,460 | | | 261,484 | | 24 | 261,504 | | | 261,527 | | 57 | 261,548 | D32— | 18 | 261,473 |
| | 162 | 261,461 | | | 261,485 | | 32 | 261,505 | D18— | 7 | 261,528 | D24— | 3 | 261,549 | | 21 | 261,514 |
| | | 261,462 | | 342 | 261,483 | D14— | 6 | 261,506 | | 34 | 261,529 | | 9 | 261,550 | | 23 | 261,515 |
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| D7— | 19 | 261,465 | | 78 | 261,488 | | 65 | 261,509 | | 64 | 261,532 | D25— | 22 | 261,553 | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | |
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| P.— | 68 | 4,781 | | 69 | 4,782 | | 72 | 4,783 | | | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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| 6 : | 4,296,654 | | 4,296,927 | | 4,297,704 | | 4,296,861 | | 4,296,665 | | 4,296,670 |
| | 4,296,766 | | 4,296,955 | | 4,297,738 | | 4,297,095 | | 4,296,671 | | 4,296,733 |
| 01 : | 4,296,669 | | 4,296,968 | 08 : | 4,296,634 | | 4,297,309 | | 4,296,674 | | 4,296,737 |
| | 4,296,820 | | 4,296,970 | | 4,296,756 | | 4,297,728 | | 4,296,784 | | 4,296,785 |
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| | 4,297,578 | | 4,297,683 | | 4,297,425 | | 4,297,399 | | 4,297,261 | | 4,297,723 |
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| | 4,296,759 | 36 : | 4,296,497 | | 4,297,458 | | 4,297,668 | | 4,297,370 | 50 : | 4,297,692 |
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| 32 : | 4,296,566 | | 4,296,610 | | 4,297,626 | | 4,296,941 | 45 : | 4,297,212 | | 4,297,677 |
| 33 : | 4,296,555 | | 4,296,632 | | 4,297,701 | | 4,297,094 | | 4,297,639 | | 4,297,699 |
| | 4,296,792 | | 4,296,655 | | 4,297,717 | | 4,297,445 | 46 : | 4,296,834 | 53 : | 4,296,897 |
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| | 4,297,522 | | 4,296,734 | | 4,297,046 | | 4,297,460 | | 4,296,721 | | 4,297,120 |
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| | 4,297,625 | | 4,296,751 | | 4,297,223 | | 4,297,506 | | 4,296,904 | | 4,297,164 |
| | 4,297,667 | | 4,296,788 | | 4,297,559 | | 4,297,745 | | 4,297,065 | | 4,297,377 |
| 34 : | 4,296,518 | | 4,296,877 | 38 : | 4,296,695 | 41 : | 4,296,540 | 48 : | 4,296,584 | | 4,297,680 |
| | 4,296,535 | | 4,296,880 | 39 : | 4,296,599 | | 4,296,562 | | 4,296,678 | 54 : | 4,297,239 |
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| 01 : | 261,550 | 08 : | 261,555 | | 261,529 | 26 : | 261,505 | | 261,458 | | 261,523 |
| 04 : | 261,453 | 09 : | 261,483 | | 261,530 | | 261,544 | | 261,459 | | 261,535 |
| 06 : | 261,448 | 11 : | 261,568 | | 261,547 | 27 : | 261,545 | | 261,460 | 37 : | 261,513 |
| | 261,455 | 12 : | 261,451 | | 261,557 | | 261,551 | | 261,461 | 39 : | 261,465 |
| | 261,463 | | 261,520 | | 261,558 | | 261,552 | | 261,462 | | 261,491 |
| | 261,477 | | 261,521 | | 261,559 | | 261,566 | | 261,467 | | 261,495 |
| | 261,480 | | 261,536 | | 261,560 | 28 : | 261,472 | | 261,479 | | 261,533 |
| | 261,488 | 17 : | 261,466 | | 261,563 | 29 : | 261,486 | | 261,481 | | 261,548 |
| | 261,504 | | 261,469 | 18 : | 261,452 | | 261,519 | | 261,482 | 41 : | 261,546 |
| | 261,507 | | 261,470 | | 261,475 | | 261,549 | | 261,484 | 42 : | 261,537 |
| | 261,510 | | 261,471 | 20 : | 261,450 | 34 : | 261,501 | | 261,485 | 47 : | 261,553 |
| | 261,517 | | 261,476 | 24 : | 261,569 | | 261,540 | | 261,506 | 48 : | 261,478 |
| | 261,525 | | 261,499 | 25 : | 261,454 | | 261,541 | | 261,508 | | 261,500 |
| | 261,526 | | 261,503 | | 261,489 | 36 : | 261,445 | | 261,512 | | 261,538 |
| | 261,527 | | 261,509 | | 261,542 | | 261,449 | | 261,516 | 53 : | 261,522 |
| | 261,539 | | 261,511 | | 261,556 | | 261,456 | | 261,518 | 55 : | 261,567 |
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